SPECIFICATIONS

FB004-01-01A

Nominal Output Voltage		1200101011	MODEL		ZWGEA E/ZW	IZWOS A 10/IZW	ZWIGEA 15/ZWI
Maximum Output Current		ITEMS			KWS5A-5/KW	KWS5A-12/KW	KWS5A-15/KW
Maximum Output Current	1	Nominal Output Voltage		V	5	12	15
Efficiency (Typ.)	2	Maximum Output Current		A	1.0	0.45	0.35
(*1)	3	Maximum Output Power		W	5.00	5.40	5.25
Solution Injust Voltage Range (*2) - 85-265VAC (47-440Hz) or 120-370VDC	4	Efficiency (Typ.)	100VAC	%	76	78	78
6 Input Current (Typ.) (*1) A 0.13 / 0.07 7 Inrush Current (Typ.) (*1)(*3) - 15A at 100VAC, 30A at 200VAC, Ta=25°C, Cold Start 8 Output Voltage Range		(*1)	200VAC	%			75
7	5	Input Voltage Range	(*2)	-	•		
8	6	Input Current (Typ.)	(*1)	A			
9	7	Inrush Current (Typ.)	(*1)(*3)	-	15A at 100V	AC, 30A at 200VAC, Ta=25°C	C, Cold Start
Maximum Ripple & Noise	8	Output Voltage Range		V		Fixed	
Maximum Line Regulation	9	Output Voltage Accuracy		-		+/- 5%	
Maximum Load Regulation	10	Maximum Ripple & Noise	(*4)(*5)(*6)	mV	200	240	240
13 Temperature Coefficient -	11	Maximum Line Regulation	(*5)(*12)	mV	20	48	60
14 Over Current Protection (*7) A 1.05 - 0.47 - 0.36 - 15 Over Voltage Protection (*8) V 5.75 - 7.0 13.8 - 18.3 17.25 - 22.4 16 Hold-up Time (Typ.) (*9) - 15ms(17ms at 70%Load)/45ms 17 Leakage Current - - 18 Parallel Operation - Possible 19 Series Operation - Possible 20 Operating Temperature (*10)(*11) - 10 to 85°C (-10 to 55°C : 100%, 70°C : 55%, 85°C : 10%) 21 Operating Humidity - 30 to 90%RH (No Condensing) 22 Storage Temperature - 40 to +85°C 23 Storage Humidity - 20 to 95%RH (No Condensing) 24 Cooling - Convection Cooling 25 Withstand Voltage - Input - Output : 3kVAC(20mA) for 1 minute. 26 Isolation Resistance - More than 100M Ohms at 25°C and 70%RH Input - Output 500VDC 27 Vibration - 10 - 55Hz, constant amplitude 1.65mmp-p (Max 10G), sweep 1 minute X, Y, Z 1 hour each 28 Shock - Less than 50G for 11 ± 5ms on ± (X, Y, Z) axis each 3 times 29 Safety (*12) Designed to meet UL60950-1, CSA60950-1, EN60950-1. 20 Designed to meet Den-an Appendix 12 30 Conducted Emission (*13) Designed to meet EN55011/EN55022-B, FCC-B, VCCI-B (Need External parts) 31 Radiated Emission (*13) Designed to meet EN55011/EN55022-B, FCC-B, VCCI-B (Need External parts) 32 Designed to meet EN55011/EN55022-A, FCC-A, VCCI-A (No Need External parts) 31 Designed to meet EN55011/EN55022-A, FCC-A, VCCI-B (Need External parts) 32 Designed to meet EN55011/EN55022-A, FCC-A, VCCI-B (Need External parts) 33 Designed to meet EN55011/EN55022-A, FCC-A, VCCI-B (Need External parts) 34 Designed to meet EN55011/EN55022-A, FCC-A, VCCI-B (Need External parts) 35 Designed to meet EN55011/EN55022-A, FCC-A, VCCI-B (Need External parts) 34 Designed to meet EN55011/EN55022-A, FCC-A, VCCI-B (Need External parts) 35 Designed to meet EN55011/EN55022-A, FCC-A, VCCI-B (Need External parts) 36 Designed to meet EN	12	Maximum Load Regulation	(*6)(*12)	mV	40	96	120
15 Over Voltage Protection (*8) V 5.75 - 7.0 13.8 - 18.3 17.25 - 22.4 16 Hold-up Time (Typ.) (*9) - 15ms(17ms at 70%Load)/45ms 17 Leakage Current - - - 18 Parallel Operation - Possible 19 Series Operation - Possible 20 Operating Temperature (*10)(*11) - 10 to 85°C (-10 to 55°C : 100%, 70°C : 55%, 85°C : 10%) 21 Operating Humidity - 30 to 90%RH (No Condensing) 22 Storage Temperature - - 40 to +85°C 23 Storage Humidity - 20 to 95%RH (No Condensing) 24 Cooling - Convection Cooling 25 Withstand Voltage - Input - Output : 3kVAC(20mA) for 1 minute. 26 Isolation Resistance - More than 100M Ohms at 25°C and 70%RH Input - Output 500VDC 27 Vibration 10 - 55Hz, constant amplitude 1.65mpp- (Max 10G), sweep 1 minute X, Y, Z 1 hour each 28 Shock - Less than 50G for 11 ± 5ms on ± (X, Y, Z) axis each 3 times 29 Safety (*12) Designed to meet UL60950-1, CSA60950-1, EN60950-1. 18 Designed to meet EN55011/EN55022-A, FCC-B, VCCI-B (Need External parts) 19 Designed to meet EN55011/EN55022-B, FCC-B, VCCI-B (Need External parts) 10 Designed to meet EN55011/EN55022-A, FCC-A, VCCI-B (Need External parts) 10 Designed to meet EN55011/EN55022-A, FCC-B, VCCI-B (Need External parts) 10 Designed to meet EN55011/EN55022-A, FCC-B, VCCI-B (Need External parts) 10 Designed to meet EN55011/EN55022-A, FCC-B, VCCI-B (Need External parts) 10 Designed to meet EN55011/EN55022-A, FCC-B, VCCI-B (Need External parts) 10 Designed to meet EN55011/EN55022-A, FCC-B, VCCI-B (Need External parts) 10 Designed to meet EN55011/EN55022-A, FCC-B, VCCI-B (Need External parts) 10 Designed to meet EN55011/EN55022-A, FCC-A, VCCI-A (No Need External parts) 10 Designed to meet EN55011/EN55022-A, FCC-A, VCCI-A (No Need External parts) 10 Designed to meet EN55011/EN55022-A, FCC-A, VCCI-A (No Need External parts) 11 Designed to meet EN55011/	13	Temperature Coefficient		-		Less than 0.02% / °C	
16 Hold-up Time (Typ.)	14	Over Current Protection	(*7)	A	1.05 -	0.47 -	0.36 -
17	15	Over Voltage Protection	(*8)	V	5.75 - 7.0	13.8 - 18.3	17.25 - 22.4
18	16	Hold-up Time (Typ.)	(*9)	-	15ms(17ms at 70%Load)/ 45ms		S
19 Series Operation	17	Leakage Current		-	-		
20 Operating Temperature	18	Parallel Operation		-	-		
Guarantee Start up at -40 to -10°C 1 Operating Humidity - 30 to 90%RH (No Condensing) 2 Storage Temperature40 to +85°C 3 Storage Humidity - Cooling - Convection Cooling Withstand Voltage - Input - Output : 3kVAC(20mA) for 1 minute. Isolation Resistance - More than 100M Ohms at 25°C and 70%RH Input - Output 500VDC Vibration - 10 - 55Hz, constant amplitude 1.65mmp-p (Max 10G), sweep 1 minute X, Y, Z 1 hour each Shock - Less than 50G for 11 ± 5ms on ± (X, Y, Z) axis each 3 times Safety (*12) - Designed to meet UL60950-1, CSA60950-1, EN60950-1. Designed to meet Den-an Appendix 12. Ocnducted Emission (*13) - Designed to meet EN55011/EN55022-B, FCC-B, VCCI-B (Need External parts) Designed to meet EN55011/EN55022-B, FCC-B, VCCI-B (Need External parts) Designed to meet EN55011/EN55022-B, FCC-B, VCCI-B (Need External parts) Designed to meet EN55011/EN55022-B, FCC-B, VCCI-B (Need External parts) Designed to meet EN55011/EN55022-B, FCC-B, VCCI-B (Need External parts) Designed to meet EN55011/EN55022-B, FCC-B, VCCI-B (Need External parts) Designed to meet EN55011/EN55022-A, FCC-A, VCCI-A (No Need External parts)	19	Series Operation		-	Possible		
21 Operating Humidity 22 Storage Temperature 23 Storage Humidity 24 Cooling 25 Withstand Voltage 26 Isolation Resistance 27 Vibration 28 Shock 29 Safety 29 Safety 29 Safety 20 Storage Humidity 20 Convection Cooling 21 Convection Cooling 22 Input - Output : 3kVAC(20mA) for 1 minute. 23 More than 100M Ohms at 25°C and 70%RH Input - Output 500VDC 26 Isolation Resistance 27 Vibration 28 Shock 29 Safety 29 Safety 29 Safety 20 Conducted Emission 29 Safety 30 Conducted Emission 31 Radiated Emission 31 Radiated Emission 31 Radiated Emission 32 Storage Temperature 33 To 90%RH (No Condensing) 34 Convection Cooling 45 Convection Cooling 46 Convection Cooling 47 Convection Cooling 48 Convection Cooling 49 Convection Cooling 40 Convection Cooling 41 Cooling 41 Cooling 41 Cooling 42 Cooling 43 Convection Cooling 41 Cooling 41 Cooling 42 Cooling 42 Cooling 42 Cooling 42 Cooling 42 Cooling 42 Cooling 43 Convection Cooling 41 Cooling 41 Cooling 42 Cooling 42 Cooling 42 Cooling 42 Cooling 43 Convection Cooling 41 Cooling 42 Cooling 42 Cooling 43 Cooling 44 Cooling 45 Cooling 46 Cooling 47 Cooling 48 Cooling 48 Cooling 49 Cooling 40 C	20	Operating Temperature	(*10)(*11)		-10 to 85°C (-10 to 55°C : 100%, 70°C : 55%, 85°C : 10%)		
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24 Cooling 25 Withstand Voltage 26 Isolation Resistance 27 Vibration 28 Shock 29 Safety 29 Conducted Emission 29 Conducted Emission 20 Conducted Emission 20 Conducted Emission 20 Conducted Emission 21 Cooling 22 Convection Cooling 23 Input - Output : 3kVAC(20mA) for 1 minute. 26 Input - Output : 3kVAC(20mA) for 1 minute. 27 More than 100M Ohms at 25°C and 70%RH Input - Output 500VDC 28 Shock 29 Safety 20 Conducted Emission 29 Conducted Emission 29 Conducted Emission 20 Conducted Emission 20 Conducted Emission 21 Pasigned to meet UL60950-1, CSA60950-1, EN60950-1. 22 Designed to meet EN55011/EN55022-B, FCC-B, VCCI-B (Need External parts) 23 Designed to meet EN55011/EN55022-A, FCC-A, VCCI-A (No Need External parts) 24 Conducted Emission 25 Withstand Voltage 26 Input - Output : 3kVAC(20mA) for 1 minute. 26 Input - Output : 3kVAC(20mA) for 1 minute. 27 Output - Output : 3kVAC(20mA) for 1 minute. 28 Input - Output : 3kVAC(20mA) for 1 minute. 29 Safety	22	Storage Temperature		•			
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Designed to meet EN55011/EN55022-A, FCC-A, VCCI-A (No Need External parts)							
	31	Radiated Emission	(*13)	-			
32 Immunity (*13) - Designed to meet IEC61000-6-2 IEC61000-4-2, -3, -4, -5, -6, -8, -11							
	32	Immunity	(*13)	-	Designed to meet IEC61000-6-2 IEC61000-4-2, -3, -4, -5, -6, -8, -11		
33 Weight (Typ.) - 45g				-			
34 Size (W x H x D) mm 45 x 28.5 x 55 (Refer to Outline Drawing)							

*Read instruction manual carefully, before using the power supply unit.

=NOTES=

- *1. At 100VAC/200VAC, Ta=25°C, nominal output voltage and maximum output power.
- *2. For cases where conformance to various safety specs (UL, CSA, EN) are required, to be described as 100 240VAC(50 60Hz).
- *3. Not applicable for the inrush current to Noise Filter for less than 0.2ms.
- *4. Measure with JEITA RC-9131B probe, Bandwidth of scope :100MHz.

 For start up at low ambient temperature and low input voltage, output ripple noise might not meet specification.

 However, specification can be met after 1 minute.

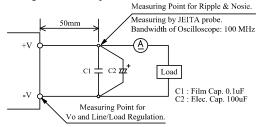
 Measurin

*5. 85 - 265VAC, constant load.

- *6. No load-Full load, constant input voltage.
- *7. Hiccup with automatic recovery.

Avoid to operate at over load or short circuit condition.

- *8. OVP apply the output zener clamp circuit.
- *9. At 100VAC with 80% load ; 200VAC with 100% load.
- *10. Output Derating
 - Refer to OUTPUT DERATING CURVE (FB004-01-02_).
 - Load (%) is percent of maximum output power or maximum output current, do not exceed its derating of maximum load.
 - For conditions of start up at -40°C to -10°C, refer to derating curve (FB004-01-03_).
- *11. Output derating needed when input voltage less than 90VAC. Refer to LOAD vs. INPUT VOLTAGE (FB004-01-02).
- *12. The /KW model didn't get safety approval, but the installed power supply on PCB board already got safety certification.
- *13. The power supply is considered a component which will be installed into a final equipment. The final equipment should be re-evaluated that it meets EMC directives.

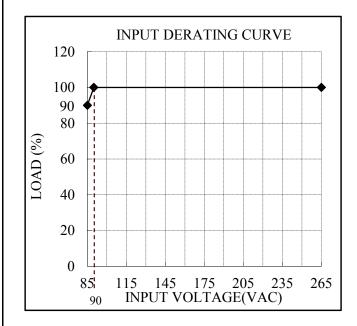


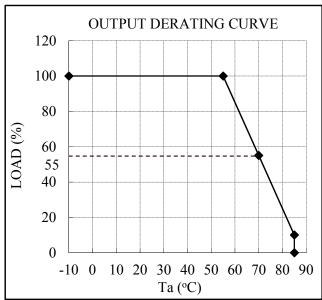
INPUT AND OUTPUT DERATING

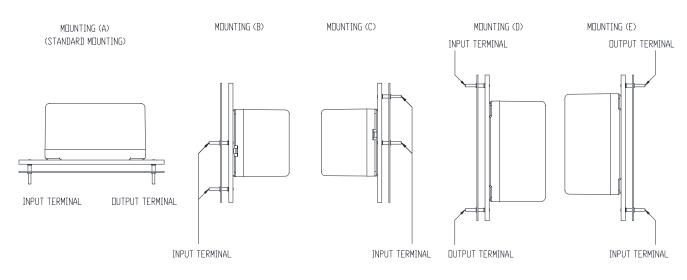
FB004-01-02A

VIN(VAC) 5V to 15V	LOAD (%)
85	90
90 to 265	100

Ta (°C) 5V to 15V	LOAD (%)
-10 to +55	100
70	55
85	10



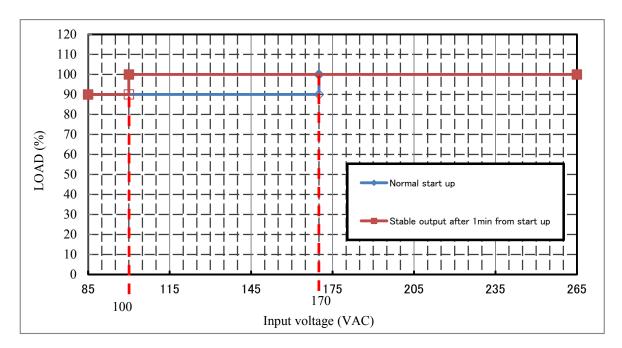




DERATING TO START UP AT Ta: -40 to -10°C

FB004-01-03A

	LOAD (%)			
VIN(VAC)	Normal start up	Stable output after 1 min from start up		
$85 \leq \text{Vin} < 100$	90	90		
100 ≤ Vin<170	90	100		
170≦Vin≦265	100	100		



NOTE:

- * At Ta: -40 to-10°C
- * Input voltage: Not gradual start up.
- * Do not use the load that is constant current mode.
- * Avoid forced air cooling . It is assumed that inside of power supply is heated by self-heating within 1 minute.
- * No condensing.
- * Pay attention to above items before using the unit. Incorrect usage could lead to unstable output voltage.