



Test Report: ODLC-45-1050

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

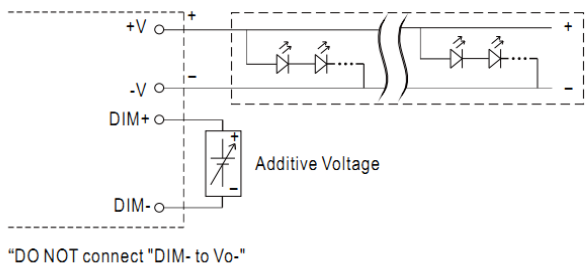
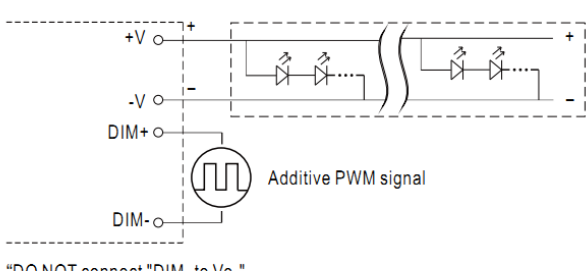
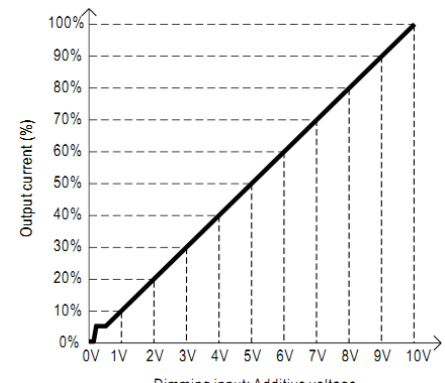
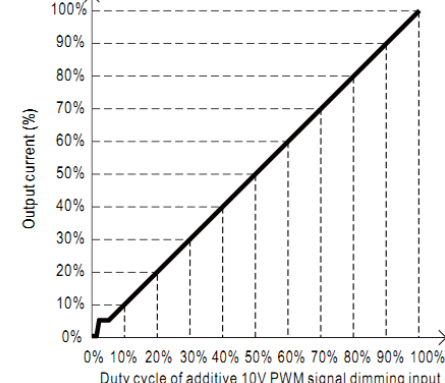
■ RELIABILITY TEST

Environment Test

DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONSTANT CURRENT REGION	26V~43V	I/P: 230VAC O/P: LED MODE Ta: 25°C	10V~43V
2	CURRENT RIPPLE	5% max@rated current	I/P: 230VAC O/P: FULL/MIN LOAD Ta: 25°C	2.08%
3	CURRENT TOLERANCE	±7%	I/P: 230VAC O/P: FULL/MIN LOAD Ta: 25°C	±0.95%
4	OPEN CIRCUIT VOLTAGE (max)	63V	I/P: 230VAC O/P: NO LOAD Ta: 25°C	44.14V
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	346ms/230VAC 388ms/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	11.92 V

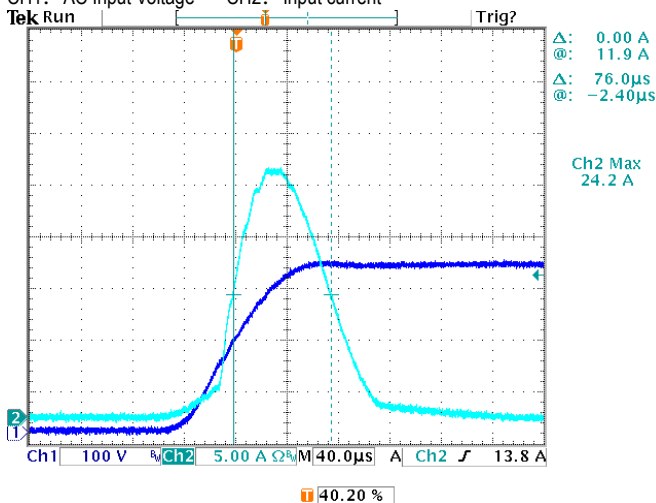
<p>8</p>	<p>DIMMING TEST(For Blank -Type)</p>	<ul style="list-style-type: none"> • Output constant current level can be adjusted by applying one of the two methodologies between DIM+ and DIM-: <ul style="list-style-type: none"> 0 ~ 10Vdc, or 10V PWM signal. • Direct connecting to LEDs is suggested. It is not suitable to be used with additional drivers. ◎ Applying additive 0 ~ 10VDC  <ul style="list-style-type: none"> ◎ Applying additive 10V PWM signal (frequency range 300Hz ~ 3KHz):  <div style="display: flex; justify-content: space-around;"> <div data-bbox="1053 336 1500 716">  </div> <div data-bbox="1053 739 1500 1120">  </div> </div> <p>Note : 1. Min. dimming level is about 8% and the output current is not defined when 0% < I_{out} < 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 1299 1436 1702"> <tr> <td rowspan="3">1</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>Output Current</td> <td>0A</td> <td>0.102</td> <td>0.217</td> <td>0.320</td> <td>0.429</td> <td>0.536</td> <td>0.647</td> <td>0.756</td> <td>0.859</td> <td>0.968</td> <td>1.057</td> </tr> <tr> <td>%</td> <td>0.00%</td> <td>9.70%</td> <td>20.70%</td> <td>30.50%</td> <td>40.89%</td> <td>51.05%</td> <td>61.61%</td> <td>71.96%</td> <td>81.82%</td> <td>92.20%</td> <td>100.69%</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>0.093</td> <td>0.206</td> <td>0.311</td> <td>0.415</td> <td>0.519</td> <td>0.624</td> <td>0.729</td> <td>0.836</td> <td>0.941</td> <td>1.035</td> </tr> <tr> <td>%</td> <td>0.00%</td> <td>8.82%</td> <td>19.61%</td> <td>29.60%</td> <td>39.54%</td> <td>49.47%</td> <td>59.38%</td> <td>69.45%</td> <td>79.58%</td> <td>89.60%</td> <td>98.54%</td> </tr> </table> <p>TEST RESULT: OK</p>	1	V	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	Output Current	0A	0.102	0.217	0.320	0.429	0.536	0.647	0.756	0.859	0.968	1.057	%	0.00%	9.70%	20.70%	30.50%	40.89%	51.05%	61.61%	71.96%	81.82%	92.20%	100.69%	2	PWM(100Hz)	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	Output Current	0A	0.093	0.206	0.311	0.415	0.519	0.624	0.729	0.836	0.941	1.035	%	0.00%	8.82%	19.61%	29.60%	39.54%	49.47%	59.38%	69.45%	79.58%	89.60%	98.54%
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<p>9</p>	<p>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 =0.452A/ 115VAC I =0.229A/ 230VAC I =0.199A/ 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	0.389W for Blank-Type 0.627W for A-Type 0.446W 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 =24.2A/ 230VAC Twidth =76us

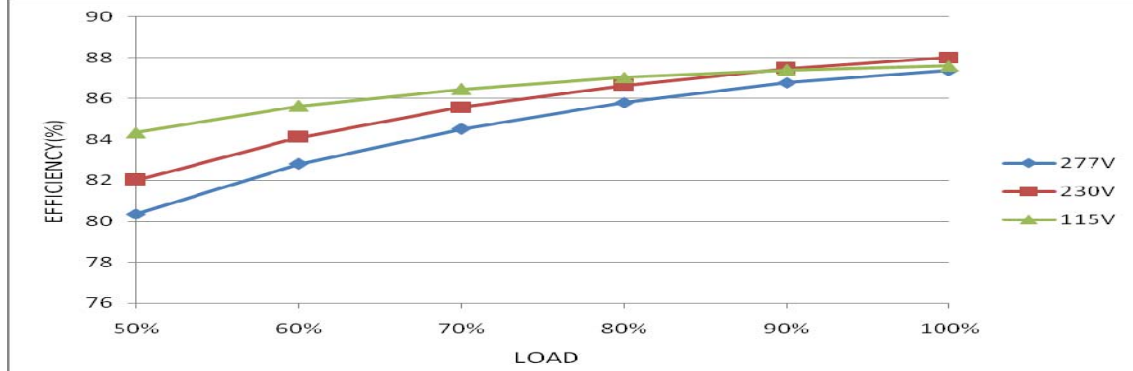
INPUT=230VAC/50HZ @ FULL LOAD

CH1: AC Input Voltage CH2: Input current



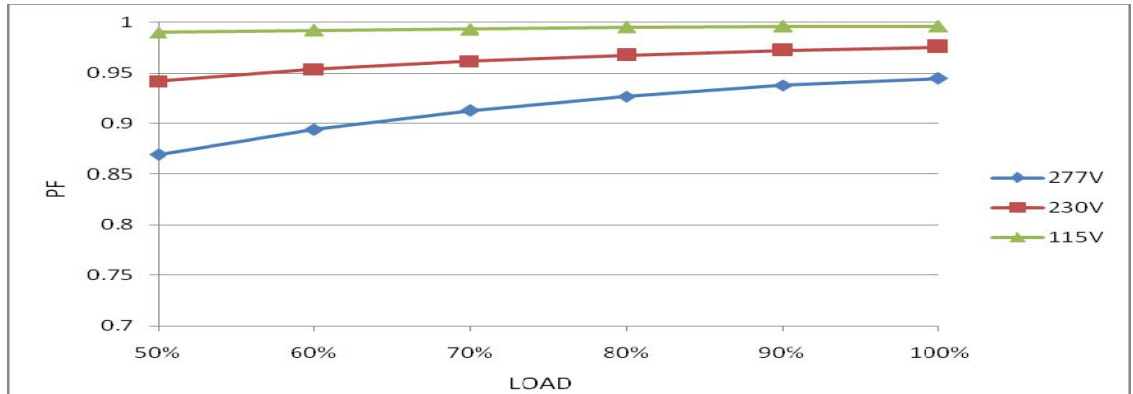
7	EFFICIENCY(Typ)	84%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	88.00%
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EFFICIENCY vs LOAD



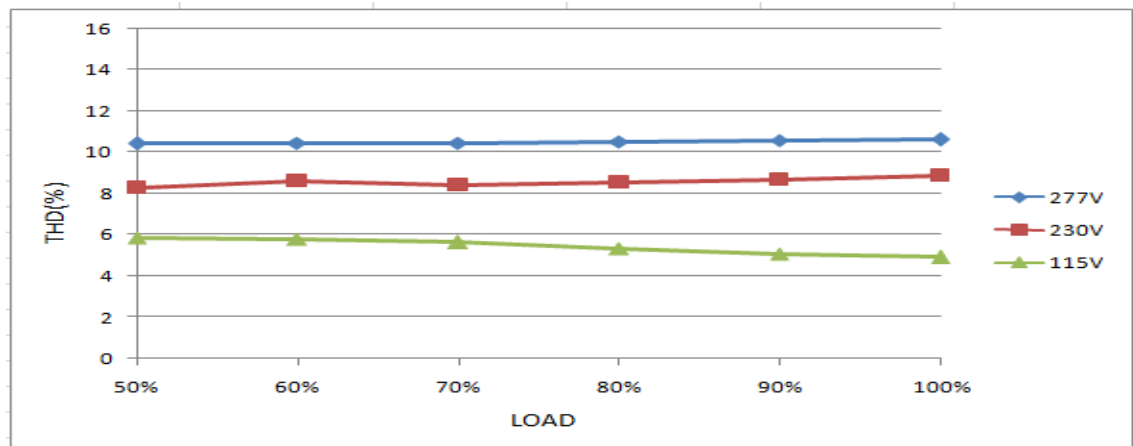
8	POWER FACTOR	0.95/ 115VAC 0.92/ 230VAC 0.90/ 277VAC	I/P: 115 VAC I/P: 230 VAC I/P: 277 VAC O/P: FULL LOAD Ta: 25°C	PF=0.996/ 115VAC PF=0.976/ 230VAC PF=0.945/ 277VAC
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P.F vs LOAD



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=6.58% @60% load /115VAC THD=8.23% @60% load /230VAC THD=10.45% @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/6A	I/P: High-Line +3V =298V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 580V (2) 522V (3) 576V
2	O/P Diode (MOSFET)	D100 Rated 400V/16A	I/P: High-Line +3V =298V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 316V (2) 343V (3) 312V
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) 17.7V (2) 17.7V (3) 17.6V
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) 498V (2) 478V

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: 2.578mA 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: ODLC-45-1050 1. ROOM AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 32.5℃ 2. HIGH AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 53.7℃																																																																		
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 32.5 ℃</th> <th>HIGH AMBIENT Ta=53.7 ℃</th> </tr> </thead> <tbody> <tr><td>1</td><td>L1</td><td>75.2℃</td><td>96.7℃</td></tr> <tr><td>2</td><td>BD1</td><td>71.5℃</td><td>92.6℃</td></tr> <tr><td>3</td><td>D1</td><td>73.5℃</td><td>95.3℃</td></tr> <tr><td>4</td><td>Q1</td><td>77.6℃</td><td>99.7℃</td></tr> <tr><td>5</td><td>U1</td><td>71.7℃</td><td>92.0℃</td></tr> <tr><td>6</td><td>T1</td><td>76.8℃</td><td>98.2℃</td></tr> <tr><td>7</td><td>C16</td><td>71.3℃</td><td>92.6℃</td></tr> <tr><td>8</td><td>RG1</td><td>79.5℃</td><td>100.6℃</td></tr> <tr><td>9</td><td>D100</td><td>75.2℃</td><td>96.2℃</td></tr> <tr><td>10</td><td>C201</td><td>69.3℃</td><td>90.2℃</td></tr> <tr><td>11</td><td>Q100</td><td>72.4℃</td><td>93.8℃</td></tr> <tr><td>12</td><td>L100</td><td>70.1℃</td><td>91.7℃</td></tr> <tr><td>13</td><td>C106</td><td>69.3℃</td><td>90.4℃</td></tr> <tr><td>14</td><td>C110</td><td>67.8℃</td><td>89.1℃</td></tr> <tr><td>15</td><td>TC</td><td>63.7℃</td><td>83.3℃</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta= 32.5 ℃	HIGH AMBIENT Ta=53.7 ℃	1	L1	75.2℃	96.7℃	2	BD1	71.5℃	92.6℃	3	D1	73.5℃	95.3℃	4	Q1	77.6℃	99.7℃	5	U1	71.7℃	92.0℃	6	T1	76.8℃	98.2℃	7	C16	71.3℃	92.6℃	8	RG1	79.5℃	100.6℃	9	D100	75.2℃	96.2℃	10	C201	69.3℃	90.2℃	11	Q100	72.4℃	93.8℃	12	L100	70.1℃	91.7℃	13	C106	69.3℃	90.4℃	14	C110	67.8℃	89.1℃	15	TC	63.7℃	83.3℃
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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 50 ℃ NO DAMAGE	I/P: 305VAC O/P: FULL LOAD Ta=50 ℃ HUMIDITY= 95 %R.H	TEST: OK																																																																
4	TEMPERATURE COEFFICIENT	±0.03 %/℃(0~40℃)	I/P: 230 VAC O/P: FULL LOAD	±0.001%/℃																																																																
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℃	TEST: OK
8	CAPACITOR LIFE CYCLE	ODL-45-1050: 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= 50 °C LIFE TIME (3) I/P: 230VAC O/P: 75% LOAD Ta= 50 °C LIFE TIME (4) I/P: 230VAC O/P: MIN LOAD Ta= 50 °C LIFE TIME	(1) 280778 HRS (2) 50053 HRS (3) 55816 HRS (4) 65277 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 408.8K hrs min. MIL-HDBK-217F (25℃)	
10	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure(Expected Life) : 30,000 hours @ Tcase 85℃ ; 50,000 hours @ Tcase 75℃	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	Carychen/ZHUOKB	SKY	LIUWY