JAMECO ELECTRONICS **Jameco SKU Number: 323522**

MEAN WELL

65W Triple Output Switching Power Supply **RT-65 series**

■ Features :

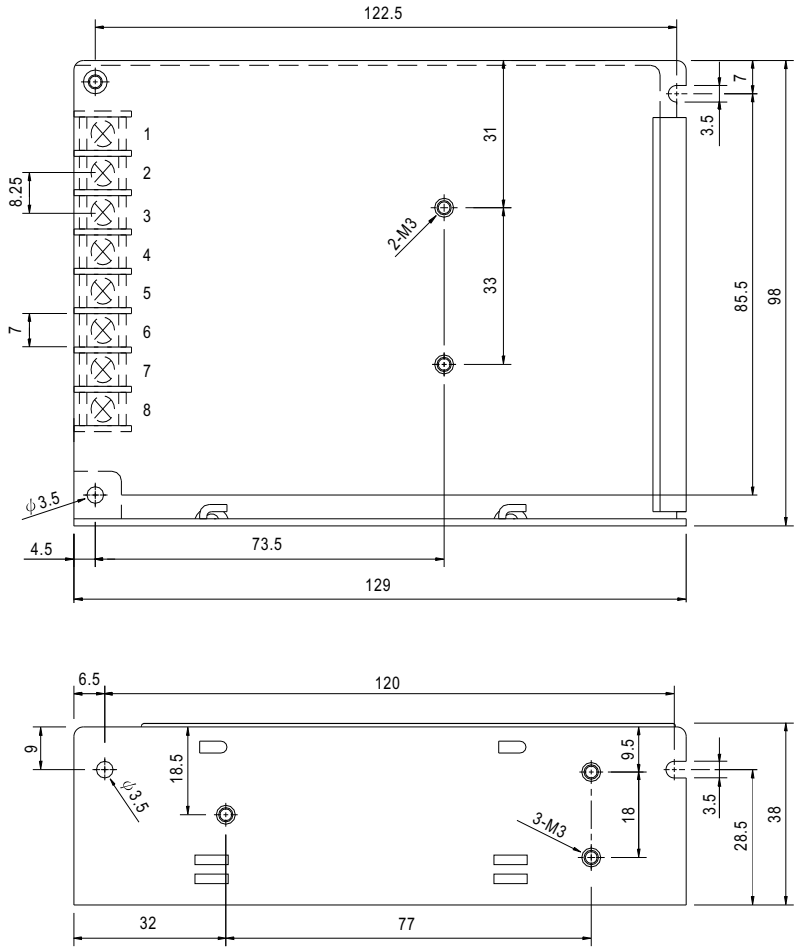
- Universal AC input / Full range
- Protections:Short circuit/Over load/Over voltage
- Cooling by free air convection
- LED indicator for power on
- 100% full load burn-in test
- All using 105℃ long life electrolytic capacitors
- Withstand 300VAC surge input for 5 second
- High operating temperature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

SPECIFICATION

MODEL		RT-65A			RT-65B			RT-65C			RT-65D		
OUTPUT	OUTPUT NUMBER	CH1	CH2	CH3	CH1	CH2	CH3	CH1	CH2	CH3	CH1	CH2	CH3
	DC VOLTAGE	5V	12V	-5V	5V	12V	-12V	5V	15V	-15V	5V	24V	12V
	RATED CURRENT	6A	2.8A	0.5A	5A	2.8A	0.5A	5A	2.2A	0.5A	4A	1.5A	1A
	CURRENT RANGE Note.6	0.5 ~ 8A	0.2 ~ 3.5A	0 ~ 1A	0.5 ~ 8A	0.2 ~ 3.5A	0 ~ 1A	0.5 ~ 8A	0.2 ~ 3A	0 ~ 1A	0.5 ~ 8A	0.2 ~ 2A	0.1 ~ 1A
	RATED POWER Note.6	66.1W			64.6W			65.5W			68W		
	RIPPLE & NOISE (max.) Note.2	80mVp-p	120mVp-p	80mVp-p	80mVp-p	120mVp-p	80mVp-p	80mVp-p	120mVp-p	80mVp-p	80mVp-p	150mVp-p	120mVp-p
	VOLTAGE ADJ. RANGE	CH1: 4.75 ~ 5.5V			CH1: 4.75 ~ 5.5V			CH1: 4.75 ~ 5.5V			CH1: 4.75 ~ 5.5V		
	VOLTAGE TOLERANCE Note.3	±2.0%	±6.0%	±5.0%	±2.0%	±6.0%	±5.0%	±2.0%	+8,-4%	±5.0%	±2.0%	+4,-6%	±6.0%
	LINE REGULATION Note.4	±0.5%	±1.5%	±0.5%	±0.5%	±1.5%	±0.5%	±0.5%	±1.5%	±0.5%	±0.5%	±1.5%	±2.0%
	LOAD REGULATION Note.5	±1.0%	±3.0%	±1.0%	±1.0%	±3.0%	±1.0%	±1.0%	±3.0%	±1.0%	±1.0%	±3.0%	±4.0%
	SETUP, RISE TIME	500ms, 20ms/230VAC 1200ms, 30ms/115VAC at full load											
	HOLD TIME (Typ.)	60ms/230VAC 14ms/115VAC at full load											
INPUT	VOLTAGE RANGE	88 ~ 264VAC 125 ~ 373VDC (Withstand 300VAC surge for 5sec. Without damage)											
	FREQUENCY RANGE	47 ~ 63Hz											
	EFFICIENCY(Typ.)	77%			77%			78%			79%		
	AC CURRENT (Typ.)	2A/115VAC 1.2A/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	254.6Khrs min. MIL-HDBK-217F (25℃)											
	DIMENSION	129*98*38mm (L*W*H)											
	PACKING	0.44Kg; 30pcs/13.2Kg/0.72CUFT											
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.												

■ Mechanical Specification

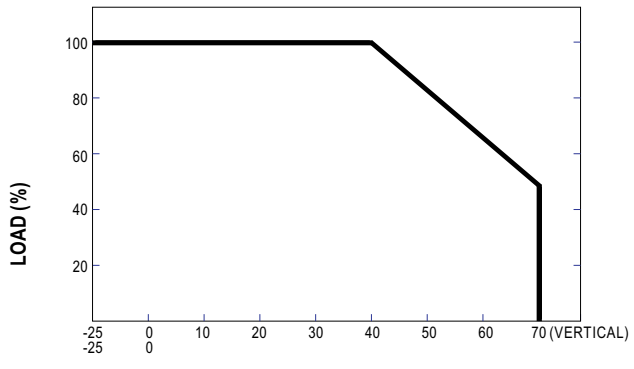
Case No. 903 Unit:mm



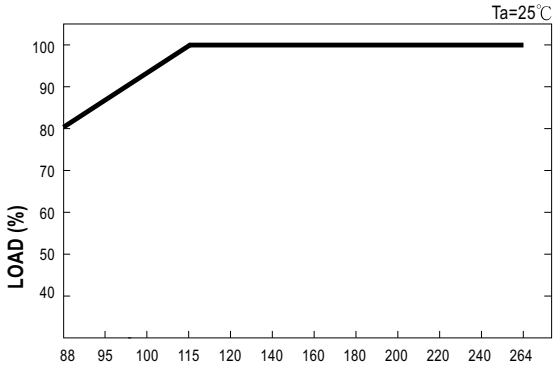
Terminal Pin. No Assignment

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

■ Derating Curve



■ Output Derating VS Input Voltage



MODEL：RT-65A

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: 80 mVp-p (Max)	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	V1: 4 mVp-p (Max) V2: 8 mVp-p (Max) V3: 3 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 4.75 V~5.5 V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25℃	4.404V~5.75V/230 VAC 4.405V~5.757V/115 VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1: -2 %~ +2 % (Max) V2: -6 %~ +6 % (Max) V3: -5 %~ +5 % (Max)	I/P:115 VAC / 264 VAC O/P:FULL LOAD Ta:25℃	V1: -0.26 %~ 0 % V2: -0.85 %~3.02 % V3: -0.12 %~ 0.26 %	P
4	LINE REGULATION	V1: -0.5 %~ +0.5 % (Max) V2: -1.5 %~ +1.5 % (Max) V3: -0.5 %~ +0.5 % (Max)	I/P: 115 VAC ~ 264 VAC O/P:FULL LOAD Ta:25℃	V1: 0 %~ 0 % V2: 0 %~ 1.05 % V3: 0 %~ 0 %	P
5	LOAD REGULATION	V1: -1 %~ +1 % (Max) V2: -3 %~ +3 % (Max) V3: -1 %~ +1 % (Max)	I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25℃	V1: 0 %~ 0.12 % V2: -0.36 %~ 0.47 % V3: -0.12 %~ 0 %	P
6	CROSS REGULATION	V1: -1 %~ +1 % (Max) V2: -3 %~ +3 % (Max) V3: -1 %~ +1 % (Max)	I/P: 230 VAC O/P: Testing O/P 60%LOAD Other O/P 40%LOAD Change Ta:25℃	V1: 0 %~ 0 % V2: -1.21 %~ 1.59 % V3: -0.12 %~0.12 %	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℃	230 VAC/ 150.3 ms 115 VAC/ 49.15 ms	P
8	RISE TIME	230VAC/ 20ms (Max) 115VAC/ 30 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230 VAC/ 6.47 ms 115 VAC/ 6.076 ms	P
9	HOLD UP TIME	230 VAC/ 50 ms (TYP) 115 VAC/ 12 ms (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230 VAC/ 97.56 ms 115 VAC/ 118.6 ms	P
10	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	TEST: 1.2 %	P
11	DYNAMIC LOAD	V1: 1000 mVp-p	I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25℃	155 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	88VAC~264 VAC	I/P:TESTING O/P:FULL LOAD Ta:25℃	41.58 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	77 % (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	77.64 %	P
4	INPUT CURRENT	230 V/ 1.2 A (TYP) 115 V/ 2 A (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	I = 0.89 A/ 230 VAC I = 1.32 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 = 31.95 A/ 230 VAC	P
6	LEAKAGE CURRENT	< 2 mA / 240 VAC	I/P: 254 VAC O/P:Min LOAD Ta:25℃	L-FG: 0.34 mA N-FG: 0.34 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℃	132.2 %/ 230VAC 138.53%115 VAC 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℃	6.40 V/ 230 VAC 6.42 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： RT-65A
1. ROOM AMBIENT BURN-IN： 2.5 HRS
I/P: 230 VAC O/P: 100% LOAD Ta= 27.3 ℃
2. HIGH AMBIENT BURN-IN： 2 HRS
I/P: 230 VAC O/P: 100% LOAD Ta= 40.8 ℃

<table>
<tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 27.3 ℃</th><th>HIGH AMBIENT Ta= 40.8 ℃</th></tr>
<tr><td>1</td><td>BD1</td><td>D3SB60 4A/600V</td><td>68.5℃</td><td>78.7℃</td></tr>
<tr><td>2</td><td>C5</td><td>150μ/400V 85℃ HP3</td><td>61.2℃</td><td>65.6℃</td></tr>
<tr><td>3</td><td>Q1</td><td>K2545 6A/600V</td><td>76.5℃</td><td>85.5℃</td></tr>
<tr><td>4</td><td>U1</td><td>IC1203</td><td>81.8℃</td><td>90.8℃</td></tr>
<tr><td>5</td><td>D1</td><td>HER306 3A/600V</td><td>95.4℃</td><td>103.9℃</td></tr>
<tr><td>6</td><td>T1CIOL</td><td>TF-1032</td><td>86.8℃</td><td>95.1℃</td></tr>
<tr><td>7</td><td>T1CORE</td><td>TF-1032</td><td>83℃</td><td>91.9℃</td></tr>
<tr><td>8</td><td>D55</td><td>MBR1545CT 15A/45V</td><td>92.3℃</td><td>101.4℃</td></tr>
<tr><td>9</td><td>D50</td><td>BYQ28X-200 10A/200V</td><td>91.6℃</td><td>100.7℃</td></tr>
<tr><td>10</td><td>D58</td><td>HER302 3A/100V</td><td>93.4℃</td><td>102.7℃</td></tr>
<tr><td>11</td><td>RG1</td><td>7905 1A/5V</td><td>73.7℃</td><td>83.6℃</td></tr>
<tr><td>12</td><td>C56</td><td>2200μ/16V 105℃ YXG</td><td>75.2℃</td><td>84.1℃</td></tr>
<tr><td>13</td><td>C53</td><td>1000μ/16V YXG</td><td>77.6℃</td><td>86.2℃</td></tr>
<tr><td>14</td><td>C51</td><td>1000μ/16V YXG</td><td>73.6℃</td><td>82.8℃</td></tr>
<tr><td>15</td><td>LF1</td><td>TF479</td><td>65.1℃</td><td>75.5℃</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: 126%
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 40 ℃
NO DAMAGE</td><td>I/P: 230 VAC
O/P:FULL LOAD
Ta= 40 ℃
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: 3.0 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: 3.92 mA I/P-FG: 3.19 mA O/P-FG: 2.24 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: 13.1 GΩ I/P-FG: 9.92 GΩ O/P-FG: 15.6 GΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta:25℃	15 mΩ	P
4	APPROVAL	TUV: Certificate NO ：R50045775 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 Test by certified Lab	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 56 IS THE MOST CRITICAL COMPONENT I/P: 230VAC O/P:FULL LOAD Ta= 25 ℃ LIFE TIME= 65268 HRS I/P: 230VAC O/P:FULL LOAD Ta= 40 ℃ LIFE TIME= 31752 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 254.6K 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 2SK2545 : 600 V 6 A	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25℃	(1) 440 V (2) 568 V (3) 568 V	P
2	Diode Peak **Voltage**	D55 Rated SBL3040PT : 40 V 30 A D50 Rated BYQ-28X-200 : 200V 10A D56 Rated HER302 100V/3A	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25℃	(1) 31.6 V (2) 36 V (3) 32 V (1) 44.2 V (2) 50 V (3) 51.2 V (1) 40 V (2) 46.6 V (3) 45 V	P
3	Clamp Diode Peak **Voltage**	D1 Rated HER306 : 600 V 3 A	I/P:High-Line +3V = 267 V O/P: (1)Full Load (2) Dynamic Load 90%Duty/1KHz Ta:25℃	(1) 564 V (2) 564 V	P
4	**Input Capacitor Voltage**	C 5 Rated : 150 u / 400 V/ 105℃	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta:25℃	(1) 364 V (2) 370V (3) 372V	P
5	**Control IC Voltage Test**	U 1 Rated 1203 : 16 V	I/P:High-Line +3V =267 V O/P: (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta:25℃	(1) 12.7 V (2) 12.7V (3) 10.4V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2003/9/29	RD SAMPLE	PASS	VINCENT TSENG	MAX LIN

2003/12/12 A50-F023