



# Test Report: ELG-300-12A

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300W Constant Voltage+Constant Current 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

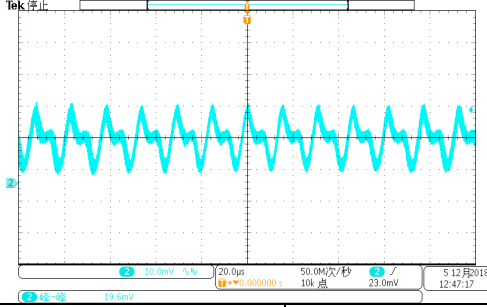
Environment Test

DESIGN VERIFY TEST

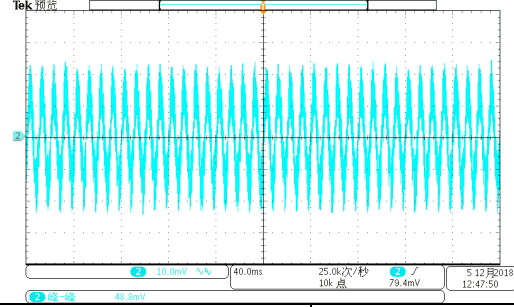
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONSTANT CURRENT REGION	10.0V~12.0V	I/P: 230VAC O/P: LED MODE Ta: 25°C	9.0 V~ 12.8 V
2	VOLTAGE ADJUST RANGE	11.2V~12.8V	I/P: 230VAC O/P: MIN LOAD Ta: 25°C	10.78V~13.01V
3	CURRENT ADJ. RANGE	11A~22A	I/P: 230VAC O/P: SETTING Ta: 25°C	10.21A~25.18A
4	VOLTAGE TOLERANCE	-3.0% ~3.0%	I/P: 100VAC / 305VAC O/P: FULL / MIN LOAD Ta: 25°C	-1%~+ 0.83%
5	LINE REGULATION	-0.5%~+0.5%	I/P: 120VAC ~ 305VAC O/P: FULL LOAD Ta: 25°C	-0.084 %~0%
6	LOAD REGULATION	-2.0% ~2.0%	I/P: 230VAC O/P: FULL ~NO LOAD Ta: 25°C	-0.91%~ +0.08%
7	OVER/UNDERSHOOT TEST	<± 5 %	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	<5 %
8	RIPPLE & NOISE (Max)	150mVp-p	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	48.8mVp-p

high frequency :



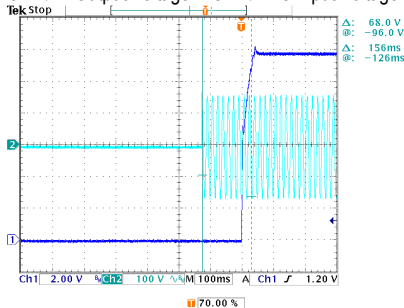
low frequency :



9	SET UP TIME(Max)	115VAC/ 500ms 230VAC/ 500ms	I/P: 115 VAC I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	115VAC/ 156 ms 230VAC/ 152 ms
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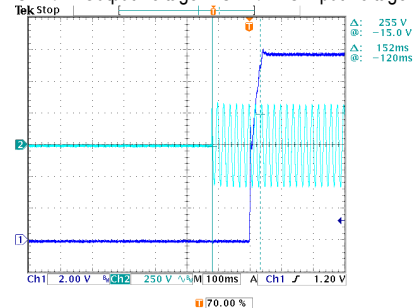
INPUT=115VAC/50HZ @ FULL LOAD

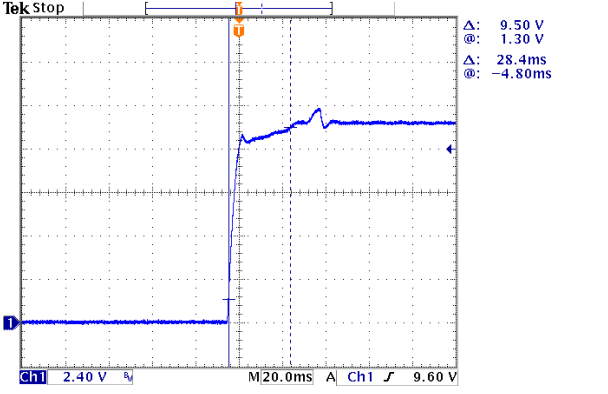
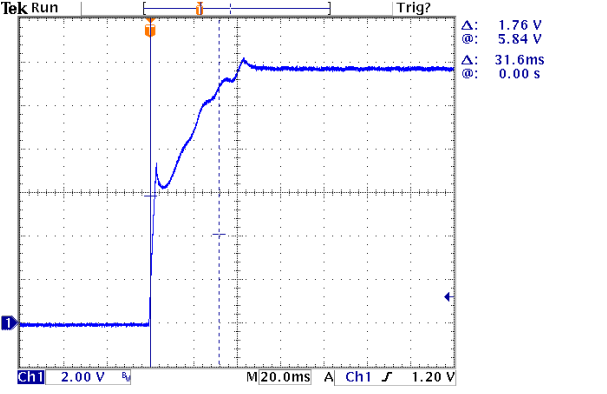
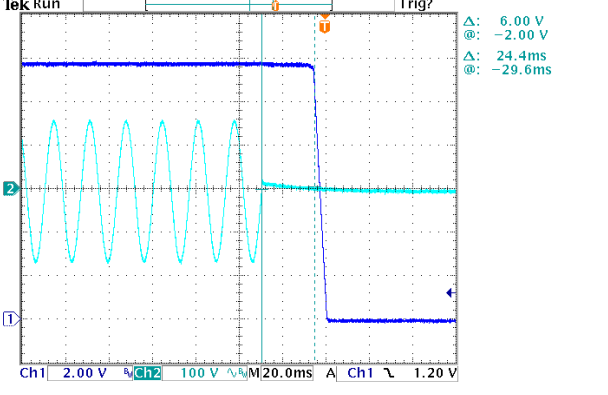
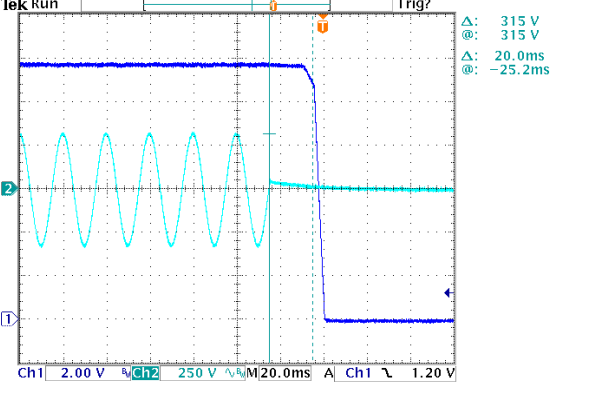
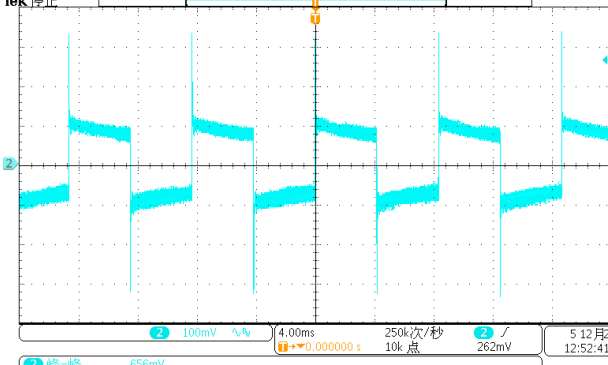
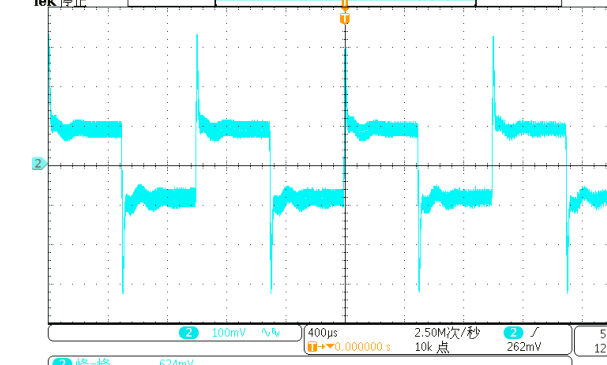
CH1: Output Voltage CH2: AC Input Voltage



INPUT=230VAC/50HZ @ FULL LOAD

CH1: Output Voltage CH2: AC Input Voltage



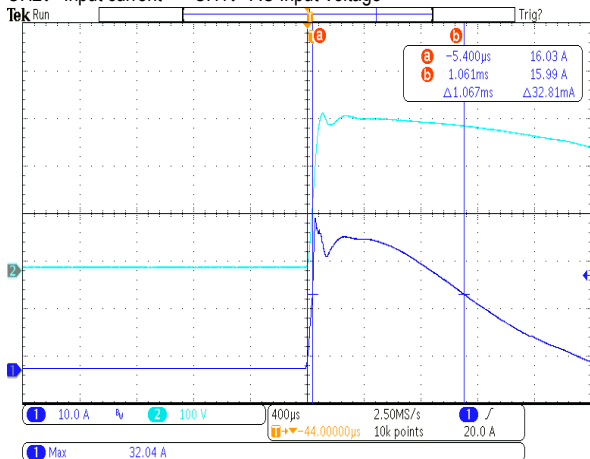
<p>10 RISE TIME (Max)</p>	<p>115VAC/ 100ms 230VAC/ 100ms</p>	<p>I/P: 115 VAC I/P: 230 VAC O/P: FULL LOAD Ta: 25°C</p>	<p>115VAC/ 28.4 ms 230VAC/ 31.6 ms</p>
<p>INPUT=115VAC/50HZ @ FULL LOAD CH1: Output Voltage</p>  <p>△: 9.50 V @: 1.30 V △: 28.4ms @: -4.80ms</p> <p>Ch1 2.40 V M20.0ms A Ch1 9.60 V</p>		<p>INPUT=230VAC/50HZ @ FULL LOAD CH1: Output Voltage</p>  <p>△: 1.76 V @: 5.84 V △: 31.6ms @: 0.00 s</p> <p>Ch1 2.00 V M20.0ms A Ch1 1.20 V</p>	
<p>11 HOLD UP TIME(Typ)</p>	<p>115VAC/ 10ms 230VAC/ 10ms</p>	<p>I/P: 115 VAC I/P: 230 VAC O/P: FULL LOAD Ta: 25°C</p>	<p>115VAC/ 24.4 ms 230VAC/ 20.0 ms</p>
<p>INPUT=115VAC/50HZ @ FULL LOAD CH1: Output Voltage CH2: AC Input Voltage</p>  <p>△: 6.00 V @: -2.00 V △: 24.4ms @: -29.6ms</p> <p>Ch1 2.00 V Ch2 100 V M20.0ms A Ch1 1.20 V</p>		<p>INPUT=230VAC/50HZ @ FULL LOAD CH1: Output Voltage CH2: AC Input Voltage</p>  <p>△: 315 V @: 315 V △: 20.0ms @: -25.2ms</p> <p>Ch1 2.00 V Ch2 250 V M20.0ms A Ch1 1.20 V</p>	
<p>12 DYNAMIC LOAD</p>	<p>V1: 1200 mVp-p</p>	<p>I/P: 230VAC O/P: (1)FULL /50% LOAD 50%DUTY / 120HZ (2)FULL /50% LOAD 50%DUTY / 1KHZ Ta: 25°C</p>	<p>(1) 656mVp-p (2) 624mVp-p</p>
<p>FULL /50% LOAD 50%DUTY / 120HZ</p>  <p>△: 656mV</p> <p>Ch1 100mV M4.00ms A Ch1 262mV</p>		<p>FULL /50% LOAD 50%DUTY / 1KHZ</p>  <p>△: 624mV</p> <p>Ch1 100mV M400µs A Ch1 262mV</p>	

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	100 V~ 305 V
			I/P: (1)LOW-LINE-3V=97 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: 100 VAC ~305 VAC O/P: FULL~NO LOAD Ta: 25°C	TEST: OK
3	AC CURRENT	1.3A/277VAC 1.6A/230VAC 3.0A/115VAC	I/P: 277 VAC I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	I = 1.07 A/ 277VAC I = 1.25 A/ 230VAC I = 2.51 A/ 115VAC
4	LEAKAGE CURRENT	< 0.75mA / 277VAC	I/P: 277 VAC O/P: NO LOAD Ta: 25°C	L-FG: 0.280 mA N-FG: 0.280 mA
5	INRUSH CURRENT(Typ)	230 V/ 45A COLD START (twidth=1200us measured at 50% Ipeak) COLD START at 230V	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	I=32.04A/ 230VAC Twidth = 1067us

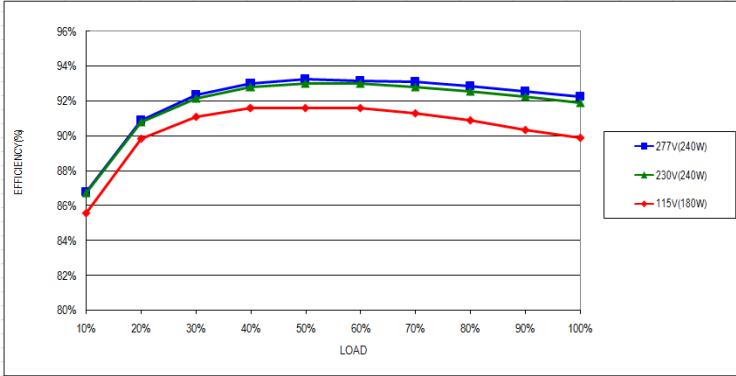
INPUT=277VAC/50HZ @ FULL LOAD

CH2: Input current CH1: AC Input Voltage



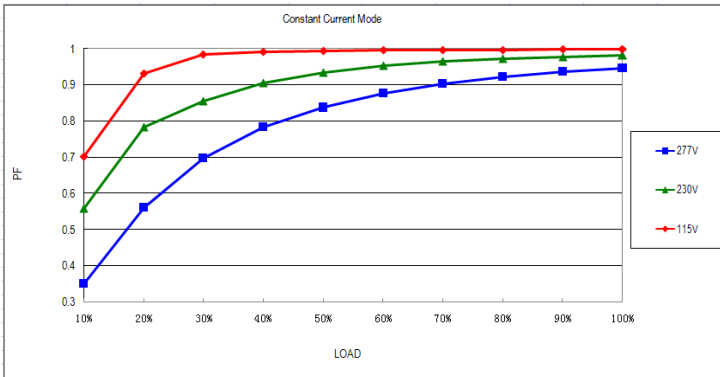
6	EFFICIENCY(Typ)	91%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	91.89%
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EFFICIENCY vs LOAD



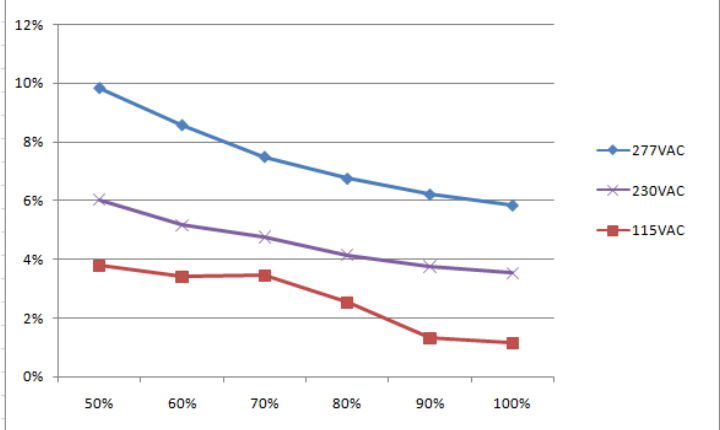
7	POWER FACTOR	0.90/ 277VAC 0.93/ 230VAC 0.95/ 115VAC	I/P: 277 VAC I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	PF= 0.946 / 277VAC PF= 0.981 / 230VAC PF= 0.999 / 115VAC
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P.F vs LOAD



8	TOTAL HARMONIC DISTORTION	THD < 10% ( @load ≥ 50%/120VAC, @load ≥ 50%/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=3.78% @50% load /115VAC THD=6.03% @50% load /230VAC THD=7.49% @75% load /277VAC
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THD vs LOAD



**PROTECTION FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER CURRENT PROTECTION	95%~108%	I/P: 100VAC I/P: 230VAC I/P: 305VAC O/P: TESTING Ta: 25°C	104%/ 100VAC 103.6%/ 230VAC 104%/ 305VAC Constant Current Limiting, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	13.5V~17V	I/P: 100VAC I/P: 230VAC I/P: 305VAC O/P: MIN LOAD Ta: 25°C	14.2 V/ 100VAC 15.3 V/ 230VAC 15.6V/ 305VAC Shut down output voltage, re-power on to recovery
3	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P: 100VAC I/P: 305VAC O/P: FULL LOAD	O.T.P. Active Shut down output voltage, re-power on to recovery
4	SHORT CIRCUIT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 100VAC I/P: 305VAC O/P: FULL LOAD Ta: 25°C	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	Q 6 Rated 600V/23.9A	I/P: High-Line +3V =308V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 464 V (2) 520 V (3) 462 V
2	O/P Diode (MOSFET)	Q100 Rated 40V/120A	I/P: High-Line +3V =308V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 30.54 V (2) 11.77 V (3) 28.53 V
3	P.F.C DIODE	D2 Rated 3A/600V	I/P: High-Line +3V =308V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 468 V (2) 468 V (3) 464 V
4	Input Capacitor	C5 Rated 150u/ 450V	I/P: High-Line +3V =308 V O/P: (1) Full Load input on/off (2) Min LOAD input on /Off (3) Full Load /NO LOAD Change (4) Full load continue Ta: 25°C	(1) 448 V (2) 444 V (3) 446 V (4) 446 V
5	Control IC	U2 Rated 50V (MAX.)	I/P: High-Line +3V =308 V O/P: ((1) FULL LOAD (2) Output Short (3) O.L.P (4) O.V.P (5) Low Line No Load Vo(min) Ta: 25°C	(1) 14.64 V (2) 14.61 V (3) 14.64 V (4) 14.62 V (5) 14.61 V

6	PFC Transistor	Q1 Rated 600V/22A	I/P: High-Line +3V =308V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 496 V (2) 532 V (3) 492 V
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### 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: 4.125 KVAC/min I/P-FG: 2.4 KVAC/min O/P-FG: 1.8 KVAC/min Ta: 25°C	I/P-O/P: 3.032 mA I/P-FG: 3.134 mA O/P-FG: 2.702 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
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25°C	17 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/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	PASS
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 2KV	I/P: 230VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS
6	SURGE	EN61000-4-5 LIGHT INDUSTRY L-N: 4KV L,N-PE: 6KV	I/P: 230VAC/50HZ O/P: FULL LOAD Ta: 25°C	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**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																																																				
1	TEMPERATURE RISE TEST	MODEL: ELG-300-12A 1. ROOM AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta=27.6 °C 2. HIGH AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta=42.7 °C																																																																																						
		<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=27.6 °C</th> <th>HIGH AMBIENT Ta=42.7 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>BD1</td><td>62.1°C</td><td>77.2°C</td></tr> <tr><td>2</td><td>RY1</td><td>61.7°C</td><td>76.6°C</td></tr> <tr><td>3</td><td>D1</td><td>65.2°C</td><td>80.4°C</td></tr> <tr><td>4</td><td>Q1</td><td>62.9°C</td><td>78.2°C</td></tr> <tr><td>5</td><td>L1</td><td>61.2°C</td><td>76.6°C</td></tr> <tr><td>6</td><td>C5</td><td>61.9°C</td><td>77.2°C</td></tr> <tr><td>7</td><td>C41</td><td>62.6°C</td><td>78.1°C</td></tr> <tr><td>8</td><td>U2</td><td>63.1°C</td><td>78.0°C</td></tr> <tr><td>9</td><td>Q5</td><td>65.4°C</td><td>81.1°C</td></tr> <tr><td>10</td><td>Q6</td><td>64.4°C</td><td>79.8°C</td></tr> <tr><td>11</td><td>C511</td><td>63.2°C</td><td>78.5°C</td></tr> <tr><td>12</td><td>T1</td><td>75.3°C</td><td>91.1°C</td></tr> <tr><td>13</td><td>Q100</td><td>75.1°C</td><td>90.9°C</td></tr> <tr><td>14</td><td>Q101</td><td>74.6°C</td><td>90.4°C</td></tr> <tr><td>15</td><td>U101</td><td>75.8°C</td><td>88.0°C</td></tr> <tr><td>16</td><td>T500</td><td>67.9°C</td><td>83.3°C</td></tr> <tr><td>17</td><td>C103</td><td>71.4°C</td><td>86.9°C</td></tr> <tr><td>18</td><td>C105</td><td>67.4°C</td><td>83.0°C</td></tr> <tr><td>19</td><td>C108</td><td>67.7°C</td><td>83.4°C</td></tr> <tr><td>20</td><td>LF100</td><td>72.1°C</td><td>88.3°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta=27.6 °C	HIGH AMBIENT Ta=42.7 °C	1	BD1	62.1°C	77.2°C	2	RY1	61.7°C	76.6°C	3	D1	65.2°C	80.4°C	4	Q1	62.9°C	78.2°C	5	L1	61.2°C	76.6°C	6	C5	61.9°C	77.2°C	7	C41	62.6°C	78.1°C	8	U2	63.1°C	78.0°C	9	Q5	65.4°C	81.1°C	10	Q6	64.4°C	79.8°C	11	C511	63.2°C	78.5°C	12	T1	75.3°C	91.1°C	13	Q100	75.1°C	90.9°C	14	Q101	74.6°C	90.4°C	15	U101	75.8°C	88.0°C	16	T500	67.9°C	83.3°C	17	C103	71.4°C	86.9°C	18	C105	67.4°C	83.0°C	19	C108	67.7°C	83.4°C	20	LF100	72.1°C	88.3°C		
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15	U101	75.8°C	88.0°C																																																																																					
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19	C108	67.7°C	83.4°C																																																																																					
20	LF100	72.1°C	88.3°C																																																																																					
2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 305VAC/100VAC O/P: 100% LOAD/85% LOAD Ta= -45°C / -35°C	TEST: OK																																																																																				
3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 40°C NO DAMAGE	I/P: 305VAC O/P: FULL LOAD Ta=40°C HUMIDITY= 95 %R.H	TEST: OK																																																																																				
4	TEMPERATURE COEFFICIENT	±0.03 %/°C (0~60°C)	I/P: 230 VAC O/P: FULL LOAD	±0.011 %/°C (0~60°C)																																																																																				
5	STORAGE TEMPERATURE TEST	-40~+80°C	1. Thermal shock Temperature: -45°C~ +85°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle: 200 CYCLE 5. Input/Output condition: STATIC TEST: OK																																																																																					





6	THERMAL SHOCK TEST	-40~+40°C	1. Thermal shock Temperature: -45°C~ +45°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle: 16CYCLE 5. Input/Output condition: 15cycle:230VAC/ FULL LOAD AC on 3 sec/AC off 1 sec TEST 1cycle: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°C TEST: OK
8	CAPACITOR LIFE CYCLE	ELG-300-12: SUPPOSE C103 IS THE MOST CRITICAL COMPONENT (1) I/P: 230VAC O/P: FULL LOAD Tc= 70 °C LIFE TIME (2) I/P: 230VAC O/P: 75% LOAD Tc= 70 °C LIFE TIME (3) I/P: 230VAC O/P: 50% LOAD Tc= 70 °C LIFE TIME	(1) 57712 HRS (2) 81650 HRS (3) 117751 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 1827.7K hrs min. Telcordia SR-332 (Bellcore) ; 196.5K hrs min. MIL-HDBK-217F (25°C)	
10	Ongoing Reliability Test	I/P: 230VAC O/P: FULL LOAD TA=50°C Demonstration Mean Time Between Failure : 50,000 hours	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	WUWQ/ZHOUB	WENF	LIUWY