



Test Report: CLG-150-30

150W 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

■ DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1 : 150 mVp-p (Max)	I/P : 230VAC O/P : FULL LOAD Ta : 25°C	V1 : 12.6 mVp-p (Max)	PASS
2	VOLTAGE ADJUST RANGE	CH1: 26 V ~ 32 V	I/P : 230VAC I/P : 115VAC O/P : CV MODE Ta : 25°C	22.328 V ~ 33.169 V /230VAC 22.342 V ~ 33.169 V /115VAC	PASS
3	CURRENT ADJUST RANGE	CH1: 2.5A ~ 5A	I/P : 230VAC I/P : 115VAC O/P : CV MODE Ta : 25°C	1.734 A ~ 5.677 A /230VAC 1.735 A ~ 5.677 A /115VAC	PASS
4	CONSTANT CURRENT REGION	V1 = 22.5V ~ 30 V	I/P : 230VAC I/P : 115VAC O/P : CV MODE Ta : 25°C	O/P= 22.5V : 4.998 A 230V O/P= 29V : 5.035 A 230V O/P= 22.5V : 5.00 A 115V O/P= 29V : 5.037 A 115V	PASS
5	OUTPUT VOLTAGE TOLERANCE	V1 : -1.0 % ~ 1.0 % (Max)	I/P : 100 VAC / 295 VAC O/P : FULL/ MIN LOAD Ta : 25°C	V1 : -0.22 %~ 0.47 %	PASS
6	LINE REGULATION	V1 : -0.5 % ~ 0.5 % (Max)	I/P : 100 VAC ~ 295 VAC O/P : FULL LOAD Ta : 25°C	V1 : -0.003 %~ 0 %	PASS
7	LOAD REGULATION	V1 : -0.5 % ~ 0.5 % (Max)	I/P : 230 VAC O/P : FULL ~MIN LOAD Ta : 25°C	V1 : -0.22 %~ 0 %	PASS
8	SET UP TIME	230VAC : 500 ms (Max) 115VAC : 3000 ms(Max)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 385.427 ms 115VAC/ 1275.549 ms	PASS
9	RISE TIME	230VAC : 80 ms (Max) 115VAC : 80 ms (Max)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 16.391 ms 115VAC/ 16.991 ms	PASS
10	HOLD UP TIME	230VAC : 50 ms (TYP) 115VAC : 16 ms (TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 87.478 ms 115VAC/ 88.124 ms	PASS
11	OVER/UNDERSHOOT TEST	< ± 5%	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	TEST : < ± 1.003 %	PASS
12	DYNAMIC LOAD	V1 : 3000 mVp-p	I/P : 230 VAC (1).O/P : FULL /Min LOAD 90%DUTY/ 1KHZ (2).O/P : FULL /Min LOAD 50%DUTY/ 120HZ Ta : 25°C	(1) 468 mVp-p (2) 832 mVp-p	PASS

13	RESISTANCE	Short -Open 50%-100%LOAD	I/P:230V						PASS
			RESISTANCE	Short	82Ω	620Ω	4.7KΩ	OPEN	
			O/P LOAD	Slightly < 50%	50%	75%	100.0%	Slightly > 100%	
			TEST RESULT: I/P : 230VAC ; Ta : 25°C						
			RESISTANCE	Short	82Ω	620Ω	4.7KΩ	OPEN	
			O/P LOAD	40.27%	51.08%	76.19%	100.1%	105.21%	

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	90 VAC~295 VAC	I/P : TESTING O/P : FULL LOAD Ta : 25°C I/P : LOW-LINE -3V=87 V HIGH-LINE=295 V O/P : FULL/MIN LOAD ON : 30 Sec . OFF : 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE)	85 V ~ 295V TEST : OK	PASS
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE OSC	I/P : 90 VAC ~ 295 VAC O/P : FULL -MIN LOAD Ta : 25°C	TEST : OK	PASS
3	POWER FACTOR	0.95 / 230 VAC(TYP) 0.98 / 115 VAC(TYP) 0.93 / 277 VAC(TYP)	I/P : 230 VAC I/P : 115 VAC I/P : 277 VAC O/P : FULL LOAD Ta : 25°C	PF= 0.981 / 100% PF= 0.997 / 100% PF= 0.951 / 100%	PASS
4	EFFICIENCY	91% (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	91.39 %	PASS
5	INPUT CURRENT	230V/ 1.00 A (TYP) 115V/ 2.00 A (TYP) 277V/ 0.68 A (TYP)	I/P : 230 VAC I/P : 115 VAC I/P : 277 VAC O/P : FULL LOAD Ta : 25°C	I = 0.720 A/ 230 VAC I = 1.460 A/ 115 VAC I = 0.615 A/ 277 VAC	PASS
6	INRUSH CURRENT	230V/ 65 A (TYP) (width=595us measured at 50% Ipeak) COLD START	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	I = 61.203 A/ 230 VAC T50= 592 us	PASS
7	LEAKAGE CURRENT	< 1 mA / 240 VAC	I/P : 295 VAC O/P : Min LOAD Ta : 25°C	L-CASE : 0.505 mA N-CASE : 0.502 mA	PASS
8	TOTAL HARMONIC DISTORTION	Total harmonic distortion will be lower than 20% when output loading is 75% or higher at 230V/115 V/277 VAC	I/P : 230VAC I/P : 115VAC I/P : 277VAC O/P : 75% LOAD Ta : 25°C	THD : 6.03 % THD : 4.63 % THD : 11.05 %	PASS

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	95 % ~ 108 %	I/P : 295 VAC I/P : 230 VAC I/P : 115 VAC O/P : TESTING Ta : 25°C	101.36 % / 295 VAC 101.25 % / 230 VAC 101.32 % / 115 VAC Constant current limiting, recovers automatically after fault condition is removed.	PASS
2	OVER VOLTAGE PROTECTION	CH1 : 33 V ~ 39 V	I/P : 295 VAC I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	35.41 V / 295 VAC 35.41 V / 230 VAC 35.41 V / 115 VAC Shunt down and latch off o/p voltage ,Re- power on to recover	PASS
3	OVER TEMPERATURE PROTECTION	SPEC : O.T.P. NO DAMAGE	I/P : 230 VAC O/P : FULL LOAD	O.T.P. Active Shut down o/p voltage, Re- power on to recover	PASS
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P : 295 VAC O/P : FULL LOAD Ta : 25°C	NO DAMAGE Hiccup mode, recovers automatically after fault condition is removed.	PASS

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 : 650 V / 11 A	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) 604 V (2) 526 V (3) 584 V	PASS
2	Diode Peak Voltage	Q100 Rated : 200 V / 75 A	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) 155 V (2) 143 V (3) 154 V	PASS
3	Input Capacitor Voltage	C5 Rated: 150uF / 450 V 105 °C / CLA Series	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) 464 V (2) 448 V (3) 466 V	PASS
4	Control IC Voltage Test	U2 Rated: 28 V	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) 17.0 V (2) 16.9 V (3) 16.9 V	PASS
5	P.F.C Transistor (D to S) or (C to E) Peak Voltage	Q2 Rated 600 V / 20 A	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) 504 V (2) 462 V (3) 454 V	PASS

■ SAFETY & E.M.C. TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P : 3.75 KVAC/min I/P-FG : 2.0 KVAC/min O/P-FG : 0.5 KVAC/min	I/P-O/P : 4.2 KVAC/min I/P-FG : 2.4 KVAC/min O/P-FG : 0.6 KVAC/min Ta : 25°C	I/P-O/P : 3.890 mA I/P-FG : 3.666 mA O/P-FG : 1.213 mA NO DAMAGE	PASS
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 : >9999 MΩ I/P-FG : >9999 MΩ O/P-FG : >9999 MΩ NO DAMAGE	PASS
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta : 25°C / 70%RH	21 mΩ	PASS

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS C	I/P:220VAC/230VAC/240VAC50HZ O/P:100%,75%LOAD Ta:25°C	PASS	PASS
2	CONDUCTION	EN55015	I/P: 230 VAC (50HZ)/115V[60HZ] O/P:FULL/65% LOAD Ta:25°C	PASS Test by certified Lab	PASS
3	RADIATION	EN55015	I/P: 230 VAC (50HZ)/115V[60HZ] O/P: FULL/65% LOAD Ta:25°C	PASS Test by certified Lab	PASS
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	PASS
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	PASS
6	SURGE	IEC61000-4-5 INDUSTRY L-N :2KV L,N-PE:4KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A	PASS
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 : CLG-150-24A 1. ROOM AMBIENT BURN-IN : 1.0 HRS I/P : 230VAC O/P : 95%LOAD Ta=35.6 °C 2. HIGH AMBIENT BURN-IN : 2.0 HRS I/P : 230VAC O/P : 95%LOAD Ta=61.0 °C	<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 35.6 °C</th> <th>HIGH AMBIENT Ta= 61.0 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>L1</td><td>64.4°C</td><td>81.6°C</td></tr> <tr><td>2</td><td>U1</td><td>66.2°C</td><td>84.1°C</td></tr> <tr><td>3</td><td>C42</td><td>55.7°C</td><td>81.9°C</td></tr> <tr><td>4</td><td>C5</td><td>67.7°C</td><td>84.8°C</td></tr> <tr><td>5</td><td>U2</td><td>65.6°C</td><td>83.4°C</td></tr> <tr><td>6</td><td>C52</td><td>61.1°C</td><td>96.6°C</td></tr> <tr><td>7</td><td>D2</td><td>79.6°C</td><td>98.3°C</td></tr> <tr><td>8</td><td>Q1</td><td>71.7°C</td><td>90.1°C</td></tr> <tr><td>9</td><td>T1</td><td>80.0°C</td><td>96.8°C</td></tr> <tr><td>10</td><td>Q100</td><td>67.4°C</td><td>85.7°C</td></tr> <tr><td>11</td><td>C107</td><td>71.3°C</td><td>88.9°C</td></tr> <tr><td>12</td><td>RTH2</td><td>64.3°C</td><td>86.9°C</td></tr> <tr><td>13</td><td>C105</td><td>69.3°C</td><td>86.3°C</td></tr> <tr><td>14</td><td>Q101</td><td>69.6°C</td><td>87.8°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta= 35.6 °C	HIGH AMBIENT Ta= 61.0 °C	1	L1	64.4°C	81.6°C	2	U1	66.2°C	84.1°C	3	C42	55.7°C	81.9°C	4	C5	67.7°C	84.8°C	5	U2	65.6°C	83.4°C	6	C52	61.1°C	96.6°C	7	D2	79.6°C	98.3°C	8	Q1	71.7°C	90.1°C	9	T1	80.0°C	96.8°C	10	Q100	67.4°C	85.7°C	11	C107	71.3°C	88.9°C	12	RTH2	64.3°C	86.9°C	13	C105	69.3°C	86.3°C	14	Q101	69.6°C	87.8°C		P
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2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 295VAC/100VAC O/P : 95% LOAD Ta= -35°C/-15°C	TEST : OK	P																																																												
3	TEMPERATURE COEFFICIENT	± 0.03 % (0-50°C)	I/P : 230 VAC O/P : 95% LOAD	± 0.002 % (0-50°C)	P																																																												
4	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	P																																																												
5	THERMAL SHOCK TEST	1. Thermal shock Temperature : -35°C ~ +60°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/95% Load AC ON/OFF TEST turn on 58sec ; turn off 2sec		OK	P																																																												
6	VIBRATION TEST	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10-500Hz (3) Sweep Time : 12min/sweep cycle (4) Acceleration : 6G (5) Test Time : 90min in each axis (X.Y.Z) (6) Ta : 25°C		TEST : OK	P																																																												
7	CAPACITOR LIFE CYCLE	CLG-150-24A:SUPPOSE C107 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=55 °C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta=55 °C LIFE TIME		(1) 201294.6 HRS (2) 48934.8 HRS (3) 59809.2 HRS	P																																																												



8	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE : 303.7KHRS	P
9	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure(Expected Life) : 30,000 hours @ Tcase 75 °C ; 50,000 hours @ Tcase 65 °C	P

TEST RESULT	TESTER	APPROVAL
PASS	ZHUOKB/ZOULF	LIUWY

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