



Test Report: SE-100-15

100W Single Output Switching Power Supply

■ DESIGN VERIFY TEST

Output Function Test
Input Function Test
Protection Function Test
Control Function Test
Component Stress Test

■ SAFETY & E.M.C. TEST

Safety Test
E.M.C. Test

■ RELIABILITY TEST

ENVIRONMENT TEST

DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1 : 120 mVp-p (Max)	I/P : 230VAC O/P : FULL LOAD Ta : 25°C	V1 : 45.6 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1 : 14.25 V ~ 16.5 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	12.39 V ~ 17.395 V/ 230 VAC 12.45 V ~ 17.432 V/ 115 VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1 : -1 %~ +1 % (Max)	I/P : 176 VAC / 264 VAC O/P : FULL/ MIN LOAD Ta : 25°C	V1 : -0.073 %~ 0.046 %	P
4	LINE REGULATION	V1 : -0.5 %~ +0.5 % (Max)	I/P : 176 VAC ~ 264 VAC O/P : FULL LOAD Ta : 25°C	V1 : 0 %~ 0 %	P
5	LOAD REGULATION	V1 : -0.5 %~ +0.5 % (Max)	I/P : 230 VAC O/P : FULL ~MIN LOAD Ta : 25°C	V1 : -0.039 %~ 0 %	P
6	SET UP TIME	230VAC : 1000 ms (Max) 115VAC : 1000 ms(Max)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 507 ms 115VAC/ 256 ms	P
7	RISE TIME	230VAC : 20 ms (Max) 115VAC : 20 ms (Max)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 5.4 ms 115VAC/ 5.4 ms	P
8	HOLD UP TIME	230VAC : 30 ms (TYP) 115VAC : 25 ms (TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 30.8 ms 115VAC/ 27.6 ms	P
9	OVER/UNDERSHOOT TEST	< ±5%	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	TEST : <5 %	P
10	DYNAMIC LOAD	V1 : 1500 mVp-p	I/P : 230 VAC (1).O/P : FULL /Min LOAD 90%DUTY/ 1KHZ (2).O/P : FULL /Min LOAD 90%DUTY/ 3KHZ (3).O/P : FULL /Min LOAD 90%DUTY/ 5KHZ (4).O/P : FULL /Min LOAD 50%DUTY/ 120HZ Ta : 25°C	(1) 338 mVp-p (2) 255 mVp-p (3) 175 mVp-p (4) 456 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	176VAC~264 VAC	I/P : TESTING O/P : FULL LOAD Ta : 25°C I/P : LOW-LINE-3V= 173 V HIGH-LINE+15%=300 V O/P : FULL/MIN LOAD ON : 30 Sec . OFF : 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE)	135.562 V~264V TEST : OK	P
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE OSC	I/P : 176 VAC ~ 264 VAC O/P : FULL~MIN LOAD Ta : 25°C	TEST : OK	P
3	EFFICIENCY	84% (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	86.1 %	P
4	INPUT CURRENT	230V/ 1.2 A (TYP) 115V/ 2 A (TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I = 0.897 A/ 230 VAC I = 1.769 A/ 115 VAC	P
5	INRUSH CURRENT	230V/ 45 A (TYP) COLD START	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	I = 40.5 A/ 230 VAC	P
6	LEAKAGE CURRENT	< 2 mA / 264VA	I/P : 264 VAC O/P : Min LOAD Ta : 25°C	FOR EARTH L-FG: 0.717 mA N-FG: 0.717 mA	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	110 % ~150 %	I/P : 230 VAC I/P : 115 VAC O/P : TESTING Ta : 25°C	129.6 %/ 230 VAC 129.8 %/ 115 VAC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1 : 17.25 V ~20.25 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	19.52 V/ 230 VAC 19.55 V/ 115 VAC Hiccup Mode	P
3	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

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated : 900 V 7 A	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25°C	(1) 820 V (2) 856 V (3) 728 V	P
2	Diode Peak Voltage	D100 Rated : 200 V20 A	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2)Output Short (3)Full load continue Ta : 25°C	(1) 121 V (2) 125 V (3) 119 V	P
3	Input Capacitor Voltage	C 5 Rated : 220u /200V/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) 188 V (2) 189 V (3) 188 V	P
4	Control IC Voltage Test	U 1 Rated : 30 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°C	(1) 20.5 V (2) 16.3 V (3) 20.6 V	P
5	CLAMP DIODE	D 1 Rated : 1000 V 2 A	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25°C	(3) 764 V (4) 765 V (3) 748 V	P

SAFETY & E.M.C. TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P : 3 KVAC/min I/P-FG : 2 KVAC/min O/P-FG : 0.5 KVAC/min	I/P-O/P : 3.6 KVAC/min I/P-FG : 2.4KVAC/min O/P-FG : 0.6 KVAC/min Ta : 25°C	I/P-O/P : 2.752 mA I/P-FG : 3.59 mA O/P-FG : 2.295 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 : 1561 MΩ I/P-FG : 1738 MΩ O/P-FG : 1549 MΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta : 25°C / 70%RH	5 mΩ	P

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS B	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	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
5	E.F.T	EN61000-4-4 INDUSTRY INPUT : 2KV	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				

RELIABILITY TEST

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																																				
1	TEMPERATURE RISE TEST	MODEL : SE-100-24 1. ROOM AMBIENT BURN-IN : 2HRS I/P : 230VAC O/P : FULL LOAD Ta= 26.5℃ 2. HIGH AMBIENT BURN-IN : 2HRS I/P : 230VAC O/P : FULL LOAD Ta=43.7℃ <table><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta= 26.5℃</th><th>HIGH AMBIENT Ta= 43.7℃</th></tr><tr><td>1</td><td>LF1</td><td>56.2℃</td><td>72.3℃</td></tr><tr><td>2</td><td>BD1</td><td>73.7℃</td><td>88.5℃</td></tr><tr><td>3</td><td>C5</td><td>67.0℃</td><td>82.5℃</td></tr><tr><td>4</td><td>C6</td><td>75.3℃</td><td>92.1℃</td></tr><tr><td>5</td><td>U1</td><td>57.2℃</td><td>73.2℃</td></tr><tr><td>6</td><td>Q1</td><td>62.8℃</td><td>81.3℃</td></tr><tr><td>7</td><td>Ticoil</td><td>81.3℃</td><td>98.5℃</td></tr><tr><td>8</td><td>T1core</td><td>79.2℃</td><td>97.9℃</td></tr><tr><td>9</td><td>C36</td><td>66.5℃</td><td>83.3℃</td></tr><tr><td>10</td><td>Q2</td><td>60.8℃</td><td>77.8℃</td></tr><tr><td>11</td><td>D4</td><td>66.7℃</td><td>83.6℃</td></tr><tr><td>12</td><td>D100</td><td>69.3℃</td><td>85.0℃</td></tr><tr><td>13</td><td>L100</td><td>100.9℃</td><td>116.0℃</td></tr><tr><td>14</td><td>C105</td><td>64.9℃</td><td>82.1℃</td></tr><tr><td>15</td><td>D1</td><td>78.2℃</td><td>95.8℃</td></tr><tr><td>16</td><td>RH1</td><td>66.6℃</td><td>86.5℃</td></tr></table>			NO	Position	ROOM AMBIENT Ta= 26.5℃	HIGH AMBIENT Ta= 43.7℃	1	LF1	56.2℃	72.3℃	2	BD1	73.7℃	88.5℃	3	C5	67.0℃	82.5℃	4	C6	75.3℃	92.1℃	5	U1	57.2℃	73.2℃	6	Q1	62.8℃	81.3℃	7	Ticoil	81.3℃	98.5℃	8	T1core	79.2℃	97.9℃	9	C36	66.5℃	83.3℃	10	Q2	60.8℃	77.8℃	11	D4	66.7℃	83.6℃	12	D100	69.3℃	85.0℃	13	L100	100.9℃	116.0℃	14	C105	64.9℃	82.1℃	15	D1	78.2℃	95.8℃	16	RH1	66.6℃	86.5℃	P
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 127% LOAD Ta : 25℃	TEST : OK	P																																																																				
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 264VAC/115VAC O/P : 100 % LOAD Ta= -25℃	TEST : OK	P																																																																				
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 45℃ NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta= 43.7℃ HUMIDITY= 95 %R.H	TEST : OK	P																																																																				
5	TEMPERATURE COEFFICIENT	±0.03%/℃ (0~50℃)	I/P : 230 VAC O/P : FULL LOAD	±0.002%/℃ (0~50℃)	P																																																																				
6	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -45℃ ~ +90℃ 2. Temperature change rate : 25℃ / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 5 CYCLE 5. Input/Output condition : STATIC		OK	P																																																																				
7	THERMAL SHOCK TEST	1. Thermal shock Temperature : -25℃ ~ +60℃ 2. Temperature change rate : 25℃ / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 10 CYCLE 5. Input/Output condition : 230VAC/Full Load AC ON/OFF TEST turn on 58sec ; turn off 2sec		OK	P																																																																				

8	VIBRATION TEST	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 12min/sweep cycle (4) Acceleration : 2G (5) Test Time : 60min in each axis (X.Y.Z) (6) Ta : 25°C	TEST : OK	P
9	CAPACITOR LIFE CYCLE	SUPPOSE C105 IS THE MOST CRITICAL COMPONENT (1) I/P : 230VAC O/P : FULL LOAD Ta= 25°C LIFE TIME (2) I/P : 230VAC O/P : FULL LOAD Ta= 45°C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta= 45°C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta= 45°C LIFE TIME	(1) 137050.2HRS (2) 34162.6HRS (3) 52658.6HRS (4) 78719.6HRS	P
10	MTBF	MIL-HDBK-217F NOTICE S2 PARTS COUNT TOTAL FAILURE RATE : 320.7 KHRS		P
11	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): Above 20,000 hours @ TA 45°C		P

SAMPLE	TEST RESULT	TESTER	APPROVAL
PRODUCT SAMPLE	PASS	Shenym	Wangdz

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