



Test Report: LRS-1200-36

1200W Low Profile Economical Enclosed Type Power Supply

■ 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

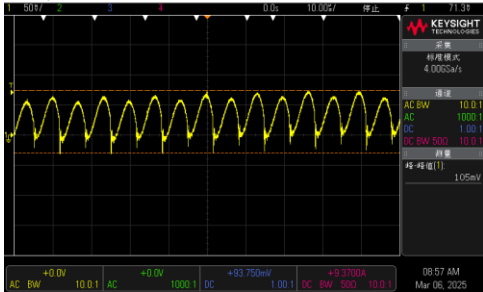
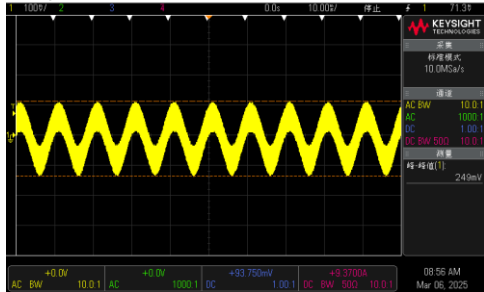
E.M.C. Test

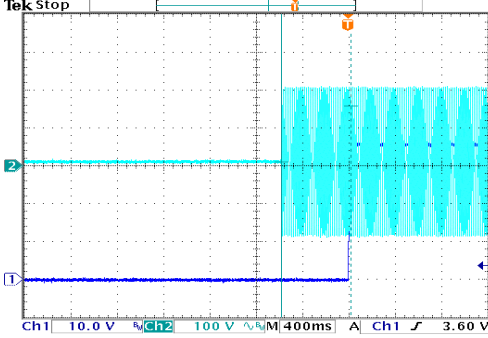
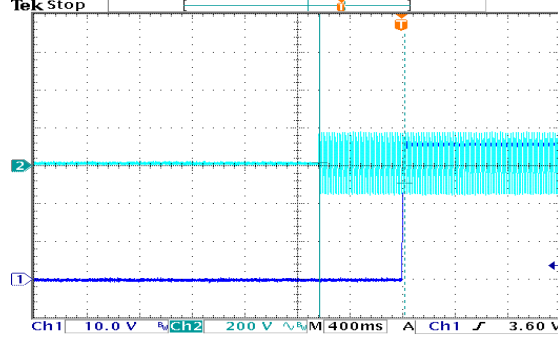
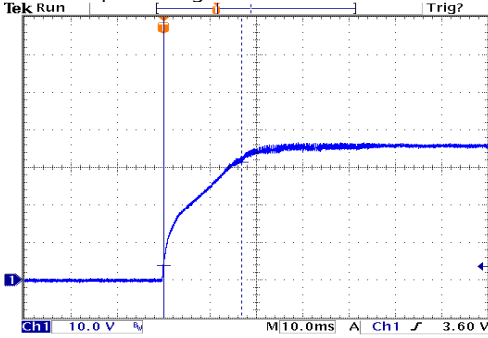
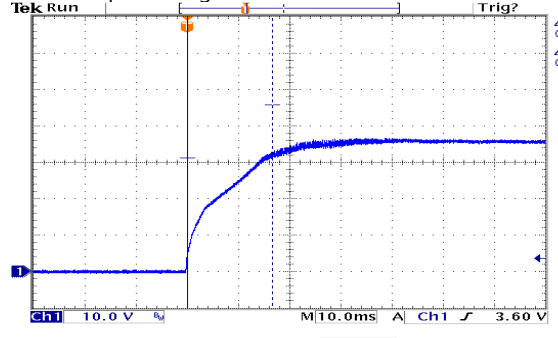
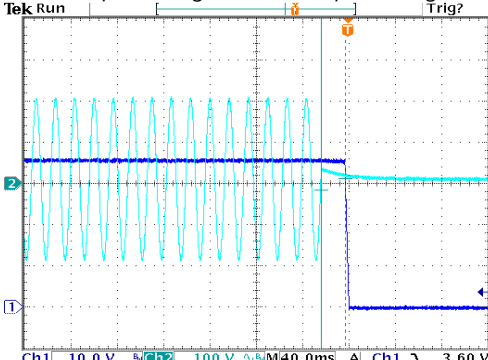
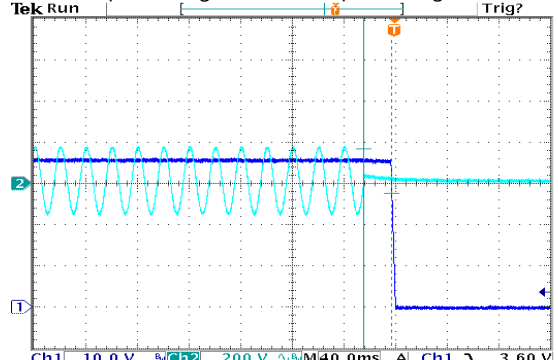
■ RELIABILITY TEST

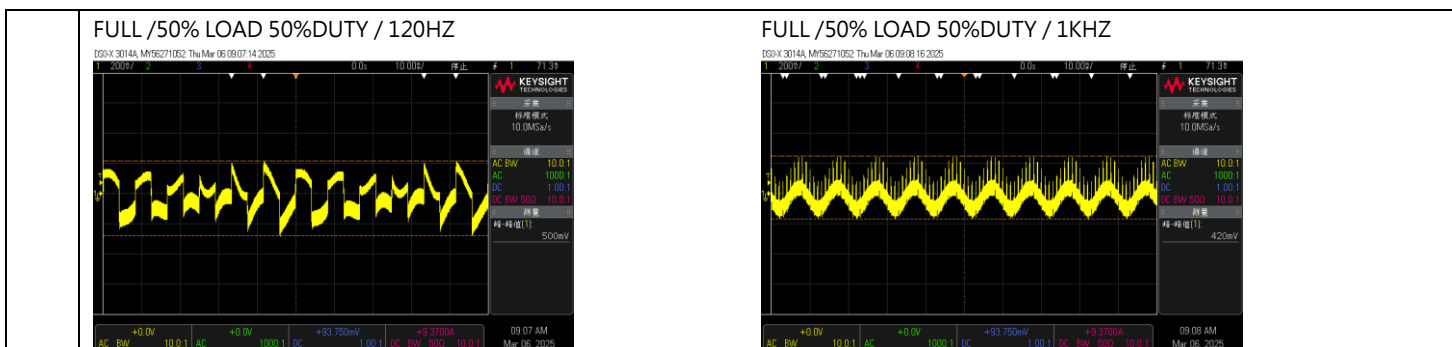
ENVIRONMENT TEST

DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

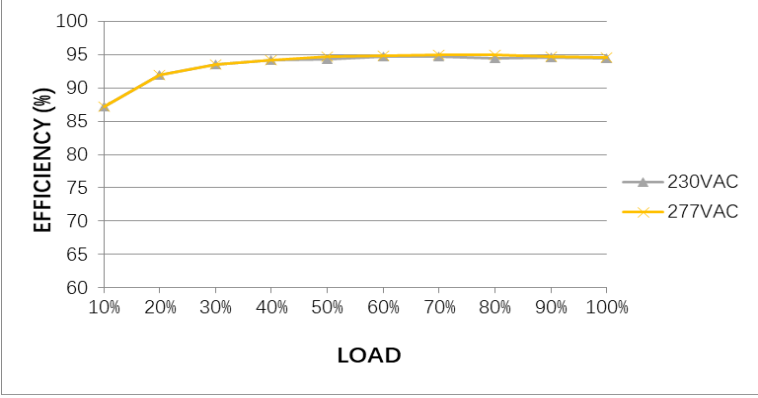
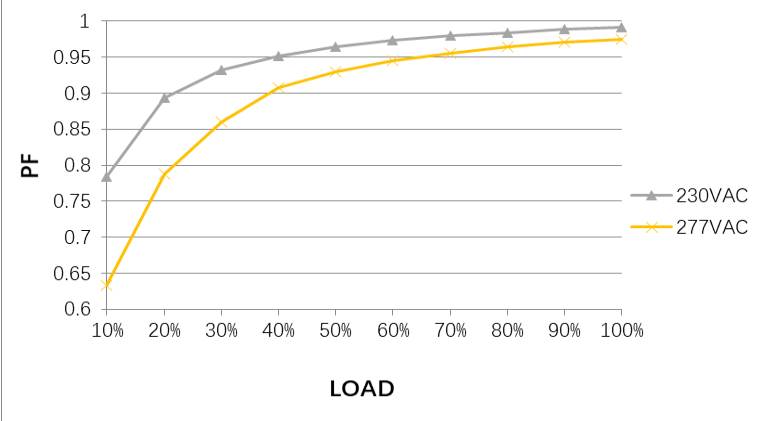
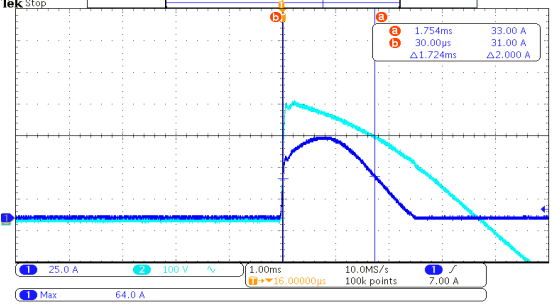
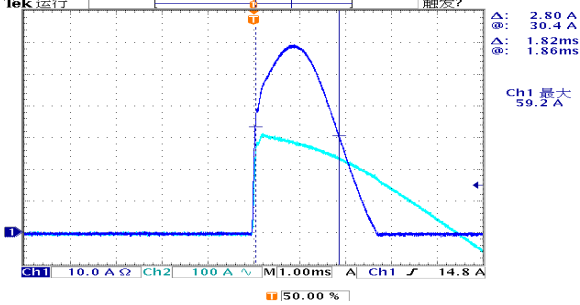
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 34V~ 40V	I/P : 230 VAC O/P : MIN LOAD Ta : 25°C	32.89V~41.29V/230VAC
2	OUTPUT VOLTAGE TOLERANCE	V1: -1%~ +1 %	I/P: 180VAC /305VAC O/P:FULL/ MIN. LOAD Ta:25°C	V1: -0.03% ~ 0.28 %
3	LINE REGULATION	V1: -0.5%~ +0.5 %	I/P: 180VAC~ 305VAC O/P:FULL LOAD Ta:25°C	V1: -0.17%~ 0.11 %
4	LOAD REGULATION	V1: -0.5%~ +0.5%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: -0.06%~ +0.19 %
5	OVER/UNDERSHOOT TEST	< ± 5%	I/P: 230VAC O/P:FULL LOAD Ta:25°C	3.6%
6	RIPPLE & NOISE (Max)	V1: 360 mVp-p	I/P: 230 VAC O/P: MIN LOAD—FULL LOAD Ta:25°C	V1: 249 mVp-p / 100% load
high frequency :		low frequency :		
				
7	SET UP TIME(Max)	277VAC/1500ms 230VAC/1500ms	I/P : 277VAC I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	277VAC/ 600ms 230VAC/ 648ms
INPUT=277VAC/60HZ @ FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage		INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage		

8	RISE TIME (Max)	277VAC/70ms 230VAC/70ms	I/P : 277VAC I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	 Δ: 148 V Δ: 10.0 V Δ: 600ms Δ: -584ms
				 Δ: 108 V Δ: 16.0 V Δ: 648ms Δ: -632ms
9	HOLD UP TIME (Typ.)	277VAC/10ms 230VAC/10ms	I/P : 277VAC I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	INPUT=277VAC/60HZ @ FULL LOAD CH1 : Output Voltage  Δ: 27.6 V Δ: 3.80 V Δ: 16.8ms Δ: 0.00 s
				INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage  Δ: 14.6 V Δ: 31.2 V Δ: 16.6ms Δ: 0.00 s
10	DYNAMIC LOAD	V1: 3600mVp-p	I/P: 230VAC O/P: (1)FULL /50% LOAD 50%DUTY / 120HZ (2)FULL /50% LOAD 50%DUTY / 1KHZ Ta:25°C	INPUT=277VAC/60HZ @ FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage  Δ: 28.0 V Δ: -16.0 V Δ: 20.8ms Δ: -24.0ms
				INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage  Δ: 216 V Δ: 168 V Δ: 21.6ms Δ: -24.8ms
10	DYNAMIC LOAD	V1: 3600mVp-p	I/P: 230VAC O/P: (1)FULL /50% LOAD 50%DUTY / 120HZ (2)FULL /50% LOAD 50%DUTY / 1KHZ Ta:25°C	500mVp-p 420mVp-p



INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	180VAC~305VAC 255VDC~ 431VDC	(1) I/P:TESTING O/P:FULL LOAD (2) I/P:DC TESTING(L:+ N:-) O/P: FULL / 50% LOAD (3) I/P:DC TESTING(L:- N:+) O/P: FULL / 50% LOAD Ta:25°C	(1) 177V~300V (2) 255 Vdc~ 431Vdc/FULL LOAD 255Vdc~431 Vdc/50% LOAD (3) 255Vdc~ 431Vdc/FULL LOAD 255Vdc~ 431Vdc/50% LOAD
			I/P: LOW-LINE-3V=177 V HIGH-LINE+10V=315V 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 ~305 VAC O/P:FULL~MIN LOAD Ta:25°C	TEST: OK
3	INPUT CURRENT (Typ.)	277V/5A 230V/7A	I/P : 277VAC I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	I =4.69A/ 277VAC I =5.56A/ 230VAC
4	LEAKAGE CURRENT	< 2mA / 277 VAC < 7.07mA (Peak)/ 277 VAC < 2mA / 240 VAC < 7.07mA (Peak)/ 240 VAC	I/P : 277 VAC I/P : 240 VAC O/P : Min LOAD Ta : 25°C	277VAC: L-FG : 0.351 mA N-FG : 0.352mA L-FG : 0.713mA(Peak) N-FG : 0.708 mA(Peak) 240VAC: L-FG : 0.293 mA N-FG : 0.292 mA L-FG : 0.572mA(Peak) N-FG : 0.564 mA(Peak)

5	EFFICIENCY(Typ.)	94%	I/P:230 VAC O/P:FULL LOAD Ta:25°C	94.4%
	EFFICIENCY vs LOAD 			
6	POWER FACTOR(TYP)	0.95/230 VAC 0.93/277 VAC	I/P: 230 VAC/277VAC O/P:FULL LOAD Ta:25°C	PF= 0.992/230V PF= 0.975/277V
	P.F vs LOAD 			
7	INRUSH CURRENT(Typ.)	277V/75A 230V/60A COLD START	I/P : 277 VAC I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	I =64A/ 277VAC T50=1724us/277VAC I =59.2A/ 230VAC T50=1820us/277VAC
	INPUT=277VAC/50HZ @ FULL LOAD CH2 : AC Input Voltage CH1: Input current  INPUT=277VAC/50HZ @ FULL LOAD CH2 : AC Input Voltage CH1: Input current 			

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	Protection type : 1、Output power >105% rated for more than 5 seconds then shut down o/p voltage, re-power on to recover 2、Constant current limiting for output power >150% rated for more than 5 seconds and then shut down o/p voltage, re-power on to recover	I/P: 305VAC I/P: 230VAC I/P: 180VAC O/P:TESTING Ta:25°C	1、 114.41%/ 305VAC 114.41%/ 230VAC 114.41%/180VAC Protection type : 1、Output power >105% rated for more than 5 seconds then shut down o/p voltage, re-power on to recover 2、Constant current limiting for output power >150% rated for more than 5 seconds and then shut down o/p voltage, re-power on to recover
2	OVER VOLTAGE PROTECTION	41V~50V	I/P: 305VAC I/P: 230VAC I/P: 180VAC O/P:MIN LOAD Ta:25°C	47.5V/ 305VAC 47.5V/ 230VAC 47.5V/ 180VAC Protection type : Shut down o/p voltage, re-power on to recover
3	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P: 305VAC I/P: 180VAC O/P:FULL LOAD	O.T.P. Active Protection type : Shut down o/p voltage, re-power on to recover

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT				
1	REMOTE CONTROL	2. Remote Control The PSU can be turned ON/OFF by using the "Remote Control" function. <table><tr><td>Between RC+(pin6) and RC-(pin5)</td><td>Output Status</td></tr><tr><td>SW OFF (0 ~ 0.8V)</td><td>ON</td></tr><tr><td>SW ON (4 ~ 10V)</td><td>OFF</td></tr></table>	Between RC+(pin6) and RC-(pin5)	Output Status	SW OFF (0 ~ 0.8V)	ON	SW ON (4 ~ 10V)	OFF
Between RC+(pin6) and RC-(pin5)	Output Status							
SW OFF (0 ~ 0.8V)	ON							
SW ON (4 ~ 10V)	OFF							

3	REMOTE SENSE	S+ / S- Compensate voltage drop on the load wiring up to 0.3V.	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	> 0.3 V
4	DC_OK Signal	1. PSU ON 3.3V~5.6V 2. PSU OFF 0V~1V	I/P:230VAC O/P:FULL LOAD Ta:25°C	TEST : OK
5	FAN NOISE(Typ.)	Built-in intelligent fan speed control detect by PSU'S internal temperature 10% load with Ta=25°C 45dB 70% load with Ta=25°C 53dB I/P:230VAC O/P:10%Load/70%Load Ta:25°C TEST : 43.08dB/10%load 46.51dB/70%load		

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q4 Rated 41A/ 600V	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. I/P:Low-Line -3V = 177V 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) 491V (2) 503V (3) 487V (4) 487V (5) 481V (6) 491V (7) 503V VDS: (1) 487V (2) 511V (3) 483V (4) 483V (5) 483V (6) 487V (7) 503V

2	P.F.C Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated 41A/ 600V	I/P:High-Line +3V =308 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. I/P:Low-Line -3V =177V 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. Ta:25°C	VDS: (1)473V (2)449V (3)473V (4)473V (5)473V (6)469V (7)449V VDS: (1)473V (2)477V (3)473V (4)473V (5)473V (6)473V (7)473V
3	P.F.C DIODE	D3 Rated 10 A/ 650V	I/P:High-Line +3V =308 V AC ON/OFF O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (4)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz I/P:Low-Line -3V = 177V AC ON/OFF O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (4)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz Ta:25°C	308VAC (1) 445V (2) 445V (3) 449V (4) 449V 177VAC (1) 449V (2) 453V (3) 449V (4) 449V

4	Diode Peak Voltage	Q100 Rated 88A/ 150V	AC ON/OFF I/P:High-Line +3V =308V 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	Q100: VDS: (1) 105.9V (2) 18.8V (3) 105.9V (4) 105.1V (5) 105.9V (6) 105.1V (7) 121.2V (8) 97.10V Q104: VDS: (1) 103.5V (2) 16.00V (3) 103.5V (4) 103.5V (5) 104.3V (6) 109.2V (7) 123.6V (8) 95.50V
5	Input Capacitor Voltage	C5 Rated: 330μ/ 450 V Surge voltage:500 V	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)441V (2)437V (3)449V (4)441V
6	Control IC Voltage Test	PWM IC U2 Rated 8.9 V~ 15.5 V PFC IC U1 Rated -0.3V~ 26V O/P IC U102 Rated 3V~ 32V AUX IC U300 Rated 0V~50V	AC ON/OFF I/P:High-Line +3V =308 V O/P(1)Full Load (2) Output Short (3)O.L.P (4)O.V.P. (5)No Load VR min (Low Line) Ta:25°C	U2 (1) 14.1V (2) 13.9V (3) 13.9V (4) 13.9V (5) 13.9V U1 (1) 14.1V (2) 13.9V (3) 13.9V (4) 13.9V (5) 13.9V

				U102 (1) 10.9V (2) 10.9V (3) 10.9V (4) 10.9V (5) 10.9V U300 (1) 14.1V (2) 13.9V (3) 13.9V (4) 13.9V (5) 13.9V
7	TOP SWITCHING STAND BY POWER	U300 Rated 1.0A/ 730V	AC ON/OFF I/P:High-Line +3V =308V O/P: (1)Full Load (2)Remote On/Off I/P:Low-Line -3V =177 V O/P: (1)Full Load (2)Remote On/Off Ta:25°C	308V (1) 533 V (2) 537V 177V (1) 533V (2) 541V

■ SAFETY& E.M.C. TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 4.2 K VAC/min I/P-FG : 2.1 K VAC/min O/P-FG: 1.25 KVAC/min	I/P-O/P: 4.62 KVAC/min I/P-FG: 2.52 KVAC/min O/P-FG: 1.5 KVAC/min Ta:25°C	I/P - O/P: 2.86 mA I / P - F G : 2.78 mA O / P - F G : 2.49 m A NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P: 500 VDC>100MΩ I / P - F G : 500 VDC>100MΩ O/P-FG: 500 VDC >100MΩ	I/P-O/P: 500 VDC I / P - F G : 500 VDC O/P-FG: 500 VDC Ta:25°C	I/P - O/P: >9999 MΩ I / P - F G : >9999 MΩ O / P - F G : >9999 MΩ NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25°C	12mΩ

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS C	I/P:230VAC/50HZ O/P:FULL LOAD Ta:25°C	PASS
2	CONDUCTION	EN55032 CLASS A	I/P : 230 VAC (50HZ) O/P : FULL/50% LOAD Ta : 25°C	PASS Test by certified Lab
3	RADIATION	EN55032 CLASS A	I/P : 230 VAC (50HZ) O/P : FULL LOAD Ta : 25°C	PASS Test by certified Lab
4	E.S.D	EN61000-4-2 AIR : 8KV / Contact : 4KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A
5	E.F.T	EN61000-4-4 INPUT : 2KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A
6	SURGE	EN61000-6-2 L-N : 2KV L,N-PE : 4KV	I/P : 230 VAC/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 : LRS-1200-48 1. ROOM AMBIENT BURN-IN : 2HRS I/P : 230VAC O/P : FULL LOAD Ta=30.9 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=51.8 °C																																																																																																																																		
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 114.5 % LOAD Ta : 25°C	TEST : OK
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 305VAC/200VAC O/P : 100 % LOAD Ta= -35 °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(0~30°C)	I/P : 230 VAC O/P : FULL LOAD	± 0.0011 %/°C(0~30°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	-30~50°C	1. Thermal shock Temperature : -35°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	10 ~ 500Hz, 3G 10min./1cycle, 60min. each along X, Y, Z axes	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 10min/sweep cycle (4) Acceleration : 4G (5) Test Time : 180min in each axis (X.Y.Z) (6) Ta : 25°C	
9	CAPACITOR LIFE CYCLE	SUPPOSE C106 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) 1245604HRS (2) 229544HRS (3) 337782HRS (4) 426485HRS	
10	MTBF	Conducted by Parts Stress Analysis Prediction 924.6K hrs min. Telcordia SR-332 (Bellcore) ; 93.2K 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 : 30,000 hours		

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	WUWQIN/ZHOUBIAO	WENF	WUWQ

2020.10.1 TAG-QA-009