



Test Report: IDLC-45-500

45W Constant Current Mode LED Driver

■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Component Stress Test

■ SAFETY & E.M.C. TEST

Safety Test

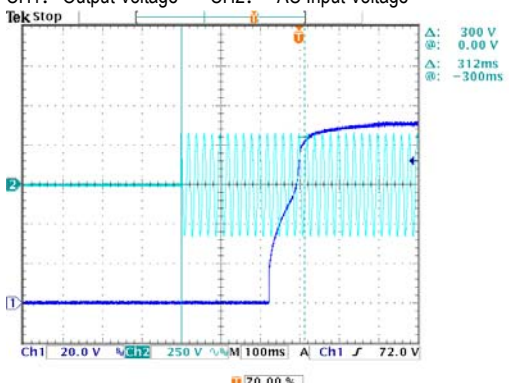
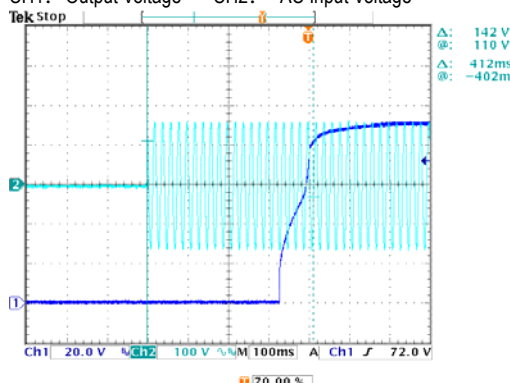
E.M.C. Test

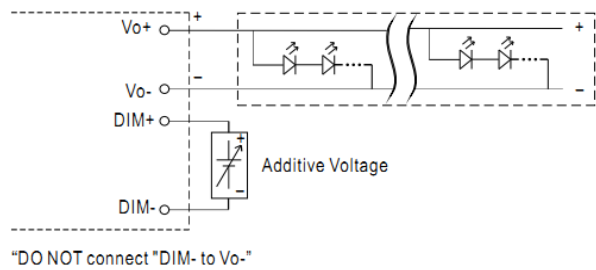
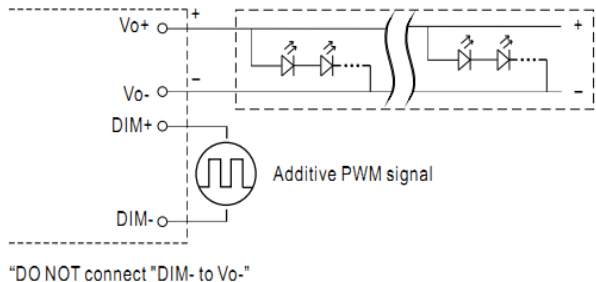
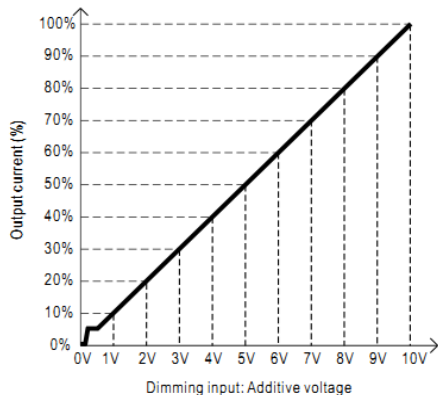
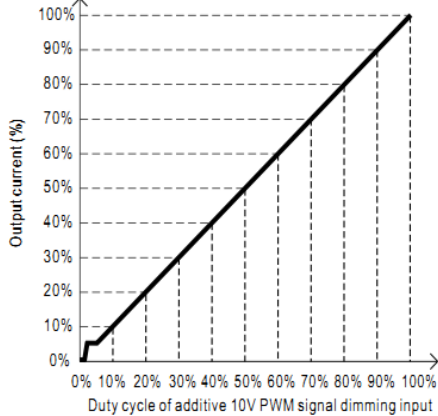
■ RELIABILITY TEST

Environment Test

■ DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONSTANT CURRENT REGION	54V~90V	I/P: 230VAC O/P: LED MODE Ta: 25°C	20V~95V
2	CURRENT RIPPLE	5% max@rated current	I/P: 230VAC O/P: FULL/MIN LOAD Ta: 25°C	3.95%
3	CURRENT TOLERANCE	±7%	I/P: 230VAC O/P: FULL/MIN LOAD Ta: 25°C	±1.0%
4	OPEN CIRCUIT VOLTAGE (max)	115V	I/P: 230VAC O/P: NO LOAD Ta: 25°C	110.11V
5	OVER/UNDERSHOOT TEST	<±5 %	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	<5 %
6	SET UP TIME	500ms/230VAC 1200ms/115VAC	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	312ms/230VAC 412ms/115VAC
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1: Output Voltage CH2: AC Input Voltage</p> 		<p>INPUT=115VAC/60HZ @ FULL LOAD</p> <p>CH1: Output Voltage CH2: AC Input Voltage</p> 		
7	AUXILIARY DC OUTPUT (A-Type only)	Nominal 12V (deviation 11.4~12.6) @50mA	I/P: 230 VAC O/P:FULL LOAD	11.98V

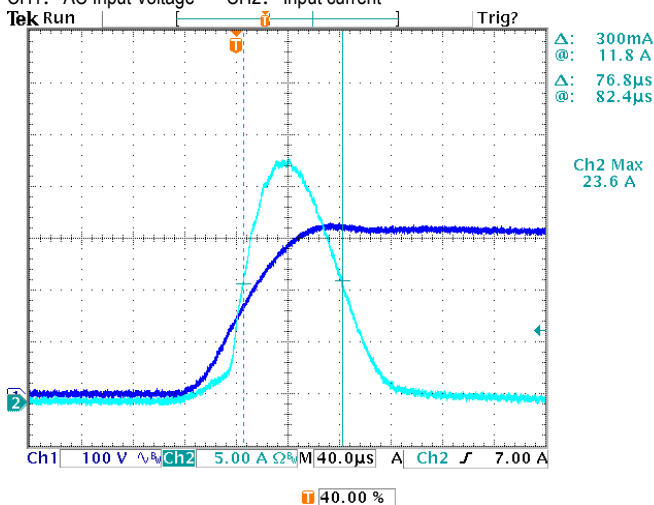
<p>8 DIMMING TEST(For Blank -Type)</p>	<ul style="list-style-type: none"> Output constant current level can be adjusted by applying one of the two methodologies between DIM+ and DIM-: <ul style="list-style-type: none"> 0 ~ 10Vdc, or 10V PWM signal. Direct connecting to LEDs is suggested. It is not suitable to be used with additional drivers. Applying additive 0 ~ 10VDC  <p>“DO NOT connect "DIM- to Vo-”</p> <ul style="list-style-type: none"> Applying additive 10V PWM signal (frequency range 300Hz ~ 3KHz):  <p>“DO NOT connect "DIM- to Vo-”</p> <div style="display: flex; justify-content: space-around;"> <div data-bbox="1077 336 1516 728">  </div> <div data-bbox="1077 739 1516 1153">  </div> </div> <p>Note : 1. Min. dimming level is about 8% and the output current is not defined when 0% < Iout < 8%. 2. The output current could drop down to 0% when dimming input is about 0Vdc or 10V PWM signal with 0% duty cycle.</p> <p>TEST RESULT: I/P: 230 VAC; Ta: 25°C</p> <table border="1" data-bbox="295 1299 1532 1758"> <thead> <tr> <th></th> <th>Dimming voltage</th> <th>0V</th> <th>1V</th> <th>2V</th> <th>3V</th> <th>4V</th> <th>5V</th> <th>6V</th> <th>7V</th> <th>8V</th> <th>9V</th> <th>10V</th> </tr> </thead> <tbody> <tr> <td rowspan="3">1</td> <td>Output Current</td> <td>0A</td> <td>0.040</td> <td>0.099</td> <td>0.147</td> <td>0.198</td> <td>0.248</td> <td>0.300</td> <td>0.350</td> <td>0.398</td> <td>0.448</td> <td>0.497</td> </tr> <tr> <td>Percentage of rated current</td> <td>0.00%</td> <td>7.90%</td> <td>19.74%</td> <td>29.48%</td> <td>39.66%</td> <td>49.58%</td> <td>59.90%</td> <td>70.06%</td> <td>79.56%</td> <td>89.58%</td> <td>99.30%</td> </tr> <tr> <td>Dimming Duty cycle</td> <td>0%</td> <td>10%</td> <td>20%</td> <td>30%</td> <td>40%</td> <td>50%</td> <td>60%</td> <td>70%</td> <td>80%</td> <td>90%</td> <td>100%</td> </tr> <tr> <td rowspan="3">2</td> <td>Output Current</td> <td>0A</td> <td>0.043</td> <td>0.101</td> <td>0.151</td> <td>0.200</td> <td>0.250</td> <td>0.299</td> <td>0.348</td> <td>0.398</td> <td>0.447</td> <td>0.491</td> </tr> <tr> <td>Percentage of rated current</td> <td>0.00%</td> <td>8.58%</td> <td>20.12%</td> <td>30.24%</td> <td>40.06%</td> <td>50.04%</td> <td>59.86%</td> <td>69.66%</td> <td>79.56%</td> <td>89.34%</td> <td>98.12%</td> </tr> <tr> <td>Dimming Duty cycle</td> <td>0%</td> <td>10%</td> <td>20%</td> <td>30%</td> <td>40%</td> <td>50%</td> <td>60%</td> <td>70%</td> <td>80%</td> <td>90%</td> <td>100%</td> </tr> </tbody> </table> <p>TEST RESULT: OK</p>		Dimming voltage	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	1	Output Current	0A	0.040	0.099	0.147	0.198	0.248	0.300	0.350	0.398	0.448	0.497	Percentage of rated current	0.00%	7.90%	19.74%	29.48%	39.66%	49.58%	59.90%	70.06%	79.56%	89.58%	99.30%	Dimming Duty cycle	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	2	Output Current	0A	0.043	0.101	0.151	0.200	0.250	0.299	0.348	0.398	0.447	0.491	Percentage of rated current	0.00%	8.58%	20.12%	30.24%	40.06%	50.04%	59.86%	69.66%	79.56%	89.34%	98.12%	Dimming Duty cycle	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
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<p>9 DALI DIMMING OPERATION (primary side: for DA-Type)</p>	<p>※DALI Interface ·Apply DALI signal between DA+ and DA-. ·DALI protocol comprises 16 groups and 64 addresses. ·First step is fixed at 8% of output.</p> <p>I/P: 230 VAC O/P: DIMMING TEST Ta: 25°C TEST RESULT: OK</p>																																																																																							

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	90VAC~295VAC	I/P: TESTING O/P: FULL LOAD Ta: 25°C	87V~305V
			I/P: (1)LOW-LINE-3V=87 V HIGH-LINE+10V=305 V O/P: FULL/MIN LOAD ON: 30 Sec OFF: 30 Sec 10MIN (2)230VAC ON: 0.5 Sec OFF: 0.5 Sec 20MIN (POWER ON/OFF NO DAMAGE)	TEST: OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P: 90 VAC ~295 VAC O/P: FULL~MIN LOAD Ta: 25°C	TEST: OK
3	AC CURRENT	0.6A/115VAC 0.4A/230VAC 0.3A/277VAC	I/P: 115 VAC I/P: 230 VAC I/P: 277 VAC O/P: FULL LOAD Ta: 25°C	I =0.434A/ 115VAC I =0.219A/ 230VAC I =0.188A/ 277VAC
4	LEAKAGE CURRENT	< 0.75mA / 277VAC	I/P: 277 VAC O/P: NO LOAD Ta: 25°C	L-CASE: 0.0027 mA N-CASE: 0.0027 mA
5	NO LOAD/STANDBY POWER CONSUMPTION	< 0.5W for Blank-Type < 1.2W for A-Type < 0.5W for DA-Type	I/P: 230VAC O/P: NO LOAD Ta: 25°C	0.468W for Blank-Type 0.568W for A-Type 0.453W for DA-Type
6	INRUSH CURRENT(Typ)	230V/ 30A Twidth =100 us measured at 50% Ipeak COLD START	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	I =23.6A/ 230VAC Twidth =76.8us

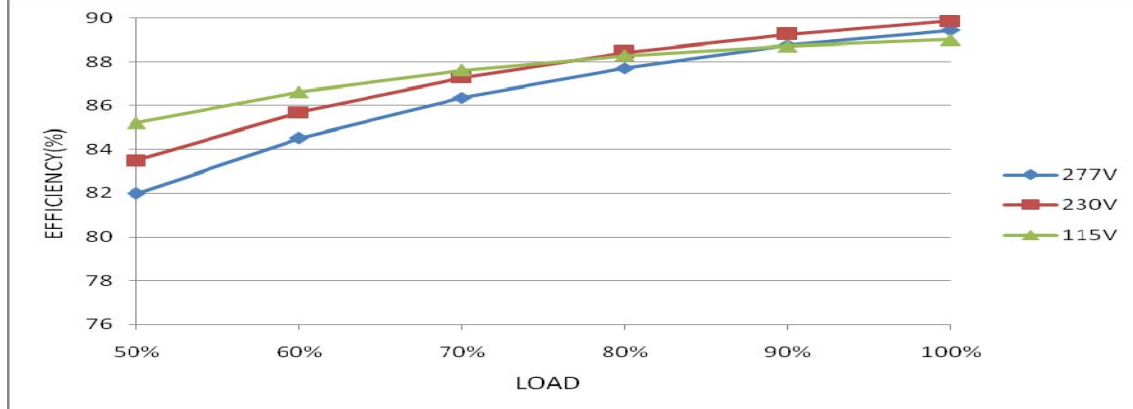
INPUT=230VAC/50HZ @ FULL LOAD

CH1: AC Input Voltage CH2: Input current



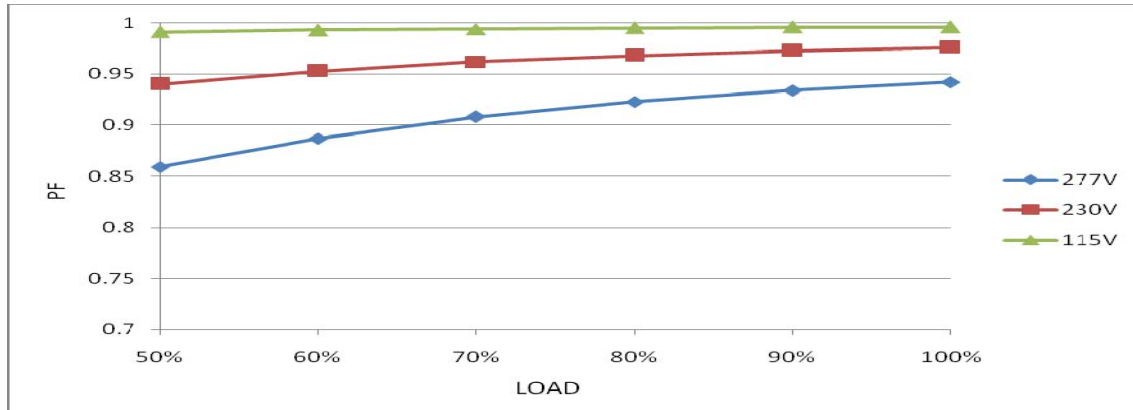
7	EFFICIENCY(Typ)	85%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	89.87%
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EFFICIENCY vs LOAD



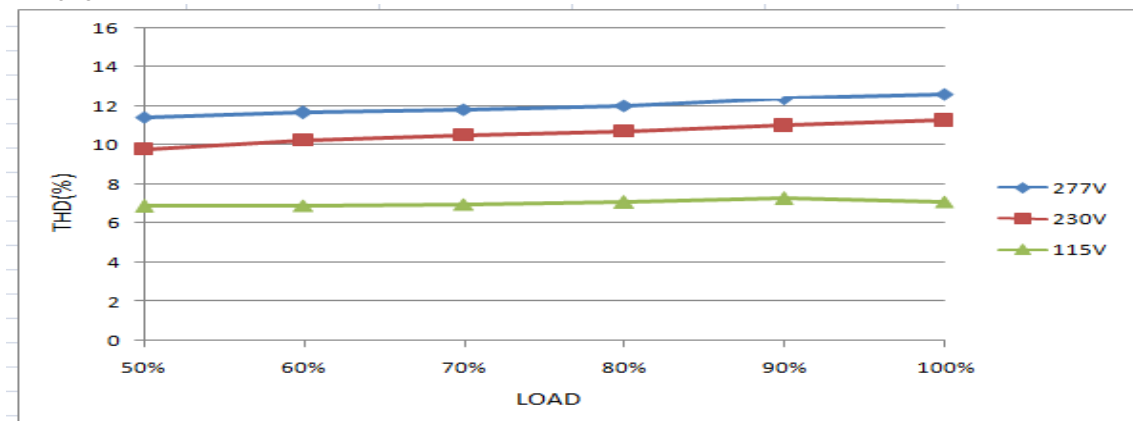
8	POWER FACTOR	0.95/ 115VAC 0.92/ 230VAC 0.90/ 277VAC	I/P: 115 VAC I/P: 230 VAC I/P: 277 VAC O/P: FULL LOAD Ta: 25°C	PF=0.996/ 115VAC PF=0.976/ 230VAC PF=0.942/ 277VAC
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P.F vs LOAD



9	TOTAL HARMONIC DISTORTION	THD<20% (@load≥60%/115VAC, 230VAC; @load≥75%/277VAC)	I/P: 115 VAC/60% LOAD I/P: 230 VAC/60% LOAD I/P: 277 VAC/75% LOAD Ta: 25°C	THD=6.89% @60% load /115VAC THD=10.20% @60% load /230VAC THD=11.85% @75% load /277VAC
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THD vs LOAD



PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	SHORT CIRCUIT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 90VAC I/P: 295VAC O/P: FULL LOAD Ta: 25°C	NO DAMAGE Hiccup mode, recovers automatically after fault condition is removed

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Power Transistor	Q 1 Rated 800V/9A	I/P: High-Line +3V =298V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 608V (2) 524V (3) 542V
2	O/P Diode (MOSFET)	D101 Rated 1000V/5A	I/P: High-Line +3V =298V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 808V (2) 796V (3) 804V
3	Control IC	U1 Rated 35V (MAX)	I/P: High-Line +3V =298V O/P: (1) FULL LOAD (2) Output Short (3) Low Line No Load Ta: 25°C	(1) 17.9V (2) 17.9V (3) 17.9V
4	Clamp Diode	D 1 Rated 1000V/1A	I/P: High-Line +3V = 298V O/P: (1) Full Load input on/off (2) Output Short Ta: 25°C	(1) 490V (2) 458V



SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 3.75KVAC/min	I/P-O/P: 4.2 KVAC/min Ta: 25°C	I/P-O/P: 2.487mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P: 500VDC>100MΩ	I/P-O/P: 500 VDC Ta: 25°C/70% RH	I/P-O/P: >9999MΩ

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS C	I/P: 230 VAC/50HZ O/P: FULL/60% LOAD Ta: 25°C	PASS
2	CONDUCTION	EN55015	I/P: 230 VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS Test by certified Lab
3	RADIATION	EN55015	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	PASS
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 230VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS
6	SURGE	EN61000-4-5 LIGHT INDUSTRY L-N: 1KV	I/P: 230VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS
7	Test by certified Lab & Test Report Prepare			

■ **RELIABILITY TEST**

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																												
1	TEMPERATURE RISE TEST	MODEL: IDLC-45-700 1. ROOM AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 32.8℃ 2. HIGH AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 42.0℃																																																														
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 32.8 ℃</th> <th>HIGH AMBIENT Ta=42.0 ℃</th> </tr> </thead> <tbody> <tr><td>1</td><td>ZNR1</td><td>47.0℃</td><td>55.1℃</td></tr> <tr><td>2</td><td>BD1</td><td>85.8℃</td><td>93.7℃</td></tr> <tr><td>3</td><td>D1</td><td>92.4℃</td><td>101.4℃</td></tr> <tr><td>4</td><td>Q1</td><td>95.7℃</td><td>104.9℃</td></tr> <tr><td>5</td><td>U1</td><td>84.8℃</td><td>93.2℃</td></tr> <tr><td>6</td><td>T1</td><td>96.5℃</td><td>105.1℃</td></tr> <tr><td>7</td><td>C16</td><td>82.1℃</td><td>90.7℃</td></tr> <tr><td>8</td><td>RG1</td><td>100.8℃</td><td>108.5℃</td></tr> <tr><td>9</td><td>D101</td><td>110.8℃</td><td>118.1℃</td></tr> <tr><td>10</td><td>C201</td><td>87.7℃</td><td>95.5℃</td></tr> <tr><td>11</td><td>Q100</td><td>85.1℃</td><td>92.9℃</td></tr> <tr><td>12</td><td>L100</td><td>92.0℃</td><td>99.7℃</td></tr> <tr><td>13</td><td>C106</td><td>79.0℃</td><td>86.7℃</td></tr> <tr><td>14</td><td>TC</td><td>76.6℃</td><td>85.3℃</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta= 32.8 ℃	HIGH AMBIENT Ta=42.0 ℃	1	ZNR1	47.0℃	55.1℃	2	BD1	85.8℃	93.7℃	3	D1	92.4℃	101.4℃	4	Q1	95.7℃	104.9℃	5	U1	84.8℃	93.2℃	6	T1	96.5℃	105.1℃	7	C16	82.1℃	90.7℃	8	RG1	100.8℃	108.5℃	9	D101	110.8℃	118.1℃	10	C201	87.7℃	95.5℃	11	Q100	85.1℃	92.9℃	12	L100	92.0℃	99.7℃	13	C106	79.0℃	86.7℃	14	TC	76.6℃	85.3℃
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2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 295VAC/90VAC O/P: FULL/80% LOAD Ta= -25℃	TEST: OK																																																												
3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 40 ℃ NO DAMAGE	I/P: 305VAC O/P: FULL LOAD Ta=40 ℃ HUMIDITY= 95 %R.H	TEST: OK																																																												
4	TEMPERATURE COEFFICIENT	±0.03 %/℃(0~40℃)	I/P: 230 VAC O/P: FULL LOAD	±0.01%/℃																																																												
5	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature: -45℃~ +85℃ 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: AC OFF STATIC		TEST: OK																																																												
6	THERMAL SHOCK TEST	1. Thermal shock Temperature: Tcase=-25℃~ +45℃ 2. Temperature change rate : 25℃ / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle: 16 CYCLE 5. Input/Output condition: 230VAC/Full Load AC ON/OFF TEST AC on 3 sec/AC off 1 sec TEST		TEST: OK																																																												



7	VIBRATION TEST	1 Carton & 1 Set (1) Waveform: Sine Wave (2) Frequency: 10~500Hz (3) Sweep Time: 10min/sweep cycle (4) Acceleration: 2G (5) Test Time: 60min in each axis (X.Y.Z) (6) Ta: 25°C	TEST: OK
8	CAPACITOR LIFE CYCLE	IDLC-45-700: SUPPOSE C106 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= 40 °C LIFE TIME (3) I/P: 230VAC O/P: 75% LOAD Ta= 40 °C LIFE TIME (4) I/P: 230VAC O/P: MIN LOAD Ta= 40 °C LIFE TIME	(1) 152506 HRS (2) 59772 HRS (3) 78859 HRS (4) 81455 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 408.8K hrs min. MIL-HDBK-217F (25°C)	
10	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure(Expected Life) : 30,000 hours @ Tcase 75°C ; 50,000 hours @ Tcase 65°C	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	ZHANGZJ/ZHUOKB	SKY	LIUWY