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

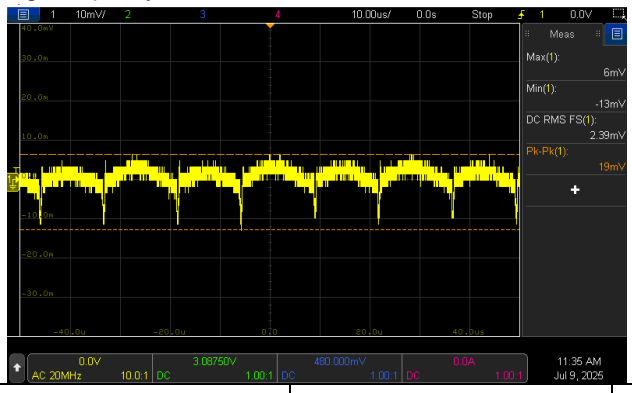
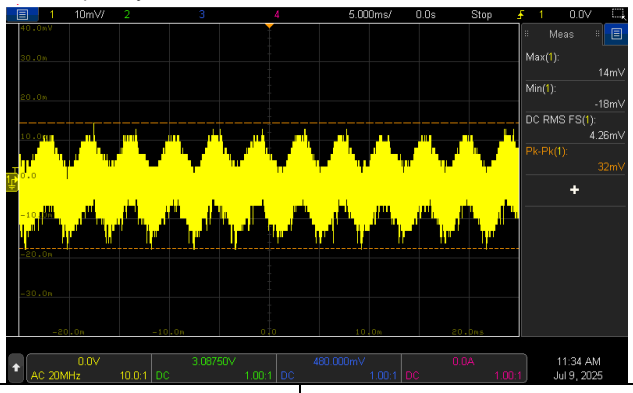
Safety Test
E.M.C. Test

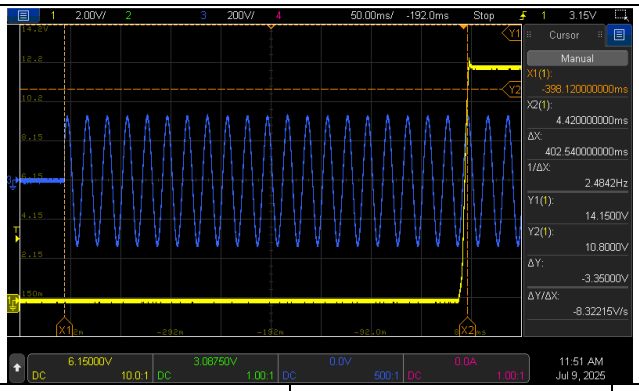
■ RELIABILITY TEST

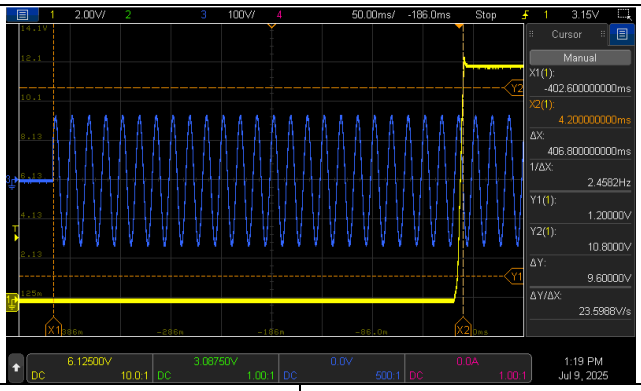
ENVIRONMENT TEST

■ DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

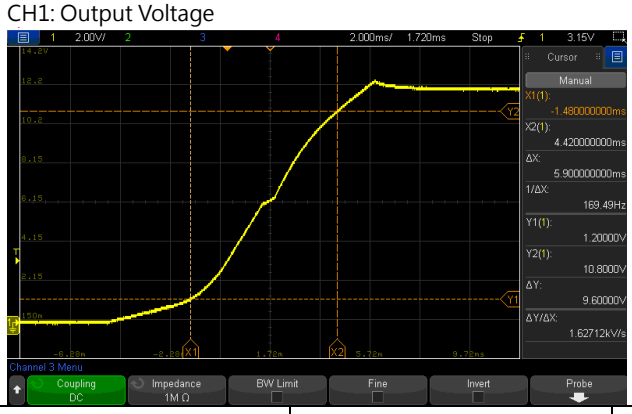
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 12V~15V	I/P： 277 VAC I/P： 230 VAC I/P： 115 VAC O/P：MIN LOAD Ta：25℃	11.270V~15.830V/277VAC 11.265V~15.829V/230VAC 11.267V~15.831V/115VAC
2	OUTPUT VOLTAGE TOLERANCE	V1: -1% ~ +1%	I/P: 85VAC~305VAC O/P:FULL~MIN. LOAD Ta:25℃	V1: -0.2% ~ 0.16%
3	LINE REGULATION	V1: -0.5% ~ +0.5%	I/P: 85VAC~ 305VAC O/P:FULL LOAD Ta:25℃	V1: 0% ~ 0.05%
4	LOAD REGULATION	V1: -1% ~ +1%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25℃	V1: -0.2% ~ 0.16%
5	OVER/UNDERSHOOT TEST	<±5%	I/P: 230VAC O/P:FULL LOAD Ta:25℃	3.02% →FULL LOAD
6	RIPPLE & NOISE (Max)	V1: 100mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25℃	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℃	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	



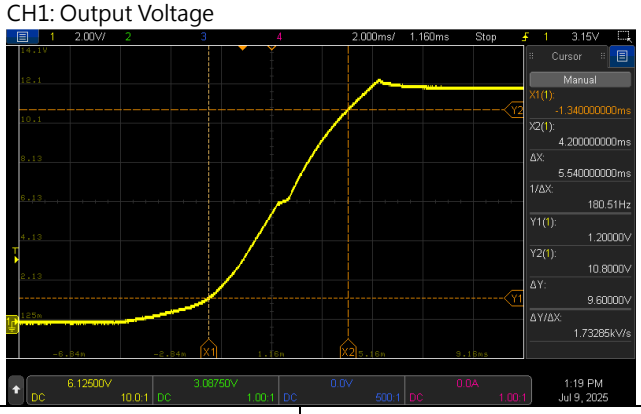


8	RISE TIME (Max)	230VAC/60ms 115VAC/60ms	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	230VAC/ 5.9ms 115VAC/ 5.54ms

INPUT=230VAC/50HZ @ FULL LOAD
CH1: Output Voltage

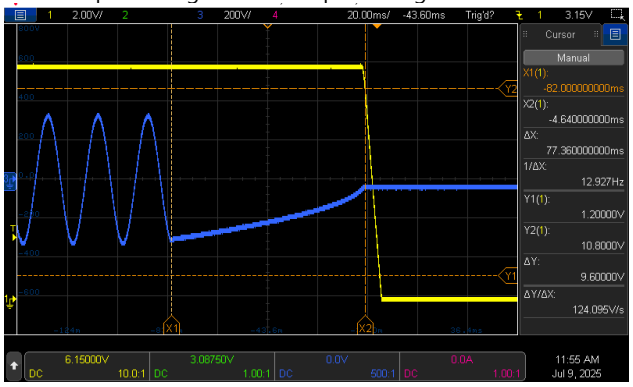


INPUT=115VAC/60HZ @ FULL LOAD
CH1: Output Voltage

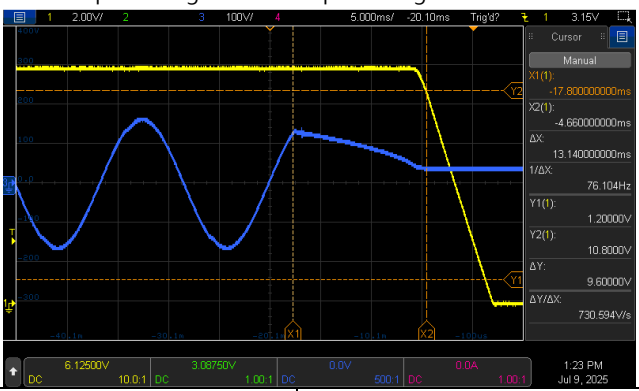


9	HOLD UP TIME (Typ.)	230VAC/ 16ms 115VAC/ 10ms	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	230VAC/ 77.36ms 115VAC/ 13.14ms

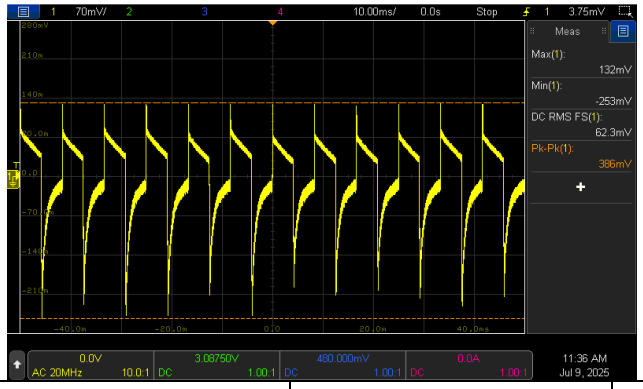
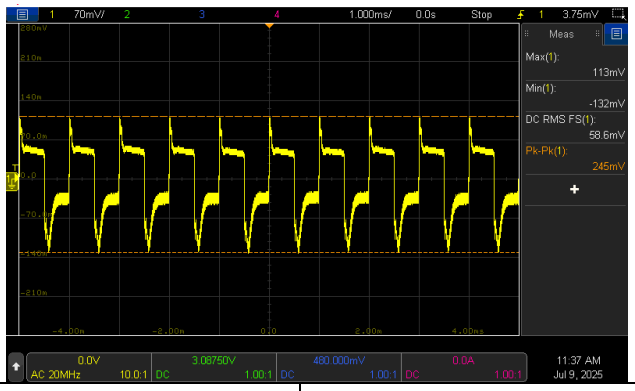
INPUT=230VAC/50HZ @ FULL LOAD
CH1: Output Voltage CH3: AC Input Voltage



INPUT=115VAC/60HZ @ FULL LOAD
CH1: Output Voltage CH3: AC Input Voltage

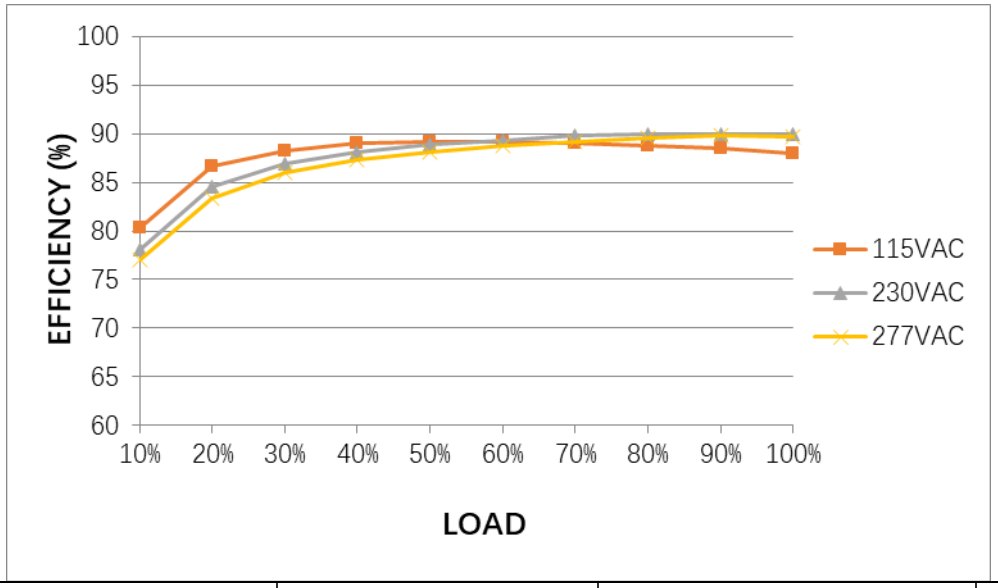
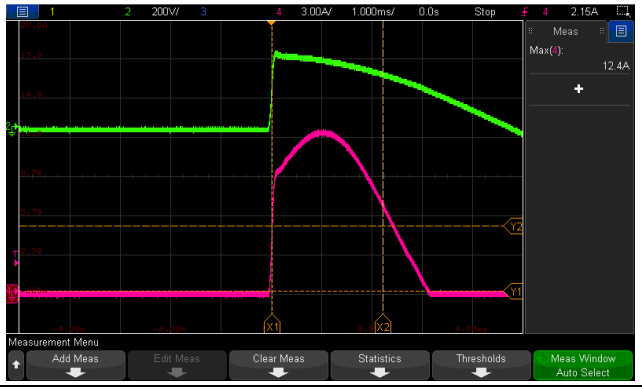
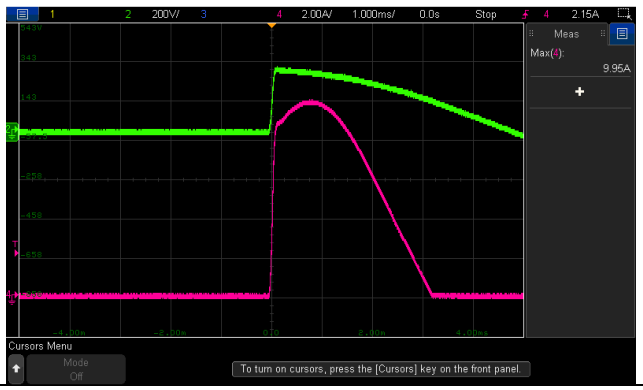


10	DYNAMIC LOAD	V1: 1200mVp-p	I/P: 230VAC O/P: (1) FULL/ MIN LOAD 50%DUTY / 120HZ (2) FULL/ MIN LOAD 50%DUTY / 1KHZ Ta:25℃	386mVp-p 245mVp-p

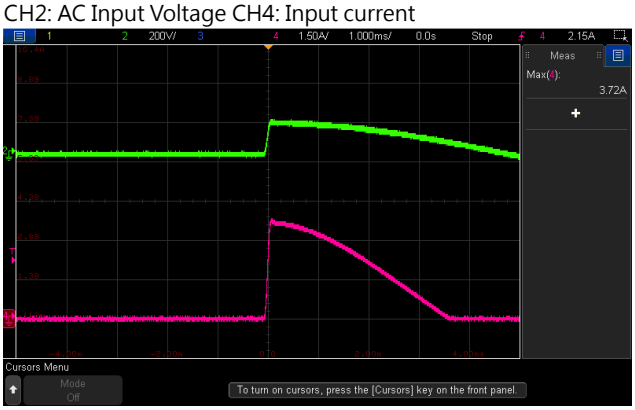
	FULL / MIN LOAD 50%DUTY / 120HZ 		FULL / MIN LOAD 50%DUTY / 1KHZ 	
11	TRANSIENT RECOVERY TIME	V1: 1200mVp-p <500us	I/P: 230VAC O/P:40% LOAD CHANGE 50%DUTY/120HZ 1.25A/us	135mVp-p 0us

INPUT FUNCTION TEST

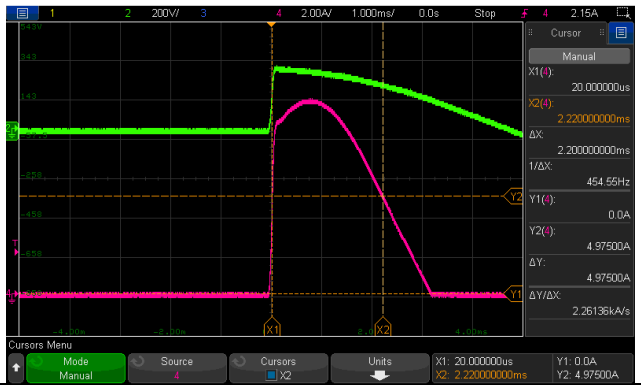
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	85VAC~305VAC 80VDC~ 431VDC	(1) I/P: TESTING O/P: FULL / 85% LOAD (2) I/P: DC TESTING (L: + N: -) O/P: FULL / 85% LOAD (3) I/P: DC TESTING (L: - N: +) O/P: FULL / 85% LOAD Ta:25℃	(1) 74V~305V/ FULL LOAD 74V~305V/ 85% LOAD (2) 76dc~431Vdc/FULL 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：OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P: 85VAC~ 305VAC O/P:FULL~MIN LOAD Ta:25℃	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℃	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℃	0.601mA@240Vac 0.698mA@277Vac
5	NO LOAD CONSUMPTION	Remote Power OFF: 0.7W@115Vac & 230Vac	I/P：115VAC I/P：230VAC	TEST： Remote / Remote

		Remote Power ON: 1.5W@115Vac & 230Vac	O/P：NO LOAD Ta：25℃	<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>
6	EFFICIENCY(Typ.)	89%	I/P:230 VAC O/P:FULL LOAD Ta:25℃	89.6%
	EFFICIENCY vs LOAD 			
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℃	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 	

INPUT=115VAC/ 60HZ @ FULL LOAD
CH2: AC Input Voltage CH4: Input current



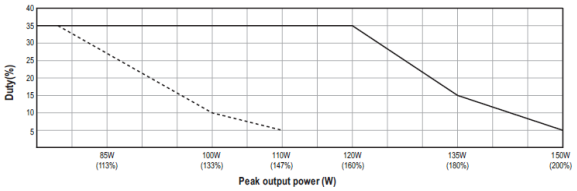
T50@230VAC:



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 Vo=10%~100%; Constant current limiting mode or Latch mode when Vo＜10% rated voltage.	I/P: 305VAC I/P: 230VAC I/P: 100VAC O/P:TESTING Ta:25℃	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 Vo=10%~100%; Constant current limiting mode or Latch mode when Vo＜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 Ta:25℃	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 Vo<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 Vo<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℃	TEST: OK
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℃	TSET: OK Power ON: ≤ 1.8 V; Power OFF: ≥ 3.2V.
3	PULSE CURRENT CAPABLILTY	Load / Vo(%) / 12V Time / 24V/36V/48V Time 3xIo 75 6ms 8ms 4xIo 60 3ms 6ms 5xIo 40 2ms 5ms 6xIo 25 -- 4ms Note: The time indicated in the table refers to Power on AC for more than 3 seconds before applying load.	I/P:230VAC O/P:FULL LOAD Ta:25℃	TEST: OK Load / Time(ms) 3xIo 15 4xIo 4.74 5xIo 4.28
4	PEAK Power	I/P: 100/200VAC O/P:  Duty(%) 85W (113%) 100W (133%) 110W (147%) 120W (160%) 135W (180%) 150W (200%) Peak output power (W) ------100VAC ——200VAC		TEST: OK

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.	VO=Vomax VDS: (1) 713V (2) 713V (3) 713V (4) 713V (5) 708V (6) 718V (7) 718V (8) 718V

			(8) Peak Load Ta:25℃	
2	Diode Peak Voltage	Q101 Rated: 80V/64A	AC ON/OFF I/P: High-Line +3V =308 V VO=Vomax 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 VO=Vnormal O/P: (1) Full Load Ta:25℃	Q100: VO=Vomax 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 VO=Vnormal (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℃	(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℃	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℃	(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℃	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℃	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℃	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℃	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℃	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℃	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℃	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℃	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℃	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

<table>
<tr><th>NO</th><th>TEST ITEM</th><th>SPECIFICATION</th><th>TEST CONDITION</th><th>RESULT</th></tr>
<tr><td>1</td><td>TEMPERATURE RISE TEST</td><td colspan="3">MODEL： XDR-75-12
1. ROOM AMBIENT BURN-IN： 2HRS
I/P： 230VAC O/P： FULL LOAD Ta= 25 ℃
2. HIGH AMBIENT BURN-IN： 2HRS
I/P： 230VAC O/P： FULL LOAD Ta= 60 ℃</td></tr>
</table>

NO	Position	ROOM AMBIENT Ta= 25 ℃	HIGH AMBIENT Ta= 60 ℃
1	C105	64.6℃	98.1℃
2	C106	57.9℃	92.0℃
3	T2	46.4℃	80.7℃
4	C202	50.9℃	85.2℃
5	Q108	62.0℃	96.2℃
6	C5	44.1℃	75.9℃
7	Q1	53.1℃	86.7℃
8	T1 Coil	66.8℃	97.8℃
9	T1 Core	61.7℃	92.1℃
10	LF2	40℃	76.9℃
11	C2	40℃	76.2℃
12	RY1	42.9℃	79.0℃
13	RTH1	45.9℃	81.5℃
14	R11	46.7℃	83.0℃
15	C110	44.2℃	77.2℃
16	LF100	48.0℃	81.9℃
17	RY100	47.3℃	80.6℃
18	C1	36.8℃	70.9℃
19	ZNR1	35.7℃	70.5℃
20	BD1	51.8℃	86.1℃
21	U2	43.0℃	77.3℃
22	U107	45.7℃	79.9℃
23	Q101	77.7℃	112.8℃
24	U100	70.1℃	104.3℃
25	D5	68.7℃	105.6℃
26	J110	66.4℃	100.2℃
27	D201	48.6℃	82.2℃
28	U5	51.1℃	83.9℃
29	U1	46.0℃	79.3℃
30	RTH3	56.8℃	89.4℃
31	C48	42.7℃	77.8℃
32	D3	47.9℃	82.7℃

2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P： 230 VAC O/P：116% LOAD Ta：25℃	TEST：OK
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P： 264VAC/100VAC O/P： 50%/100% LOAD Ta= -40℃/-30℃	TEST：OK
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 60℃/95 %R.H NO DAMAGE	I/P： 272 VAC O/P：FULL LOAD Ta= 60℃ HUMIDITY= 95 %R.H	TEST：OK
5	TEMPERATURE COEFFICIENT	± 0.03 %/℃(0~60℃)	I/P： 230 VAC O/P：FULL LOAD	± 0.012 %/℃(0~60℃)
6	STORAGE TEMPERATURE TEST	-40~85℃	1. Thermal shock Temperature： -45℃~ +90℃ 2. Temperature change rate ：25℃ / 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℃	1. Thermal shock Temperature： -35℃~ +65℃ 2. Temperature change rate ：25℃ / 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℃	
9	CAPACITOR LIFE CYCLE	SUPPOSE C106 IS THE MOST CRITICAL COMPONENT (1) I/P： 230VAC O/P：FULL LOAD Ta= 25 ℃ LIFE TIME (2) I/P： 230VAC O/P：FULL LOAD Ta= 60 ℃ LIFE TIME (3) I/P： 230VAC O/P：75% LOAD Ta= 60 ℃ LIFE TIME (4) I/P： 230VAC O/P：50% LOAD Ta= 60 ℃ 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℃)		
11	Ongoing Reliability Test	I/P：230VAC O/P：FULL LOAD TA=50℃ Demonstration Mean Time Between Failure：50,000 hours		

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	YUWEI	LIUTT	WANGZD

2020.10.1 TAG-QA-009