



Test Report: HEP-2300-230

2300W Switching Power Supply for Harsh Environment

■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Control Function Test

Component Stress Test

■ SAFETY & E.M.C. TEST

Safety Test

E.M.C. Test

■ RELIABILITY TEST

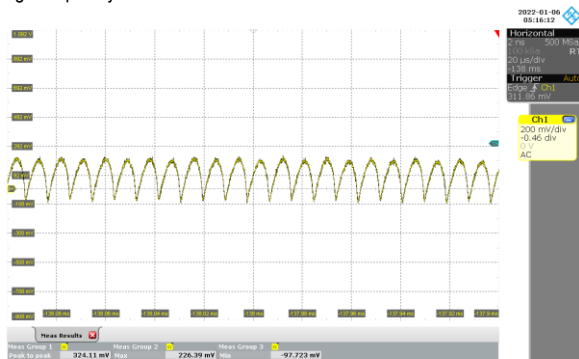
ENVIRONMENT TEST

DESIGN VERIFY TEST

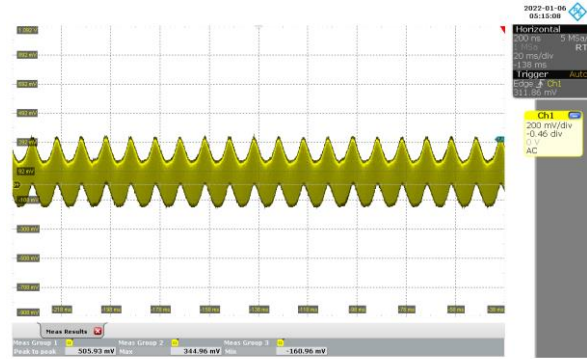
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1 : 170V ~ 260V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	165.28V~266.2V/230VAC 165.28V~266.2V/115VAC
2	OUTPUT VOLTAGE(Max) TOLERANCE	V1 : -1%~ +1%	I/P : 90VAC /305VAC O/P:FULL/ MIN. LOAD Ta : 25°C	V1 : 0.01%~0.017%
3	LINE REGULATION (Max)	V1 : -0.5%~ +0.5%	I/P : 220VAC~ 305VAC O/P : FULL LOAD Ta : 25°C	V1 : -0.043%~-0.009%
4	LOAD REGULATION(Max)	V1 : -0.5%~ +0.5%	I/P : 230VAC O/P : FULL ~MIN LOAD Ta : 25°C	V1 : -0.022%~0%
5	OVER/UNDERSHOOT TEST	< ±5%	I/P : 230VAC O/P : FULL LOAD Ta : 25°C	1.001%
6	RIPPLE & NOISE(Max)	V1 : 2500mVp-p	I/P : 230VAC O/P : FULL LOAD Ta : 25°C	V1 : 505mVp-p

high frequency :



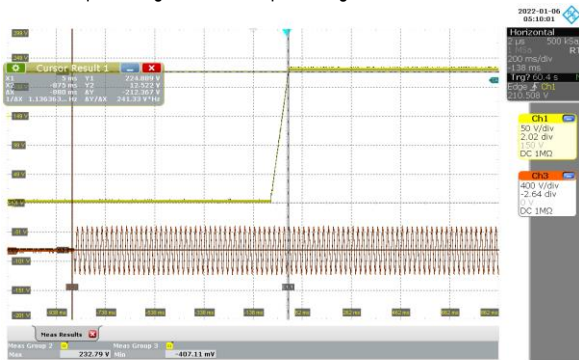
low frequency :



7	SET UP TIME(Max)	230VAC/1800ms	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 880ms
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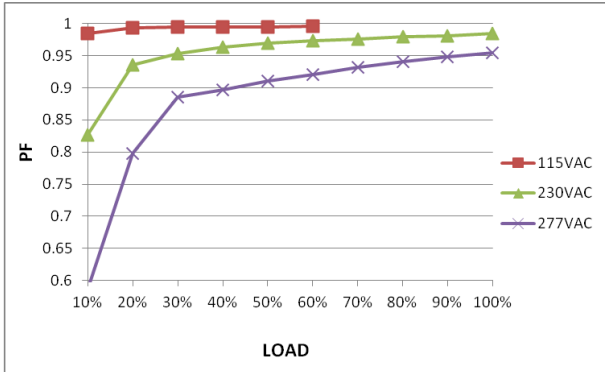
INPUT=230VAC/50HZ @ FULL LOAD

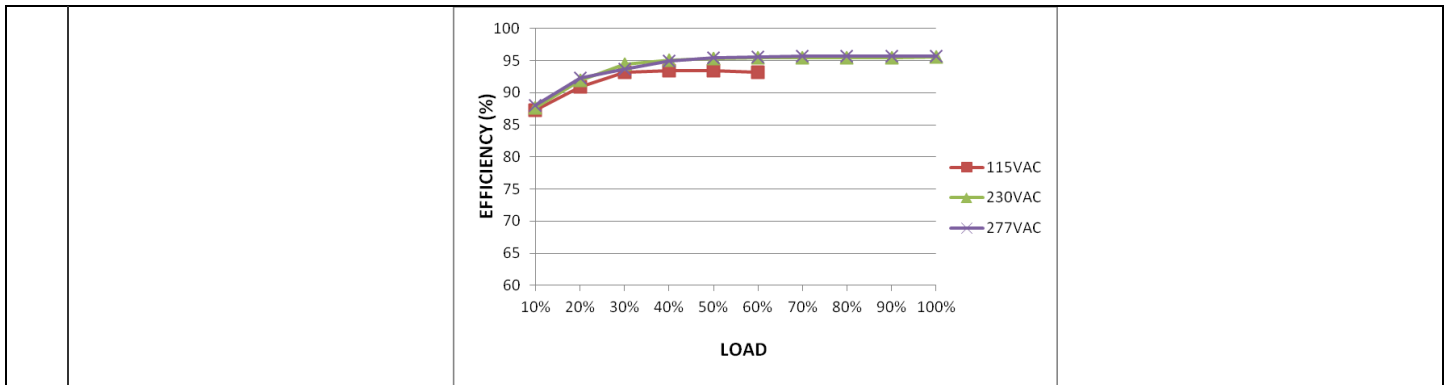
CH1 : Output Voltage CH2 : AC Input Voltage



<p>8</p> <p>RISE TIME (Max)</p>	<p>230VAC/100ms</p>	<p>I/P : 230 VAC O/P : FULL LOAD Ta : 25°C</p>	<p>230VAC/ 58.4 ms</p>
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1 : Output Voltage</p> <p>Δ: 26.0 V @: 166 V Δ: 58.4ms @: 0.00 s</p> <p>Ch1 50.0 V M20.0ms A Ch1 23.0 V</p>			
<p>9</p> <p>HOLD UP TIME (Typ.)</p>	<p>230VAC/12ms @FULL LOAD</p>	<p>I/P : 230 VAC O/P : FULL LOAD Ta : 25°C</p>	<p>230VAC/ 18 ms@ FULL LOAD</p>
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1 : Output Voltage CH2 : AC Input Voltage</p> <p>Δ: 308 V @: 104 V Δ: 18.0ms @: -40.4ms</p> <p>Ch1 50.0 V Ch2 100 V M20.0ms A Ch1 23.0 V</p>			
<p>10</p> <p>DYNAMIC LOAD</p>	<p>V1: 23Vp-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>9.32Vp-p 3.24Vp-p</p>
<div style="display: flex; justify-content: space-around;"> <div style="width: 45%;"> <p>FULL /50% LOAD 50%DUTY / 120HZ</p> <p>Peak to peak: 9.3281 V</p> </div> <div style="width: 45%;"> <p>FULL /50% LOAD 50%DUTY / 1KHZ</p> <p>Peak to peak: 3.2411 V</p> </div> </div>			

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	90VAC~305VAC	I/P : TESTING O/P : Derating Load Ta : 25°C	83.8V~305V
			I/P : LOW-LINE-3V=87 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 : 90 VAC ~305 VAC O/P : FULL~MIN LOAD Ta : 25°C	TEST : OK
3	INPUT CURRENT (Typ.)	277/ 9.3A 230V/ 11A 115V/ 13.3A	I/P : 277 VAC O/P : FULL LOAD I/P : 230 VAC O/P : FULL LOAD I/P : 115 VAC O/P : 60% LOAD Ta : 25°C	I=9.15A/ 277VAC I=10.66A/ 230VAC I=12.84A/ 115VAC
4	LEAKAGE CURRENT	<1.8mA(peak)/240V <2 mA(peak)/277V	I/P : 264 VAC I/P : 305 VAC O/P : Min LOAD Ta : 25°C	L-FG : 1.28 mA / 264V N-FG : 1.28 mA/264V L-FG : 1.52 mA/305V N-FG : 1.52 mA/305V
5	POWER FACTOR (Typ.)	0.93/277VAC 0.95/230VAC 0.99/115VAC	I/P : 277AC O/P : FULL LOAD I/P : 230 VAC O/P : FULL LOAD I/P : 115 VAC O/P : 60% LOAD Ta : 25°C	PF=0.958/277VAC PF=0.9836/230VAC PF=0.9957/115VAC
			P.F vs LOAD 	
6	EFFICIENCY(Typ.)	95.5%	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	95.7%
EFFICIENCY vs LOAD				

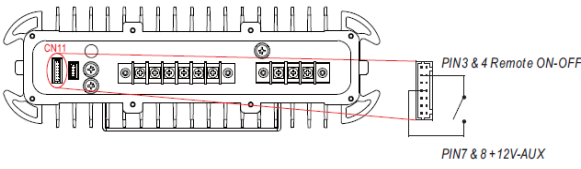
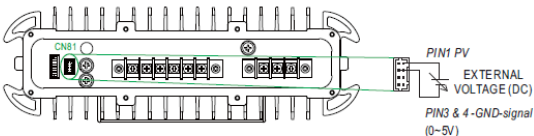
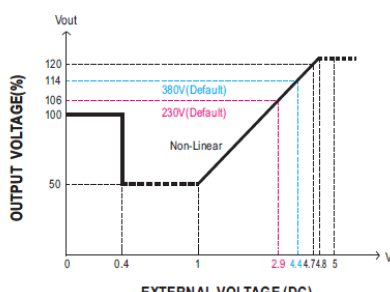
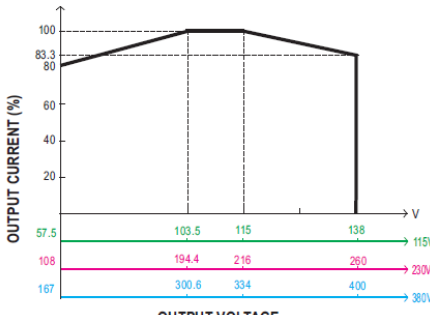


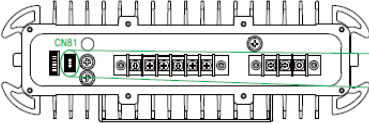
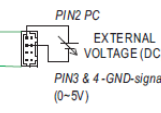
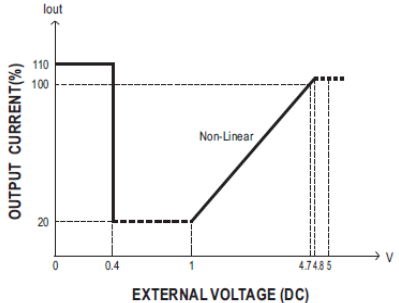
7	INRUSH CURRENT(Typ.)	230V/60A COLD START	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	I=51.5A / 230VAC T50= 1.44 ms /230V
<p>INPUT=230VAC/50HZ @ FULL LOAD CH2 : AC Input Voltage CH4 : Input current 090-X3014A, M/51330359 Fri Dec 03 21:18:33 2021</p> <p>Agilent Acquisition Normal 5.00MSa/s</p> <p>Channels: AC BW 1.00:1, AC BW 100:1, DC BW 50.0:1, AC BW 100:1</p> <p>Measurements: Max(-): 51.5A</p> <p>09:17 PM Dec 03, 2021</p>				

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	105%~115% PROTECTION TYPE : Constant current limiting,unit will shutdown after 5 sec,re-power on to recover.	I/P : 305VAC I/P : 90V O/P : TESTING Ta : 25°C	111%/ 305VAC 53% /90VAC
2	OVER VOLTAGE PROTECTION	273V ~ 312V Protection type : Shut down O/P voltage,re-power on to recover.	I/P : 305VAC I/P : 90VAC O/P : MIN LOAD Ta : 25°C	276.8V/ 305VAC 276.3V/ 90VAC
3	OVER TEMPERATURE PROTECTION	Protection type : Shut down O/P voltage,, recovers automatically after temperature goes down	I/P : 305VAC O/P : FULL LOAD I/P : 90VAC O/P : 50% LOAD	O.T.P.Active Shut down O/P voltage,, recovers automatically after temperature goes down
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE PROTECTION TYPE : Constant current limiting,unit will shutdown after 5 sec,re-power on to recover.	I/P : 305VAC I/P : 90VAC O/P : FULL LOAD Ta : 25°C	NO DAMAGE

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT												
1	AUXILIARY POWER (AUX)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C Test Result : <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>AUX</th> <th>TOLERANCE</th> <th>RIPPLE</th> <th>TEST RESULT</th> </tr> </thead> <tbody> <tr> <td>12V / 0.5A</td> <td>10.8~13.2 V</td> <td>150mVp-p</td> <td>11.87V/43mv</td> </tr> </tbody> </table>	AUX	TOLERANCE	RIPPLE	TEST RESULT	12V / 0.5A	10.8~13.2 V	150mVp-p	11.87V/43mv						
AUX	TOLERANCE	RIPPLE	TEST RESULT													
12V / 0.5A	10.8~13.2 V	150mVp-p	11.87V/43mv													
2	REMOTE ON/OFF CONTROL	3.Remote ON-OFF Control The power supply can be turned ON/OFF individually or along with other units in parallel by using the "Remote ON-OFF" function.  <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Remote ON-OFF</th> <th>Power Supply Status</th> </tr> </thead> <tbody> <tr> <td>Short circuit</td> <td>ON</td> </tr> <tr> <td>Open circuit</td> <td>OFF</td> </tr> </tbody> </table> I/P : 230 VAC O/P : FULL LOAD Ta : 25°C Test Result : <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Between ON/OFF and +5V-AUX</th> <th>Power Supply Status</th> </tr> </thead> <tbody> <tr> <td>SW SHORT</td> <td>ON</td> </tr> <tr> <td>SW OPEN</td> <td>OFF</td> </tr> </tbody> </table>	Remote ON-OFF	Power Supply Status	Short circuit	ON	Open circuit	OFF	Between ON/OFF and +5V-AUX	Power Supply Status	SW SHORT	ON	SW OPEN	OFF		
Remote ON-OFF	Power Supply Status															
Short circuit	ON															
Open circuit	OFF															
Between ON/OFF and +5V-AUX	Power Supply Status															
SW SHORT	ON															
SW OPEN	OFF															
3	OUTPUT VOLTAGE PROGRAMMABLE(PV)	1.Output Voltage Programming (or, PV / remote voltage programming / remote adjust / margin programming / dynamic voltage trim) ※ In addition to the adjustment via the built-in potentiometer, the output voltage can be trimmed by applying EXTERNAL VOLTAGE.  <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>© The 100% output voltage is 115/216/334V.</p> </div> <div style="text-align: center;">  <p>© The rated current should change with the Output Voltage Programming accordingly.</p> </div> </div> I/P : 230 VAC O/P : FULL LOAD Ta : 25°C TEST RESULT : <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>MODEL \ PV</th> <th><0.4V</th> <th>1V</th> <th>5V</th> </tr> </thead> <tbody> <tr> <td>SPEC</td> <td>230±5%</td> <td>108±5%</td> <td>260±5%</td> </tr> <tr> <td>Vout</td> <td>230.52V</td> <td>108.43V</td> <td>263.2V</td> </tr> </tbody> </table>	MODEL \ PV	<0.4V	1V	5V	SPEC	230±5%	108±5%	260±5%	Vout	230.52V	108.43V	263.2V		
MODEL \ PV	<0.4V	1V	5V													
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<p>4</p> <p>OUTPUT CURRENT PROGRAMMABLE (PC)</p>	<p>2. Output Current Programming (or, PC / remote current programming / dynamic current trim) ※ The output current can be trimmed to 20~100% of the rated current by applying EXTERNAL VOLTAGE.</p> <div style="display: flex; justify-content: space-around; align-items: center;">    </div> <p style="text-align: center;">EXTERNAL VOLTAGE (DC)</p> <p>⊙ The 100% output current is rated current. ⊙ Maximum operation current <100% is recommended.</p> <p>I/P : 230 VAC O/P : TESTING Ta : 25°C</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td>ADJ V</td> <td><0.4V</td> <td>1V</td> <td>5V</td> </tr> <tr> <td>SPEC</td> <td>11A±5%</td> <td>2A±10%</td> <td>10A±10%</td> </tr> <tr> <td>TEST</td> <td>10.914A</td> <td>2.16A</td> <td>10.787A</td> </tr> </table>			ADJ V	<0.4V	1V	5V	SPEC	11A±5%	2A±10%	10A±10%	TEST	10.914A	2.16A	10.787A
ADJ V	<0.4V	1V	5V												
SPEC	11A±5%	2A±10%	10A±10%												
TEST	10.914A	2.16A	10.787A												
<p>5</p> <p>DC-OK SIGNAL</p>	<p>The TTL signal out, PSU turn on = 4.5 ~ 5.5V PSU turn off = -0.5V ~ 0.5V Please refer to the Function Manual</p>	<p>I/P : 230VAC O/P : FULL LOAD Ta : 25°C</p>	<p>PSU turn on = 5.1 V PSU turn off = -0.005 V</p>												
<p>6</p> <p>LED Indicators</p>	<p>※ LED Status Indicators</p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>LED</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>● Green</td> <td>The power supply functions normally.</td> </tr> <tr> <td>● Red</td> <td>Abnormal status (Over temperature protection, Overload protection)</td> </tr> <tr> <td>● Red (Flashing)</td> <td>The LED will flash with the red light when the internal temperature reaches 95°C; under this condition, the unit still operates normally without entering OTP. (In the meantime, an alarm signal will be sent out through the PMBus/CANBus/MODBus interface.)</td> </tr> </tbody> </table>		LED	Description	● Green	The power supply functions normally.	● Red	Abnormal status (Over temperature protection, Overload protection)	● Red (Flashing)	The LED will flash with the red light when the internal temperature reaches 95°C; under this condition, the unit still operates normally without entering OTP. (In the meantime, an alarm signal will be sent out through the PMBus/CANBus/MODBus interface.)	<p>PASS</p>				
LED	Description														
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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	Q903 Rated 76A/600V VGS : ± 30V	AC ON/OFF I/P : High-Line +3V =308V 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. (8)CV-1V(CHARGE MODE) I/P : Low-Line -3V =217V 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	VDS : (1) 505.53V (2) 495.72V (3) 493.68V (4) 499.68V (5) 507.58V (6) 501.58V (7) 495.72V (8) 495.72V VDS : (1) 464.1V (2) 456.2V (3) 464.1V (4) 460.12V (5) 460.15V (6) 468.06V

			<p>(5)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz</p> <p>(6)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz</p> <p>(7)0%→400% Load.</p> <p>(8)CV-1V(CHARGE MODE) Ta : 25°C</p>	<p>(7) 460.12V</p> <p>(8) 456.2V</p>
2	P.F.C Transistor (D to S) or (C to E) Peak Voltage	Q66 Rated 40A/650V VGS : ± 30V	<p>I/P : High-Line +3V =308V</p> <p>AC ON/OFF</p> <p>O/P : (1)Full Load</p> <p>(2)Output Short</p> <p>(3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz</p> <p>(4)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz</p> <p>(5)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz</p> <p>(6)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz</p> <p>(7)0%→400% Load.</p> <p>I/P : Low-Line -3V = 217V</p> <p>AC ON/OFF</p> <p>O/P : (1)Full Load</p> <p>(2)Output Short</p> <p>(3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz</p> <p>(4)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz</p> <p>(5)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz</p> <p>(6)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz</p> <p>(7)0%→400% Load.</p> <p>Ta : 25°C</p>	<p>VDS :</p> <p>(1) 562.9V</p> <p>(2) 543.5V</p> <p>(3) 551.06V</p> <p>(4) 547.1V</p> <p>(5) 562.92V</p> <p>(6) 578.73V</p> <p>(7) 578.72V</p> <p>VDS:</p> <p>(1) 531.3V</p> <p>(2) 483.87V</p> <p>(3) 519.44V</p> <p>(4) 523.39V</p> <p>(5) 523.39V</p> <p>(6) 491.77V</p> <p>(7) 503.63V</p>
3	P.F.C DIODE	D14 Rated 10A/650V	<p>I/P : High-Line +3V =308V</p> <p>AC ON/OFF</p> <p>O/P : (1)Full Load</p> <p>(2)Output Short</p> <p>(3)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz</p> <p>(4)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz</p> <p>I/P : Low-Line -3V = 217V</p> <p>AC ON/OFF</p> <p>O/P : (1)Full Load</p> <p>(2)Output Short</p> <p>(3)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz</p> <p>(4)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz</p> <p>Ta : 25°C</p>	<p>(1) 519.44V</p> <p>(2) 519.44V</p> <p>(3) 507.58V</p> <p>(4) 523.39V</p> <p>(1) 491V</p> <p>(2) 493.87V</p> <p>(3) 475.96V</p> <p>(4) 479.91V</p>
4	Diode Peak Voltage	D201 Rated 4A/650V	<p>AC ON/OFF</p> <p>I/P : High-Line +3V =308V</p> <p>O/P : (1)Full Load</p> <p>(2)Output Short</p>	<p>D201 : D207 :</p> <p>VDS : VDS :</p> <p>(1) 592.06V (1) 619.73V</p> <p>(2) 592.06V (2) 611.1V</p> <p>(3) 592.06V (3) 619.73V</p>

		D207 Rated 4A/650V	(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 (9)CV-1V(CHARGE MODE) Ta : 25°C	(4) 596.02V (5) 596.02V (6) 599.06V (7) 592.06V (8) 584.16V (9) 596.02V (10) 584.16V	(4) 623.68V (5) 623.68V (6) 627.64V (7) 627.68V (8) 607.87V (9) 623.68V (10) 599.97V
5	Input Capacitor Voltage	C5 Rated : 220u/450V -40~105°C Surge Voltage 495V	I/P : High-Line +3V =308V 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) 449V (2) 448.29V (3) 449V (4) 449V	
6	Control IC Voltage Test	PWM IC U900 Rated 8.9 V ~ 15.5V PFC IC U301 Rated 23V ~ 27 V O/P IC U203 Rated -0.3V ~37 V MCU IC U701 Rated 2.0V ~3.6V AUX IC U601 Rated 10.5V~25V	AC ON/OFF I/P : High-Line +3V =308V 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	U900 : (1) 13.2V (2) 12.9V (3) 13.2V (4) 13.0V (5) 13.0V U301 : (1) 13.6V (2) 13.0V (3) 13.4V (4) 12.7V (5) 12.8V U203 : (1) 12.4V (2) 12.5V (3) 12.4V (4) 12.2V (5) 12.2V	U701 : (1) 3.37V (2) 3.39V (3) 3.59V (4) 3.37V (5) 3.39V U601 : (1) 14.4V (2) 14.3V (3) 14.4V (4) 14V (5) 14.4V
7	TOP SWITCHING STAND BY POWER	U601 Rated 3.5 A/ 800 V	AC ON/OFF I/P:High-Line +3V =308V O/P : (1)Full Load (2)Remote On/Off I/P : Low-Line -3V =217V O/P : (1)Full Load (2)Remote On/Off Ta : 25°C	U601 : (1) 564.8V (2) 576.7V (1) 529.2V (2) 541.1V	

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P : 6KVDC/min I/P-FG : 4KVDC/min O/P-FG : 4KVDC/min	I/P-O/P : 6.6KVDC/min I/P-FG : 4.8KVDC /min O/P-FG : 4.8KVDC /min Ta : 25°C	PASS 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 : 4.3GΩ I/P-FG : >30GΩ O/P-FG : 3.31GΩ NO DAMAGE

3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta : 25°C	26 mΩ
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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	EN55032 (CISPR32) CLASS B	I/P : 230 VAC (50HZ) O/P : FULL/50% LOAD Ta : 25°C	PASS
3	RADIATION	EN55032 (CISPR32) CLASS B	I/P : 230 VAC (50HZ) O/P : FULL LOAD Ta : 25°C	PASS
4	E.S.D	EN61000-4-2 Level 3, 8KV air Level 2, 4KV contact	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A
5	E.F.T	EN61000-4-4 Level 3	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A
6	SURGE	IEC61000-6-2 INDUSTRY 2KV/Line-Line 4KV/Line-Earth	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A
7	Test by certified Lab & Test Report Prepare			

■ RELIABILITY TEST

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
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1	TEMPERATURE RISE TEST	MODEL : HEP-2300-115																																																																																																																																				
		<p>1. ROOM AMBIENT BURN-IN : 2HRS I/P : 230VAC O/P : FULL LOAD Ta= 25.5 °C</p> <p>2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta= 51.2 °C</p>																																																																																																																																				
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			33	U301	65.8°C	93.4°C
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			35	Q51	72.2°C	99.7°C
			36	Q65	71.6°C	99.5°C
			37	D14	83.4°C	112.1°C
			38	Q901	69.9°C	100.6°C
			39	Q904	69.5°C	101.2°C
			40	Q202	75.2°C	104.2°C
			41	Q204	67.7°C	95.9°C
			42	Q206	73.8°C	101.2°C
			43	Q209	74.0°C	103.0°C
			44	Q214	71.2°C	98.4°C
			45	U201	69.0°C	97.0°C
			46	RT31	63.1°C	91.6°C
			47	RT5	66.6°C	94.7°C
			48	U601	76.4°C	104.9°C
			49	C611	65.4°C	93.8°C
			50	T601	67.6°C	95.9°C
			51	D651	67.0°C	94.5°C
			52	C652	65.2°C	92.9°C
			53	C675	61.0°C	88.1°C
			54	R613	74.3°C	103.0°C
			55	U751	61.5°C	88.6°C
			56	RG75	58.0°C	84.8°C
			57	L751	59.5°C	86.7°C
			58	RG65	62.8°C	90.1°C
			59	TC	57.6°C	85.3°C
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 108.5%LOAD Ta : 25°C		TEST : OK	
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 305VAC/220VAC O/P : 100 %LOAD Ta= -45 °C		TEST : OK	
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50°C/95 %R.H NO DAMAGE	I/P : 315 VAC O/P : FULL LOAD Ta= 50 °C HUMIDITY= 95 %R.H		TEST : OK	
5	TEMPERATURE COEFFICIENT	± 0.03 %/°C(0~50°C)	I/P : 230 VAC O/P : FULL LOAD		± 0.003 %/°C(0~50°C)	

6	STORAGE TEMPERATURE TEST	-40~85°C	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 : 10 CYCLE 5. Input/Output condition : STATIC
7	THERMAL SHOCK TEST	-40~50°C	1. Thermal shock Temperature : -45°C~ +55°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:230V/ FULL LOAD AC ON 3sec/AC OFF 1sec TEST 1cycle:230V/ FULL LOAD Burn In Test
8	VIBRATION TEST	20~500Hz, 10G 12min./1cycle, 72min. each along X, Y, Z axes	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 20~500Hz (3) Sweep Time : 12min/sweep cycle (4) Acceleration : 10G (5) Test Time : 180min in each axis (X.Y.Z) (6) Ta : 25°C
9	CAPACITOR LIFE CYCLE	SUPPOSE C111 IS THE MOST CRITICAL COMPONENT (1) I/P : 230VAC O/P : FULL LOAD Ta= 25 °C LIFE TIME (2) I/P : 230VAC O/P : FULL LOAD Ta= 50 °C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta= 50 °C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta= 50 °C LIFE TIME	(1) 201245HRS (2) 26590HRS (3) 96451HRS (4) 267975HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 478K hrs min. Telcordia SR-332 (Bellcore) ; 44.8K hrs min. MIL-HDBK-217F (25°C)	
11	Ongoing Reliability Test	I/P : 230VAC O/P : FULL LOAD TA=50°C Demonstration Mean Time Between Failure : 55,000 hours	

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

2020.10.1 TAG-QA-009