



Test Report: XDR-75-12

75W AC/DC High-End Ultra Slim Industrial DIN Rail
Power

■ 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

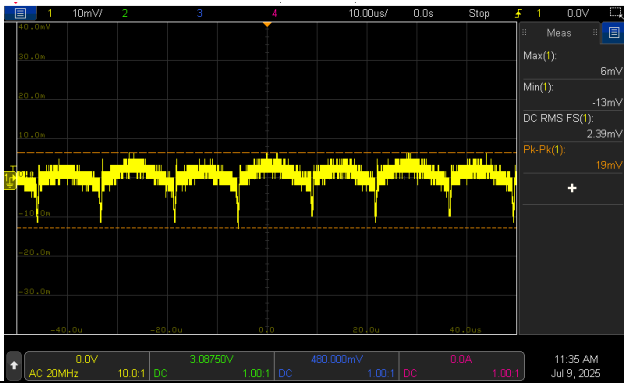
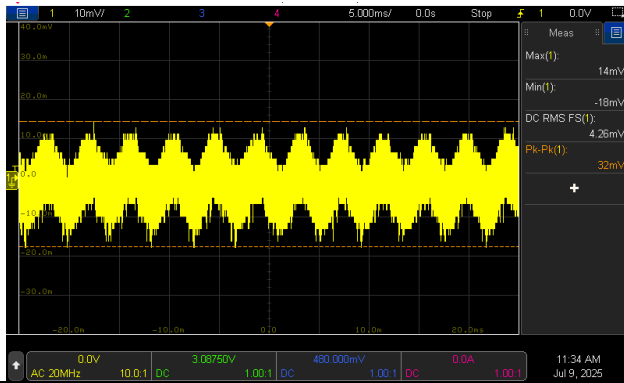
E.M.C. Test

■ RELIABILITY TEST

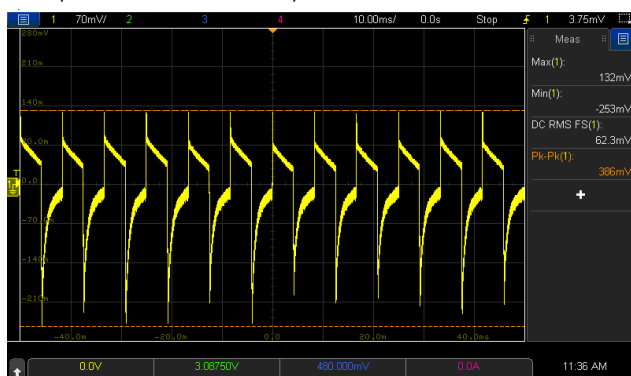
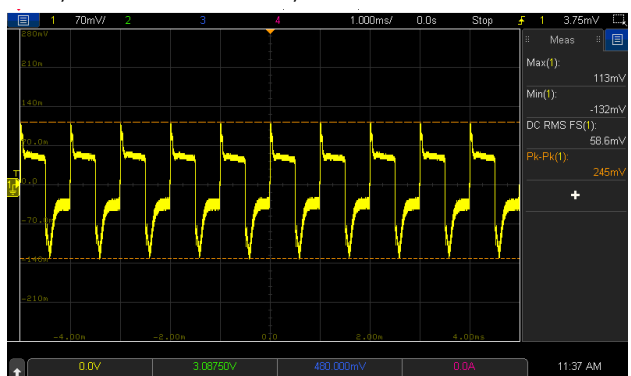
ENVIRONMENT TEST

DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

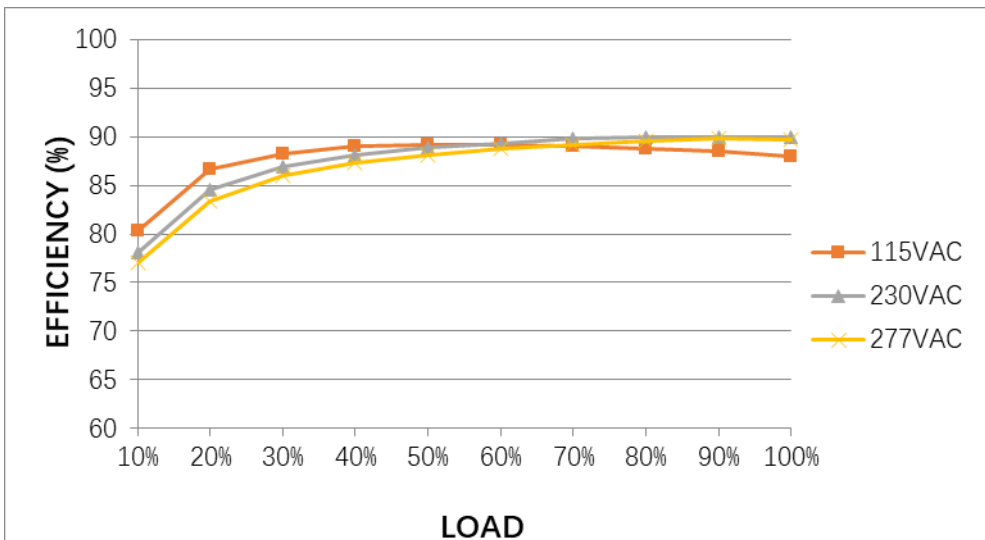
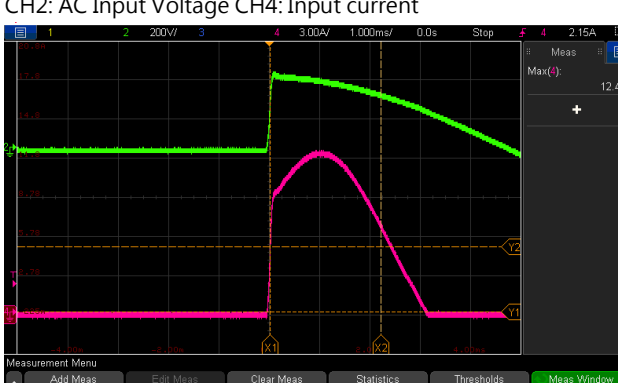
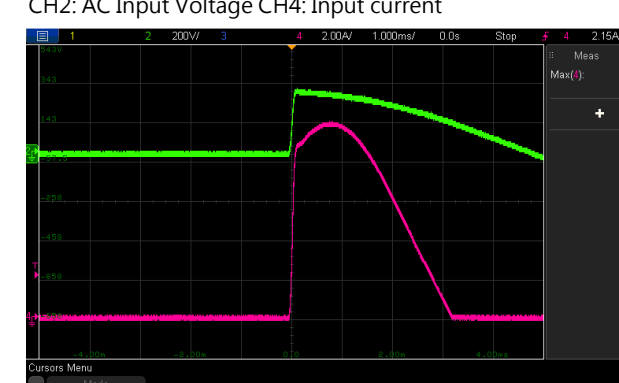
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 12V~15V	I/P : 277 VAC I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	11.270V~15.830V/277VAC 11.265V~15.829V/230VAC 11.267V~15.831V/115VAC
2	OUTPUT VOLTAGE TOLERANCE	V1: -1% ~ +1%	I/P: 85VAC~305VAC O/P:FULL~MIN. LOAD Ta:25°C	V1: -0.2% ~ 0.16%
3	LINE REGULATION	V1: -0.5% ~ +0.5%	I/P: 85VAC~ 305VAC O/P:FULL LOAD Ta:25°C	V1: 0% ~ 0.05%
4	LOAD REGULATION	V1: -1% ~ +1%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: -0.2% ~ 0.16%
5	OVER/UNDERSHOOT TEST	<±5%	I/P: 230VAC O/P:FULL LOAD Ta:25°C	3.02% →FULL LOAD
6	RIPPLE & NOISE (Max)	V1: 100mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25°C	19mVp-p / high frequency 32mVp-p / low frequency
high frequency :  low frequency : 				
7	SET UP TIME(Max)	230VAC/1200ms 115VAC/2500ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 402.54ms 115VAC/ 406.8ms
INPUT=230VAC/50HZ @ FULL LOAD CH1: Output Voltage CH3: AC Input Voltage			INPUT=115VAC/60HZ @ FULL LOAD CH1: Output Voltage CH3: AC Input Voltage	

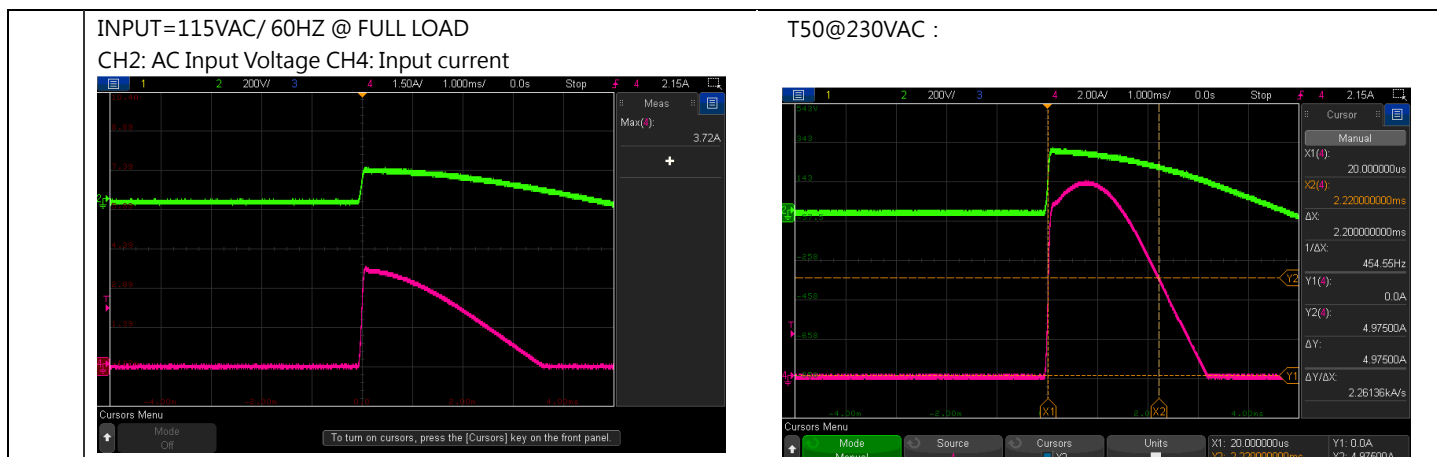
8	RISE TIME (Max)	230VAC/60ms 115VAC/60ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 5.9ms 115VAC/ 5.54ms
	INPUT=230VAC/50HZ @ FULL LOAD CH1: Output Voltage		INPUT=115VAC/60HZ @ FULL LOAD CH1: Output Voltage	
9	HOLD UP TIME (Typ.)	230VAC/ 16ms 115VAC/ 10ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 77.36ms 115VAC/ 13.14ms
	INPUT=230VAC/50HZ @ FULL LOAD CH1: Output Voltage CH3: AC Input Voltage		INPUT=115VAC/60HZ @ FULL LOAD CH1: Output Voltage CH3: AC Input Voltage	
10	DYNAMIC LOAD	V1: 1200mVp-p	I/P: 230VAC O/P: (1) FULL/ MIN LOAD 50%DUTY / 120HZ (2) FULL/ MIN LOAD 50%DUTY / 1KHZ Ta:25°C	386mVp-p 245mVp-p

FULL / MIN LOAD 50%DUTY / 120HZ		FULL / MIN LOAD 50%DUTY / 1KHZ		
				
11	TRANSIENT RECOVERY TIME	V1: 1200mVp-p <500us	I/P: 230VAC O/P:40% LOAD CHANGE 50%DUTY/120HZ 1.25A/us	135mVp-p 0us

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT			
1	INPUT VOLTAGE RANGE	85VAC~305VAC 80VDC~ 431VDC	(1) I/P: TESTING O/P: FULL / 85% LOAD (2) I/P: DC TESTING (L: + N: -) O/P: FULL / 85% LOAD (3) I/P: DC TESTING (L: - N: +) O/P: FULL / 85% LOAD Ta:25°C	(1) 74V~305V/ FULL LOAD 74V~305V/ 85% LOAD (2) 76dc~431Vdc/FULL LOAD 76Vdc~431Vdc/85% LOAD (3) 76Vdc~431Vdc/FULL LOAD 76Vdc~431Vdc/85% LOAD			
			I/P: 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			
		Derating 50% Load @80VDC	I/P: 80VDC O/P: 50% Load	TEST : <u>OK</u>			
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P: 85VAC~ 305VAC O/P:FULL~MIN LOAD Ta:25°C	TEST : OK			
3	INPUT CURRENT (Typ.)	277V/ 0.8A 230V/ 0.9A 115V/ 1.5A	I/P : 277 VAC I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I =0.689A/ 277VAC I =0.780A/ 230VAC I =1.338A/ 115VAC			
4	LEAKAGE CURRENT	< 1mA@240Vac < 1.5mA@277Vac	I/P : 240VAC/60HZ I/P : 277VAC/60HZ O/P : Min LOAD Ta : 25°C	0.601mA@240Vac 0.698mA@277Vac			
5	NO LOAD CONSUMPTION	Remote Power OFF: 0.7W@115Vac & 230Vac	I/P : 115VAC I/P : 230VAC	TEST: <table><tr><td></td><td>Remote</td><td>Remote</td></tr></table>		Remote	Remote
	Remote	Remote					

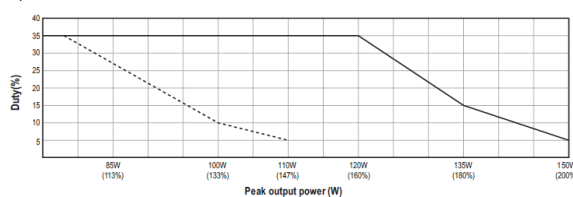
		Remote Power ON: 1.5W@115Vac & 230Vac	O/P : NO LOAD Ta : 25°C	<table><tr><td></td><td>Power OFF</td><td>Power ON</td></tr><tr><td>230V</td><td>0.429W</td><td>1.044W</td></tr><tr><td>115V</td><td>0.245W</td><td>0.789W</td></tr></table>		Power OFF	Power ON	230V	0.429W	1.044W	115V	0.245W	0.789W																																			
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6	EFFICIENCY(Typ.)	89%	I/P:230 VAC O/P:FULL LOAD Ta:25°C	89.6%																																												
EFFICIENCY vs LOAD  <table><caption>Efficiency vs Load Data (Approximate)</caption><thead><tr><th>LOAD (%)</th><th>115VAC (%)</th><th>230VAC (%)</th><th>277VAC (%)</th></tr></thead><tbody><tr><td>10</td><td>80</td><td>78</td><td>78</td></tr><tr><td>20</td><td>86</td><td>84</td><td>84</td></tr><tr><td>30</td><td>88</td><td>86</td><td>86</td></tr><tr><td>40</td><td>89</td><td>87</td><td>87</td></tr><tr><td>50</td><td>89</td><td>88</td><td>88</td></tr><tr><td>60</td><td>89</td><td>89</td><td>89</td></tr><tr><td>70</td><td>89</td><td>89</td><td>89</td></tr><tr><td>80</td><td>89</td><td>89</td><td>89</td></tr><tr><td>90</td><td>89</td><td>89</td><td>89</td></tr><tr><td>100</td><td>89</td><td>89</td><td>89</td></tr></tbody></table>					LOAD (%)	115VAC (%)	230VAC (%)	277VAC (%)	10	80	78	78	20	86	84	84	30	88	86	86	40	89	87	87	50	89	88	88	60	89	89	89	70	89	89	89	80	89	89	89	90	89	89	89	100	89	89	89
LOAD (%)	115VAC (%)	230VAC (%)	277VAC (%)																																													
10	80	78	78																																													
20	86	84	84																																													
30	88	86	86																																													
40	89	87	87																																													
50	89	88	88																																													
60	89	89	89																																													
70	89	89	89																																													
80	89	89	89																																													
90	89	89	89																																													
100	89	89	89																																													
7	INRUSH CURRENT(Typ.)	277V/15A 230V/10A 115V/6A COLD START	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I = 12.4A/ 277VAC I = 9.95A/ 230VAC I = 3.72A/ 115VAC T50=2200us/230V																																												
INPUT=277VAC/50HZ @ FULL LOAD CH2: AC Input Voltage CH4: Input current  INPUT=230VAC/50HZ @ FULL LOAD CH2: AC Input Voltage CH4: Input current 																																																



PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	105%~200% rated output power Protection type: 105%~200% rated output power for more than 5 sec then constant current limiting at rate current without shutdown when $V_o=10\%\sim 100\%$; Constant current limiting mode or Latch mode when $V_o < 10\%$ rated voltage.	I/P: 305VAC I/P: 230VAC I/P: 100VAC O/P: TESTING $T_a: 25^{\circ}\text{C}$	118.6%/ 305VAC 118.6%/ 230VAC 117.0%/ 100VAC Protection type: 105%~200% rated output power for more than 5 sec then constant current limiting at rate current without shut down when $V_o=10\%\sim 100\%$; Constant current limiting mode or Latch mode when $V_o < 10\%$ rated voltage.
2	OVER VOLTAGE PROTECTION	16V~19V Protection type: Shut down o/p voltage, re-power on to recover	I/P: 305VAC I/P: 85VAC O/P: MIN LOAD $T_a: 25^{\circ}\text{C}$	16.92V/ 305VAC 16.88V/ 85VAC PROTECTION TYPE : Shut down o/p voltage, re-power on to recover
3	OVER TEMPERATURE PROTECTION	Protection type: Shut down o/p voltage, recovers automatically after temperature goes down	I/P: 305VAC I/P: 85VAC O/P: FULL LOAD	O.T.P. Active OK Protection type : 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 mode or Latch mode when $V_o < 10\%$ rated voltage.	I/P: 305VAC I/P: 85VAC O/P: FULL LOAD	NO DAMAGE OK PROTECTION TYPE : Constant current limiting mode or Latch mode when $V_o < 10\%$ rated voltage.

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																										
1	DC OK CONTACT RATINGS	Relay Contact Ratings(max.): 30Vdc/1A,30Vac/0.5A resistive load	I/P:230VAC O/P:FULL LOAD Ta:25°C	TEST: <u>OK</u>																																										
2	REMOTE CONTROL	Power ON: RC + ~ RC- keep<0.5Vdc Power OFF: RC + ~ RC- keep 4~5Vdc	I/P:230VAC O/P:FULL LOAD Ta:25°C	TSET: OK Power ON: <u>≤ 1.8 V</u> ; Power OFF: <u>≥ 3.2V</u> .																																										
3	PULSE CURRENT CAPABILTY	<table><tr><th rowspan="2">Load</th><th rowspan="2">Vo(%)</th><th colspan="2">12V</th><th colspan="2">24V/36V/48V</th></tr><tr><th>Time</th><th>Time</th><th>Time</th><th>Time</th></tr><tr><td>3xIo</td><td>75</td><td>6ms</td><td>8ms</td><td>6ms</td><td>8ms</td></tr><tr><td>4xIo</td><td>60</td><td>3ms</td><td>6ms</td><td>3ms</td><td>6ms</td></tr><tr><td>5xIo</td><td>40</td><td>2ms</td><td>5ms</td><td>2ms</td><td>5ms</td></tr><tr><td>6xIo</td><td>25</td><td>--</td><td>4ms</td><td>--</td><td>4ms</td></tr></table> Note: The time indicated in the table refers to Power on AC for more than 3 seconds before applying load.	Load	Vo(%)	12V		24V/36V/48V		Time	Time	Time	Time	3xIo	75	6ms	8ms	6ms	8ms	4xIo	60	3ms	6ms	3ms	6ms	5xIo	40	2ms	5ms	2ms	5ms	6xIo	25	--	4ms	--	4ms	I/P:230VAC O/P:FULL LOAD Ta:25°C	TEST: <u>OK</u> <table><tr><th>Load</th><th>Time(ms)</th></tr><tr><td>3xIo</td><td>15</td></tr><tr><td>4xIo</td><td>4.74</td></tr><tr><td>5xIo</td><td>4.28</td></tr></table>	Load	Time(ms)	3xIo	15	4xIo	4.74	5xIo	4.28
Load	Vo(%)	12V			24V/36V/48V																																									
		Time	Time	Time	Time																																									
3xIo	75	6ms	8ms	6ms	8ms																																									
4xIo	60	3ms	6ms	3ms	6ms																																									
5xIo	40	2ms	5ms	2ms	5ms																																									
6xIo	25	--	4ms	--	4ms																																									
Load	Time(ms)																																													
3xIo	15																																													
4xIo	4.74																																													
5xIo	4.28																																													
4	PEAK Power	I/P: 100/200VAC O/P:  -----100VAC ————200VAC		TEST: <u>OK</u>																																										

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated: 800V/12A	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.	Q1: VDS: (1) 713V (2) 713V (3) 713V (4) 713V (5) 708V (6) 718V (7) 718V (8) 718V

			(8) Peak Load Ta:25°C	
2	Diode Peak Voltage	Q101 Rated: 80V/64A	AC ON/OFF I/P: High-Line +3V =308 V <u>VO=Vomax</u> 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 (9) Peak Load <u>VO=Vnormal</u> O/P: (1) Full Load Ta:25°C	Q100: <u>VO=Vomax</u> VDS: (1) 60.1V (2) 65.3V (3) 60.1V (4) 60.6V (5) 60.1V (6) 60.1V (7) 60.1V (8) 60.1V (9) 60.1V <u>VO=Vnormal</u> (1) 57.5V
4	Input Capacitor Voltage	C5 Rated: 150μ /450V	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 (5) Peak Load on/off (6) Peak Load continue Ta:25°C	(1) 441V (2) 433V (3) 433V (4) 433V (5) 441V (6) 433V
5	Control IC Voltage Test	PWM IC U1 Rated : 8V~ 26.5V O/P IC U100 Rated : 4V~13V IC U107 Rated : 3V~32V	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 VR min (Low Line) Ta:25°C	U1 U107 (1) 18.1V (1) 11.7V (2) 18.1V (2) 11.7V (3) 18.2V (3) 11.7V (4) 18.2V (4) 11.7V (5) 18.2V (5) 11.7V U100 (1) 11.9V (2) 11.5V (3) 11.5V (4) 11.5V (5) 11.5V
6	Clamp Diode Peak Voltage	D5 Rated : 1A/620V	AC ON/OFF I/P : High-Line +3V = 308V O/P : (1) Dynamic Load 90%Duty/1KHz (2) Full load continue Ta:25°C	(1) 550V (2) 538V

■ SAFETY& E.M.C. TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 4 KVAC/min I/P-FG : 2 KVAC/min O/P-FG:1.5 KVAC/min O/P-DC OK: 0.5 KVAC/min	I/P-O/P: 4.4 KVAC/min I/P-FG: 2.4 KVAC/min O/P-FG: 1.8 KVAC/min O/P-DC OK: 0.6 KVAC/min Ta:25°C	I/P-O/P: 4.20 mA I/P-FG: 3.02 mA O/P-FG: 4.59 mA O/P-DC OK: 0.009 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: 600 VDC I/P-FG: 600 VDC O/P-FG: 600 VDC Ta:25°C	I/P-O/P: 50 GΩ I/P-FG: 22180 MΩ O/P-FG: 50 GΩ NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100mΩ	40A /2min Ta:25°C	12mΩ

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	BS EN/EN61000-3-2 CLASS A	I/P:230VAC/50HZ O/P:FULL LOAD Ta:25°C	PASS
2	CONDUCTION	BS EN/EN55032(CISPR32)/ BS EN/EN61204-3/CNS15936 CLASS B	I/P : 230 VAC (50HZ) O/P : FULL/50% LOAD Ta : 25°C	PASS Test by certified Lab
3	RADIATION	BS EN/EN55032(CISPR32)/ BS EN/EN61204-3/CNS15936 CLASS B	I/P : 230 VAC (50HZ) O/P : FULL LOAD Ta : 25°C	PASS Test by certified Lab
4	E.S.D	BS EN/EN61000-4-2 INDUSTRY AIR : 15KV / Contact : 8KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A
5	E.F.T	BS EN/EN61000-4-4 INDUSTRY INPUT : 4KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A
6	SURGE	BS EN/EN61000-4-5 INDUSTRY 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 : XDR-75-12 1. ROOM AMBIENT BURN-IN : 2HRS I/P : 230VAC O/P : FULL LOAD Ta= 25 °C 2. HIGH AMBIENT BURN-IN : 2HRS I/P : 230VAC O/P : FULL LOAD Ta= 60 °C																																																																																																																																						
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 116% LOAD Ta : 25°C	TEST : OK
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 264VAC/100VAC O/P : 50%/100% LOAD Ta= -40°C/-30°C	TEST : OK
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 60°C/95 %R.H NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta= 60°C HUMIDITY= 95 %R.H	TEST : OK
5	TEMPERATURE COEFFICIENT	± 0.03 %/°C(0~60°C)	I/P : 230 VAC O/P : FULL LOAD	± 0.012 %/°C(0~60°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	-30~60°C	1. Thermal shock Temperature : -35°C~ +65°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, 2G 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 : 3G (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= 60 °C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta= 60 °C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta= 60 °C LIFE TIME		(1) 274432.7 HRS (2) 25818.1 HRS (3) 49691.8 HRS (4) 93577.8 HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 1907.3K hrs min. Telcordia SR-332 (Bellcore) ; 333.9K 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 : 50,000 hours		

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	YUWEI	LIUTT	WANGZD

2020.10.1 TAG-QA-009