



POWER SUPPLY DESIGN CHECK LIST

COMPANY NAME: TDK-LAMBDA

MODEL NAME: CSS500-12

REVISION: A

| APPROVAL BY | CHECKED BY | PREPARED BY | DATE |
|-------------|------------|-------------|-----------|
| | | Sam | 1/29/2010 |



POWER SUPPLY DESIGN CHECK LIST

| | | | |
|------------|-----------|------------|-----------|
| MODEL NAME | CSS500-12 | TOTAL PAGE | 88 |
| P.M. | Jack | DATE | 1/29/2010 |

| NO. | TEST ITEM | SPEC. | NAME. | PAGE | RESULT |
|-----|---------------------------------------|--------------------|-------|---------|--------|
| 1 | INRUSH CURRENT | Max. 50.0 A | Sam | 4 | OK |
| 2 | LINE REGULATION | Max. 0.5% | Sam | 5 | OK |
| | | Min. -0.5% | | | |
| 3 | LOAD REGULATION | Max. 1.0% | Sam | 6 | OK |
| | | Min. -1.0% | | | |
| 4 | POWER SUPPLY CHARACTERISTICS | | | | |
| 4.1 | INPUT CURRENT | Max. 6.0 A | Sam | 7 | OK |
| 4.2 | INPUT POWER AND EFFICIENCY | Pin 602.4 W | Sam | 8 | OK |
| | | η 83% | | | |
| 4.3 | POWER FACTOR (P.F.) | Min. 0.9 | Sam | 9 | OK |
| 4.4 | POWER CONSUMPTION | Max. N/A | Primo | 10 | Ref. |
| 5 | RIPPLE AND NOISE | Max. 120mV | Primo | 11~11-1 | OK |
| 6 | O.C.P. | Max. --- | --- | 12 | --- |
| | | Min. --- | | | |
| 7 | O.P.P. | Max. 150% | Primo | 13 | OK |
| | | Min. 110% | | | |
| 8 | O.V.P. | Max. 15.6 V | Primo | 14 | OK |
| | | Min. 13.2 V | | | |
| 9 | HOLD UP TIME | Min. 20 ms | Primo | 15 | OK |
| 10 | TURN ON DELAY TIME | Max. 2 s | Primo | 16~16-1 | OK |
| 11 | RISE TIME AND FALL TIME | Max. 100 ms | Primo | 17~18 | OK |
| 12 | OVER SHOOT AND UNDER SHOOT | Max. 5% | Primo | 19~20 | OK |
| | | Min. -5% | | | |
| 13 | OUTPUT SHORT POWER DISSIPATION | Max. N/A | Primo | 21 | Ref. |
| 14 | TRANSIENT RESPONSE AND DEVIATION TEST | Max. 5% | Primo | 22~22-5 | OK |
| | | Min. -5% | | | |
| 15 | HI-POT AND INSULATION | Max. 5 mA | Primo | 23 | OK |
| | | Min. 10 M Ω | | | |
| 16 | PRI. - SEC. LEAKAGE CURRENT | Max. --- | Primo | 24 | OK |



1 . INRUSH CURRENT TEST

Test Condition :

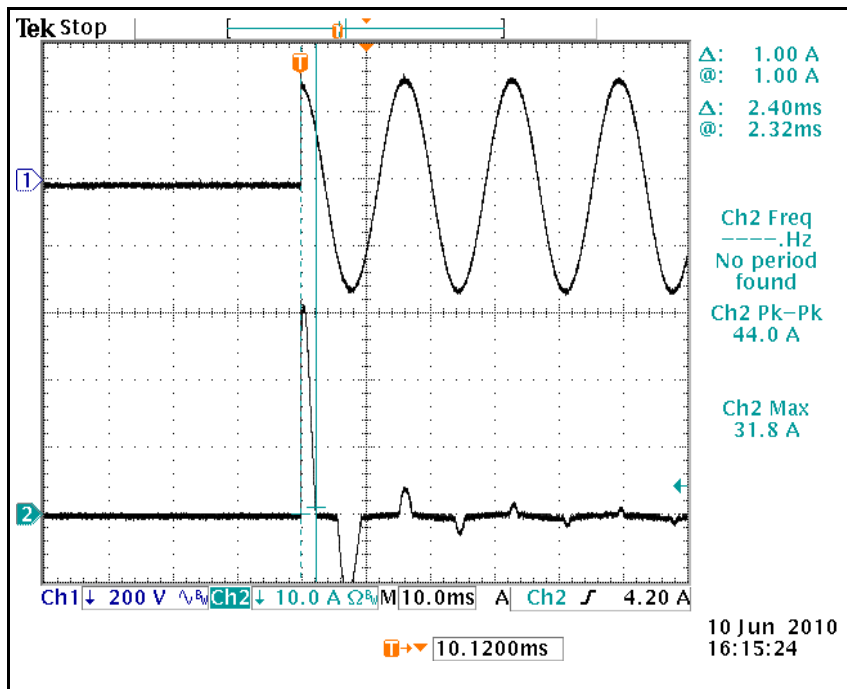
| | | |
|---|-----------------|-----------------|
| 1 | Input Voltage | 230Vac / 264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. |
|------|--------------|--------------|---------------------|
| 1 | AC Source | Chroma | 6520 |
| 2 | DC Load | Chroma | 63106 |
| 3 | Oscilloscope | Tektronix | TDS3054B |

Test Waveform :

| Inrush Current Test Result | | | | | | | | OK |
|----------------------------|---------------|-----------------|-------------|-----------|------------------|------------|------------------|-------|
| Test Item | Input Voltage | Output Load (A) | Measured | | | SPEC. | | OK/NG |
| | | | Current (A) | Time (ms) | i ² T | Max. Curr. | i ² T | |
| 1 | 230V / 60Hz | 41.67 A | 31.8 A | 2.4 ms | 2.43 | 50 A | 345.6 | OK |
| 2 | 264V / 60Hz | 41.67 A | 39.8 A | 2.4 ms | 3.80 | 50 A | 345.6 | OK |



| MEASUREMENT INFO. | | |
|-------------------|---------------|-----|
| AC SOURCE | 230 | V |
| AC FREQUENCY | 60 | Hz |
| APPLIED PHASE | 90 | Deg |
| OUTPUT LOAD | 41.67 | A |
| TEST RESULT | | |
| INRUSH CURR. | 31.8 | A |
| i ² T | 2.43 | |
| WAVE | | |
| CH1 | Input Voltage | |
| CH2 | Input Current | |



2 . LINE REGULATION TEST

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Shenq Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

Ambient temperature : 25°C

| Rate output voltage : | | $\% = \{V_o(\text{high line}) - V_o(\text{low line})\} / V_o(\text{nominal line})$ | | | | |
|-----------------------------|---------------|--|--------------------------------|-------------------------|--------|-------|
| Line Regulation Test Result | | | | | | OK |
| Test Item | Input Voltage | Output Load (A) | Measured (V) (Mean or Ave.) | Measured Regulation (%) | | OK/NG |
| 1 | 90V | 41.67 A | 11.958 V | 115V | 0.008% | OK |
| | 115V | 41.67 A | 11.958 V | | | |
| | 230V | 41.67 A | 11.958 V | 230V | 0.008% | |
| | 264V | 41.67 A | 11.959 V | | | |
| | Max. SPEC. | Max. | 0.5% | | | |
| Min. | | -0.5% | | | | |



3 . LOAD REGULATION TEST

Test Condition :

| | | | | | | | |
|---|-----------------|-----------|---------|-----------|---------|-----------|-------|
| 1 | Input Voltage | 90~264Vac | | | | | |
| 2 | Input Frequency | 60Hz | | | | | |
| 3 | Output Load | Max. Load | 41.66 A | Half Load | 20.83 A | Min. Load | 0.0 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Shenq Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

Ambient temperature : 25°C

| Rate output voltage : | | $\% = \{Vo(\text{Max. Load}) - Vo(\text{Min. Load})\} / Vo(\text{Half Load})$ | | | | | | |
|-----------------------------|---------------|---|--------------------------------|----------|---------|------|---------|----|
| Load Regulation Test Result | | | | | | | | |
| Test Item | Input Voltage | Output Load (A) | Measured (V) (Mean or Ave.) | % | SPEC. | | OK / NG | |
| | | | | | MIN. | MAX. | | |
| 1 | 90V | MAX. | 41.67 A | 11.905 V | -0.750% | -1% | 1% | OK |
| | | HALF | 20.83 A | 11.995 V | | | | |
| | | MIN. | 0.0 A | 12.056 V | 0.509% | | | |
| | 115V | MAX. | 41.67 A | 11.906 V | -0.742% | -1% | 1% | OK |
| | | HALF | 20.83 A | 11.995 V | | | | |
| | | MIN. | 0.0 A | 12.056 V | 0.509% | | | |
| | 230V | MAX. | 41.67 A | 11.907 V | -0.734% | -1% | 1% | OK |
| | | HALF | 20.83 A | 11.995 V | | | | |
| | | MIN. | 0.0 A | 12.056 V | 0.509% | | | |
| | 264V | MAX. | 41.67 A | 11.906 V | -0.742% | -1% | 1% | OK |
| | | HALF | 20.83 A | 11.995 V | | | | |
| | | MIN. | 0.0 A | 12.056 V | 0.509% | | | |



4 . POWER SUPPLY CHARACTERISTICS

1 . INPUT CURRENT :

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|-------------|--------------|---------------------|----------------|
| 1 | AC Source | Shenq Yann | SA101 | 2010.10.12 |
| 2 | DC Load | Prodigit | 3311D | 2010.07.30 |
| 3 | Power Meter | Chroma | 2100 | 2010.07.11 |

Ambient temperature : 25°C

| Test Item | Input Current Test Result | | | | OK |
|-----------|---------------------------|-----------------|--------------|---------------------|-------|
| | Input Voltage | Output Load (A) | Measured (A) | Max. SPEC. (115Vac) | OK/NG |
| 1 | 90V | 41.67 A | 6.81 A | 6.0 A | Ref. |
| | 115V | 41.67 A | 5.03 A | 6.0 A | OK |
| | 230V | 41.67 A | 2.60 A | 6.0 A | OK |
| | 264V | 41.67 A | 2.34 A | 6.0 A | OK |



4 . POWER SUPPLY CHARACTERISTICS

2 . INPUT POWER & EFFICIENCY :

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|-------------|--------------|---------------------|----------------|
| 1 | AC Source | Shenq Yann | SA101 | 2010.10.12 |
| 2 | DC Load | Prodigit | 3311D | 2010.07.30 |
| 3 | Power Meter | Chroma | 2100 | 2010.07.11 |

Ambient temperature : 25°C

| Input Power & Efficiency Test Result | | | | | | OK |
|--------------------------------------|---------------|-----------------|-----------|-----------|----------------|-------|
| Test Item | Input Voltage | Output Load (A) | I / P (W) | O / P (W) | Efficiency (%) | OK/NG |
| 1 | 90V | 41.67 A | 609.0 W | 495.8 W | 81.41% | Ref. |
| | 115V | 41.67 A | 588.0 W | 495.7 W | 84.30% | OK |
| | 230V | 41.67 A | 567.9 W | 495.7 W | 87.29% | OK |
| | 264V | 41.67 A | 567.4 W | 495.7 W | 87.36% | OK |
| SPEC. | Input Power | MAX. | 602.41 W | | | |
| | Efficiency | MIN.(115Vac) | 83.0% | | | |



4 . POWER SUPPLY CHARACTERISTICS

3 . POWER FACTOR (P.F.) :

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|-------------|--------------|---------------------|----------------|
| 1 | AC Source | Shenq Yann | SA101 | 2010.10.12 |
| 2 | DC Load | Prodigit | 3311D | 2010.07.30 |
| 3 | Power Meter | Chroma | 2100 | 2010.07.11 |

Ambient temperature : 25°C

| Test Item | Power Factor Test Result | | | | OK |
|-----------|--------------------------|-----------------|----------|------------|-------|
| | Input Voltage | Output Load (A) | Measured | MIN. SPEC. | OK/NG |
| 1 | 90V | 41.67 A | 0.996 | 0.9 | OK |
| | 115V | 41.67 A | 0.999 | 0.9 | OK |
| | 230V | 41.67 A | 0.946 | 0.9 | OK |
| | 264V | 41.67 A | 0.917 | 0.9 | OK |



4 . POWER SUPPLY CHARACTERISTICS

4 . POWER CONSUMPTION :

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 0.0 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|-------------|--------------|---------------------|----------------|
| 1 | AC Source | Shenq Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Power Meter | Chroma | 2100 | 2010.07.11 |

Ambient temperature : 25°C

| Test Item | Power Consumption Test Result | | | | Ref. |
|-----------|-------------------------------|-----------------|--------------|------------|-------|
| | Input Voltage | Output Load (A) | Measured (W) | MAX. SPEC. | OK/NG |
| 1 | 90V | 0.0 A | 15.41 W | N/A | Ref. |
| | 115V | 0.0 A | 15.06 W | N/A | Ref. |
| | 230V | 0.0 A | 13.88 W | N/A | Ref. |
| | 264V | 0.0 A | 12.27 W | N/A | Ref. |



5 . RIPPLE AND NOISE

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Shenq Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

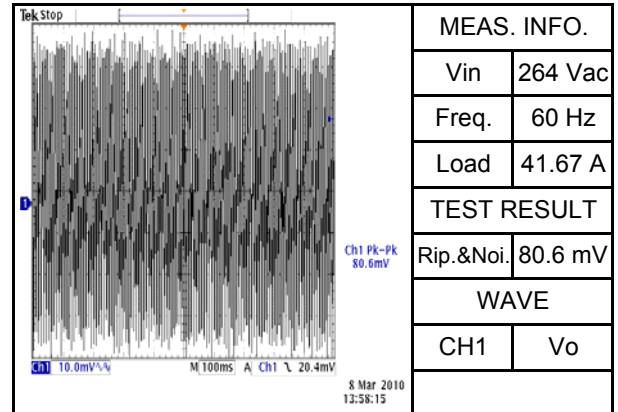
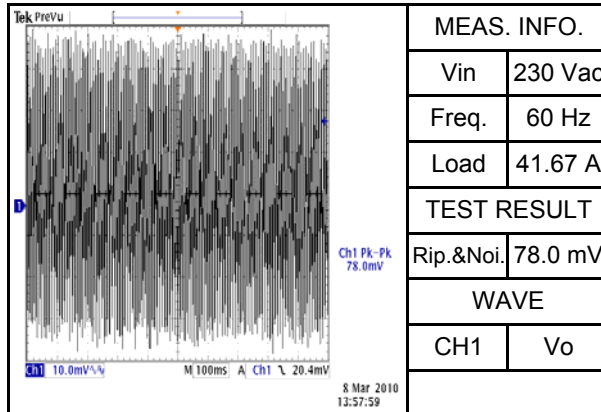
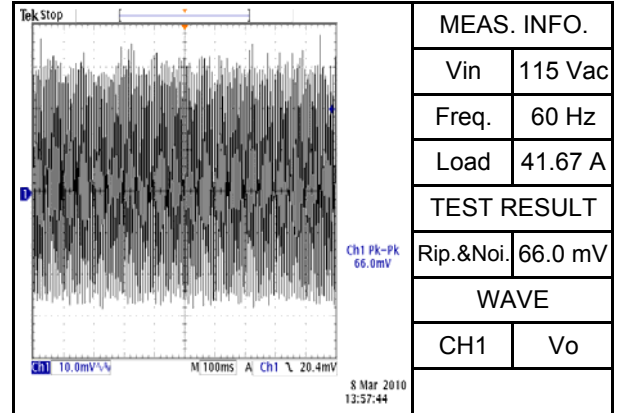
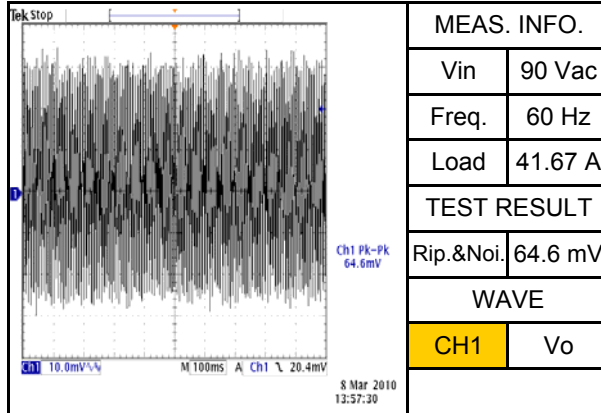
Ambient temperature : 25°C

| Test Item | Ripple & Noise Test Result | | | | OK |
|-----------|----------------------------|-----------------|------------------|-------------|-------|
| | Input Voltage | Output Load (A) | Measured (mVp-p) | MAX. SPEC. | OK/NG |
| 1 | 90V | 41.67 A | 64.6 mVp-p | 120.0 mVp-p | OK |
| | 115V | 41.67 A | 66.0 mVp-p | 120.0 mVp-p | OK |
| | 230V | 41.67 A | 78.0 mVp-p | 120.0 mVp-p | OK |
| | 264V | 41.67 A | 80.6 mVp-p | 120.0 mVp-p | OK |

5 . RIPPLE AND NOISE

Test Waveform :

Ambient temperature : 25°C





7 . OVER POWER PROTECTION (O.P.P.)

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Sheng Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

Ambient temperature :25 °C

| Test Item | Over Power Protection (O.P.P.) Test Result | | | | | | OK |
|-----------|--|-----------------|--------------|------------|-------|------|-------|
| | Input Voltage | Output Power(W) | Measured (W) | O.P.P. (%) | SPEC. | | OK/NG |
| | | | | | MIN. | MAX. | |
| 1 | 90V | 500.0 W | 628.5 W | 125.70% | 110% | 150% | OK |
| | 115V | 500.0 W | 643.6 W | 128.72% | 110% | 150% | OK |
| | 230V | 500.0 W | 633.5 W | 126.70% | 110% | 150% | OK |
| | 264V | 500.0 W | 633.5 W | 126.70% | 110% | 150% | OK |



8 . OVER VOLTAGE PROTECTION (O.V.P.)

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Shenq Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

Ambient temperature : 25°C

| Test Item | Over Voltage Protection (O.V.P.) Test Result | | | | | | | OK |
|-----------|--|-----------------|--------------|------------|--------|--------|--------|-------|
| | Input Voltage | Output Load (A) | Measured (V) | O.V.P. (%) | SPEC. | | | OK/NG |
| | | | | | MIN. | NOR. | MAX. | |
| 1 | 90V | 41.67 A | 15.3 V | 128% | 13.2 V | 12.0 V | 15.6 V | OK |
| | 115V | 41.67 A | 15.3 V | 128% | 13.2 V | 12.0 V | 15.6 V | OK |
| | 230V | 41.67 A | 15.3 V | 128% | 13.2 V | 12.0 V | 15.6 V | OK |
| | 264V | 41.67 A | 15.2 V | 127% | 13.2 V | 12.0 V | 15.6 V | OK |



9 . HOLD UP TIME

Test Condition :

| | | |
|---|-------------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load (70%) | 29.17 A |

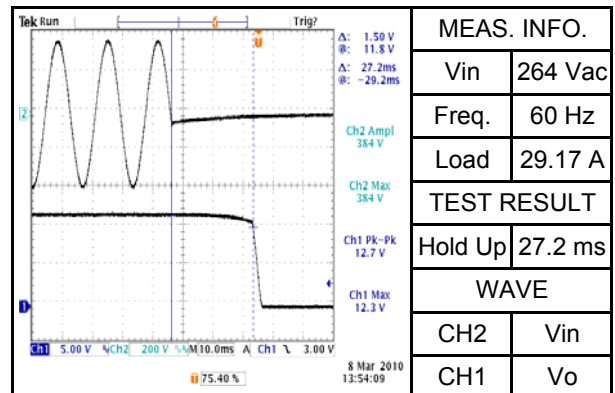
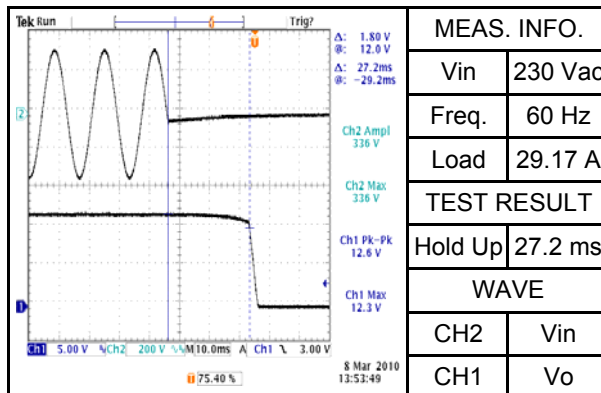
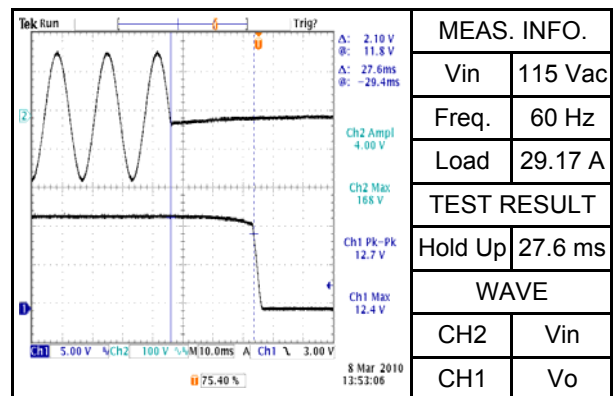
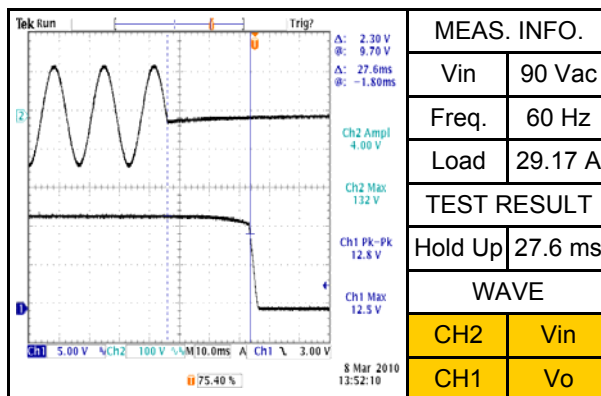
Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Shenq Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

Ambient temperature : 25°C

| Hold Up Time Test Result | | | | | OK |
|--------------------------|---------------|-----------------|---------------|------------|-------|
| Test Item | Input Voltage | Output Load (A) | Measured (ms) | MIN. SPEC. | OK/NG |
| 1 | 90V | 29.17 A | 27.6 ms | 20 ms | OK |
| | 115V | 29.17 A | 27.6 ms | 20 ms | OK |
| | 230V | 29.17 A | 27.2 ms | 20 ms | OK |
| | 264V | 29.17 A | 27.2 ms | 20 ms | OK |

Test Waveform :





10 . TURN ON DELAY TIME

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Sheng Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

Ambient temperature : 25°C

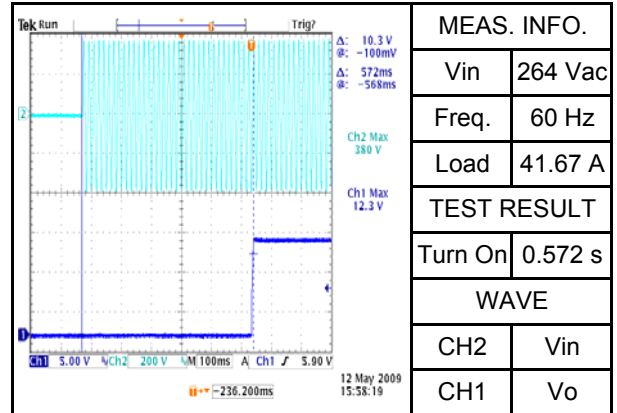
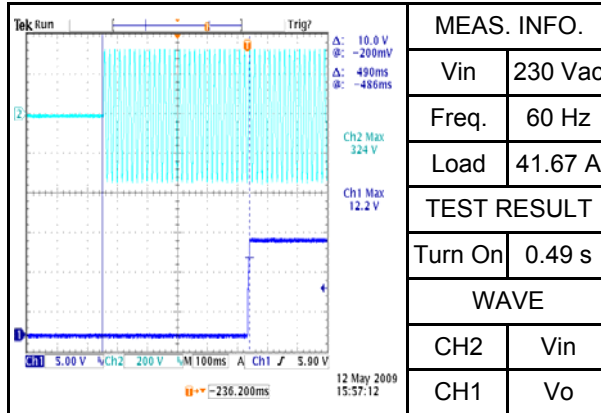
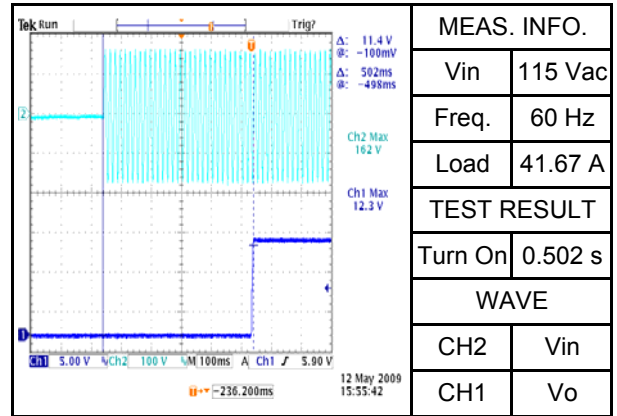
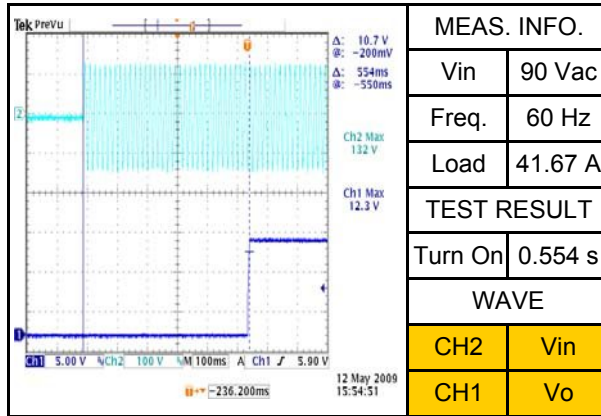
| Test Item | Turn On Delay Time Test Result | | | | OK |
|-----------|--------------------------------|-----------------|--------------|------------|-------|
| | Input Voltage | Output Load (A) | Measured (s) | MAX. SPEC. | OK/NG |
| 1 | 90V | 41.67 A | 0.554 s | 2 s | OK |
| | 115V | 41.67 A | 0.502 s | 2 s | OK |
| | 230V | 41.67 A | 0.490 s | 2 s | OK |
| | 264V | 41.67 A | 0.572 s | 2 s | OK |



10 . Turn On Delay Time

Test Waveform :

Ambient temperature : 25 °C





11 . RISE TIME AND FALL TIME

Test Condition : RISE TIME :

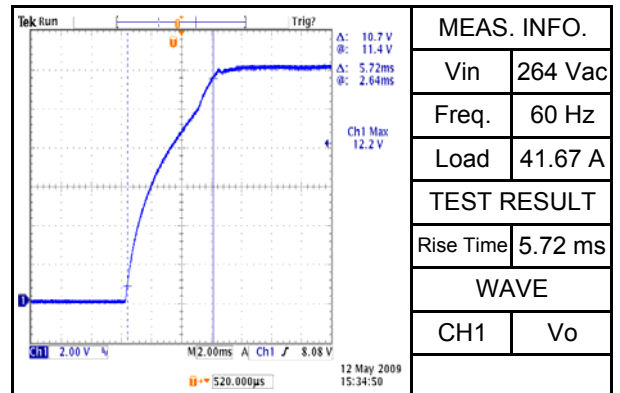
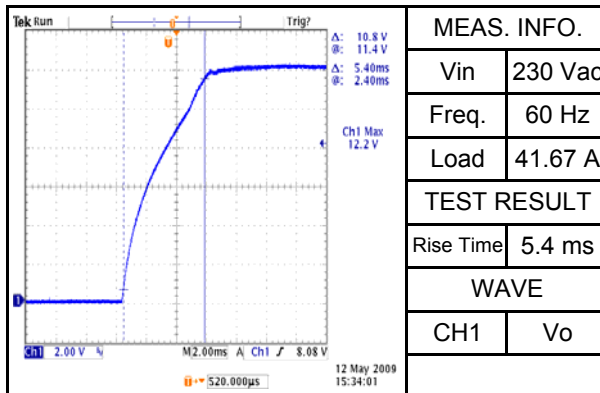
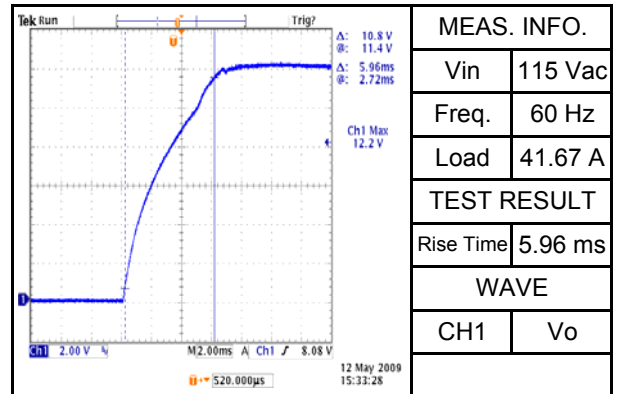
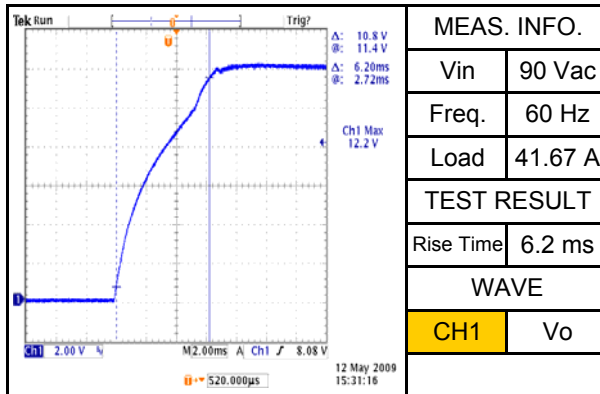
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|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Sheng Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

| Rise Time Test Result | | | | | OK |
|-----------------------|---------------|-----------------|---------------|------------|-------|
| Test Item | Input Voltage | Output Load (A) | Measured (ms) | MAX. SPEC. | OK/NG |
| 1 | 90V | 41.67 A | 6.2 ms | 100.0 ms | OK |
| | 115V | 41.67 A | 5.96 ms | 100.0 ms | OK |
| | 230V | 41.67 A | 5.4 ms | 100.0 ms | OK |
| | 264V | 41.67 A | 5.72 ms | 100.0 ms | OK |

Test Waveform :





11 . RISE TIME AND FALL TIME

Test Condition : FALL TIME

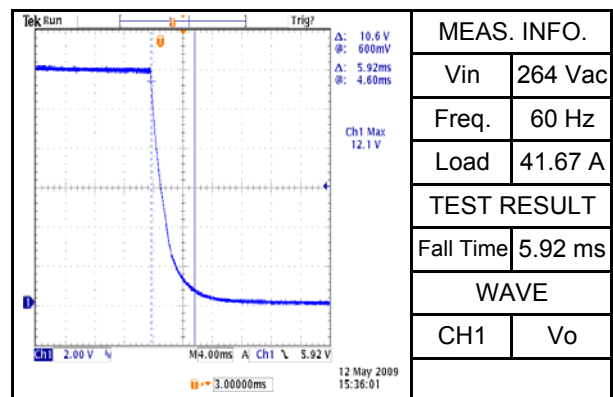
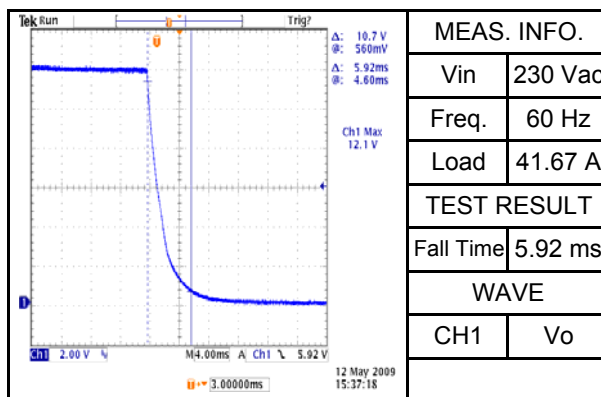
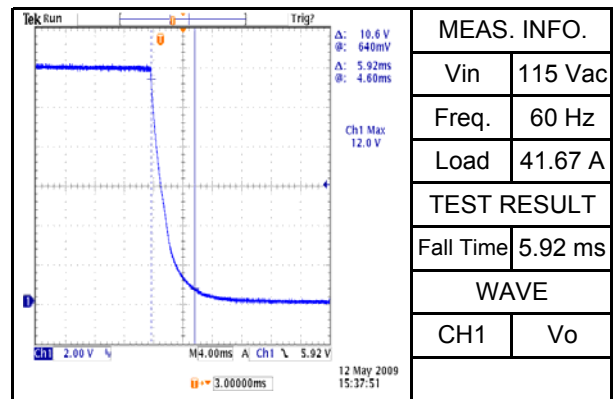
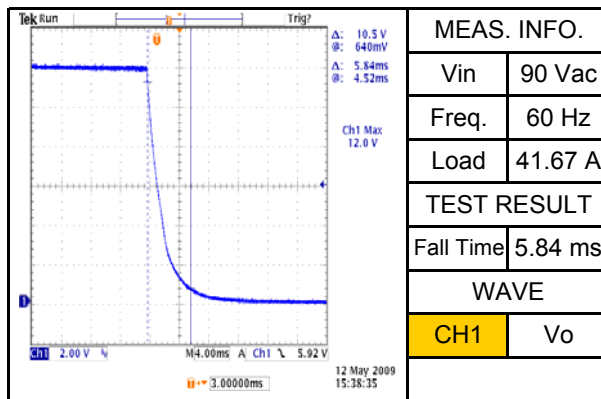
| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Shenq Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

| Fall Time Test Result | | | | | OK |
|-----------------------|---------------|-----------------|---------------|------------|-------|
| Test Item | Input Voltage | Output Load (A) | Measured (ms) | MAX. SPEC. | OK/NG |
| 1 | 90V | 41.67 A | 5.84 ms | 100.0 ms | OK |
| | 115V | 41.67 A | 5.92 ms | 100.0 ms | OK |
| | 230V | 41.67 A | 5.92 ms | 100.0 ms | OK |
| | 264V | 41.67 A | 5.92 ms | 100.0 ms | OK |

Test Waveform :





12 . OVER SHOOT AND UNDER SHOOT

1 . OVER SHOOT :

Test Condition :

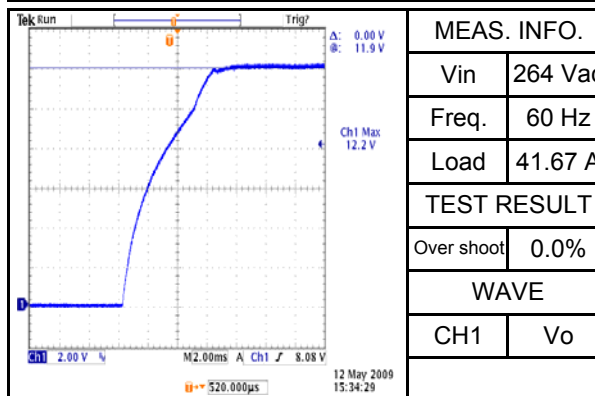
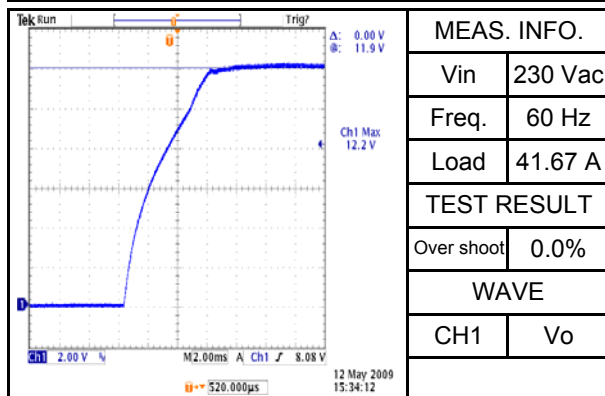
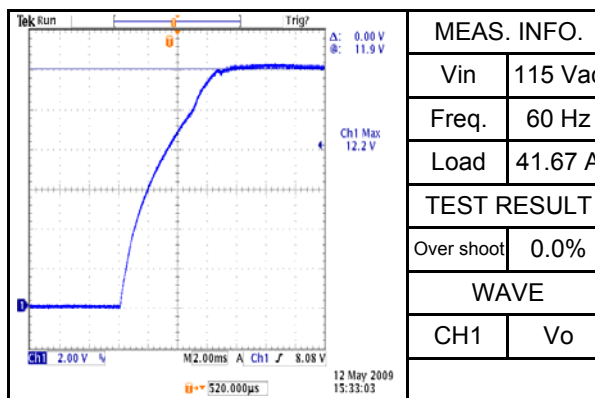
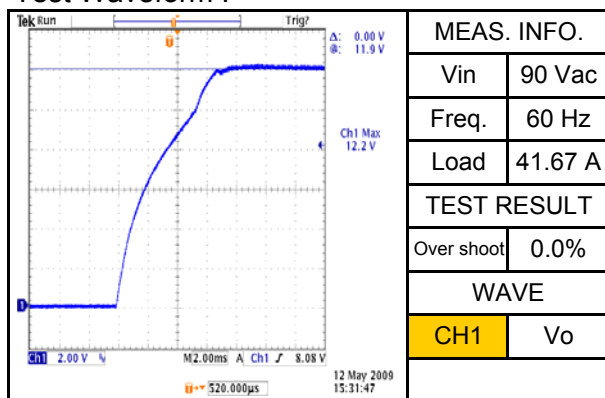
| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Sheng Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

| Over Shoot Test Result | | | | | | OK |
|------------------------|---------------|-----------------|--------------|-------|------|-------|
| Test Item | Input Voltage | Output Load (A) | Measured (%) | SPEC. | | OK/NG |
| | | | | MIN. | MAX. | |
| 1 | 90V | 41.67 A | 0.0% | -5% | 5% | OK |
| | 115V | 41.67 A | 0.0% | -5% | 5% | OK |
| | 230V | 41.67 A | 0.0% | -5% | 5% | OK |
| | 264V | 41.67 A | 0.0% | -5% | 5% | OK |

Test Waveform :





12 . OVER SHOOT AND UNDER SHOOT

2 . UNDER SHOOT :

Test Condition : UNDER SHOOT :

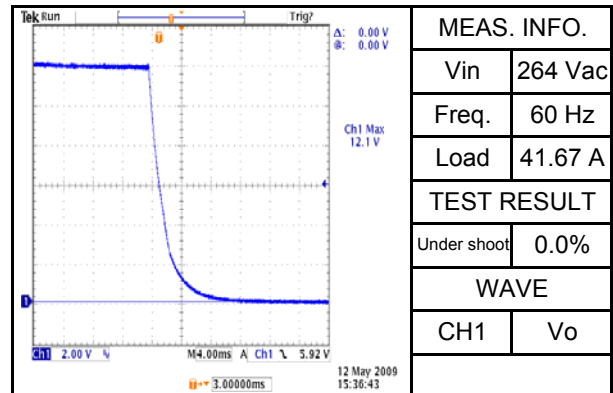
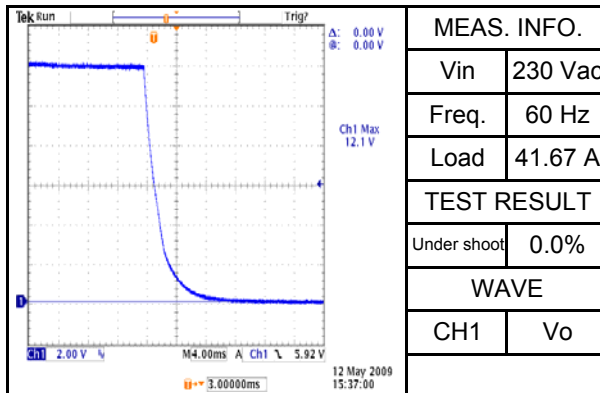
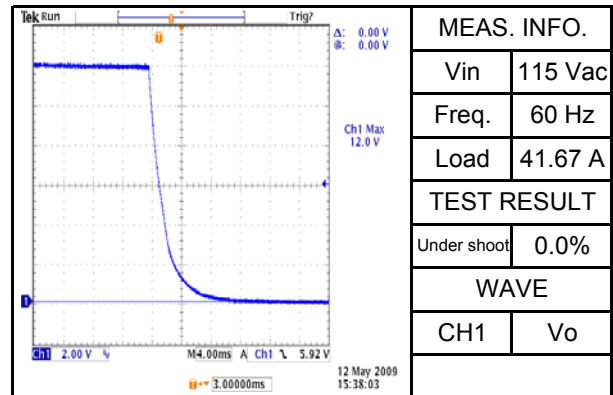
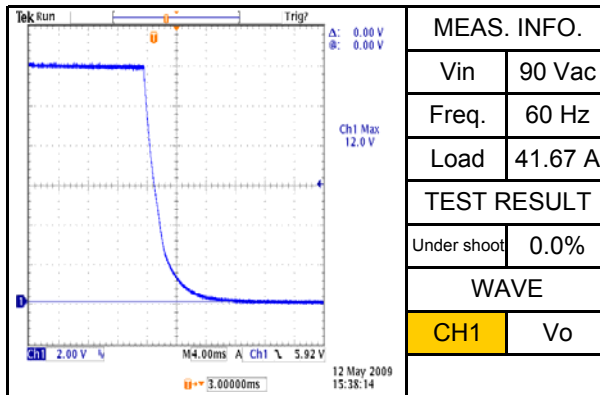
| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Sheng Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

| Under Shoot Test Result | | | | | | OK |
|-------------------------|---------------|-----------------|--------------|-------|------|-------|
| Test Item | Input Voltage | Output Load (A) | Measured (%) | SPEC. | | OK/NG |
| | | | | MIN. | MAX. | |
| 1 | 90V | 41.67 A | 0.0% | -5% | 5% | OK |
| | 115V | 41.67 A | 0.0% | -5% | 5% | OK |
| | 230V | 41.67 A | 0.0% | -5% | 5% | OK |
| | 264V | 41.67 A | 0.0% | -5% | 5% | OK |

Test Waveform :





13 . OUTPUT SHORT POWER DISSIPATION

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | Short |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|-------------|--------------|---------------------|----------------|
| 1 | AC Source | Shenq Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Power Meter | Tektronix | TDS3054B | 2010.07.30 |

| Short O/P Connector Before AC Applied Test Result | | | | | | Ref. |
|---|---------------|-------------|--------------|-----------|--------------|-------|
| Test Item | Input Voltage | Output Load | Measured (W) | SPEC. (W) | Protect Mode | OK/NG |
| 1 | 90V | Short | 24.9 W | N/A | Auto Recover | Ref. |
| | 115V | Short | 22.5 W | N/A | Auto Recover | Ref. |
| | 230V | Short | 25.9 W | N/A | Auto Recover | Ref. |
| | 264V | Short | 24.9 W | N/A | Auto Recover | Ref. |

| Short O/P Connector After AC Applied Test Result | | | | | | Ref. |
|--|---------------|-------------|--------------|-----------|--------------|-------|
| Test Item | Input Voltage | Output Load | Measured (W) | SPEC. (W) | Protect Mode | OK/NG |
| 1 | 90V | Short | 22.6 W | N/A | Auto Recover | Ref. |
| | 115V | Short | 23.8 W | N/A | Auto Recover | Ref. |
| | 230V | Short | 26.1 W | N/A | Auto Recover | Ref. |
| | 264V | Short | 26.3 W | N/A | Auto Recover | Ref. |



13 . TRANSIENT RESPONSE AND DEVIATION TEST

1 . The Setting 0~100% Rate Load

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Sheng Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

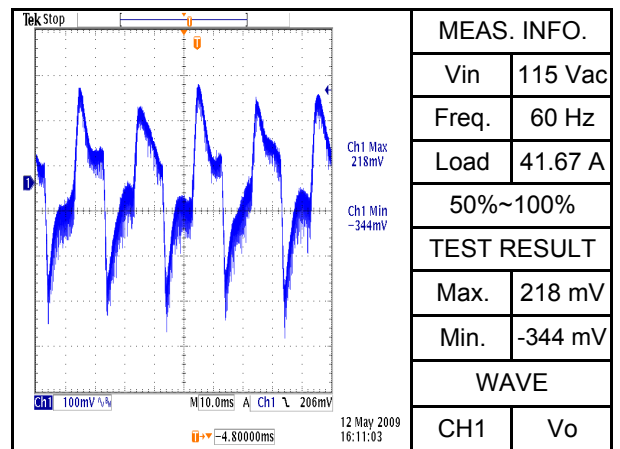
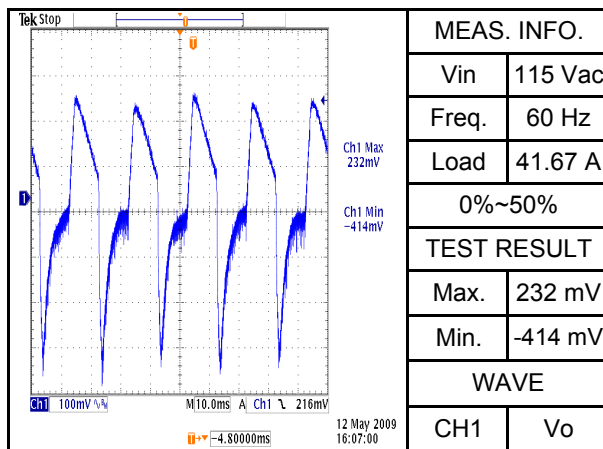
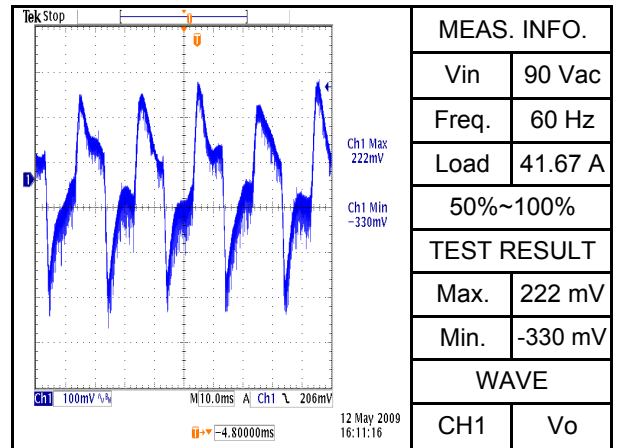
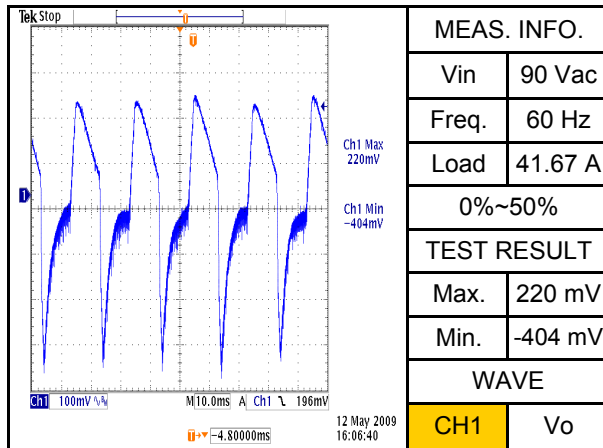
| Transient Response and Deviation Test Result | | | | | | | OK |
|---|--------|----------|-----------|----------|-------------|--------|-------|
| Output Voltage | 12.0 V | Rated | Measured | | Measured(%) | | OK/NG |
| | | | MIN. | MAX. | MIN. | MAX. | |
| Rated input voltage to the primary circuit , and the 0~100% rated load 10ms/1 without load 10ms . (dv/dt:200A/ms or more) | 90V | 0%~50% | -404.0 mV | 220.0 mV | -3.367% | 1.833% | OK |
| | | 50%~100% | -330.0 mV | 222.0 mV | -2.750% | 1.850% | OK |
| | 115V | 0%~50% | -414.0 mV | 232.0 mV | -3.450% | 1.933% | OK |
| | | 50%~100% | -344.0 mV | 218.0 mV | -2.867% | 1.817% | OK |
| | 230V | 0%~50% | -486.0 mV | 254.0 mV | -4.050% | 2.117% | OK |
| | | 50%~100% | -334.0 mV | 236.0 mV | -2.783% | 1.967% | OK |
| | 264V | 0%~50% | -480.0 mV | 276.0 mV | -4.000% | 2.300% | OK |
| | | 50%~100% | -334.0 mV | 240.0 mV | -2.783% | 2.000% | OK |
| SPEC. | | MAX. | 5% | | | | |
| | | MIN. | -5% | | | | |

13 . TRANSIENT RESPONSE AND DEVIATION TEST

1 . The Setting 0~100% Rate Load

Rated input voltage to the primary circuit , and the 0~100% rated load 10ms/1 without load 10ms

Test Waveform :

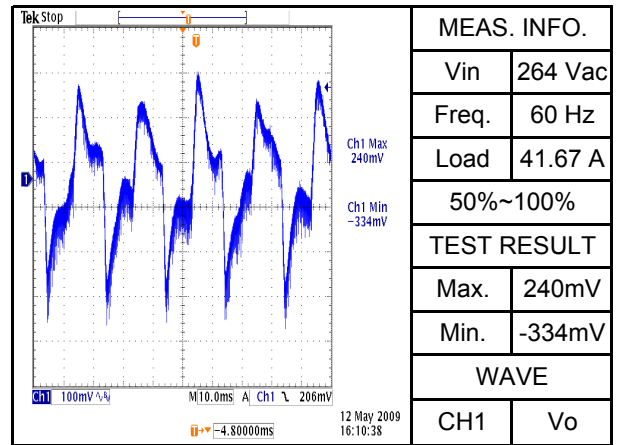
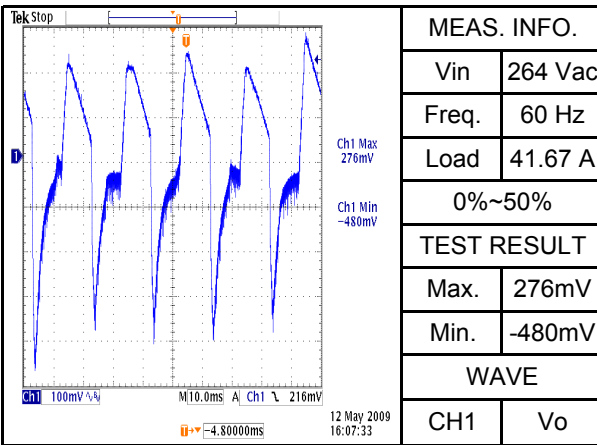
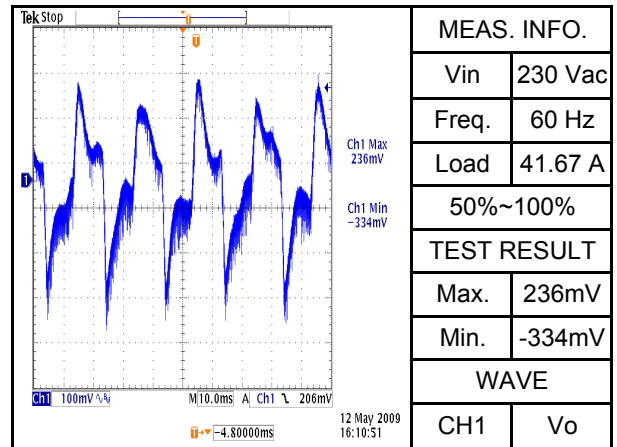
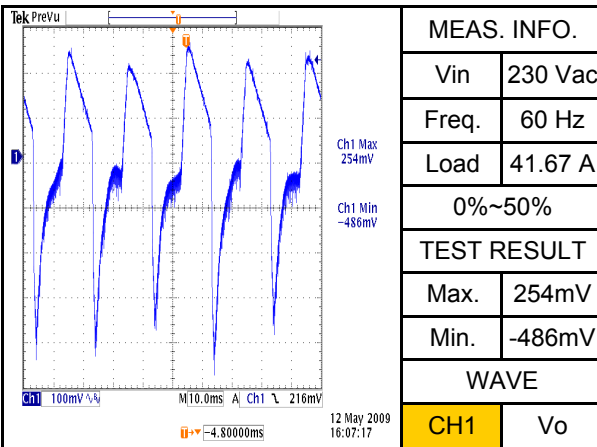


13 . TRANSIENT RESPONSE AND DEVIATION TEST

1 . The Setting 0~100% Rate Load

Rated input voltage to the primary circuit , and the 0~100% rated load 10ms/1 without load 10ms

Test Waveform :





13 . TRANSIENT RESPONSE AND DEVIATION TEST

2 . The Setting 0~100% Rate Load

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Shenq Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

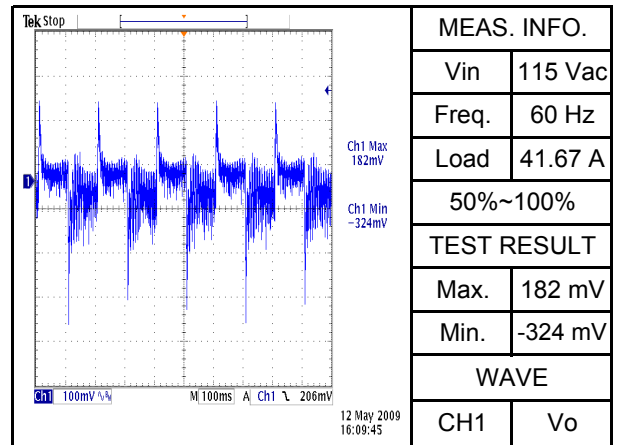
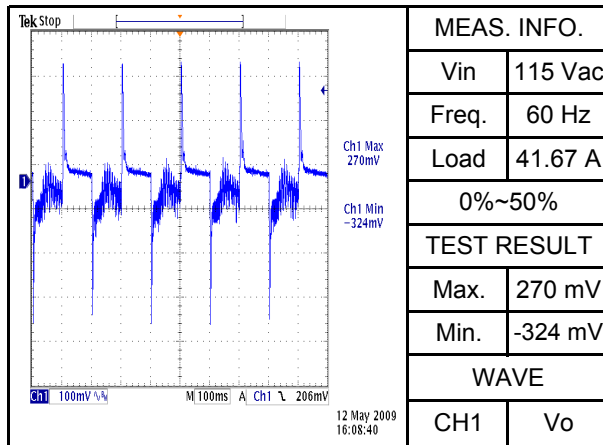
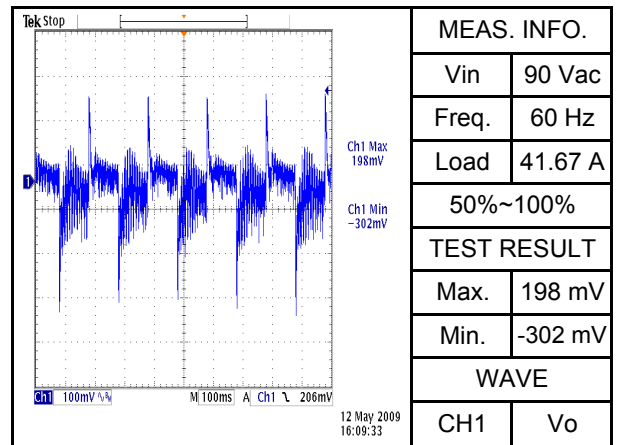
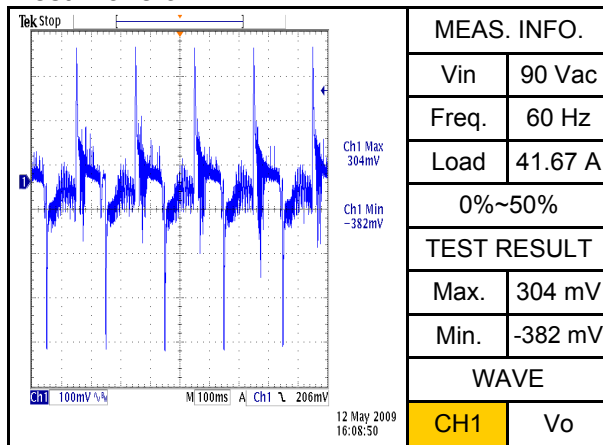
| | | Transient Response and Deviation Test Result | | | | | OK |
|---|--------|--|-----------|----------|-------------|--------|-------|
| Output Voltage | 12.0 V | Rated | Measured | | Measured(%) | | OK/NG |
| | | | MIN. | MAX. | MIN. | MAX. | |
| Rated input voltage to the primary circuit , and the 0~100% rated load 100ms/1 without load 100ms . (dv/dt:200A/ms or more) | 90V | 0%~50% | -382.0 mV | 304.0 mV | -3.183% | 2.533% | OK |
| | | 50%~100% | -302.0 mV | 198.0 mV | -2.517% | 1.650% | OK |
| | 115V | 0%~50% | -324.0 mV | 270.0 mV | -2.700% | 2.250% | OK |
| | | 50%~100% | -324.0 mV | 182.0 mV | -2.700% | 1.517% | OK |
| | 230V | 0%~50% | -310.0 mV | 225.0 mV | -2.583% | 1.875% | OK |
| | | 50%~100% | -310.0 mV | 178.0 mV | -2.583% | 1.483% | OK |
| | 264V | 0%~50% | -306.0 mV | 244.0 mV | -2.550% | 2.033% | OK |
| | | 50%~100% | -360.0 mV | 178.0 mV | -3.000% | 1.483% | OK |
| SPEC. | | MAX. | 5% | | | | |
| | | MIN. | -5% | | | | |

13 . TRANSIENT RESPONSE AND DEVIATION TEST

2 . The Setting 0~100% Rate Load

Rated input voltage to the primary circuit , and the 0~100% rated load 100ms/1 without load 100ms

Test Waveform :

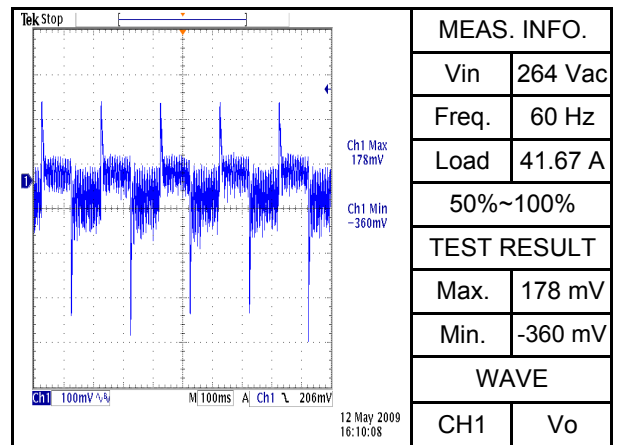
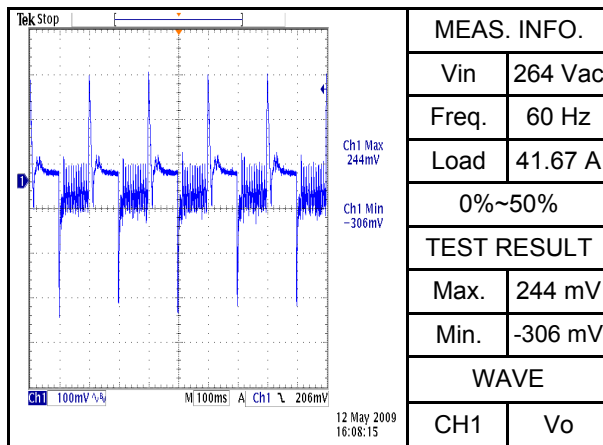
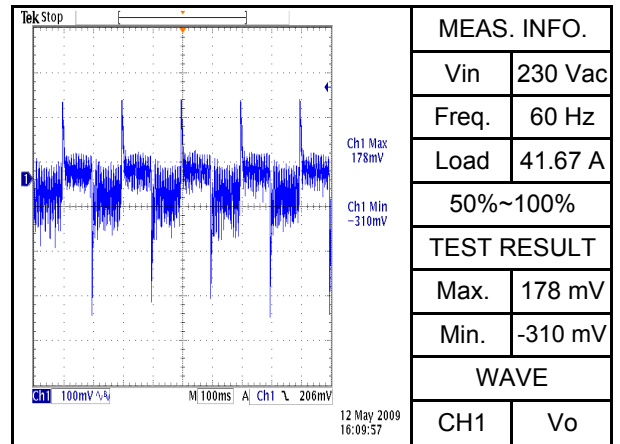
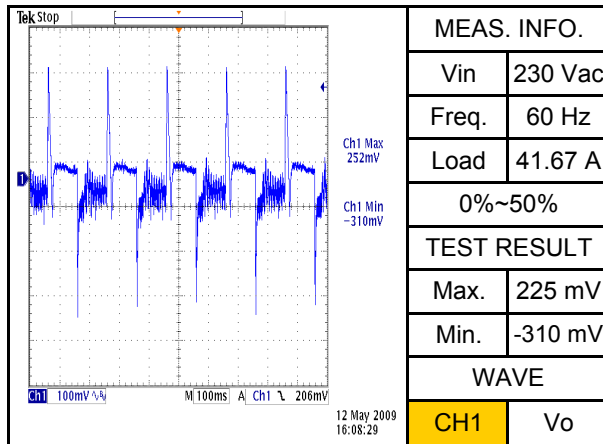


13 . TRANSIENT RESPONSE AND DEVIATION TEST

2 . The Setting 0~100% Rate Load

Rated input voltage to the primary circuit , and the 0~100% rated load 100ms/1 without load 100ms

Test Waveform :





15 . HI-POT AND INSULATION TEST

Test Condition :

| | | |
|---|---------------|---------------------|
| 1 | Input Voltage | Vdc 5656 / Vdc 2121 |
| 2 | Insulation | Vdc 500 |
| 3 | Output Load | Short Circuit |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|---------------|--------------|---------------------|----------------|
| 1 | Hi-Pot Tester | Chroma | 19032 | 2008.05.23 |

| Hi-Pot Test Result | | | | | OK |
|--------------------|---------------|---------------|---------------|--------|-------|
| Test Item | Input Voltage | Output Load | Measured (mA) | SPEC. | OK/NG |
| P-S | 5656 Vdc | Short Circuit | 0.003 mA | 5.0 mA | OK |
| P-E | 2121 Vdc | Short Circuit | 0.003 mA | 5.0 mA | OK |

| Insulation Test Result | | | | | OK |
|------------------------|---------------|---------------|---------------|-------|-------|
| Test Item | Input Voltage | Output Load | Measured (GΩ) | SPEC. | OK/NG |
| P-S | 500 Vdc | Short Circuit | 24.4 GΩ | 10 MΩ | OK |
| P-E | 500 Vdc | Short Circuit | 28.2 GΩ | 10 MΩ | OK |

16 . PRI. - SEC. LEAKAGE CURRENT TEST

Test Condition :

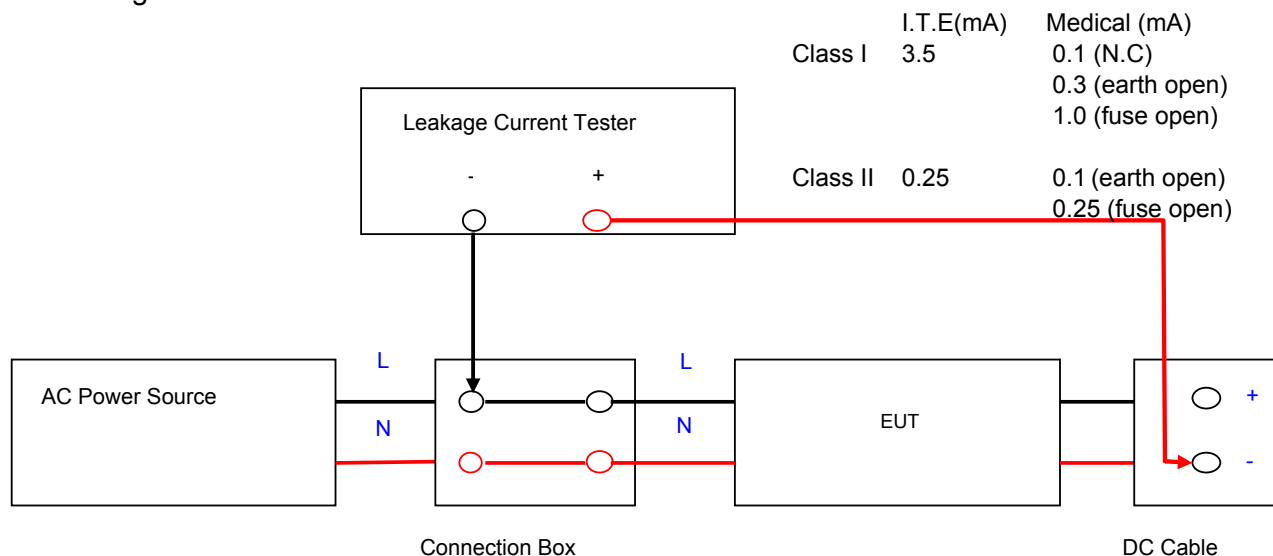
| | | |
|---|-----------------|---------|
| 1 | Input Voltage | 264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|------------------------|--------------|---------------------|----------------|
| 1 | Leakage Current Tester | Simpson | 228 | 2008.7.24 |

| Pri. - Sec. Leakage Current Test Result | | | | OK |
|---|---------------------------------------|---------------|---------|-------|
| Test Item | Test Condition | Measured (mA) | SPEC. | OK/NG |
| 1 | Line - Output | 0.04 mA | 0.10 mA | OK |
| | Neutral - Output | 0.04 mA | 0.10 mA | OK |
| | Line - Output (Ground Open) | 0.17 mA | 0.30 mA | OK |
| | Neutral - Output (Ground OPEN) | 0.17 mA | 0.30 mA | OK |
| | Line - Output (Fuse & Ground Open) | 0.35 mA | 1.00 mA | OK |
| | Neutral - Output (Fuse & Ground Open) | 0.35 mA | 1.00 mA | OK |

Block Diagram :





17 . TEMPERATURE RISE TEST

Test Condition :

| | | |
|---|-----------------|----------------|
| 1 | Input Voltage | 90Vac & 264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 30A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|------------------|--------------|---------------------|----------------|
| 1 | AC Source | Sheng Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Thermal Recorder | YOKOGAWA | MV200 | 2011.03.20 |

| Temperature Rise : 40°C | | | | | | | | | | |
|-------------------------|-------------|-------------|------------|---------|--------------|---------|------------|---------|--------------|---------|
| No | Location | Description | 90Vac | | | | 264Vac | | | |
| | | | Tspec (°C) | Tm (°C) | Spec. X 100% | OK / NG | Tspec (°C) | Tm (°C) | Spec. X 100% | OK / NG |
| 1 | AMB1 | Ambi | 40 | 40.3 | | | 40 | 40 | | |
| 2 | LF1 | LF-0035 | 120 | 116.4 | 120 | OK | 120 | 64.8 | 120 | OK |
| 3 | LF2 | LF-0035 | 120 | 114.2 | 120 | OK | 120 | 64.3 | 120 | OK |
| 4 | LF3 | LF-0028 | 120 | 111.8 | 120 | OK | 120 | 65.2 | 120 | OK |
| 5 | TR1 | SCK15105M | 130 | 106.0 | 130 | OK | 130 | 69.4 | 130 | OK |
| 6 | BD1 | GBU1006 | 120 | 104.1 | 120 | OK | 120 | 73.9 | 120 | OK |
| 7 | Q1 | SPA11N60C3 | 130 | 95.7 | 130 | OK | 130 | 83.3 | 130 | OK |
| 8 | Q3 | SPA11N60C3 | 130 | 100.2 | 130 | OK | 130 | 87.3 | 130 | OK |
| 9 | Q2 | STF25NM60N | 130 | 117.4 | 130 | OK | 130 | 89.6 | 130 | OK |
| 10 | Q4 | STF25NM60N | 130 | 115.9 | 130 | OK | 130 | 89.6 | 130 | OK |
| 11 | Q6 | IRFB3607Pbf | 130 | 95.6 | 130 | OK | 130 | 85.9 | 130 | OK |
| 12 | Q7 | IRFB3607Pbf | 130 | 101.4 | 130 | OK | 130 | 91.5 | 130 | OK |
| 13 | Q8 | IRFB3607Pbf | 130 | 98.7 | 130 | OK | 130 | 89.8 | 130 | OK |
| 14 | Q9 | IRFB3607Pbf | 130 | 97.2 | 130 | OK | 130 | 88.3 | 130 | OK |
| 15 | Q11 | FDP8874 | 130 | 93.9 | 130 | OK | 130 | 88.2 | 130 | OK |
| 16 | Q12 | FDP8874 | 130 | 98.1 | 130 | OK | 130 | 93.4 | 130 | OK |
| 17 | D1 | SB2100 | 120 | 103.4 | 120 | OK | 120 | 90.5 | 120 | OK |
| 18 | D2 | STTH12S06FP | 120 | 99.7 | 120 | OK | 120 | 82.6 | 120 | OK |
| 19 | D3 | UF1002 | 120 | 82.8 | 120 | OK | 120 | 75.4 | 120 | OK |
| 20 | D4 | IN4007 | 120 | 87.6 | 120 | OK | 120 | 78.7 | 120 | OK |
| 21 | T1-Envelope | T-0094 | 120 | 113.7 | 120 | OK | 120 | 85 | 120 | OK |
| 22 | T2-Envelope | T-0095C | 110 | 100.2 | 110 | OK | 110 | 95.9 | 110 | OK |
| 23 | T3-Envelope | T-0096 | 120 | 72.3 | 120 | OK | 120 | 68.2 | 120 | OK |
| 24 | T1 | T-0094 | 120 | 106.6 | 120 | OK | 120 | 71.7 | 120 | OK |
| 25 | T1-Core | T-0094 | 120 | 104.2 | 120 | OK | 120 | 78.1 | 120 | OK |
| 26 | T2 | T-0095C | 110 | 100.1 | 110 | OK | 110 | 96.6 | 110 | OK |
| 27 | T2-Core | T-0095C | 110 | 89.5 | 110 | OK | 110 | 85 | 110 | OK |
| 28 | T3 | T-0096 | 120 | 64.7 | 120 | OK | 120 | 62.2 | 120 | OK |
| 29 | T3-Core | T-0096 | 120 | 69.3 | 120 | OK | 120 | 65.6 | 120 | OK |
| 30 | L2 | LR-0042 | 120 | 66.2 | 120 | OK | 120 | 62.3 | 120 | OK |



17 . TEMPERATURE RISE TEST

Test Condition :

| | | |
|---|-----------------|----------------|
| 1 | Input Voltage | 90Vac & 264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 30A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|------------------|--------------|---------------------|----------------|
| 1 | AC Source | Sheng Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Thermal Recorder | YOKOGAWA | MV200 | 2011.03.20 |

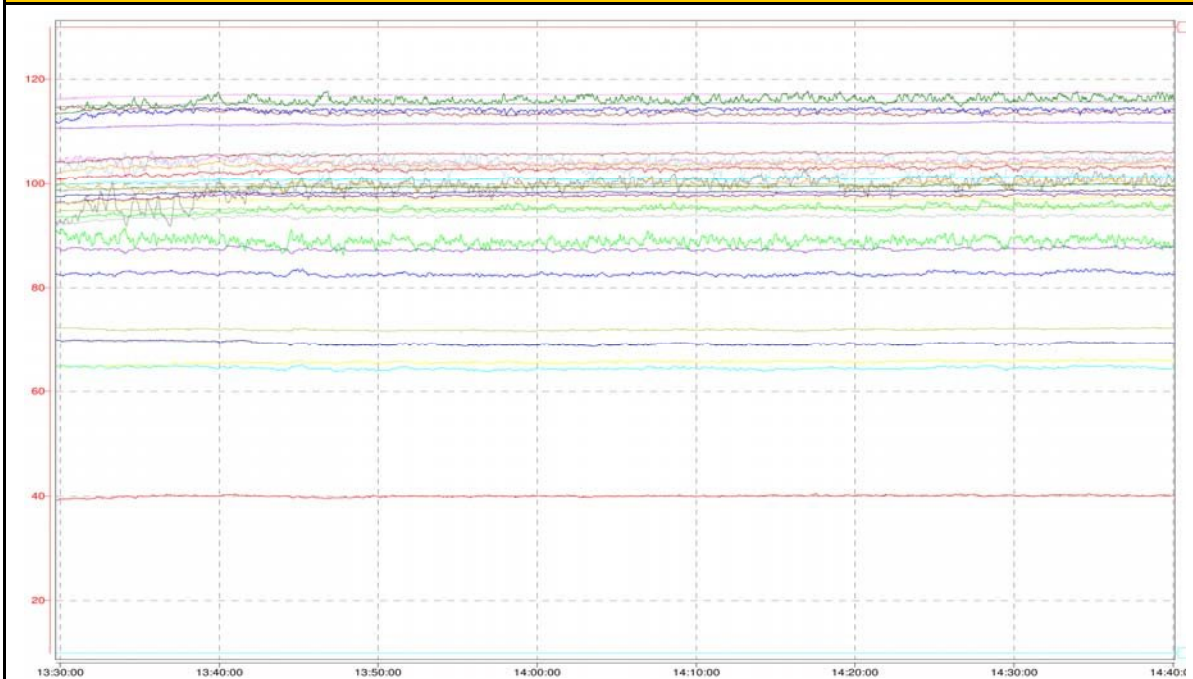
| Temperature Rise | | | | | | | | | | | |
|------------------|----------|-------------|------------|---------|--------------|---------|------------|---------|--------------|---------|--|
| No | Location | Description | 90Vac | | | | 264Vac | | | | |
| | | | Tspec (°C) | Tm (°C) | Spec. X 100% | OK / NG | Tspec (°C) | Tm (°C) | Spec. X 100% | OK / NG | |
| 31 | L3 | LR-0050 | 120 | 93.8 | 120 | OK | 120 | 90.7 | 120 | OK | |
| 32 | U1 | TNY278P | 120 | 96.3 | 120 | OK | 120 | 84.2 | 120 | OK | |
| 33 | D6 | L6599D | 120 | 80.2 | 120 | OK | 120 | 72.8 | 120 | OK | |
| 34 | D8 | L6562AD | 120 | 73.8 | 120 | OK | 120 | 67.6 | 120 | OK | |
| 35 | C5 | 22µF/50V | 105 | 94.8 | 105 | OK | 105 | 74.9 | 105 | OK | |
| 36 | C11 | 22µF/50V | 105 | 94.3 | 105 | OK | 105 | 84.4 | 105 | OK | |
| 37 | C14 | 22µF/50V | 105 | 84.7 | 105 | OK | 105 | 75.1 | 105 | OK | |
| 38 | C17 | 22µF/50V | 105 | 98.4 | 105 | OK | 105 | 83 | 105 | OK | |
| 39 | C7 | 68µF/450V | 105 | 93.2 | 105 | OK | 105 | 72.5 | 105 | OK | |
| 40 | C8 | 68µF/450V | 105 | 82.2 | 105 | OK | 105 | 72 | 105 | OK | |
| 41 | C9 | 68µF/450V | 105 | 95.3 | 105 | OK | 105 | 79.4 | 105 | OK | |
| 42 | C10 | 68µF/450V | 105 | 87.5 | 105 | OK | 105 | 72.6 | 105 | OK | |
| 43 | C13 | 47µF/50V | 105 | 80.8 | 105 | OK | 105 | 72.9 | 105 | OK | |
| 44 | C16 | 47µF/50V | 105 | 73.6 | 105 | OK | 105 | 67.8 | 105 | OK | |
| 45 | C18 | 47µF/50V | 105 | 79.8 | 105 | OK | 105 | 73.7 | 105 | OK | |
| 46 | C19 | 2200µF/16V | 105 | 99.5 | 105 | OK | 105 | 87 | 105 | OK | |
| 47 | C21 | 2200µF/16V | 105 | 97.9 | 105 | OK | 105 | 84.2 | 105 | OK | |
| 48 | C22 | 2200µF/16V | 105 | 72.1 | 105 | OK | 105 | 67.1 | 105 | OK | |
| 49 | C25 | 2200µF/16V | 105 | 92.1 | 105 | OK | 105 | 88.2 | 105 | OK | |
| 50 | C20 | 470µF/25V | 105 | 74.8 | 105 | OK | 105 | 69 | 105 | OK | |
| 51 | C27 | 470µF/25V | 105 | 64.4 | 105 | OK | 105 | 60.6 | 105 | OK | |
| 52 | C23 | 10µF/50V | 105 | 70.1 | 105 | OK | 105 | 64 | 105 | OK | |
| 53 | C24 | 1000µF/16V | 105 | 70.2 | 105 | OK | 105 | 65.3 | 105 | OK | |
| 54 | AMB2 | Ambi | 40 | 40 | | | 40 | 40 | | | |
| 55 | D5 | 1N4007 | 120 | 87.3 | 120 | OK | 120 | 77.6 | 120 | OK | |
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17 . TEMPERATURE RISE TEST

Test Waveform : Po: 360W AMB:40°C

Vin: 90Vac / 60Hz Iin: 4.68A Pin: 419.76 PF: 0.98 Vout: 11.29V Load: 30A



Vin:90Vac / 60Hz

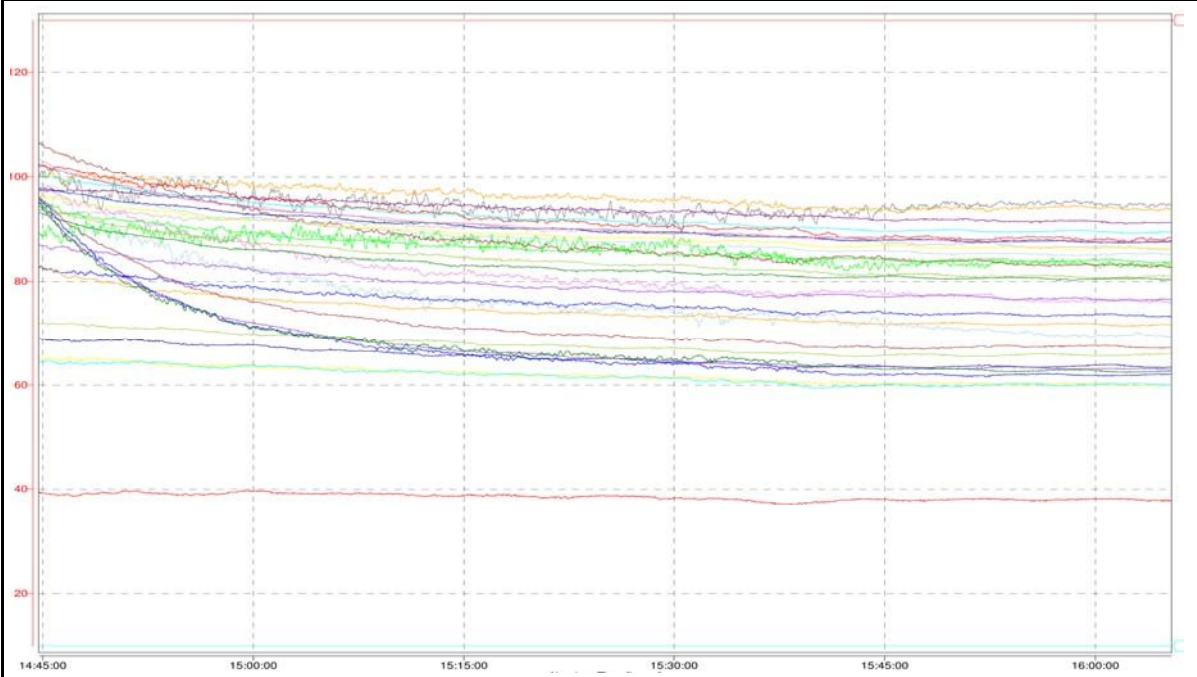




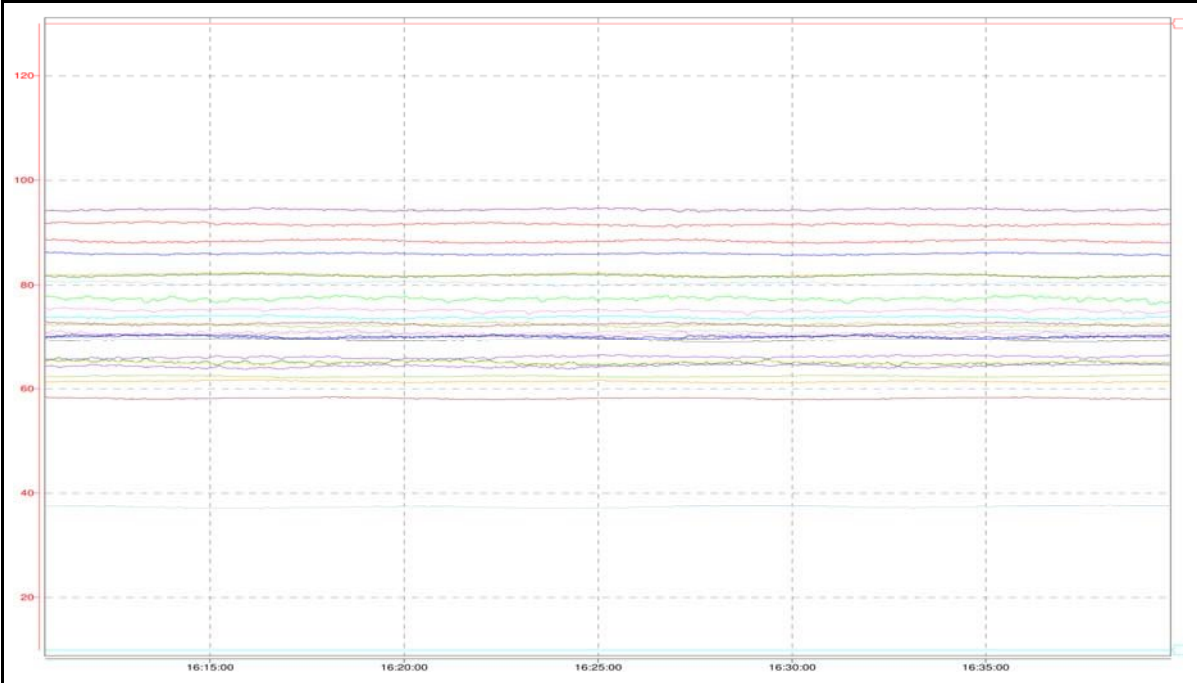
17 . TEMPERATURE RISE TEST

Test Waveform : Po: 360W AMB:40°C

Vin: 264Vac / 60Hz Iin: 1.75A Pin: 400.4W PF: 0.86 Vo: 11.69V Load: 30A



Vin:264Vac / 60Hz





17 . TEMPERATURE RISE TEST

Test Condition :

| | | |
|---|-----------------|----------------|
| 1 | Input Voltage | 90Vac & 264Vac |
| | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|------------------|--------------|---------------------|----------------|
| 1 | AC Source | Sheng Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Thermal Recorder | YOKOGAWA | MV200 | 2011.03.20 |

| Temperature Rise : 50°C | | | | | | | | | | |
|-------------------------|-------------|-------------|----------------|---------|--------------|---------|-----------------|---------|--------------|---------|
| No | Location | Description | 90Vac-500W+Fan | | | | 264Vac-500W+Fan | | | |
| | | | Tspec (°C) | Tm (°C) | Spec. X 100% | OK / NG | Tspec (°C) | Tm (°C) | Spec. X 100% | OK / NG |
| 1 | AMB1 | Ambi | 50 | 50 | | | 50 | 50 | | |
| 2 | LF1 | LF-0035 | 120 | 66.6 | 120 | OK | 120 | 51.9 | 120 | OK |
| 3 | LF2 | LF-0035 | 120 | 74.1 | 120 | OK | 120 | 53.1 | 120 | OK |
| 4 | LF3 | LF-0028 | 120 | 76.8 | 120 | OK | 120 | 53.7 | 120 | OK |
| 5 | TR1 | SCK15105M | 130 | 62.1 | 130 | OK | 130 | 52.4 | 130 | OK |
| 6 | BD1 | GBU1006 | 120 | 66.9 | 120 | OK | 120 | 55.6 | 120 | OK |
| 7 | Q1 | SPA11N60C3 | 130 | 79.9 | 130 | OK | 130 | 71.4 | 130 | OK |
| 8 | Q3 | SPA11N60C3 | 130 | 81.6 | 130 | OK | 130 | 73.2 | 130 | OK |
| 9 | Q2 | STF25NM60N | 130 | 85.7 | 130 | OK | 130 | 65.4 | 130 | OK |
| 10 | Q4 | STF25NM60N | 130 | 92.8 | 130 | OK | 130 | 68.3 | 130 | OK |
| 11 | Q6 | IRFB3607Pbf | 130 | 80.1 | 130 | OK | 130 | 73.6 | 130 | OK |
| 12 | Q7 | IRFB3607Pbf | 130 | 90.8 | 130 | OK | 130 | 83.5 | 130 | OK |
| 13 | Q8 | IRFB3607Pbf | 130 | 90.9 | 130 | OK | 130 | 83.4 | 130 | OK |
| 14 | Q9 | IRFB3607Pbf | 130 | 90.8 | 130 | OK | 130 | 83.4 | 130 | OK |
| 15 | Q11 | FDP8874 | 130 | 83.4 | 130 | OK | 130 | 77.2 | 130 | OK |
| 16 | Q12 | FDP8874 | 130 | 92.6 | 130 | OK | 130 | 86.1 | 130 | OK |
| 17 | D1 | SB2100 | 120 | 68.6 | 120 | OK | 120 | 62.5 | 120 | OK |
| 18 | D2 | STTH12S06FP | 120 | 80.1 | 120 | OK | 120 | 66.3 | 120 | OK |
| 19 | D3 | UF1002 | 120 | 74.4 | 120 | OK | 120 | 62 | 120 | OK |
| 20 | D4 | IN4007 | 120 | 71.5 | 120 | OK | 120 | 61.9 | 120 | OK |
| 21 | T1-Envelope | T-0094 | 120 | 69.9 | 120 | OK | 120 | 57.6 | 120 | OK |
| 22 | T2-Envelope | T-0095C | 110 | 83.6 | 110 | OK | 110 | 78.6 | 110 | OK |
| 23 | T3-Envelope | T-0096 | 120 | 68 | 120 | OK | 120 | 59.7 | 120 | OK |
| 24 | T1 | T-0094 | 120 | 66.7 | 120 | OK | 120 | 57 | 120 | OK |
| 25 | T1-Core | T-0094 | 120 | 70.5 | 120 | OK | 120 | 58.2 | 120 | OK |
| 26 | T2 | T-0095C | 110 | 74 | 110 | OK | 110 | 69.5 | 110 | OK |
| 27 | T2-Core | T-0095C | 110 | 59.5 | 110 | OK | 110 | 55.4 | 110 | OK |
| 28 | T3 | T-0096 | 120 | 66.4 | 120 | OK | 120 | 59 | 120 | OK |
| 29 | T3-Core | T-0096 | 120 | 64.6 | 120 | OK | 120 | 57.5 | 120 | OK |
| 30 | L2 | LR-0042 | 120 | 68.6 | 120 | OK | 120 | 60.2 | 120 | OK |



17 . TEMPERATURE RISE TEST

Test Condition :

| | | |
|---|-----------------|----------------|
| 1 | Input Voltage | 90Vac & 264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

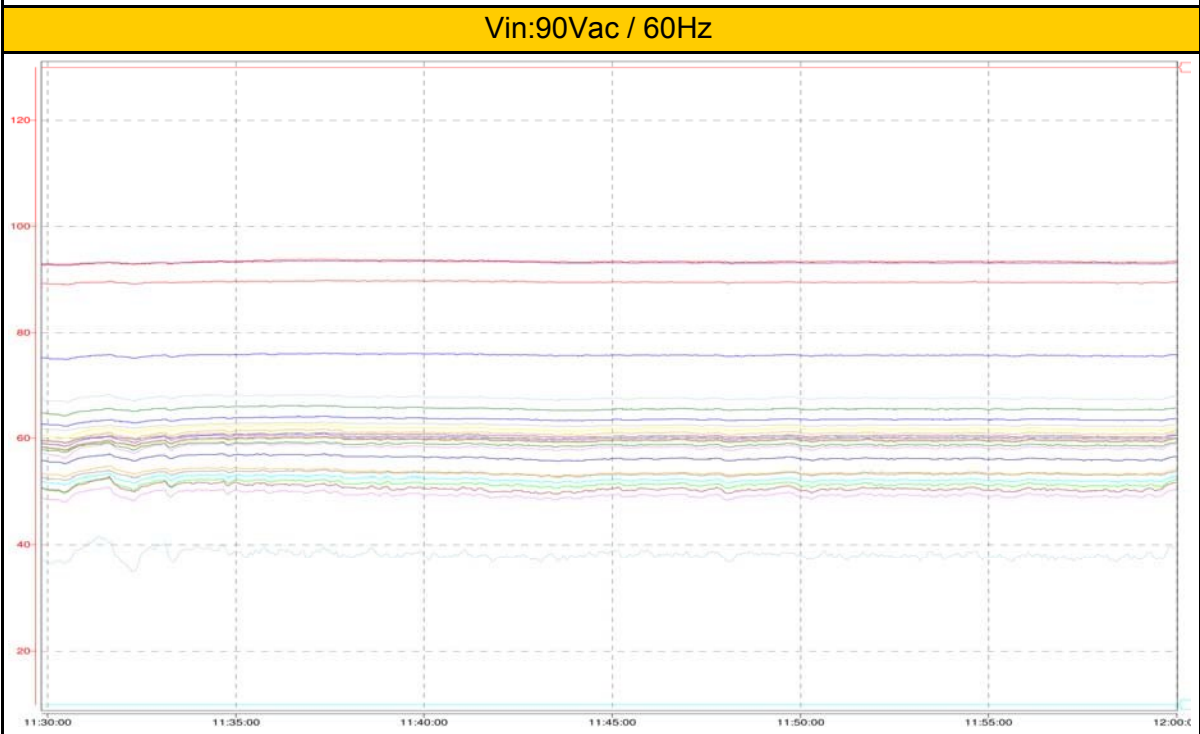
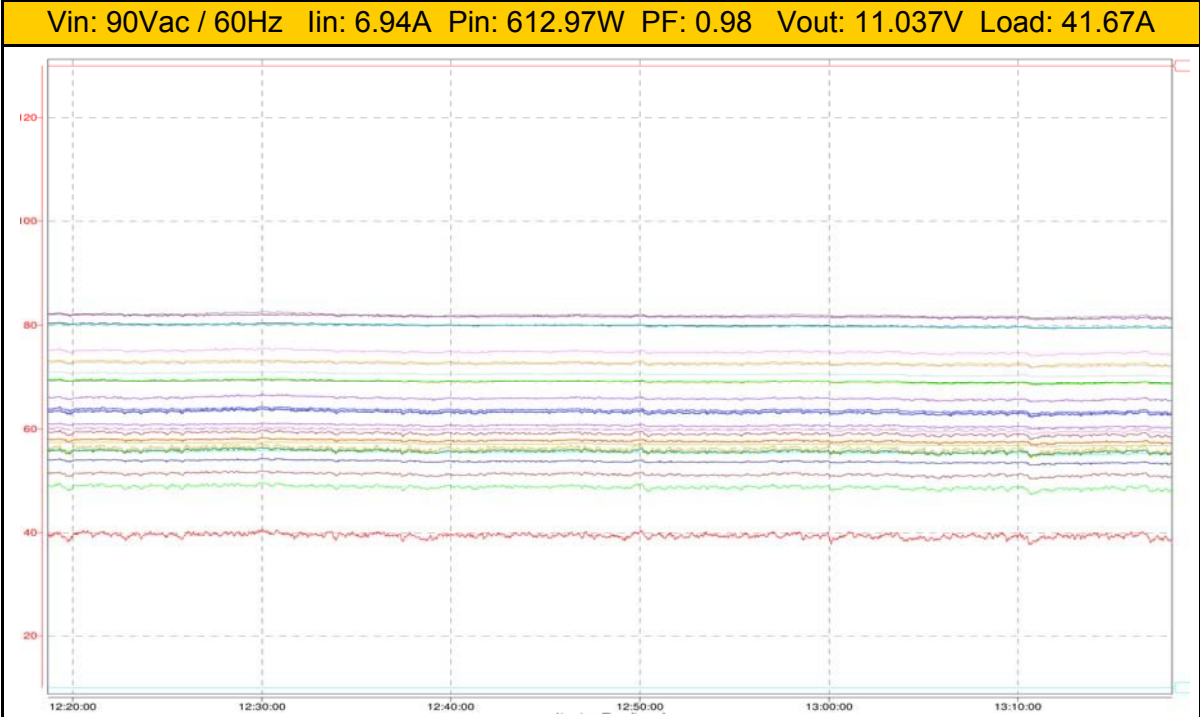
| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|------------------|--------------|---------------------|----------------|
| 1 | AC Source | Sheng Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Thermal Recorder | YOKOGAWA | MV200 | 2011.03.20 |

| Temperature Rise | | | | | | | | | | |
|------------------|----------|-------------|----------------|---------|--------------|---------|-----------------|---------|--------------|---------|
| No | Location | Description | 90Vac-500W+Fan | | | | 264Vac-500W+Fan | | | |
| | | | Tspec (°C) | Tm (°C) | Spec. X 100% | OK / NG | Tspec (°C) | Tm (°C) | Spec. X 100% | OK / NG |
| 31 | L3 | LR-0050 | 120 | 104 | 120 | OK | 120 | 99.1 | 120 | OK |
| 32 | U1 | TNY278P | 120 | 76.3 | 120 | OK | 120 | 66.6 | 120 | OK |
| 33 | D6 | L6599D | 120 | 74.3 | 120 | OK | 120 | 65.8 | 120 | OK |
| 34 | D8 | L6562AD | 120 | 71.1 | 120 | OK | 120 | 62 | 120 | OK |
| 35 | C5 | 22µF/50V | 105 | 62.3 | 105 | OK | 105 | 55.1 | 105 | OK |
| 36 | C11 | 22µF/50V | 105 | 64.7 | 105 | OK | 105 | 58.1 | 105 | OK |
| 37 | C14 | 22µF/50V | 105 | 71.5 | 105 | OK | 105 | 61.5 | 105 | OK |
| 38 | C17 | 22µF/50V | 105 | 78.5 | 105 | OK | 105 | 73 | 105 | OK |
| 39 | C7 | 68µF/450V | 105 | 61 | 105 | OK | 105 | 54.8 | 105 | OK |
| 40 | C8 | 68µF/450V | 105 | 64.3 | 105 | OK | 105 | 57.5 | 105 | OK |
| 41 | C9 | 68µF/450V | 105 | 62.8 | 105 | OK | 105 | 56.9 | 105 | OK |
| 42 | C10 | 68µF/450V | 105 | 63.4 | 105 | OK | 105 | 57.3 | 105 | OK |
| 43 | C13 | 47µF/50V | 105 | 67.2 | 105 | OK | 105 | 60.9 | 105 | OK |
| 44 | C16 | 47µF/50V | 105 | 72.7 | 105 | OK | 105 | 62.3 | 105 | OK |
| 45 | C18 | 47µF/50V | 105 | 73.1 | 105 | OK | 105 | 65.7 | 105 | OK |
| 46 | C19 | 2200µF/16V | 105 | 103.7 | 105 | OK | 105 | 98.7 | 105 | OK |
| 47 | C21 | 2200µF/16V | 105 | 100.1 | 105 | OK | 105 | 94.6 | 105 | OK |
| 48 | C22 | 2200µF/16V | 105 | 69.8 | 105 | OK | 105 | 64.3 | 105 | OK |
| 49 | C25 | 2200µF/16V | 105 | 86.5 | 105 | OK | 105 | 80.9 | 105 | OK |
| 50 | C20 | 470µF/25V | 105 | 71.2 | 105 | OK | 105 | 63.9 | 105 | OK |
| 51 | C27 | 470µF/25V | 105 | 70.6 | 105 | OK | 105 | 61.5 | 105 | OK |
| 52 | C23 | 10µF/50V | 105 | 72 | 105 | OK | 105 | 61.9 | 105 | OK |
| 53 | C24 | 1000µF/16V | 105 | 70.4 | 105 | OK | 105 | 61.5 | 105 | OK |
| 54 | AMB2 | Ambi | 50 | 50 | | | 50 | 50 | | |
| 55 | D5 | 1N4007 | 120 | 69.5 | 120 | OK | 120 | 61.2 | 120 | OK |
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17 . TEMPERATURE RISE TEST

Test Waveform : Po: 500W+fan AMB:50°C

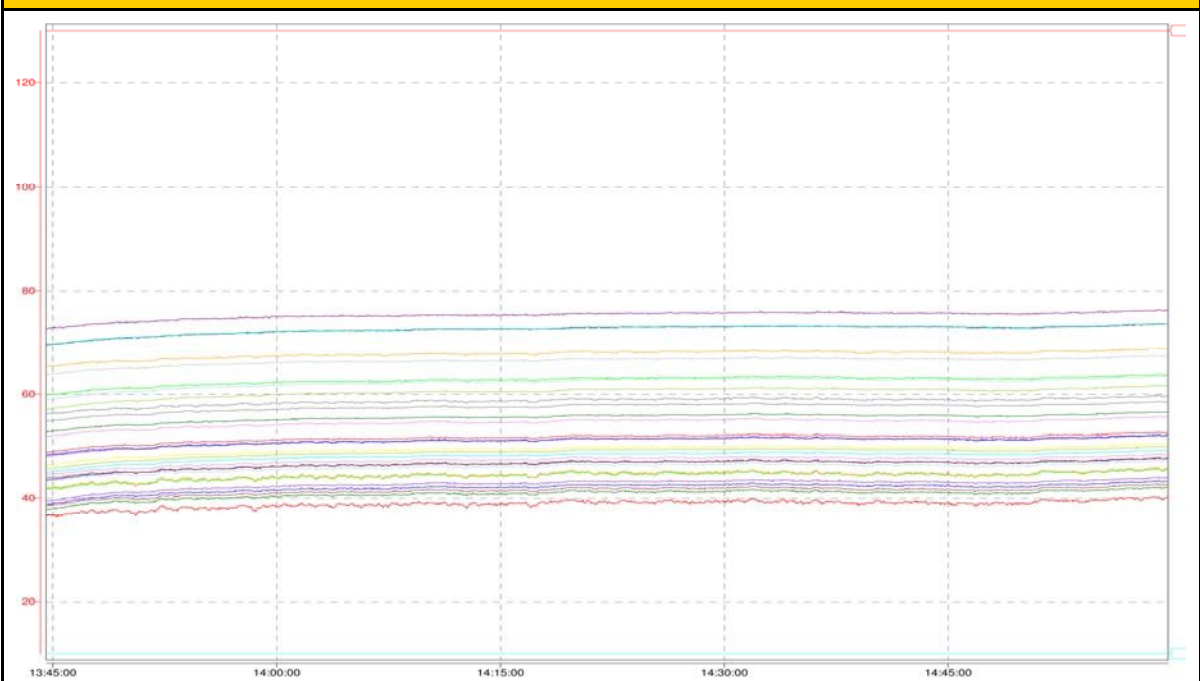




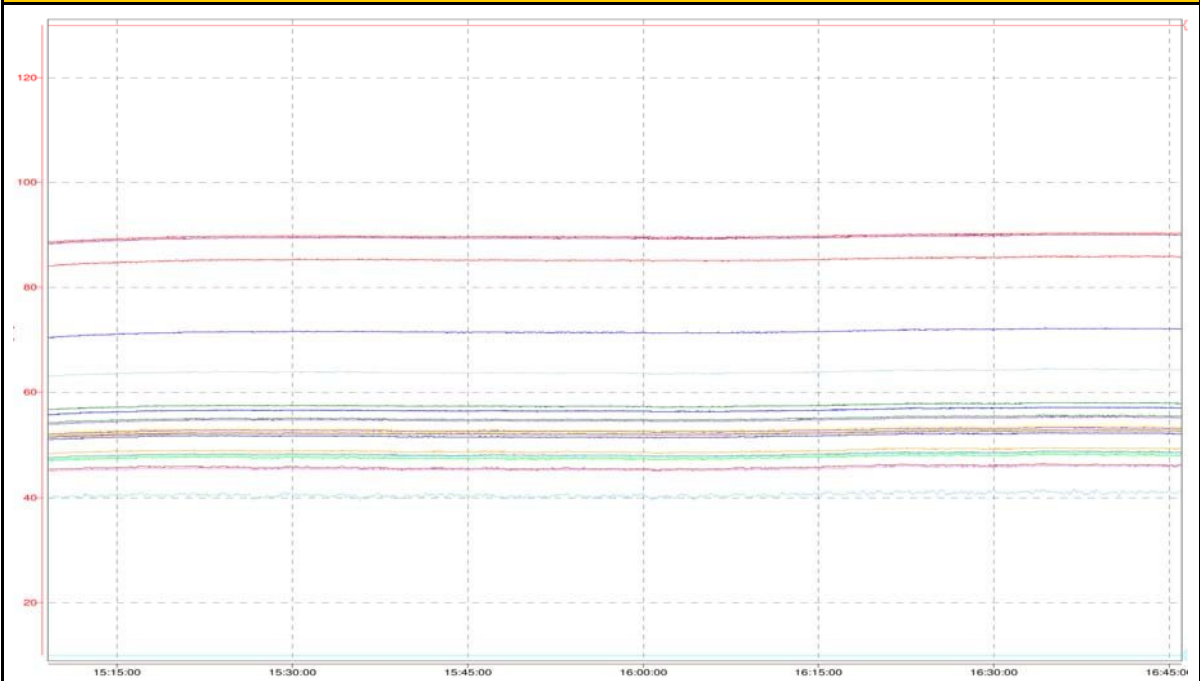
17 . TEMPERATURE RISE TEST

Test Waveform : Po: 500W+fan AMB:50°C

Vin:264Vac / 60Hz Iin: 2.29A Pin: 555.05W PF: 0.92 Vout: 11.060V Load: 41.67A



Vin:264Vac / 60Hz





18 . SWITCHING COMPONENT WAVEFORM

1 . SWITCHING MOS-FET WAVEFORM :

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Sheng Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

| MOS-FET Voltage (Vds) --- Working Voltage Test Result | | | | | OK |
|---|---------------|-----------------|--------------|-------|-------|
| Test Item | Input Voltage | Output Load (A) | Measured (V) | SPEC. | OK/NG |
| Q1 SPA11N60C3 | 90V | 41.67 A | 428.0 V | 600 V | OK |
| | 115V | 41.67 A | 444.0 V | 600 V | OK |
| | 230V | 41.67 A | 426.0 V | 600 V | OK |
| | 264V | 41.67 A | 444.0 V | 600 V | OK |
| Q2 STF25NM60 | 90V | 41.67 A | 540.0 V | 600 V | OK |
| | 115V | 41.67 A | 536.0 V | 600 V | OK |
| | 230V | 41.67 A | 504.0 V | 600 V | OK |
| | 264V | 41.67 A | 474.0 V | 600 V | OK |
| Q3 SPA11N60C3 | 90V | 41.67 A | 446.0 V | 600 V | OK |
| | 115V | 41.67 A | 432.0 V | 600 V | OK |
| | 230V | 41.67 A | 454.0 V | 600 V | OK |
| | 264V | 41.67 A | 456.0 V | 600 V | OK |
| Q4 STF25NM60 | 90V | 41.67 A | 550.0 V | 600 V | OK |
| | 115V | 41.67 A | 512.0 V | 600 V | OK |
| | 230V | 41.67 A | 502.0 V | 600 V | OK |
| | 264V | 41.67 A | 470.0 V | 600 V | OK |
| Q6 IRFB3607PbF | 90V | 41.67 A | 47.2 V | 75 V | OK |
| | 115V | 41.67 A | 49.8 V | 75 V | OK |
| | 230V | 41.67 A | 46.8 V | 75 V | OK |
| | 264V | 41.67 A | 45.6 V | 75 V | OK |



18 . SWITCHING COMPONENT WAVEFORM

1 . SWITCHING MOS-FET WAVEFORM :

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Sheng Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

| MOS-FET Voltage (Vds) --- Working Voltage Test Result | | | | | OK |
|---|---------------|-----------------|--------------|-------|-------|
| Test Item | Input Voltage | Output Load (A) | Measured (V) | SPEC. | OK/NG |
| Q7 IRFB3607PbF | 90V | 41.67 A | 50.4 V | 75 V | OK |
| | 115V | 41.67 A | 48.0 V | 75 V | OK |
| | 230V | 41.67 A | 48.6 V | 75 V | OK |
| | 264V | 41.67 A | 47.4 V | 75 V | OK |
| Q8 IRFB3607PbF | 90V | 41.67 A | 55.8 V | 75 V | OK |
| | 115V | 41.67 A | 57.2 V | 75 V | OK |
| | 230V | 41.67 A | 56.4 V | 75 V | OK |
| | 264V | 41.67 A | 57.6 V | 75 V | OK |
| Q9 IRFB3607PbF | 90V | 41.67 A | 56.8 V | 75 V | OK |
| | 115V | 41.67 A | 57.2 V | 75 V | OK |
| | 230V | 41.67 A | 58.2 V | 75 V | OK |
| | 264V | 41.67 A | 57.0 V | 75 V | OK |
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18 . SWITCHING COMPONENT WAVEFORM

1 . SWITCHING MOS-FET WAVEFORM :

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Shenq Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

| MOS-FET Voltage (Vds) --- Turn On Voltage Test Result | | | | | OK |
|---|---------------|-----------------|--------------|-------|-------|
| Test Item | Input Voltage | Output Load (A) | Measured (V) | SPEC. | OK/NG |
| Q1 SPA11N60C3 | 90V | 41.67 A | 474.0 V | 600 V | OK |
| | 115V | 41.67 A | 452.0 V | 600 V | OK |
| | 230V | 41.67 A | 450.0 V | 600 V | OK |
| | 264V | 41.67 A | 464.0 V | 600 V | OK |
| Q2 STF25NM60 | 90V | 41.67 A | 546.0 V | 600 V | OK |
| | 115V | 41.67 A | 542.0 V | 600 V | OK |
| | 230V | 41.67 A | 494.0 V | 600 V | OK |
| | 264V | 41.67 A | 478.0 V | 600 V | OK |
| Q3 SPA11N60C3 | 90V | 41.67 A | 460.0 V | 600 V | OK |
| | 115V | 41.67 A | 448.0 V | 600 V | OK |
| | 230V | 41.67 A | 444.0 V | 600 V | OK |
| | 264V | 41.67 A | 442.0 V | 600 V | OK |
| Q4 STF25NM60 | 90V | 41.67 A | 542.0 V | 600 V | OK |
| | 115V | 41.67 A | 500.0 V | 600 V | OK |
| | 230V | 41.67 A | 498.0 V | 600 V | OK |
| | 264V | 41.67 A | 480.0 V | 600 V | OK |
| Q6 IRFB3607PbF | 90V | 41.67 A | 50.0 V | 75 V | OK |
| | 115V | 41.67 A | 50.4 V | 75 V | OK |
| | 230V | 41.67 A | 48.6 V | 75 V | OK |
| | 264V | 41.67 A | 51.4 V | 75 V | OK |



18 . SWITCHING COMPONENT WAVEFORM

1 . SWITCHING MOS-FET WAVEFORM :

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

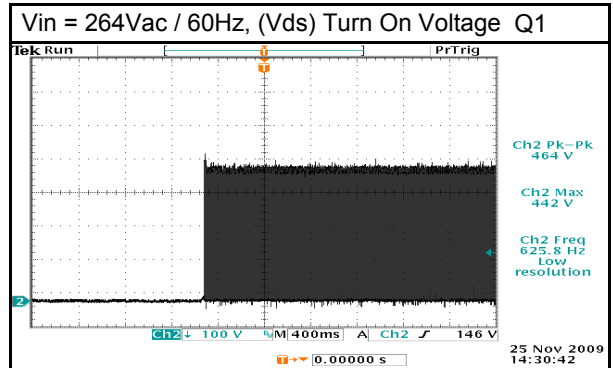
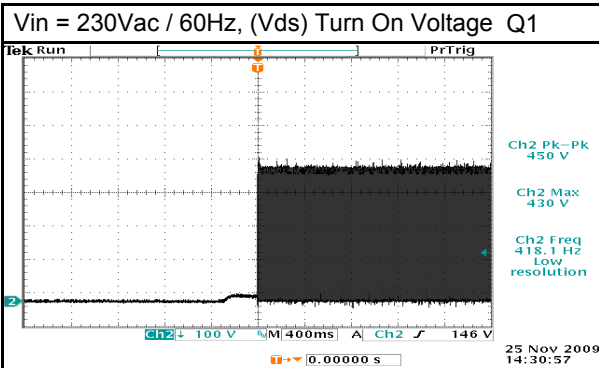
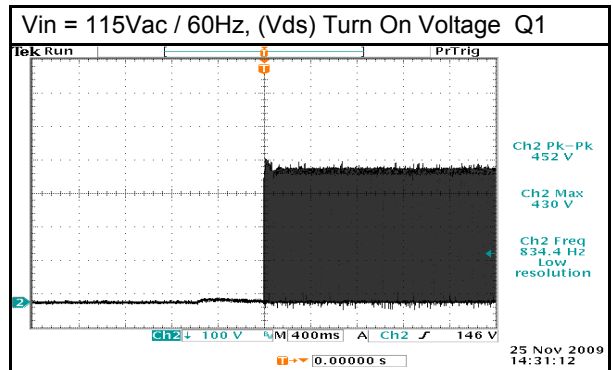
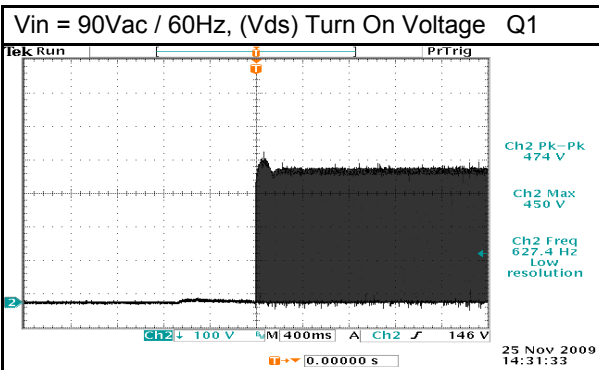
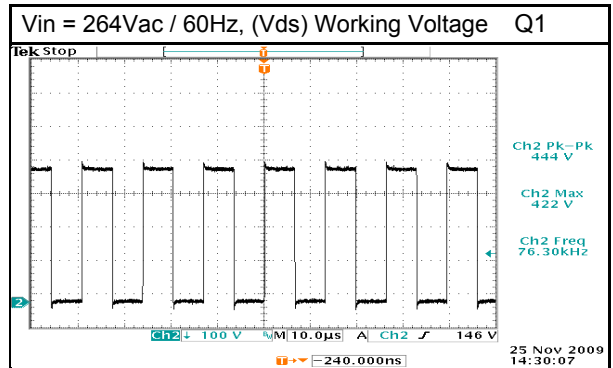
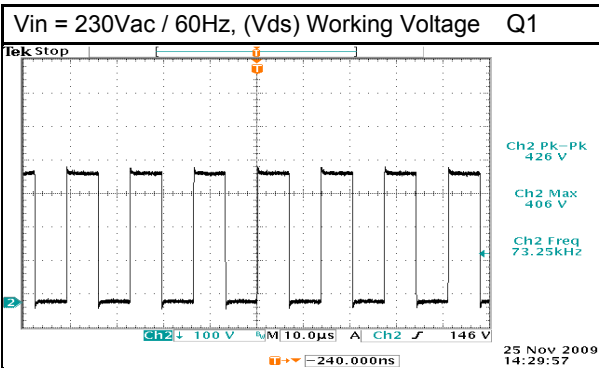
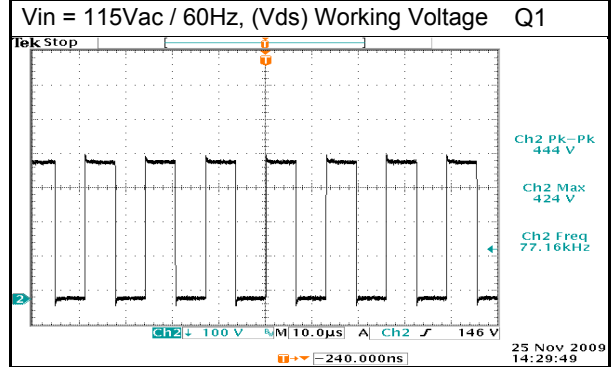
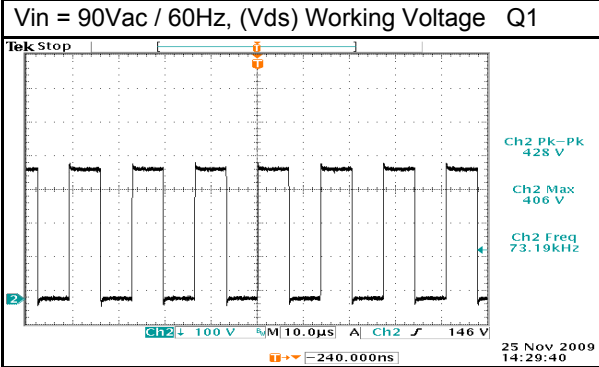
| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Shenq Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

| MOS-FET Voltage (Vds) --- Turn On Voltage Test Result | | | | | OK |
|---|---------------|-----------------|--------------|-------|-------|
| Test Item | Input Voltage | Output Load (A) | Measured (V) | SPEC. | OK/NG |
| Q7 IRFB3607PbF | 90V | 41.67 A | 52.2 V | 75 V | OK |
| | 115V | 41.67 A | 53.4 V | 75 V | OK |
| | 230V | 41.67 A | 52.0 V | 75 V | OK |
| | 264V | 41.67 A | 51.8 V | 75 V | OK |
| Q8 IRFB3607PbF | 90V | 41.67 A | 56.2 V | 75 V | OK |
| | 115V | 41.67 A | 56.8 V | 75 V | OK |
| | 230V | 41.67 A | 57.6 V | 75 V | OK |
| | 264V | 41.67 A | 58.2 V | 75 V | OK |
| Q9 IRFB3607PbF | 90V | 41.67 A | 55.2 V | 75 V | OK |
| | 115V | 41.67 A | 58.0 V | 75 V | OK |
| | 230V | 41.67 A | 56.4 V | 75 V | OK |
| | 264V | 41.67 A | 58.6 V | 75 V | OK |
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18 . SWITCHING COMPONENT WAVEFORM

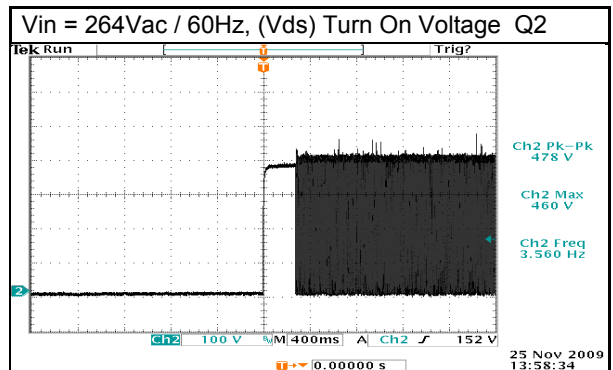
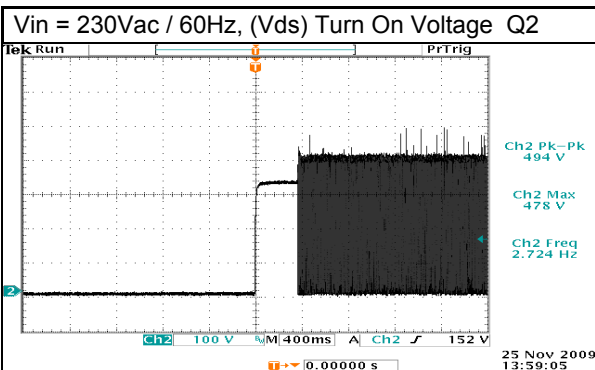
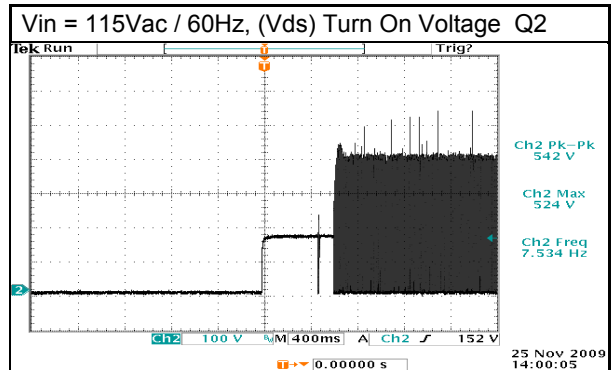
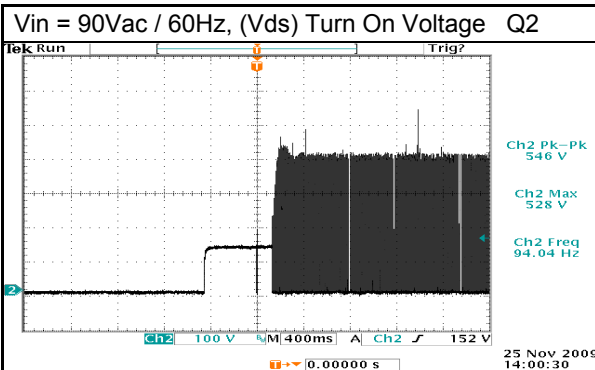
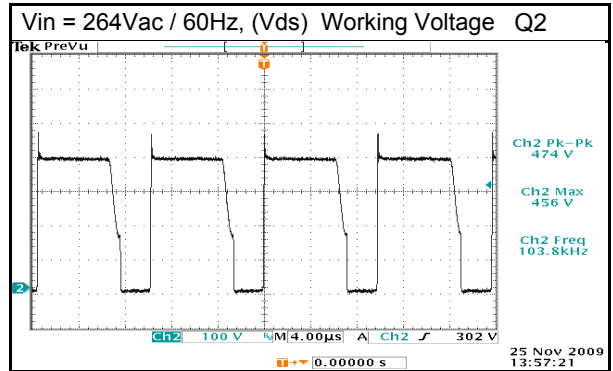
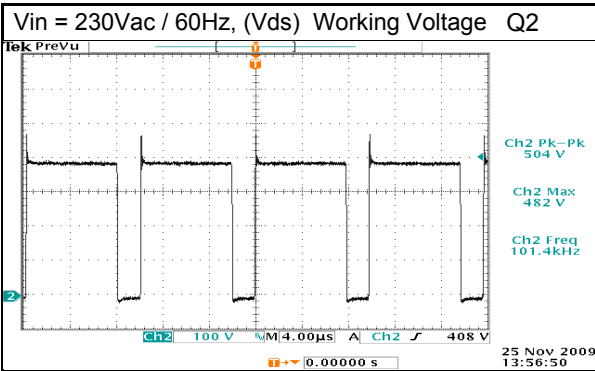
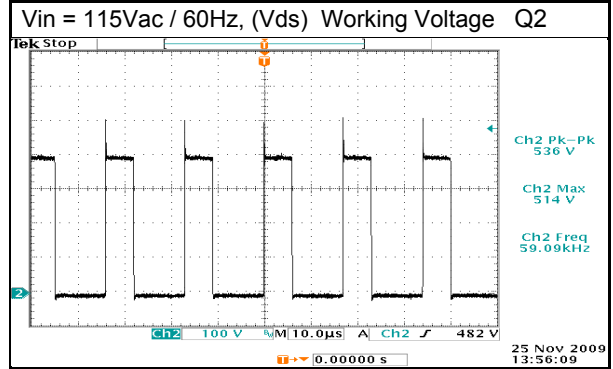
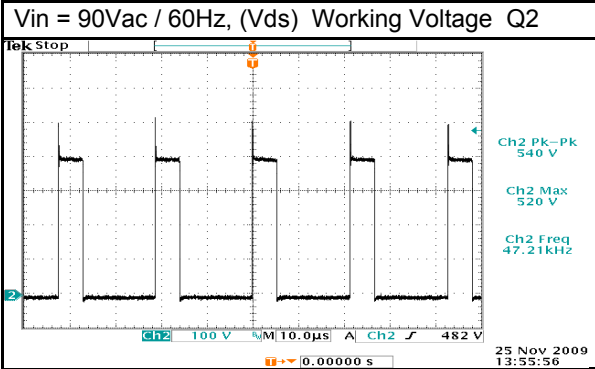
1 . SWITCHING MOS-FET WAVEFORM :





18 . SWITCHING COMPONENT WAVEFORM

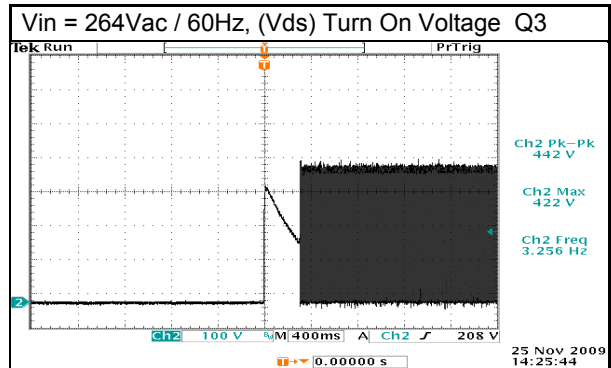
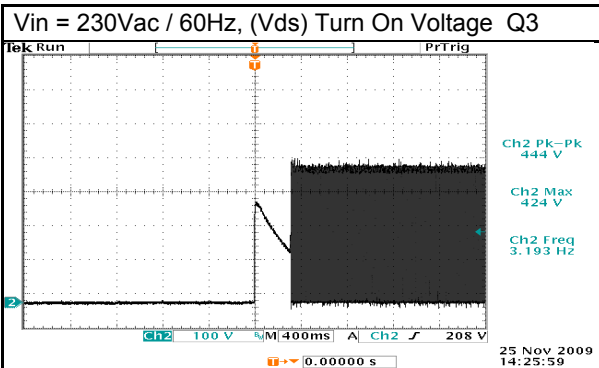
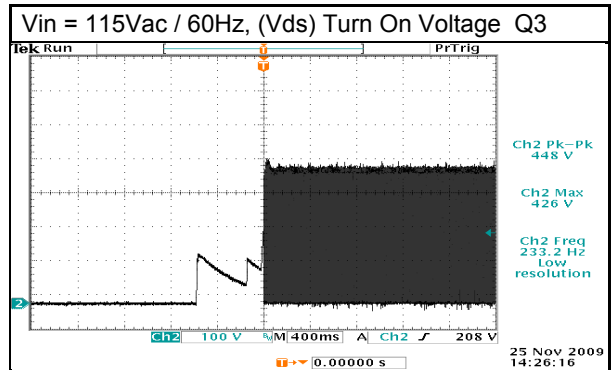
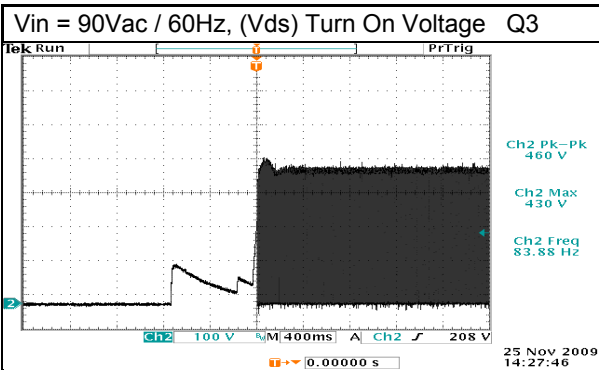
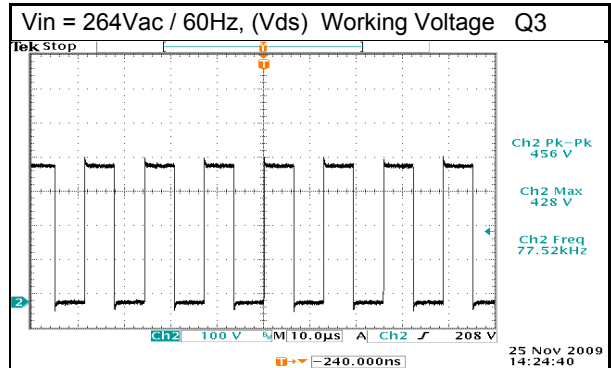
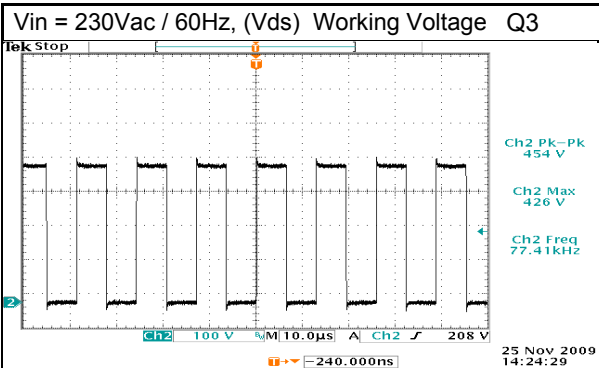
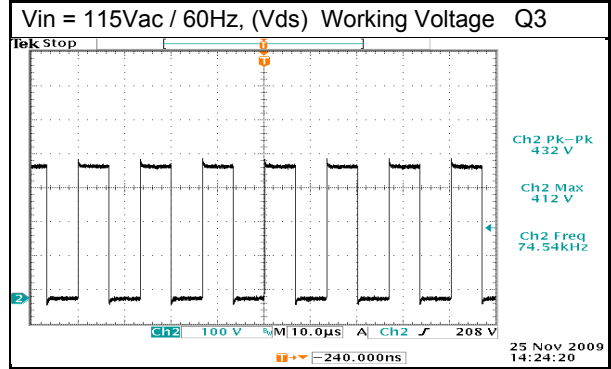
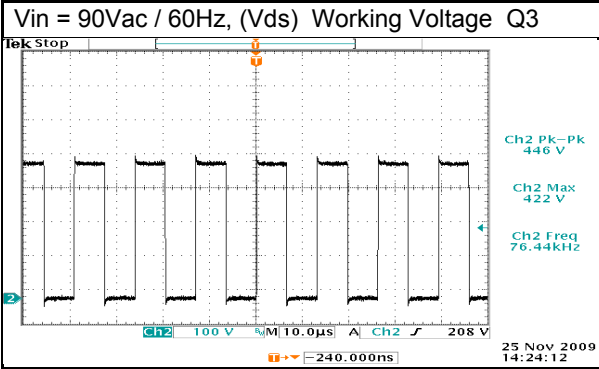
1 . SWITCHING MOS-FET WAVEFORM :





18 . SWITCHING COMPONENT WAVEFORM

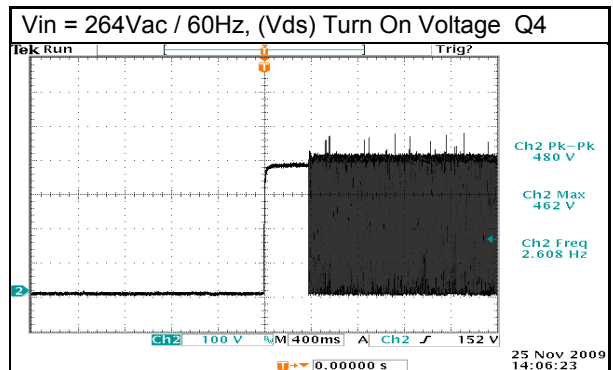
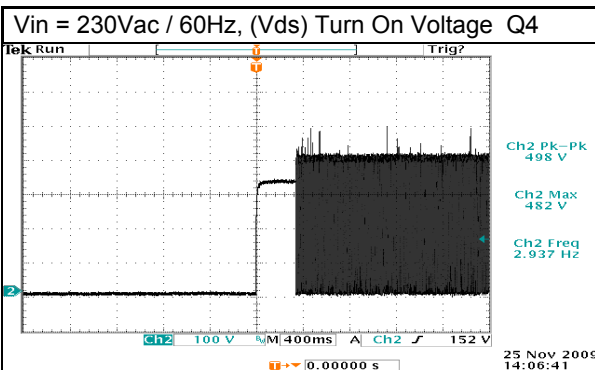
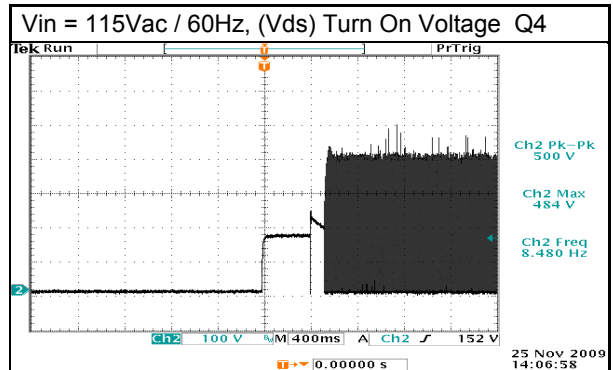
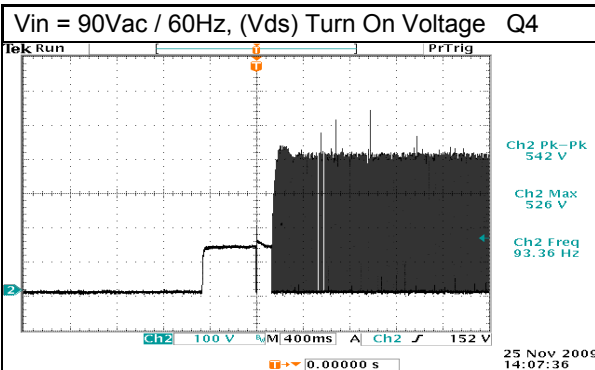
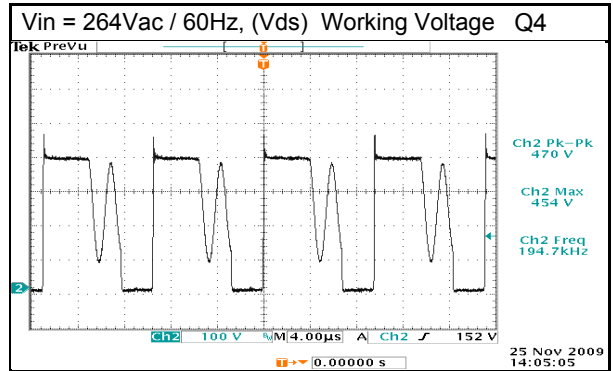
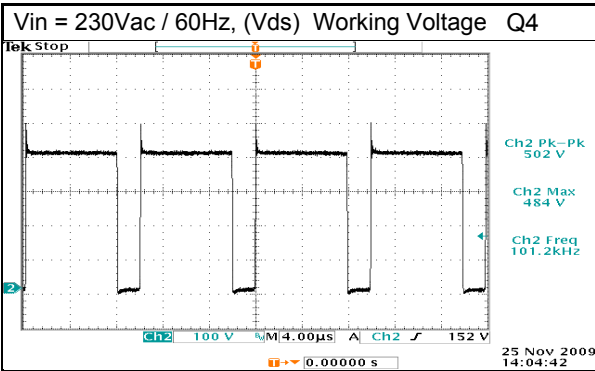
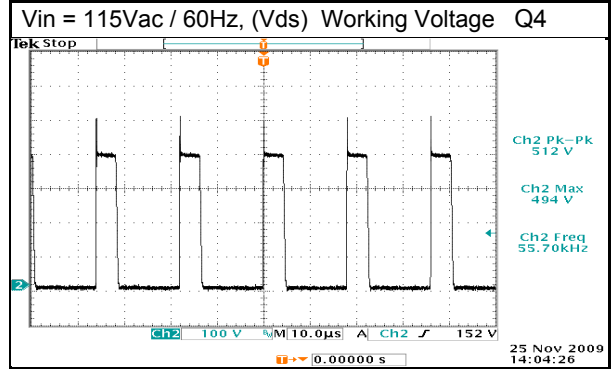
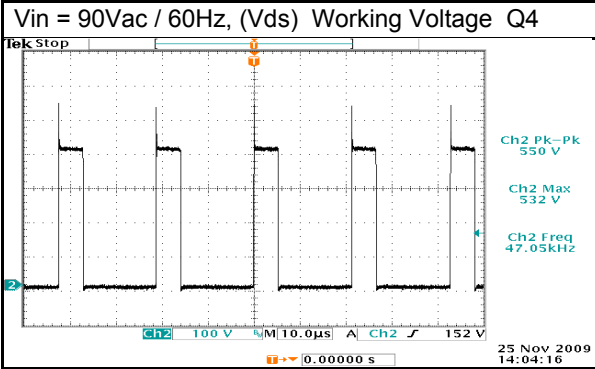
1 . SWITCHING MOS-FET WAVEFORM :





18 . SWITCHING COMPONENT WAVEFORM

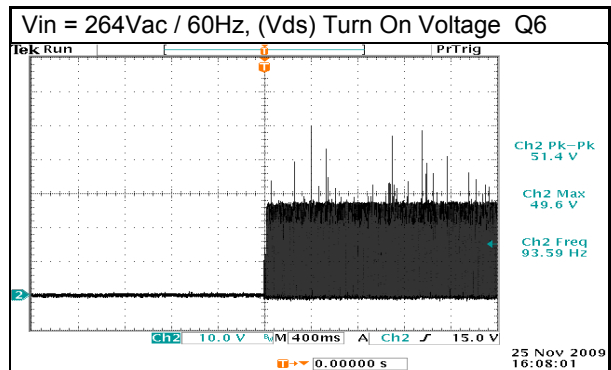
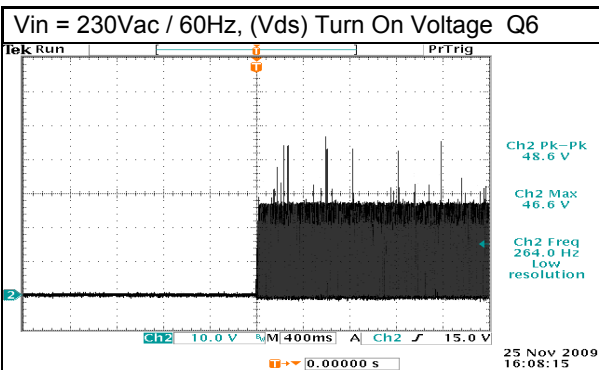
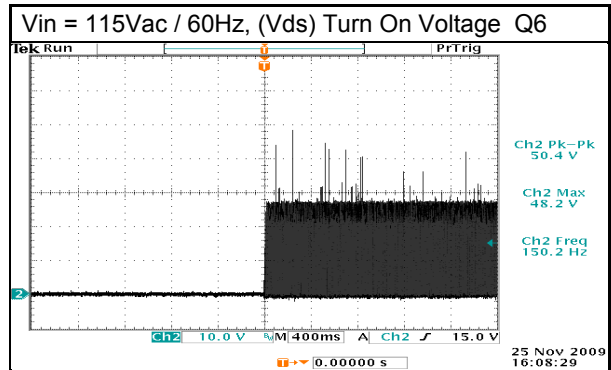
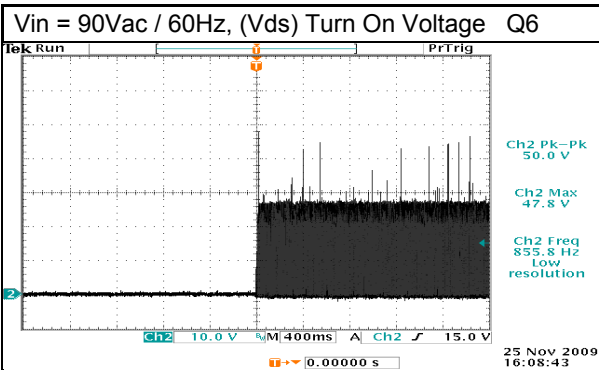
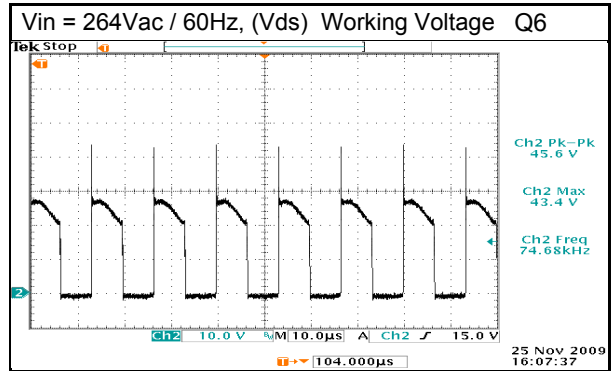
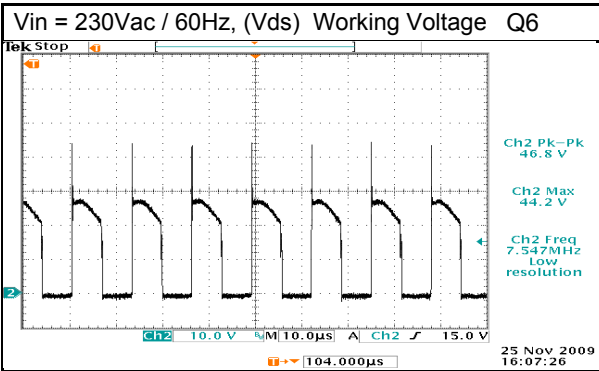
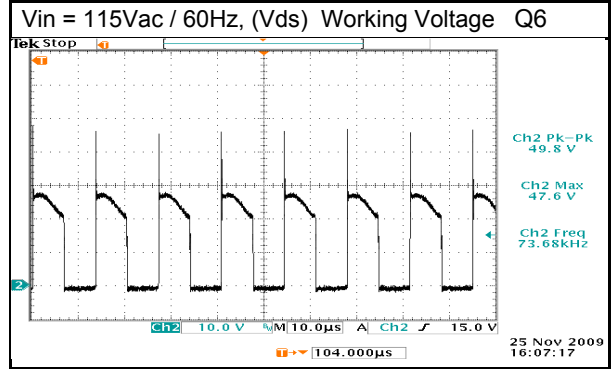
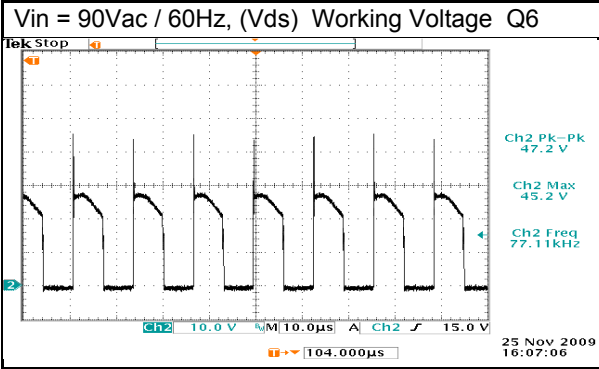
1 . SWITCHING MOS-FET WAVEFORM :





17 . SWITCHING COMPONENT WAVEFORM

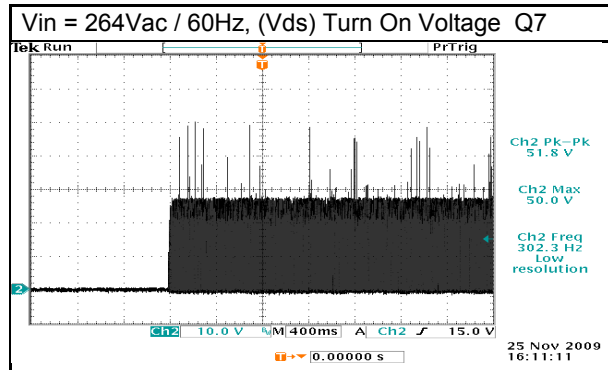
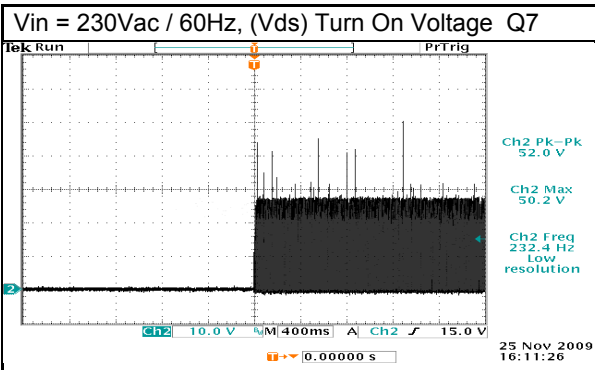
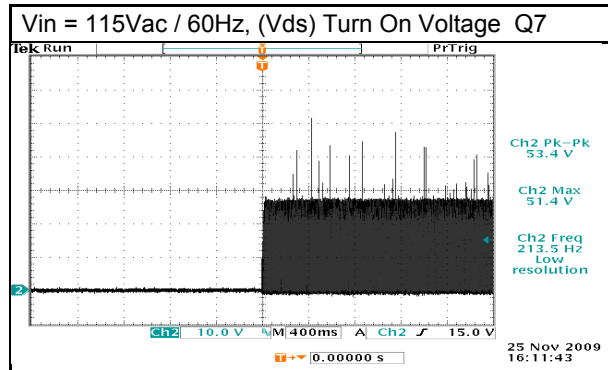
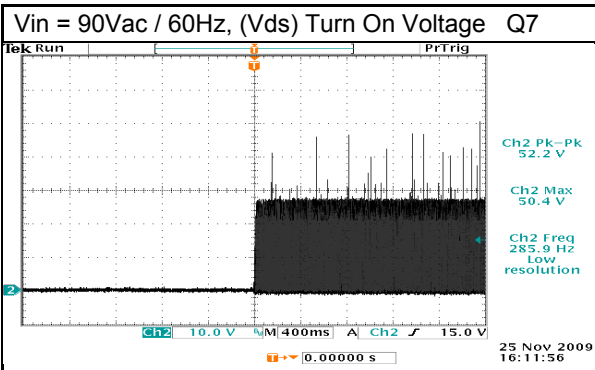
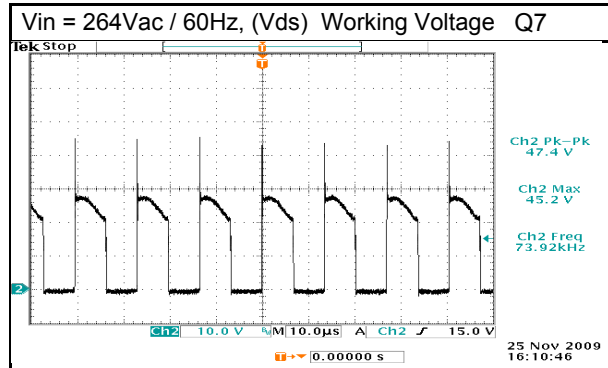
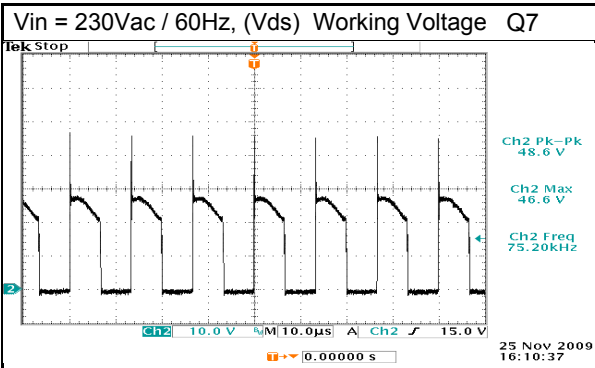
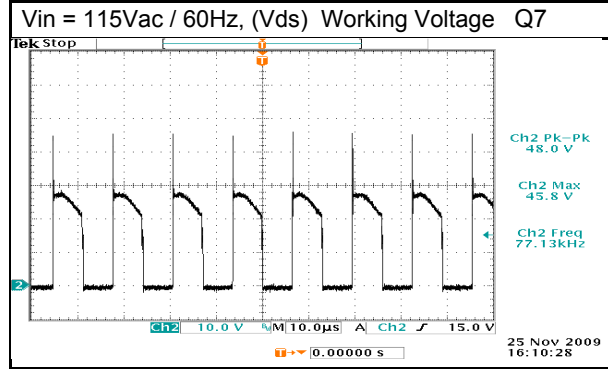
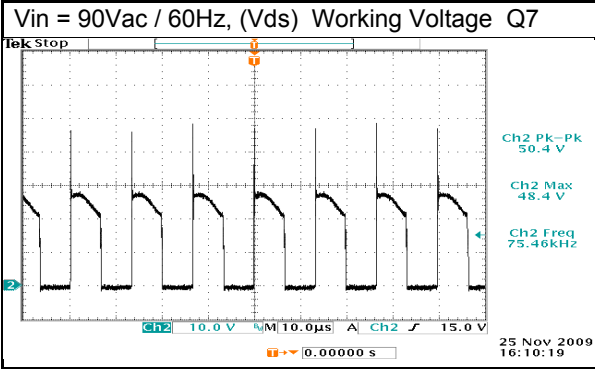
1 . SWITCHING MOS-FET WAVEFORM :





17 . SWITCHING COMPONENT WAVEFORM

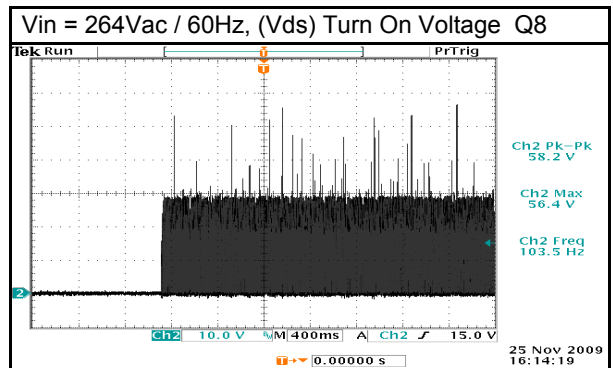
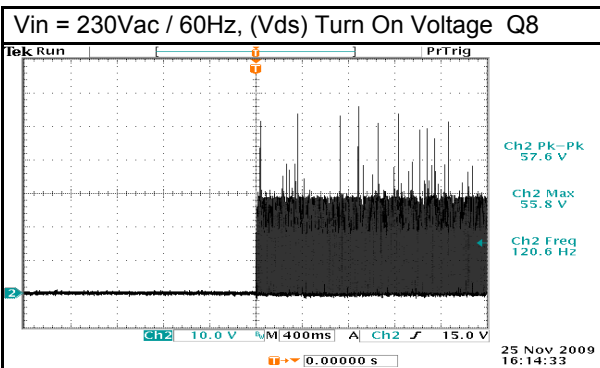
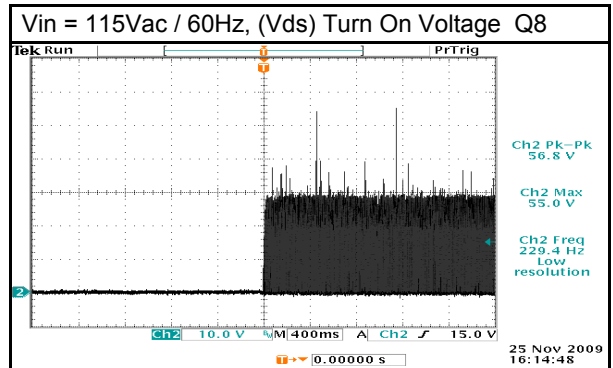
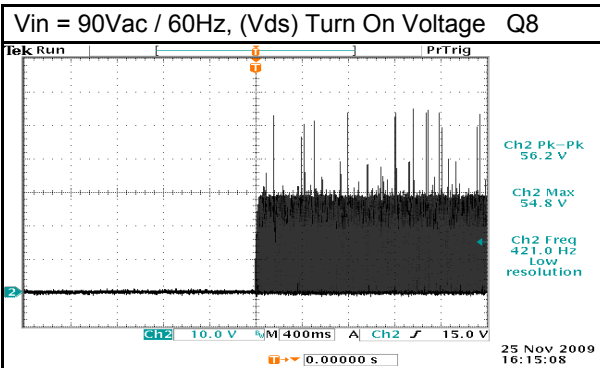
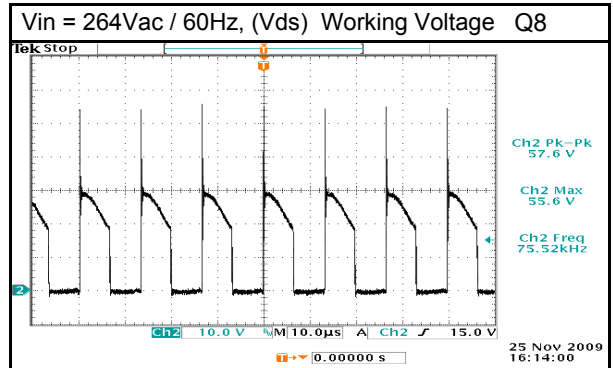
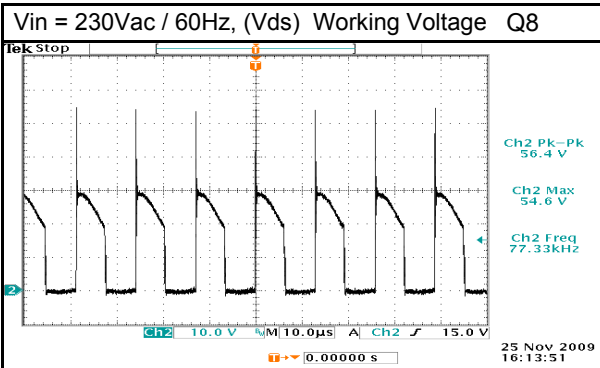
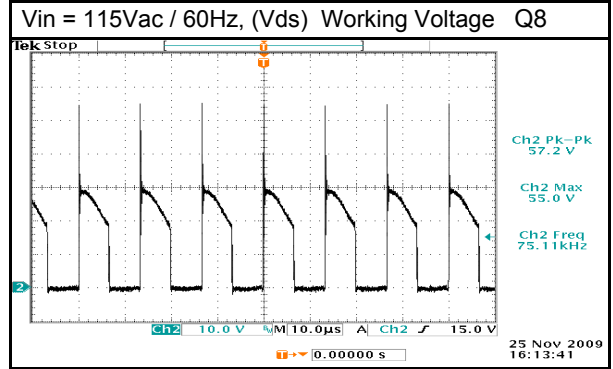
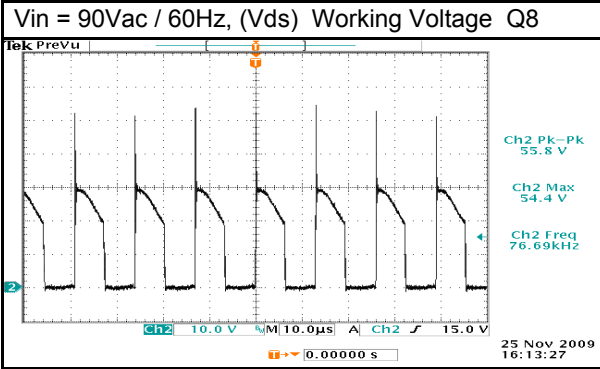
1 . SWITCHING MOS-FET WAVEFORM :





18 . SWITCHING COMPONENT WAVEFORM

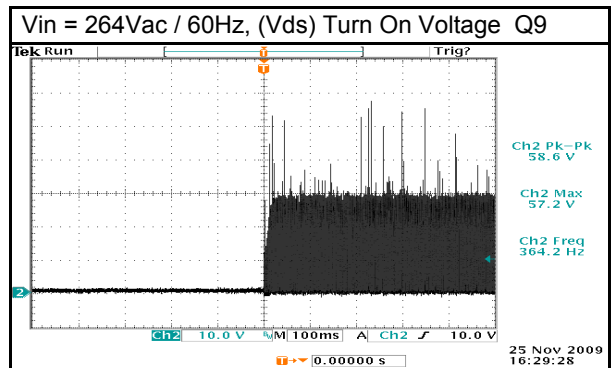
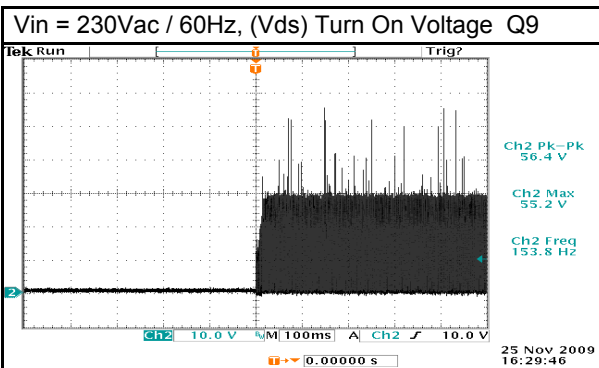
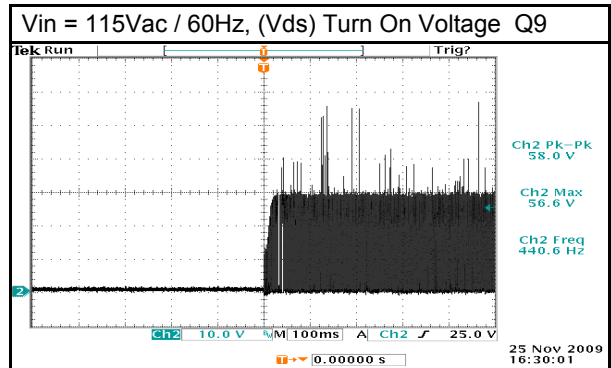
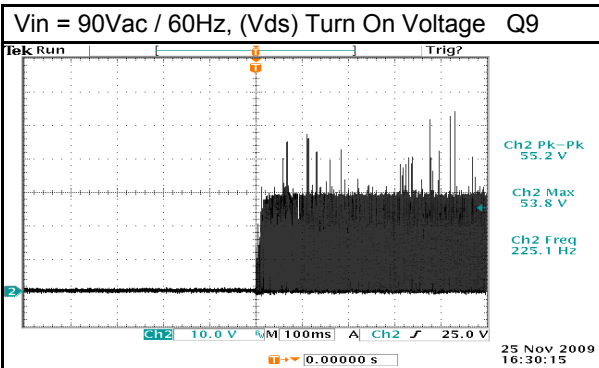
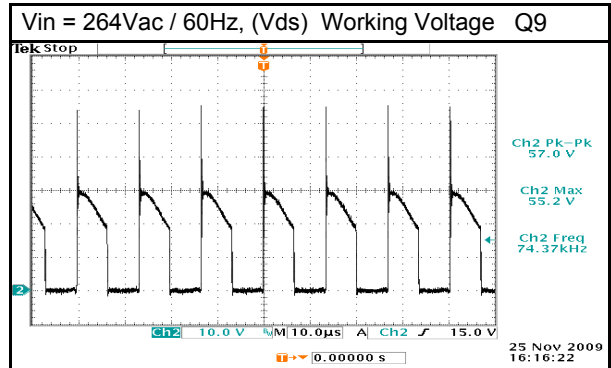
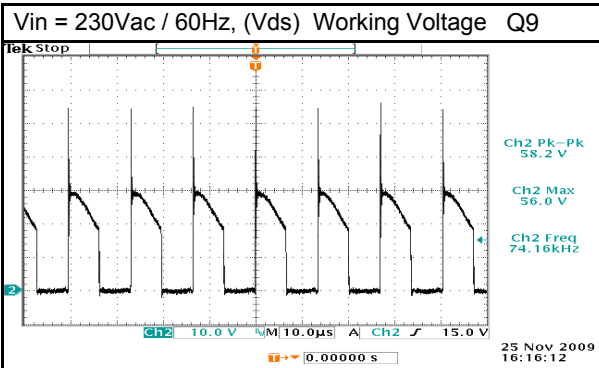
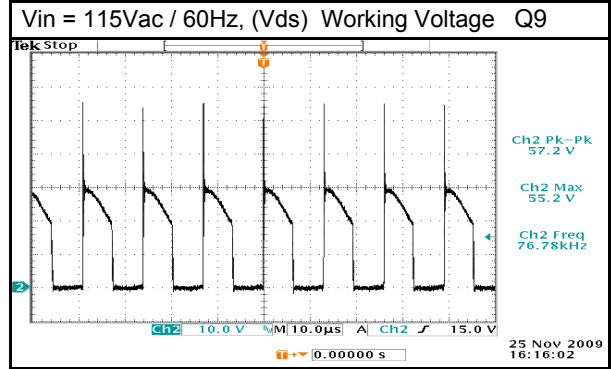
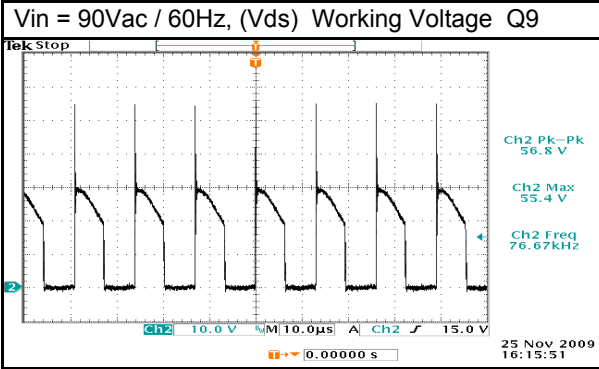
1 . SWITCHING MOS-FET WAVEFORM :





18 . SWITCHING COMPONENT WAVEFORM

1 . SWITCHING MOS-FET WAVEFORM :



**18 . SWITCHING COMPONENT WAVEFORM****1 . SWITCHING MOS-FET WAVEFORM :**

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Shenq Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

| MOS-FET Current (Id) --- Working Current Test Result | | | | | OK |
|--|---------------|-----------------|--------------|-------|-------|
| Test Item | Input Voltage | Output Load (A) | Measured (A) | SPEC. | OK/NG |
| Q1 SPA11N60C3 | 90V | 41.67 A | 2.33 A | 11 A | OK |
| | 115V | 41.67 A | 2.32 A | 11 A | OK |
| | 230V | 41.67 A | 2.33 A | 11 A | OK |
| | 264V | 41.67 A | 2.38 A | 11 A | OK |
| Q2 STF25NM60N | 90V | 41.67 A | 4.27 A | 20 A | OK |
| | 115V | 41.67 A | 3.33 A | 20 A | OK |
| | 230V | 41.67 A | 0.94 A | 20 A | OK |
| | 264V | 41.67 A | 0.91 A | 20 A | OK |
| Q3 SPA11N60C3 | 90V | 41.67 A | 2.26 A | 11 A | OK |
| | 115V | 41.67 A | 2.25 A | 11 A | OK |
| | 230V | 41.67 A | 2.27 A | 11 A | OK |
| | 264V | 41.67 A | 2.26 A | 11 A | OK |
| Q4 STF25NM60N | 90V | 41.67 A | 4.28 A | 20 A | OK |
| | 115V | 41.67 A | 3.20 A | 20 A | OK |
| | 230V | 41.67 A | 0.93 A | 20 A | OK |
| | 264V | 41.67 A | 0.73 A | 20 A | OK |
| Q6 IRFB3607PbF | 90V | 41.67 A | 3.47 A | 80 A | OK |
| | 115V | 41.67 A | 3.53 A | 80 A | OK |
| | 230V | 41.67 A | 4.06 A | 80 A | OK |
| | 264V | 41.67 A | 3.44 A | 80 A | OK |



18 . SWITCHING COMPONENT WAVEFORM

1 . SWITCHING MOS-FET WAVEFORM :

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Shenq Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

| MOS-FET Current (Id) --- Working Current Test Result | | | | | OK |
|--|---------------|-----------------|--------------|-------|-------|
| Test Item | Input Voltage | Output Load (A) | Measured (A) | SPEC. | OK/NG |
| Q7 IRFB3607Pbf | 90V | 41.67 A | 4.40 A | 80 A | OK |
| | 115V | 41.67 A | 4.04 A | 80 A | OK |
| | 230V | 41.67 A | 4.79 A | 80 A | OK |
| | 264V | 41.67 A | 4.19 A | 80 A | OK |
| Q8 IRFB3607Pbf | 90V | 41.67 A | 13.2 A | 80 A | OK |
| | 115V | 41.67 A | 13.2 A | 80 A | OK |
| | 230V | 41.67 A | 12.9 A | 80 A | OK |
| | 264V | 41.67 A | 13.1 A | 80 A | OK |
| Q9 IRFB3607Pbf | 90V | 41.67 A | 13.3 A | 80 A | OK |
| | 115V | 41.67 A | 13.2 A | 80 A | OK |
| | 230V | 41.67 A | 13.4 A | 80 A | OK |
| | 264V | 41.67 A | 13.3 A | 80 A | OK |
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18 . SWITCHING COMPONENT WAVEFORM

1 . SWITCHING MOS-FET WAVEFORM :

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Shenq Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

| MOS-FET Current (Id) --- Turn On Current Test Result | | | | | OK |
|--|---------------|-----------------|--------------|-------|-------|
| Test Item | Input Voltage | Output Load (A) | Measured (A) | SPEC. | OK/NG |
| Q1 SPA11N60C3 | 90V | 41.67 A | 9.36 A | 33 A | OK |
| | 115V | 41.67 A | 9.60 A | 33 A | OK |
| | 230V | 41.67 A | 8.60 A | 33 A | OK |
| | 264V | 41.67 A | 8.88 A | 33 A | OK |
| Q2 STF25NM60N | 90V | 41.67 A | 9.48 A | 80 A | OK |
| | 115V | 41.67 A | 7.08 A | 80 A | OK |
| | 230V | 41.67 A | 5.24 A | 80 A | OK |
| | 264V | 41.67 A | 5.46 A | 80 A | OK |
| Q3 SPA11N60C3 | 90V | 41.67 A | 8.20 A | 33 A | OK |
| | 115V | 41.67 A | 9.44 A | 33 A | OK |
| | 230V | 41.67 A | 8.68 A | 33 A | OK |
| | 264V | 41.67 A | 10.00 A | 33 A | OK |
| Q4 STF25NM60N | 90V | 41.67 A | 9.08 A | 80 A | OK |
| | 115V | 41.67 A | 8.40 A | 80 A | OK |
| | 230V | 41.67 A | 3.88 A | 80 A | OK |
| | 264V | 41.67 A | 3.68 A | 80 A | OK |
| Q6 IRFB3607PbF | 90V | 41.67 A | 13.60 A | 80 A | OK |
| | 115V | 41.67 A | 14.40 A | 80 A | OK |
| | 230V | 41.67 A | 13.20 A | 80 A | OK |
| | 264V | 41.67 A | 13.60 A | 80 A | OK |



18 . SWITCHING COMPONENT WAVEFORM

1 . SWITCHING MOS-FET WAVEFORM :

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

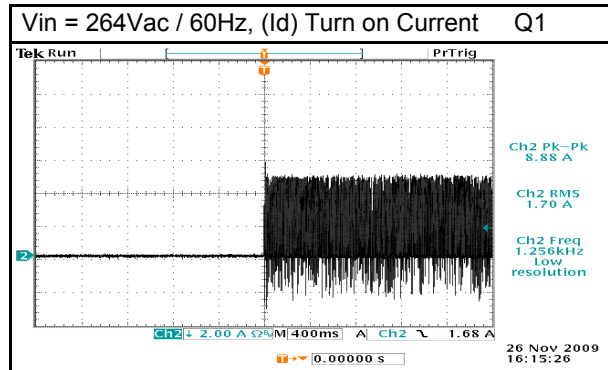
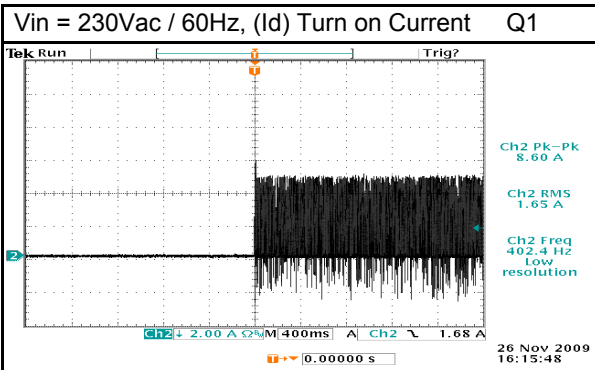
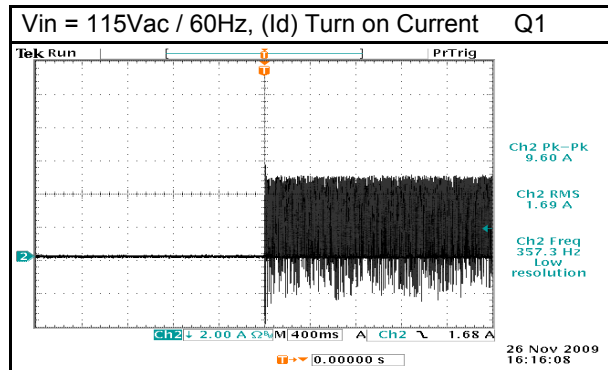
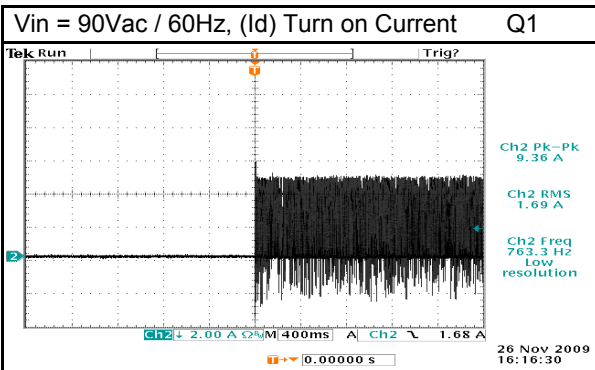
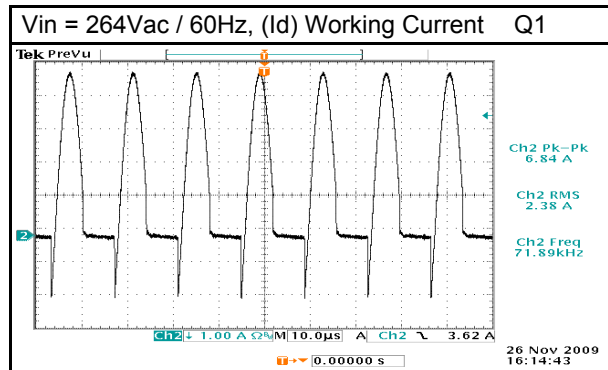
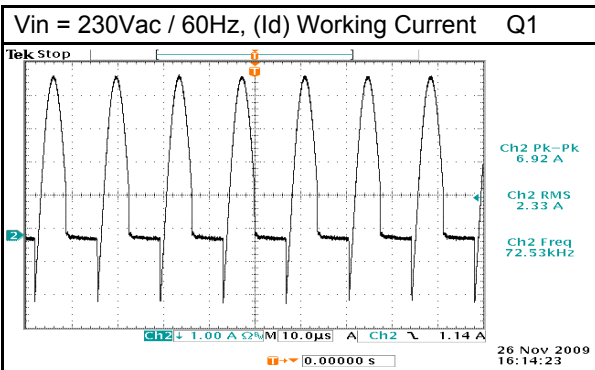
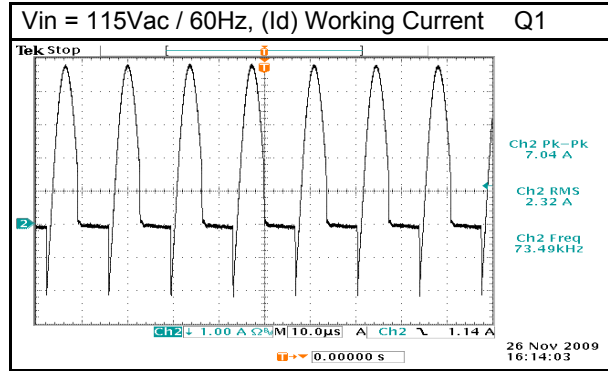
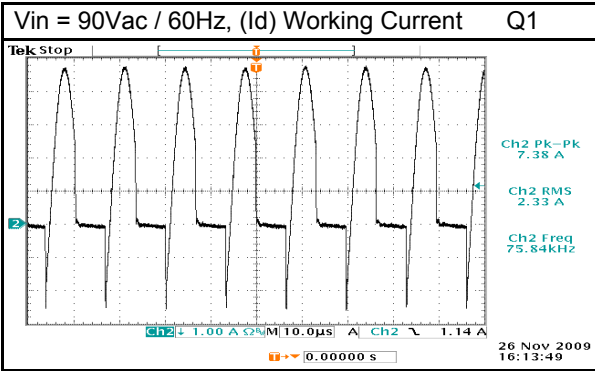
| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Shenq Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

| MOS-FET Current (Id) --- Turn On Current Test Result | | | | | OK |
|--|---------------|-----------------|--------------|-------|-------|
| Test Item | Input Voltage | Output Load (A) | Measured (A) | SPEC. | OK/NG |
| Q7 IRFB3607PbF | 90V | 41.67 A | 15.30 A | 310 A | OK |
| | 115V | 41.67 A | 15.20 A | 310 A | OK |
| | 230V | 41.67 A | 14.40 A | 310 A | OK |
| | 264V | 41.67 A | 14.50 A | 310 A | OK |
| Q8 IRFB3607PbF | 90V | 41.67 A | 30.50 A | 310 A | OK |
| | 115V | 41.67 A | 30.20 A | 310 A | OK |
| | 230V | 41.67 A | 30.50 A | 310 A | OK |
| | 264V | 41.67 A | 30.40 A | 310 A | OK |
| Q9 IRFB3607PbF | 90V | 41.67 A | 31.00 A | 310 A | OK |
| | 115V | 41.67 A | 31.20 A | 310 A | OK |
| | 230V | 41.67 A | 31.00 A | 310 A | OK |
| | 264V | 41.67 A | 30.60 A | 310 A | OK |
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18 . SWITCHING COMPONENT WAVEFORM

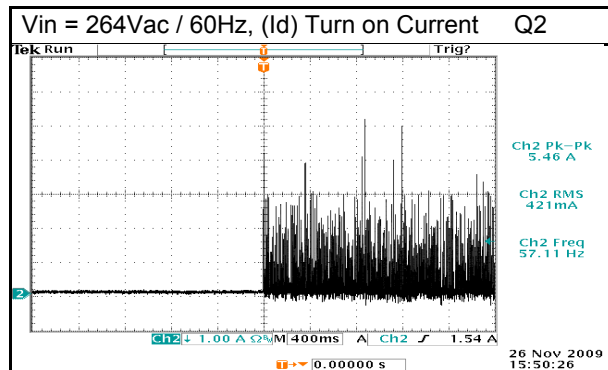
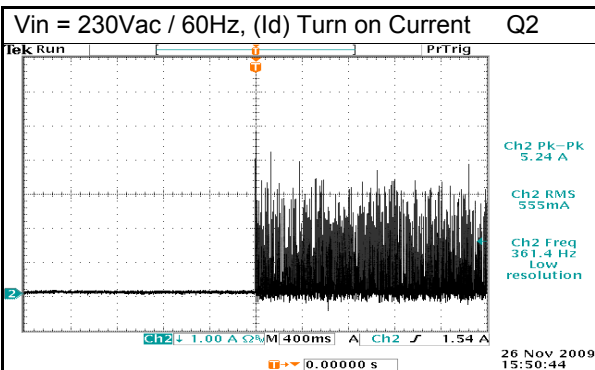
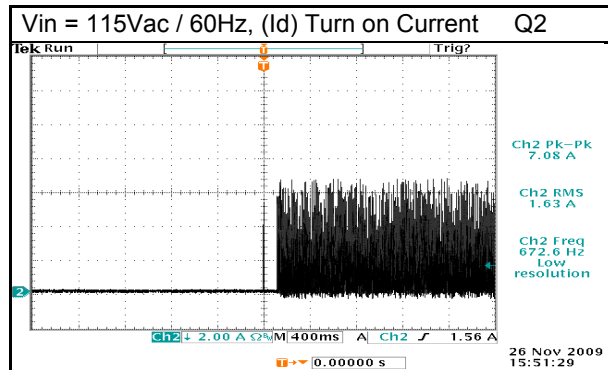
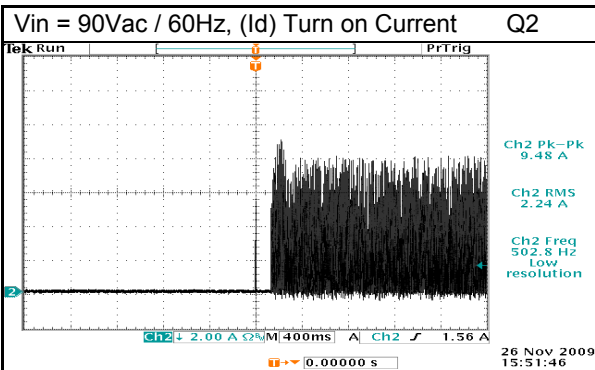
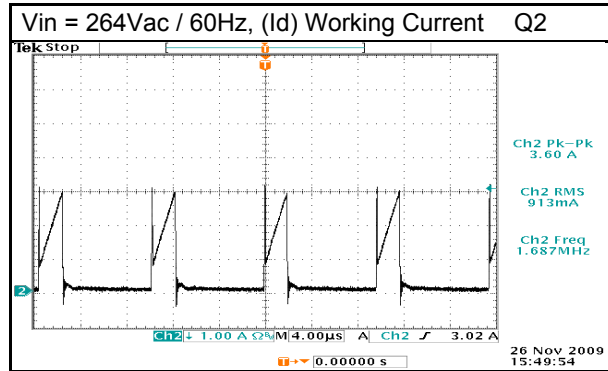
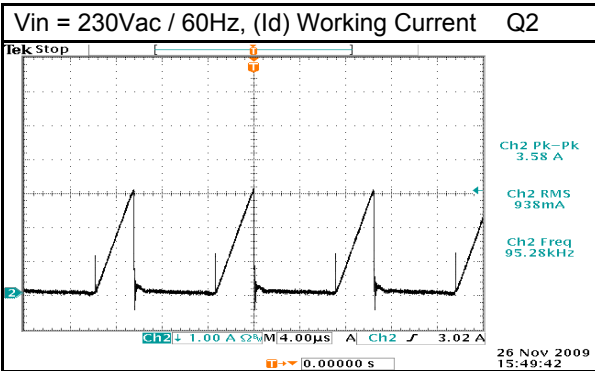
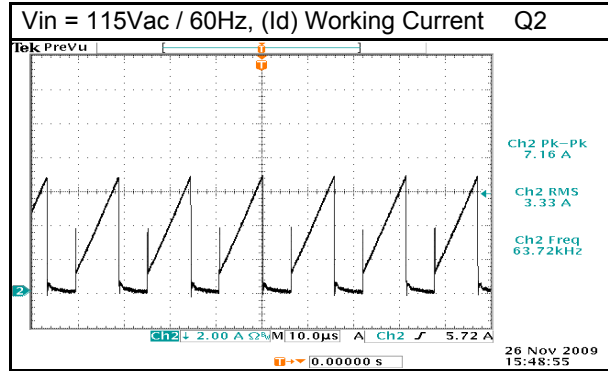
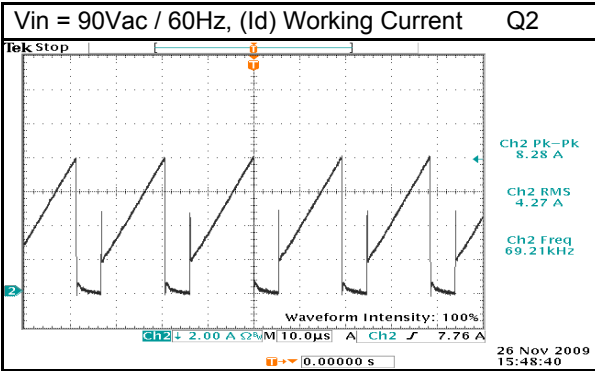
1 . SWITCHING MOS-FET WAVEFORM :





18 SWITCHING COMPONENT WAVEFORM

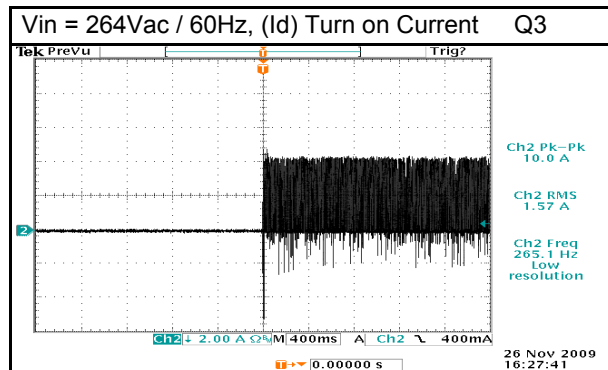
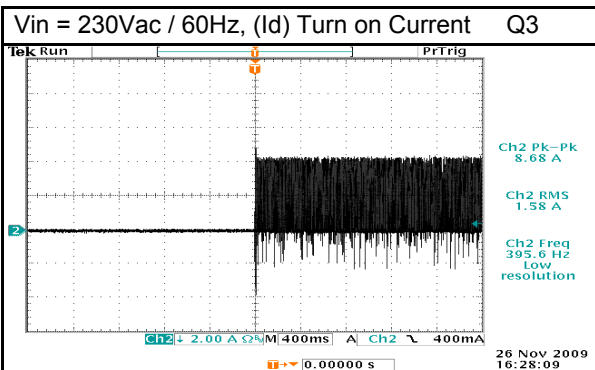
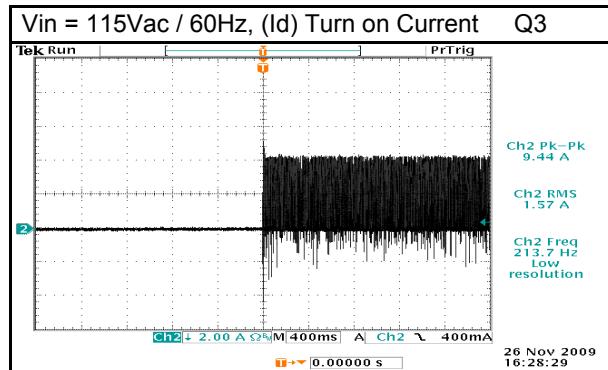
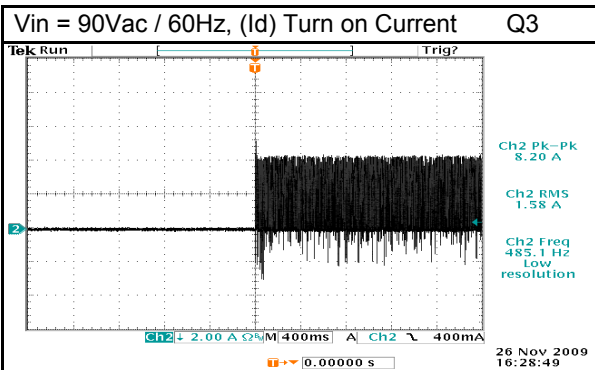
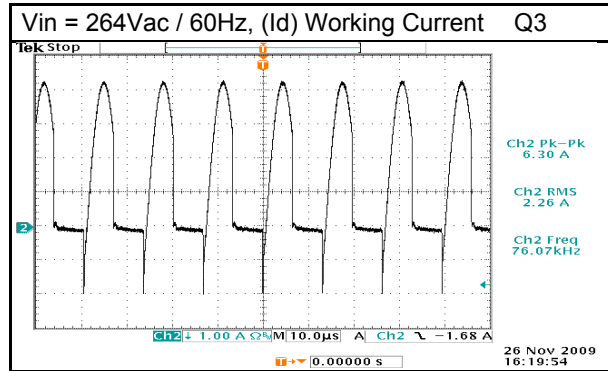
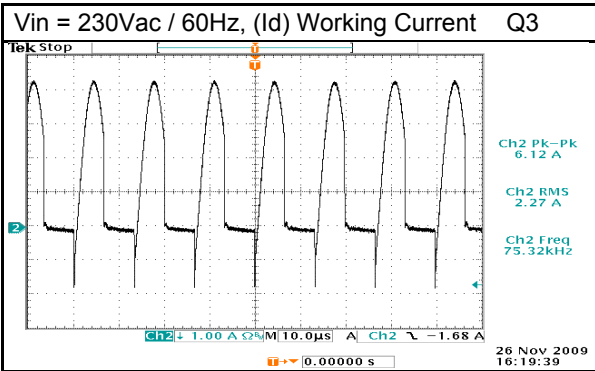
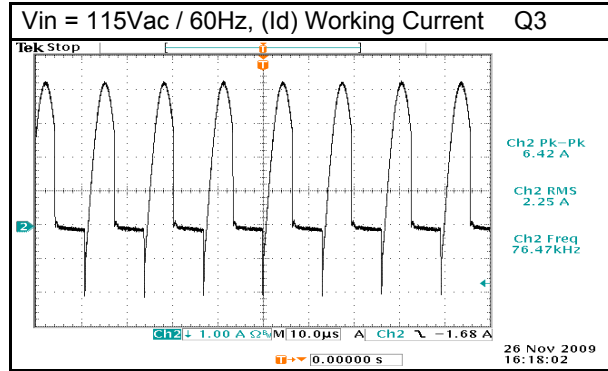
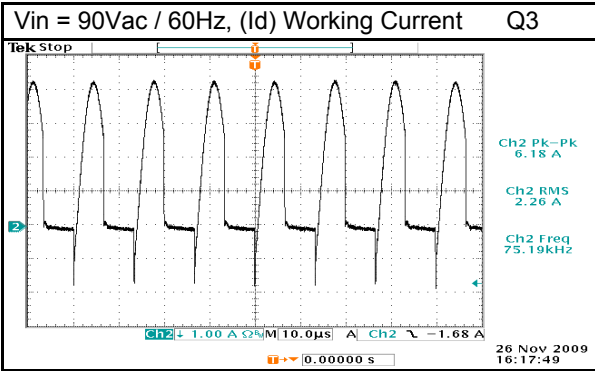
1 SWITCHING MOS-FET WAVEFORM :





18 SWITCHING COMPONENT WAVEFORM

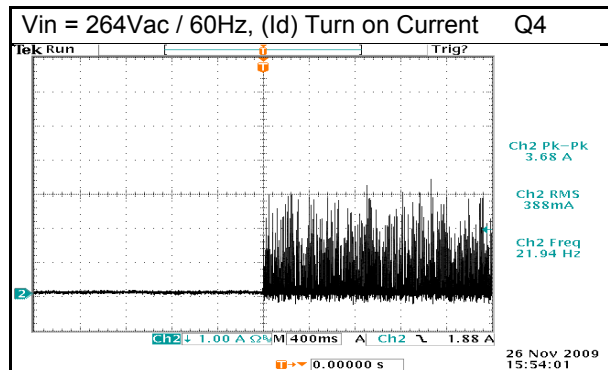
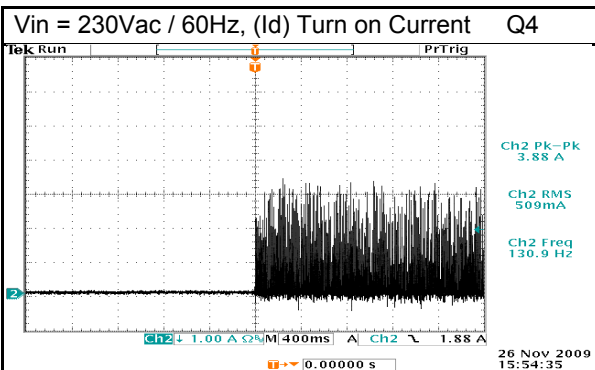
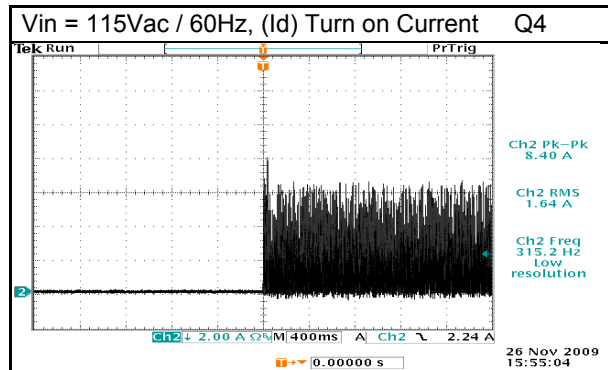
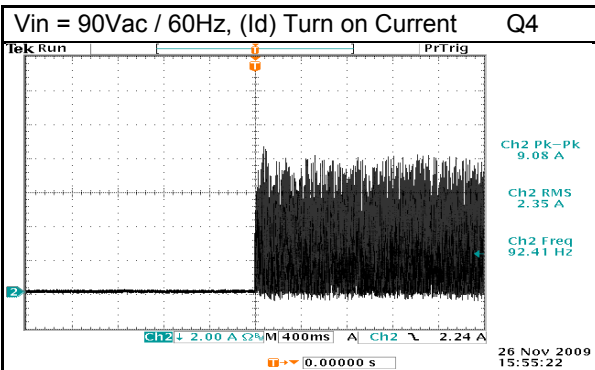
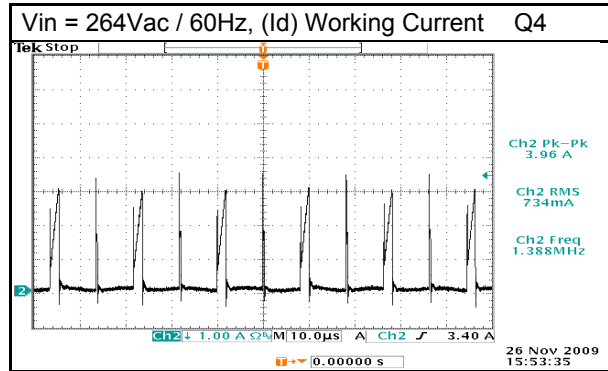
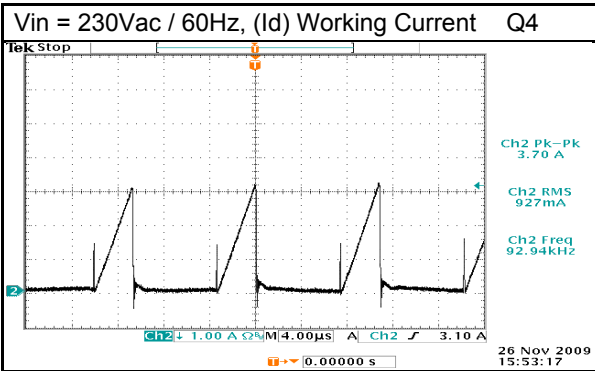
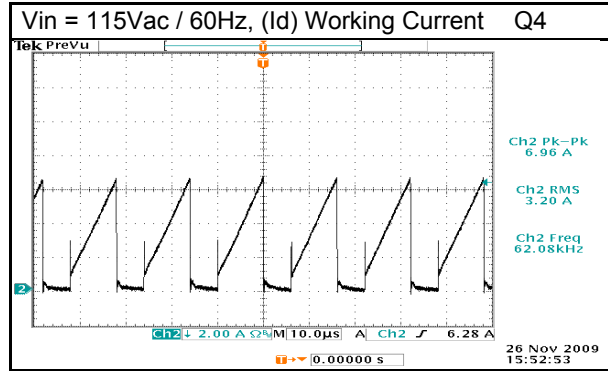
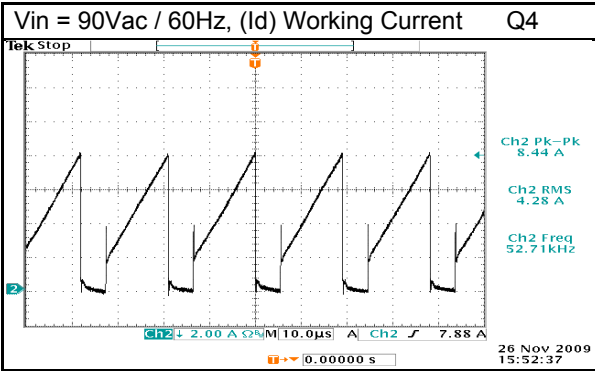
1 SWITCHING MOS-FET WAVEFORM :





18 SWITCHING COMPONENT WAVEFORM

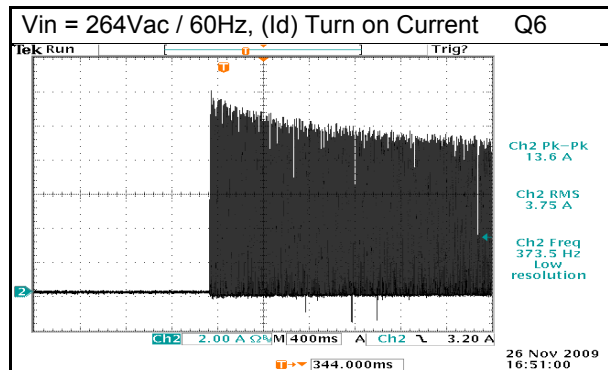
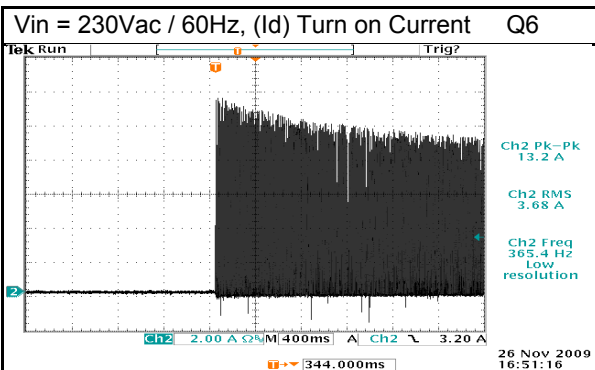
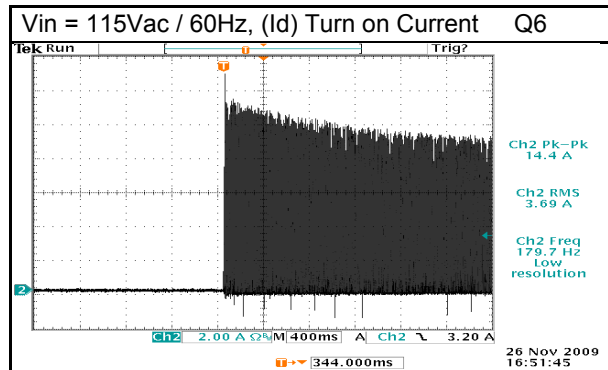
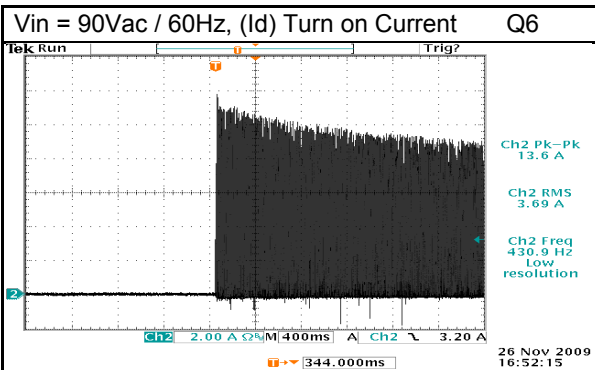
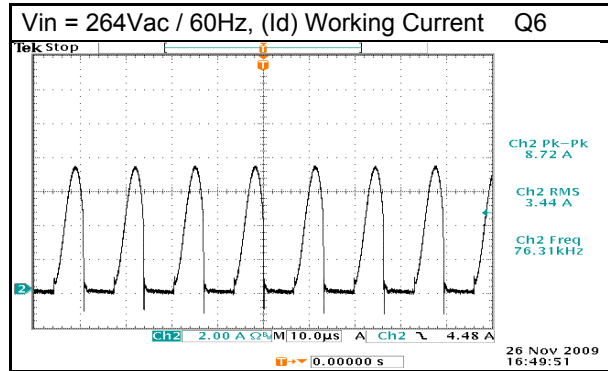
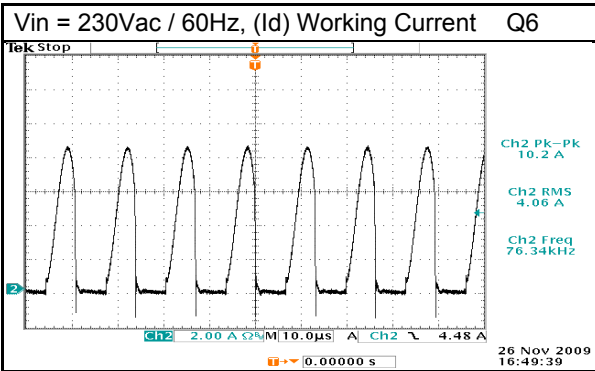
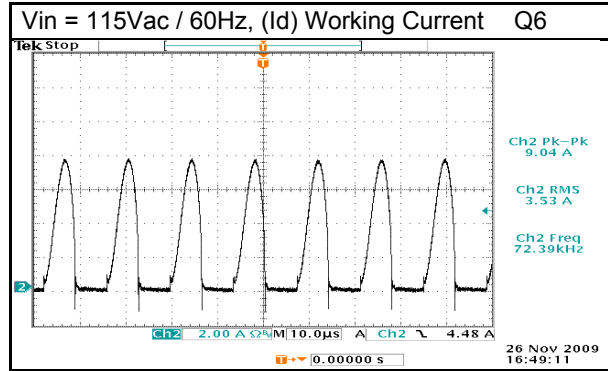
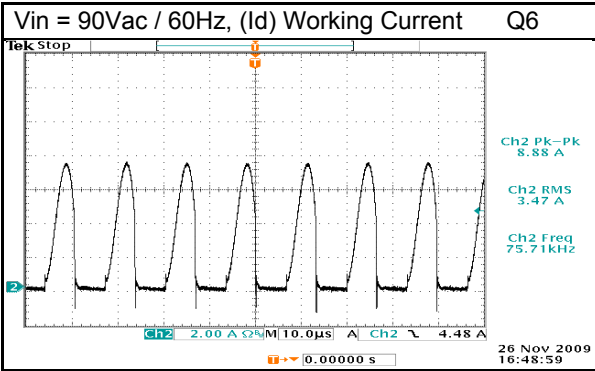
1 SWITCHING MOS-FET WAVEFORM :





18 . SWITCHING COMPONENT WAVEFORM

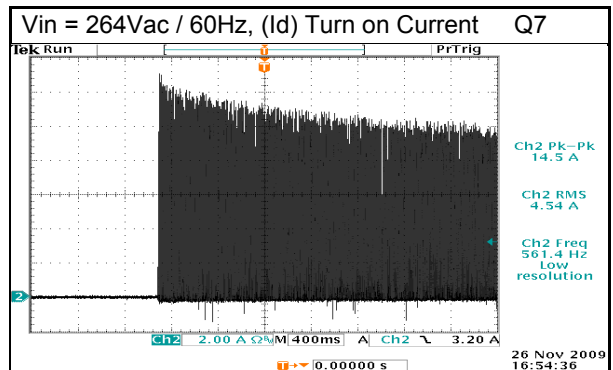
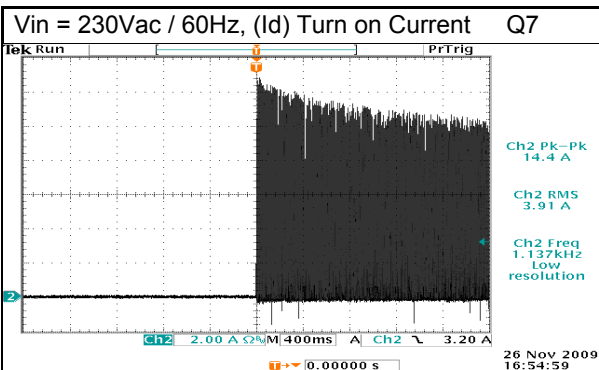
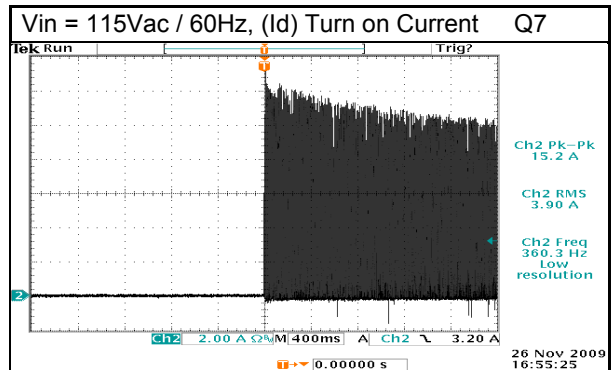
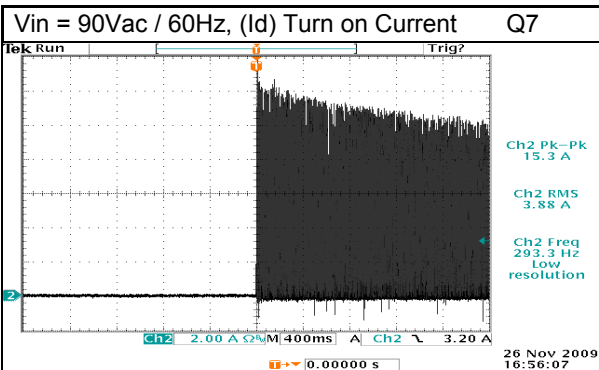
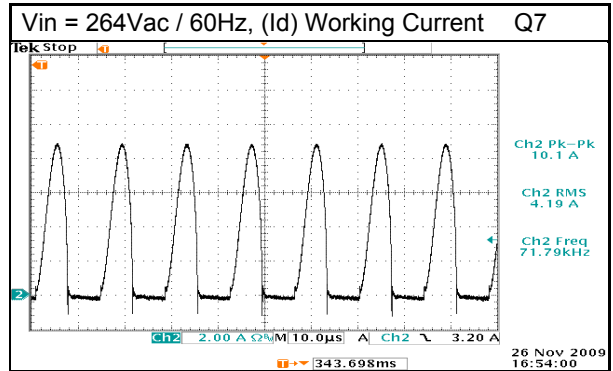
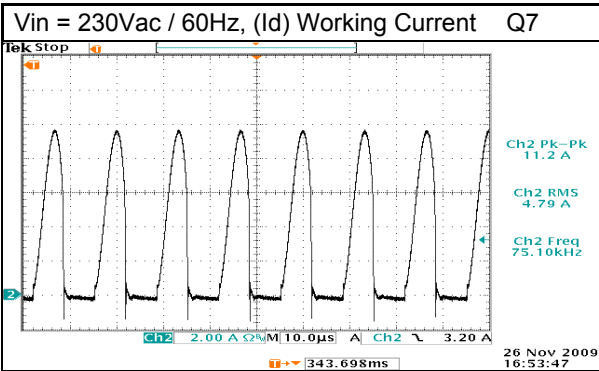
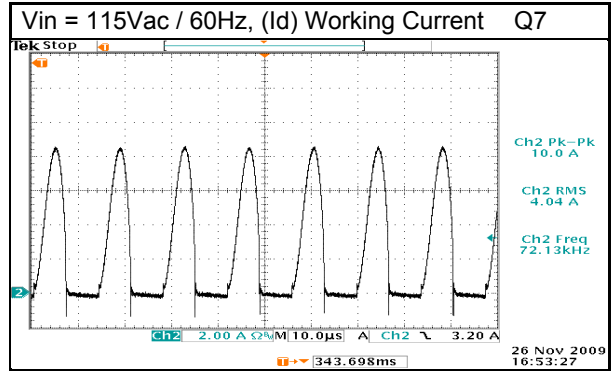
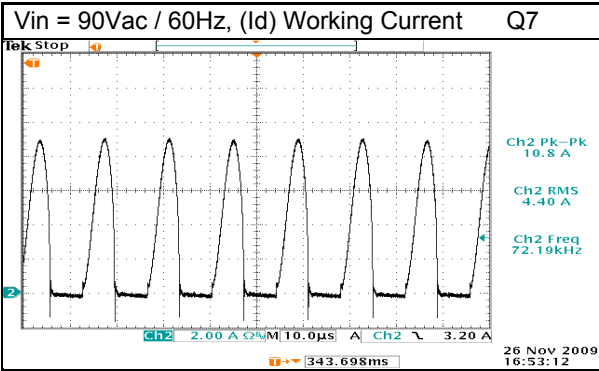
1 . SWITCHING MOS-FET WAVEFORM :





18 SWITCHING COMPONENT WAVEFORM

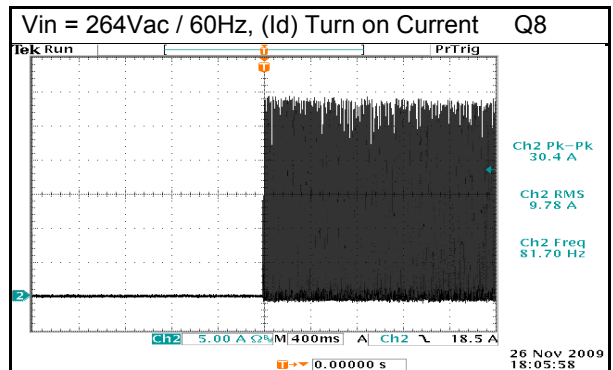
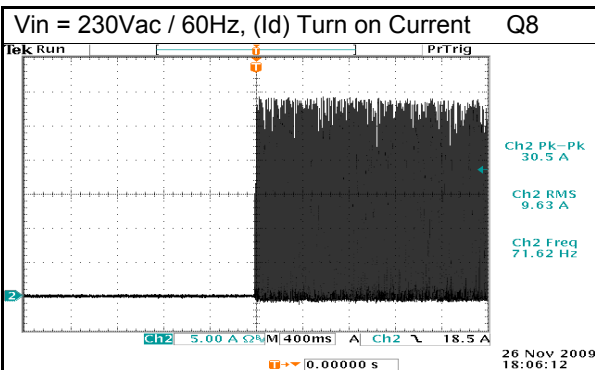
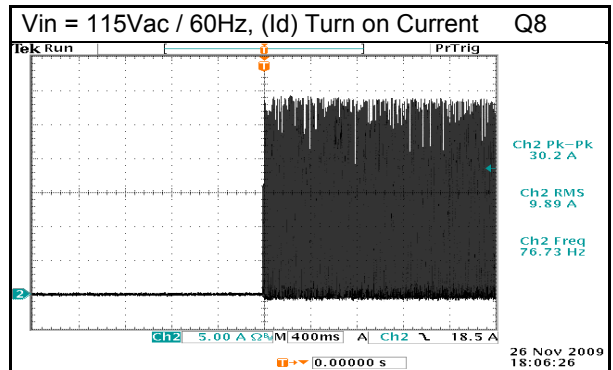
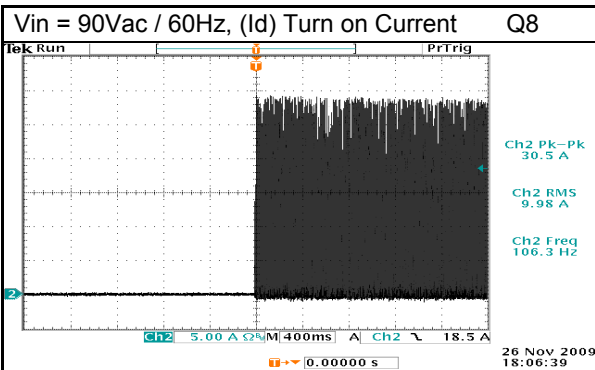
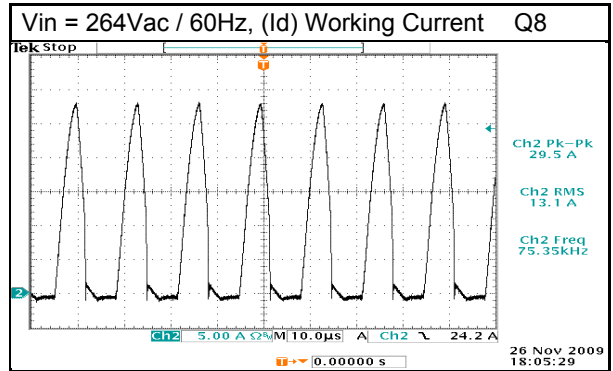
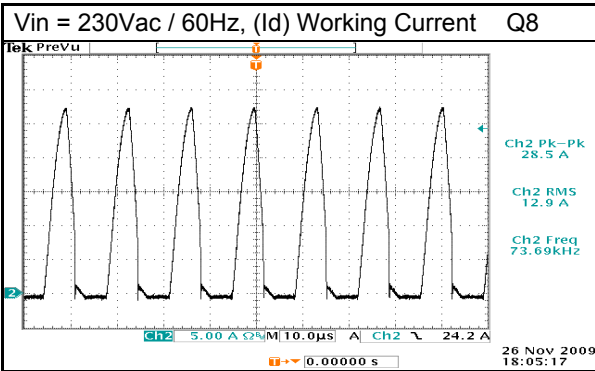
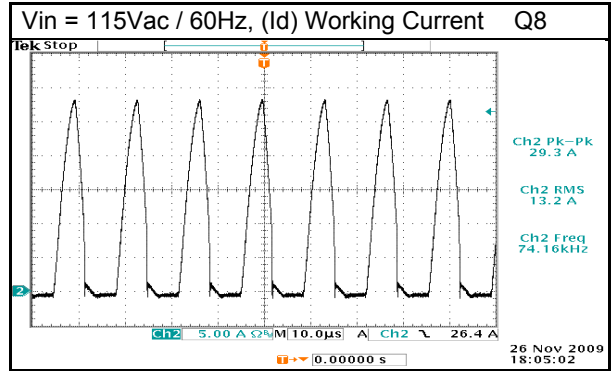
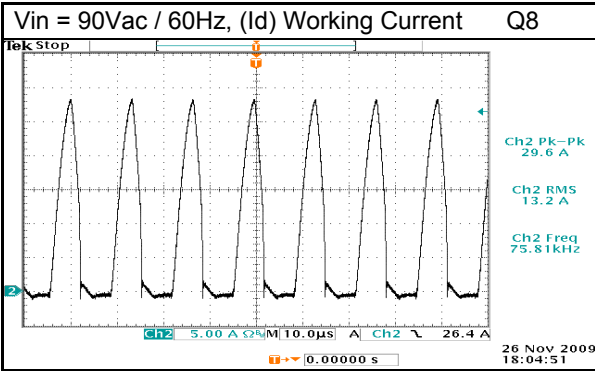
1 SWITCHING MOS-FET WAVEFORM :





18 SWITCHING COMPONENT WAVEFORM

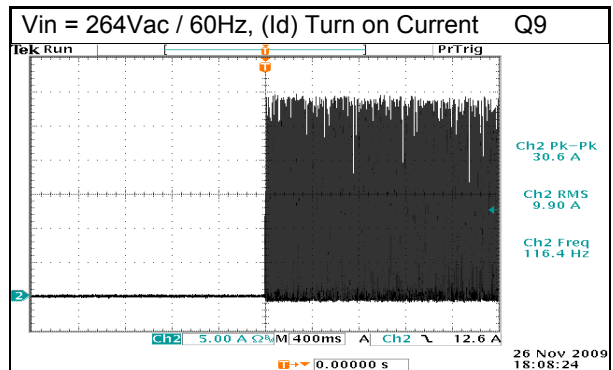
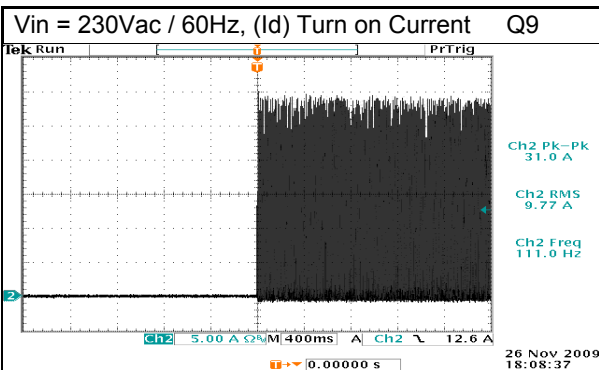
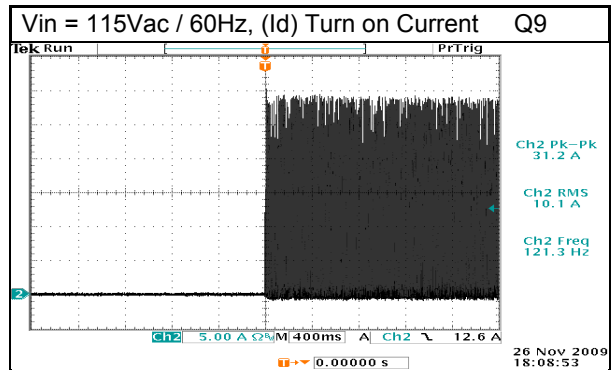
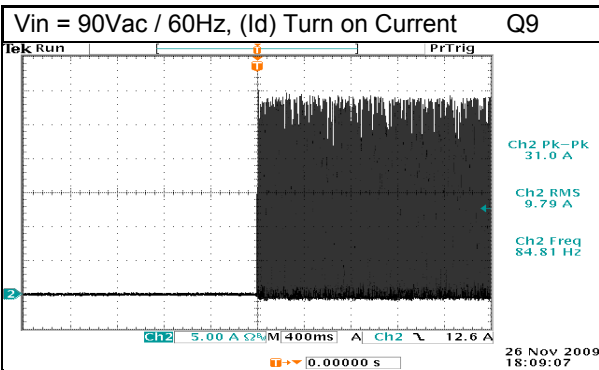
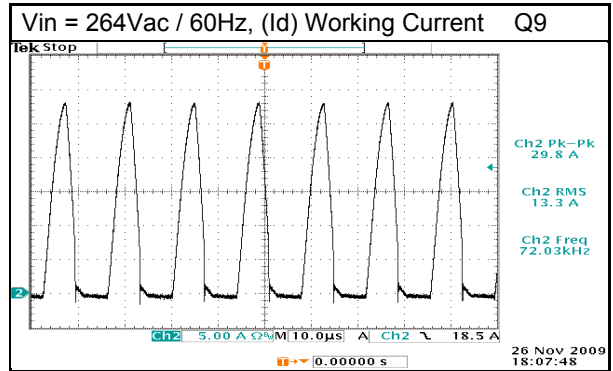
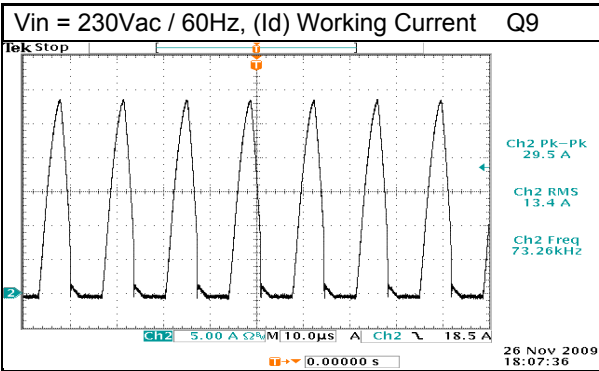
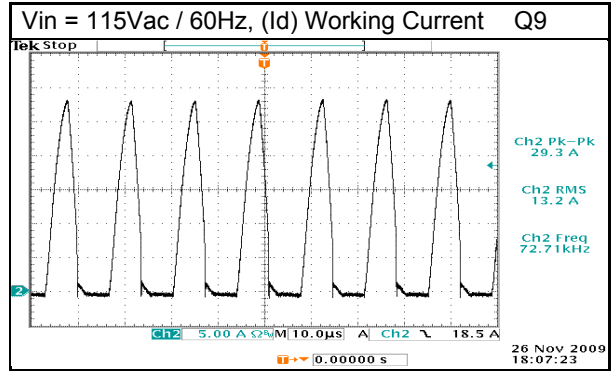
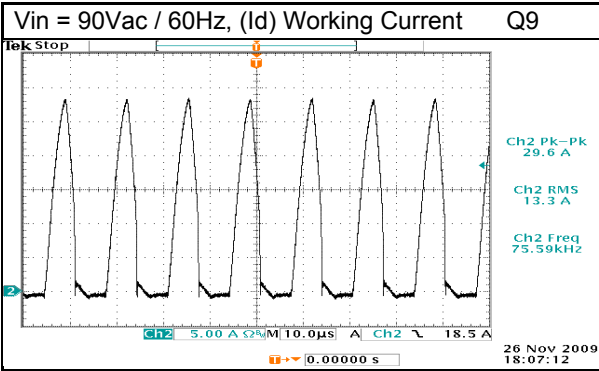
1 SWITCHING MOS-FET WAVEFORM :





18 SWITCHING COMPONENT WAVEFORM

1 SWITCHING MOS-FET WAVEFORM :





18 . SWITCHING COMPONENT WAVEFORM

2 . SWITCHING RECTIFIER DIODE WAVEFORM :

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Sheng Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

| RECTIFIER DIODE Voltage (Vr) --- Working Voltage Test Result | | | | | OK |
|--|---------------|-----------------|--------------|--------|-------|
| Test Item | Input Voltage | Output Load (A) | Measured (V) | SPEC. | OK/NG |
| D1 SB2100 | 90V | 41.67 A | 51.2 V | 100 V | OK |
| | 115V | 41.67 A | 51.4 V | 100 V | OK |
| | 230V | 41.67 A | 51.0 V | 100 V | OK |
| | 264V | 41.67 A | 51.6 V | 100 V | OK |
| D2 STTH12S06FP | 90V | 41.67 A | 480.0 V | 600 V | OK |
| | 115V | 41.67 A | 462.0 V | 600 V | OK |
| | 230V | 41.67 A | 460.0 V | 600 V | OK |
| | 264V | 41.67 A | 460.0 V | 600 V | OK |
| D4 1N4007 | 90V | 41.67 A | 114.0 V | 1000 V | OK |
| | 115V | 41.67 A | 111.0 V | 1000 V | OK |
| | 230V | 41.67 A | 111.0 V | 1000 V | OK |
| | 264V | 41.67 A | 112.0 V | 1000 V | OK |
| D5 1N4007 | 90V | 41.67 A | 420.0 V | 1000 V | OK |
| | 115V | 41.67 A | 418.0 V | 1000 V | OK |
| | 230V | 41.67 A | 406.0 V | 1000 V | OK |
| | 264V | 41.67 A | 424.0 V | 1000 V | OK |
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18 . SWITCHING COMPONENT WAVEFORM

2 . SWITCHING RECTIFIER DIODE WAVEFORM :

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Sheng Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

| RECTIFIER DIODE Voltage (Vr) --- Working Voltage Test Result | | | | | OK |
|--|---------------|-----------------|--------------|-------|-------|
| Test Item | Input Voltage | Output Load (A) | Measured (V) | SPEC. | OK/NG |
| D6 SB3100 | 90V | 41.67 A | 42.2 V | 100 V | OK |
| | 115V | 41.67 A | 41.6 V | 100 V | OK |
| | 230V | 41.67 A | 42.6 V | 100 V | OK |
| | 264V | 41.67 A | 42.6 V | 100 V | OK |
| D8 SB560 | 90V | 41.67 A | 31.4 V | 60 V | OK |
| | 115V | 41.67 A | 29.8 V | 60 V | OK |
| | 230V | 41.67 A | 31.0 V | 60 V | OK |
| | 264V | 41.67 A | 29.7 V | 60 V | OK |
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18 . SWITCHING COMPONENT WAVEFORM

2 . SWITCHING RECTIFIER DIODE WAVEFORM :

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Sheng Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

| RECTIFIER DIODE Voltage (Vr) --- Turn On Voltage Test Result | | | | | OK |
|--|---------------|-----------------|--------------|--------|-------|
| Test Item | Input Voltage | Output Load (A) | Measured (V) | SPEC. | OK/NG |
| D1 SB2100 | 90V | 41.67 A | 54.8 V | 100 V | OK |
| | 115V | 41.67 A | 51.8 V | 100 V | OK |
| | 230V | 41.67 A | 51.4 V | 100 V | OK |
| | 264V | 41.67 A | 51.8 V | 100 V | OK |
| D2 STTH12S06FP | 90V | 41.67 A | 502.0 V | 600 V | OK |
| | 115V | 41.67 A | 502.0 V | 600 V | OK |
| | 230V | 41.67 A | 490.0 V | 600 V | OK |
| | 264V | 41.67 A | 472.0 V | 600 V | OK |
| D4 1N4007 | 90V | 41.67 A | 107.0 V | 1000 V | OK |
| | 115V | 41.67 A | 111.0 V | 1000 V | OK |
| | 230V | 41.67 A | 105.0 V | 1000 V | OK |
| | 264V | 41.67 A | 114.0 V | 1000 V | OK |
| D5 1N4007 | 90V | 41.67 A | 418.0 V | 1000 V | OK |
| | 115V | 41.67 A | 424.0 V | 1000 V | OK |
| | 230V | 41.67 A | 404.0 V | 1000 V | OK |
| | 264V | 41.67 A | 424.0 V | 1000 V | OK |
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18 . SWITCHING COMPONENT WAVEFORM

2 . SWITCHING RECTIFIER DIODE WAVEFORM :

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

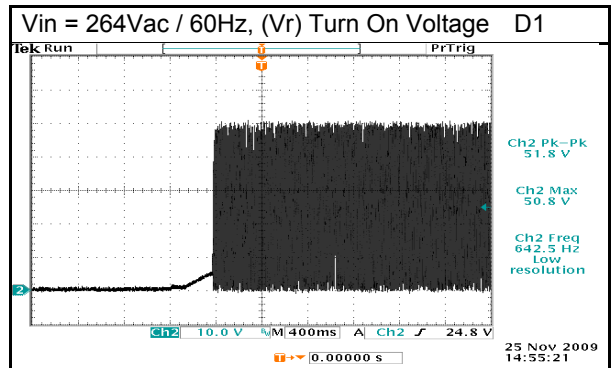
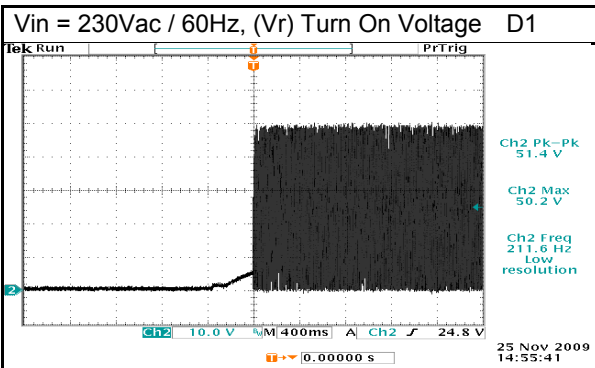
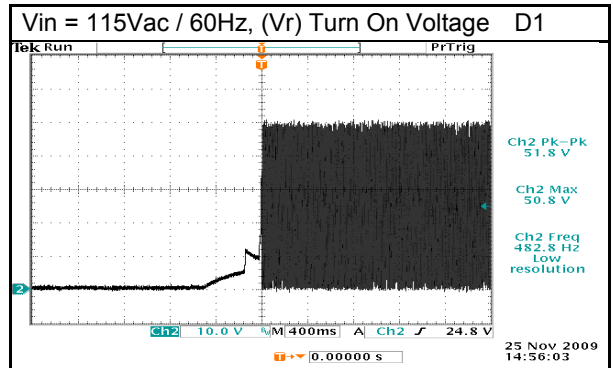
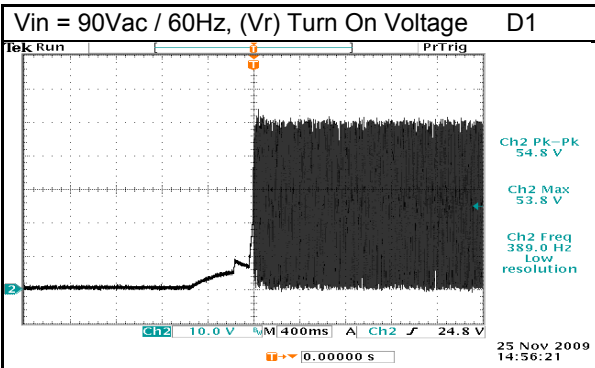
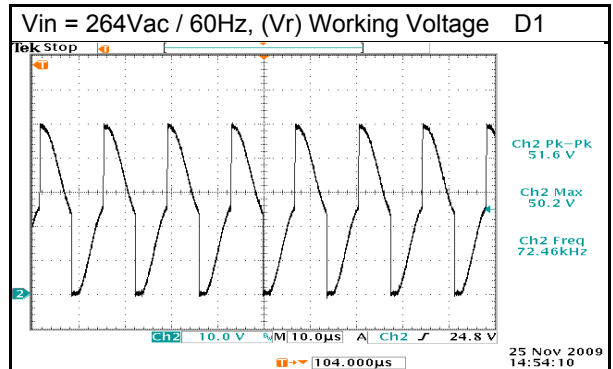
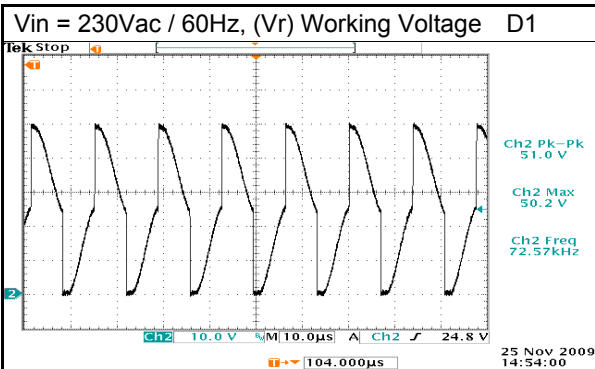
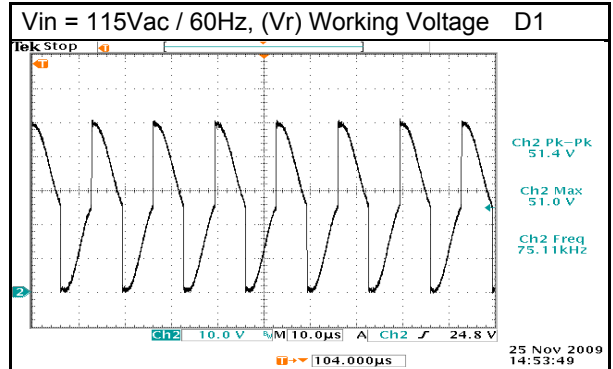
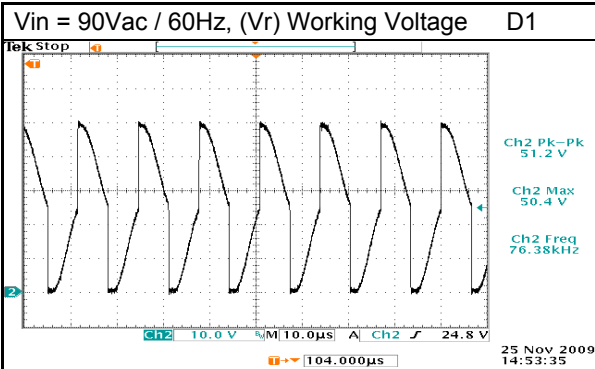
| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Sheng Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

| RECTIFIER DIODE Voltage (Vr) --- Turn On Voltage Test Result | | | | | OK |
|--|---------------|-----------------|--------------|-------|-------|
| Test Item | Input Voltage | Output Load (A) | Measured (V) | SPEC. | OK/NG |
| D6 SB3100 | 90V | 41.67 A | 41.0 V | 100 V | OK |
| | 115V | 41.67 A | 40.6 V | 100 V | OK |
| | 230V | 41.67 A | 41.4 V | 100 V | OK |
| | 264V | 41.67 A | 42.0 V | 100 V | OK |
| D8 SB560 | 90V | 41.67 A | 30.2 V | 60 V | OK |
| | 115V | 41.67 A | 30.0 V | 60 V | OK |
| | 230V | 41.67 A | 30.1 V | 60 V | OK |
| | 264V | 41.67 A | 30.1 V | 60 V | OK |
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18 . SWITCHING COMPONENT WAVEFORM

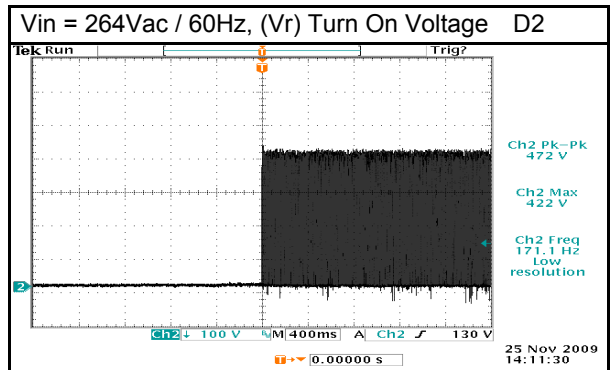
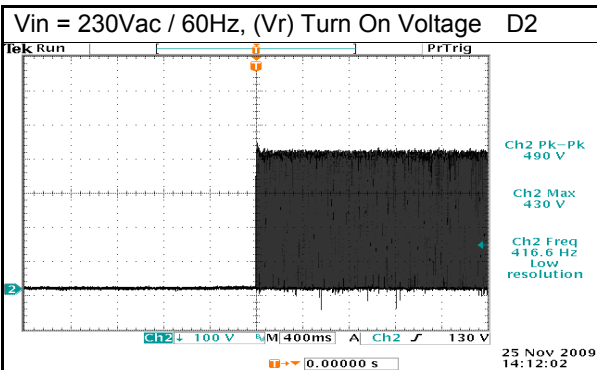
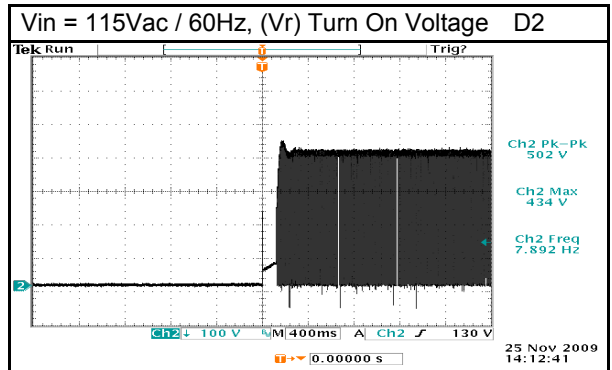
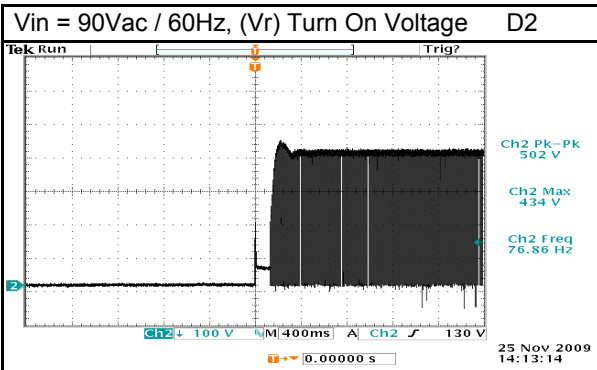
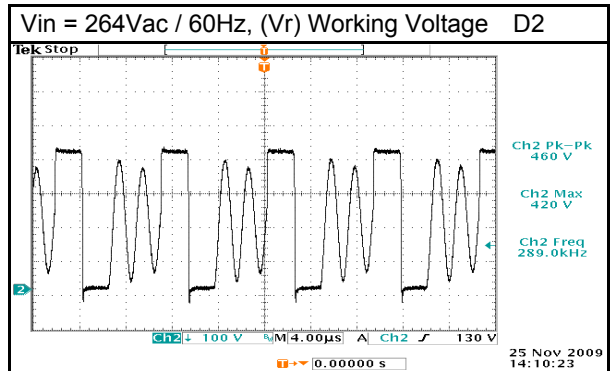
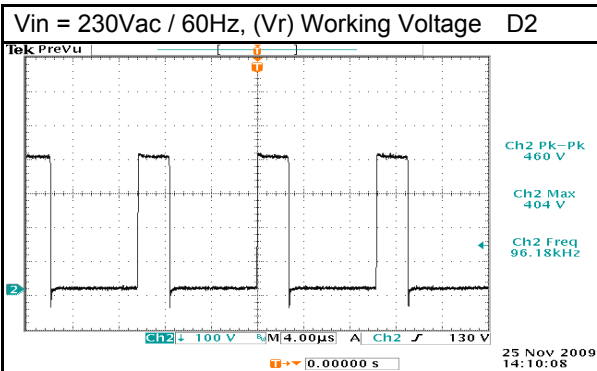
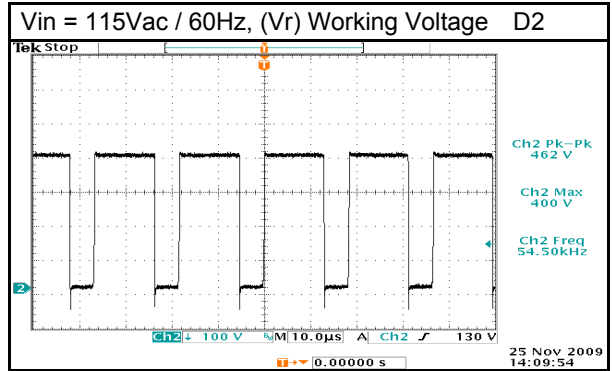
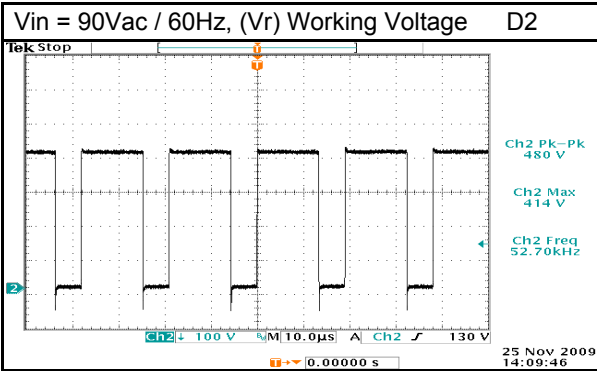
2 . SWITCHING RECTIFIER DIODE WAVEFORM :





18 . SWITCHING COMPONENT WAVEFORM

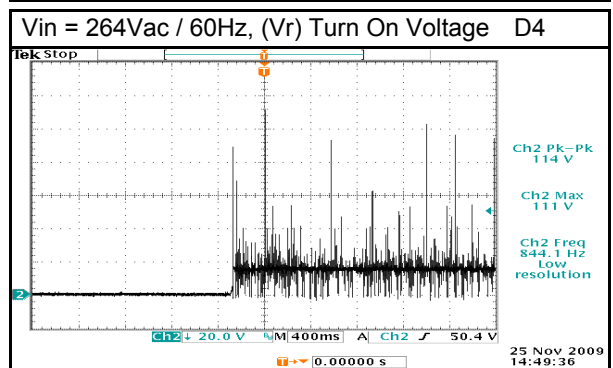
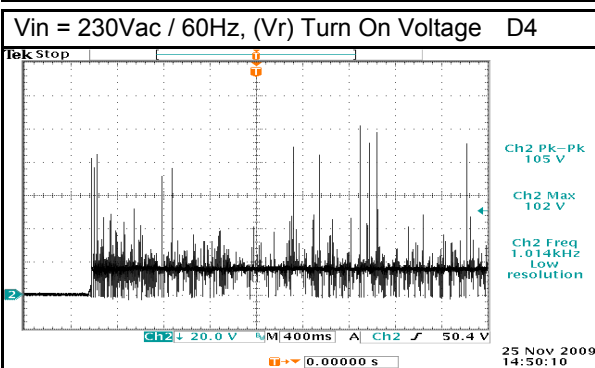
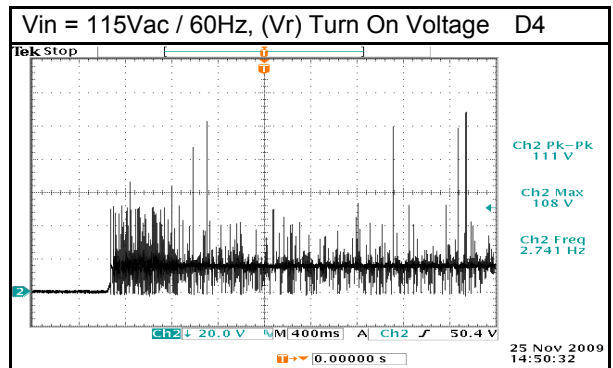
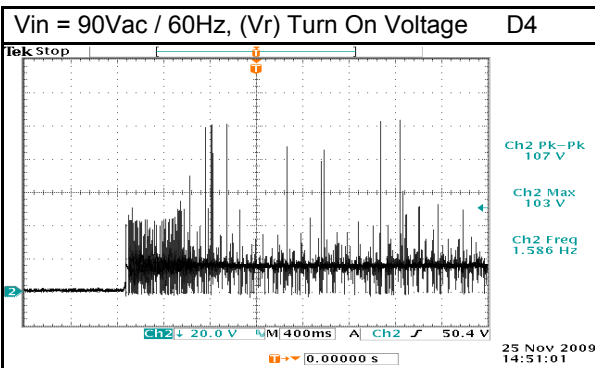
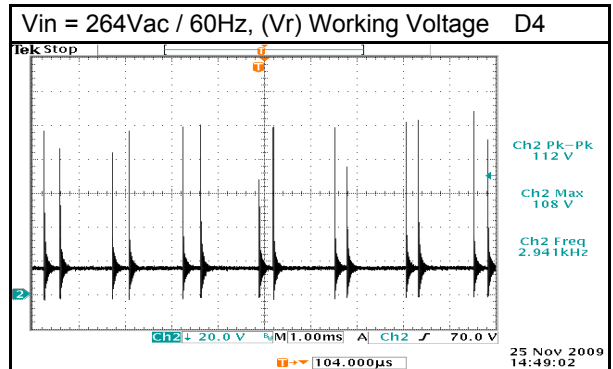
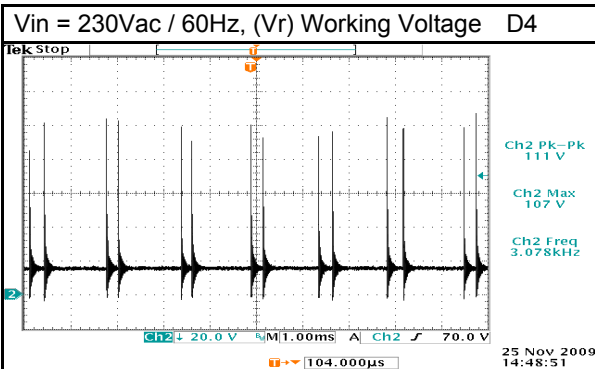
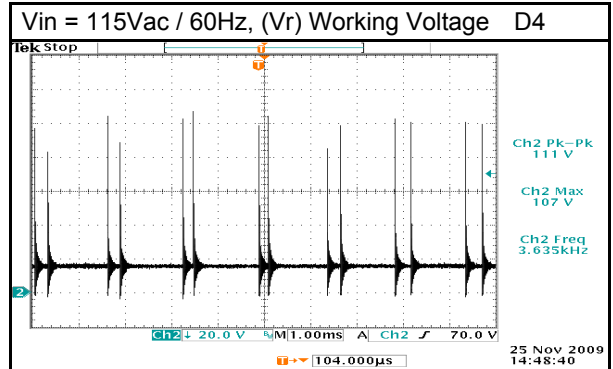
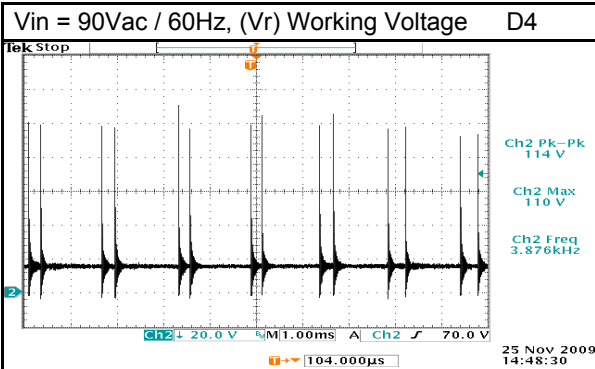
2 . SWITCHING RECTIFIER DIODE WAVEFORM :





18 . SWITCHING COMPONENT WAVEFORM

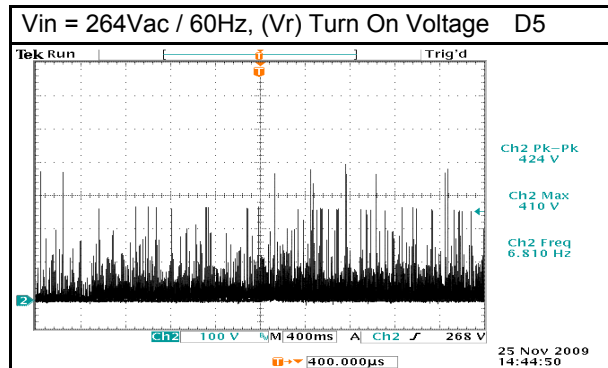
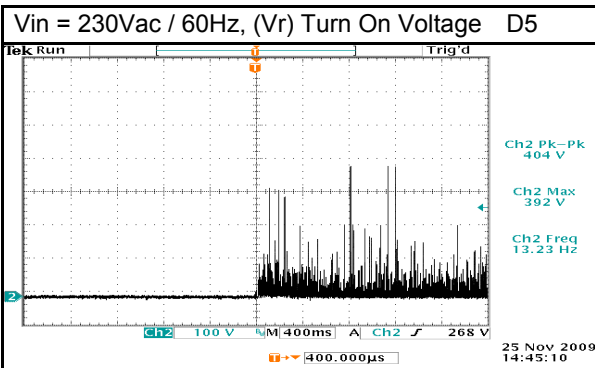
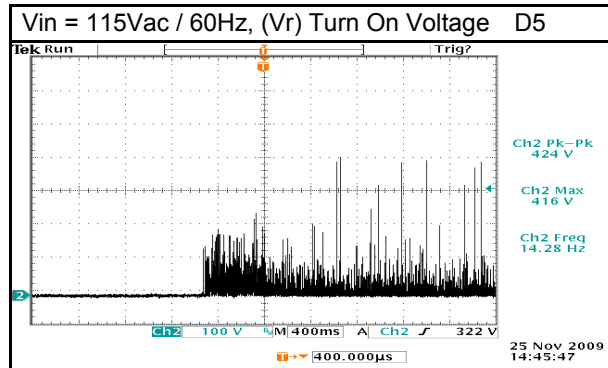
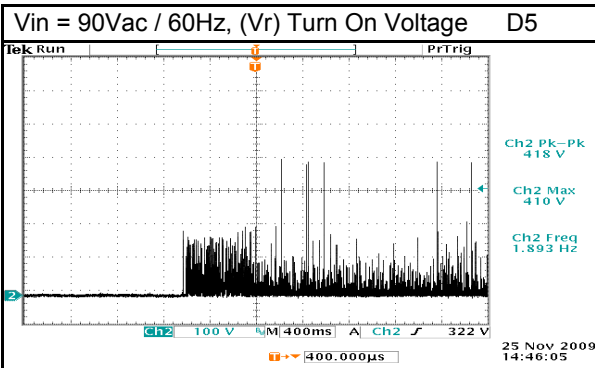
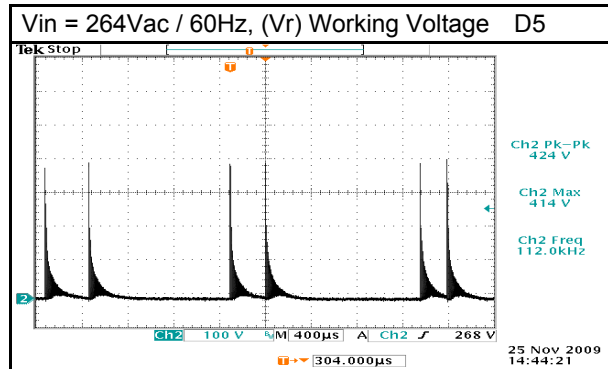
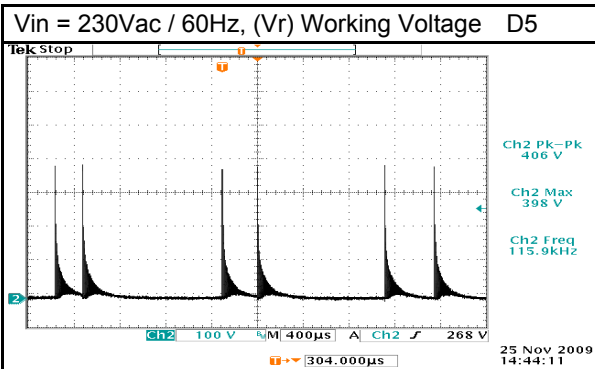
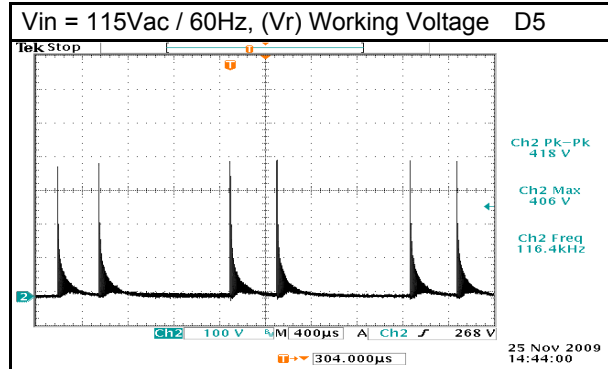
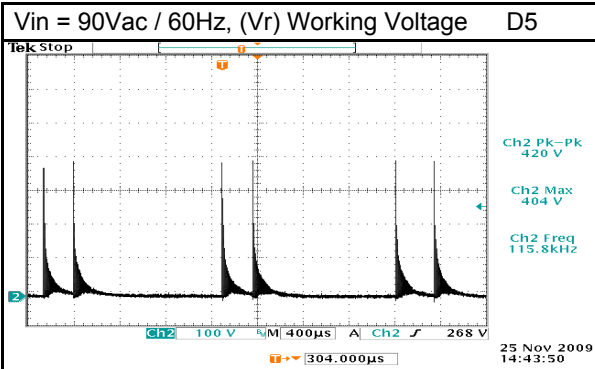
2 . SWITCHING RECTIFIER DIODE WAVEFORM :





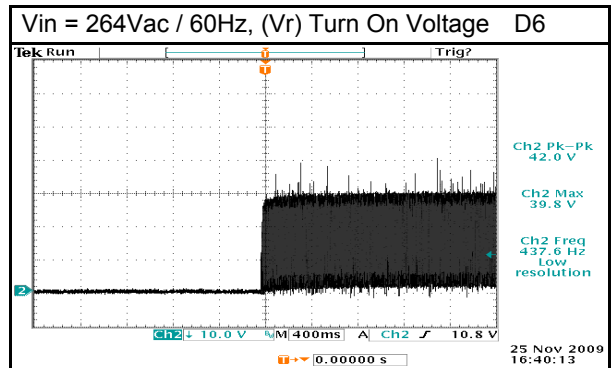
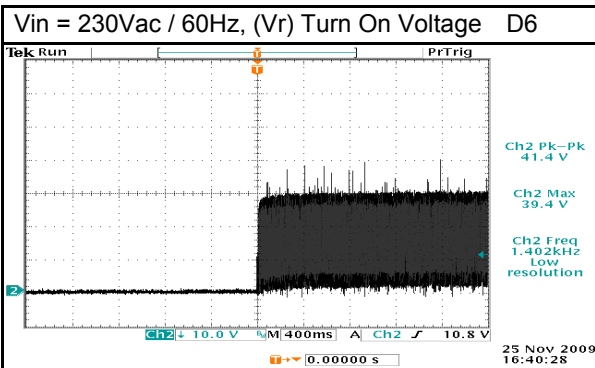
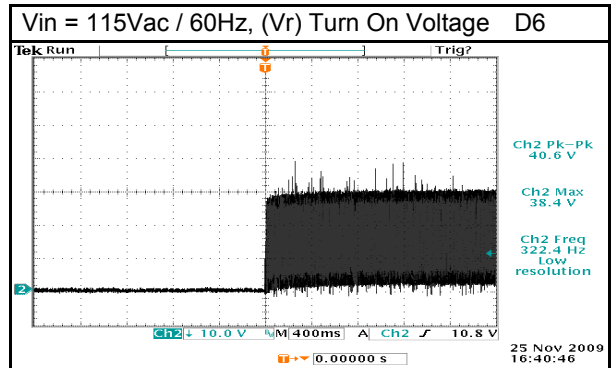
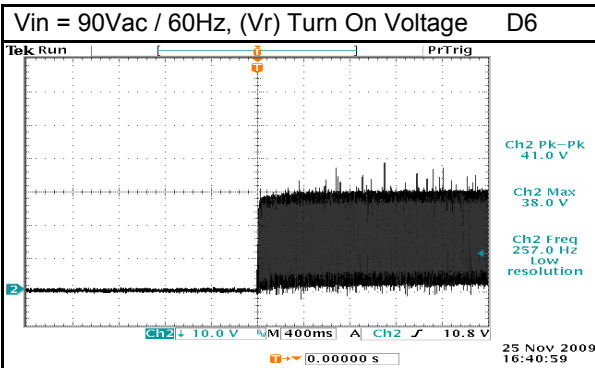
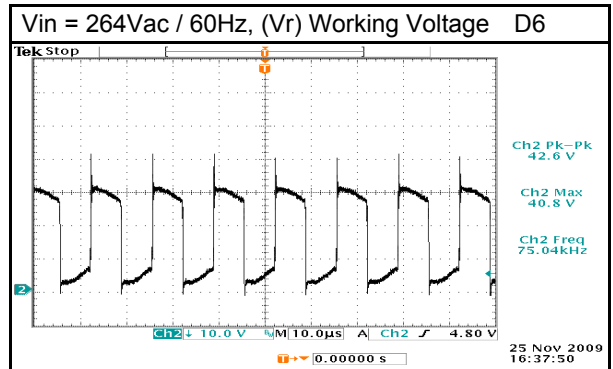
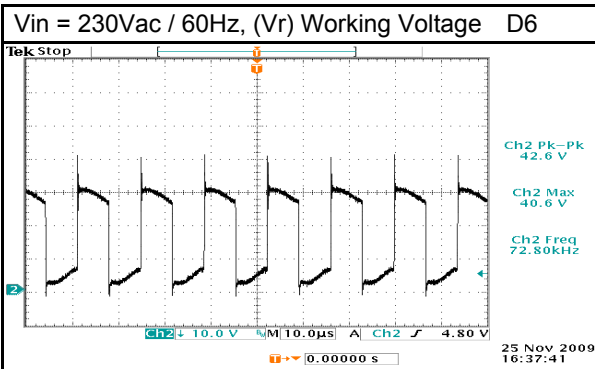
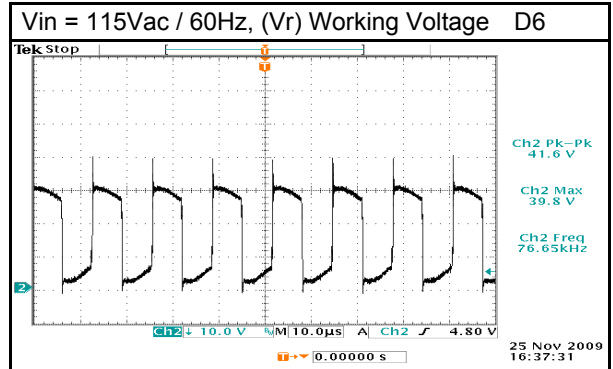
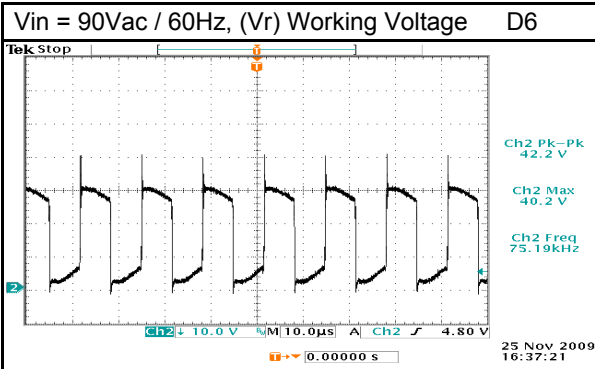
18 . SWITCHING COMPONENT WAVEFORM

2 . SWITCHING RECTIFIER DIODE WAVEFORM :



18 . SWITCHING COMPONENT WAVEFORM

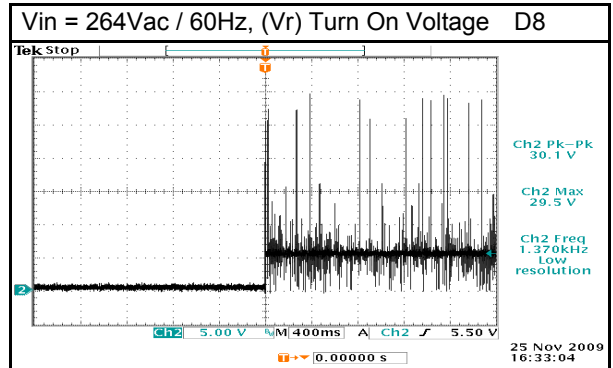
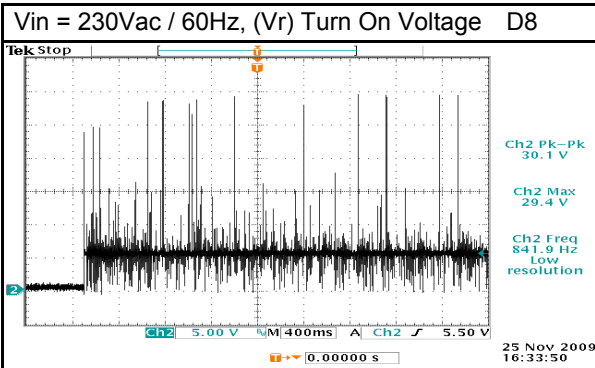
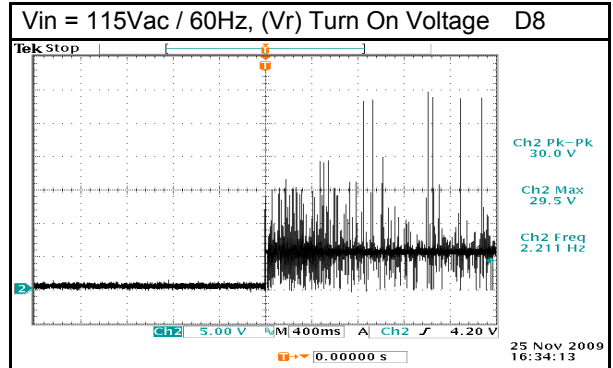
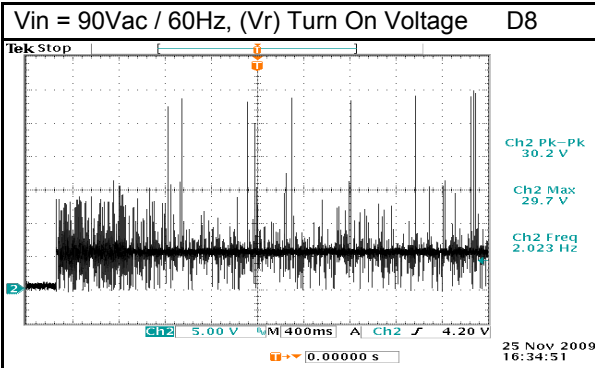
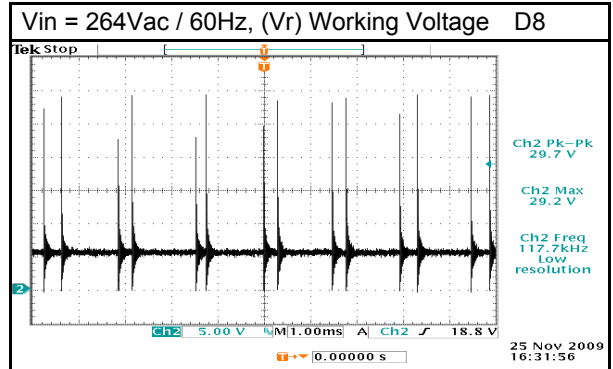
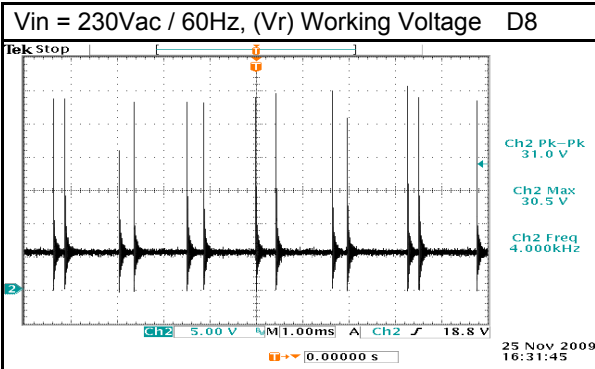
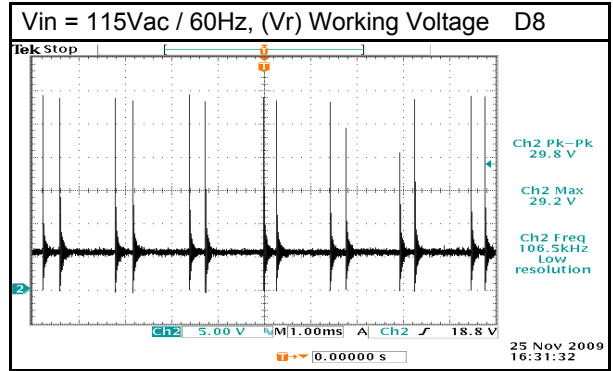
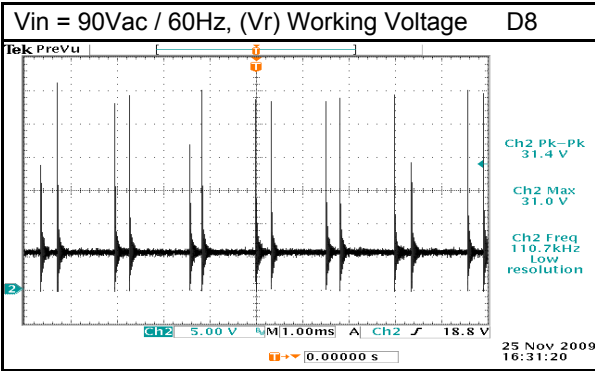
2 . SWITCHING RECTIFIER DIODE WAVEFORM :





18 . SWITCHING COMPONENT WAVEFORM

2 . SWITCHING RECTIFIER DIODE WAVEFORM :





18 . SWITCHING COMPONENT WAVEFORM

2 . SWITCHING RECTIFIER DIODE WAVEFORM :

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Sheng Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

| RECTIFIER DIODE Current (Id) --- Working Current Test Result | | | | | OK |
|--|---------------|-----------------|--------------|-------|-------|
| Test Item | Input Voltage | Output Load (A) | Measured (A) | SPEC. | OK/NG |
| D1 SB2100 | 90V | 41.67 A | 0.0801 A | 2 A | OK |
| | 115V | 41.67 A | 0.0874 A | 2 A | OK |
| | 230V | 41.67 A | 0.0966 A | 2 A | OK |
| | 264V | 41.67 A | 0.0974 A | 2 A | OK |
| D2 STTH12S06FP | 90V | 41.67 A | 4.930 A | 12 A | OK |
| | 115V | 41.67 A | 4.460 A | 12 A | OK |
| | 230V | 41.67 A | 3.460 A | 12 A | OK |
| | 264V | 41.67 A | 2.660 A | 12 A | OK |
| D4 1N4007 | 90V | 41.67 A | 0.0289 A | 1 A | OK |
| | 115V | 41.67 A | 0.0286 A | 1 A | OK |
| | 230V | 41.67 A | 0.0284 A | 1 A | OK |
| | 264V | 41.67 A | 0.0284 A | 1 A | OK |
| D5 1N4007 | 90V | 41.67 A | 0.0251 A | 1 A | OK |
| | 115V | 41.67 A | 0.0225 A | 1 A | OK |
| | 230V | 41.67 A | 0.0213 A | 1 A | OK |
| | 264V | 41.67 A | 0.0209 A | 1 A | OK |
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18 . SWITCHING COMPONENT WAVEFORM

2 . SWITCHING RECTIFIER DIODE WAVEFORM :

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Sheng Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

| RECTIFIER DIODE Current (Id) --- Working Current Test Result | | | | | OK |
|--|---------------|-----------------|--------------|-------|-------|
| Test Item | Input Voltage | Output Load (A) | Measured (A) | SPEC. | OK/NG |
| D6 SB3100 | 90V | 41.67 A | 0.0849 A | 3 A | OK |
| | 115V | 41.67 A | 0.0845 A | 3 A | OK |
| | 230V | 41.67 A | 0.0843 A | 3 A | OK |
| | 264V | 41.67 A | 0.0832 A | 3 A | OK |
| D8 SB560 | 90V | 41.67 A | 0.246 A | 5 A | OK |
| | 115V | 41.67 A | 0.236 A | 5 A | OK |
| | 230V | 41.67 A | 0.245 A | 5 A | OK |
| | 264V | 41.67 A | 0.233 A | 5 A | OK |
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18 . SWITCHING COMPONENT WAVEFORM

2 . SWITCHING RECTIFIER DIODE WAVEFORM :

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Sheng Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

| RECTIFIER DIODE Current (Id) --- Turn On Current Test Result | | | | | OK |
|--|---------------|-----------------|--------------|-------|-------|
| Test Item | Input Voltage | Output Load (A) | Measured (A) | SPEC. | OK/NG |
| D1 SB2100 | 90V | 41.67 A | 0.378 A | 50 A | OK |
| | 115V | 41.67 A | 0.438 A | 50 A | OK |
| | 230V | 41.67 A | 0.514 A | 50 A | OK |
| | 264V | 41.67 A | 0.534 A | 50 A | OK |
| D2 STTH12S06FP | 90V | 41.67 A | 18.20 A | 100 A | OK |
| | 115V | 41.67 A | 15.50 A | 100 A | OK |
| | 230V | 41.67 A | 32.20 A | 100 A | OK |
| | 264V | 41.67 A | 20.50 A | 100 A | OK |
| D4 1N4007 | 90V | 41.67 A | 0.868 A | 30 A | OK |
| | 115V | 41.67 A | 0.876 A | 30 A | OK |
| | 230V | 41.67 A | 1.00 A | 30 A | OK |
| | 264V | 41.67 A | 0.868 A | 30 A | OK |
| D5 1N4007 | 90V | 41.67 A | 0.329 A | 30 A | OK |
| | 115V | 41.67 A | 0.388 A | 30 A | OK |
| | 230V | 41.67 A | 0.326 A | 30 A | OK |
| | 264V | 41.67 A | 0.393 A | 30 A | OK |
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18 . SWITCHING COMPONENT WAVEFORM

2 . SWITCHING RECTIFIER DIODE WAVEFORM :

Test Condition :

| | | |
|---|-----------------|-----------|
| 1 | Input Voltage | 90~264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

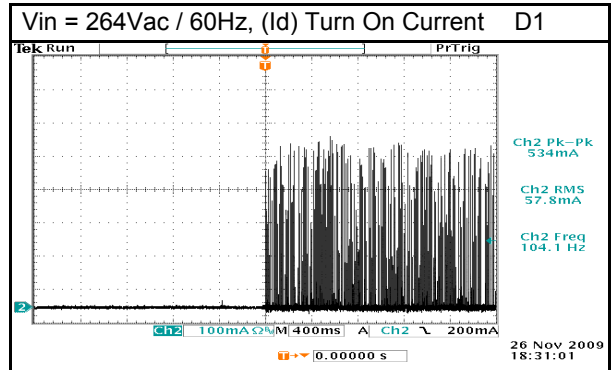
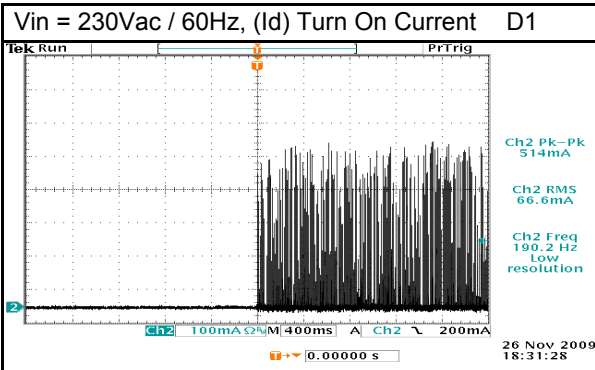
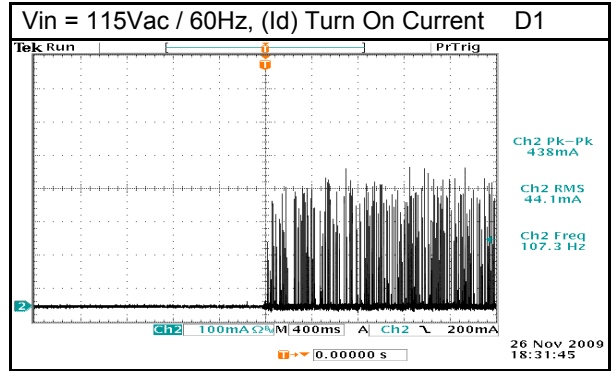
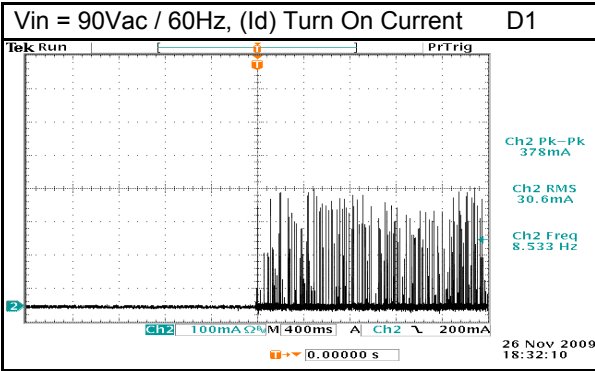
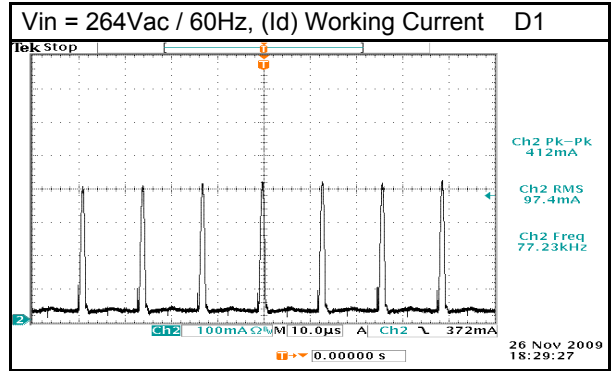
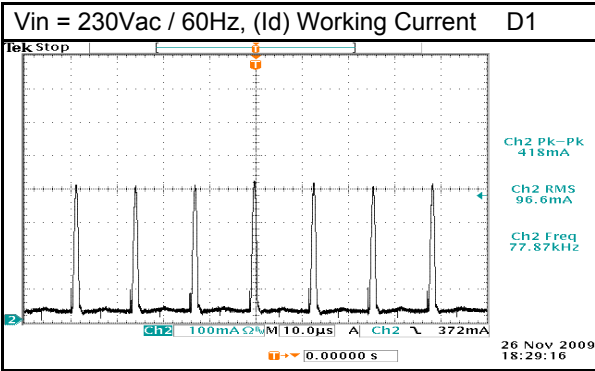
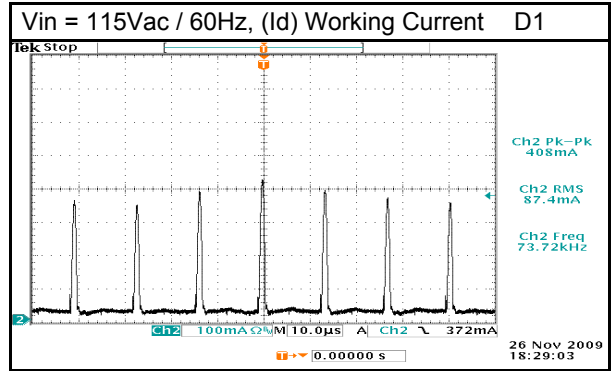
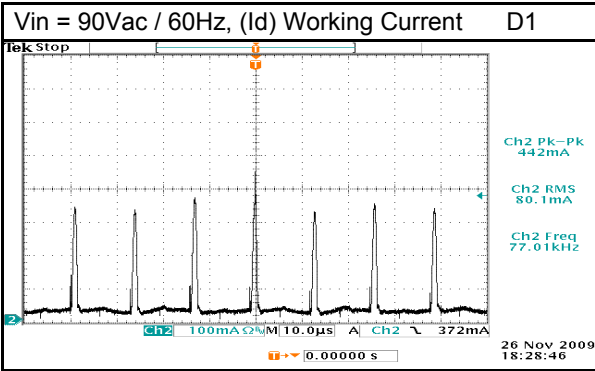
| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Sheng Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

| RECTIFIER DIODE Current (Id) --- Turn On Current Test Result | | | | | OK |
|--|---------------|-----------------|--------------|-------|-------|
| Test Item | Input Voltage | Output Load (A) | Measured (A) | SPEC. | OK/NG |
| D6 SB3100 | 90V | 41.67 A | 0.152 A | 80 A | OK |
| | 115V | 41.67 A | 0.153 A | 80 A | OK |
| | 230V | 41.67 A | 0.154 A | 80 A | OK |
| | 264V | 41.67 A | 0.149 A | 80 A | OK |
| D8 SB560 | 90V | 41.67 A | 6.32 A | 150 A | OK |
| | 115V | 41.67 A | 6.54 A | 150 A | OK |
| | 230V | 41.67 A | 6.98 A | 150 A | OK |
| | 264V | 41.67 A | 6.60 A | 150 A | OK |
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18 . SWITCHING COMPONENT WAVEFORM

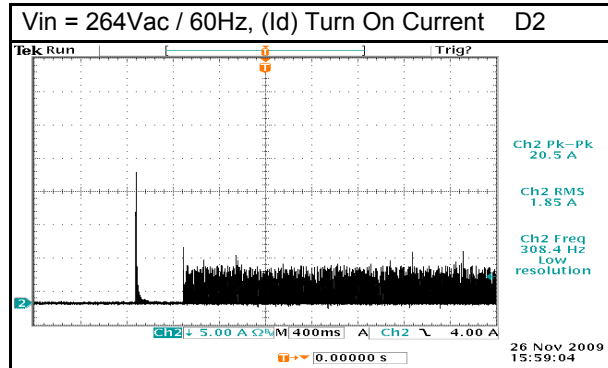
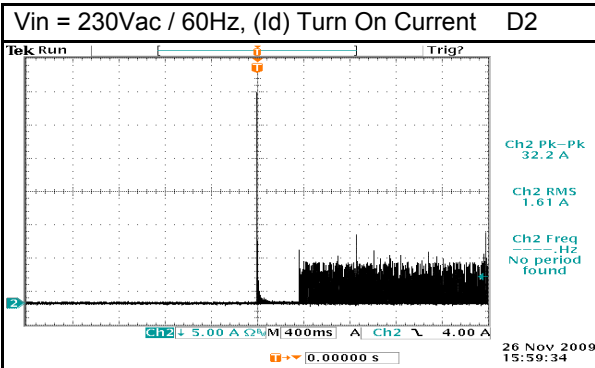
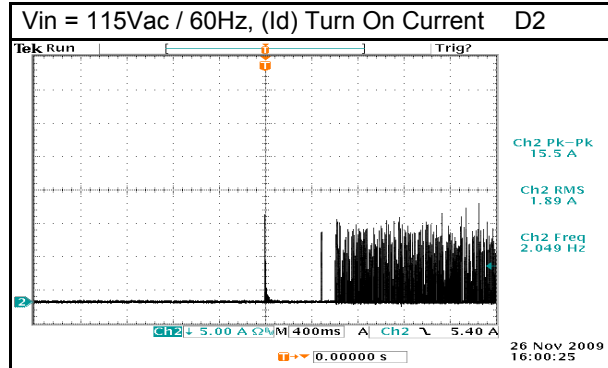
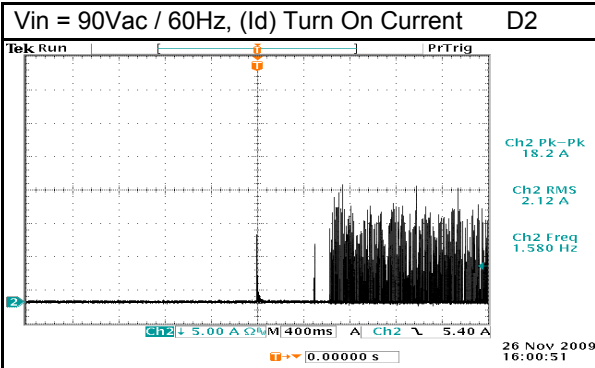
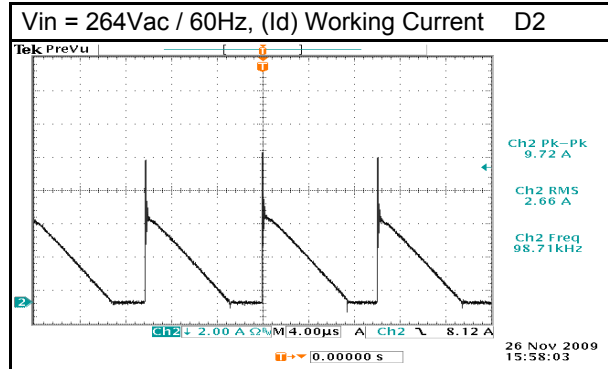
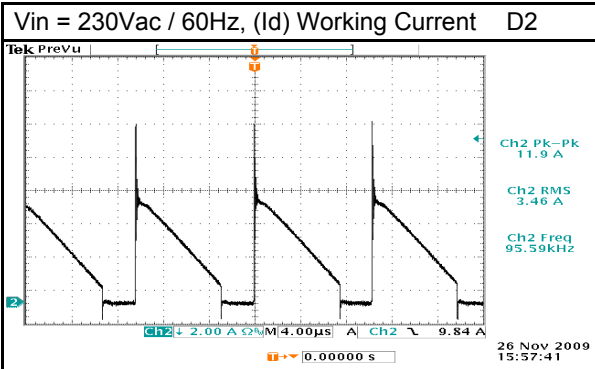
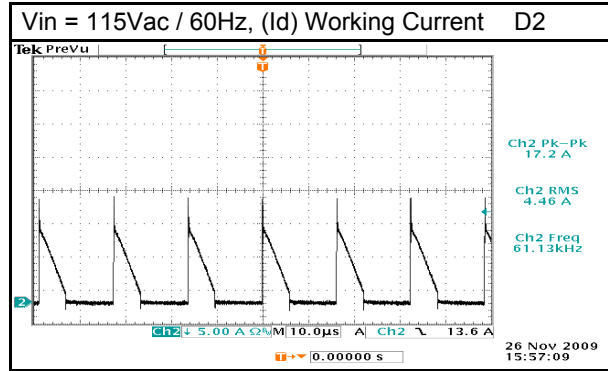
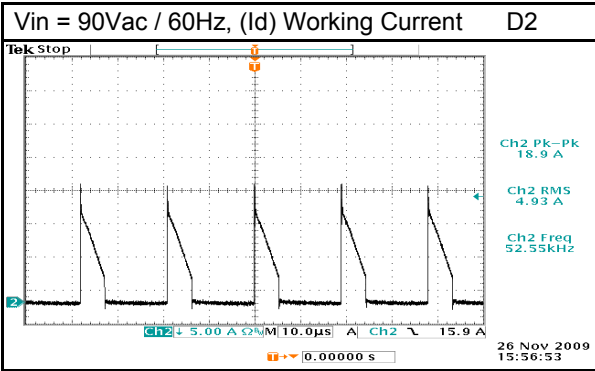
2 . SWITCHING RECTIFIER DIODE WAVEFORM :





18 . SWITCHING COMPONENT WAVEFORM

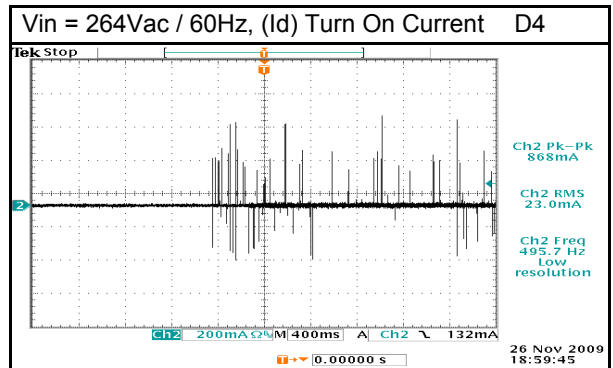
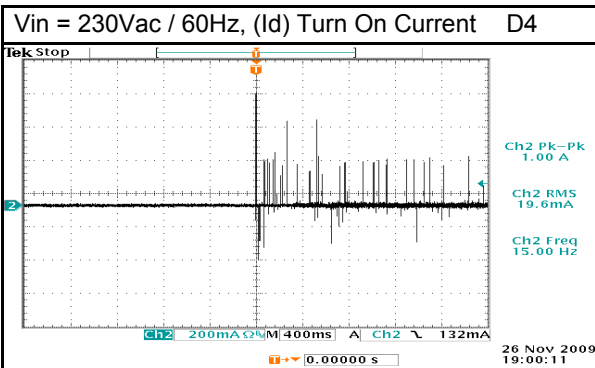
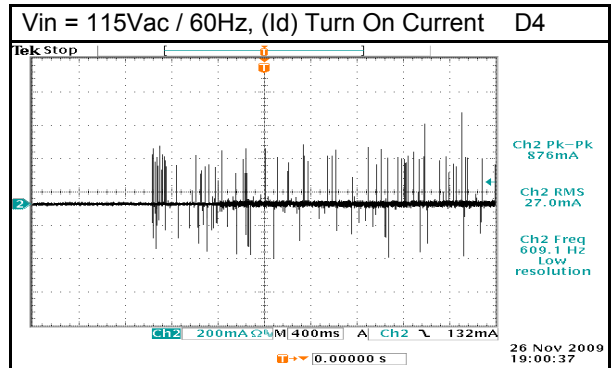
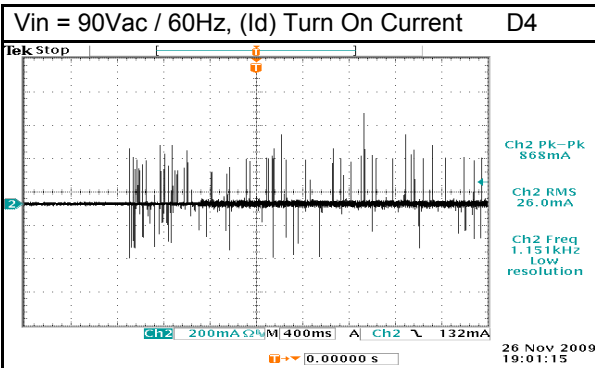
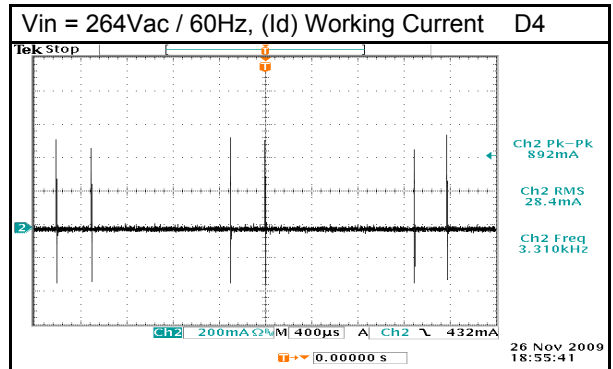
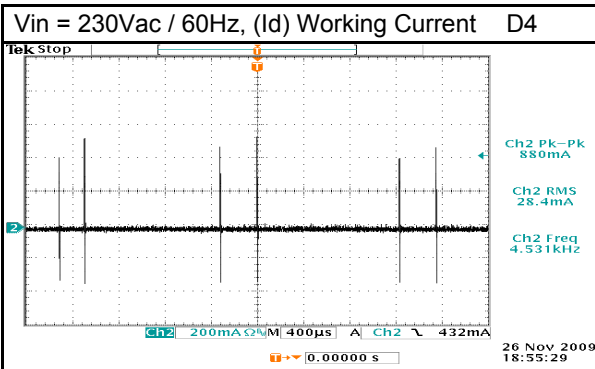
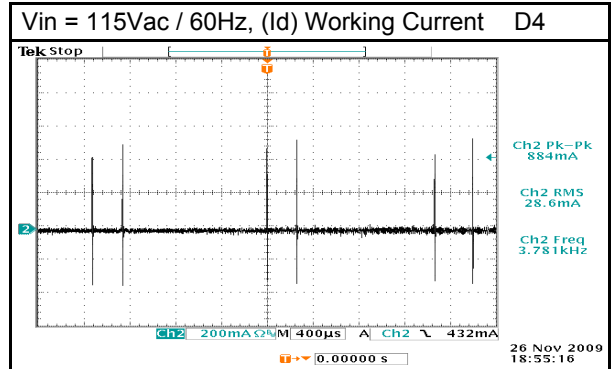
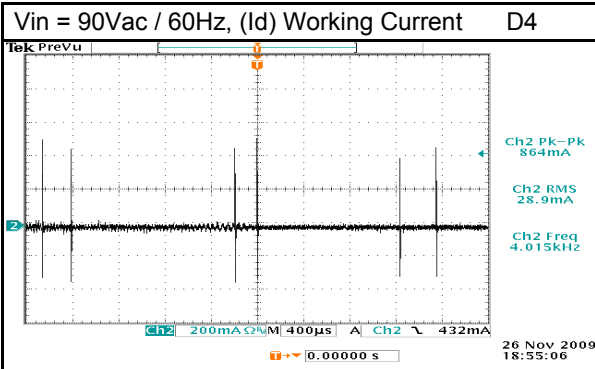
2 . SWITCHING RECTIFIER DIODE WAVEFORM :





18 . SWITCHING COMPONENT WAVEFORM

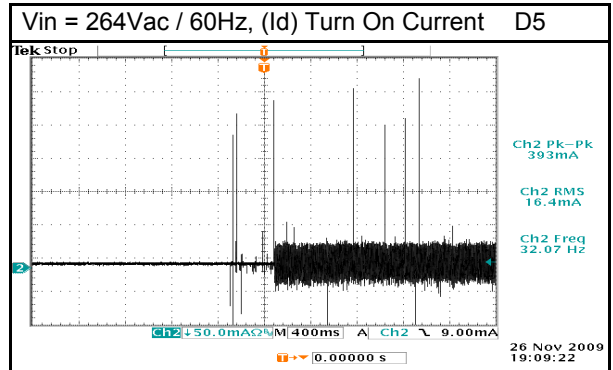
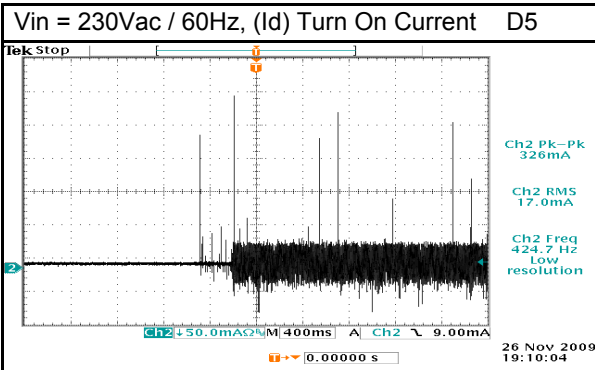
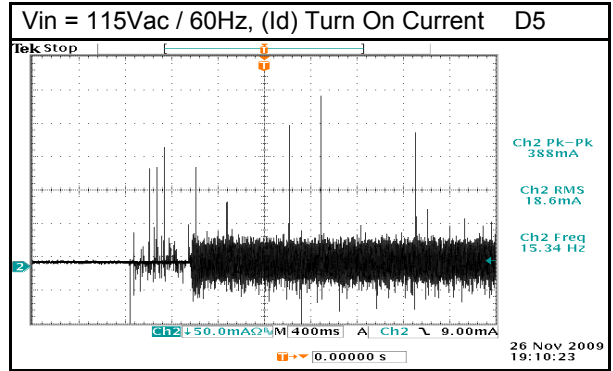
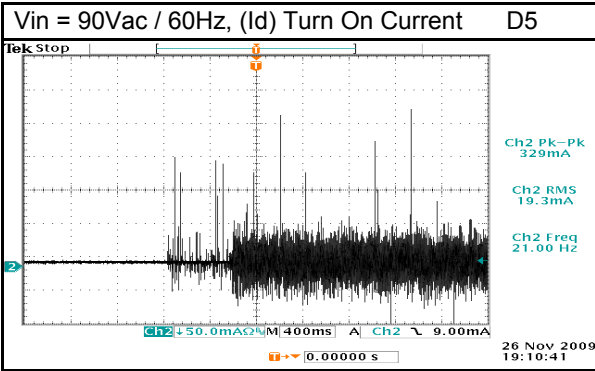
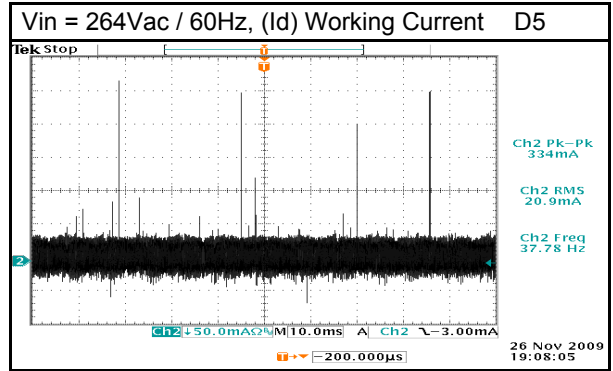
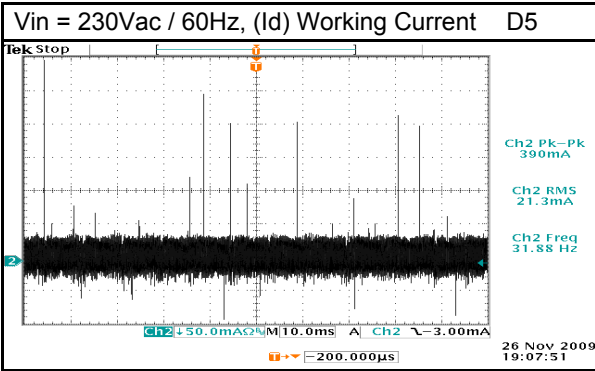
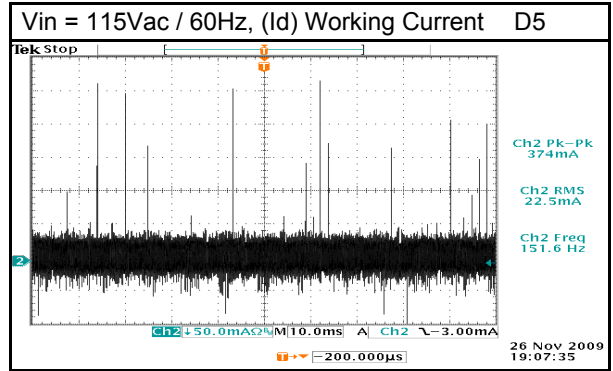
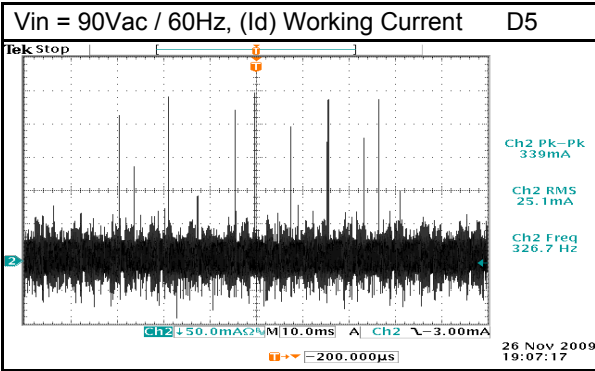
2 . SWITCHING RECTIFIER DIODE WAVEFORM :





18 . SWITCHING COMPONENT WAVEFORM

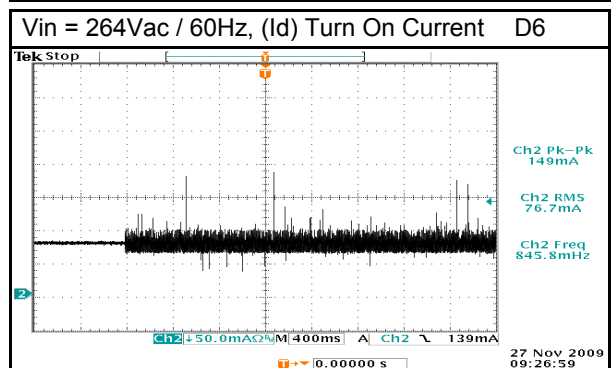
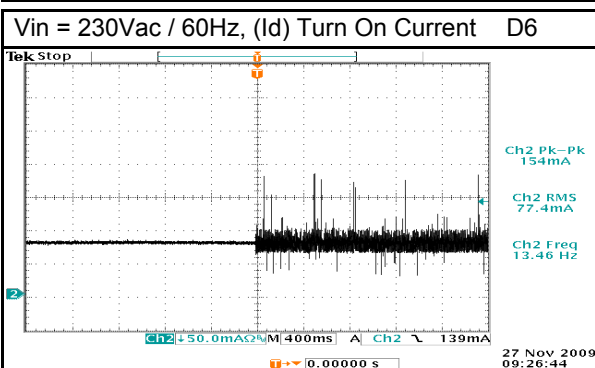
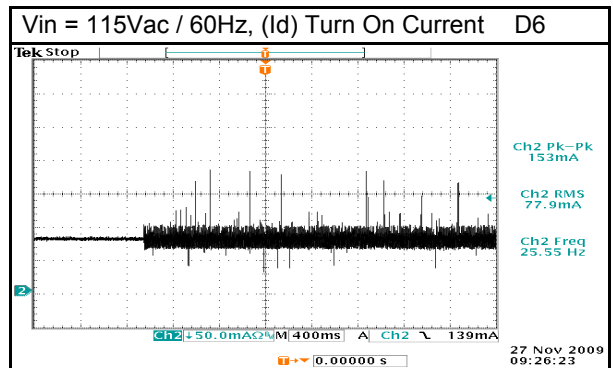
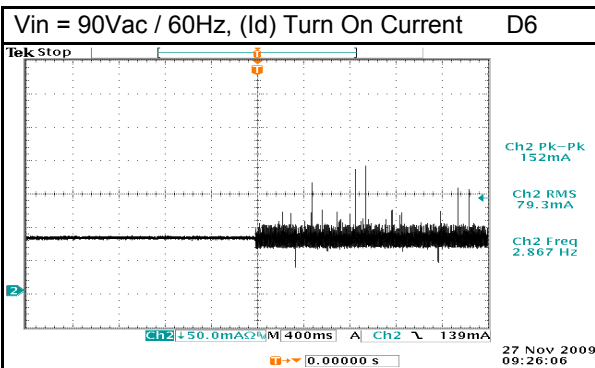
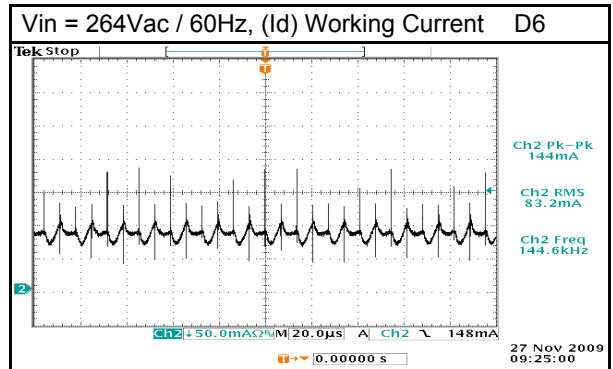
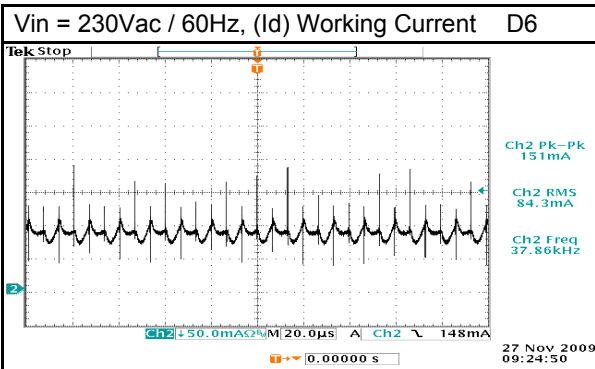
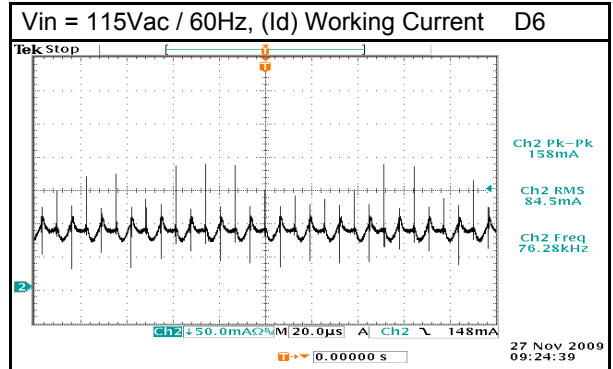
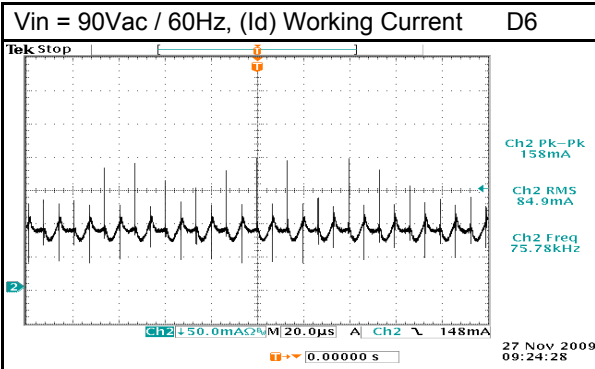
2 . SWITCHING RECTIFIER DIODE WAVEFORM :





18 . SWITCHING COMPONENT WAVEFORM

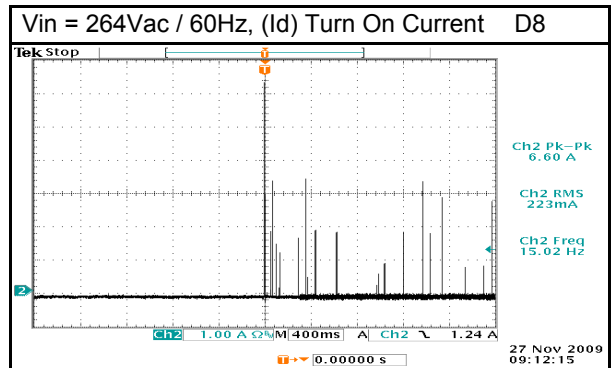
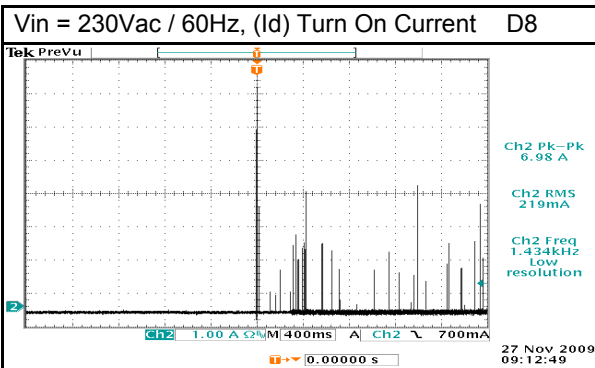
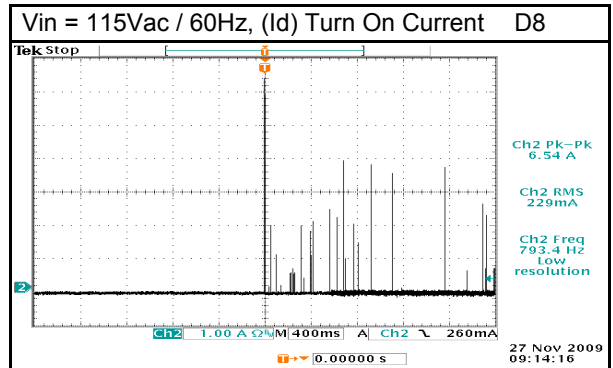
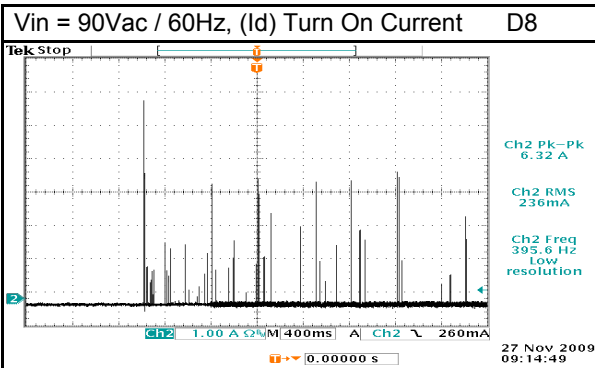
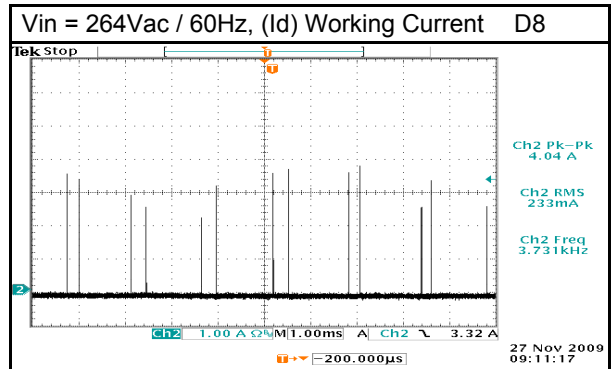
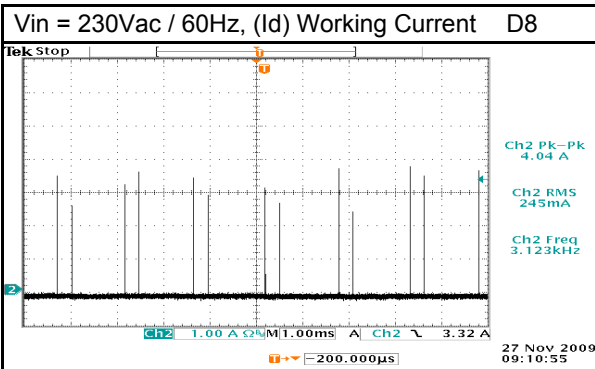
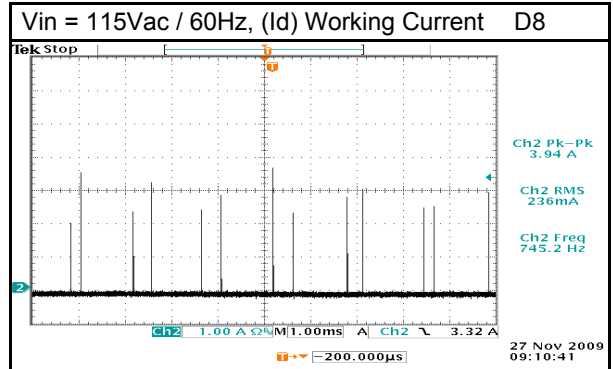
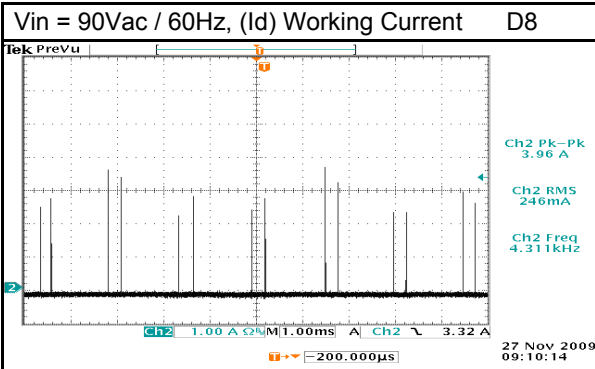
2 . SWITCHING RECTIFIER DIODE WAVEFORM :





18 . SWITCHING COMPONENT WAVEFORM

2 . SWITCHING RECTIFIER DIODE WAVEFORM :





19 . CRITICAL PARTS DERATING LIST

Test Condition :

| | | |
|---|-----------------|---------|
| 1 | Input Voltage | 90Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Sheng Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

MOSFET : Vin = 90Vac Vds Derating: 95%

| Part No. | Input Voltage | Rating | Measurement Value | Derating (%) | OK/NG |
|----------|---------------|--------|-------------------|--------------|-------|
| Q1 | 90V | 600 V | 428.0 V | 71.33% | OK |
| Q2 | | 600 V | 540.0 V | 90.00% | OK |
| Q3 | | 600 V | 446.0 V | 74.33% | OK |
| Q4 | | 600 V | 550.0 V | 91.67% | OK |
| Q6 | | 75 V | 47.2 V | 62.93% | OK |
| Q7 | | 75 V | 50.4 V | 67.20% | OK |
| Q8 | | 75 V | 55.8 V | 74.40% | OK |
| Q9 | | 75 V | 56.8 V | 75.73% | OK |

DIODE : Vin = 90Vac Vr Derating: 95%

| Part No. | Input Voltage | Rating | Measurement Value | Derating (%) | OK/NG |
|----------|---------------|--------|-------------------|--------------|-------|
| D1 | 90V | 100 V | 51.2 V | 51.20% | OK |
| D2 | | 600 V | 480.0 V | 80.00% | OK |
| D4 | | 1000 V | 114.0 V | 11.40% | OK |
| D5 | | 1000 V | 420.0 V | 42.00% | OK |
| D6 | | 100 V | 42.2 V | 42.20% | OK |
| D8 | | 60 V | 31.4 V | 52.33% | OK |



19 . CRITICAL PARTS DERATING LIST

Test Condition :

| | | |
|---|-----------------|---------|
| 1 | Input Voltage | 264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Sheng Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

MOSFET : Vin = 264Vac Vds Derating: 95%

| Part No. | Input Voltage | Rating | Measurement Value | Derating (%) | OK/NG |
|----------|---------------|--------|-------------------|--------------|-------|
| Q1 | 264V | 600 V | 444.0 V | 74.00% | OK |
| Q2 | | 600 V | 474.0 V | 79.00% | OK |
| Q3 | | 600 V | 456.0 V | 76.00% | OK |
| Q4 | | 600 V | 470.0 V | 78.33% | OK |
| Q6 | | 75 V | 45.6 V | 60.80% | OK |
| Q7 | | 75 V | 47.4 V | 63.20% | OK |
| Q8 | | 75 V | 57.6 V | 76.80% | OK |
| Q9 | | 75 V | 57.0 V | 76.00% | OK |

DIODE : Vin = 264Vac Vr Derating: 95%

| Part No. | Input Voltage | Rating | Measurement Value | Derating (%) | OK/NG |
|----------|---------------|--------|-------------------|--------------|-------|
| D1 | 264V | 100 V | 51.6 V | 51.60% | OK |
| D2 | | 600 V | 460.0 V | 76.67% | OK |
| D4 | | 1000 V | 112.0 V | 11.20% | OK |
| D5 | | 1000 V | 424.0 V | 42.40% | OK |
| D6 | | 100 V | 42.6 V | 42.60% | OK |
| D8 | | 60 V | 29.7 V | 49.50% | OK |



19 . CRITICAL PARTS DERATING LIST

Test Condition :

| | | |
|---|-----------------|---------|
| 1 | Input Voltage | 90Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Sheng Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

| FUSE : Vin = 90Vac | | FUSE Derating: 100% | | | |
|--------------------|--------------|----------------------------|---------------------------------|--------------|-------|
| Part No. | Manufacturer | Rating (Ip ² T) | Measurement (Ip ² T) | Derating (%) | OK/NG |
| 1 | Conquer | 345.6 | 0.210 | 0.06% | OK |

| IC : Vin = 90Vac | | IC Derating: 90% | | | |
|------------------|-------------|------------------|-------------------|--------------|-------|
| Part No. | Part number | Rating (Vcc) | Measurement (Vcc) | Derating (%) | OK/NG |
| 1 | L6599D | 17.0 V | 13.2 V | 77.65% | OK |



19 . CRITICAL PARTS DERATING LIST

Test Condition :

| | | |
|---|-----------------|---------|
| 1 | Input Voltage | 264Vac |
| 2 | Input Frequency | 60Hz |
| 3 | Output Load | 41.67 A |

Test Equipment :

| Item | Instrument | Manufacturer | Type No./Serial No. | Calibrate Date |
|------|--------------|--------------|---------------------|----------------|
| 1 | AC Source | Sheng Yann | SA101 | 2010.09.15 |
| 2 | DC Load | Prodigit | 3311D | 2010.10.12 |
| 3 | Oscilloscope | Tektronix | TDS3054B | 2010.07.30 |

| FUSE : Vin = 264Vac | | FUSE Derating: 100% | | | |
|---------------------|--------------|----------------------------|---------------------------------|--------------|-------|
| Part No. | Manufacturer | Rating (Ip ² T) | Measurement (Ip ² T) | Derating (%) | OK/NG |
| 1 | Conquer | 345.6 | 3.800 | 1.10% | OK |

| IC : Vin = 264Vac | | IC Derating: 90% | | | |
|-------------------|-------------|------------------|-------------------|--------------|-------|
| Part No. | Part number | Rating (Vcc) | Measurement (Vcc) | Derating (%) | OK/NG |
| 1 | L6599D | 17.0 V | 13.2 V | 77.65% | OK |



TDK-LAMBDA AMERICAS INC.
ALUMINUM E.CAP LIFETIME ESTIMATION

| | | | |
|-----------|----------|---------|----------|
| MODEL | Approval | Checked | Prepared |
| CSS500-12 | | | Sam |

Ambient temperature : 25°C AC Input: 90V 60Hz DC Output: 12.0 V

| Location | Manufacturer Type | Capacity Voltage | Size D*L | Case Coeff. | Cap. Rating °C | Baselife Hrs | Rated Ripple Current at 105°C, Irms,A | | Ripple Current Factor | | Max.allowable Ripple Current at 25°C, Irms,A | Case Tc at 25°C | Ambient Tc at 25°C | Increase temp. in core temp.°C | ΔTo °C | Measured Ripp.Cur. Irms,A | Useful Lifetime Hrs. |
|----------|-------------------|------------------|----------|-------------|----------------|--------------|---------------------------------------|-------|-----------------------|--------|--|-----------------|--------------------|--------------------------------|--------|---------------------------|----------------------|
| | | | | | | | Ir | Kfreq | Ktemp | Io | | | | | | | |
| C5 | NCC/KY | 22uF/50V | 5*11 | 1.1 | 105 | 5000 | 0.18 | 1 | 1.73 | 0.31 | 80.8 | 80.65 | 0.16 | 5 | 0.032 | 52865.53 | |
| C7 | NCC/KXG | 68uF/450V | 18*25 | 1.3 | 105 | 10000 | 0.58 | 2.5 | 2.00 | 2.90 | 78.2 | 75.86 | 3.04 | 5 | 1.130 | 98919.97 | |
| C8 | NCC/KXG | 68uF/450V | 18*25 | 1.3 | 105 | 10000 | 0.58 | 2.5 | 2.23 | 3.23 | 67.2 | 64.70 | 3.26 | 5 | 1.170 | 208118.62 | |
| C9 | NCC/KXG | 68uF/450V | 18*25 | 1.3 | 105 | 10000 | 0.58 | 2.5 | 2.00 | 2.90 | 80.3 | 78.36 | 2.52 | 5 | 1.030 | 89350.96 | |
| C10 | NCC/KXG | 68uF/450V | 18*25 | 1.3 | 105 | 10000 | 0.58 | 2.5 | 2.00 | 2.90 | 72.5 | 69.73 | 3.60 | 5 | 1.230 | 139983.66 | |
| C11 | NCC/KY | 22uF/50V | 5*11 | 1.1 | 105 | 5000 | 0.18 | 1 | 1.73 | 0.31 | 85.3 | 84.92 | 0.42 | 5 | 0.052 | 37959.95 | |
| C13 | NCC/KY | 47uF/50V | 6.3*11 | 1.1 | 105 | 5000 | 0.295 | 1 | 2.23 | 0.66 | 65.8 | 65.72 | 0.09 | 5 | 0.039 | 150387.50 | |
| C14 | NCC/KY | 22uF/50V | 5*11 | 1.1 | 105 | 5000 | 0.18 | 1 | 2.23 | 0.40 | 69.7 | 69.45 | 0.28 | 5 | 0.042 | 113127.46 | |
| C16 | NCC/KY | 47uF/50V | 6.3*11 | 1.1 | 105 | 5000 | 0.295 | 1 | 2.23 | 0.66 | 58.6 | 58.44 | 0.18 | 5 | 0.055 | 246030.14 | |
| C19 | NCC/KY | 2200uF/16V | 12.5*25 | 1.2 | 105 | 10000 | 2.23 | 1 | 2.00 | 4.46 | 84.5 | 75.87 | 10.36 | 5 | 3.210 | 35833.37 | |
| C21 | NCC/KY | 2200uF/16V | 12.5*25 | 1.2 | 105 | 10000 | 2.23 | 1 | 2.00 | 4.46 | 82.9 | 73.78 | 10.95 | 5 | 3.300 | 38173.63 | |
| C22 | NCC/KY | 2200uF/16V | 12.5*25 | 1.2 | 105 | 10000 | 2.23 | 1 | 2.23 | 4.97 | 57.1 | 55.11 | 2.38 | 5 | 1.540 | 456266.72 | |
| C25 | NCC/KY | 2200uF/16V | 12.5*25 | 1.2 | 105 | 10000 | 2.23 | 1 | 2.00 | 4.46 | 77.1 | 76.99 | 0.13 | 5 | 0.363 | 136851.86 | |
| C18 | NCC/KY | 47uF/50V | 6.3*11 | 1.1 | 105 | 5000 | 0.295 | 1 | 2.23 | 0.66 | 64.8 | 64.46 | 0.37 | 5 | 0.080 | 157751.82 | |
| C20 | NCC/KY | 470uF/25V | 8*20 | 1.1 | 105 | 7000 | 1.05 | 1 | 2.23 | 2.34 | 59.8 | 59.70 | 0.11 | 5 | 0.155 | 318570.47 | |
| C24 | NCC/KY | 1000uF/16V | 10*20 | 1.1 | 105 | 7000 | 1.4 | 1 | 2.23 | 3.12 | 55.2 | 55.19 | 0.01 | 5 | 0.061 | 441514.19 | |
| C27 | NCC/KY | 470uF/25V | 8*20 | 1.1 | 105 | 7000 | 1.05 | 1 | 2.23 | 2.3415 | 49.4 | 49.39 | 0.01 | 5 | 0.046 | 659993.52 | |

Test Equipment:

- a.AC Source : SA101
- b.DC Load : PRODIGIT 3311D
- c.SCOPE : LECROY 24Xs
- d.Thermal Recorder : Yokogawa MV200S
- e.Current Probe : LECROY AP015

$$Lx=Lr*2^{((Tr-Ta)/10)*2^{((\Delta To -\Delta T) /5)}}$$

$$\text{※ } Ta=Tc-(5*(Ix/Ir)^2)/Kc$$

$$Io=Ir*Kfreq*Ktemp$$

$$\Delta T=Kc*(Tc-Ta)$$

| | | |
|------------------------|-----|-----|
| Ambinet Temp. °C | 85 | 105 |
| Guide limit of Δto(°C) | 15 | 5 |
| Core temp.(=Ta+Δto) | 100 | 110 |

| | | | | | | | |
|---------------|----------|------|-------|-------|-----|------|------|
| Diameter (mm) | Φ5 to Φ8 | Φ10 | Φ12.5 | Φ16 | Φ18 | Φ22 | Φ25 |
| Kc | 1.1 | 1.15 | 1.2 | 1.25 | 1.3 | 1.35 | 1.4 |
| Diameter (mm) | Φ30&Φ35 | Φ40 | Φ50 | Φ63.5 | Φ76 | Φ89 | Φ100 |
| Kc | 1.5&1.65 | 1.75 | 1.9 | 2.2 | 2.5 | 2.8 | 3.1 |



TDK-LAMBDA AMERICAS INC.
ALUMINUM E.CAP LIFETIME ESTIMATION

| | | | |
|-----------|----------|---------|----------|
| MODEL | Approval | Checked | Prepared |
| CSS500-12 | | | Sam |

Ambient temperature : 25°C AC Input: 264V 60Hz DC Output: 12.0 V

| Location | Manufacturer Type | Capacity Voltage | Size D*L | Case Coeff. | Cap. Rating °C | Baselife Hrs | Rated Ripple Current at 105°C, Irms,A | Ripple Current Factor | | Max.allowable Ripple Current at 25°C, Irms,A | Case Tc at 25°C | Ambient Tc at 25°C | Increase temp. in core temp.°C | ΔTo °C | Measured Ripp.Cur. Irms,A | Useful Lifetime Hrs. |
|----------|-------------------|------------------|----------|-------------|----------------|--------------|---------------------------------------|-----------------------|-------|--|-----------------|--------------------|--------------------------------|--------|---------------------------|----------------------|
| | | | | | | | | Kfreq | Ktemp | | | | | | | |
| Spec. | uF / V | mm | Kc | Tr | Lr | Ir | lo | Tc | Ta | ΔT | ΔTo | Ix | Lx | | | |
| C5 | NCC/KY | 22uF/50V | 5*11 | 1.1 | 105 | 5000 | 0.18 | 1 | 2.23 | 0.40 | 59.9 | 59.75 | 0.17 | 5 | 0.033 | 225005.48 |
| C7 | NCC/KXG | 68uF/450V | 18*25 | 1.3 | 105 | 10000 | 0.58 | 2.5 | 2.23 | 3.23 | 57.5 | 56.50 | 1.30 | 5 | 0.739 | 481730.66 |
| C8 | NCC/KXG | 68uF/450V | 18*25 | 1.3 | 105 | 10000 | 0.58 | 2.5 | 2.23 | 3.23 | 57.0 | 55.97 | 1.33 | 5 | 0.749 | 497215.57 |
| C9 | NCC/KXG | 68uF/450V | 18*25 | 1.3 | 105 | 10000 | 0.58 | 2.5 | 2.23 | 3.23 | 64.4 | 63.52 | 1.14 | 5 | 0.692 | 302704.96 |
| C10 | NCC/KXG | 68uF/450V | 18*25 | 1.3 | 105 | 10000 | 0.58 | 2.5 | 2.23 | 3.23 | 57.6 | 56.47 | 1.47 | 5 | 0.785 | 471647.12 |
| C11 | NCC/KY | 22uF/50V | 5*11 | 1.1 | 105 | 5000 | 0.18 | 1 | 2.23 | 0.40 | 69.4 | 68.39 | 1.11 | 5 | 0.085 | 108448.54 |
| C13 | NCC/KY | 47uF/50V | 6.3*11 | 1.1 | 105 | 5000 | 0.295 | 1 | 2.23 | 0.66 | 57.9 | 57.82 | 0.09 | 5 | 0.039 | 260022.44 |
| C14 | NCC/KY | 22uF/50V | 5*11 | 1.1 | 105 | 5000 | 0.18 | 1 | 2.23 | 0.40 | 60.1 | 59.89 | 0.23 | 5 | 0.039 | 220798.11 |
| C16 | NCC/KY | 47uF/50V | 6.3*11 | 1.1 | 105 | 5000 | 0.295 | 1 | 2.23 | 0.66 | 52.8 | 52.56 | 0.27 | 5 | 0.068 | 365280.40 |
| C19 | NCC/KY | 2200uF/16V | 12.5*25 | 1.2 | 105 | 10000 | 2.23 | 1 | 1.73 | 3.86 | 82.0 | 73.42 | 10.30 | 5 | 3.200 | 42835.98 |
| C21 | NCC/KY | 2200uF/16V | 12.5*25 | 1.2 | 105 | 10000 | 2.23 | 1 | 2.23 | 4.97 | 79.2 | 70.35 | 10.62 | 5 | 3.250 | 50665.12 |
| C22 | NCC/KY | 2200uF/16V | 12.5*25 | 1.2 | 105 | 10000 | 2.23 | 1 | 2.23 | 4.97 | 57.1 | 55.06 | 2.45 | 5 | 1.560 | 453972.43 |
| C25 | NCC/KY | 2200uF/16V | 12.5*25 | 1.2 | 105 | 10000 | 2.23 | 1 | 2.00 | 4.46 | 73.2 | 73.09 | 0.13 | 5 | 0.365 | 179308.55 |
| C18 | NCC/KY | 47uF/50V | 6.3*11 | 1.1 | 105 | 5000 | 0.295 | 1 | 2.23 | 0.66 | 58.7 | 58.38 | 0.36 | 5 | 0.079 | 241036.42 |
| C20 | NCC/KY | 470uF/25V | 8*20 | 1.1 | 105 | 7000 | 1.05 | 1 | 2.23 | 2.34 | 54.0 | 53.91 | 0.10 | 5 | 0.148 | 476561.32 |
| C24 | NCC/KY | 1000uF/16V | 10*20 | 1.1 | 105 | 7000 | 1.4 | 1 | 2.23 | 3.12 | 50.3 | 50.29 | 0.01 | 5 | 0.057 | 620141.62 |
| C27 | NCC/KY | 470uF/25V | 8*20 | 1.1 | 105 | 7000 | 1.05 | 1 | 2.23 | 2.34 | 45.6 | 45.59 | 0.01 | 5 | 0.046 | 858890.66 |

Test Equipment:

- a.AC Source : SA101
- b.DC Load : PRODIGIT 3311D
- c.SCOPE : LECROY 24Xs
- d.Thermal Recorder : Yokogawa MV200S
- e.Current Probe : LECROY AP015

$$Lx=Lr*2^{((Tr-Ta)/10)}*2^{((\Delta To -\Delta T) /5)}$$

$$\ast Ta=Tc-(5*(Ix/Ir)^2)/Kc$$

$$I_o=I_r*K_{freq}*K_{temp}$$

$$\Delta T=K_c*(T_c-T_a)$$

| | | |
|------------------------|-----|-----|
| Ambinet Temp. °C | 85 | 105 |
| Guide limit of Δto(°C) | 15 | 5 |
| Core temp.(=Ta+Δto) | 100 | 110 |

| | | | | | | | |
|---------------|----------|------|-------|-------|-----|------|------|
| Diameter (mm) | Φ5 to Φ8 | Φ10 | Φ12.5 | Φ16 | Φ18 | Φ22 | Φ25 |
| Kc | 1.1 | 1.15 | 1.2 | 1.25 | 1.3 | 1.35 | 1.4 |
| Diameter (mm) | Φ30&Φ35 | Φ40 | Φ50 | Φ63.5 | Φ76 | Φ89 | Φ100 |
| Kc | 1.5&1.65 | 1.75 | 1.9 | 2.2 | 2.5 | 2.8 | 3.1 |