



Test Report: HVG-65-42

65W 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

■ ESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	RIPPLE & NOISE	V1 : 300 mVp-p (Max)	I/P : 347VAC O/P : FULL LOAD Ta : 25°C	V1 : 23 mVp-p (Max)
2	OUTPUT VOLTAGE ADJUST RANGE	CH1 : 38V ~ 46 V	I/P : 480 VAC I/P : 347 VAC O/P : MIN LOAD Ta : 25°C	36.507 V ~ 48.073 V / 480 VAC 36.503 V ~ 48.072 V / 347 VAC
3	OUTPUT CURRENT ADJUST RANGE	CH1 : 0.93A~1.55 A	I/P : 480 VAC I/P : 347 VAC O/P : CV MODE Ta : 25°C	0.750 A ~ 1.731 A / 480 VAC 0.747 A ~ 1.726 A / 347 VAC
4	OUTPUT VOLTAGE TOLERANCE	V1 : 1%~ -1 % (Max)	I/P : 180 VAC / 480 VAC O/P : FULL/ MIN LOAD Ta : 25°C	V1 : 0.06 % ~ -0.06 %
5	LINE REGULATION	V1 : 0.5 %~ -0.5% (Max)	I/P : 180 VAC ~ 480 VAC O/P : FULL LOAD Ta : 25°C	V1 : 0 % ~ 0 %
6	LOAD REGULATION	V1 : 0.5 %~ -0.5% (Max)	I/P : 347 VAC O/P : FULL ~ MIN LOAD Ta : 25°C	V1 : 0.043 % ~ -0.06 %
7	SET UP TIME	480 VAC : 400 ms (Max) 347VAC : 400 ms(Max) 230VAC : 500 ms(Max)	I/P : 480 VAC I/P : 347 VAC I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	480 VAC/ 169 ms 347VAC/ 268 ms 230VAC/ 329 ms
8	RISE TIME	480 VAC : 80 ms (Max) 347VAC : 80 ms (Max) 230VAC : 80 ms (Max)	I/P : 480 VAC I/P : 347 VAC I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	480 VAC/ 21.4 ms 347VAC/ 22 ms 230VAC/ 22 ms
9	HOLD UP TIME	480 VAC : 30 ms (TYP) 347VAC : 16 ms (TYP)	I/P : 480 VAC I/P : 347 VAC O/P : FULL LOAD Ta : 25°C	480 VAC/ 42 ms 347VAC/ 18 ms
10	OVER/UNDERSHOOT TEST	< ±5%	I/P : 347 VAC O/P : FULL LOAD Ta : 25°C	TEST : <5 %

11	DYNAMIC LOAD	V1 : 4200 mVp-p	I/P : 347VAC (1).O/P : FULL /Min LOAD 90%DUTY/ 1KHZ (2).O/P : FULL /Min LOAD 90%DUTY/ 3KHZ (3).O/P : FULL /Min LOAD 90%DUTY/ 5KHZ (4).O/P : FULL /Min LOAD 50%DUTY/ 120HZ Ta : 25°C	(1)267 mVp-p (2)133 mVp-p (3)125 mVp-p (4)490 mVp-p																																																																																																																																																																																																						
12	<p>DIMMER TEST (B Type only) SPEC: ※Built-in 3 in 1 dimming function, IP67 rated. Output constant current level can be adjusted through output cable by connecting a resistance or 0 ~ 10Vdc or 10V PWM signal between DIM+ and DIM-. ※Please DO NOT connect "DIM-" to "-V". ※Reference resistance value for output current adjustment (Typical)</p> <table border="1"> <tr> <th>Resistance value</th> <th>Short</th> <th>10K</th> <th>20K</th> <th>30K</th> <th>40K</th> <th>50K</th> <th>60K</th> <th>70K</th> <th>80K</th> <th>90K</th> <th>100K</th> <th>OPEN</th> </tr> <tr> <td>Output current</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> <td>95%~108%</td> </tr> </table> <p>*1 ~ 10V dimming function for output current adjustment (Typical)</p> <table border="1"> <tr> <th>Dimming value</th> <th>Short</th> <th>1V</th> <th>2V</th> <th>3V</th> <th>4V</th> <th>5V</th> <th>6V</th> <th>7V</th> <th>8V</th> <th>9V</th> <th>10V</th> <th>OPEN</th> </tr> <tr> <td>Output current</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> <td>95%~108%</td> </tr> </table> <p>*10V PWM signal for output current adjustment (Typical) : Frequency range :100Hz ~ 3KHz</p> <table border="1"> <tr> <th>Duty value</th> <th>Short</th> <th>10%</th> <th>20%</th> <th>30%</th> <th>40%</th> <th>50%</th> <th>60%</th> <th>70%</th> <th>80%</th> <th>90%</th> <th>100%</th> <th>OPEN</th> </tr> <tr> <td>Output current</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> <td>95%~108%</td> </tr> </table> <p>TEST RESULT: I/P : 230 VAC ;Ta : 25°C</p> <table border="1"> <tr> <td rowspan="3">1</td> <td>Resistance value</td> <td>SHORT</td> <td>10K</td> <td>20K</td> <td>30K</td> <td>40K</td> <td>50K</td> <td>60K</td> <td>70K</td> <td>80K</td> <td>90K</td> <td>100K</td> <td>OPEN</td> </tr> <tr> <td>Output current</td> <td>0.000A</td> <td>0.151A</td> <td>0.307A</td> <td>0.463A</td> <td>0.619A</td> <td>0.774A</td> <td>0.930A</td> <td>1.090A</td> <td>1.243A</td> <td>1.402A</td> <td>1.551A</td> <td>1.614A</td> </tr> <tr> <td>%</td> <td>0.00%</td> <td>9.74%</td> <td>19.81%</td> <td>29.87%</td> <td>39.94%</td> <td>49.94%</td> <td>60.00%</td> <td>70.32%</td> <td>80.19%</td> <td>90.45%</td> <td>100.06%</td> <td>104.13%</td> </tr> <tr> <td rowspan="3">2</td> <td>Dimming value</td> <td>SHORT</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> <td>OPEN</td> </tr> <tr> <td>Output current</td> <td>0.000A</td> <td>0.156A</td> <td>0.321A</td> <td>0.478A</td> <td>0.634A</td> <td>0.789A</td> <td>0.947A</td> <td>1.092A</td> <td>1.254A</td> <td>1.409A</td> <td>1.561A</td> <td>1.614A</td> </tr> <tr> <td>%</td> <td>0.00%</td> <td>10.06%</td> <td>20.71%</td> <td>30.84%</td> <td>40.90%</td> <td>50.90%</td> <td>61.10%</td> <td>70.45%</td> <td>80.90%</td> <td>90.90%</td> <td>100.71%</td> <td>104.13%</td> </tr> <tr> <td rowspan="3">3</td> <td>Duty value</td> <td>SHORT</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> <td>OPEN</td> </tr> <tr> <td>Output current</td> <td>0.000A</td> <td>0.186A</td> <td>0.326A</td> <td>0.481A</td> <td>0.637A</td> <td>0.793A</td> <td>0.949A</td> <td>1.105A</td> <td>1.261A</td> <td>1.418A</td> <td>1.574A</td> <td>1.614A</td> </tr> <tr> <td>%</td> <td>0.00%</td> <td>12.00%</td> <td>21.03%</td> <td>31.03%</td> <td>41.10%</td> <td>51.16%</td> <td>61.23%</td> <td>71.29%</td> <td>81.35%</td> <td>91.48%</td> <td>101.55%</td> <td>104.13%</td> </tr> </table>				Resistance value	Short	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K	OPEN	Output current	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	95%~108%	Dimming value	Short	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN	Output current	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	95%~108%	Duty value	Short	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN	Output current	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	95%~108%	1	Resistance value	SHORT	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K	OPEN	Output current	0.000A	0.151A	0.307A	0.463A	0.619A	0.774A	0.930A	1.090A	1.243A	1.402A	1.551A	1.614A	%	0.00%	9.74%	19.81%	29.87%	39.94%	49.94%	60.00%	70.32%	80.19%	90.45%	100.06%	104.13%	2	Dimming value	SHORT	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN	Output current	0.000A	0.156A	0.321A	0.478A	0.634A	0.789A	0.947A	1.092A	1.254A	1.409A	1.561A	1.614A	%	0.00%	10.06%	20.71%	30.84%	40.90%	50.90%	61.10%	70.45%	80.90%	90.90%	100.71%	104.13%	3	Duty value	SHORT	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN	Output current	0.000A	0.186A	0.326A	0.481A	0.637A	0.793A	0.949A	1.105A	1.261A	1.418A	1.574A	1.614A	%	0.00%	12.00%	21.03%	31.03%	41.10%	51.16%	61.23%	71.29%	81.35%	91.48%	101.55%	104.13%
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13	CONSTANT CURRENT REGION	25.2V ~ 42V	I/P : 347 VAC O/P : FULL LOAD Ta : 25°C	O/P=25.2V : 1.581A O/P=41V: 1.581A																																																																																																																																																																																																						

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
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1	INPUT VOLTAGE RANGE	180VAC-528 VAC	I/P : TESTING O/P : FULL LOAD Ta : 25°C	158V~480V TEST : OK
			I/P : LOW-LINE-3V=177V HIGH-LINE+3V=531 V O/P : FULL/MIN LOAD ON : 30 Sec . OFF : 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE)	
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P : 180VAC ~ 528 VAC O/P : FULL-MIN LOAD Ta : 25°C	TEST : OK
3	POWER FACTOR	0.98 / 230 VAC(TYP)	I/P : 230VAC	PF= 0.9913 / 230 VAC
		0.97 / 277VAC(TYP)	I/P : 277VAC	PF= 0.9881 / 277 VAC
		0.97 /347 VAC(TYP)	I/P : 347VAC	PF= 0.9768 / 347VAC
		0.93 / 480 VAC(TYP)	I/P : 480VAC O/P : FULL LOAD Ta : 25°C	PF= 0.9757 / 480VAC
4	EFFICIENCY	89.5 % (TYP)	I/P : 347 VAC O/P : FULL LOAD Ta : 25°C	90.79 %
5	INPUT CURRENT	347V/ 0.22 A (TYP)	I/P : 347 VAC	I = 0.2019 A/ 347 VAC
		480V/ 0.18 A (TYP)	I/P : 480 VAC O/P : FULL LOAD Ta : 25°C	I = 0.149 A/ 480 VAC
6	INRUSH CURRENT	480V/ 25 A (TYP) (twidth=420us measured at 50% Ipeak) COLD START	I/P : 480VAC O/P : FULL LOAD Ta : 25°C	I = 19.75 A/ 480VAC T50= 386 us
7	LEAKAGE CURRENT	< 0.75 mA / 480 VAC	I/P : 480 VAC O/P : Min LOAD Ta : 25°C	L-FG : 0.34 mA N-FG : 0.34 mA
8	TOTAL HARMONIC DISTORTION	Total harmonic distortion will be lower than 20% when output loading is 60% or higher at 230VAC / 277VAC / 347VAC	I/P : 230VAC I/P : 277VAC I/P : 347VAC O/P : 60% LOAD Ta : 25°C	THD : 8.89 % THD : 10.18 % THD : 12.88 %
		Total harmonic distortion will be lower than 20% when output loading is 75% or higher at 480VAC	I/P : 480VAC O/P : 75% LOAD Ta : 25°C	THD : 13.78 %

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER CURRENT	95% - 108%	I/P : 480 VAC I/P : 347 VAC O/P : TESTING Ta : 25°C	102.45%/ 480 VAC 102.45%/ 347 VAC Constant current limiting, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	CH1 : 47V - 53 V	I/P : 480 VAC I/P : 347 VAC O/P : MIN LOAD Ta : 25°C	49.48V/ 480VAC 49.45 V/ 347 VAC Shut down o/p voltage with auto-recovery or re-power on to recovery
3	OVER TEMPERATURE PROTECTION	SPEC : NO DAMAGE	I/P : 347 VAC O/P : FULL LOAD	O.T.P. Active Shut down o/p voltage, recovers automatically after temperature goes down
4	SHORT PROTECTION	NO DAMAGE	I/P : 528VAC 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	Power Transistor (D to S) or (C to E) Peak Voltage	Q3 Rated : 5 9A/950V	I/P : High-Line +3V = 531 V O/P : (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25°C	(1) 754 V (2) 706 V (3) 513 V
2	Diode Peak Voltage	D101 Rated : 10A/150V	I/P : High-Line +3V = 531 V O/P : (1)Full Load Turn on (2)Output Short (3)Full load continue Ta : 25°C	(1) 133 V (2) 139 V (3) 133 V
3	Input Capacitor Voltage	C5 Rated : 22u/450V	I/P : High-Line +3V = 531 V O/P : (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta : 25°C	(1) 421 V (2) 401 V (3) 425 V
4	Control IC Voltage Test	U1 Rated : 10.3V-22.5V U2 Rated : 11V-28V	I/P : High-Line +3V = 531 V O/P : (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Ta : 25°C	(1) 19.2 V (2) 19.2 V (3) 19 V (4) 17 V (5) 19.8 V (6) 16.4 V

5	Power Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated : 9A/950V	I/P : High-Line +3V = 531 V O/P : (1) Full Load Turn on (2) Output Short (3) Full load continue Ta : 25°C	(1) 895 V (2) 831 V (3) 782 V
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■ SAFETY & E.M.C. TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P : 3.75 KVAC/min I/P-FG : 2 KVAC/min O/P-FG : 1.5 KVAC/min	I/P-O/P : 4 KVAC/min I/P-FG : 2.4 KVAC/min O/P-FG : 1.8 KVAC/min Ta : 25°C	I/P-O/P : 3.28 mA I/P-FG : 2.976 mA O/P-FG : 1.976 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 / 70%RH	I/P-O/P : 3.83 GΩ I/P-FG : 3.93 GΩ O/P-FG : 28.7 GΩ NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta : 25°C / 70%RH	25 mΩ

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS C	I/P:230VAC/380VAC/50HZ/60HZ O/P:100/60%ELECTRONIC LOAD O/P:100%LED LOAD Ta:25°C	PASS
2	CONDUCTION	EN55015 CLASS B FCC Part 15 Subpart B	I/P: 230VAC/380VAC/50HZ/60HZ O/P:FULL/50% LOAD Ta:25°C	PASS Test by certified Lab
3	RADIATION	EN55015 CLASS B FCC Part 15 Subpart B	I/P: 230VAC/380VAC/50HZ/60HZ 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: 230VAC/380VAC/50HZ/60HZ O/P:FULL LOAD Ta:25°C	CRITERIA A
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT : 1KV	I/P: 230VAC/380VAC/50HZ/60HZ O/P:FULL LOAD Ta:25°C	CRITERIA A
6	SURGE	IEC61000-4-5 INDUSTRY L-N :2KV L,N-PE:4KV	I/P: 230VAC/380VAC/50HZ/60HZ O/P:FULL LOAD Ta:25°C	CRITERIA A
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 : HVG-65-24 1. ROOM AMBIENT BURN-IN : 4.5 HRS I/P : 347VAC O/P : FULL LOAD Ta=33.2 °C 2. HIGH AMBIENT BURN-IN : 1 HRS I/P : 347VAC O/P : FULL LOAD Ta=65.5 °C	<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 33.2 °C</th> <th>HIGH AMBIENT Ta= 65.5 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>BD1</td><td>52.5°C</td><td>82.2°C</td></tr> <tr><td>2</td><td>L2</td><td>55.3°C</td><td>84.7°C</td></tr> <tr><td>3</td><td>Q1</td><td>57.8°C</td><td>86.9°C</td></tr> <tr><td>4</td><td>U1</td><td>55.3°C</td><td>85.1°C</td></tr> <tr><td>5</td><td>Q3</td><td>60.1°C</td><td>88.9°C</td></tr> <tr><td>6</td><td>C5</td><td>56.6°C</td><td>85.4°C</td></tr> <tr><td>7</td><td>RTH2</td><td>54.1°C</td><td>83.5°C</td></tr> <tr><td>8</td><td>T1</td><td>65.0°C</td><td>93.4°C</td></tr> <tr><td>9</td><td>C62</td><td>56.7°C</td><td>85.6°C</td></tr> <tr><td>10</td><td>C46</td><td>51.7°C</td><td>81.8°C</td></tr> <tr><td>11</td><td>D101</td><td>65.5°C</td><td>95.1°C</td></tr> <tr><td>12</td><td>C102</td><td>60.3°C</td><td>89.5°C</td></tr> <tr><td>13</td><td>C203</td><td>58.9°C</td><td>87.8°C</td></tr> <tr><td>14</td><td>LF100</td><td>55.1°C</td><td>84.7°C</td></tr> <tr><td>15</td><td>C104</td><td>55.7°C</td><td>85.3°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta= 33.2 °C	HIGH AMBIENT Ta= 65.5 °C	1	BD1	52.5°C	82.2°C	2	L2	55.3°C	84.7°C	3	Q1	57.8°C	86.9°C	4	U1	55.3°C	85.1°C	5	Q3	60.1°C	88.9°C	6	C5	56.6°C	85.4°C	7	RTH2	54.1°C	83.5°C	8	T1	65.0°C	93.4°C	9	C62	56.7°C	85.6°C	10	C46	51.7°C	81.8°C	11	D101	65.5°C	95.1°C	12	C102	60.3°C	89.5°C	13	C203	58.9°C	87.8°C	14	LF100	55.1°C	84.7°C	15	C104	55.7°C	85.3°C	
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2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 528VAC/180VAC O/P : 100 % LOAD Ta= -40 °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 : 528 VAC O/P : FULL LOAD Ta= 60 °C HUMIDITY= 95 %R.H	TEST : OK																																																																
4	TEMPERATURE COEFFICIENT	± 0.03%(0-60°C)	I/P : 347 VAC O/P : FULL LOAD	± 0.011 %(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		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 : 347VAC/Full Load AC ON/OFF TEST turn on 58sec ; turn off 2sec		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	SUPPOSE C102 IS THE MOST CRITICAL COMPONENT (1) I/P : 347VAC O/P : FULL LOAD Tc=75 °C LIFE TIME (2) I/P : 347VAC O/P : 75% LOAD Tc= 75 °C LIFE TIME (3) I/P : 347VAC O/P : 50% LOAD Tc=75 °C LIFE TIME	(1) 56870 HRS (2) 63621 HRS (3) 76129 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 612.6K hrs min. Telcordia SR-332 (Bellcore) ; 208K 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 : 62,000 hours	

RESULT	TESTER	REVIEW	APPROVAL
PASS	DANIEL GAO	SANFORD SU	VINCENT TSENG

12.10.30 A50-F031