



# Test Report: ELG-200-C1750

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200W 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

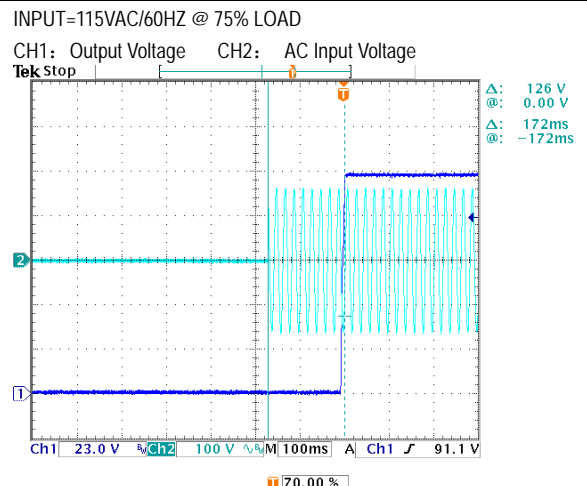
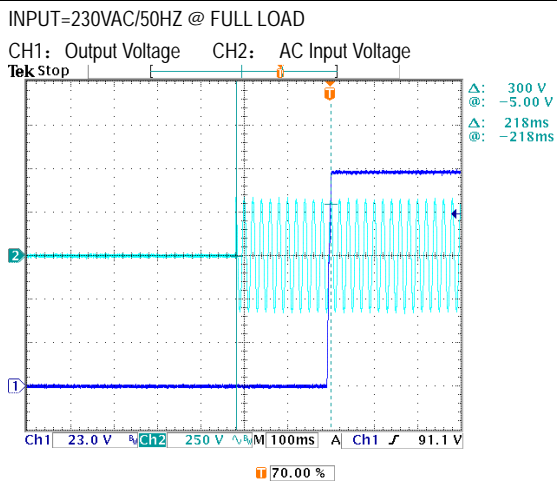
## ■ RELIABILITY TEST

Environment Test

## DESIGN VERIFY TEST

### OUTPUT FUNCTION TEST

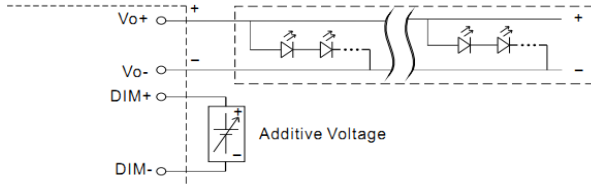
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONSTANT CURRENT REGION	57V-114V	I/P: 230VAC O/P: LED MODE Ta: 25°C	42V-114V
2	OUTPUT CURRENT ADJUST RANGE (For A-Type only)	875-1750mA	I/P: 230VAC O/P: SETTING Ta: 25°C	0.805 A- 1.909A
3	CURRENT RIPPLE	5.0% max.@rated current	I/P: 230VAC O/P: FULL/MIN LOAD Ta: 25°C	3.0%
4	CURRENT TOLERANCE	±5.0%	I/P: 230VAC O/P: FULL/MIN LOAD Ta: 25°C	±0.80%
5	OPEN CIRCUIT VOLTAGE (max)	120V	I/P: 230VAC O/P: NO LOAD Ta: 25°C	119.86V
6	SET UP TIME	500ms/230VAC 800ms/115VAC	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD/75% LOAD Ta: 25°C	218ms/230VAC 172ms/115VAC



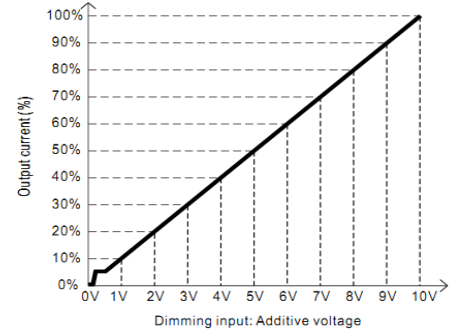
7 DIMMING OPERATION (for B-Type)

- Output constant current level can be adjusted by applying one of the three methodologies between DIM+ and DIM-: 0 ~ 10Vdc, or 10V PWM signal or resistance.
- Direct connecting to LEDs is suggested. It is not suitable to be used with additional drivers.
- Dimming source current from power supply: 100uA(typ.)

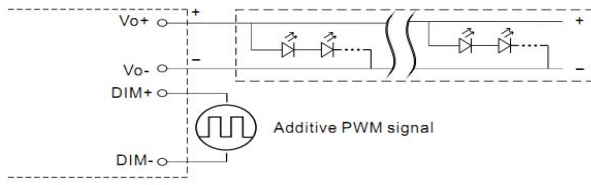
◎ Applying additive 0 ~ 10VDC



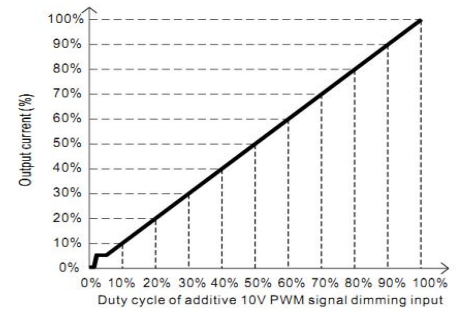
"DO NOT connect "DIM- to Vo-"



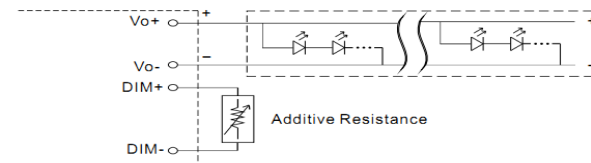
◎ Applying additive 10V PWM signal (frequency range 100Hz ~ 3KHz):



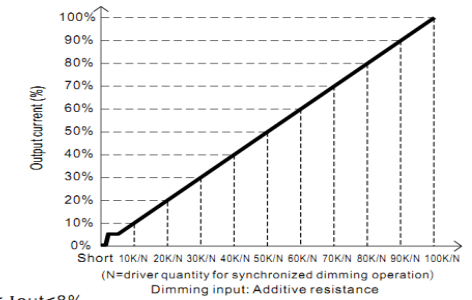
"DO NOT connect "DIM- to Vo-"



◎ Applying additive resistance:



"DO NOT connect "DIM- to Vo-"



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 0kΩ or 0Vdc, or 10V PWM signal with 0% duty cycle.

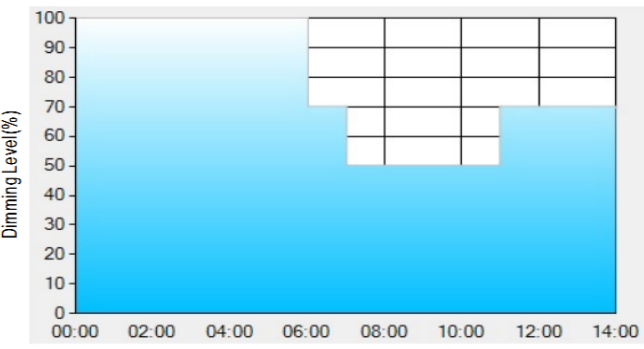
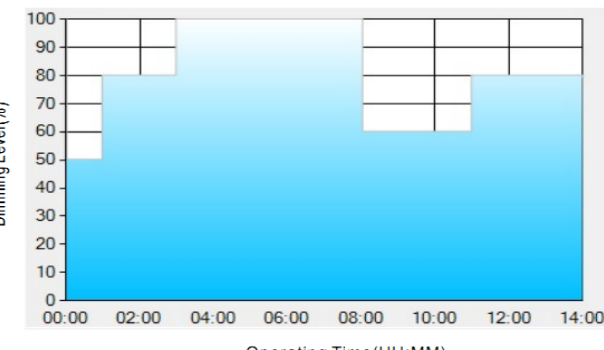
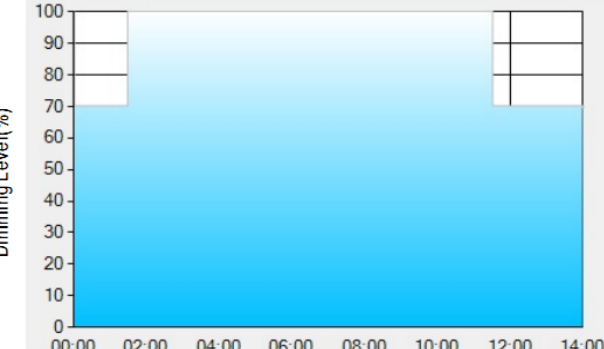
I/P: 230 VAC

O/P: DIMMING TEST

Ta: 25°C

	V	Short	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN
1	Output Current	0.00	0.199	0.375	0.550	0.726	0.903	1.079	1.255	1.431	1.607	1.747	1.762
	%	0%	11.37%	21.43%	31.43%	41.49%	41.60%	61.66%	71.71%	81.77%	91.83%	99.83%	100.69%
2	PWM(100Hz)	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
	Output Current	0.00	0.245	0.419	0.585	0.760	0.927	1.101	1.268	1.442	1.609	1.747	1.762
	%	0%	14.00%	23.94%	33.43%	43.43%	52.97%	62.91%	72.46%	82.40%	91.94%	99.83%	100.69%
3	R	0	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K	OPEN
	Output Current	0.00	0.204	0.384	0.567	0.748	0.933	1.117	1.304	1.482	1.649	1.748	1.762
	%	0%	11.66%	21.94%	32.40%	42.74%	53.31%	63.83%	74.51%	84.69%	94.23%	99.89%	100.69%

TEST RESULT: OK

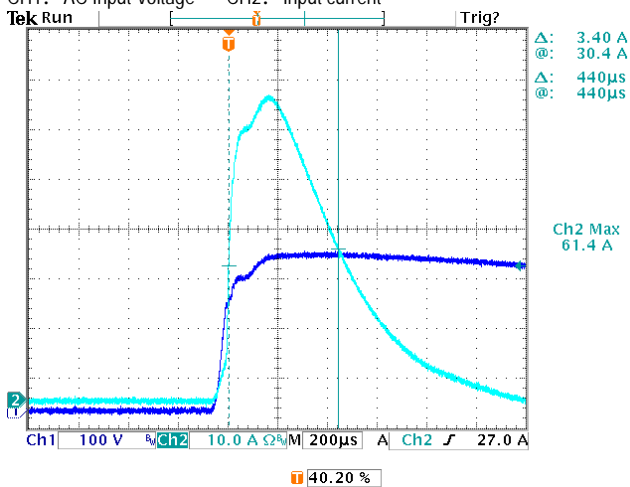
<p>8 DIMMING OPERATION (primary side;for DA-Type)</p>	<p>※DALI Interface          ·Apply DALI signal between DA+ and DA-.          ·DALI protocol comprises 16 groups and 64 addresses.          ·First step is fixed at 8% of output.Please contact MEAN WELL for other setup.</p> <p>I/P: 230 VAC          O/P: DIMMING TEST          Ta: 25°C          TEST RESULT: OK</p>																																													
<p>9 DIMMING OPERATION (for DXX-Type by User definition)</p>	<p>※Smart timer dimming function          ·MEAN WELL Smart timer dimming primarily provides the adaptive proportion dimming profile for the output constant current level to perform up to 14 consecutive hours.3 dimming profiles hereunder are defined accounting for the most frequently seen applications.If other options may be needed,Please contact MEAN WELL for other setup.          Ex : ☉ D01-Type: the profile recommended for residential lighting</p>  <p>Set up for D01-Type in Smart timer dimming software program:</p> <table border="1" data-bbox="965 772 1492 907"> <tr> <td></td> <td>T1</td> <td>T2</td> <td>T3</td> <td>T4</td> </tr> <tr> <td>TIME**</td> <td>06:00</td> <td>07:00</td> <td>11:00</td> <td>---</td> </tr> <tr> <td>LEVEL**</td> <td>100%</td> <td>70%</td> <td>50%</td> <td>70%</td> </tr> </table> <p>Ex : ☉ D02-Type: the profile recommended for street lighting</p>  <p>Set up for D02-Type in Smart timer dimming software program:</p> <table border="1" data-bbox="893 1187 1508 1321"> <tr> <td></td> <td>T1</td> <td>T2</td> <td>T3</td> <td>T4</td> <td>T5</td> </tr> <tr> <td>TIME**</td> <td>01:00</td> <td>03:00</td> <td>8:00</td> <td>11:00</td> <td>---</td> </tr> <tr> <td>LEVEL**</td> <td>50%</td> <td>80%</td> <td>100%</td> <td>60%</td> <td>80%</td> </tr> </table> <p>Ex : ☉ D03-Type: the profile recommended for tunnel lighting</p>  <p>Set up for D03-Type in Smart timer dimming software program:</p> <table border="1" data-bbox="981 1612 1412 1758"> <tr> <td></td> <td>T1</td> <td>T2</td> <td>T3</td> </tr> <tr> <td>TIME**</td> <td>01:30</td> <td>11:00</td> <td>---</td> </tr> <tr> <td>LEVEL**</td> <td>70%</td> <td>100%</td> <td>70%</td> </tr> </table> <p>I/P: 230 VAC          O/P: DIMMING TEST          Ta: 25°C          TEST RESULT: OK</p>		T1	T2	T3	T4	TIME**	06:00	07:00	11:00	---	LEVEL**	100%	70%	50%	70%		T1	T2	T3	T4	T5	TIME**	01:00	03:00	8:00	11:00	---	LEVEL**	50%	80%	100%	60%	80%		T1	T2	T3	TIME**	01:30	11:00	---	LEVEL**	70%	100%	70%
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LEVEL**	70%	100%	70%																																											

## INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	100VAC~305VAC	I/P: TESTING O/P: FULL LOAD Ta: 25°C	97V-305V
			I/P: (1)LOW-LINE-3V=97 V HIGH-LINE+10V=315 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: 100 VAC ~305 VAC O/P: FULL-MIN LOAD Ta: 25°C	TEST: OK
3	AC CURRENT	1.8A/115VAC 1.0A/230VAC 0.8A/277VAC	I/P: 115 VAC I/P: 230 VAC I/P: 277 VAC O/P: FULL LOAD Ta: 25°C	I =1.434A/ 115VAC I =0.927A/ 230VAC I =0.776A/ 277VAC
4	LEAKAGE CURRENT	< 0.75mA / 277VAC	I/P: 277 VAC O/P: NO LOAD Ta: 25°C	L-CASE: 0.428 mA N-CASE: 0.402 mA
5	NO LOAD/STANDBY POWER CONSUMPTION	<0.5W	I/P: 230VAC O/P: NO LOAD/STANDBY Ta: 25°C	0.402W
6	INRUSH CURRENT(Typ)	65A/230VAC Twidth =450 us measured at 50% Ipeak COLD START	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	I =61.4A/ 230VAC Twidth =440us

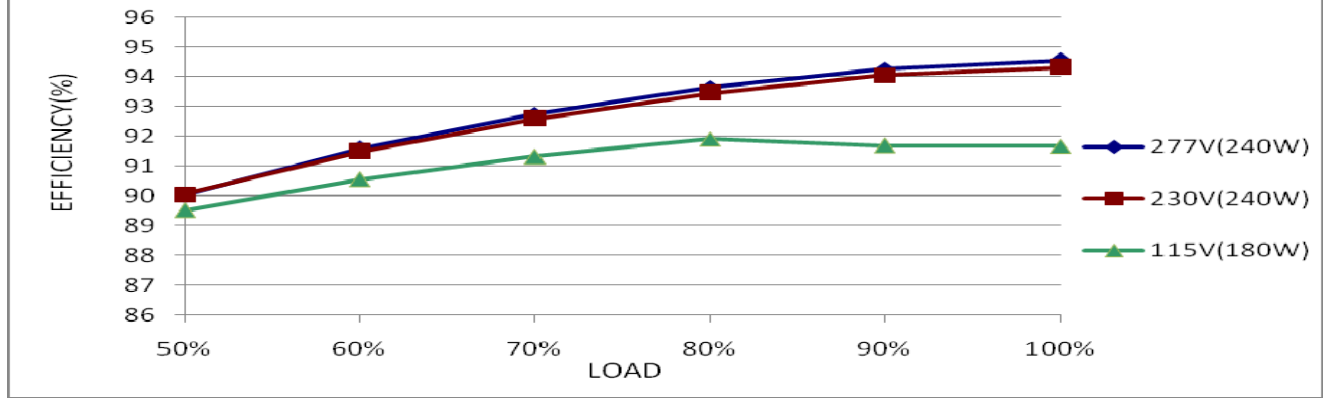
INPUT=230VAC/50HZ @ FULL LOAD

CH1: AC Input Voltage CH2: Input current



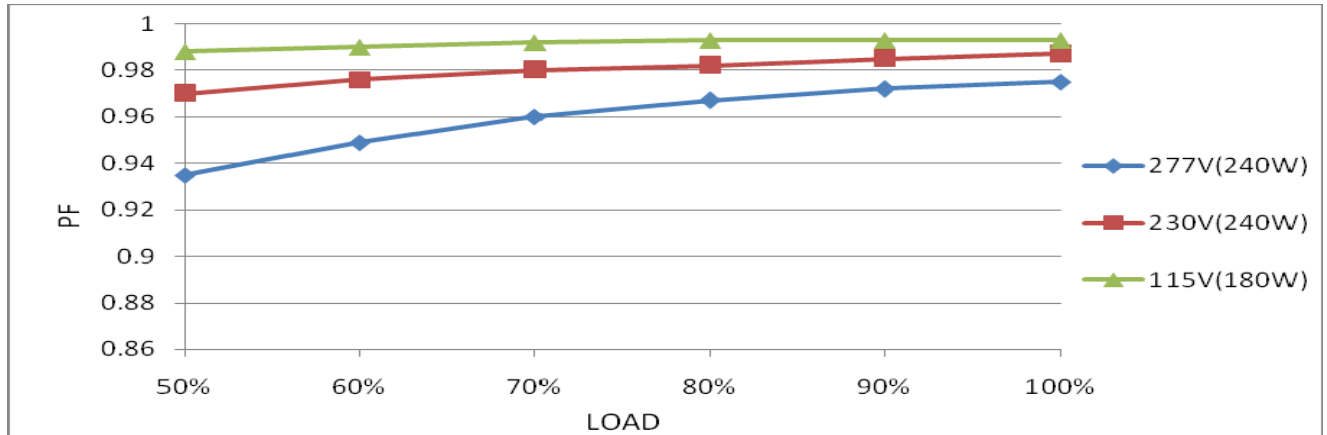
7	EFFICIENCY(Typ)	92%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	94.30%
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EFFICIENCY vs LOAD



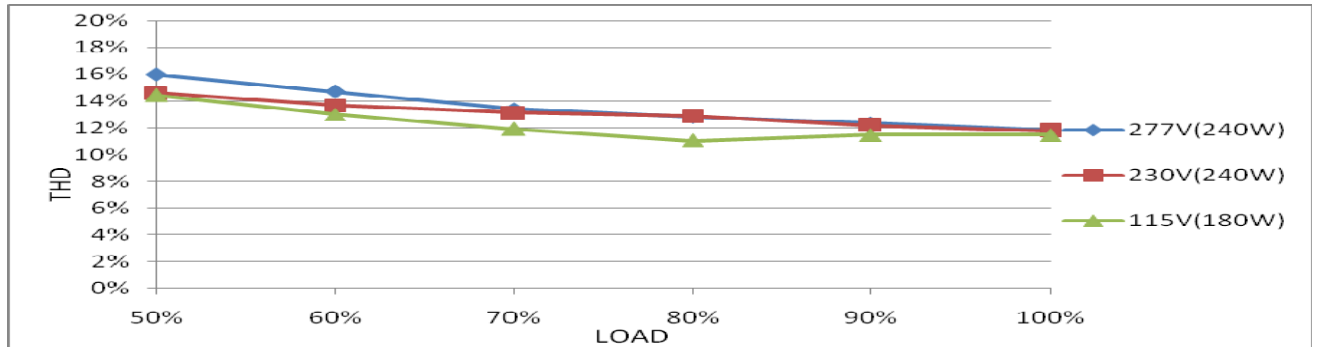
8	POWER FACTOR	0.97/ 115VAC 0.95/ 230VAC 0.92/ 277VAC	I/P: 115 VAC I/P: 230 VAC I/P: 277 VAC O/P: FULL LOAD Ta: 25°C	PF=0.993 /115VAC PF=0.987 /230VAC PF=0.975 /277VAC
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P.F vs LOAD



9	TOTAL HARMONIC DISTORTION	THD<20% (@load ≥50%/115VAC, 230VAC; @load ≥75%/277VAC)	I/P: 115 VAC/50% LOAD I/P: 230 VAC/50% LOAD I/P: 277 VAC/75% LOAD Ta: 25°C	THD=14.43% @50% load /115VAC THD=14.61% @50% load /230VAC THD=13.10% @75% load /277VAC
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THD vs LOAD



## PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER VOLTAGE PROTECTION	125V~150V	I/P: 100VAC I/P: 230VAC I/P: 305VAC O/P: NO LOAD Ta: 25°C	135.49 V/ 100VAC 135.52 V/ 230VAC 135.50 V/ 305VAC Shut down o/p voltage, re-power on to recovery
2	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P: 200VAC I/P: 230VAC I/P: 305VAC O/P: FULL LOAD	O.T.P. Active Shut down o/p voltage, re-power on to recovery
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 100VAC I/P: 305VAC 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 2 Rated 600V/11A	I/P: High-Line +3V =308V O/P: (1) FULL LOAD Turn on (2) Output Short (3) FULL LOAD continue Ta: 25°C	(1) 506 V (2) 5.1 V (3) 442 V
2	O/P Diode (MOSFET)	D103 Rated 400V/10A	I/P: High-Line +3V =308V O/P: (1) FULL LOAD Turn on (2) Output Short (3) FULL LOAD continue Ta: 25°C	(1) 248 V (2) 54.0 V (3) 243 V
3	Input Capacitor	C5 Rated 100u/ 450V	I/P: High-Line +3V =308 V O/P: (1) FULL LOAD input on/off (2) NO LOAD input on /Off (3) FULL LOAD /NO LOAD Change Ta: 25°C	(1) 448 V (2) 444 V (3) 440 V
4	Control IC	U3 Rated 20V (MAX.)	I/P: High-Line +3V =308 V O/P: ((1) FULL LOAD (2) Output Short (3) O.V.P Ta: 25°C	(1) 16.1 V (2) 16.1 V (3) 16.1 V
5	PFC Power Transistor	Q 3 Rated 600V/20A	I/P: High-Line +3V =308V O/P: (1) FULL LOAD Turn on (2) Output Short (3) FULL LOAD continue Ta: 25°C	(1) 542 V (2) 448 V (3) 480 V

## SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 3.75KVAC/min I/P-FG: 2.0KVAC/min O/P-FG: 1.5KVAC/min	I/P-O/P: 4.2 KVAC/min I/P-FG: 2.4 KVAC/min O/P-FG: 1.8 KVAC/min Ta: 25°C	I/P-O/P: 2.784 mA I/P-FG: 3.025 mA O/P-FG: 2.588 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: >9999 MΩ I/P-FG: >9999 MΩ O/P-FG: >9999 MΩ

## E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS C	I/P: 230VAC/50HZ O/P: FULL /50% 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 INDUSTRY L-N: 4KV L,N-PE: 6KV	I/P: 230VAC/50HZ O/P: FULL LOAD L-N: 4KV L,N-PE: 6KV Ta: 25°C	CRITERIA A
7	Test by certified Lab & Test Report Prepare			

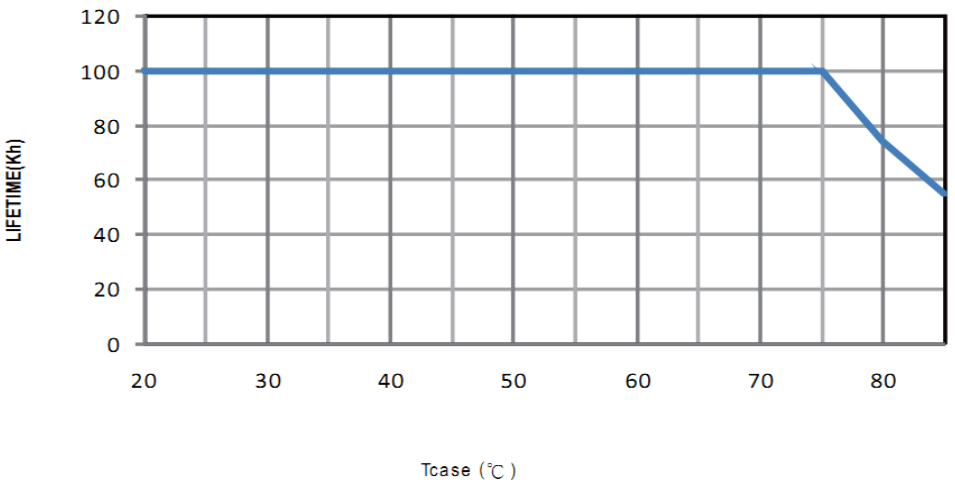


## RELIABILITY TEST

### ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																																																
1	TEMPERATURE RISE TEST	MODEL: ELG-200-C2100 1. ROOM AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta=32.4 °C 2. HIGH AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta=59.6 °C																																																																																		
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=32.4 °C</th> <th>HIGH AMBIENT Ta=59.6 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>BD1</td><td>61.7°C</td><td>84.9°C</td></tr> <tr><td>2</td><td>C7</td><td>59.5°C</td><td>82.8°C</td></tr> <tr><td>3</td><td>L2</td><td>60.1°C</td><td>83.3°C</td></tr> <tr><td>4</td><td>Q3</td><td>61.1°C</td><td>84.3°C</td></tr> <tr><td>5</td><td>D3</td><td>59.2°C</td><td>82.4°C</td></tr> <tr><td>6</td><td>Q2</td><td>58.8°C</td><td>82.2°C</td></tr> <tr><td>7</td><td>Q1</td><td>59.3°C</td><td>82.6°C</td></tr> <tr><td>8</td><td>C5</td><td>57.6°C</td><td>80.3°C</td></tr> <tr><td>9</td><td>L3</td><td>61.1°C</td><td>83.8°C</td></tr> <tr><td>10</td><td>C16</td><td>59.5°C</td><td>81.9°C</td></tr> <tr><td>11</td><td>T1</td><td>68.2°C</td><td>90.5°C</td></tr> <tr><td>12</td><td>D102</td><td>64.6°C</td><td>87.2°C</td></tr> <tr><td>13</td><td>D103</td><td>65.1°C</td><td>87.8°C</td></tr> <tr><td>14</td><td>C102</td><td>61.3°C</td><td>83.9°C</td></tr> <tr><td>15</td><td>C103</td><td>54.9°C</td><td>77.9°C</td></tr> <tr><td>16</td><td>U3</td><td>57.6°C</td><td>81.1°C</td></tr> <tr><td>17</td><td>C45</td><td>57.9°C</td><td>80.7°C</td></tr> <tr><td>18</td><td>RTH2</td><td>58.2°C</td><td>81.4°C</td></tr> <tr><td>19</td><td>TC</td><td>52.5°C</td><td>76.0°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta=32.4 °C	HIGH AMBIENT Ta=59.6 °C	1	BD1	61.7°C	84.9°C	2	C7	59.5°C	82.8°C	3	L2	60.1°C	83.3°C	4	Q3	61.1°C	84.3°C	5	D3	59.2°C	82.4°C	6	Q2	58.8°C	82.2°C	7	Q1	59.3°C	82.6°C	8	C5	57.6°C	80.3°C	9	L3	61.1°C	83.8°C	10	C16	59.5°C	81.9°C	11	T1	68.2°C	90.5°C	12	D102	64.6°C	87.2°C	13	D103	65.1°C	87.8°C	14	C102	61.3°C	83.9°C	15	C103	54.9°C	77.9°C	16	U3	57.6°C	81.1°C	17	C45	57.9°C	80.7°C	18	RTH2	58.2°C	81.4°C	19	TC	52.5°C	76.0°C
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16	U3	57.6°C	81.1°C																																																																																	
17	C45	57.9°C	80.7°C																																																																																	
18	RTH2	58.2°C	81.4°C																																																																																	
19	TC	52.5°C	76.0°C																																																																																	
2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 305VAC/100VAC O/P: FULL LOAD/75% LOAD Ta= -45°C / -30°C	TEST: OK																																																																																
3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 60°C NO DAMAGE	I/P: 305VAC O/P: FULL LOAD Ta=60°C HUMIDITY= 95 %R.H	TEST: OK																																																																																
4	TEMPERATURE COEFFICIENT	±0.03 %/°C (0-60°C)	I/P: 230 VAC O/P: FULL LOAD	±0.001 %/°C (0-60°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		TEST: OK																																																																																



6	THERMAL SHOCK TEST	1. Thermal shock Temperature: -45°C ~ +65°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/ 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: 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	ELG-200-C2100: SUPPOSE C103 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= 60 °C LIFE TIME (3) I/P: 230VAC O/P: 75% LOAD Ta= 60 °C LIFE TIME (4) I/P: 230VAC O/P: MIN LOAD Ta= 60 °C LIFE TIME	(1) 579103 HRS (2) 68433 HRS (3) 70329 HRS (4) 78500 HRS																				
9	MTBF	Conducted by Parts Stress Analysis Prediction 958.9K hrs min. Telcordia SR-332 (Bellcore) 235K hrs min. MIL-HDBK-217F (25°C)																					
10	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): Above 50000 hours @ Tc 85°C  <table border="1" data-bbox="478 1086 1436 1568"> <caption>Graph Data: Lifetime vs Tcase</caption> <thead> <tr> <th>Tcase (°C)</th> <th>Lifetime (kh)</th> </tr> </thead> <tbody> <tr><td>20</td><td>100</td></tr> <tr><td>30</td><td>100</td></tr> <tr><td>40</td><td>100</td></tr> <tr><td>50</td><td>100</td></tr> <tr><td>60</td><td>100</td></tr> <tr><td>70</td><td>100</td></tr> <tr><td>75</td><td>100</td></tr> <tr><td>80</td><td>75</td></tr> <tr><td>85</td><td>55</td></tr> </tbody> </table>		Tcase (°C)	Lifetime (kh)	20	100	30	100	40	100	50	100	60	100	70	100	75	100	80	75	85	55
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TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	CHENZH/ZHUOKB	SKY	LIUWY