



Test Report: HVG-320-48

320W Single Output Switching Power Supply

■ 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

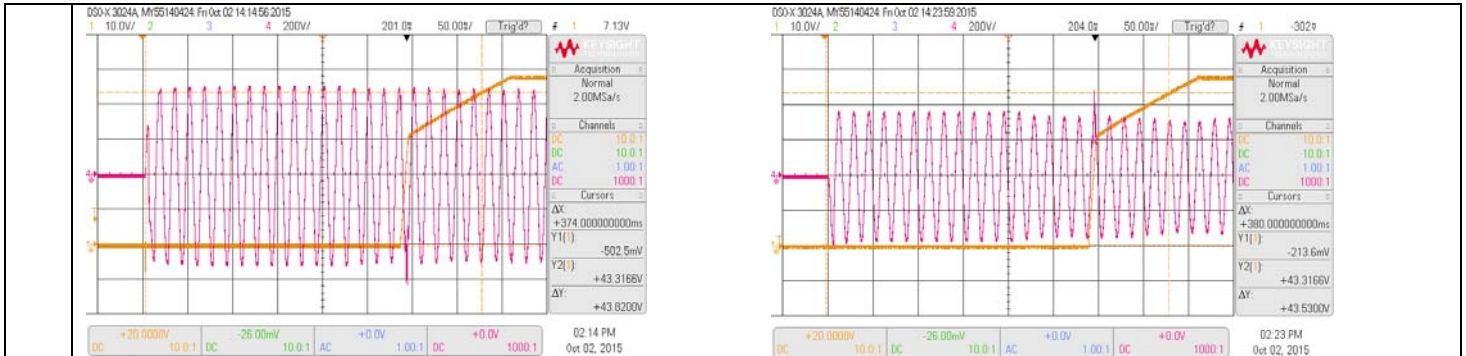
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONSTANT CURRENT REGION	CH1: 24V~ 48V	I/P: 347 VAC O/P:FULL LOAD Ta:25°C	0.47V~47.92 V /347VAC
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 43V~ 52 V	I/P: 347 VAC I/P:230VAC O/P:MIN LOAD Ta:25°C	41.82V~ 53.76 V /347VAC 41.81V~53.76 V/230VAC
3	CURRENT ADJ. RANGE	CH1:3.35A~ 6.7A	I/P: 347 VAC I/P:230VAC O/P:CV MIN & CV MAX-1V Ta:25°C	3.05A~7.725 A /347VAC@CV MAX-1V 3.06A~7.76 A /347VAC@CV MIN 3.07A~7.72 A/230VAC@CV MAX-1V 3.06A~7.75 A/230VAC@CV MIN
4	OUTPUT VOLTAGE TOLERANCE (Max)	V1: 1 % ~ -1 %	I/P:180VAC /528AC O/P:FULL/ MIN LOAD Ta:25°C	V1:0.01 %~-0.15%
5	LINE REGULATION (Max)	V1: 0.5 % ~ -0.5 %	I/P:180VAC~528AC O/P:FULL LOAD Ta:25°C	V1:0.004 %~-0.03%
6	LOAD REGULATION (Max)	V1: 0.5 % ~ -0.5 %	I/P: 347 VAC O/P:FULL ~MIN LOAD Ta:25°C	V1:0.06 %~-0.04 %
7	OVER/UNDERSHOOT TEST	< ±5%	I/P: 347 VAC O/P:FULL LOAD Ta:25°C	TEST: 2.08 %
8	RIPPLE & NOISE (Max)	V1: 250 mVp-p	I/P: 347 VAC O/P:FULL LOAD Ta:25°C	V1: 68 mVp-p
<p>low frequency :</p>				
9	SET UP TIME	480VAC/ 500 ms (Max) 347VAC/ 500 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	480VAC/ 303 ms 347VAC/ 374 ms 230 VAC/ 380 ms
INPUT=347VAC/60HZ @ FULL LOAD CH1 : Output Voltage CH4 : AC Input Voltage			INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage CH4 : AC Input Voltage	

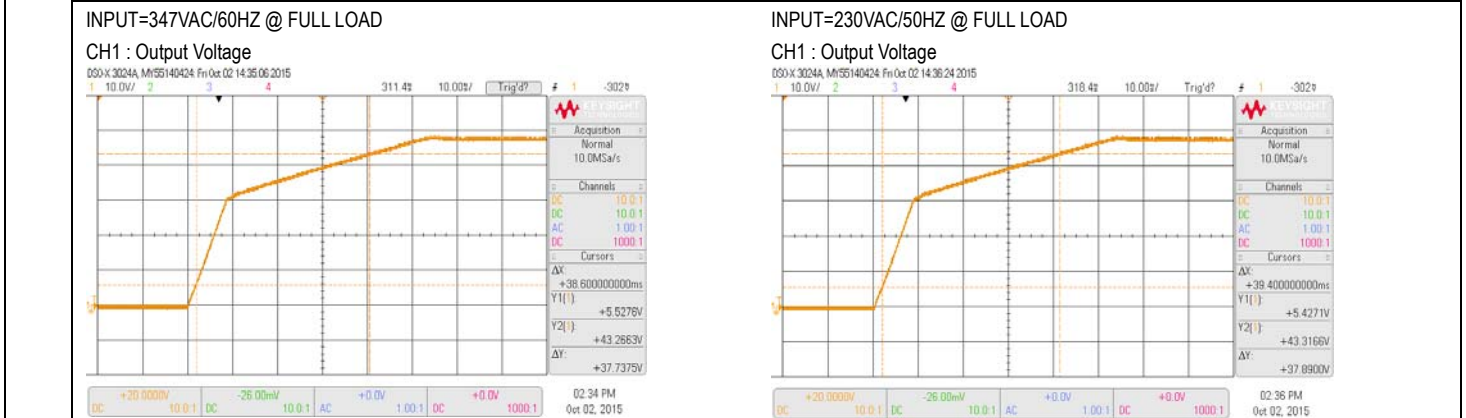


320W Single Output Switching Power Supply

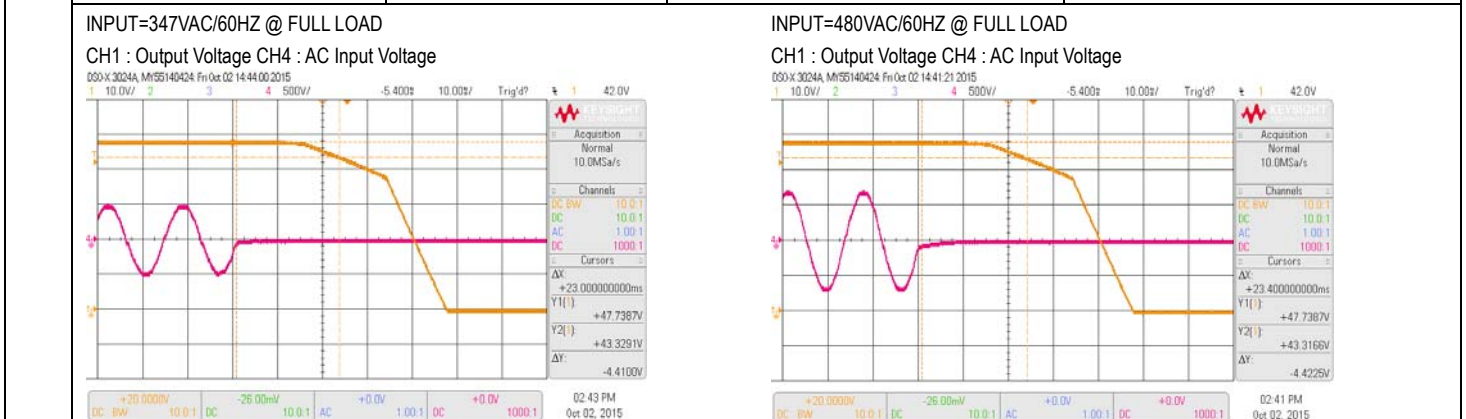
HVG-320 series



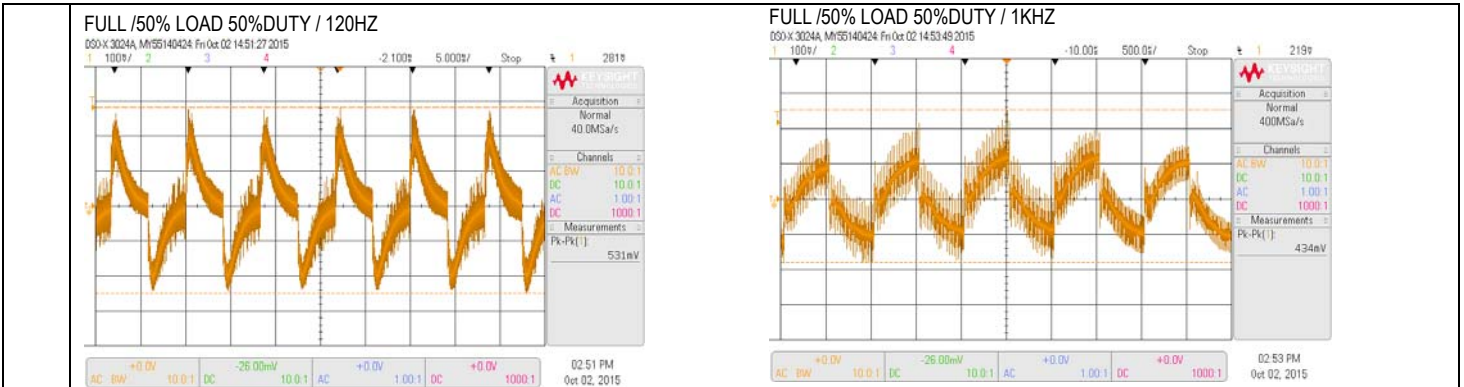
10	RISE TIME	480VAC/ 80 ms (Max) 347VAC/ 80 ms (Max) 230VAC/ 150 ms (Max)	I/P: 480 VAC I/P: 347 VAC I/P: 230 VAC O/P: FULL LOAD Ta:25°C	480VAC/ 39 ms 347VAC/ 38.6 ms 230VAC/ 39.4 ms
	INPUT=347VAC/60HZ @ FULL LOAD CH1 : Output Voltage		INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage	



11	HOLD UP TIME	480VAC/ 15 ms (Max) 347VAC/ 15 ms (Max)	I/P: 480 VAC I/P: 347 VAC O/P: FULL LOAD Ta:25°C	480VAC/ 23.4 ms 347VAC/ 23 ms
	INPUT=347VAC/60HZ @ FULL LOAD CH1 : Output Voltage CH4 : AC Input Voltage		INPUT=480VAC/60HZ @ FULL LOAD CH1 : Output Voltage CH4 : AC Input Voltage	



12	DYNAMIC LOAD	V1: 4800 mVp-p	I/P: 347VAC O/P: (1) FULL /50% LOAD 50%DUTY / 120HZ (2) FULL /50% LOAD 50%DUTY / 1KHZ Ta:25°C	531mVp-p 434 mVp-p
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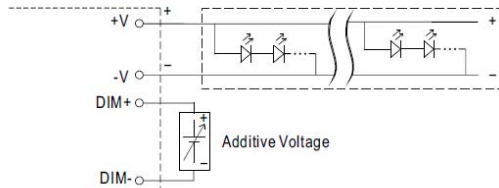


13 DIMMING OPERATION (for B-Type)

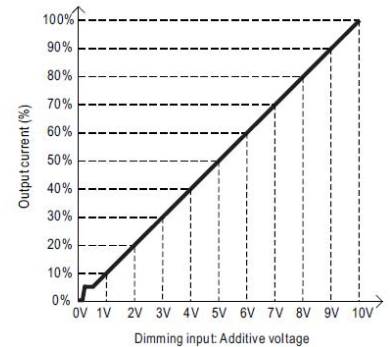
※3 in 1 dimming function

- ※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.)

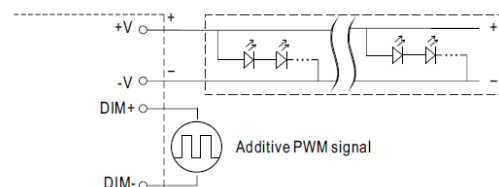
Ⓒ Applying additive 0 ~ 10VDC



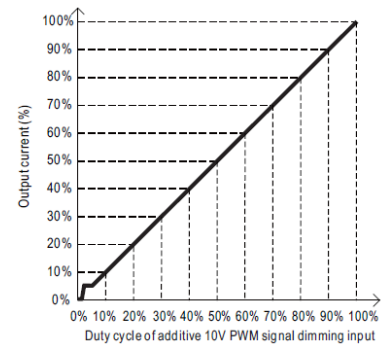
“DO NOT connect “DIM- to -V”



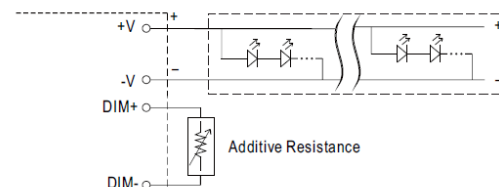
Ⓒ Applying additive 10V PWM signal (frequency range 100Hz ~ 3KHz):



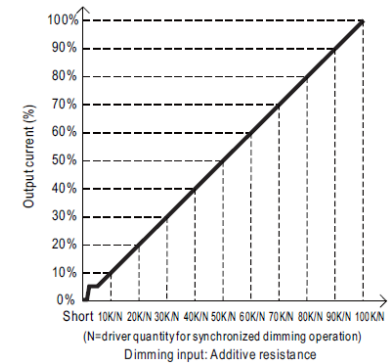
“DO NOT connect “DIM- to -V”



Ⓒ Applying additive resistance:



“DO NOT connect “DIM- to -V”

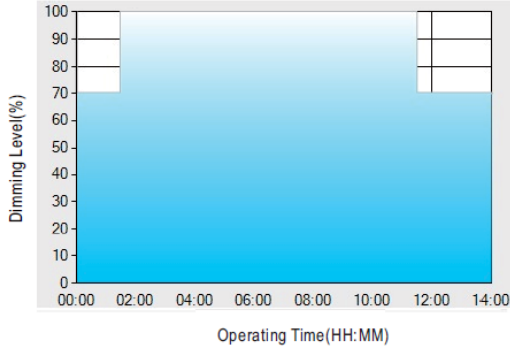


Note : 1. Min. dimming level is about 5% and the output current is not defined when 0% < I_{out} < 5%.
 2. The output current could drop down to 0% when dimming input is about 0k Ω or 0Vdc, or 10V PWM signal with 0% duty cycle.

I/P : 347VAC

		<p>O/P : DIMMING TEST TA : 25°C</p> <table border="1"> <tr> <th>R</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>O/P CURRENT</td> <td>0.00000A</td> <td>0.672A</td> <td>1.324A</td> <td>1.986A</td> <td>2.660A</td> <td>3.302A</td> <td>3.942A</td> <td>4.595A</td> <td>5.224A</td> <td>5.867A</td> <td>6.467A</td> <td>6.776A</td> </tr> <tr> <td>%</td> <td>0.00%</td> <td>10.03%</td> <td>19.76%</td> <td>29.64%</td> <td>39.70%</td> <td>49.28%</td> <td>58.84%</td> <td>68.58%</td> <td>77.97%</td> <td>87.57%</td> <td>96.52%</td> <td>101.13%</td> </tr> <tr> <th>V</th> <th>0V</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>O/P CURRENT</td> <td>0.00000A</td> <td>0.723A</td> <td>1.381A</td> <td>2.052A</td> <td>2.739A</td> <td>3.429A</td> <td>4.099A</td> <td>4.767A</td> <td>5.385A</td> <td>6.053A</td> <td>6.734A</td> <td>6.776A</td> </tr> <tr> <td>%</td> <td>0.00%</td> <td>10.79%</td> <td>20.61%</td> <td>30.63%</td> <td>40.88%</td> <td>51.18%</td> <td>61.18%</td> <td>71.15%</td> <td>80.37%</td> <td>90.34%</td> <td>100.51%</td> <td>101.13%</td> </tr> <tr> <th>PWM (100HZ)</th> <th>0%</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>O/P CURRENT</td> <td>0.00000A</td> <td>0.714A</td> <td>1.375A</td> <td>2.059A</td> <td>2.739A</td> <td>3.407A</td> <td>4.069A</td> <td>4.728A</td> <td>5.392A</td> <td>6.054A</td> <td>6.711A</td> <td>6.776A</td> </tr> <tr> <td>%</td> <td>0.00%</td> <td>10.66%</td> <td>20.52%</td> <td>30.73%</td> <td>40.88%</td> <td>50.85%</td> <td>60.73%</td> <td>70.57%</td> <td>80.48%</td> <td>90.36%</td> <td>100.16%</td> <td>101.13%</td> </tr> </table> <p>TEST RESULT : OK</p>	R	SHORT	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K	OPEN	O/P CURRENT	0.00000A	0.672A	1.324A	1.986A	2.660A	3.302A	3.942A	4.595A	5.224A	5.867A	6.467A	6.776A	%	0.00%	10.03%	19.76%	29.64%	39.70%	49.28%	58.84%	68.58%	77.97%	87.57%	96.52%	101.13%	V	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN	O/P CURRENT	0.00000A	0.723A	1.381A	2.052A	2.739A	3.429A	4.099A	4.767A	5.385A	6.053A	6.734A	6.776A	%	0.00%	10.79%	20.61%	30.63%	40.88%	51.18%	61.18%	71.15%	80.37%	90.34%	100.51%	101.13%	PWM (100HZ)	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN	O/P CURRENT	0.00000A	0.714A	1.375A	2.059A	2.739A	3.407A	4.069A	4.728A	5.392A	6.054A	6.711A	6.776A	%	0.00%	10.66%	20.52%	30.73%	40.88%	50.85%	60.73%	70.57%	80.48%	90.36%	100.16%	101.13%
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<p>14</p>	<p>DIMMING OPERATION (for Dxx-Type by User definition)</p>	<p>※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</p> <p>Set up for D01-Type in Smart timer dimming software program:</p> <table border="1"> <thead> <tr> <th></th> <th>T1</th> <th>T2</th> <th>T3</th> <th>T4</th> </tr> </thead> <tbody> <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> </tbody> </table> <p>Ex : ☉ D02-Type: the profile recommended for street lighting</p> <p>Set up for D02-Type in Smart timer dimming software program:</p> <table border="1"> <thead> <tr> <th></th> <th>T1</th> <th>T2</th> <th>T3</th> <th>T4</th> <th>T5</th> </tr> </thead> <tbody> <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> </tbody> </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%																																																																																				
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Ex: ☉ D03-Type: the profile recommended for tunnel lighting



Set up for D03-Type in Smart timer dimming software program:

	T1	T2	T3
TIME**	01:30	11:00	---
LEVEL**	70%	100%	70%

I/P : 347VAC
 O/P : DIMMING TEST
 TA : 25°C
 TEST RESULT : OK

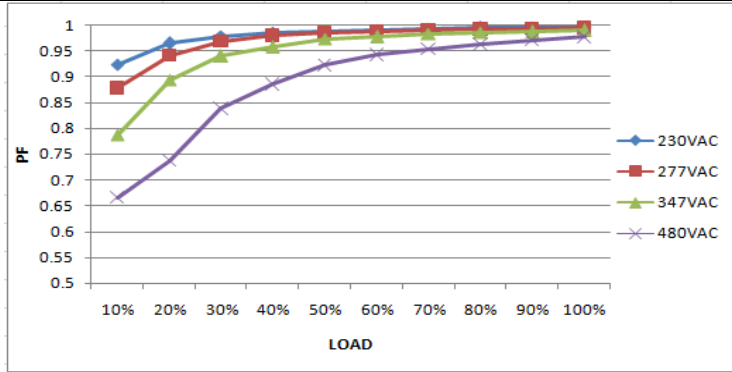
INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	180VAC~528 VAC	I/P: TESTING O/P: FULL LOAD Ta: 25°C	142V~528 V
			I/P: LOW-LINE-3V=177 V HIGH-LINE+10V=538 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: 180 VAC ~528VAC O/P: FULL~MIN LOAD Ta: 25°C	OK
3	INPUT CURRENT (TYP)	480VAC/ 0.8 A 347 VAC/ 1.1 A	I/P: 480VAC/347 VAC O/P: FULL LOAD Ta: 25°C	I=0.708A/480VAC I=0.975A/ 347VAC
4	LEAKAGE CURRENT	< 0.75 mA / 480VAC	I/P : 480 VAC O/P : Min LOAD Ta : 25°C	L-FG: 0.33 mA N-FG: 0.29 mA L,N -V(+): 0.175mA L,N-V(-): 0.175 mA
5	POWER FACTOR(TYP)	0.93/480 VAC FULL LOAD 0.95/347 VAC FULL LOAD 0.98/230 VAC FULL LOAD 0.97/277 VAC FULL LOAD	I/P: 480VAC/347VAC/230VAC/277VAC O/P: FULL LOAD Ta: 25°C	PF=0.9798 /480V/100%LOAD PF=0.9904/347V/100%LOAD PF=0.9965 /230V/100%LOAD PF=0.9948/277V/100%LOAD
	P.F vs LOAD			



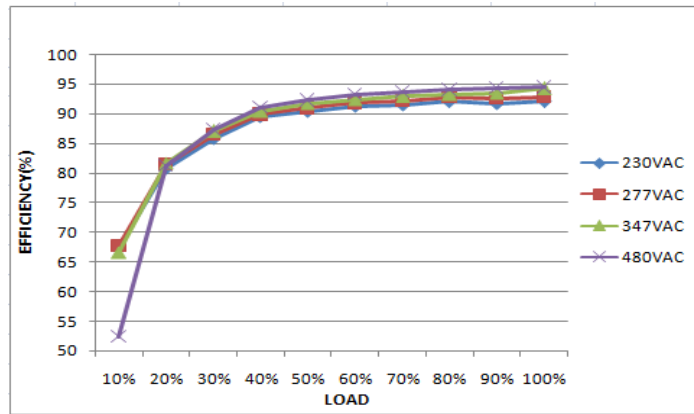
320W Single Output Switching Power Supply

HVG-320 series



6	EFFICIENCY (TYP)	94%	I/P: 347 VAC O/P: FULL LOAD Ta: 25°C	94.35%
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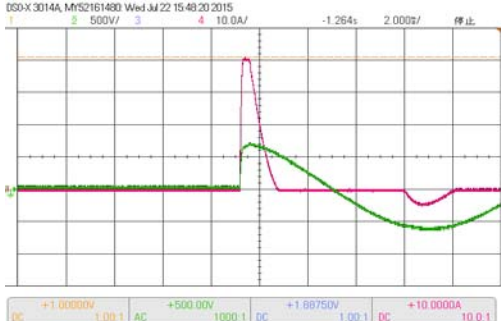
EFFICIENCY vs LOAD



7	INRUSH CURRENT (TYP)	480 V/ 50 A COLD START (twidh=850us measured at 50% Ipeak) COLD START	I/P: 480VAC O/P: FULL LOAD Ta: 25°C	I = 41 A/ 480VAC T50= 770 us
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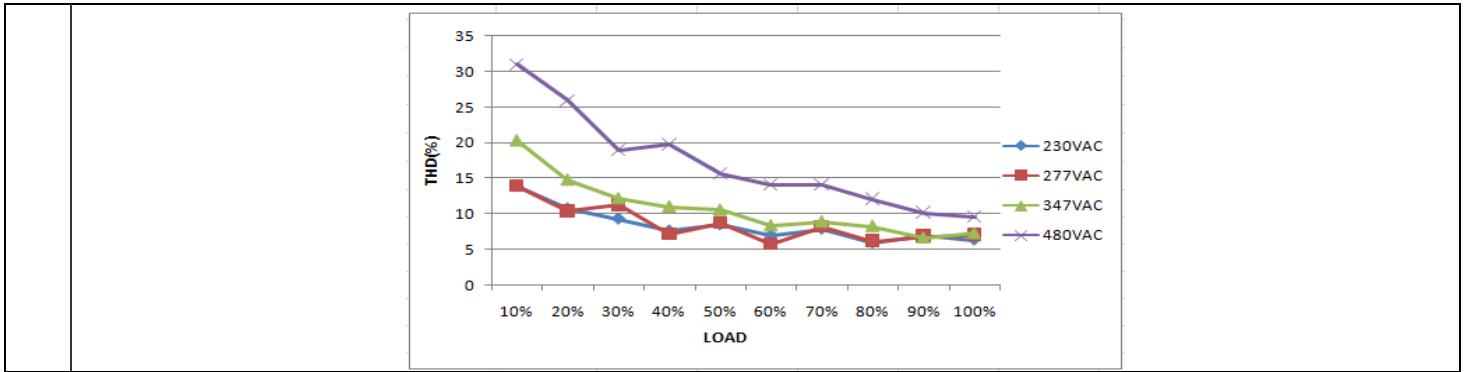
INPUT=480VAC/60HZ @ FULL LOAD

CH2 : AC Input Voltage CH4 : Input current (1V=10A)



8	TOTAL HARMONIC DISTORTION	Total harmonic distortion will be lower than 20% when output loading is 50% or higher at 230V/277V/347V/480V	I/P : 347VAC O/P : 100% LOAD 50% LOAD I/P : 230VAC/277VAC/480V O/P : 60% LOAD Ta : 25°C	THD : 7.0704 % THD : 11.697 % THD : 7.5238 % THD : 7.3145 % THD : 16.5 %
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THD&LOAD:



PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	95 %~ 108 % PROTECTION TYPE : Constant current limiting, recovers automatically after fault condition is removed	I/P: 528VAC I/P: 347VAC I/P: 180VAC O/P: TESTING Ta:25°C	104.179%/ 528VAC 104.17%/ 347VAC 104.03%/180VAC PROTECTION TYPE : Constant current limiting, recovers automatically after condition is removed
2	OVER VOLTAGE PROTECTION	V1: 53.5 V~ 60 V PROTECTION TYPE : Shut down and latch off o/p voltage, re-power on to recover.	I/P: 528VAC I/P: 347VAC I/P: 180VAC O/P: MIN LOAD Ta:25°C	56.05V / 528VAC 56.04V / 347VAC 56.06V / 180VAC PROTECTION TYPE : Shut down and latch off o/p voltage, re-power on to recover.
3	OVER TEMPERATURE PROTECTION	PROTECTION TYPE : Shut down and latch off o/p voltage, re-power on to recover	I/P: 528 VAC I/P: 180 VAC O/P: FULL LOAD	O.T.P. Active PROTECTION TYPE : Shut down and latch off o/p voltage, re-power on to recover
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE PROTECTION TYPE : Constant current limiting, recovers automatically after fault condition is removed	I/P: 528VAC I/P: 180 VAC O/P: FULL LOAD Ta:25°C	NO DAMAGE PROTECTION TYPE : Constant current limiting, recovers automatically after condition is removed

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	P.F.C Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated 9A/ 950V	I/P: High-Line +3V =531 V AC ON/OFF O/P: (1) Full Load (2) Output Short (3) Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4) Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (5) Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (6) Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz	VDS: (1)833V (2)809V (3)817V (4)817V (5)809V (6)801V (7)809V

			(7)0%→400% Load. Ta:25°C	
2	PWM Transistor (D to S) or (C to E) Peak Voltage	Q901 Rated 9A/ 950V	I/P:High-Line +3V =531V AC ON/OFF VDS: O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (5)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (6)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load. Ta:25°C	VDS: (1)809V (2)817V (3)809V (4)809V (5)809V (6)811V (7)809V
3	Diode Peak Voltage	Q102 Rated: 117A/150 V	I/P:High-Line +3V =531 V AC ON/OFF O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (5)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (6)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load. (8)NO LOAD Ta:25°C	Q102: VDS: (1)109V (2)3.8V (3)110V (4)109V (5)108V (6)108V (7)109V (8)107V
4	Input Capacitor Voltage	C5 Rated: 120 μ/450 V	I/P:High-Line +3V =531V 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	(1)376V (2)408V (3)376V (4)360V
5	Control IC Voltage Test	PWM IC U901 Rated 8.85V~16V PFC IC U1 Rated: 10 V~20V	I/P:High-Line +3V =531 V AC ON/OFF O/P(1)FULL LOAD (2) Output Short (3)O.L.P (4)O.V.P. Ta:25°C	(1) 13.1V (2) 12.9V (3) 12.8V (4) 13.2V

SAFETY & EMC TEST REPORT

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	IEC60950-1 I/P-O/P: 3.75KVAC/min I/P-FG:2 KVAC/min<4.5mA O/P-FG:1.5KVAC/min	I/P-O/P: 4.125 KVAC/min I/P-FG: 2.4KVAC/min O/P-FG: 1.8 KVAC/min Ta:25°C	I/P-O/P: 2.84mA I/P-FG: 1.64 mA O/P-FG:2.47 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:30 GΩ I/P-FG:22G Ω O/P-FG: 30G Ω NO DAMAGE
3	GROUNDING CONTINUITY	IEC60950-1 FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25°C	25mΩ

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONDUCTION	FCC Part 15 Subpart B	I/P: 440 VAC /60HZ O/P:FULL/30% LOAD Ta:25°C	PASS Test by certified Lab
2	RADIATION	FCC Part 15 Subpart B	I/P: 480 VAC /60HZ O/P:FULL LOAD Ta:25°C	PASS Test by certified Lab
3	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR:8KV / Contact:4KV	I/P: 230VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A
3	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A
5	SURGE	IEC61000-4-5 INDUSTRY L-N :2KV L,N-PE:4KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A
6	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-320-48 1. ROOM AMBIENT BURN-IN : 3 HRS I/P : 347VAC O/P : FULL LOAD Ta= 30.5 °C 2. HIGH AMBIENT BURN-IN : 14 HRS I/P : 347VAC O/P : FULL LOAD Ta= 55.9 °C																																																																																														
		<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 30.5 °C</th> <th>HIGH AMBIENT Ta= 55.9 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>BD1</td><td>64.0°C</td><td>89.2°C</td></tr> <tr><td>2</td><td>Q1</td><td>64.1°C</td><td>89.8°C</td></tr> <tr><td>3</td><td>D1</td><td>71.6°C</td><td>95.6°C</td></tr> <tr><td>4</td><td>Q901</td><td>64.3°C</td><td>90.3°C</td></tr> <tr><td>5</td><td>RTH3</td><td>59.4°C</td><td>84.4°C</td></tr> <tr><td>6</td><td>L2</td><td>62.1°C</td><td>87.0°C</td></tr> <tr><td>7</td><td>C2</td><td>60.2°C</td><td>84.8°C</td></tr> <tr><td>8</td><td>LF1</td><td>62.2°C</td><td>86.2°C</td></tr> <tr><td>9</td><td>ZNR1</td><td>59.2°C</td><td>83.6°C</td></tr> <tr><td>10</td><td>C11</td><td>63.1°C</td><td>88.2°C</td></tr> <tr><td>11</td><td>D2</td><td>62.8°C</td><td>88.0°C</td></tr> <tr><td>12</td><td>C5</td><td>64.6°C</td><td>89.2°C</td></tr> <tr><td>13</td><td>C46</td><td>62.2°C</td><td>87.2°C</td></tr> <tr><td>14</td><td>C902</td><td>63.2°C</td><td>88.2°C</td></tr> <tr><td>15</td><td>T1</td><td>64.2°C</td><td>89.4°C</td></tr> <tr><td>16</td><td>L1</td><td>64.3°C</td><td>90.2°C</td></tr> <tr><td>17</td><td>T2</td><td>64.6°C</td><td>90.4°C</td></tr> <tr><td>18</td><td>C200</td><td>62.4°C</td><td>87.8°C</td></tr> <tr><td>19</td><td>Q102</td><td>59.2°C</td><td>84.9°C</td></tr> <tr><td>20</td><td>C102</td><td>56.4°C</td><td>81.8°C</td></tr> <tr><td>21</td><td>U1</td><td>60.5°C</td><td>85.7°C</td></tr> <tr><td>22</td><td>ZNR5</td><td>62.7°C</td><td>87.5°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta= 30.5 °C	HIGH AMBIENT Ta= 55.9 °C	1	BD1	64.0°C	89.2°C	2	Q1	64.1°C	89.8°C	3	D1	71.6°C	95.6°C	4	Q901	64.3°C	90.3°C	5	RTH3	59.4°C	84.4°C	6	L2	62.1°C	87.0°C	7	C2	60.2°C	84.8°C	8	LF1	62.2°C	86.2°C	9	ZNR1	59.2°C	83.6°C	10	C11	63.1°C	88.2°C	11	D2	62.8°C	88.0°C	12	C5	64.6°C	89.2°C	13	C46	62.2°C	87.2°C	14	C902	63.2°C	88.2°C	15	T1	64.2°C	89.4°C	16	L1	64.3°C	90.2°C	17	T2	64.6°C	90.4°C	18	C200	62.4°C	87.8°C	19	Q102	59.2°C	84.9°C	20	C102	56.4°C	81.8°C	21	U1	60.5°C	85.7°C	22	ZNR5	62.7°C	87.5°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= -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 : 538 VAC O/P : FULL LOAD Ta= 60°C HUMIDITY= 95 %R.H	TEST : OK																																																																																												
4	TEMPERATURE COEFFICIENT	± 0.03 %/°C (0~60°C)	I/P : 347 VAC O/P : FULL LOAD	± 0.0213 %/°C (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																																																																																												



320W Single Output Switching Power Supply

HVG-320 series

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 : 230VAC/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= 80 °C LIFE TIME (2) I/P : 347VAC O/P : 75% LOAD Tc= 80 °C LIFE TIME (3) I/P : 347VAC O/P : 50% LOAD Tc= 80 °C LIFE TIME	(1) 56488HRS (2) 64589HRS (3) 70227HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 124.3K 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	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	DANIEL GAO	SANFORD SU	VINCENT ZENG

12.10.30 A50-F031