



# Test Report: ELG-75-C350

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75W 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

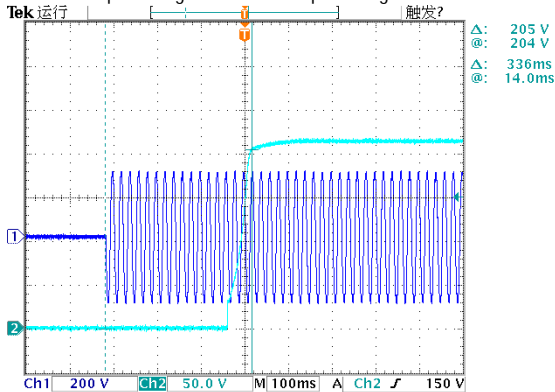
■ DESIGN VERIFY TEST

**OUTPUT FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT CURRENT ADJUST RANGE	175mA-350mA	I/P: 230VAC O/P: LED MODE Ta: 25°C	0.135A-0.387A
2	OUTPUT CURRENT TOLERANCE	±5%	I/P: 230VAC O/P: FULL/ MIN LOAD Ta: 25°C	±1.37%
3	CONSTANT CURRENT REGION	107V-214V	I/P: 230VAC O/P: LED MODE Ta: 25°C	94V-214V
4	OPEN CIRCUIT VOLTAGE (Max)	224V	I/P: 230VAC O/P: NO LOAD Ta: 25°C	217.95V
5	OVER/UNDERSHOOT TEST	<±5 %	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	<5 %
6	OUTPUT CURRENT RIPPLE (Max)	±5%	I/P: 230 VAC O/P: LED MODE Ta: 25°C	<5 %
7	SET UP TIME(Max)	230VAC/ 500ms	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	230VAC/ 336ms

INPUT=230VAC/50HZ @ FULL LOAD

CH1: AC Input Voltage CH2: Output Voltage



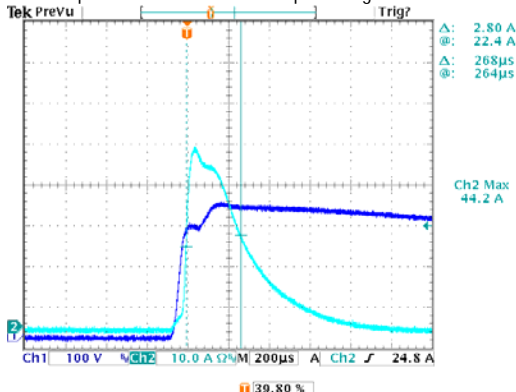
8	DIMMING TEST (For B-Type only)	SPEC:											
		<ul style="list-style-type: none"> <li>Output constant current level can be adjusted by applying one of the three methodologies between DIM+ and DIM-: 0 ~ 10Vdc, or 10V PWM signal or resistance.</li> <li>Direct connecting to LEDs is suggested. It is not suitable to be used with additional drivers.</li> <li>Dimming source current from power supply: 100uA (typ.)</li> <li>DO NOT connect "DIM-" to "-V".</li> </ul>											
		©Applying additive 0 ~ 10VDC:											
		Dimming input additive voltage	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V
		Output current	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
		©Applying additive 10V PWM signal (frequency range 100Hz~3KHz):											
		Duty cycle of additive 10V PWM signal dimming input	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
		Output current	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
		©Applying additive resistance:											
		Dimming input additive resistance	Short	10K Ω	20K Ω	30K Ω	40K Ω	50K Ω	60K Ω	70K Ω	80K Ω	90K Ω	100K Ω
Output current	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%		
TEST RESULT:													
I/P: 230 VAC; Ta: 25°C													
1	Dimming voltage	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	
	Output Current	0A	0.0273A	0.0644A	0.0997A	0.1371A	0.1734A	0.2114A	0.2486A	0.2838A	0.3211A	0.3551A	
	Percentage of rated current	0.00%	7.80%	18.40%	28.49%	39.17%	49.54%	60.40%	71.03%	81.09%	91.74%	101.46%	
	2	Dimming Duty cycle	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
		Output Current	0A	0.0267A	0.0632A	0.1000A	0.1359A	0.1728A	0.2091A	0.2459A	0.2823A	0.3197A	0.3528A
		Percentage of rated current	0.00%	7.63%	18.06%	28.57%	38.83%	49.37%	59.74%	70.26%	80.66%	91.34%	100.80%
	3	Dimming Resistance	Short	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K
		Output Current	0A	0.0257A	0.0626A	0.0995A	0.1361A	0.1729A	0.2091A	0.2456A	0.2823A	0.3193A	0.3549A
		Percentage of rated current	0.00%	7.34%	17.89%	28.43%	38.89%	49.40%	59.74%	70.17%	80.66%	91.23%	101.40%

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	0.38A/277VAC 0.45A/230VAC	I/P: 277 VAC I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	I=0.306A/ 277VAC I=0.363A/ 230VAC
4	LEAKAGE CURRENT	< 0.75mA / 277VAC	I/P: 277 VAC O/P: NO LOAD Ta: 25°C	L-FG: 0.367 mA N-FG: 0.393 mA
5	NO LOAD POWER CONSUMPTION	< 0.5W	I/P: 230VAC O/P: NO LOAD Ta: 25°C	0.076W/ 230VAC
6	TOTAL HARMONIC DISTORTION	Total harmonic distortion will be lower than 20% when output loading is 50% or higher at 230VAC	I/P: 230VAC O/P: 50% LOAD	THD: 10.17 %
		Total harmonic distortion will be lower than 20% when output loading is 75% or higher at 277VAC	I/P: 277VAC O/P: 75% LOAD	THD: 10.73 %
7	INRUSH CURRENT(Typ)	230V/ 50A Twidth =350 us measured at 50% Ipeak COLD START	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	I=44.2A/ 230VAC Twidth =268us

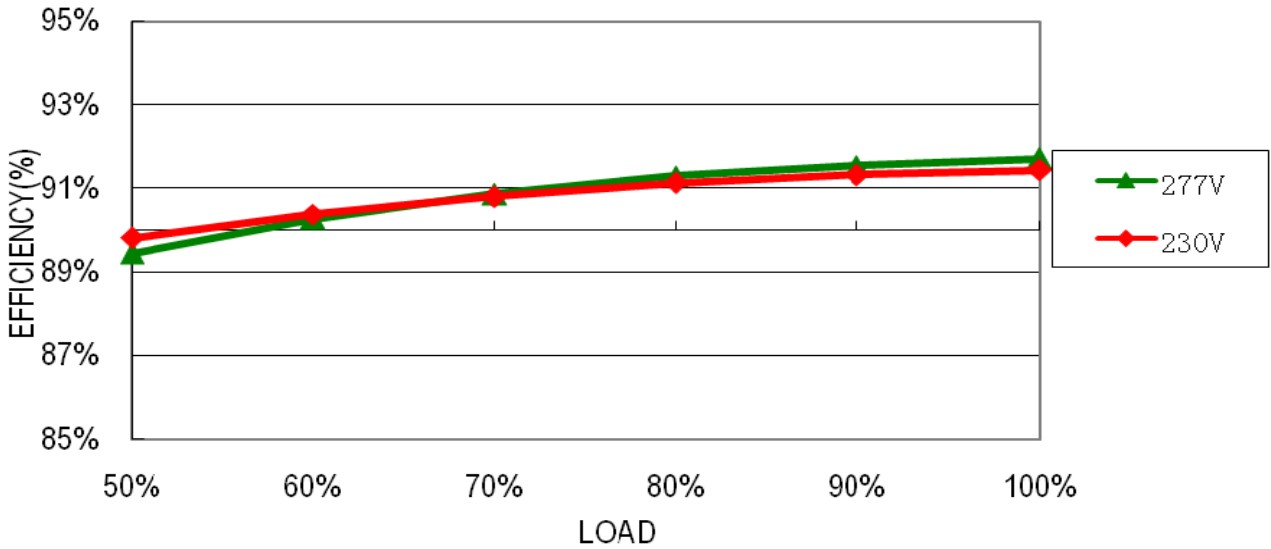
INPUT=230VAC/50HZ @ FULL LOAD

CH2: Input current CH1: AC Input Voltage



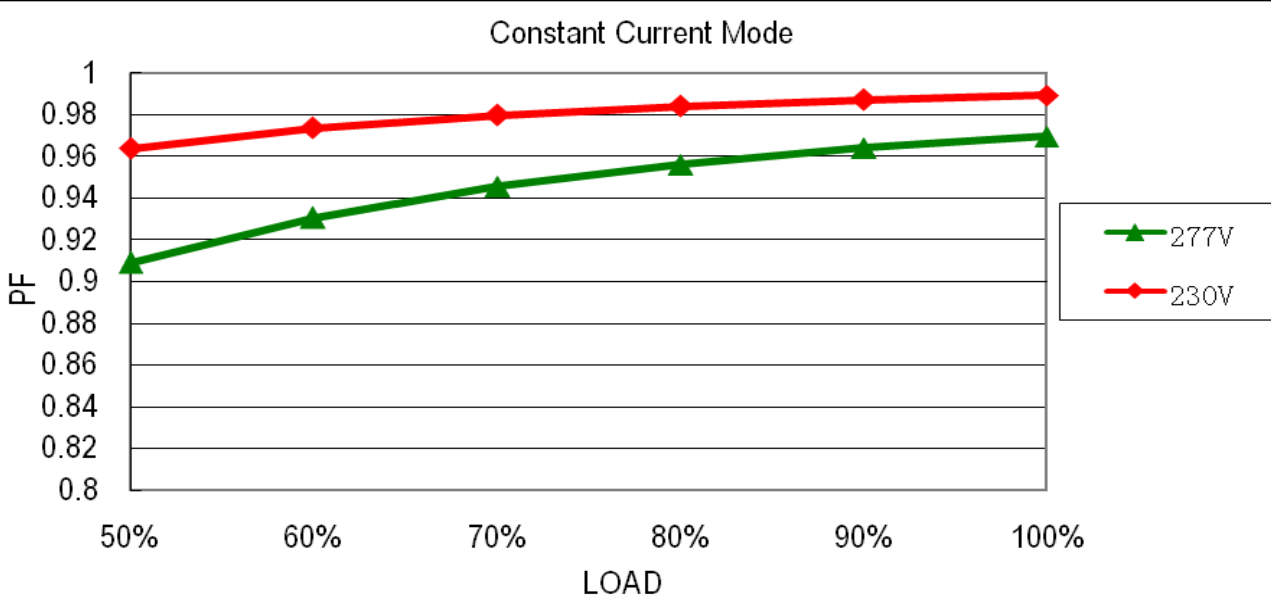
8	EFFICIENCY(Typ)	91%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	91.44%
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EFFICIENCY vs LOAD



9	POWER FACTOR	0.92/ 277VAC 0.95/ 230VAC	I/P: 277 VAC I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	PF=0.969/ 277VAC PF=0.989/ 230VAC
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P.F vs LOAD



**PROTECTION FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER VOLTAGE PROTECTION	225V-260V	I/P: 100VAC I/P: 230VAC I/P: 305VAC O/P: NO LOAD Ta: 25°C	245.69V/ 100VAC 245.65V/ 230VAC 245.73V/ 305VAC Shut down o/p voltage, re-power on to recover
2	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P: 200 VAC I/P: 230VAC I/P: 305VAC O/P: FULL LOAD	O.T.P. Active Shut down o/p voltage, re-power on to recover
3	SHORT CIRCUIT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 200VAC 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 800V/5.7A	I/P: High-Line +3V =308V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 688V (2) 514V (3) 674V
2	O/P Diode (MOSFET)	D101 Rated 600V/3A	I/P: High-Line +3V =308V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 524V (2) 396V (3) 510V
3	Input Capacitor	C5 Rated 47u/ 450V	I/P: High-Line +3V =308V O/P: (1) Full Load input on/off (2) Min load input on /Off (3) Full Load /Min load Change Ta: 25°C	(1) 448V (2) 440V (3) 446V
4	Control IC	U1 Rated 28V (MAX.)	I/P: High-Line +3V =308V O/P: (1) FULL LOAD (2) Output Short (3) O.V.P (4) Low Line No Load Vo(min) Ta: 25°C	(1) 17.2V (2) 11.1V (3) 15.1V (4) 13.2V
5	PFC Power Transistor	Q 1 Rated 600V/5.7A	I/P: High-Line +3V =308V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 484V (2) 462V (3) 462V
6	Clamp Diode	D 10 Rated 800V/2A	I/P: High-Line +3V = 308V O/P: (1) Full Load input on/off (2) Output Short Ta: 25°C	(1) 682V (2) 508V

**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: 2.248mA I/P-FG: 2.455mA O/P-FG: 2.532mA 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: >9999MΩ I/P-FG: >9999MΩ O/P-FG: >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/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 Ta: 25°C	CRITERIA A
7	Test by certified Lab & Test Report Prepare			

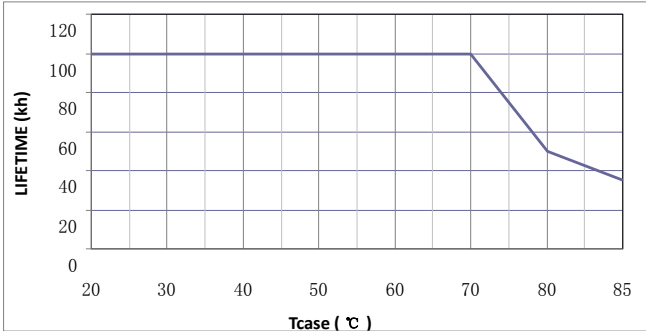
■ **RELIABILITY TEST**

**ENVIRONMENT TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																																
1	TEMPERATURE RISE TEST	MODEL: ELG-75-C350 1. ROOM AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 31.2°C 2. HIGH AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 60°C																																																																		
		<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 31.2 °C</th> <th>HIGH AMBIENT Ta=60 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>L3</td><td>52.5°C</td><td>77.8°C</td></tr> <tr><td>2</td><td>Q1</td><td>53.0°C</td><td>78.8°C</td></tr> <tr><td>3</td><td>Q2</td><td>55.0°C</td><td>80.8°C</td></tr> <tr><td>4</td><td>D10</td><td>58.4°C</td><td>84.9°C</td></tr> <tr><td>5</td><td>C5</td><td>53.8°C</td><td>78.9°C</td></tr> <tr><td>6</td><td>C45</td><td>52.4°C</td><td>77.5°C</td></tr> <tr><td>7</td><td>T1</td><td>51.0°C</td><td>76.8°C</td></tr> <tr><td>8</td><td>D101</td><td>58.4°C</td><td>83.2°C</td></tr> <tr><td>9</td><td>D102</td><td>54.6°C</td><td>79.7°C</td></tr> <tr><td>10</td><td>C105</td><td>52.4°C</td><td>77.6°C</td></tr> <tr><td>11</td><td>C106</td><td>56.5°C</td><td>81.5°C</td></tr> <tr><td>12</td><td>C108</td><td>52.5°C</td><td>77.8°C</td></tr> <tr><td>13</td><td>U1</td><td>50.9°C</td><td>76.6°C</td></tr> <tr><td>14</td><td>RTH2</td><td>52.5°C</td><td>77.8°C</td></tr> <tr><td>15</td><td>TC</td><td>48.3°C</td><td>74.0°C</td></tr> </tbody> </table>			NO	Position	ROOM AMBIENT Ta= 31.2 °C	HIGH AMBIENT Ta=60 °C	1	L3	52.5°C	77.8°C	2	Q1	53.0°C	78.8°C	3	Q2	55.0°C	80.8°C	4	D10	58.4°C	84.9°C	5	C5	53.8°C	78.9°C	6	C45	52.4°C	77.5°C	7	T1	51.0°C	76.8°C	8	D101	58.4°C	83.2°C	9	D102	54.6°C	79.7°C	10	C105	52.4°C	77.6°C	11	C106	56.5°C	81.5°C	12	C108	52.5°C	77.8°C	13	U1	50.9°C	76.6°C	14	RTH2	52.5°C	77.8°C	15	TC	48.3°C	74.0°C
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2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 305VAC/200VAC O/P: FULL LOAD Ta= -45°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 (0-50°C)	I/P: 230 VAC O/P: FULL LOAD	±0.02%/°C (0-50°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: AC OFF 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: 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: 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-75-C350: SUPPOSE C102 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: 50% LOAD Ta= 60 °C LIFE TIME	(1) 866860 HRS (2) 98329 HRS (3) 109519 HRS (4) 126118 HRS
9	MTBF	MIL-HDBK-217F NOTICE 2 STRESS ANALYSIS TOTAL FAILURE RATE: 305K HRS	
10	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): 50000 hours @ Tcase 80°C 	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	ZHANGZJ/ZHUOKB	SKY	LIUWY