



Test Report: IDLC-65-1400

65W 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

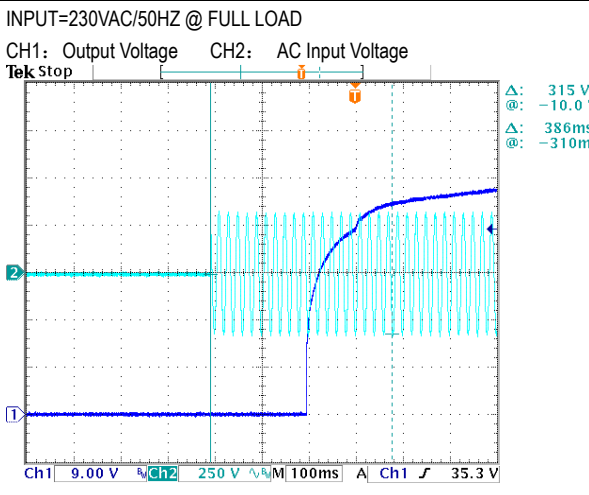
E.M.C. Test

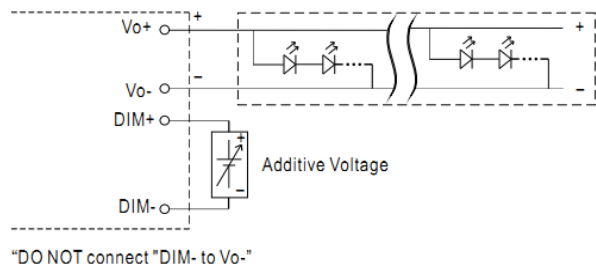
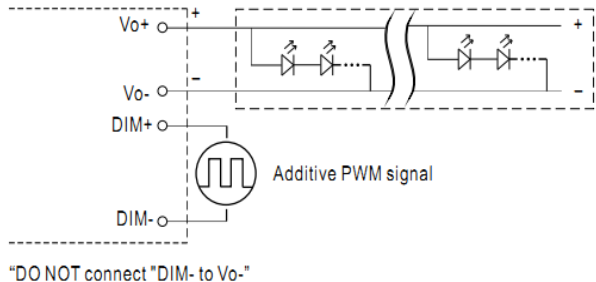
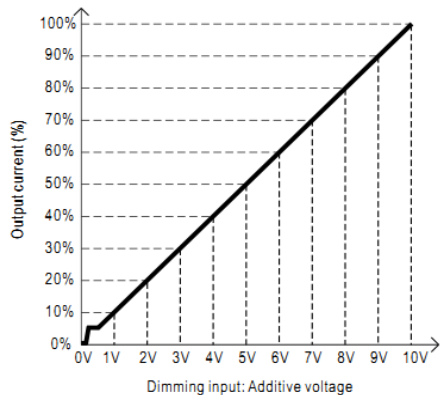
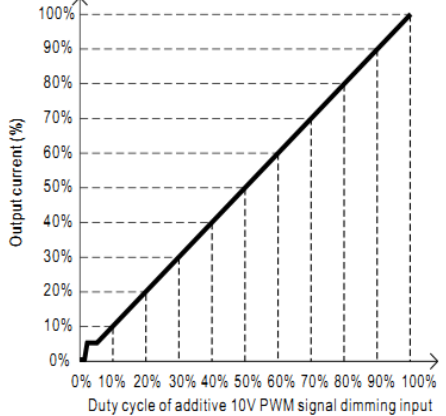
■ RELIABILITY TEST

Environment Test

DESIGN VERIFY TEST

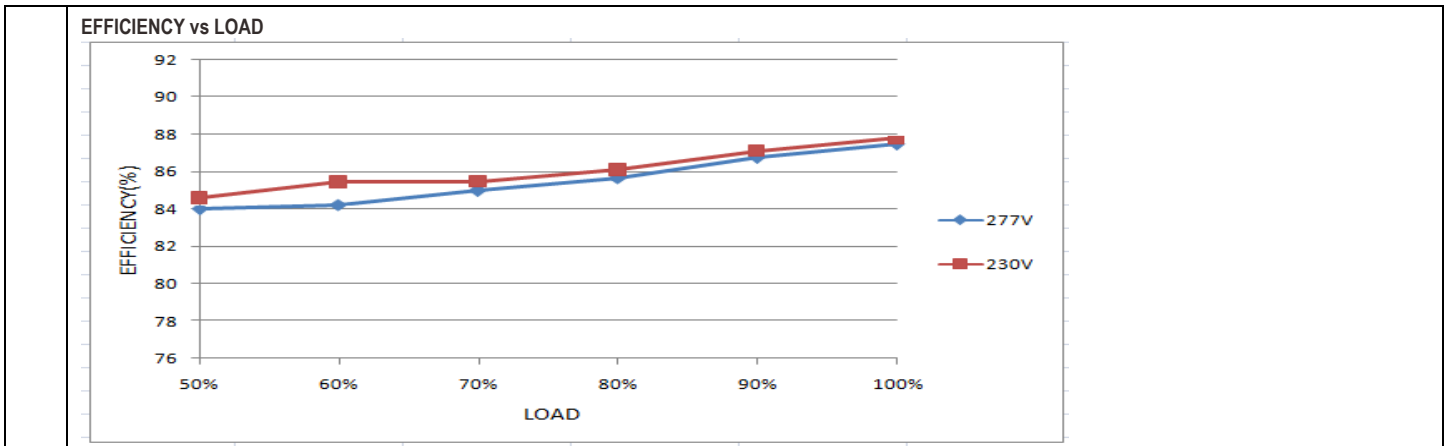
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONSTANT CURRENT REGION	34V~46V	I/P: 230VAC O/P: LED MODE Ta: 25°C	28 V~46 V
2	CURRENT RIPPLE	5% max@rated current	I/P: 230VAC O/P: FULL/MIN LOAD Ta: 25°C	4.05%
3	CURRENT TOLERANCE	±7%	I/P: 230VAC O/P: FULL/MIN LOAD Ta: 25°C	±2.24%
4	OPEN CIRCUIT VOLTAGE (max)	60V	I/P: 230VAC O/P: NO LOAD Ta: 25°C	59.5 V
5	OVER/UNDERSHOOT TEST	<±5 %	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	<5 %
6	SET UP TIME	500ms/230VAC	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	386 ms/230VAC
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1: Output Voltage CH2: AC Input Voltage</p>  <p>Ch1 9.00 V Ch2 250 V 100ms A Ch1 35.3 V</p> <p>70.00 %</p> <p>Δ: 315 V @: -10.0 V Δ: 386ms @: -310ms</p>				
7	AUXILIARY DC OUTPUT (For A-Type only)	Nominal 12V (deviation 11.4~12.6) @50mA	I/P: 230 VAC O/P: FULL LOAD	11.94 V

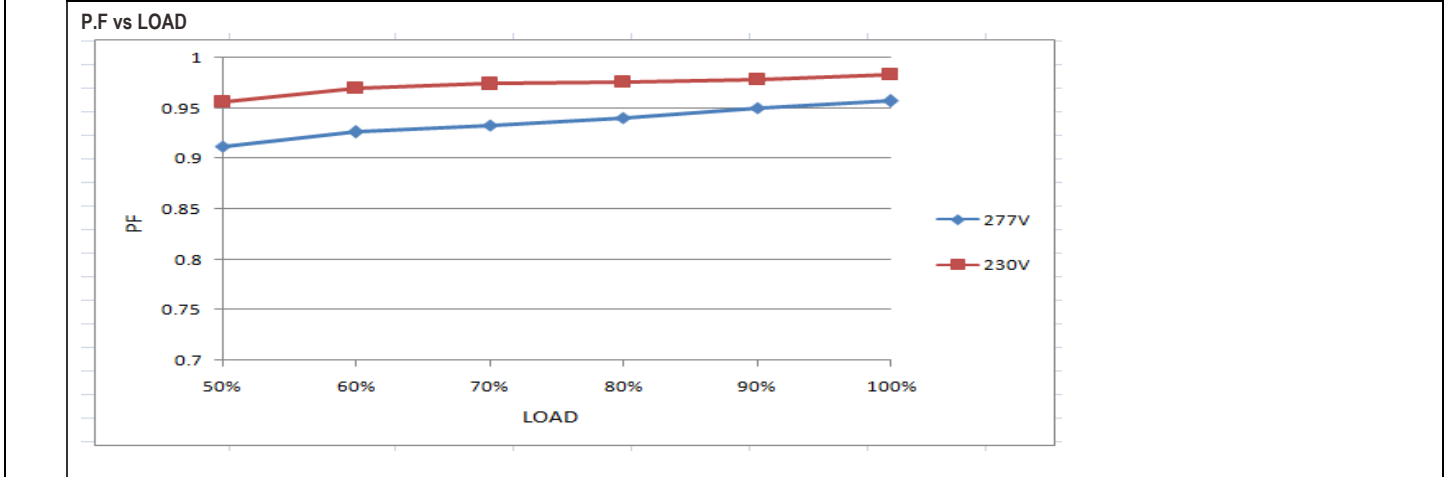
<p>8 DIMMING TEST (For Blank -Type)</p>	<ul style="list-style-type: none"> • Output constant current level can be adjusted by applying one of the two methodologies between DIM+ and DIM-: 0 ~ 10Vdc, or 10V PWM signal. • Direct connecting to LEDs is suggested. It is not suitable to be used with additional 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 1524 728">  </div> <div data-bbox="1077 739 1524 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>I/P: 230 VAC O/P: DIMMING TEST Ta: 25°C</p> <table border="1" data-bbox="295 1355 1492 1758"> <tr> <td></td> <td>V</td> <td>0V</td> <td>1V</td> <td>2V</td> <td>3V</td> <td>4V</td> <td>5V</td> <td>6V</td> <td>7V</td> <td>8V</td> <td>9V</td> <td>10V</td> </tr> <tr> <td rowspan="2">1</td> <td>Output Current</td> <td>0A</td> <td>0.1720A</td> <td>0.3060A</td> <td>0.4360A</td> <td>0.5716A</td> <td>0.7039A</td> <td>0.8415A</td> <td>0.9769A</td> <td>1.1048A</td> <td>1.2398A</td> <td>1.3718A</td> </tr> <tr> <td>%</td> <td>0.00%</td> <td>12.29%</td> <td>21.86%</td> <td>31.14%</td> <td>40.83%</td> <td>50.28%</td> <td>60.11%</td> <td>69.78%</td> <td>78.91%</td> <td>88.56%</td> <td>97.99%</td> </tr> <tr> <td rowspan="3">2</td> <td>PWM(100Hz)</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>Output Current</td> <td>0A</td> <td>0.1680A</td> <td>0.3000A</td> <td>0.4320A</td> <td>0.5680A</td> <td>0.7000A</td> <td>0.8400A</td> <td>0.9769A</td> <td>1.1000A</td> <td>1.2400A</td> <td>1.3759A</td> </tr> <tr> <td>%</td> <td>0.00%</td> <td>12.00%</td> <td>21.43%</td> <td>30.86%</td> <td>40.57%</td> <td>50.00%</td> <td>60.00%</td> <td>69.78%</td> <td>78.57%</td> <td>88.57%</td> <td>98.28%</td> </tr> </table> <p>TEST RESULT: OK</p>		V	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	1	Output Current	0A	0.1720A	0.3060A	0.4360A	0.5716A	0.7039A	0.8415A	0.9769A	1.1048A	1.2398A	1.3718A	%	0.00%	12.29%	21.86%	31.14%	40.83%	50.28%	60.11%	69.78%	78.91%	88.56%	97.99%	2	PWM(100Hz)	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	Output Current	0A	0.1680A	0.3000A	0.4320A	0.5680A	0.7000A	0.8400A	0.9769A	1.1000A	1.2400A	1.3759A	%	0.00%	12.00%	21.43%	30.86%	40.57%	50.00%	60.00%	69.78%	78.57%	88.57%	98.28%
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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. ·Firse 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

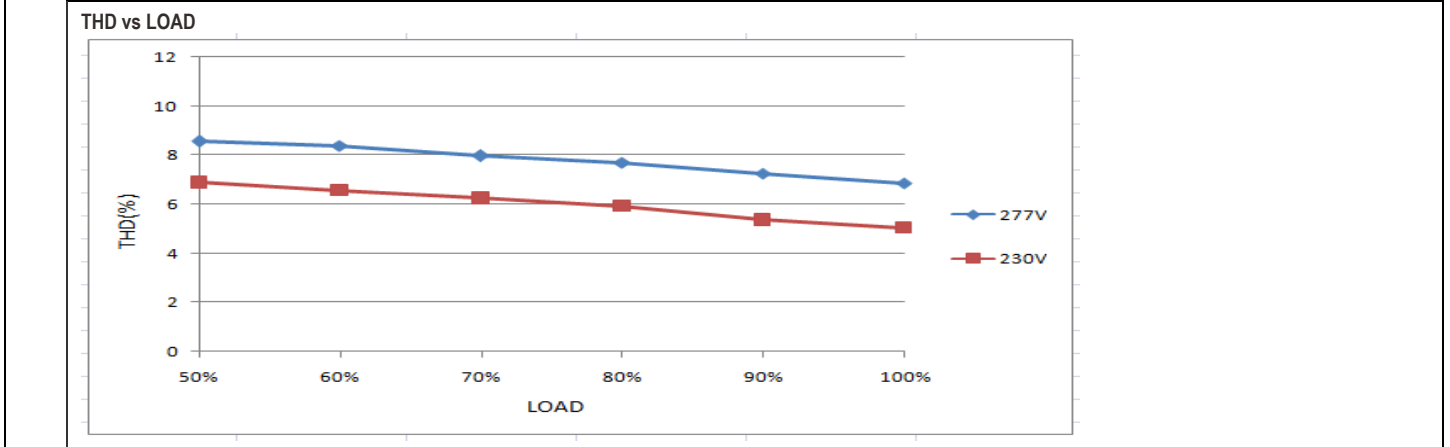
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	180VAC~295VAC	I/P: TESTING O/P: 80%/FULL LOAD Ta: 25°C	177V~305V
			I/P: (1)LOW-LINE-3V=177 V HIGH-LINE+10V=305 V O/P: 80%/FULL/MIN LOAD ON: 30 Sec OFF: 30 Sec 10MIN (2)230VAC ON: 0.5 Sec OFF: 0.5 Sec 20MIN (POWER ON/OFF NO DAMAGE)	TEST: OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P: 180 VAC ~295 VAC O/P: FULL~MIN LOAD Ta: 25°C	TEST: OK
3	AC CURRENT	0.4A/230VAC 0.3A/277VAC	I/P: 230 VAC I/P: 277 VAC O/P: FULL LOAD Ta: 25°C	I =0.313A/ 230VAC I =0.251A/ 277VAC
4	LEAKAGE CURRENT	< 0.75mA / 277VAC	I/P: 277 VAC O/P: NO LOAD Ta: 25°C	L-CASE: 0.0029 mA N-CASE: 0.0029 mA
5	NO LOAD 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	0.388W for Blank-Type 0.582W for A-Type 0.442W 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 =19.9A/ 230VAC Twidth =84.0 us
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1: AC Input Voltage CH2: Input current</p> <p>Tek PreVu</p> <p>Ch1 100 V Ch2 5.00 A M 40.0µs A Ch2 10.9 A</p> <p>40.8000µs</p>				
7	EFFICIENCY(Typ)	86%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	87.75%



8	POWER FACTOR	0.95/ 230VAC 0.90/ 277VAC	I/P: 230 VAC I/P: 277 VAC O/P: FULL LOAD Ta: 25°C	PF=0.984/ 230VAC PF=0.954/ 277VAC
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9	TOTAL HARMONIC DISTORTION	THD < 20% (@load ≥ 75% 230VAC; @load ≥ 75% 277VAC)	I/P: 230 VAC / 75% LOAD I/P: 277 VAC / 75% LOAD Ta: 25°C	THD=6.10% @75% load / 230VAC THD=7.92% @75% load / 277VAC
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PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	SHORT CIRCUIT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 180VAC I/P: 295VAC O/P: 80%/FULL LOAD Ta: 25°C	NO DAMAGE Hiccup mode, auto-recovery after fault condition is removed for DA type; Hiccup mode, re-power on to recovery for other type

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) 690V (2) 644V (3) 680V
2	O/P Diode (MOSFET)	D100 Rated 16A/400V	I/P: High-Line +3V =298V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 260V (2) 268V (3) 204V
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) 15.8V (2) 14.5V (3) 15.5V
4	Clamp Diode	D 1 Rated 800V/2A	I/P: High-Line +3V = 298V O/P: (1) Full Load input on/off (2) Output Short Ta: 25°C	(1) 540V (2) 484V

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: 1.662 mA 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: > 9999 MΩ

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/75% 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	CRITERIA A
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 230VAC/50HZ O/P: FULL LOAD Ta: 25°C	CRITERIA A
6	SURGE	EN61000-4-5 LIGHT INDUSTRY L-N: 1KV	I/P: 230VAC/50HZ O/P: FULL LOAD Ta: 25°C	CRITERIA A
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-65-1050 1. ROOM AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 27.3℃ 2. HIGH AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 42.3℃																																																														
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 27.3 ℃</th> <th>HIGH AMBIENT Ta=42.3 ℃</th> </tr> </thead> <tbody> <tr><td>1</td><td>BD1</td><td>89.6℃</td><td>104.0℃</td></tr> <tr><td>2</td><td>C8</td><td>85.9℃</td><td>100.5℃</td></tr> <tr><td>3</td><td>Q1</td><td>92.0℃</td><td>106.3℃</td></tr> <tr><td>4</td><td>D1</td><td>90.9℃</td><td>106.5℃</td></tr> <tr><td>5</td><td>U1</td><td>82.8℃</td><td>97.2℃</td></tr> <tr><td>6</td><td>T1</td><td>93.9℃</td><td>108.2℃</td></tr> <tr><td>7</td><td>RG1</td><td>92.6℃</td><td>101.5℃</td></tr> <tr><td>8</td><td>D100</td><td>86.1℃</td><td>100.5℃</td></tr> <tr><td>9</td><td>Q100</td><td>82.8℃</td><td>97.3℃</td></tr> <tr><td>10</td><td>L100</td><td>89.2℃</td><td>103.4℃</td></tr> <tr><td>11</td><td>C106</td><td>76.8℃</td><td>91.2℃</td></tr> <tr><td>12</td><td>C110</td><td>63.6℃</td><td>78.2℃</td></tr> <tr><td>13</td><td>U100</td><td>82.4℃</td><td>96.4℃</td></tr> <tr><td>14</td><td>TC</td><td>76.6℃</td><td>90.5℃</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta= 27.3 ℃	HIGH AMBIENT Ta=42.3 ℃	1	BD1	89.6℃	104.0℃	2	C8	85.9℃	100.5℃	3	Q1	92.0℃	106.3℃	4	D1	90.9℃	106.5℃	5	U1	82.8℃	97.2℃	6	T1	93.9℃	108.2℃	7	RG1	92.6℃	101.5℃	8	D100	86.1℃	100.5℃	9	Q100	82.8℃	97.3℃	10	L100	89.2℃	103.4℃	11	C106	76.8℃	91.2℃	12	C110	63.6℃	78.2℃	13	U100	82.4℃	96.4℃	14	TC	76.6℃	90.5℃
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2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 295VAC/180VAC 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	±0.0023%/℃																																																												
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℃~ +85℃ 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-65-1050: 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: MIN LOAD Ta= 40 °C LIFE TIME	(1) 279460 HRS (2) 103015 HRS (3) 124645 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 380.7K hrs min MIL-HDBK-217F (25°C)	
10	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure(Expected Life) : 30,000 hours @ Tcase 80°C ; 50,000 hours @ Tcase 70°C	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	Carychen/ZHUOKB	SKY	LIUWY