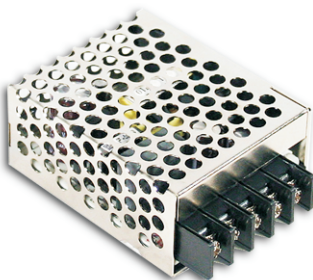




15W Single Output Switching Power Supply

RS-15 series



■ Features :

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

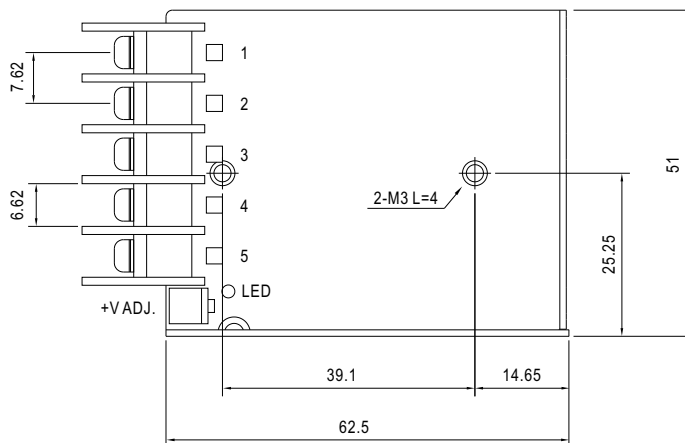


SPECIFICATION

MODEL		RS-15-3.3	RS-15-5	RS-15-12	RS-15-15	RS-15-24	RS-15-48
OUTPUT	DC VOLTAGE	3.3V	5V	12V	15V	24V	48V
	RATED CURRENT	3A	3A	1.3A	1A	0.625A	0.313A
	CURRENT RANGE	0 ~ 3A	0 ~ 3A	0 ~ 1.3A	0 ~ 1A	0 ~ 0.625A	0 ~ 0.313A
	RATED POWER	9.9W	15W	15.6W	15W	15W	15W
	RIPPLE & NOISE (max.) Note.2	80mVp-p	80mVp-p	120mVp-p	120mVp-p	200mVp-p	200mVp-p
	VOLTAGE ADJ. RANGE	2.9 ~ 3.6V	4.75 ~ 5.5V	10.8 ~ 13.2V	13.5 ~ 16.5V	22 ~ 27.6V	43.2 ~ 52.8V
	VOLTAGE TOLERANCE Note.3	3.0%	2.0%	1.0%	1.0%	1.0%	1.0%
	LINE REGULATION Note.4	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
	LOAD REGULATION Note.5	2.0%	1.5%	0.5%	0.5%	0.5%	0.5%
	SETUP, RISE TIME	1000ms, 30ms/230VAC 1000ms, 30ms/115VAC at full load					
HOLD UP TIME (Typ.)	70ms/230VAC 15ms/115VAC at full load						
INPUT	VOLTAGE RANGE	85 ~ 264VAC 120 ~ 370VDC					
	FREQUENCY RANGE	47 ~ 63Hz					
	EFFICIENCY (Typ.)	72%	77%	81%	81%	82%	82%
	AC CURRENT (Typ.)	0.35A/115VAC 0.25A/230VAC					
	INRUSH CURRENT (Typ.)	COLD START 65A / 230VAC					
	LEAKAGE CURRENT	<2mA / 240VAC					
PROTECTION	OVERLOAD	Above 105% rated output power Protection type : Hiccup mode, recovers automatically after fault condition is removed					
	OVER VOLTAGE	3.8 ~ 4.45V	5.75 ~ 6.75V	13.8 ~ 16.2V	17.25 ~ 20.25V	28.4 ~ 32.4V	55.2 ~ 64.8V
		Protection type : Shut off o/p voltage, clamping by zener diode					
	OVER TEMPERATURE	U1 Tj 140℃ typically (U1) detect on main control IC Protection type : Shut down o/p voltage, recovers automatically after temperature goes down					
ENVIRONMENT	WORKING TEMP.	-20 ~ +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℃)					
	VIBRATION	10 ~ 500Hz, 5G 10min./1cycle, period for 60min. each along X, Y, Z axes					
SAFETY & EMC (Note 6)	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 25℃ 70%RH					
	EMI CONDUCTION & RADIATION	Compliance to EN55022 (CISPR22) Class B					
	HARMONIC CURRENT	Compliance to EN61000-3-2,-3					
OTHERS	EMS IMMUNITY	Compliance to EN61000-4-2, 3, 4, 5, 6, 8,11, ENV50204, EN55024, EN61000-6-1, light industry level, criteria A					
	MTBF	1608.8Khrs min. MIL-HDBK-217F (25℃)					
	DIMENSION	62.5*51*28mm (L*W*H)					
	PACKING	0.13Kg; 108pcs/15Kg/0.71CUFT					
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 0% to 100% rated load. 6. 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.						

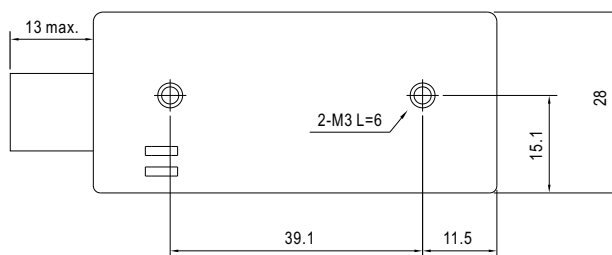
Mechanical Specification

Case No.971A Unit:mm

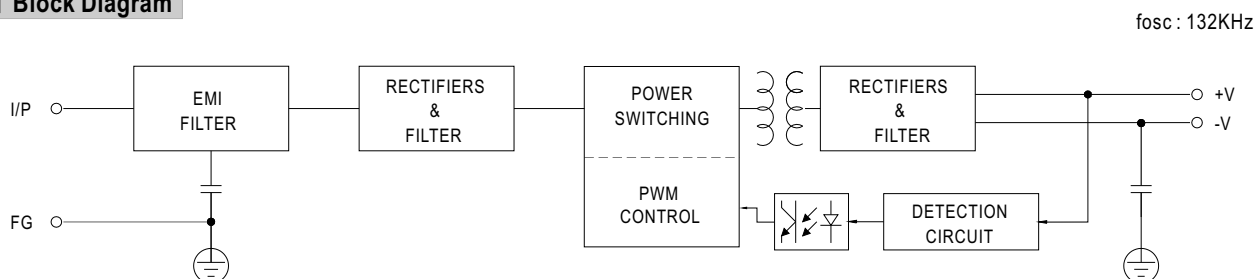


Terminal Pin No. Assignment

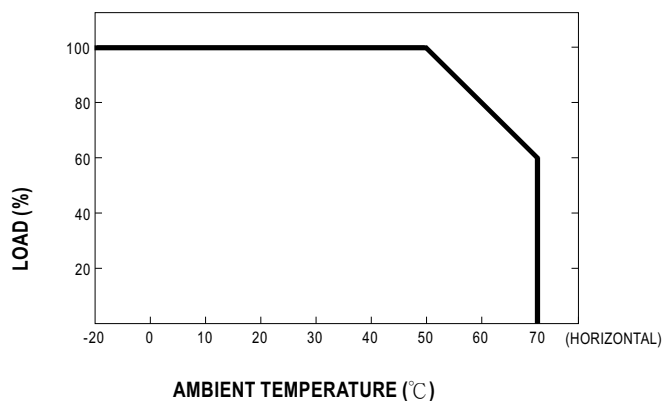
Pin No.	Assignment	Pin No.	Assignment
1	AC/L	4	DC OUTPUT -V
2	AC/N	5	DC OUTPUT +V
3	FG $\perp$		



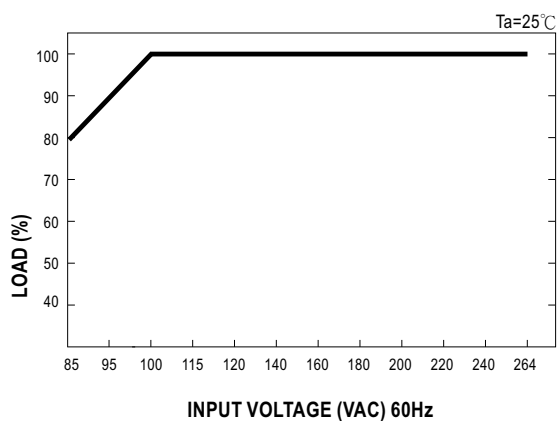
Block Diagram



Derating Curve



Output Derating VS Input Voltage



MODEL : RS-15-3.3

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1:80 mVp-p (Max)	I/P: 230VAC O/P:FULL LOAD Ta:25℃	V1: 31 mVp-p	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1:2.9 V~3.6V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25℃	2.62 V~ 3.97 V/ 230 VAC 2.62 V~ 3.97 V/ 115 VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1: 3 %~ -3% (Max)	I/P: 100 VAC / 264 VAC O/P:FULL/ MIN LOAD Ta:25℃	V1: 0.4 %~ -0.4 %	P
4	LINE REGULATION	V1: 0.5 %~ -0.5 % (Max)	I/P: 100VAC ~ 264 VAC O/P:FULL LOAD Ta:25℃	V1: 0.1 %~ -0.1 %	P
5	LOAD REGULATION	V1: 2 %~ -2 % (Max)	I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25℃	V1: 0.3 %~ -0.3 %	P
6	SET UP TIME	230VAC: 1000 ms (Max) 115 VAC: 1000 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 3 ms 115VAC/ 3 ms	P
7	RISE TIME	230VAC: 30 ms (Max) 115VAC: 30 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 1 ms 115VAC/ 2 ms	P
8	HOLD UP TIME	230VAC: 70 ms (TYP) 115VAC: 15 ms (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 123 ms 115VAC/ 26 ms	P
9	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	TEST: <5 %	P
10	DYNAMIC LOAD	V1: 660 mVp-p	I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25℃	205 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	85VAC~264 VAC	I/P: TESTING O/P: FULL LOAD Ta: 25°C	44 V~264V	P
			I/P: LOW-LINE-3V= 82 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	47HZ ~63 HZ NO DAMAGE OSC	I/P: 85 VAC ~ 264 VAC O/P: FULL~MIN LOAD Ta: 25°C	TEST: OK	P
3	EFFICIENCY	72 % (TYP)	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	72.4 %	P
4	INPUT CURRENT	230V/ 0.25 A (TYP) 115V/ 0.35 A (TYP)	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	I = 0.15 A/ 230 VAC I = 0.23 A/ 115 VAC	P
5	INRUSH CURRENT	230V/ 65 A (TYP) COLD START	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	I = 60 A/ 230 VAC	P
6	LEAKAGE CURRENT	< 2 mA / 240 VAC	I/P: 264 VAC O/P: Min LOAD Ta: 25°C	L-FG: 0.08 mA N-FG: 0.08 mA	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	Above 105%	I/P: 230 VAC I/P: 115 VAC O/P: TESTING Ta: 25°C	173 %/ 230 VAC 143 %/ 115 VAC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1: 3.8V~ 4.45V	O/P: DC SOURCE Ta: 25°C	4.1 V/ 60mA Shut off o/p voltage ,clamping by zener diode	P
3	OVER TEMPERATURE PROTECTION	SPEC: U1 Tj140°C typically detect on main control IC NO DAMAGE	I/P: 230 VAC O/P: FULL LOAD	O.T.P. Active Shut down o/p voltage , recovers automatically after temperature goes down	P
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264 VAC O/P: FULL LOAD Ta: 25°C	NO DAMAGE Hiccup Mode	P

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																												
1	TEMPERATURE RISE TEST	MODEL : RS-15-5 1. ROOM AMBIENT BURN-IN : 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 28.8℃ 2. HIGH AMBIENT BURN-IN : 3 HRS I/P: 230VAC O/P: FULL LOAD Ta= 48.2℃ <table><tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 28.8 ℃</th><th>HIGH AMBIENT Ta= 48.2 ℃</th></tr><tr><td>1</td><td>U1</td><td>TNY279PN</td><td>84.9℃</td><td>106.8℃</td></tr><tr><td>2</td><td>D1</td><td>FR107 1A/1KV</td><td>76.6℃</td><td>94.5℃</td></tr><tr><td>3</td><td>ZD1</td><td>P6KE250A</td><td>73.6℃</td><td>91.4℃</td></tr><tr><td>4</td><td>C5</td><td>33U/400V 105℃ KMG</td><td>59.8℃</td><td>77.6℃</td></tr><tr><td>5</td><td>BD1</td><td>KBP208G 2A/800V</td><td>63.9℃</td><td>81.4℃</td></tr><tr><td>6</td><td>LF1</td><td>LF-510</td><td>61.7℃</td><td>80.2℃</td></tr><tr><td>7</td><td>T1 COIL</td><td>TF-1641</td><td>83.4℃</td><td>101.6℃</td></tr><tr><td>8</td><td>C105</td><td>1000U/16V 105℃ ZLH</td><td>67.2℃</td><td>84.7℃</td></tr><tr><td>9</td><td>D100</td><td>STPS30L60CT 30A/60V</td><td>70.3℃</td><td>88.6℃</td></tr><tr><td>10</td><td>L100</td><td>DR011C</td><td>58.6℃</td><td>77.0℃</td></tr><tr><td>11</td><td>PCB</td><td>TI 與 C105 間</td><td>72.2℃</td><td>90.4℃</td></tr></table>			NO	Position	P/N	ROOM AMBIENT Ta= 28.8 ℃	HIGH AMBIENT Ta= 48.2 ℃	1	U1	TNY279PN	84.9℃	106.8℃	2	D1	FR107 1A/1KV	76.6℃	94.5℃	3	ZD1	P6KE250A	73.6℃	91.4℃	4	C5	33U/400V 105℃ KMG	59.8℃	77.6℃	5	BD1	KBP208G 2A/800V	63.9℃	81.4℃	6	LF1	LF-510	61.7℃	80.2℃	7	T1 COIL	TF-1641	83.4℃	101.6℃	8	C105	1000U/16V 105℃ ZLH	67.2℃	84.7℃	9	D100	STPS30L60CT 30A/60V	70.3℃	88.6℃	10	L100	DR011C	58.6℃	77.0℃	11	PCB	TI 與 C105 間	72.2℃	90.4℃	P
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P: 230 VAC O/P: 120 % LOAD Ta:25℃	TEST : OK	P																																																												
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 230 VAC O/P: 100% LOAD Ta= -20℃	TEST : OK	P																																																												
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50℃ NO DAMAGE	I/P: 272 VAC O/P:FULL LOAD Ta= 50℃ HUMIDITY= 95 %R.H	TEST : OK	P																																																												
5	TEMPERATURE COEFFICIENT	± 0.03 %(0~50℃)	I/P: 230 VAC O/P:FULL LOAD	± 0.01 %(0~50℃)	P																																																												
6	VIBRATION TEST	1 Carton & 1 Set (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℃		TEST : OK	P																																																												

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	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°C	I/P-O/P: 1.69 mA I/P-FG: 0.85 mA O/P-FG: 0.52 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°C / 70%RH	I/P-O/P: 4 GΩ I/P-FG: 1.5 GΩ O/P-FG: 3 GΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta:25°C / 70%RH	7 mΩ	P
4	APPROVAL	TUV: Certificate NO : R 50111751 UL: File NO : E183223			P

E.M.C TEST

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

M.T.B.F & LIFE CYCLE CALCULATION

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	CAPACITOR LIFE CYCLE	RS-15-5 : SUPPOSE C105 IS THE MOST CRITICAL COMPONENT I/P: 230VAC O/P:FULL LOAD Ta= 25°C LIFE TIME= 163780 HRS I/P: 230VAC O/P:FULL LOAD Ta= 50°C LIFE TIME= 33067 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 1608.8K HRS			P
3	ORT (Ongoing Reliability test)	RS-15-12:I/P : 230VAC O/P : FULL LOAD TA=50°C Sample=10pcs TEST TIME=576HRS			P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	U1 Rated TNY279PN : 700V 1.2 A	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Output Short Ta:25°C	(1) 672 V (2) 664 V	P
2	Diode Peak Voltage	D100 Rated STPS30S45CT 30A/45V	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2)Output Short Ta:25°C	(1) 24 V (2) 23 V	P
3	Clamp Diode Peak Voltage	D1 Rated FR107 1A/1KV	I/P:High-Line +3V = 267 V O/P: (1) Dynamic Load 90%Duty/1KHz Ta:25°C	(1) 628 V	P
4	Input Capacitor Voltage	C5 Rated 33u/400V 105°C	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°C	(1) 382 V (2) 384 V (3) 384 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2007/6/1	RD SAMPLE	PASS	VINCENT TSENG	MAX LIN
2007/7/6	PRODUCT SAMPLE W0706C14	PASS	VINCENT TSENG	MAX LIN
2007/8/30	PRODUCT SAMPLE W0708C17	PASS	VINCENT TSENG	MAX LIN

2003/12/12 A50-F023