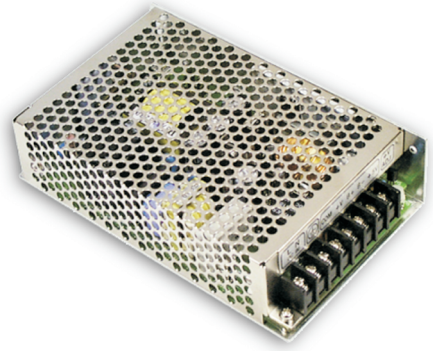
JAMECO ELECTRONICS **Jameco SKU Number: 323686**

MEAN WELL

85W Quad Output Switching Power Supply **RQ-85 series**



■ Features :

- Universal AC input / Full range
- Protections:Short circuit/Over load/Over voltage
- Cooling by free air convection
- LED indicator for power on
- 100% full load burn-in test
- All using 105℃ long life electrolytic capacitors
- Withstand 300VAC surge input for 5 second
- High operating temperature up to 70℃
- Withstand 5G vibration test
- High efficiency, long life and high reliability
- 3 years warranty

SPECIFICATION

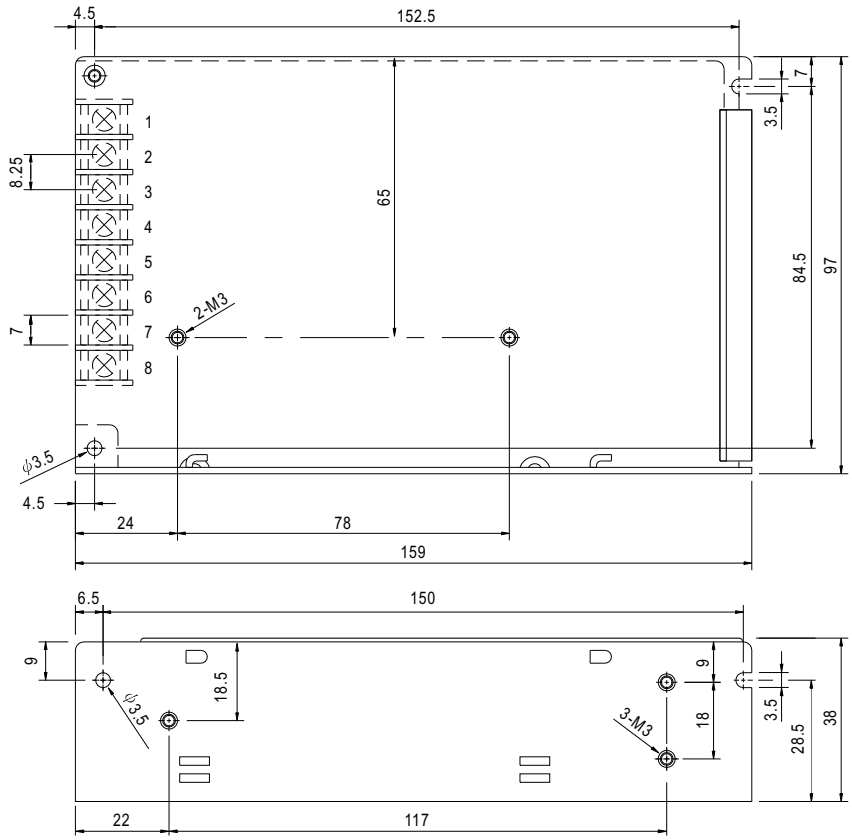
MODEL		RQ-85B				RQ-85C				RQ-85D			
OUTPUT	OUTPUT NUMBER	CH1	CH2	CH3	CH4	CH1	CH2	CH3	CH4	CH1	CH2	CH3	CH4
	DC VOLTAGE	5V	12V	-5V	-12V	5V	15V	-5V	-15V	5V	12V	24V	-12V
	RATED CURRENT	7A	3.1A	0.5A	0.5A	7A	2.5A	0.5A	0.5A	6A	2A	1A	0.5A
	CURRENT RANGE Note.6	2 ~ 10A	0.3 ~ 4A	0 ~ 1A	0 ~ 1A	2 ~ 10A	0.3 ~ 4A	0 ~ 1A	0 ~ 1A	2 ~ 10A	0.3 ~ 4A	0.1 ~ 1.5A	0 ~ 1A
	RATED POWER Note.6	80.7W				82.5W				84W			
	RIPPLE & NOISE (max.) Note.2	80mVp-p	120mVp-p	100mVp-p	80mVp-p	80mVp-p	120mVp-p	100mVp-p	80mVp-p	80mVp-p	120mVp-p	150mVp-p	80mVp-p
	VOLTAGE ADJ. RANGE	CH1: 4.75 ~ 5.5V				CH1: 4.75 ~ 5.5V				CH1: 4.75 ~ 5.5V			
	VOLTAGE TOLERANCE Note.3	±2.0%	+7,-3%	±8.0%	±5.0%	±2.0%	+3,-7%	±8.0%	±5.0%	±2.0%	+7,-3%	±8.0%	±5.0%
	LINE REGULATION Note.4	±0.5%	±1.0%	±1.0%	±1.0%	±0.5%	±1.0%	±1.0%	±1.0%	±0.5%	±1.0%	±1.0%	±1.0%
	LOAD REGULATION Note.5	±1.0%	±3.0%	±6.0%	±2.0%	±1.0%	±3.0%	±6.0%	±2.0%	±1.0%	±3.0%	±5.0%	±2.0%
	SETUP, RISE TIME	500ms, 20ms/230VAC 1200ms, 30ms/115VAC at full load											
	HOLD TIME (Typ.)	100ms/230VAC 18ms/115VAC at full load											
INPUT	VOLTAGE RANGE	88 ~ 264VAC 125 ~ 373VDC (Withstand 300VAC surge for 5sec. Without damage)											
	FREQUENCY RANGE	47 ~ 63Hz											
	EFFICIENCY (Typ.)	76%				77%				78%			
	AC CURRENT (Typ.)	2.5A/115VAC 1.5A/230VAC											
	INRUSH CURRENT (Typ.)	COLD START 40A/230VAC											
	LEAKAGE CURRENT	<2mA / 240VAC											
PROTECTION	OVER LOAD	110 ~ 150% rated output power											
		Protection type : Hiccup mode, recovers automatically after fault condition is removed											
	OVER VOLTAGE	CH1: 5.75 ~ 6.75V											
		Protection type : Hiccup mode, recovers automatically after fault condition is removed											
ENVIRONMENT	WORKING TEMP.	-25 ~ +70℃ (Refer to output load derating curve)											
	WORKING HUMIDITY	20 ~ 90% RH non-condensing											
	STORAGE TEMP., HUMIDITY	-40 ~ +85℃, 10 ~ 95% RH											
	TEMP. COEFFICIENT	±0.03%/℃ (0 ~ 50℃)on +5V output											
	VIBRATION	10 ~ 500Hz, 5G 10min./1cycle, period for 60min. each along X, Y, Z axes											
SAFETY & EMC (Note 7)	SAFETY STANDARDS	UL60950-1, TUV EN60950-1 Approved											
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC I/P-FG:1.5KVAC O/P-FG:0.5KVAC											
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms/500VDC											
	EMI CONDUCTION & RADIATION	Compliance to EN55022 (CISPR22) Class B											
	HARMONIC CURRENT	Compliance to EN61000-3-2,-3											
	EMS IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11; ENV50204, EN61000-6-2 (EN50082-2) heavy industry level, criteria A											
OTHERS	MTBF	206.8Khrs min. MIL-HDBK-217F (25℃)											
	DIMENSION	159*97*38mm (L*W*H)											
	PACKING	0.6Kg; 24pcs/15.4Kg/0.7CUFT											

NOTE

1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature.
2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.
3. Tolerance : includes set up tolerance, line regulation and load regulation.
4. Line regulation is measured from low line to high line at rated load.
5. Load regulation is measured from 20% to 100% rated load, and other output at 60% rated load.
6. Each output can work within current range. But total output power can't exceed rated output power.
7. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives.
8. Length of set up time is measured at cold first start. Turning ON/OFF the power supply very quickly may lead to increase of the set up time.

■ Mechanical Specification

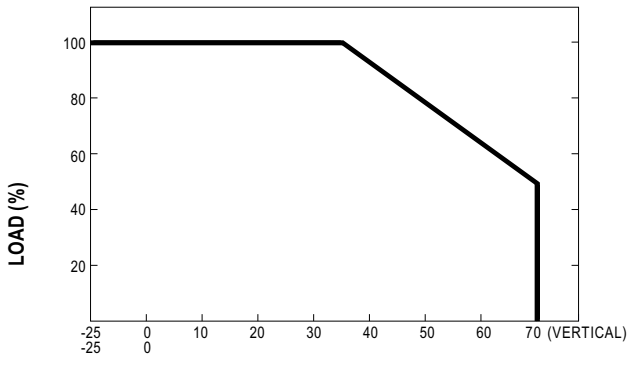
Case No. 901 Unit:mm



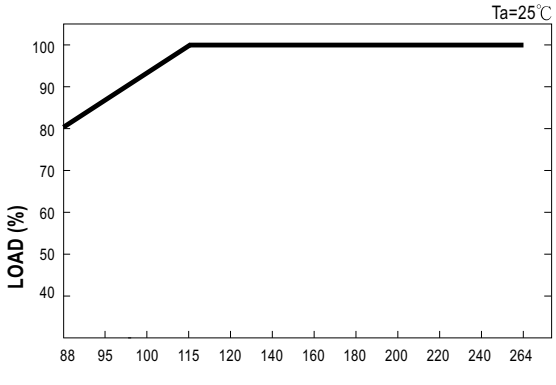
Terminal Pin. No Assignment

Pin No.	Assignment	Pin No.	Assignment	Pin No.	Assignment
1	AC/L	4	DC OUTPUT -V4	7	DC OUTPUT COM
2	AC/N	5	DC OUTPUT V3	8	DC OUTPUT +V1
3	FG ⏚	6	DC OUTPUT +V2		

■ Derating Curve



■ Static Characteristics



MODEL：RQ-85B

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 80 mVp-p (Max) V2: 120 mVp-p (Max) V3: 100 mVp-p (Max) V4: 80 mVp-p (Max)	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	V1: 21 mVp-p (Max) V2: 26 mVp-p (Max) V3: 18 mVp-p (Max) V4: 13 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 4.75V ~ 5.5V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25℃	4.66V~ 5.58 V/ 230VAC 4.66V~ 5.58 V/ 115VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1: -2 %~ 2 % (Max) V2:-3 %~ +7 % (Max) V3: -8 %~ 8 % (Max) V4:-5 %~ 5 % (Max)	I/P: 115 VAC / 264 VAC O/P:FULL/ MIN 40 % LOAD Ta:25℃	V1: 0.4 %~ -0.4 % V2: 1.6 %~ -1.6 % V3: 4 %~ -4 % V4: 0.2 %~ -0.2 %	P
4	LINE REGULATION	V1:-0.5 %~ 0.5 % (Max) V2:-1 %~ 1 % (Max) V3: -1 %~ 1 % (Max) V4:-1 %~ 1 % (Max)	I/P: 115 VAC ~ 264 VAC O/P:FULL LOAD Ta:25℃	V1: 0 %~ 0 % V2: 0.05 %~ -0.05 % V3: 0.4 %~ -0.4 % V4: 0 %~ 0 %	P
5	LOAD REGULATION	V1: -1 %~ 1 % (Max) V2:-3 %~ 3 % (Max) V3: -6 %~ 6 % (Max) V4:-2 %~ 2 % (Max)	I/P:230 VAC O/P:FULL ~MIN LOAD Ta:25℃	V1: 0.2 %~ -0.2 % V2: 1.5 %~ -1.5 % V3: 1.3 %~ -1.3 % V4: 0.2 %~ -0.2 %	P
6	CROSS REGULATION	V1: -1 %~ 1 % (Max) V2:-3 %~ 3 % (Max) V3: -6 %~ 6 % (Max) V4:-2 %~ 2 % (Max)	I/P:230 VAC O/P: Testing O/P 60%LOAD Other O/P 40%LOAD Change Ta:25℃	V1: 0 %~ 0 % V2: 1.6 %~ -1.6 % V3: 4 %~ -4 % V4: 0.1 %~ -0.1 %	P
7	SET UP TIME	230 VAC/ 500 ms (Max) 115 VAC/ 1200 ms (Max)	I/P:230 VAC I/P:115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 179 ms 115VAC/ 594 ms	P
8	RISE TIME	230 VAC/ 20 ms (Max) 115 VAC/ 30 ms (Max)	I/P:230 VAC I/P:115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 8 ms 115VAC/ 9 ms	P
9	HOLD UP TIME	230 VAC/ 50 ms (TYP) 115 VAC/ 10 ms (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 127 ms 115VAC/ 26 ms	P
10	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	TEST: <5 %	P
11	DYNAMIC LOAD	V1: 1000 mVp-p	I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25℃	94 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	88 VAC~ 264 VAC	I/P:TESTING O/P:FULL LOAD Ta:25℃	58 V~ 264 V	P
			I/P: LOW-LINE-3V= 85 V HIGH-LINE+15%= 300 V O/P:FULL/MIN LOAD ON: 30 Sec . OFF: 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE)	TEST: OK	
2	INPUT FREQUENCY RANGE	47 HZ ~ 63 HZ NO DAMAGE OSC	I/P: 88 VAC ~ 264 VAC O/P:FULL~MIN LOAD Ta:25℃	TEST: OK	P
3	EFFICIENCY	76 % (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	76.8 %	P
4	INPUT CURRENT	230 V/ 1.5 A(TYP) 115 V/ 2.5 A (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	I = 1 A/ 230 VAC I = 1.6 A/115 VAC	P
5	INRUSH CURRENT	230 V/ 40 A (TYP) COLD START	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	I = 33 A/ 230 VAC	P
6	LEAKAGE CURRENT	< 2 mA / 240 VAC	I/P: 254 VAC O/P:Min LOAD Ta:25℃	L-FG: 0.8 mA N-FG: 0.8 mA	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	110 %~ 150 %	I/P: 230 VAC I/P: 115 VAC O/P:TESTING Ta:25℃	116%/230VAC 116%/115VAC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1: 5.75 V~ 6.75 V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25℃	5.89 V/ 230 VAC 5.89 V/ 115 VAC Hiccup Model	P
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264 VAC O/P: Full LOAD Ta:25℃	NO DAMAGE Hiccup Mode	P

ENVIRONMENT TEST

<table>
<tr><th>NO</th><th>TEST ITEM</th><th>SPECICATION</th><th>TEST CONDITION</th><th>RESULT</th><th>VERDICT</th></tr>
<tr><td>1</td><td>TEMPERATURE RISE TEST</td><td colspan="3">MODEL：RQ-85C
1. ROOM AMBIENT BURN-IN：62 HRS
I/P: 230 VAC O/P: FULL LOAD Ta= 33 ℃
2. HIGH AMBIENT BURN-IN： 3 HRS
I/P: 230 VAC O/P: FULL LOAD Ta= 42.7 ℃

<table>
<tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 33 ℃</th><th>HIGH AMBIENT Ta= 42.7 ℃</th></tr>
<tr><td>1</td><td>LF1</td><td>LF-058</td><td>74.2℃</td><td>79.6℃</td></tr>
<tr><td>2</td><td>BD1</td><td>D3SB80 4A/800V SHI</td><td>66.2℃</td><td>74.4℃</td></tr>
<tr><td>3</td><td>ZD1</td><td>P6KE300A</td><td>83.3℃</td><td>90.3℃</td></tr>
<tr><td>4</td><td>C5</td><td>150U/400V HU4 105℃</td><td>63.5℃</td><td>71.5℃</td></tr>
<tr><td>5</td><td>D1</td><td>HER208 2A/1KV REC</td><td>82.2℃</td><td>90.0℃</td></tr>
<tr><td>6</td><td>U1</td><td>1203 ON</td><td>84.0℃</td><td>90.9℃</td></tr>
<tr><td>7</td><td>Q1</td><td>2SK2082 9A/800V FUJI</td><td>77.5℃</td><td>86.1℃</td></tr>
<tr><td>8</td><td>C10</td><td>100U/35V RUB 105℃ YXF</td><td>78.1℃</td><td>84.0℃</td></tr>
<tr><td>9</td><td>T1 CORE</td><td>TF-1052 LS</td><td>85.9℃</td><td>91.3℃</td></tr>
<tr><td>10</td><td>T1 COIL</td><td>TF-1052 LS</td><td>87.7℃</td><td>93.2℃</td></tr>
<tr><td>11</td><td>D55</td><td>BYQ28X-200 10A/200V PH</td><td>93.5℃</td><td>100.1℃</td></tr>
<tr><td>12</td><td>D60</td><td>MBR3060PT 25A/60V GI</td><td>94.6℃</td><td>100.4℃</td></tr>
<tr><td>13</td><td>L60</td><td>TR398</td><td>100.1℃</td><td>106.0℃</td></tr>
<tr><td>14</td><td>D50</td><td>BYQ28X-200 10A/200V PH</td><td>87.6℃</td><td>93.9℃</td></tr>
<tr><td>15</td><td>C62</td><td>2200U/16V NCC 105℃ KY</td><td>76.0℃</td><td>81.8℃</td></tr>
</table></td><td>P</td></tr>
<tr><td>2</td><td>OVER LOAD BURN-IN TEST</td><td>NO DAMAGE
1 HOUR (MIN)</td><td>I/P: 230 VAC
O/P: 132 % LOAD
Ta:25℃</td><td>TEST： OK</td><td>P</td></tr>
<tr><td>3</td><td>LOW TEMPERATURE
TURN ON TEST</td><td>TURN ON AFTER 2 HOUR</td><td>I/P: 230 VAC
O/P: 100 % LOAD
Ta= -25 ℃</td><td>TEST： OK</td><td>P</td></tr>
<tr><td>4</td><td>HIGH HUMIDITY
HIGH TEMPERATURE
HIGH VOLTAGE
TURN ON TEST</td><td>AFTER 12 HOURS
IN CHAMBER ON
CONTROL 35 ℃
NO DAMAGE</td><td>I/P: 272 VAC
O/P:FULL LOAD
Ta= 35℃
HUMIDITY= 95 %R.H</td><td>TEST： OK</td><td>P</td></tr>
<tr><td>5</td><td>TEMPERATURE
COEFFICIENT</td><td>± 0.03 %(0~50℃)</td><td>I/P: 230 VAC
O/P:FULL LOAD</td><td>± 0.01 %(0~50℃)</td><td>P</td></tr>
<tr><td>6</td><td>VIBRATION TEST</td><td colspan="2">1 Set Operating at I/P: 230 VAC NO LOAD
(1) Waveform: Sine Wave
(2) Frequency:10~500Hz
(3) Sweep Time:10min/sweep cycle
(4) Acceleration:5G
(5) Test Time:1 hour in each axis (X.Y.Z)
(6) Ta:25℃</td><td>TEST： OK</td><td>P</td></tr>
</table>

SAFETY TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P: 3 KVAC/min I/P-FG: 1.5 KVAC/min O/P-FG: 0.5 KVAC/min	I/P-O/P: 3.6 KVAC/min I/P-FG: 1.8 KVAC/min O/P-FG: 0.6 KVAC/min Ta:25℃	I/P-O/P: 4.8 mA I/P-FG: 4.36 mA O/P-FG: 2.51 mA NO DAMAGE	P
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ I/P-FG: 500VDC>100MΩ O/P-FG:500VDC>100MΩ	I/P-O/P: 500 VDC I/P-FG: 500 VDC O/P-FG: 500 VDC Ta:25℃	I/P-O/P: 3 G Ω I/P-FG: 4 G Ω O/P-FG: 1 G Ω NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta:25℃	6 mΩ	P
4	APPROVAL	TUV: Certificate NO ：R50045826 UL: File NO ：E183223			P

E.M.C TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	PASS	P
2	CONDUCTION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL/50% LOAD Ta:25℃	PASS	P
3	RADIATION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL LOAD Ta:25℃	PASS Test by certified Lab	P
4	E.S.D	EN61000-4-2 INDUSTRY AIR:8KV / Contact:4KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	CRITERIA A	P
5	E.F.T	EN61000-4-4 INDUSTRY INPUT: 2KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	CRITERIA A	P
6	SURGE	IEC61000-4-5 INDUSTRY L-N :2KV L,N-PE:4KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	CRITERIA A	P
7	Test by certified Lab & Test Report Prepare				

M.T.B.F & LIFE CYCLE CALCULATION

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	CAPACITOR LIFE CYCLE	SUPPOSE C 62 IS THE MOST CRITICAL COMPONENT I/P: 230 VAC O/P:FULL LOAD Ta=25 ℃ LIFE TIME= 159250 HRS I/P: 230 VAC O/P:FULL LOAD Ta=35 ℃ LIFE TIME= 104247 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 206.8K HRS			P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) **Peak Voltage**	Q 1 Rated 2SK2082 : 800 V / 9 A	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25℃	(1) 438 V (2) 532 V (3) 602 V	P
2	Diode Peak **Voltage**	D 60 Rated MBR3060PT : 60 V/ 30 A D 55 Rated BYQ28X-200 : 200V/ 10 A D52 Rated BYQ28X-200: 200V /10 A D 52 Rated HER305 : 400 V / 3 A	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short (1)Full Load Turn on (2) Full Load (3)Output Short (1)Full Load Turn on (2) Full Load (3)Output Short (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25℃	 (1) 51.2 V (2) 43.8 V (3) 51 V (1) 108 V (2) 66.8 V (3) 107 V (1) 49.2 V (2) 50 V (3)52.6 V (1) 175 V (2) 130 V (3) 175 V	P
3	Clamp Diode Peak **Voltage**	D 1 Rated HER208 : 1K V / 2 A	I/P:High-Line +3V = 267 V O/P: (1)Full Load (2) Dynamic Load 90%Duty/1KHz Ta:25℃	(1) 520 V (2) 524 V	P
4	**Input Capacitor Voltage**	C 5 Rated : 150 u / 400 V	I/P:High-Line +3V = 267 V O/P: (1)Full Load (2) Min load (3)Full Load /Min load Change Ta:25℃	(1) 364 V (2) 370 V (3) 370 V	P
5	**Control IC Voltage Test**	U 1 Rated 1203 : 16 V	I/P:High-Line +3V = 267 V O/P: (1)Full Load (2) Min load (3)Full Load /Min load Change Ta:25℃	(1) 14 V (2) 12.7 V (3) 10.4 V	P

ATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2003/12/30	RD SMAPLE	PASS	VINCENT TSENG	MAX LIN
2004/7/22	PRODUCT SAMPLE A404B36	PASS	VINCENT TSENG	MAX LIN
2004/8/19	PRODUCT SAMPLE A408A15	PASS	VINCENT TSENG	MAX LIN

2003/12/12 A50-F023