



Test Report: HVGC-650-H

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

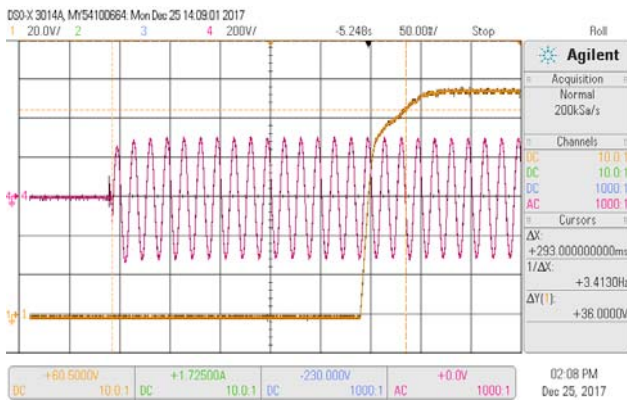
ENVIRONMENT TEST

■ **DESIGN VERIFY TEST**

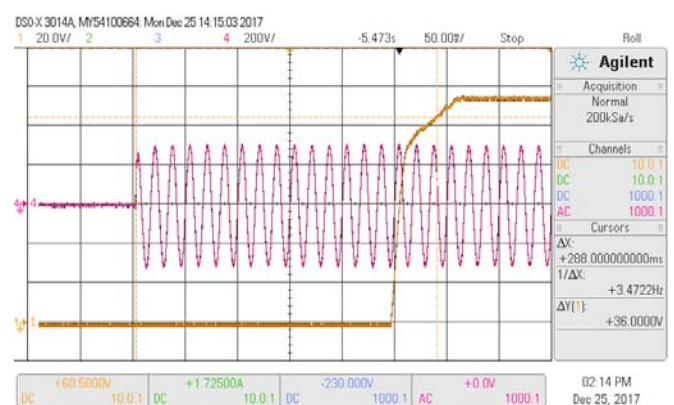
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CURRENT TOLERANCE	±5%	I/P: 347VAC I/P: 480VAC O/P: FULL LOAD CP: 5.6A & 7A Ta: 25°C	CP 5.6A: 5.614A/347VAC@LED MAX-1V 5.629A/347VAC@LED MIN 5.610A/480VAC@LED MAX-1V 5.633A/480VAC@LED MIN 0.58% CP 7A: 7.035A/347VAC@LED MAX-1V 7.037A/347VAC@LED MIN 7.031A/480VAC@LED MAX-1V 7.041A/480VAC@LED MIN 0.58%
2	FULL POWER CURRENT RANGE	5600~7000mA	I/P: 347VAC O/P: FULL LOAD CP: 5.6A & 7A Ta: 25°C	116.93V/5.6A/347VAC 94.66V/7A/347VAC
3	OPEN CIRCUIT VOLTAGE (max)	120V	I/P: 347VAC O/P: NO LOAD CP: OPEN Ta: 25°C	117.8V
4	CONSTANT CURRENT REGION	CP 5.6A: CH1: 58V~ 116V CP 7A: CH1: 46.4V~ 92.8V	I/P: 347VAC O/P: FULL LOAD CP: 5.6A & 7A Ta: 25°C	CP 5.6A: 0.62V~ 116V/347VAC CP 7A: 0.84V~ 92.8V/347VAC
5	CURRENT ADJ. RANGE	CH1: 2800mA~7000mA	I/P: 347VAC I/P: 480VAC O/P: LED MIN & LED MAX-1V Ta: 25°C	2370mA~7037mA/347VAC@LED MAX-1V 2338mA~7039mA /347VAC@LED MIN 2375mA~7031mA /480VAC@LED MAX-1V 2375mA~7045mA /480VAC@LED MIN
6	CURRENT RIPPLE	5% max. @rated current	I/P: 347VAC O/P: FULL LOAD CP: 5.6A & 7A Ta: 25°C	CP 5.6A: 2.12% CP 7A: 2.31%
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 5.6A Ta: 25°C	230VAC/293ms 347VAC/288ms 480VAC/258ms

INPUT=230VAC/50HZ @ FULL LOAD@ CP 5.6A
CH1 : Output Voltage CH2 : AC Input Voltage



INPUT=347VAC/60HZ @ FULL LOAD@ CP 5.6A
CH1 : Output Voltage CH2 : AC Input Voltage

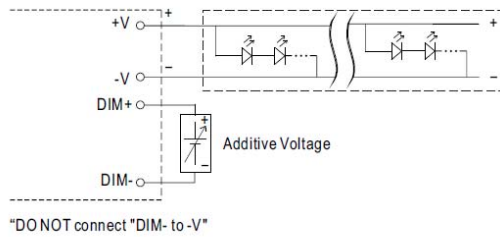


8 DIMMING OPERATION (for B-Type)

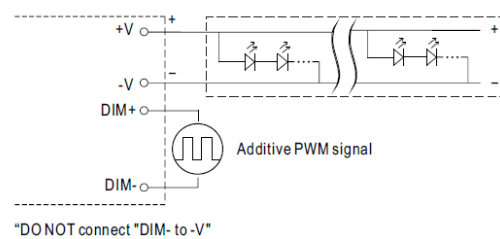
※3 in 1 dimming function

- ※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.)

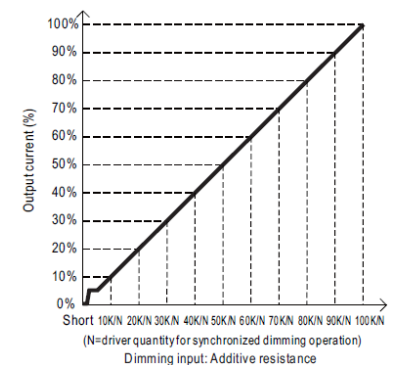
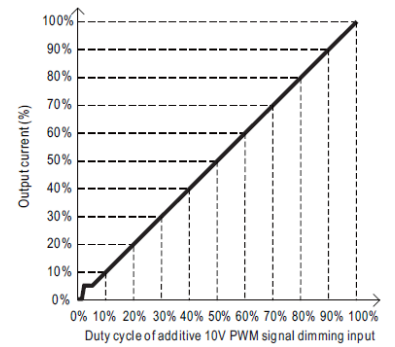
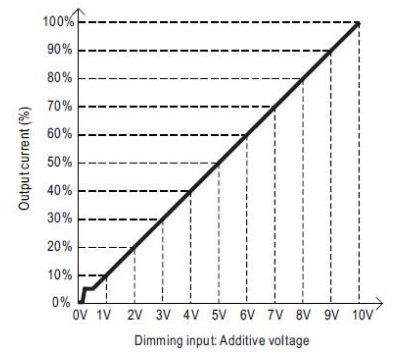
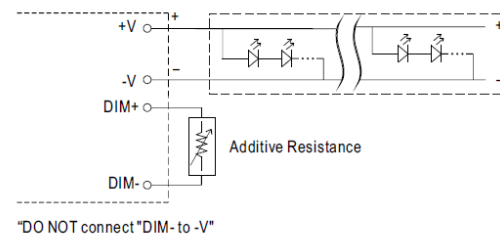
◎ Applying additive 0 ~ 10VDC



◎ 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°C

R	SHORT	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K	OPEN
O/P CURRENT	0A	0.623A	1.090A	1.610A	2.190A	2.700A	3.330A	3.890A	4.430A	4.900A	5.460A	5.510A
%	0.00%	11.13%	19.46%	28.75%	39.11%	48.21%	59.46%	69.46%	79.11%	87.50%	97.50%	98.39%
V	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN
O/P CURRENT	0A	0.670A	1.180A	1.720A	2.300A	2.860A	3.390A	3.910A	4.480A	4.990A	5.480A	5.470A
%	0.00%	11.96%	21.07%	30.71%	41.07%	51.07%	60.54%	69.82%	80.00%	89.11%	97.86%	97.68%
PWM (100HZ)	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
O/P CURRENT	0A	0.622A	1.180A	1.720A	2.280A	2.830A	3.380A	3.910A	4.480A	5.010A	5.480A	5.470A
%	0.00%	11.11%	21.07%	30.71%	40.71%	50.54%	60.36%	69.82%	80.00%	89.46%	97.86%	97.68%

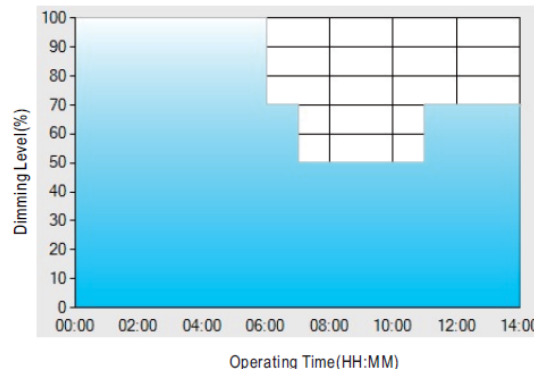
TEST RESULT : OK

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.

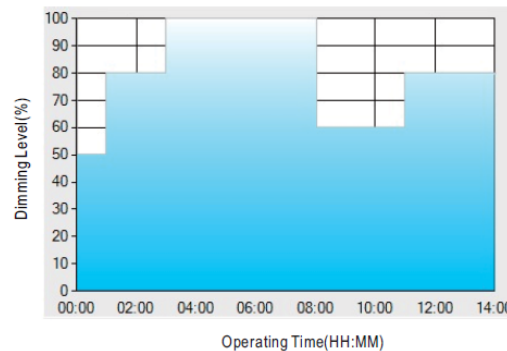
Ex: © D01-Type: the profile recommended for residential lighting



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

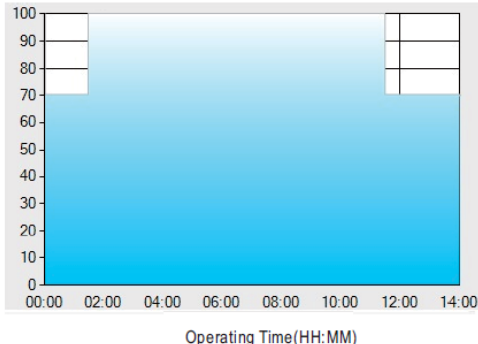
	T1	T2	T3	T4
TIME**	06:00	07:00	11:00	--
LEVEL**	100%	70%	50%	70%

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



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

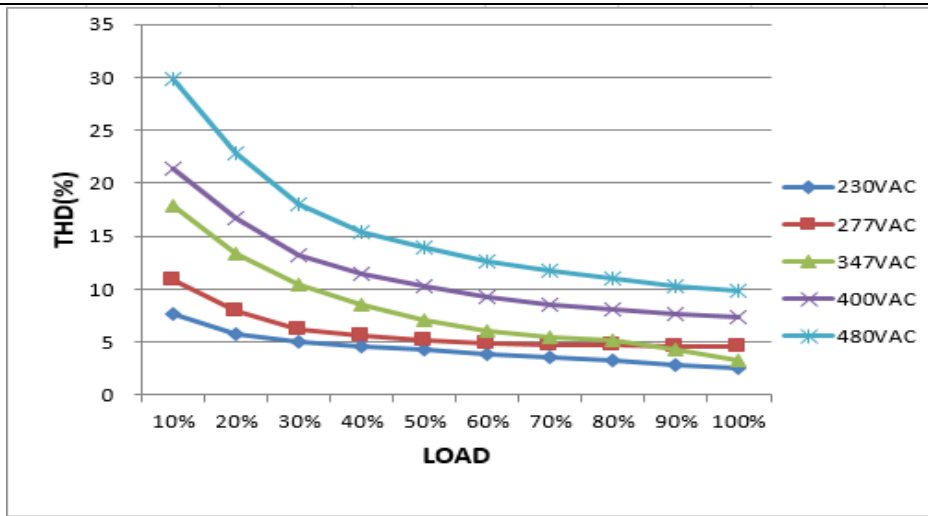
	T1	T2	T3	T4	T5
TIME**	01:00	03:00	8:00	11:00	--
LEVEL**	50%	80%	100%	60%	80%

		<p>Ex: ☉ D03-Type: the profile recommended for tunnel lighting</p>  <p>Set up for D03-Type in Smart timer dimming software program:</p> <table border="1" data-bbox="1066 369 1417 504"> <thead> <tr> <th></th> <th>T1</th> <th>T2</th> <th>T3</th> </tr> </thead> <tbody> <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> </tbody> </table> <p>I/P : 347VAC O/P : DIMMING TEST TA : 25°C TEST RESULT : OK</p>		T1	T2	T3	TIME**	01:30	11:00	---	LEVEL**	70%	100%	70%
	T1	T2	T3											
TIME**	01:30	11:00	---											
LEVEL**	70%	100%	70%											
10	DALI interface(primary side)	<p>DALI protocol including 16 groups and 64 addresses. First step is fixed at 6% of output.</p> <p>I/P : 347VAC O/P : DALI TEST TA : 25°C TEST RESULT : OK</p>												

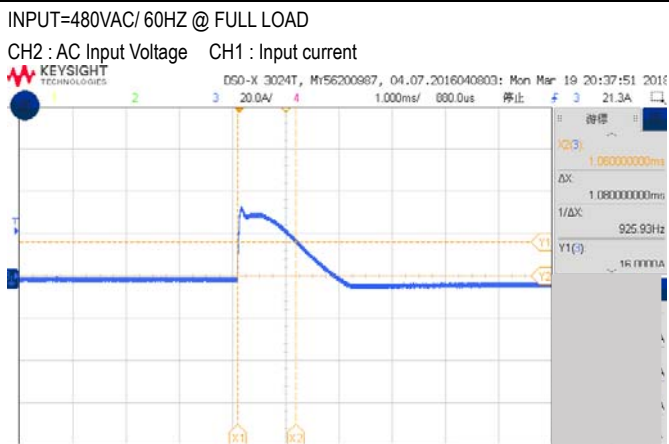
INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	180VAC~528 VAC	I/P:TESTING O/P:FULL LOAD CP 5.6A Ta:25°C	150V~528V
			I/P: LOW-LINE-3V=177 V HIGH-LINE+10V=538 V O/P:FULL/MIN LOAD CP 5.6A (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 5.6A 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 5.6A Ta:25°C	I=1.932A/ 347VAC I=1.415A/480VAC
4	LEAKAGE CURRENT	IEC60950-1 < 0.75mA / 480VAC	I/P: 480 VAC O/P:Min LOAD Ta:25°C	L-FG:0.28mA N-FG: 0.28mA
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: 480VAC/400VAC/347VAC /277VAC/230VAC O/P:FULL LOAD CP 5.6A Ta:25°C	PF= 0.9726/480V/100%LOAD PF= 0.985/400V/100%LOAD PF= 0.9920/347V/100%LOAD PF=0.9960/277V/100%LOAD PF=0.9982/230V/100%LOAD

	<p>P.F vs LOAD</p> <table border="1"> <caption>PF vs LOAD Data</caption> <thead> <tr> <th>LOAD (%)</th> <th>230VAC</th> <th>277VAC</th> <th>347VAC</th> <th>400VAC</th> <th>480VAC</th> </tr> </thead> <tbody> <tr><td>10%</td><td>0.95</td><td>0.92</td><td>0.84</td><td>0.79</td><td>0.70</td></tr> <tr><td>20%</td><td>0.97</td><td>0.95</td><td>0.90</td><td>0.85</td><td>0.80</td></tr> <tr><td>30%</td><td>0.98</td><td>0.97</td><td>0.94</td><td>0.91</td><td>0.86</td></tr> <tr><td>40%</td><td>0.98</td><td>0.98</td><td>0.96</td><td>0.93</td><td>0.90</td></tr> <tr><td>50%</td><td>0.99</td><td>0.99</td><td>0.97</td><td>0.94</td><td>0.92</td></tr> <tr><td>60%</td><td>0.99</td><td>0.99</td><td>0.98</td><td>0.95</td><td>0.93</td></tr> <tr><td>70%</td><td>0.99</td><td>0.99</td><td>0.98</td><td>0.96</td><td>0.94</td></tr> <tr><td>80%</td><td>0.99</td><td>0.99</td><td>0.98</td><td>0.97</td><td>0.95</td></tr> <tr><td>90%</td><td>0.99</td><td>0.99</td><td>0.98</td><td>0.97</td><td>0.96</td></tr> <tr><td>100%</td><td>0.99</td><td>0.99</td><td>0.98</td><td>0.97</td><td>0.96</td></tr> </tbody> </table>					LOAD (%)	230VAC	277VAC	347VAC	400VAC	480VAC	10%	0.95	0.92	0.84	0.79	0.70	20%	0.97	0.95	0.90	0.85	0.80	30%	0.98	0.97	0.94	0.91	0.86	40%	0.98	0.98	0.96	0.93	0.90	50%	0.99	0.99	0.97	0.94	0.92	60%	0.99	0.99	0.98	0.95	0.93	70%	0.99	0.99	0.98	0.96	0.94	80%	0.99	0.99	0.98	0.97	0.95	90%	0.99	0.99	0.98	0.97	0.96	100%	0.99	0.99	0.98	0.97	0.96
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6	EFFICIENCY (TYP)	95%	I/P: 347VAC O/P: FULL LOAD. CP 5.6A Ta: 25°C	95.4%	<p>EFFICIENCY vs LOAD</p> <table border="1"> <caption>Efficiency vs LOAD Data</caption> <thead> <tr> <th>LOAD (%)</th> <th>230VAC</th> <th>277VAC</th> <th>347VAC</th> <th>400VAC</th> <th>480VAC</th> </tr> </thead> <tbody> <tr><td>10%</td><td>80</td><td>80</td><td>79</td><td>79</td><td>79</td></tr> <tr><td>20%</td><td>86</td><td>86</td><td>85</td><td>85</td><td>85</td></tr> <tr><td>30%</td><td>90</td><td>90</td><td>89</td><td>89</td><td>89</td></tr> <tr><td>40%</td><td>92</td><td>92</td><td>91</td><td>91</td><td>91</td></tr> <tr><td>50%</td><td>93</td><td>93</td><td>92</td><td>92</td><td>92</td></tr> <tr><td>60%</td><td>94</td><td>94</td><td>93</td><td>93</td><td>93</td></tr> <tr><td>70%</td><td>94.5</td><td>94.5</td><td>94</td><td>94</td><td>94</td></tr> <tr><td>80%</td><td>95</td><td>95</td><td>94.5</td><td>94.5</td><td>94.5</td></tr> <tr><td>90%</td><td>95</td><td>95</td><td>94.5</td><td>94.5</td><td>94.5</td></tr> <tr><td>100%</td><td>95</td><td>95</td><td>94.5</td><td>94.5</td><td>94.5</td></tr> </tbody> </table>	LOAD (%)	230VAC	277VAC	347VAC	400VAC	480VAC	10%	80	80	79	79	79	20%	86	86	85	85	85	30%	90	90	89	89	89	40%	92	92	91	91	91	50%	93	93	92	92	92	60%	94	94	93	93	93	70%	94.5	94.5	94	94	94	80%	95	95	94.5	94.5	94.5	90%	95	95	94.5	94.5	94.5	100%	95	95	94.5	94.5	94.5
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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 5.6A Ta : 25°C	<table border="1"> <thead> <tr> <th>THD</th> <th>Input Voltage</th> <th>Load</th> </tr> </thead> <tbody> <tr><td>4.27</td><td>%/230V</td><td>50%</td></tr> <tr><td>2.48</td><td>%/230V</td><td>100%</td></tr> <tr><td>5.15</td><td>%/277V</td><td>50%</td></tr> <tr><td>4.57</td><td>%/277V</td><td>100%</td></tr> <tr><td>7.05</td><td>%/347V</td><td>50%</td></tr> <tr><td>3.23</td><td>%/347V</td><td>100%</td></tr> <tr><td>13.94</td><td>%/480V</td><td>50%</td></tr> <tr><td>9.79</td><td>%/480V</td><td>100%</td></tr> <tr><td>10.24</td><td>%/400V</td><td>50%</td></tr> <tr><td>7.3</td><td>%/400V</td><td>100%</td></tr> </tbody> </table>	THD	Input Voltage	Load	4.27	%/230V	50%	2.48	%/230V	100%	5.15	%/277V	50%	4.57	%/277V	100%	7.05	%/347V	50%	3.23	%/347V	100%	13.94	%/480V	50%	9.79	%/480V	100%	10.24	%/400V	50%	7.3	%/400V	100%																																		
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8	INRUSH CURRENT (TYP)	480V/ 40A COLD START (twidth=1100 us measured at 50% Ipeak) COLD START	I/P: 480VAC O/P:FULL LOAD CP 5.6A 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: 118V~135V PROTECTION TYPE : Shut down output voltage, re-power on to recovery	I/P: 528VAC I/P: 347VAC I/P: 180VAC CP 5.6A O/P:MIN LOAD Ta:25°C	128V / 528VAC 124V/ 347VAC 126V/ 180VAC
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 5.6A Ta:25°C	O.T.P. Active 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: 5.6A &7A Ta:25°C	CP: 5.6A PROTECTION TYPE : Constant current, recovers automatically after fault condition is removed CP: 7A

				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 Q13 Rated: 12A/950V	I/P:High-Line +3V =531v CP: 5.6A&7A VDS: O/P: (1)Full Load (2)Output Short (3) Full Load continue I/P:Low-Line -3V = 177V O/P: (1)Full Load (2)Output Short (3) Full Load continue Ta:25°C	CP: 5.6A Q11 VDS: (1) 865V (2) 849V (3) 785V VDS: (1)849 V (2)809V (3)769 V Q13 VDS: (1)849V (2)841V (3) 785V VDS: (1)857V (2)817V (3) 777V CP: 7A Q11 VDS: (1)851V (2)843 V (3)786V VDS: (1) 851V (2)827 V (3)827V Q13 VDS: (1) 835V (2) 835V (3) 786V VDS: (1) 843V (2) 811V (3) 811V
2	P.F.C Transistor (D to S) or (C to E) Peak Voltage	Q4 Rated: 6 A/1050V	I/P:High-Line +3V =531V CP: 5.6A VDS: O/P: (1)Full Load (2)Output Short (3) Full Load continue	CP: 5.6A Q4 VDS: (1)889V (2)801V (3)825V
3	P.F.C DIODE	D8 Rated: 8A/1200V	I/P:High-Line +3V =531 V CP: 5.6A O/P: (1)Full Load (2)Output Short (3) Full Load continue Ta:25°C	CP: 5.6A (1)821V (2)837V (3)813 V
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: 5.6A & 7A O/P: (1)Full Load (2)Output Short (3) Full Load continue (4)NO LOAD (5) burst mode Ta:25°C	CP: 5.6A Q100 VDS: (1)239V (2)58.7V (3) 239V (4)232V (5)233V CP:7A Q100 VDS: (1)193V (2)59.3V (3)193V (4)191V (5)192V Q101 VDS: (1)235 V (2)55.9V (3)235V Q101 VDS: (1)199V (2) 53.4V (3)199V

				(4)233V (5)233V	(4)199V (5)198V
				Q130 VDS: (1)239V (2)53.5V (3)239 V (4)236V (5)234V	Q130 VDS: (1)193 V (2)56.2 V (3)189V (4)188V (5)189V
				Q131 VDS: (1)241V (2) 55.1V (3)241 V (4)239V (5)240V	Q131 VDS: (1)197 V (2) 49.8V (3) 197V (4)199V (5)196V
				D561 (1)207 V (2) 251V (3) 175V	D561 (1)208 V (2) 255V (3) 176V
5	Input Capacitor Voltage	C5 Rated: : 220μ/450 V	I/P:High-Line +3V =531V CP 5.6A 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: 5.6A (1) 423V (2) 399V (3) 407V (4) 387V	
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: 5.6A 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) 14.1V (2) 14.1V (3) 14.1V (4) 14.1V (5) 14.1V	U2 (1) 14.1V (2) 14.1V (3) 13.9V (4) 14.1V (5) 14.1V

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: 27.6GΩ I/P-FG:23.1 G Ω O/P-FG: 24.2G 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-U 1. ROOM AMBIENT BURN-IN : 1.5 HRS I/P : 347VAC O/P : FULL LOAD 2. HIGH AMBIENT BURN-IN : 3 HRS I/P : 347VAC O/P : FULL LOAD		

CH.	Position	ROOM AMBIENT	
		Ta= 25 °C	HIGH AMBIENT Ta= 55 °C
1	BD1	66.7°C	95.8°C
2	ZNR4	62.3°C	91.8°C
3	RTH4	73.5°C	99.4°C
4	C10	61.6°C	91.8°C
5	Q1	61.4°C	92.0°C
6	Q3	60.7°C	90.9°C
7	D5	60.3°C	92.2°C
8	D8	69.6°C	106.3°C
9	L3	64.8°C	97.4°C
10	LF3	61.1°C	91.4°C
11	Q10	64.1°C	97.5°C
12	C7	62.0°C	93.8°C
13	Q12	58.5°C	88.0°C
14	T3	61.0°C	92.3°C
15	C93	60.4°C	91.3°C
16	C5	57.3°C	87.0°C
17	RY1	64.4°C	95.0°C
18	T1-1	71.2°C	101.5°C
19	T1-2	72.4°C	102.1°C
20	T2-1	63.0°C	93.8°C
21	T2-2	82.4°C	111.4°C
22	C925	59.7°C	89.4°C
23	Q101	59.2°C	88.8°C
24	Q130	59.1°C	88.9°C
25	C105	57.2°C	86.2°C
26	C109	56.2°C	85.7°C
27	LF100	57.3°C	86.6°C
28	RTH2	60.0°C	89.3°C
29	U501	60.4°C	89.7°C
30	T500	61.6°C	91.4°C
31	Q511	63.8°C	93.1°C
32	D500	60.1°C	90.1°C
33	D501	59.8°C	89.3°C
34	U600	55.0°C	83.7°C
35	LF61	53.5°C	82.3°C

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	± 0.024 %/°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 TEST : OK	



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 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 : 12min/sweep cycle (4) Acceleration : 6G (5) Test Time : 180 min in each axis (X.Y.Z) (6) Ta : 25°C TEST : OK
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) 49862 HRS (2) 46224 HRS (3) 44515HRS
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