Test Report： ELGC-300-L

300W Constant Power 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

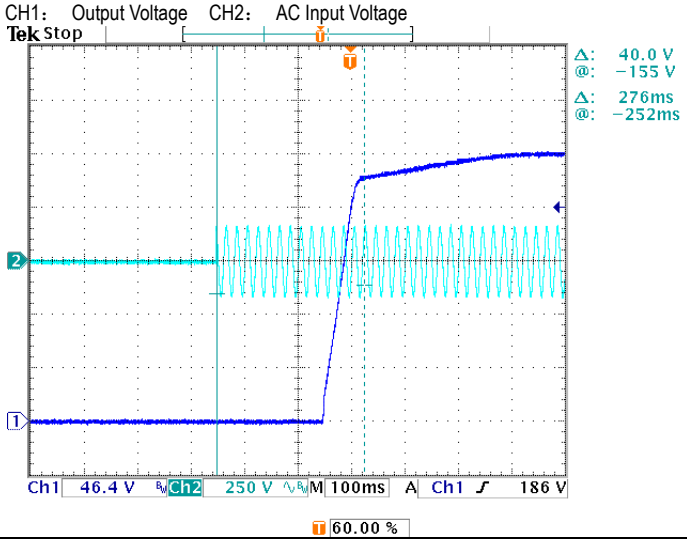
■ DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CURRENT TOLERANCE	±5%	I/P：100 VAC / 305 VAC O/P：FULL/ MIN LOAD Ta：25℃	<±5%
2	CONSTANT CURRENT REGION	116 V~ 232 V	I/P： 230 VAC O/P：FULL LOAD Ta：25℃	27 V~ 232 V
3	OPEN CIRCUIT VOLTAGE (max.)	240 V	I/P： 230 VAC O/P：NO LOAD	235.5V
4	CURRENT RIPPLE	5.0% max. @rated current	I/P： 230 VAC O/P： FULL LOAD Ta：25℃	1.5%
5	CURRENT ADJ. RANGE	0.65A ~ 2.0 A	I/P: 230 VAC O/P：TESTING Ta：25℃	0.65 A ~ 2.2A
6	CONSTANT POWER	O/P：301.6W	I/P：230 VAC O/P：Vo×Io	TEST：OK
7	SET UP TIME(Max)	500ms/115VAC 500ms/230VAC	I/P： 115 VAC I/P： 230 VAC O/P：FULL LOAD Ta：25℃	276 ms/115 VAC 276 ms/230 VAC

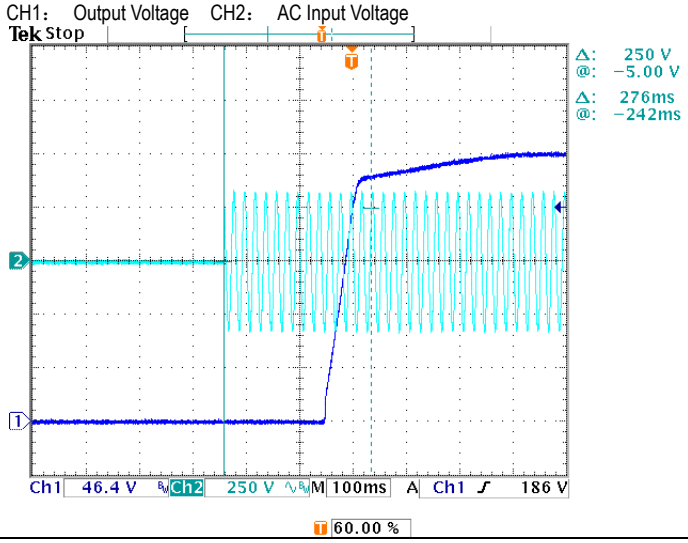
INPUT=115VAC/50HZ @ FULL LOAD

CH1： Output Voltage CH2： AC Input Voltage



INPUT=230 VAC/50HZ @ FULL LOAD

CH1： Output Voltage CH2： AC Input Voltage

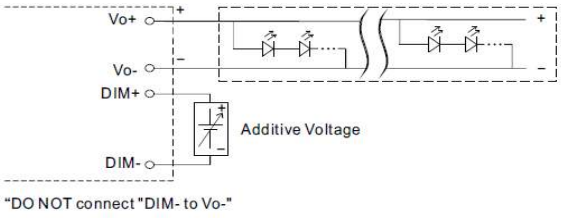


8 DIMMING OPERATION (for AB-Type)

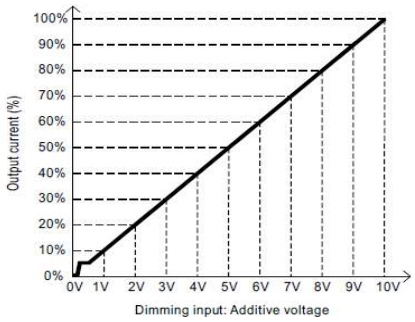
※ **3 in 1 dimming function(for B-Type)**

- 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: 100μA (typ.)

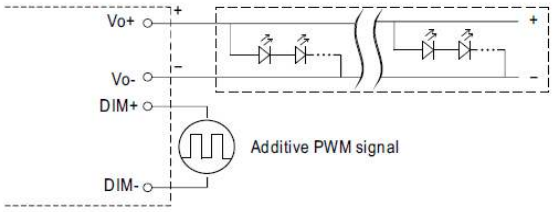
◎ Applying additive 0 ~ 10VDC



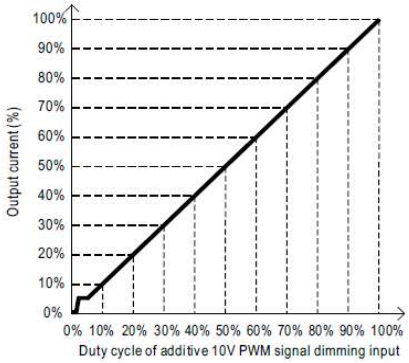
"DO NOT connect "DIM- to Vo-"



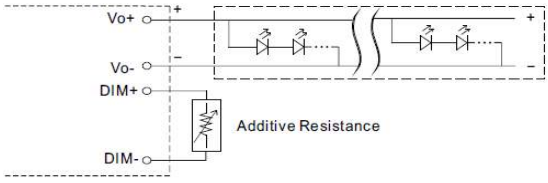
◎ Applying additive 10V PWM signal (frequency range 100Hz ~ 3KHz):



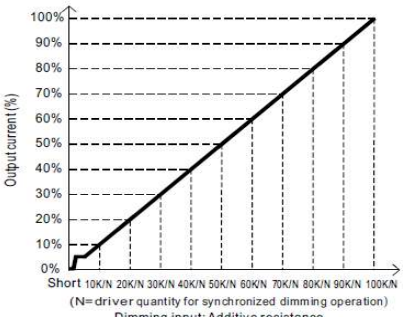
"DO NOT connect "DIM- to Vo-"



◎ 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℃

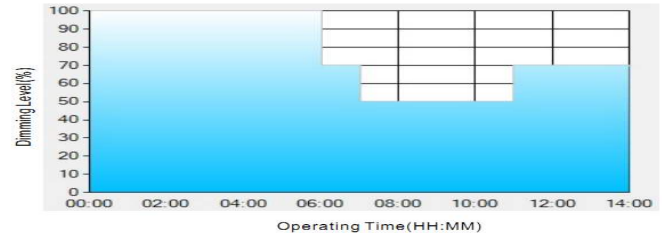
	DIMMING	Short	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN
1	Output Current	0	0.1477A	0.2865A	0.4060A	0.5257A	0.6665A	0.7929A	0.9363A	1.0580A	1.1897A	1.3053A	1.3055A
	%	0%	11.36%	22.04%	31.23%	40.44%	51.27%	60.99%	72.02%	81.38%	91.52%	100.41%	100.42%
2	PWM	0V	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
	Output Current	0	0.1554A	0.2730A	0.4200A	0.5326A	0.6560A	0.8000A	0.9217A	1.0550A	1.1836A	1.3082A	1.3084A
	%	0%	11.95%	21.00%	32.31%	40.97%	50.46%	61.54%	70.90%	81.15%	91.05%	100.63%	100.65%
3	R	0%	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K	OPEN
	Output Current	0	0.1495A	0.2680A	0.4080A	0.5277A	0.6480A	0.7945A	0.9178A	1.0490A	1.1800A	1.3000A	1.3064A
	%	0%	11.50%	20.62%	31.38%	40.59%	49.85%	61.12%	70.60%	80.69%	90.77%	100.00%	100.49%

TEST RESULT：OK

TEST RESULT：OK

9	DIMMING OPERATION (for DXX-Type by User definition)	※ **DALI Interface (primary side; for DA-Type)** • Apply DALI signal between DA+ and DA-. • DALI protocol comprises 16 groups and 64 addresses. • First step is fixed at 8% of output. TEST RESULT：OK ※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 details.

Ex : ◎ D01-Type: the profile recommended for residential lighting

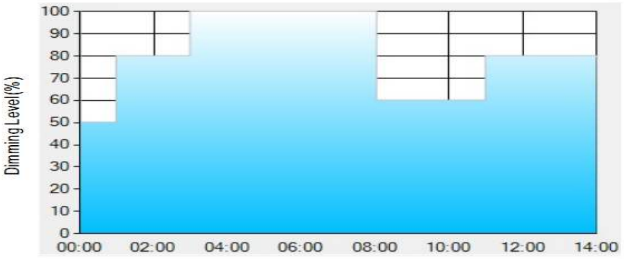


Set up for D01-Type in Smart timer dimming software program:

	T1	T2	T3	T4
TIME**	06:00	07:00	11:00	---
LEVEL**	100%	70%	50%	70%

**: TIME matches Operating Time in the diagram whereas LEVEL matches Dimming Level.
Example: If a residential lighting application adopts D01-Type, when turning on the power supply at 6:00pm, for instance:
[1] The power supply will switch to the constant current level at 100% starting from 6:00pm.
[2] The power supply will switch to the constant current level at 70% in turn, starting from 0:00am, which is 06:00 after the power supply turns on.
[3] The power supply will switch to the constant current level at 50% in turn, starting from 1:00am, which is 07:00 after the power supply turns on.
[4] The power supply will switch to the constant current level at 70% in turn, starting from 5:00am, which is 11:00 after the power supply turns on. The constant current level remains till 8:00am, which is 14:00 after the power supply turns on.

Ex: ◎ D02-Type: the profile recommended for street lighting

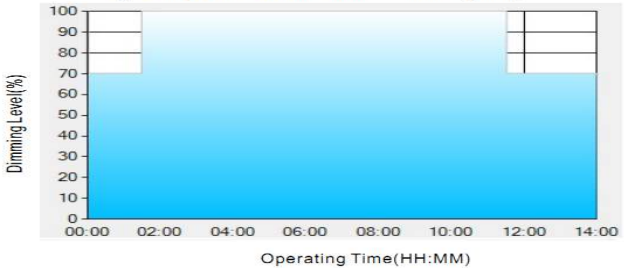


Set up for D02-Type in Smart timer dimming software program:

	T1	T2	T3	T4	T5
TIME**	01:00	03:00	8:00	11:00	---
LEVEL**	50%	80%	100%	60%	80%

**: TIME matches Operating Time in the diagram whereas LEVEL matches Dimming Level.
Example: If a street lighting application adopts D02-Type, when turning on the power supply at 5:00pm, for instance:
[1] The power supply will switch to the constant current level at 50% starting from 5:00pm.
[2] The power supply will switch to the constant current level at 80% in turn, starting from 6:00pm, which is 01:00 after the power supply turns on.
[3] The power supply will switch to the constant current level at 100% in turn, starting from 8:00pm, which is 03:00 after the power supply turns on.
[4] The power supply will switch to the constant current level at 60% in turn, starting from 1:00am, which is 08:00 after the power supply turns on.
[5] The power supply will switch to the constant current level at 80% in turn, starting from 4:00am, which is 11:00 after the power supply turns on. The constant current level remains till 6:30am, which is 14:00 after the power supply turns on.

Ex: ◎ D03-Type: the profile recommended for tunnel lighting

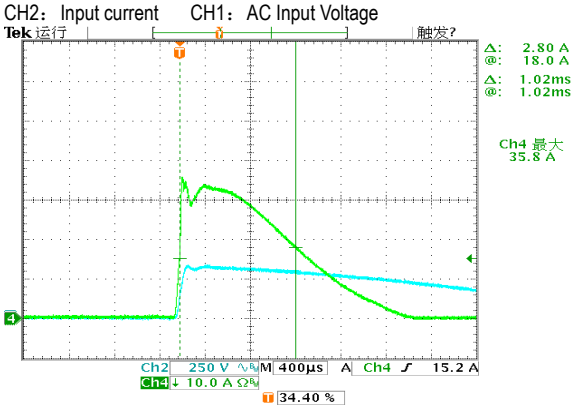


Set up for D03-Type in Smart timer dimming software program:

	T1	T2	T3
TIME**	01:30	11:00	---
LEVEL**	70%	100%	70%

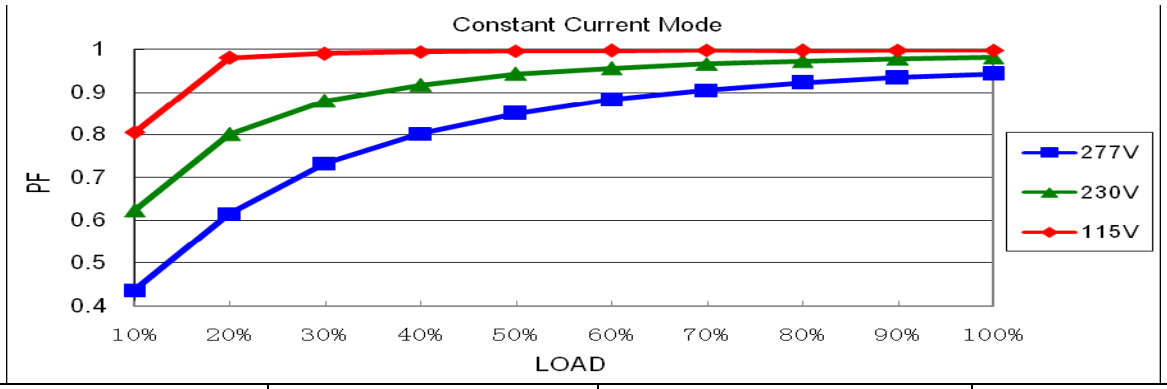
**: TIME matches Operating Time in the diagram whereas LEVEL matches Dimming Level.
Example: If a tunnel lighting application adopts D03-Type, when turning on the power supply at 4:30pm, for instance:
[1] The power supply will switch to the constant current level at 70% starting from 4:30pm.
[2] The power supply will switch to the constant current level at 100% in turn, starting from 6:00pm, which is 01:30 after the power supply turns on.
[3] The power supply will switch to the constant current level at 70% in turn, starting from 5:00am, which is 11:00 after the power supply turns on.
The constant current level remains till 6:30am, which is 14:00 after the power supply turns on.
TEST RESULT：OK

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	90VAC~305 VAC	I/P：TESTING O/P：FULL LOAD (PLEASE CHECK DERATING CURVE) Ta：25℃	87V~305 V
			I/P： LOW-LINE-3V=87 V HIGH-LINE+10V=315 V O/P：FULL/MIN LOAD (PLEASE CHECK DERATING CURVE) ON：30 Sec OFF：30 Sec 10MIN (POWER ON/OFF NO DAMAGE)	TEST：OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P： 90 VAC ~305 VAC O/P：FULL~NO LOAD Ta：25℃	TEST：OK
3	AC CURRENT	115VAC/ 3.0 A 230 VAC/ 1.6 A 277 VAC/ 1.3 A	I/P： 115 VAC I/P： 230 VAC I/P： 277 VAC O/P：FULL LOAD Ta：25℃	I =2.821A/ 115VAC I = 1.401A/ 230VAC I = 1.207A/277VAC
4	LEAKAGE CURRENT	< 0.75mA / 277VAC	I/P： 277 VAC O/P：NO LOAD Ta：25℃	L-FG： 0.364mA N-FG： 0.356mA
5	STANDBY POWER CONSUMPTION	<0.5W for A/B/DA-Type	I/P：230VAC O/P：NO LOAD/STANDBY Ta：25℃	0.40W
6	INRUSH CURRENT(Typ)	230 V/ 45A COLD START (twidth=1300us measured at 50% Ipeak) COLD START at 230V	I/P： 230 VAC O/P：FULL LOAD Ta：25℃	I=35.8A/ 230VAC Twidth = 1020 us
	INPUT=230VAC/50HZ @ FULL LOAD CH2：Input current CH1：AC Input Voltage 			

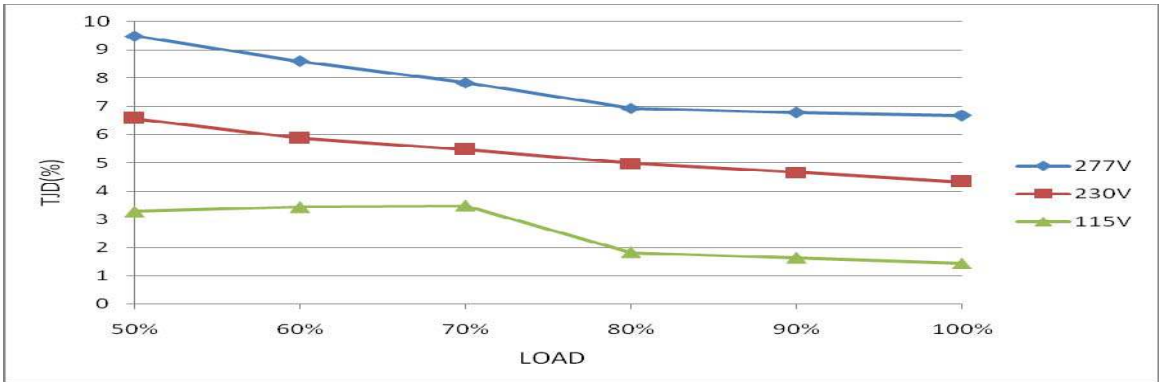
7	POWER FACTOR	0.97/ 115VAC@ FULL LOAD 0.95/ 230VAC@ FULL LOAD 0.92/ 277VAC@ FULL LOAD	I/P： 115 VAC I/P： 230 VAC I/P： 277 VAC O/P：FULL LOAD Ta：25℃	PF=0.998@ FULL LOAD /115VAC PF=0.981 @ FULL LOAD /230VAC PF=0.943@ FULL LOAD /277VAC

PF vs LOAD



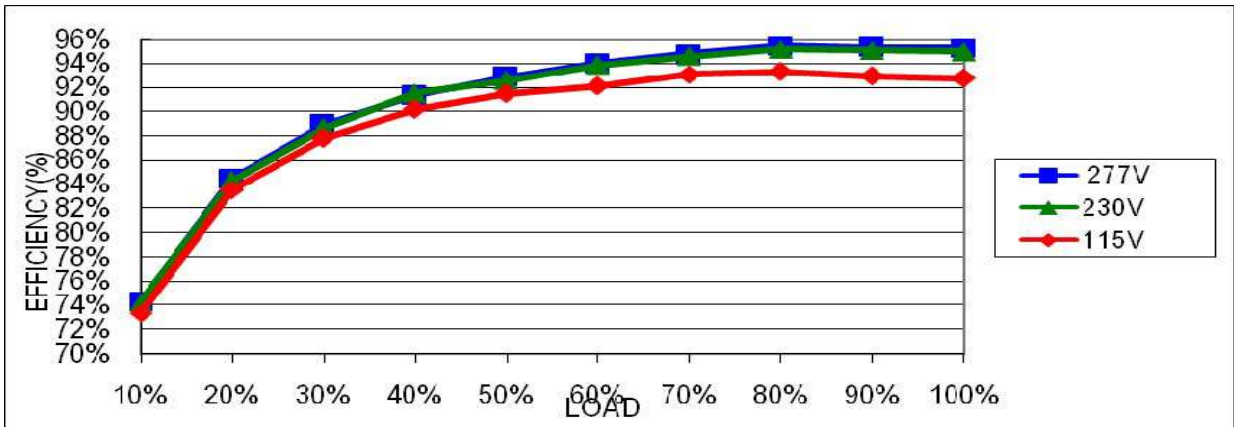
8	TOTAL HARMONIC DISTORTION	THD＜10% （@load≥50%/115VAC； @load≥50%/230VAC； @load≥75%/277VAC）	I/P： 115 VAC I/P： 230 VAC I/P： 277 VAC O/P：50% /75% LOAD Ta：25℃	THD=3.23% @50% load /115VAC THD=6.56% @50% load /230VAC THD=7.22% @75% load /277VAC

THD vs LOAD



9	EFFICIENCY(Typ)	94.5%	I/P： 230VAC O/P：FULL LOAD Ta：25℃	95.01%

EFFICIENCY vs LOAD



PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER VOLTAGE PROTECTION	241V~275V	I/P： 100VAC I/P： 230VAC I/P： 305VAC O/P： NO LOAD	249.07V/ 100VAC 249.08V/ 230VAC 248.99V/ 305VAC Shut down o/p voltage,re-power on to recovery
2	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P： 100VAC I/P： 230VAC I/P： 305VAC O/P：FULL LOAD	O.T.P. Active Tcase>85℃±5℃, derate power automatically by 6%/℃ max
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P： 100VAC I/P： 230VAC I/P： 305VAC O/P： FULL LOAD Ta：25℃	NO DAMAGE constant current limiting ,recovers automatically after fault condition is removed

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q5 Rated 23.9A/ 600V	I/P：High-Line +3V =308V O/P： (1) Full Load Turn on (2) Output Short (3) Full load continue Ta：25℃	(1) 442V (2) 448V (3) 446V
2	PFC Transistor	Q1 Rated 22A/600V	I/P：High-Line +3V =308V O/P: (1)Full Load (2)Output Short (3) Full Load continue	(1) 490V (2) 452V (3) 486V
3	P.F.C DIODE	D1 Rated 10 A/ 600 V	I/P：High-Line +3V =308V O/P： (1) Full Load Turn on (2) Output Short (3) Full load continue Ta：25℃	(1) 442V (2) 436V (3) 446V
4	Diode Peak Voltage	Q100 Rated 10A/600V	I/P：High-Line +3V =308V O/P: (1)Full Load (2)Output Short (3) Full Load continue (4) No Load Ta：25℃	(1) 492V (2) 42V (3)486V (4) 494V
5	Input Capacitor Voltage	C5 Rated： 150 μ/ 450 V	I/P：High-Line +3V =308 V O/P: (1)Full Load input on/off (2) Min load input on /Off (3)Full Load /Min load Change (4)Full load continue Ta：25℃	(1) 440V (2) 438V (3) 446V (4) 444V

6	Control IC Voltage Test	U2 Rated 16 V	I/P：High-Line +3V =308V O/P(1)FULL LOAD (2) Output Short (3)O.V.P. (4)NO LOAD VR.LOW LINE Ta：25℃	 (1) 13.4V (2) 13.4V (3) 13.4V (4) 13.4V

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P： 3.75KVAC/min I/P-FG： 2 KVAC/min<4.5mA O/P-FG：1.5KVAC/min	I/P-O/P： 4.125 KVAC/min I/P-FG： 2.4KVAC/min O/P-FG： 1.8 KVAC/min Ta：25℃	I/P-O/P： 2.304 mA I/P-FG： 2.455mA O/P-FG： 2.764mA 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℃	I/P-O/P： >9999GΩ I/P-FG： >1004 G Ω O/P-FG： >999 G Ω NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25℃	27mΩ

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℃	PASS
2	CONDUCTION	EN55015	I/P：230 VAC/50HZ O/P：FULL LOAD Ta：25℃	PASS
3	RADIATION	EN55015	I/P：230 VAC/50HZ O/P：FULL LOAD Ta：25℃	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℃	PASS
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT：2KV	I/P： 230VAC/50HZ O/P：FULL LOAD Ta：25℃	PASS
6	SURGE	EN61000-4-5 LIGHT INDUSTRY L-N ： 4KV L -PE：6KV	I/P： 230VAC/50HZ O/P：FULL LOAD Ta：25℃	PASS
7	Test by certified Lab ＆ Test Report Prepare. Any contradictions of the test results please refer to the latest EMC test report.			

■ RELIABILITY TEST

ENVIRONMENT TEST

<table>
<tr><th>NO</th><th>TEST ITEM</th><th>SPECIFICATION</th><th>TEST CONDITION</th><th>RESULT</th></tr>
<tr><td>1</td><td>TEMPERATURE RISE TEST</td><td colspan="3">MODEL： ELGC-300-L
1. ROOM AMBIENT BURN-IN：2 HRS
I/P： 230VAC O/P： FULL LOAD Ta= 27.8℃
2. HIGH AMBIENT BURN-IN： 2 HRS
I/P： 230VAC O/P： FULL LOAD Ta=43.6℃
<table>
<tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta= 27.8 ℃</th><th>HIGH AMBIENT Ta=43.6 ℃</th></tr>
<tr><td>1</td><td>RT1</td><td>62.2℃</td><td>78.1℃</td></tr>
<tr><td>2</td><td>L1</td><td>63.5℃</td><td>79.2℃</td></tr>
<tr><td>3</td><td>BD1</td><td>68.1℃</td><td>79.5℃</td></tr>
<tr><td>4</td><td>C5</td><td>62.7℃</td><td>79.9℃</td></tr>
<tr><td>5</td><td>Q1</td><td>63.9℃</td><td>76.2℃</td></tr>
<tr><td>6</td><td>D1</td><td>65.6℃</td><td>78.3℃</td></tr>
<tr><td>7</td><td>Q6</td><td>64.3℃</td><td>77.9℃</td></tr>
<tr><td>8</td><td>Q5</td><td>65.1℃</td><td>79.1℃</td></tr>
<tr><td>9</td><td>U2</td><td>62.9℃</td><td>89.7℃</td></tr>
<tr><td>10</td><td>R8</td><td>63.6℃</td><td>81.0℃</td></tr>
<tr><td>11</td><td>C41</td><td>63.9℃</td><td>80.8℃</td></tr>
<tr><td>12</td><td>T1</td><td>73.4℃</td><td>80.8℃</td></tr>
<tr><td>13</td><td>Q100</td><td>65.5℃</td><td>73.7℃</td></tr>
<tr><td>14</td><td>Q101</td><td>65.4℃</td><td>71.9℃</td></tr>
<tr><td>15</td><td>U107</td><td>66.0℃</td><td>84.2℃</td></tr>
<tr><td>16</td><td>C103</td><td>61.1℃</td><td>82.4℃</td></tr>
<tr><td>17</td><td>C107</td><td>58.4℃</td><td>88.7℃</td></tr>
<tr><td>18</td><td>T500</td><td>68.3℃</td><td>83.2℃</td></tr>
<tr><td>19</td><td>C562</td><td>66.6℃</td><td>78.5℃</td></tr>
<tr><td>20</td><td>U510</td><td>71.6℃</td><td>78.1℃</td></tr>
</table></td></tr>
<tr><td>2</td><td>LOW TEMPERATURE
TURN ON TEST</td><td>TURN ON AFTER 2 HOUR</td><td>I/P： 305VAC/100VAC
O/P：FULL LOAD/85% LOAD
Ta= -45℃/-35℃</td><td>TEST：OK</td></tr>
<tr><td>3</td><td>HIGH HUMIDITY
HIGH TEMPERATURE
HIGH VOLTAGE
TURN ON TEST</td><td>AFTER 12 HOURS
IN CHAMBER ON
CONTROL 50 ℃
NO DAMAGE</td><td>I/P： 305VAC
O/P：FULL LOAD
Ta=50 ℃
HUMIDITY= 95% R.H</td><td>TEST：OK</td></tr>
<tr><td>4</td><td>TEMPERATURE
COEFFICIENT</td><td>±0.03%/℃(0~60℃)</td><td>I/P： 230 VAC
O/P：FULL LOAD</td><td>±0.0025%/℃(0~60℃)</td></tr>
<tr><td>5</td><td>STORAGE TEMPERATURE TEST</td><td>-40~+80℃</td><td colspan="2">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：5CYCLE
5. Input/Output condition： STATIC</td></tr>
</table>

6	THERMAL SHOCK TEST	-40~+50℃	1. Thermal shock Temperature： -45℃~ +55℃ 2. Temperature change rate ： 25℃ / MIN 3. Dwell time low and high temperature ： 30 MIN/EACH 4. Total test cycle：16CYCLE 5. Input/Output condition： 15cyle:230VAC/ FULL LOAD AC on 3 sec/AC off 1 sec TEST 1cyle:230VAC/ FULL LOAD Burn In Test TEST：OK
7	VIBRATION TEST	10~ 500Hz, 5G 12min./1cycle, period for 72min. each along X, Y, Z axes	1 Carton & 1 Set (1) Waveform： Sine Wave (2) Frequency：10~500Hz (3) Sweep Time：10min/sweep cycle (4) Acceleration：6G (5) Test Time：180min in each axis (X.Y.Z) (6) Ta：25℃
8	CAPACITOR LIFE CYCLE	ELGC-300-L：SUPPOSE C105 IS THE MOST CRITICAL COMPONENT (1) I/P： 230VAC O/P：FULL LOAD Tc= 70 ℃ LIFE TIME (2) I/P： 230VAC O/P：75% LOAD Tc= 70 ℃ LIFE TIME (3) I/P： 230VAC O/P：50% LOAD Tc= 70 ℃ LIFE TIME	(1) 138348 HRS (2) 142241 HRS (3) 140748 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 565 K hrs min. Telcordia SR-332 (Bellcore) 166K hrs min. MIL-HDBK-217F (25℃)	
10	Ongoing Reliability Test	I/P：230VAC O/P：FULL LOAD TA=50℃ Demonstration Mean Time Between Failure : 50,000 hours	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	WUWQ/ZHOUB	WENF	LIUWY