



Test Report: SE-200-3.3

200W Single Output Switching Power Supply

■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Component Stress Test

■ SAFETY & E.M.C. TEST

Safety Test

E.M.C. Test

■ RELIABILITY TEST

ENVIRONMENT TEST



200W Single Output Switching Power Supply

SE-200 series

MODEL : SE-200-3.3

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 150 mVp-p (Max)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	V1: 65 mVp-p (Max)	PASS
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 2.97V ~ 3.7V	I/P: 230 VAC I/P:115 VAC O/P:MIN LOAD Ta:25°C	2.808V~3.782V/230VAC 2.810V~3.785V//115VAC	PASS
3	OUTPUT VOLTAGE TOLERANCE	V1: -2 %~ +2 % (Max)	I/P: 190VAC / 264 VAC O/P:FULL/ 0% LOAD Ta:25°C	V1: -1.101%~ 1.961 %	PASS
4	LINE REGULATION	V1: -0.5 %~ +0.5 % (Max)	I/P: 190 VAC ~ 264VAC O/P:FULL LOAD Ta:25°C	V1: -0.181 %~ 0.181 %	PASS
5	LOAD REGULATION	V1: -1.5 %~ +1.5 % (Max)	I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: -1.101 %~ 0.927 %	PASS
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	230 VAC/ 183.46 ms 115 VAC/ 131.75 ms	PASS
7	RISE TIME	230VAC/ 50 ms (Max) 115VAC/ 50 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230 VAC/ 0.854 ms 115 VAC/ 0.876 ms	PASS
8	HOLD TIME	230VAC/ 20 ms (Typ) 115VAC/ 16 ms (Typ)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230 VAC/ 50.01 ms 115 VAC/ 44.08 ms	PASS
9	OVER/UNDERSHOOT TEST	< ±10 %	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	TEST: +1.198 % -2.096 %	PASS
10	DYNAMIC LOAD	V1: 660 mVp-p	I/P: 230 VAC O/P: (1)FULL /Min LOAD 90%DUTY/1KHZ (2)FULL /Min LOAD 50%DUTY/120HZ Ta:25°C	(1) 340 mVp-p (2) 540 mVp-p	PASS



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INPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	180 VAC~ 264 VAC	I/P: TESTING O/P: FULL LOAD Ta: 25°C	180 V~ 264 V	PASS
			(1) I/P: LOW-LINE-3V= 177 V HIGH-LINE+15%= 300 V O/P: FULL/MIN LOAD ON: 30 Sec . OFF: 30 Sec 10MIN (2) I/P: 230VAC ON: 0.5 Sec . OFF: 0.5 Sec 20MIN (AC POWER ON/OFF NO DAMAGE)	TEST: (1) OK (2) OK	
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE OSC	I/P: 180 VAC ~264 VAC O/P: FULL-MIN LOAD Ta: 25°C	TEST: OK	PASS
3	EFFICIENCY	75 % (Typ)	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	76.22 %	PASS
4	INPUT CURRENT	230 V/ 2.5 A (Typ) 115 V/ 4.5 A (Typ)	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	I = 1.693A / 230VAC I = 2.826A / 115VAC	PASS
5	INRUSH CURRENT	230 V/ 55 A 115 V/ 40 A COLD START	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	I = 44.125 A / 230VAC I = 28.468 A / 115VAC	PASS

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105%~ 150 % RATED OUTPUT POWER	I/P: 264 VAC I/P: 230 VAC I/P: 190 VAC O/P: TESTING Ta: 25°C	121.23 %/264VAC 121.0 %/ 230VAC 122.13 %/ 190 VAC Constant Current Limiting	PASS
2	OVER VOLTAGE PROTECTION	CH1: 3.8 V~ 4.9 V	I/P: 264 VAC I/P: 230 VAC I/P: 180 VAC O/P: MIN LOAD Ta: 25°C	4.52 V/264VAC 4.52 V/ 230VAC 4.53 V/ 180VAC Shut down O/P voltage, Re-power on to recover	PASS
3	OVER TEMPERATURE PROTECTION	SPEC: TSW1= 95 °C ±5 °C O.T.P. NO DAMAGE	I/P: 230 VAC O/P: FULL LOAD	98.7 °C / 230 VAC O.T.P. Active Shut down o/p voltage , recovers automatically after temperature goes down	PASS
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264 VAC O/P: FULL LOAD Ta: 25°C	NO DAMAGE Constant Current Limiting	PASS



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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 900 V 9 A	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2)Output Short (3)Dynamic Load 50% Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz Ta:25°C	(1) 884 V (2) 796 V (3) 792 V (4) 796 V	PASS
2	Diode Peak Voltage	D 100 Rated 40 V 30 A	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2)Output Short (3)Dynamic Load 50% Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz Ta:25°C	(1) 26.6 V (2) 20.7 V (3) 20.5 V (4) 20.6 V	PASS
3	Control IC Voltage Test	U 1 Rated 30 V	I/P:High-Line +3V =267 V O/P: (1) Output Short (2)O.L.P (3)O.V.P (4)NO LOAD VR 下限 LOW LINE Ta:25°C	(1) 14.4 V (2) 14.4 V (3) 13.8 V (4) 13.0 V	PASS

SAFETY TEST

1	WITHSTAND VOLTAGE	I/P-FG: 1.5 KVAC/min I/P-O/P: 3.0 KVAC/min O/P-FG: 0.5 KVAC/min EN 60950	I/P-FG: 1.8 KVAC/min I/P-O/P: 3.6 KVAC/min O/P-FG: 0.6 KVAC/min Ta:25°C	I/P-FG: 3.705 mA I/P-O/P: 3.824 mA O/P-FG: 5.30 mA NO DAMAGE	PASS
2	ISOLATION RESISTANCE	I/P-FG: 500VDC>100MΩ I/P-O/P:500VDC>100MΩ O/P-FG:500VDC>100MΩ	I/P-FG: 500 VDC I/P-O/P: 500 VDC O/P-FG: 500 VDC Ta:25°C	I/P-FG: >9999 MΩ I/P-O/P: >9999 MΩ O/P-FG: >9999 MΩ NO DAMAGE	PASS
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ EN 60950	40 A / 2 min Ta:25°C	3 mΩ	PASS
4	LEAKAGE CURRENT	< 3.5 mA / 240VAC EN 60950	I/P: 264 VAC O/P:NO LOAD Ta:25°C	L-FG: 1.020 mA N-FG: 0.979 mA	PASS

E.M.C TEST

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

ENVIRONMENT TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT																																																																																				
1	TEMPERATURE RISE TEST	MODEL : SE-200-5 1. ROOM AMBIENT BURN-IN : 2 HRS I/P: 230 VAC O/P: 100% LOAD Ta= 25.1 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P: 230 VAC O/P: 100% LOAD Ta= 33.5 °C	<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 25.1 °C</th> <th>HIGH AMBIENT Ta= 33.5 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>TSW1</td><td>81.2°C</td><td>90.1°C</td></tr> <tr><td>2</td><td>LF1</td><td>55.9°C</td><td>65.3°C</td></tr> <tr><td>3</td><td>BD1</td><td>58.1°C</td><td>68.7°C</td></tr> <tr><td>4</td><td>Q1</td><td>58.9°C</td><td>67.9°C</td></tr> <tr><td>5</td><td>D15</td><td>55.7°C</td><td>60.3°C</td></tr> <tr><td>6</td><td>D31</td><td>40.1°C</td><td>46.1°C</td></tr> <tr><td>7</td><td>U1</td><td>40.3°C</td><td>45.7°C</td></tr> <tr><td>8</td><td>T1</td><td>43.1°C</td><td>51.7°C</td></tr> <tr><td>9</td><td>D100</td><td>64.7°C</td><td>71.5°C</td></tr> <tr><td>10</td><td>D101</td><td>63.4°C</td><td>71.3°C</td></tr> <tr><td>11</td><td>L100</td><td>72.6°C</td><td>81.6°C</td></tr> <tr><td>12</td><td>R110</td><td>87.2°C</td><td>97.4°C</td></tr> <tr><td>13</td><td>J100</td><td>75.2°C</td><td>83.8°C</td></tr> <tr><td>14</td><td>C185</td><td>56.1°C</td><td>61.1°C</td></tr> <tr><td>15</td><td>C36</td><td>52.4°C</td><td>59.5°C</td></tr> <tr><td>16</td><td>C37</td><td>36.6°C</td><td>40.7°C</td></tr> <tr><td>17</td><td>C5</td><td>45.9°C</td><td>51.1°C</td></tr> <tr><td>18</td><td>C105</td><td>63.3°C</td><td>72.5°C</td></tr> <tr><td>19</td><td>C106</td><td>59.1°C</td><td>67.8°C</td></tr> <tr><td>20</td><td>PCB</td><td>72.7°C</td><td>80.7°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta= 25.1 °C	HIGH AMBIENT Ta= 33.5 °C	1	TSW1	81.2°C	90.1°C	2	LF1	55.9°C	65.3°C	3	BD1	58.1°C	68.7°C	4	Q1	58.9°C	67.9°C	5	D15	55.7°C	60.3°C	6	D31	40.1°C	46.1°C	7	U1	40.3°C	45.7°C	8	T1	43.1°C	51.7°C	9	D100	64.7°C	71.5°C	10	D101	63.4°C	71.3°C	11	L100	72.6°C	81.6°C	12	R110	87.2°C	97.4°C	13	J100	75.2°C	83.8°C	14	C185	56.1°C	61.1°C	15	C36	52.4°C	59.5°C	16	C37	36.6°C	40.7°C	17	C5	45.9°C	51.1°C	18	C105	63.3°C	72.5°C	19	C106	59.1°C	67.8°C	20	PCB	72.7°C	80.7°C		PASS
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P: 230 VAC O/P: 122.5% LOAD Ta:25°C	TEST : OK	PASS																																																																																				
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 264 VAC/190 VAC O/P: 100% LOAD Ta= -20 °C	TEST : OK	PASS																																																																																				
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 30 °C NO DAMAGE	I/P: 272 VAC O/P:FULL LOAD Ta= 30 °C HUMIDITY= 95 %R.H	TEST : OK	PASS																																																																																				



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5	TEMPERATURE COEFFICIENT	$\pm 0.03\%$ (0~50°C)	I/P: 230 VAC O/P:FULL LOAD	$\pm 0.012\%$ (0~50°C)	PASS
6	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -40°C~ +90°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 5 CYCLE 5. Input/Output condition : STATIC		TEST : OK	PASS
7.	THERMAL SHOCK TEST	1. Thermal shock Temperature : -25 °C~ +35 °C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 10 CYCLE 5. Input/Output condition : 230VAC/Full Load 58SEC ON/2SEC OFF		TEST : OK	PASS
8	VIBRATION TEST	1 Carton & 1 Set (1) Waveform: Sine Wave (2) Frequency:10~500Hz (3) Sweep Time:10min/sweep cycle (4) Acceleration:3G (5) Test Time:1 hour in each axis (X.Y.Z) (6) Ta:25°C		TEST : OK	PASS
9	CAPACITOR LIFE CYCLE	NES-200-5: SUPPOSE C105 IS THE MOST CRITICAL COMPONENT (1) I/P: 230 VAC O/P:FULL LOAD Ta= 25 °C LIFE TIME= 174193 HRS (2) I/P: 230 VAC O/P:FULL LOAD Ta= 30 °C LIFE TIME= 116545 HRS (3) I/P: 230 VAC O/P:75% LOAD Ta= 30 °C LIFE TIME= 277094 HRS (4) I/P: 230 VAC O/P:50% LOAD Ta= 30 °C LIFE TIME= 496061 HRS			PASS
10	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 271.9K HRS			PASS
11	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure(Expected Life) : 20,000 hours @ Ta 30°C for 3.3v/5v; Ta 40°C for 7.5v~48v			PASS

SAMPLE	TESTER	APPROVAL
PRODUCT SAMPLE	SYM	WANGDZ