



Test Report: HVGC-650-M

650W 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

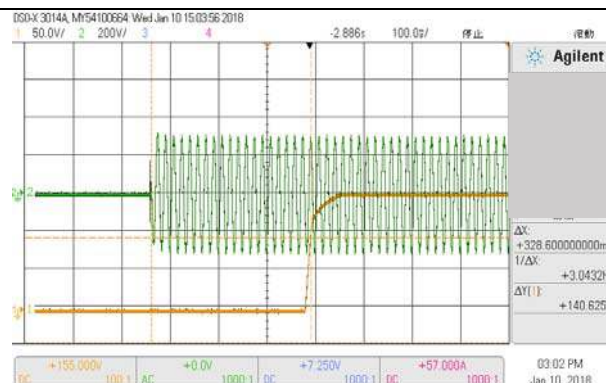
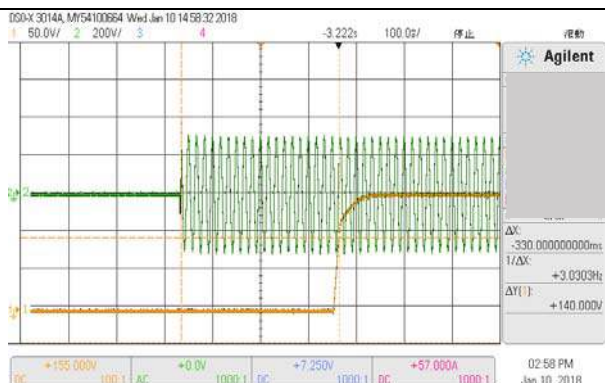
■ RELIABILITY TEST

ENVIRONMENT TEST

DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CURRENT TOLERANCE	±5%	I/P: 347VAC I/P: 480VAC O/P: FULL LOAD CP: 4.2A & 5.25A Ta: 25°C	CP 4.2A: 4.213A/347VAC@LED MAX-1V 4.294A/347VAC@LED MIN 4.212A/480VAC@LED MAX-1V 4.304A/480VAC@LED MIN 2.19% CP 5.25A: 5.241A/347VAC@LED MAX-1V 5.240A/347VAC@LED MIN 5.237A/480VAC@LED MAX-1V 5.238A/480VAC@LED MIN 0.11%
2	FULL POWER CURRENT RANGE	4200~5250mA	I/P: 347VAC O/P: FULL LOAD CP: 4.2A & 5.25A Ta: 25°C	157.11V/4.2A/347VAC 124.85V/5.25A/347VAC
3	OPEN CIRCUIT VOLTAGE (max)	160V	I/P: 347VAC O/P: NO LOAD CP: 1/2 I _o min Ta: 25°C	157.11V
4	CONSTANT CURRENT REGION	CP 4.2A: CH1: 77.5V~ 155V CP 5.25A: CH1: 62V~ 124V	I/P: 347VAC O/P: FULL LOAD CP: 4.2A & 5.25A Ta: 25°C	CP 4.2A: 0.9V~ 155V/347VAC CP 5.25A: 1.11V~ 124V/347VAC
5	CURRENT ADJ. RANGE	CH1: 2100mA~5250mA	I/P: 347VAC I/P: 480VAC O/P: LED MIN & LED MAX-1V Ta: 25°C	1882mA~5250mA/347VAC@LED MAX-1V 1885mA~5297mA /347VAC@LED MIN 12892mA~5256mA /480VAC@LED MAX-1V 1899mA~5302mA /480VAC@LED MIN
6	CURRENT RIPPLE	5% max. @rated current	I/P: 347VAC O/P: FULL LOAD CP: 4.2A & 5.25A Ta: 25°C	CP 4.2A: 3.26% CP 5.25A: 3.17%
7	SET UP TIME	230VAC/ 500 ms (Max) 347VAC/ 500 ms (Max) 480VAC/ 500 ms (Max)	I/P: 230VAC I/P: 347VAC I/P: 480VAC O/P: FULL LOAD CP 4.2A Ta: 25°C	230VAC/ 330ms 347VAC/328 ms 480VAC/302 ms
INPUT=230VAC/50HZ @ FULL LOAD@ CP 4.2A CH1 : Output Voltage CH2 : AC Input Voltage		INPUT=347VAC/60HZ @ FULL LOAD@ CP 4.2A CH1 : Output Voltage CH2 : AC Input Voltage		



8 DIMMING OPERATION (for B-Type)

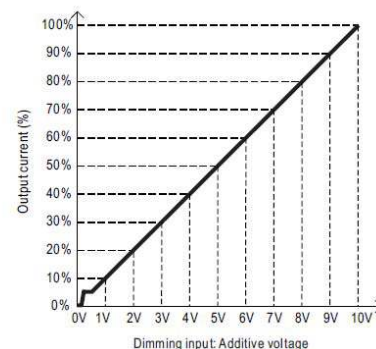
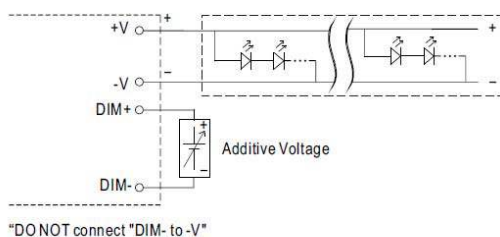
※3 in 1 dimming function

※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.

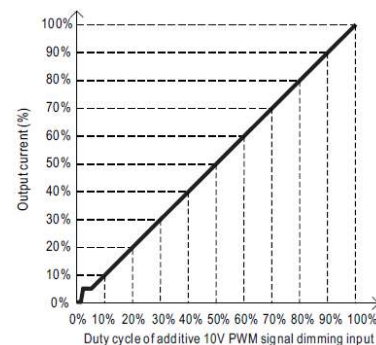
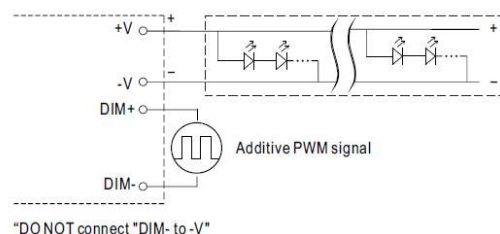
※Direct connecting to LEDs is suggested. It is not suitable to be used with additional drivers.

※Dimming source current from power supply: 100 μ A (typ.)

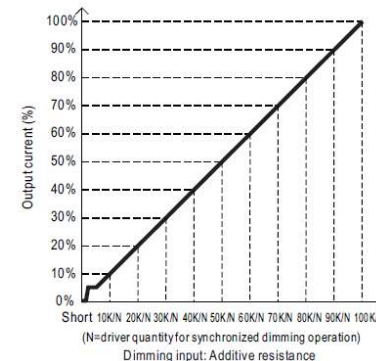
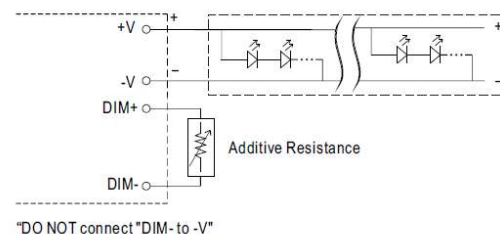
◎ Applying additive 0 ~ 10VDC



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



◎ Applying additive resistance:



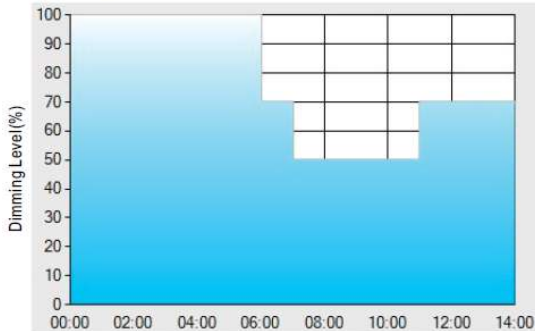
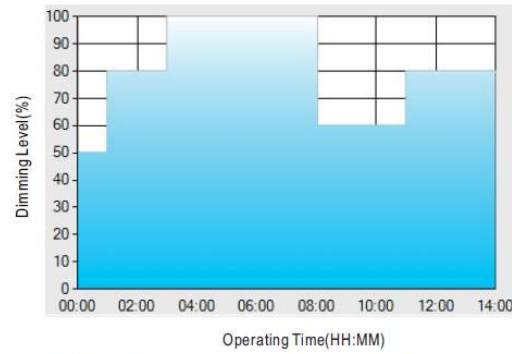
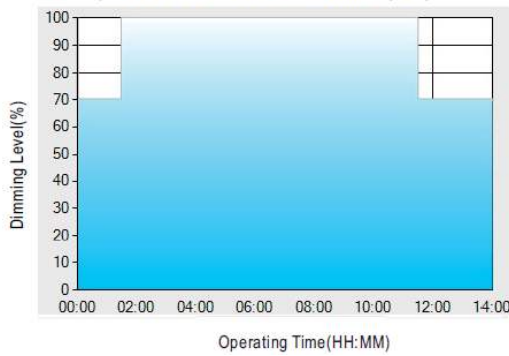
Note : 1. Min. dimming level is about 5% and the output current is not defined when 0% < I_{out} < 6%.

2. The output current could drop down to 0% when dimming input is about 0k Ω or 0Vdc, or 10V PWM signal with 0% duty cycle.

I/P : 347VAC

O/P : DIMMING TEST

TA : 25 $^{\circ}$ C

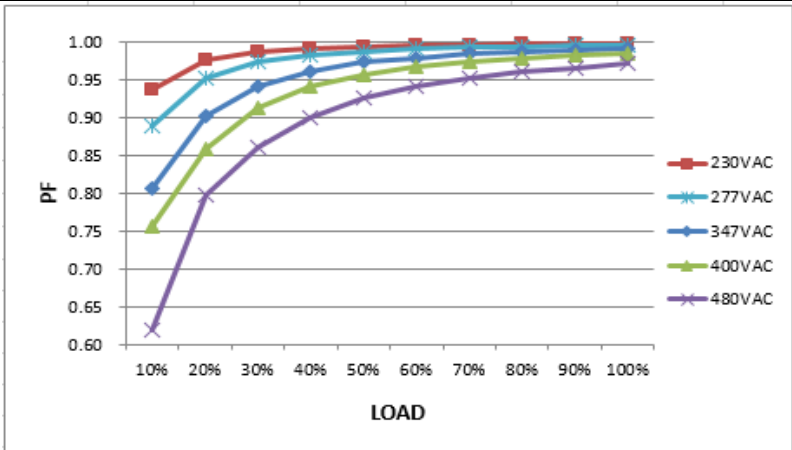
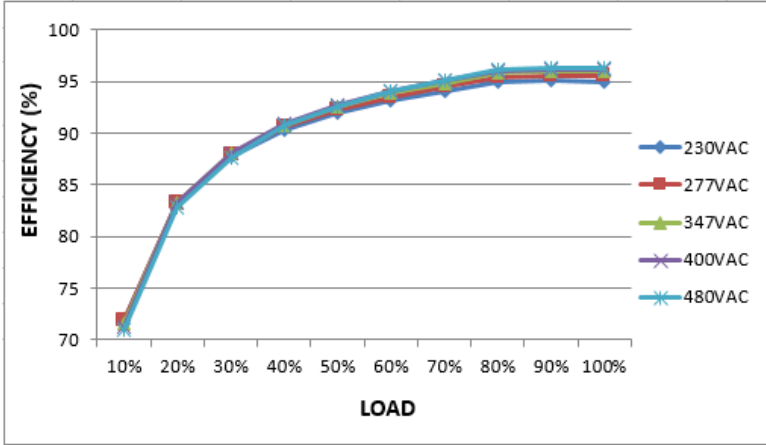
		<table><tr><td>R</td><td>SHORT</td><td>10K</td><td>20K</td><td>30K</td><td>40K</td><td>50K</td><td>60K</td><td>70K</td><td>80K</td><td>90K</td><td>100K</td><td>OPEN</td></tr><tr><td>O/P CURRENT</td><td>0</td><td>0.6</td><td>0.95</td><td>1.35</td><td>1.79</td><td>2.18</td><td>2.64</td><td>3.07</td><td>3.43</td><td>3.81</td><td>4.15</td><td>4.150A</td></tr><tr><td>%</td><td>0.00%</td><td>14.29%</td><td>22.62%</td><td>32.14%</td><td>42.62%</td><td>51.90%</td><td>62.86%</td><td>73.10%</td><td>81.67%</td><td>90.71%</td><td>98.81%</td><td>98.81%</td></tr></table> <table><tr><td>V</td><td>0V</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>O/P CURRENT</td><td>0A</td><td>0.650A</td><td>1.040A</td><td>1.450A</td><td>1.880A</td><td>2.270A</td><td>2.680A</td><td>3.040A</td><td>3.470A</td><td>3.890A</td><td>4.210A</td><td>4.200A</td></tr><tr><td>%</td><td>0.00%</td><td>15.48%</td><td>24.76%</td><td>34.52%</td><td>44.76%</td><td>54.05%</td><td>63.81%</td><td>72.38%</td><td>82.62%</td><td>92.62%</td><td>100.24%</td><td>100.00%</td></tr></table> <table><tr><td>PWM (100HZ)</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>OPEN</td></tr><tr><td>O/P CURRENT</td><td>0</td><td>0.613</td><td>1.04</td><td>1.43</td><td>1.84</td><td>2.25</td><td>2.66</td><td>3.06</td><td>3.45</td><td>3.86</td><td>4.16</td><td>4.200A</td></tr><tr><td>%</td><td>0.00%</td><td>14.60%</td><td>24.76%</td><td>34.05%</td><td>43.81%</td><td>53.57%</td><td>63.33%</td><td>72.86%</td><td>82.14%</td><td>91.90%</td><td>99.05%</td><td>100.00%</td></tr></table> TEST RESULT : OK	R	SHORT	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K	OPEN	O/P CURRENT	0	0.6	0.95	1.35	1.79	2.18	2.64	3.07	3.43	3.81	4.15	4.150A	%	0.00%	14.29%	22.62%	32.14%	42.62%	51.90%	62.86%	73.10%	81.67%	90.71%	98.81%	98.81%	V	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN	O/P CURRENT	0A	0.650A	1.040A	1.450A	1.880A	2.270A	2.680A	3.040A	3.470A	3.890A	4.210A	4.200A	%	0.00%	15.48%	24.76%	34.52%	44.76%	54.05%	63.81%	72.38%	82.62%	92.62%	100.24%	100.00%	PWM (100HZ)	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN	O/P CURRENT	0	0.613	1.04	1.43	1.84	2.25	2.66	3.06	3.45	3.86	4.16	4.200A	%	0.00%	14.60%	24.76%	34.05%	43.81%	53.57%	63.33%	72.86%	82.14%	91.90%	99.05%	100.00%
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9	DIMMING OPERATION (for Dxx-Type by User definition)	※Smart timer dimming function (for Dxx-Type by User definition) 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: <table><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> Ex: ☉ D02-Type: the profile recommended for street lighting  Set up for D02-Type in Smart timer dimming software program: <table><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> Ex: ☉ D03-Type: the profile recommended for tunnel lighting  Set up for D03-Type in Smart timer dimming software program: <table><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>		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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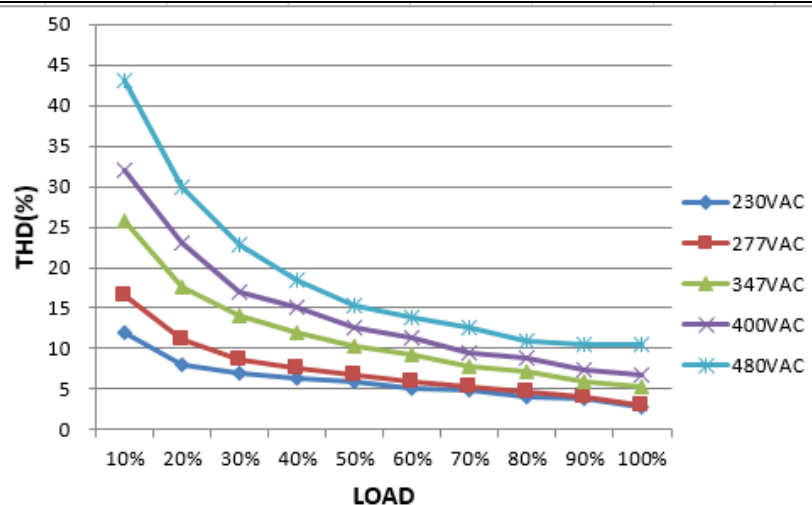
I/P : 347VAC
O/P : DIMMING TEST

		TA : 25°C TEST RESULT : OK
10	DALI interface(primary side)	DALI protocol including 16 groups and 64 addresses. First step is fixed at 6% of output. I/P : 347VAC O/P : DALI TEST TA : 25°C TEST RESULT : OK

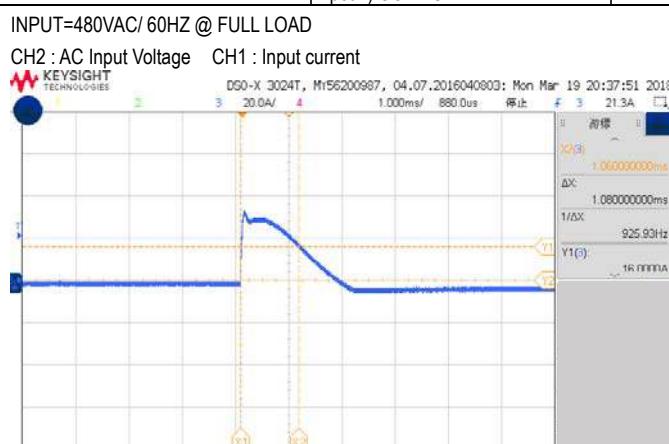
INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	180VAC~528 VAC	I/P:TESTING O/P:FULL LOAD CP 4.2A Ta:25°C	160V~ 528V
			I/P: LOW-LINE-3V=177 V HIGH-LINE+10V=538 V O/P:FULL/MIN LOAD CP 4.2A (PLEASE CHECK DERATING CURVE) ON: 30 Sec OFF: 30 Sec 10MIN (POWER ON/OFF NO DAMAGE)	(1).TEST: OK (2).TEST : OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P: 180 VAC ~528VAC O/P:FULL~MIN LOAD CP 4.2A Ta:25°C	TEST: OK
3	INPUT CURRENT (TYP)	347VAC/ 2.1 A 480VAC/ 1.5A	I/P: 347VAC/480VAC O/P:FULL LOAD CP 4.2A Ta:25°C	I =1.97A/ 347VAC I =1.44A/480VAC
4	LEAKAGE CURRENT	IEC60950-1 < 0.75mA / 480VAC	I/P: 480 VAC O/P:Min LOAD Ta:25°C	L-FG: 0.29mA N-FG: 0.26mA
5	POWER FACTOR(TYP)	0.95/480VAC FULL LOAD 0.96/400VAC FULL LOAD 0.97/347VAC FULL LOAD 0.98/277 VAC FULL LOAD 0.98/230 VAC FULL LOAD	I/P: 230VAC/277VAC/347VAC/400VAC/480VAC O/P:FULL LOAD CP 4.2A Ta:25°C	PF=0.9713/480V/100%LOAD PF=0.985/400V/100%LOAD PF= 0.9916/347V/100%LOAD PF=0.9965/277V/100%LOAD PF=0.9984 /230V/100%LOAD
	P.F vs LOAD			

		 Graph showing Power Factor (PF) vs Load (%) for input voltages: 230VAC, 277VAC, 347VAC, 400VAC, and 480VAC. PF increases with load and input voltage, reaching near 1.0 at 100% load.		
6	EFFICIENCY (TYP)	95%	I/P: 347VAC O/P: FULL LOAD. CP 4.2A Ta: 25°C	95.48%
	EFFICIENCY vs LOAD	 Graph showing Efficiency (%) vs Load (%) for input voltages: 230VAC, 277VAC, 347VAC, 400VAC, and 480VAC. Efficiency increases with load, reaching approximately 95% at 100% load.		
7	TOTAL HARMONIC DISTORTION	THD < 20% output load ≥ 50% at 230VAC/277VAC/347VAC /480VAC input	I/P : 230V/277V/347V/480V/400VAC O/P : 100% LOAD 50% LOAD CP 4.2A Ta : 25°C	THD : 6 %/230V 50% THD : 2.69 %/230V 100% THD : 6.7 %/277V 50% THD : 3.08 %/277V 100% THD : 10.28 %/347V 50% THD : 5.28 %/347V 100% THD : 15.4 %/480V 50% THD : 10.54 %/480V 100% THD : 12.62 %/400V 50% THD : 6.71 %/400V 100%
	THD vs LOAD			



8	INRUSH CURRENT (TYP)	480V/ 40A COLD START (twidh=1100 us measured at 50% Ipeak) COLD START	I/P: 480VAC O/P:FULL LOAD CP 4.2A Ta:25°C	I =32.5A/480VAC T50= 1080 μS
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ROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER VOLTAGE PROTECTION	V1: 161V~174V PROTECTION TYPE : Shut down output voltage, re-power on to recovery	I/P: 528VAC I/P: 347VAC I/P: 180VAC CP 4.2A O/P:MIN LOAD Ta:25°C	165V/ 528VAC 165V / 347VAC 165V / 180VAC PROTECTION TYPE : Shut down output voltage, re-power on to recovery
2	OVER TEMPERATURE PROTECTION	PROTECTION TYPE : Shut down output voltage, re-power on to recovery	I/P: 528 VAC I/P: 180 VAC O/P:FULL LOAD CP 4.2A Ta:25°C	O.T.P. Active PROTECTION TYPE : Shut down output voltage, re-power on to recovery

3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE PROTECTION TYPE : Constant current, recovers automatically after fault condition is removed	I/P: 528VAC I/P: 180 VAC O/P: FULL LOAD CP: 4.2A & 5.25A Ta:25°C	CP: 4.2A/5.25A NO DAMAGE PROTECTION TYPE : Constant current, recovers automatically after fault condition is removed
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COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q11 Rated 12A /950V 		

4	Diode Peak Voltage	Q100 Rated 22A/600V Q101 Rated 22A/600V Q130 Rated 22A/600V Q131 Rated 22A/600V D561 Rated 1A/400V	I/P:High-Line +3V =531 V VDS : CP: 4.2A & 5.25A O/P: (1)Full Load (2)Output Short (3) Full Load continue (4) NO LOAD (5) burst mode Ta:25°C	CP: 4.2A Q100 VDS: (1) 310V (2) 52.4V (3)310 V (4)308V (5)308V Q101 VDS: (1) 310V (2) 50.7V (3) 319V (4)318V (5)316V Q130 VDS: (1) 316V (2) 30.4V (3) 314V (4)312V (5)313V Q131 VDS: (1) 314V (2) 47.9V (3) 314V (4)313V (5)314V D561 (1) 213V (2) 233V (3)157 V	CP:5.25A Q100 VDS: (1) 252V (2) 34.4V (3) 250V (4)252V (5)250V Q101 VDS: (1) 262V (2) 42.8V (3) 262V (4)262V (5)260V Q130 VDS: (1)252 V (2) 33.6V (3) 250V (4)252V (5)251V Q131 VDS: (1) 262V (2) 45.6V (3) 260V (4)258V (5)259V D561 (1) 216V (2) 232V (3)162V
5	Input Capacitor Voltage	C5 Rated: : 220μ/450 V	I/P:High-Line +3V =531V CP 4.2A 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°C	CP: 4.2A (1) 443V (2) 419V (3) 419V (4) 395V	
6	Control IC Voltage Test	PFC IC U1 Rated 21V~11.5V(MIN.) PWM IC U2 Rated 16V~ 8.85V(MIN.)	I/P:High-Line +3V =531 V CP: 4.2A O/P(1)FULL LOAD (2) Output Short (3)O.L.P (4)O.V.P. (5)NO LOAD VRmin.LOW LINE Ta:25°C	U1 (1) 13.6V (2) 13.6V (3)13.6V (4) 13.6V (5) 13.6V	U2 (1) 13.6V (2) 13.6V (3) 13.6V (4)13.6 V (5) 13.6V

SAFETY & EMC TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	IEC60950-1 I/P-O/P: 4.2KVAC/min I/P-FG: 2.1KVAC/min<4.5mA O/P-FG:1.5KVAC/min	I/P-O/P: 4.62 KVAC/min I/P-FG: 2.52KVAC/min O/P-FG: 1.8 KVAC/min Ta:25°C	I/P-O/P:3.7 mA I/P-FG:2.39 mA O/P-FG: 6.51mA 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:14.1 GΩ I/P-FG: 12.5G Ω O/P-FG:12.9 G Ω NO DAMAGE
3	GROUNDING CONTINUITY	IEC60950-1 FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25°C	24mΩ

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS A	I/P:230VAC/50HZ O/P:FULL LOAD Ta:25°C	PASS
2	CONDUCTION	FCC PART 15 CLASS B EN55015	I/P:230V/400V/480VAC (50HZ/60HZ) O/P:FULL/40% LOAD Ta:25°C	PASS Test by certified Lab
3	RADIATION	FCC PART 15 CLASS B EN55015	I/P:230V/400V/480VAC (50HZ/60HZ) O/P:FULL/40% LOAD Ta:25°C	PASS Test by certified Lab
4	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR:8KV / Contact:4KV	I/P: 230/400VAC (50HZ) O/P:FULL LOAD Ta:25°C	CRITERIA A
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 230/400VAC (50HZ) O/P:FULL LOAD Ta:25°C	CRITERIA A
6	SURGE	IEC61000-4-5 INDUSTRY L-N :4KV L,N-PE:8KV	I/P: 230/400VAC (50HZ) 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 : HVGC-650-M 1. ROOM AMBIENT BURN-IN : 1.5 HRS I/P : 347VAC O/P : FULL LOAD 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 347VAC O/P : FULL LOAD		

		<table><tr><th>CH.</th><th>Position</th><th>ROOM AMBIENT Ta= 25 °C</th><th>HIGH AMBIENT Ta= 55 °C</th></tr><tr><td>1</td><td>BD1</td><td>67.1°C</td><td>98.4°C</td></tr><tr><td>2</td><td>ZNR4</td><td>64.8°C</td><td>96.6°C</td></tr><tr><td>3</td><td>RTH4</td><td>75.8°C</td><td>103.4°C</td></tr><tr><td>4</td><td>C10</td><td>64.1°C</td><td>97.3°C</td></tr><tr><td>5</td><td>Q3</td><td>62.6°C</td><td>95.7°C</td></tr><tr><td>6</td><td>Q1</td><td>62.8°C</td><td>95.4°C</td></tr><tr><td>7</td><td>D5</td><td>60.8°C</td><td>96.0°C</td></tr><tr><td>8</td><td>D8</td><td>70.0°C</td><td>107.2°C</td></tr><tr><td>9</td><td>L3</td><td>67.2°C</td><td>102.5°C</td></tr><tr><td>10</td><td>LF3</td><td>63.7°C</td><td>95.6°C</td></tr><tr><td>11</td><td>C7</td><td>61.3°C</td><td>93.2°C</td></tr><tr><td>12</td><td>Q10</td><td>66.6°C</td><td>102.0°C</td></tr><tr><td>13</td><td>Q12</td><td>65.6°C</td><td>100.6°C</td></tr><tr><td>14</td><td>T3</td><td>66.3°C</td><td>99.9°C</td></tr><tr><td>15</td><td>C93</td><td>65.9°C</td><td>99.3°C</td></tr><tr><td>16</td><td>C5</td><td>62.4°C</td><td>95.1°C</td></tr><tr><td>17</td><td>RY1</td><td>65.6°C</td><td>99.0°C</td></tr><tr><td>18</td><td>T1-1</td><td>71.3°C</td><td>103.9°C</td></tr><tr><td>19</td><td>T1-2</td><td>79.1°C</td><td>114.7°C</td></tr><tr><td>20</td><td>T2-1</td><td>71.7°C</td><td>107.5°C</td></tr><tr><td>21</td><td>T2-2</td><td>71.0°C</td><td>103.3°C</td></tr><tr><td>22</td><td>C925</td><td>66.0°C</td><td>99.6°C</td></tr><tr><td>23</td><td>Q101</td><td>64.9°C</td><td>98.9°C</td></tr><tr><td>24</td><td>Q130</td><td>63.7°C</td><td>97.2°C</td></tr><tr><td>25</td><td>Q102</td><td>64.2°C</td><td>96.5°C</td></tr><tr><td>26</td><td>C105</td><td>60.8°C</td><td>93.6°C</td></tr><tr><td>27</td><td>C109</td><td>58.1°C</td><td>90.3°C</td></tr><tr><td>28</td><td>C120</td><td>60.1°C</td><td>92.6°C</td></tr><tr><td>29</td><td>RTH2</td><td>67.4°C</td><td>100.9°C</td></tr><tr><td>30</td><td>U501</td><td>72.6°C</td><td>107.1°C</td></tr><tr><td>31</td><td>T500</td><td>70.3°C</td><td>104.3°C</td></tr><tr><td>32</td><td>Q511</td><td>72.1°C</td><td>106.9°C</td></tr><tr><td>33</td><td>D501</td><td>68.2°C</td><td>102.2°C</td></tr><tr><td>34</td><td>C570</td><td>64.5°C</td><td>97.4°C</td></tr><tr><td>35</td><td>C571</td><td>56.0°C</td><td>87.5°C</td></tr><tr><td>36</td><td>LF50</td><td>55.0°C</td><td>86.9°C</td></tr><tr><td>37</td><td>U650</td><td>57.2°C</td><td>88.9°C</td></tr></table>	CH.	Position	ROOM AMBIENT Ta= 25 °C	HIGH AMBIENT Ta= 55 °C	1	BD1	67.1°C	98.4°C	2	ZNR4	64.8°C	96.6°C	3	RTH4	75.8°C	103.4°C	4	C10	64.1°C	97.3°C	5	Q3	62.6°C	95.7°C	6	Q1	62.8°C	95.4°C	7	D5	60.8°C	96.0°C	8	D8	70.0°C	107.2°C	9	L3	67.2°C	102.5°C	10	LF3	63.7°C	95.6°C	11	C7	61.3°C	93.2°C	12	Q10	66.6°C	102.0°C	13	Q12	65.6°C	100.6°C	14	T3	66.3°C	99.9°C	15	C93	65.9°C	99.3°C	16	C5	62.4°C	95.1°C	17	RY1	65.6°C	99.0°C	18	T1-1	71.3°C	103.9°C	19	T1-2	79.1°C	114.7°C	20	T2-1	71.7°C	107.5°C	21	T2-2	71.0°C	103.3°C	22	C925	66.0°C	99.6°C	23	Q101	64.9°C	98.9°C	24	Q130	63.7°C	97.2°C	25	Q102	64.2°C	96.5°C	26	C105	60.8°C	93.6°C	27	C109	58.1°C	90.3°C	28	C120	60.1°C	92.6°C	29	RTH2	67.4°C	100.9°C	30	U501	72.6°C	107.1°C	31	T500	70.3°C	104.3°C	32	Q511	72.1°C	106.9°C	33	D501	68.2°C	102.2°C	34	C570	64.5°C	97.4°C	35	C571	56.0°C	87.5°C	36	LF50	55.0°C	86.9°C	37	U650	57.2°C	88.9°C
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2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR TEMPERATURE :-40°C	I/P : 528VAC/180VAC O/P : 100 % LOAD Ta= -45°C	TEST : OK																																																																																																																																																						
3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 55 °C / 95 %R.H NO DAMAGE	I/P : 538VAC O/P : FULL LOAD Ta= 55 °C HUMIDITY= 95 %R.H	TEST : OK																																																																																																																																																						
4	TEMPERATURE COEFFICIENT	± 0.03%/°C (0~55°C)	I/P : 347 VAC O/P : FULL LOAD	± 0 %/°C (0~55°C)																																																																																																																																																						
5	STORAGE TEMPERATURE TEST	-40°C~+80°C	1. Thermal shock Temperature : -50°C~ +125°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																																																																																																																																																							

6	THERMAL SHOCK TEST	-40°C~+55°C (PLEASE CHECK DERATING CURVE)	1. Thermal shock Temperature : -45°C~ +60°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 : 15cycle:347V/ FULL LOAD AC ON 3sec/AC OFF 1sec TEST 1cycle:347V/ FULL LOAD Burn In Test
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 : 12min/sweep cycle (4) Acceleration : 6G (5) Test Time : 180min in each axis (X.Y.Z) (6) Ta : 25°C
8	CAPACITOR LIFE CYCLE	SUPPOSE C105 IS THE MOST CRITICAL COMPONENT (1) I/P : 347VAC O/P : FULL LOAD Tc= 80 °C LIFE TIME (2) I/P : 347VAC O/P : FULL LOAD Tc= 80 °C LIFE TIME (3) I/P : 347VAC O/P : 75% LOAD Tc= 80 °C LIFE TIME	(1) 51484 HRS (2) 52171 HRS (3) 52935 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 218.8K hrs min. Telcordia SR-332(Bellcore) ; 60.2K 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	DANIEL GAO	SANFORD SU	VINCENT ZENG

12.10.30 A50-F031