



Test Report: CEN-100-48

100W Single Output LED Power Supply

■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Other Test

Component Stress Test

■ SAFETY & E.M.C. TEST

Safety Test

E.M.C. Test

■ RELIABILITY TEST

DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	RIPPLE & NOISE	V1: 4.6 Vp-p (Max)	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	V1: 2.28 Vp-p (Max)
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 43 V~53 V	I/P: 230 VAC I/P: 115VAC O/P: MIN LOAD Ta: 25°C	41.82V~ 54.07 V /230VAC 41.87V~ 54.2 V/115VAC
3	CURRENT ADJ RANGE	1.3 A~2 A	I/P: 230 VAC O/P: CV=Vo-2V Ta: 25°C	1.136 A~ 2.286 A
4	CONSTANT CURRENT REGION	31.2 V~48 V	I/P: 230 VAC O/P: CV MODE Ta: 25°C	O/P=47V: 2.098 A O/P=31.2V: 2.102 A
5	OUTPUT VOLTAGE TOLERANCE	V1: 10 % ~ -10 % (Max)	I/P: 100 VAC /295VAC O/P: FULL / 0 % LOAD Ta: 25°C	V1: 1.3 % ~ -1.3 %
6	LINE REGULATION	V1: 3 % ~ -3 % (Max)	I/P: 100 VAC ~295 VAC O/P: FULL LOAD Ta: 25°C	V1: 1.3 % ~ -1.3 %
7	LOAD REGULATION	V1: 5 % ~ -5 % (Max)	I/P: 230 VAC O/P: FULL ~MIN LOAD Ta: 25°C	V1: 1 % ~ -1 %
8	SET UP TIME	230VAC/500 ms (Max) 115VAC/ 1200 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	230VAC/ 404 ms 115 VAC/ 988 ms
9	OVER/UNDERSHOOT TEST	< ±10%	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	TEST: < 10 %

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	90VAC~295 VAC	I/P:TESTING O/P:FULL LOAD Ta:25°C	68V~295V
			I/P: (1)LOW-LINE-3V=87 V (2)HIGH-LINE=305 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	I/P: 100 VAC ~295AC O/P:FULL~MIN LOAD Ta:25°C	OK
3	POWER FACTOR	0.95/ 230 VAC FULL LOAD 0.97/ 115 VAC FULL LOAD 0.92/ 277 VAC FULL LOAD	I/P: 230 VAC I/P: 115 VAC I/P: 277 VAC O/P:FULL LOAD Ta:25°C	PF=0.962 /230V/100%LOAD PF=0.989 /115V/100%LOAD PF=0.928 /277V/100%LOAD
4	EFFICIENCY	91 % (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	91.57 %
5	INPUT CURRENT	230 V/ 0.7 A (Typ) 115 V/ 1.4 A (Typ)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	I = 0.45 A/ 230VAC I = 0.9 A/ 115VAC
6	INRUSH CURRENT	230 V/ 45A (Typ) COLD START	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	I = 39 A/ 230VAC

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	95 %~110 %	I/P: 230 VAC I/P: 115 VAC O/P:TESTING Ta:25°C	104 %/ 230VAC 104 %/115VAC Constant current limiting,
2	OVER VOLTAGE PROTECTION	V1: 54V~ 60 V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25°C	58.01V/ 230VAC 58.01V/ 115VAC Shunt down Re- power ON
3	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P: 230 VAC O/P:FULL LOAD	O.T.P. Active Shut down o/p voltage · re-power on to recover
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 295VAC O/P: FULL LOAD Ta:25°C	NO DAMAGE Hiccup Mode

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated 13A/600V	I/P : High-Line +3V = 298 V O/P : (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25°C	(1) 584 V (2) 516 V (3) 552 V
2	Diode Peak Voltage	D100 Rated 20A/300V	I/P : High-Line +3V = 298 V O/P : (1)Full Load Turn on (2)Output Short (3)Full load continue Ta : 25°C	(1) 276 V (2) 220 V (3) 272 V
3	Control IC Voltage Test	U 1 Rated 10.5V~21V	I/P : High-Line +3V = 298 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) 14.61 V (2) 14.53 V (3) 14.55 V

SAFETY & EMC TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	IEC60950-1 I/P-O/P: 3.75KVAC/min I/P-FG:2 KVAC/min<4.5mA O/P-FG:1.5KVAC/min	I/P-O/P: 4 KVAC/min I/P-FG: 2.4KVAC/min O/P-FG: 1.8 KVAC/min Ta:25°C	I/P-O/P: 5.08 mA I/P-FG: 3.85 mA O/P-FG: 4.51 mA NO DAMAGE
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	I/P-O/P: 30 GΩ I/P-FG: 23.3 GΩ O/P-FG: 30 GΩ NO DAMAGE
3	GROUNDING CONTINUITY	IEC60950-1 FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25°C	38 mΩ
4	LEAKAGE CURRENT	IEC60950-1 < 0.75 mA / 240VAC	I/P: 264 VAC O/P:Min LOAD Ta:25°C	L-FG: 0.41 mA N-FG: 0.4 mA
5	APPROVAL	TUV : Certificate NO : R50174015 UL : File NO :		

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS A CLASS C	I/P: 230VAC/50HZ LOAD:LED/ELECTRONIC LOAD O/P:100% LOAD Ta:25°C	PASS
2	CONDUCTION	EN55015 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL/65% LOAD Ta:25°C	PASS Test by certified Lab
3	RADIATION	EN55015 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL LOAD Ta:25°C	PASS Test by certified Lab
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
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 2KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A
6	SURGE	IEC61000-4-5 LIGHT INDUSTRY L-N :2KV L,N-PE:4KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A

RELIABILITY TEST

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																																																
1	TEMPERATURE RISE TEST	MODEL : CEN-100-24 1. ROOM AMBIENT BURN-IN : 14 HRS I/P : 230 VAC O/P : CV=23V Ta= 28.3 °C 2. HIGH AMBIENT BURN-IN : 5 HRS I/P : 230 VAC O/P : CV=23V Ta= 55.5 °C	<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 28.3 °C</th> <th>HIGH AMBIENT Ta= 55.5 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>LF1</td><td>55.7°C</td><td>78.7°C</td></tr> <tr><td>2</td><td>BD1</td><td>57.6°C</td><td>81.7°C</td></tr> <tr><td>3</td><td>L1</td><td>69.6°C</td><td>91.3°C</td></tr> <tr><td>4</td><td>C7</td><td>63.5°C</td><td>86.8°C</td></tr> <tr><td>5</td><td>C5</td><td>63.2°C</td><td>85.3°C</td></tr> <tr><td>6</td><td>D2</td><td>85.3°C</td><td>108.9°C</td></tr> <tr><td>7</td><td>T1</td><td>74.5°C</td><td>94.4°C</td></tr> <tr><td>8</td><td>RTH1</td><td>65.2°C</td><td>87.3°C</td></tr> <tr><td>9</td><td>C47</td><td>71.1°C</td><td>92.3°C</td></tr> <tr><td>10</td><td>C46</td><td>63.2°C</td><td>85.3°C</td></tr> <tr><td>11</td><td>U1</td><td>70.0°C</td><td>92.1°C</td></tr> <tr><td>12</td><td>Q1</td><td>74.2°C</td><td>98.6°C</td></tr> <tr><td>13</td><td>D100</td><td>76.4°C</td><td>98.2°C</td></tr> <tr><td>14</td><td>C105</td><td>68.3°C</td><td>89.3°C</td></tr> <tr><td>15</td><td>C107</td><td>62.5°C</td><td>84.3°C</td></tr> <tr><td>16</td><td>C150</td><td>56.7°C</td><td>79.1°C</td></tr> <tr><td>17</td><td>LF100</td><td>58.4°C</td><td>80.8°C</td></tr> <tr><td>18</td><td>C120</td><td>58.2°C</td><td>80.4°C</td></tr> <tr><td>19</td><td>C122</td><td>60.5°C</td><td>82.2°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta= 28.3 °C	HIGH AMBIENT Ta= 55.5 °C	1	LF1	55.7°C	78.7°C	2	BD1	57.6°C	81.7°C	3	L1	69.6°C	91.3°C	4	C7	63.5°C	86.8°C	5	C5	63.2°C	85.3°C	6	D2	85.3°C	108.9°C	7	T1	74.5°C	94.4°C	8	RTH1	65.2°C	87.3°C	9	C47	71.1°C	92.3°C	10	C46	63.2°C	85.3°C	11	U1	70.0°C	92.1°C	12	Q1	74.2°C	98.6°C	13	D100	76.4°C	98.2°C	14	C105	68.3°C	89.3°C	15	C107	62.5°C	84.3°C	16	C150	56.7°C	79.1°C	17	LF100	58.4°C	80.8°C	18	C120	58.2°C	80.4°C	19	C122	60.5°C	82.2°C	
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2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 230 VAC/100VAC O/P : CV=23V Ta= -35 °C	TEST : OK																																																																																
3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50 °C NO DAMAGE	I/P : 295 VAC O/P : CV=23V Ta= 50 °C HUMIDITY= 95 %R.H	TEST : OK																																																																																
4	TEMPERATURE COEFFICIENT	± 0.03 %(0~50°C)	I/P : 230 VAC O/P : FULL LOAD	± 0.002 %(0~50°C)																																																																																
5	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -45°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		OK																																																																																



100W Single Output LED Power Supply

CEN-100 series

7	VIBRATION TEST	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 12min/sweep cycle (4) Acceleration : 5G (5) Test Time : 72min in each axis (X.Y.Z) (6) Ta : 25°C	TEST : OK
8	CAPACITOR LIFE CYCLE	CEN-100-24: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= 50 °C LIFE TIME	(1) 195520HRS (2) 53157HRS
9	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE : 519.5K HRS	
10	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure(Expected Life) : 30,000 hours @ Tcase 70°C; 50,000 hours @ Tcase 60°C	

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2009/10/8	RD SAMPLE	PASS	SANFORD SU	VINCENT TSENG
2009/12/7	PRODUCT SAMPLE W0911A60	PASS	SANFORD SU	VINCENT TSENG

2003/12/12 A50-F023