Test Report: XDR-240E-48

240W AC/DC Economical 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

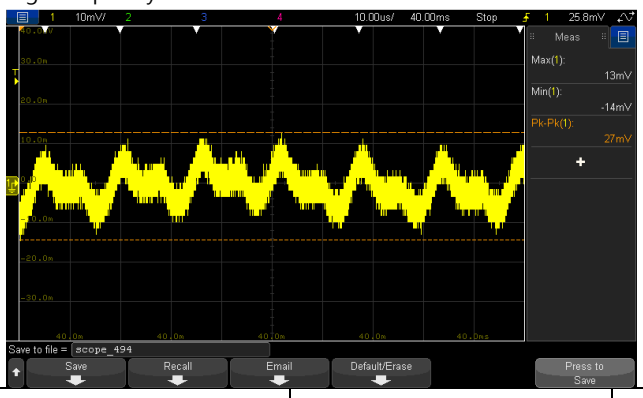
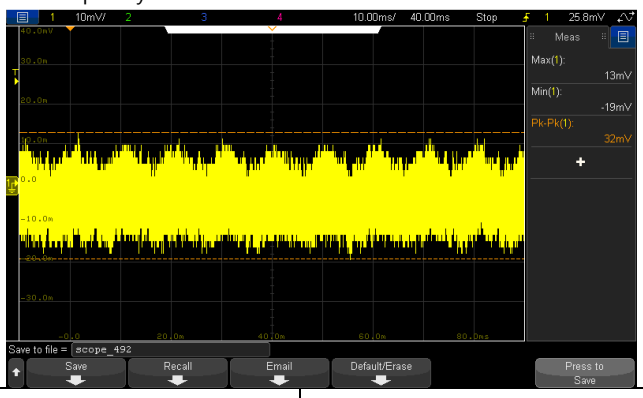
Safety Test
E.M.C. Test

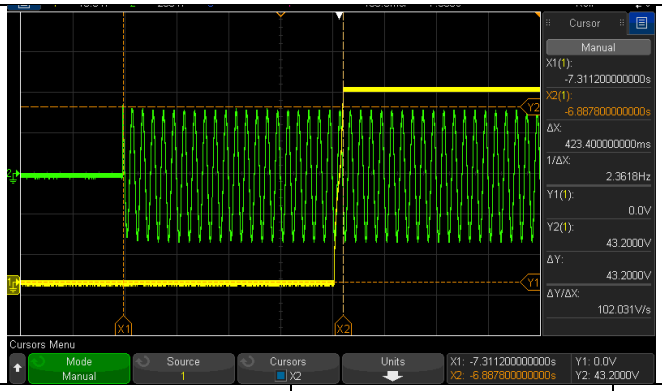
■ RELIABILITY TEST

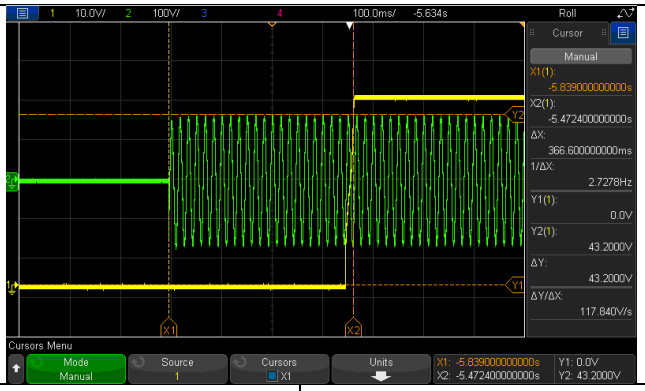
ENVIRONMENT TEST

■ DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

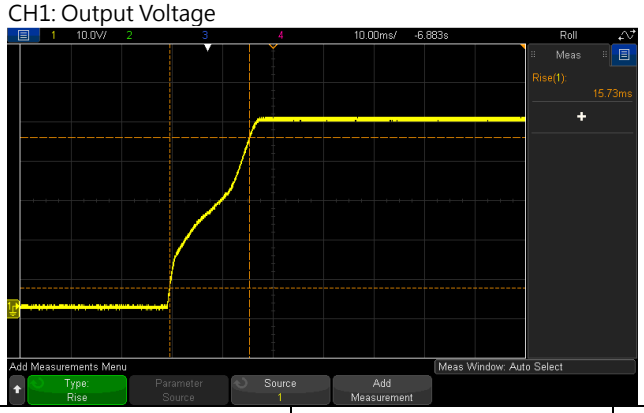
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 48V~55V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25℃	46.085V~57.01V/230VAC 46.086V~57.01V/115VAC
2	OUTPUT VOLTAGE TOLERANCE	V1: -1% ~ +1%	I/P: 85VAC~ 264VAC O/P:FULL~ MIN. LOAD Ta:25℃	V1: -0.025% ~0.036 %
3	LINE REGULATION	V1: -0.5% ~ +0.5%	I/P: 85VAC~ 264VAC O/P:FULL LOAD Ta:25℃	V1: 0% ~ 0.011%
4	LOAD REGULATION	V1: -1% ~ +1%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25℃	V1: -0.025% ~0.036 %
5	OVER/UNDERSHOOT TEST	<±5%	I/P: 230VAC O/P:FULL LOAD / NO LOAD Ta:25℃	0.5%
6	RIPPLE & NOISE (Max)	V1: 150mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25℃	V1: 27mVp-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/ 423.4ms 115VAC/ 366.6ms
	INPUT=230VAC/50HZ @ FULL LOAD CH1: Output Voltage CH3: AC Input Voltage		INPUT=115VAC/60HZ @ FULL LOAD CH1: Output Voltage CH3: AC Input Voltage	



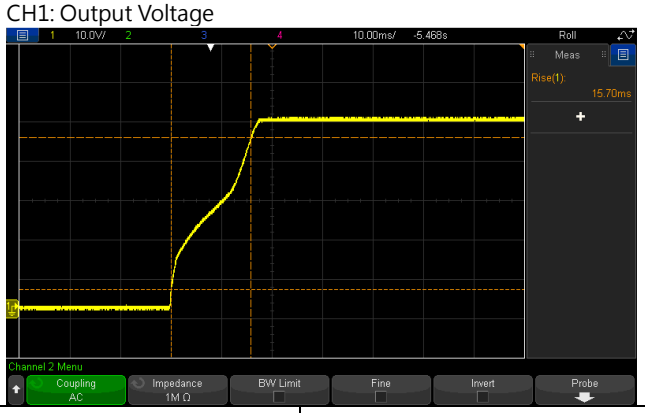


8	RISE TIME (Max)	230VAC/60ms 115VAC/150ms	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	230VAC/ 15.73ms 115VAC/15.70 ms

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

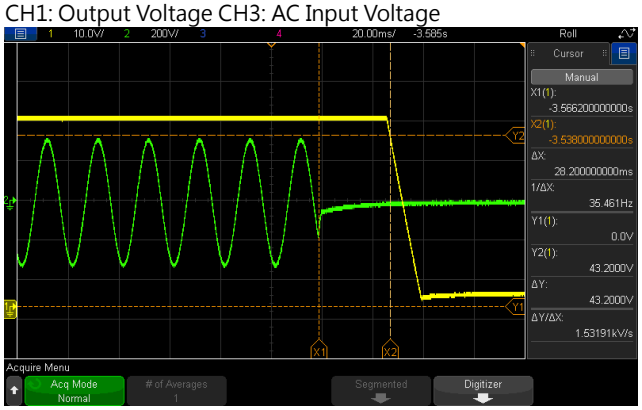


INPUT=115VAC/60HZ @ FULL LOAD
CH1: Output Voltage

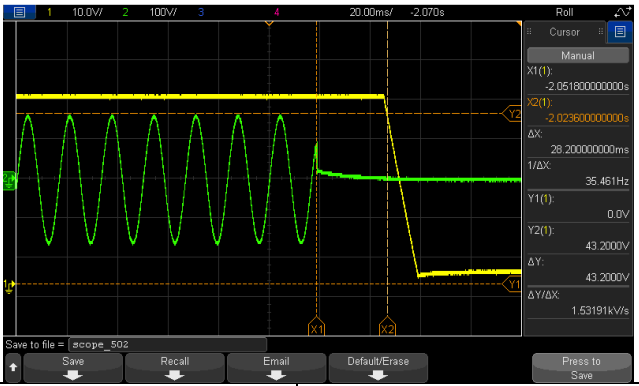


9	HOLD UP TIME (Typ.)	230VAC/ 20ms 115VAC/ 20ms	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	230VAC/28.2 ms 115VAC/ 28.2ms

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



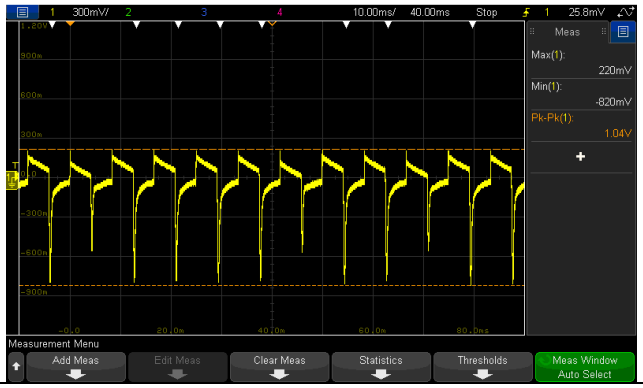
INPUT=115VAC/60HZ @ FULL LOAD
CH1: Output Voltage CH3: AC Input Voltage



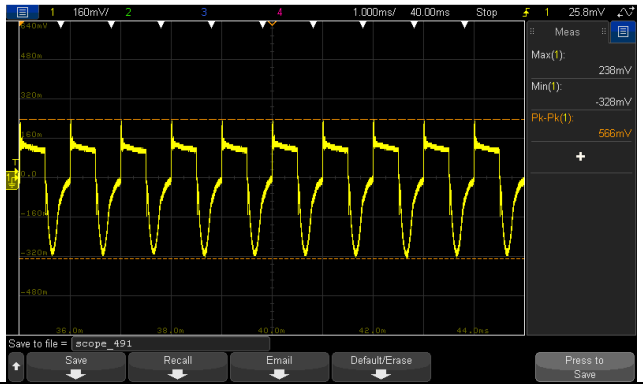
10	DYNAMIC LOAD	V1: 4800mVp-p	I/P: 230VAC O/P: (1) FULL/ MIN LOAD 50%DUTY / 120HZ (2) FULL/ MIN LOAD 50%DUTY /	1040mVp-p 566mVp-p

			1KHZ Ta:25℃	

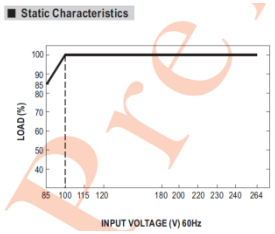
FULL / MIN LOAD 50%DUTY / 120HZ

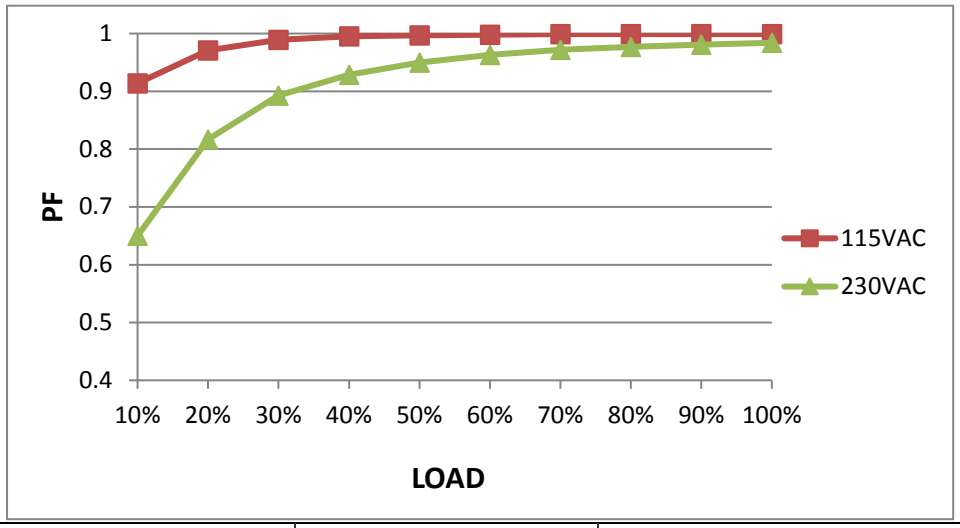
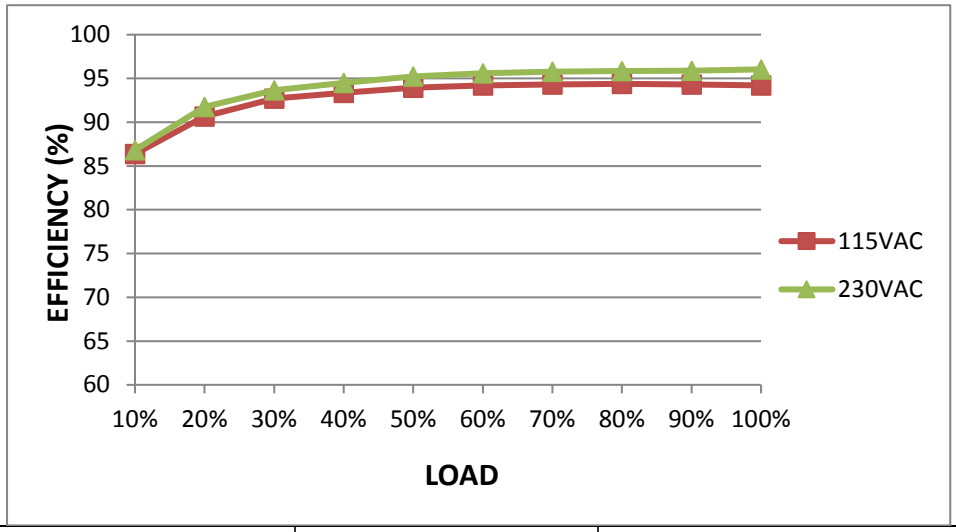


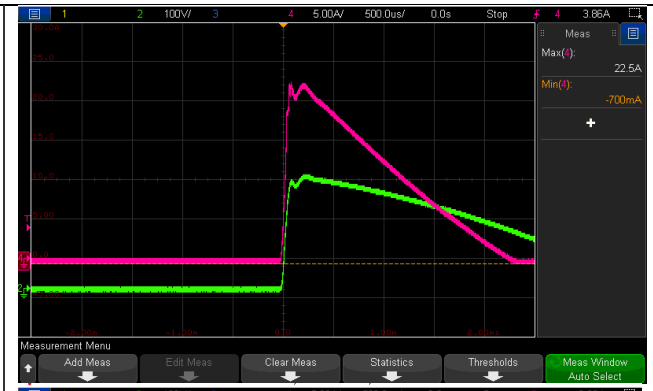
FULL / MIN LOAD 50%DUTY / 1KHZ

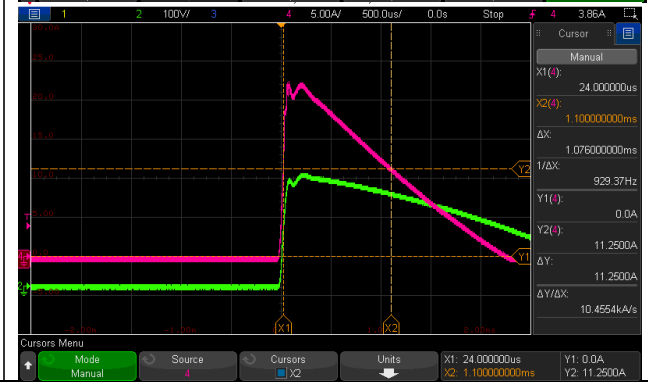


INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	85VAC~264VAC 120VDC~ 370VDC 	(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) 73.5V~264V/ FULL LOAD 73.3V~264V/ 85% LOAD (2) 103.5Vdc~370Vdc/FULL LOAD 103.4Vdc~370Vdc/85% LOAD (3)103.2 Vdc~370Vdc/FULL LOAD 103.1Vdc~370Vdc/85% LOAD
			I/P: HIGH-LINE+15%=300V O/P:FULL/MIN LOAD (PLEASE CHECK DERATING CURVE) ON: 30 Sec OFF: 30 Sec 10MIN (POWER ON/OFF NO DAMAGE)	TESTOK：OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P:85VAC ~264 VAC O/P:FULL~MIN LOAD Ta:25℃	TEST：OK
3	INPUT CURRENT (Typ.)	230V/ 1.3A 115V/ 2.6A	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	I =1.102 A/ 230VAC I =2.217 A/ 115VAC
4	LEAKAGE CURRENT	< 1mA / 240 VAC	I/P： 240 VAC/60HZ O/P：Min LOAD Ta：25℃	0.4738mA
5	NO LOAD CONSUMPTION	< 1.2W	I/P：230VAC I/P：115VAC O/P：NO LOAD Ta：25℃	1.0006W/ 230VAC 0.9488W/ 115VAC
6	POWER FACTOR (Typ.)	0.95/ 230VAC	I/P： 230 VAC	PF=0.9844/230VAC

		0.98/115VAC	I/P： 115 VAC O/P：FULL LOAD Ta：25℃	PF=0.9986/115VAC
	P.F vs LOAD 			
7	EFFICIENCY(Typ.)	95.5%	I/P:230 VAC O/P:FULL LOAD Ta:25℃	96.15%
	EFFICIENCY vs LOAD 			
8	INRUSH CURRENT(Typ.)	230V/30A 115V/15A COLD START	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	I =22.5A/ 230VAC I =11.7A/ 115VAC T50=1076 us/230V
	INPUT=230VAC/50HZ @ FULL LOAD CH1: AC Input Voltage CH4: Input current		INPUT=115VAC/ 60HZ @ FULL LOAD CH1: AC Input Voltage CH4: Input current	





PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	105%~130% rated output power Protection type: Hiccup mode when output voltage <30%, recovers automatically after fault condition is removed Constant current limiting without shutdown within 30%~100% rated output voltage, recovers automatically after fault condition is removed	I/P: 264VAC I/P: 230VAC I/P: 100VAC O/P:TESTING Ta:25℃	120.4%/ 264VAC 120.4%/ 230VAC 6.02A 120.4%/ 100VAC PROTECTION TYPE： Hiccup mode when output voltage <30%, recovers automatically after fault condition is removed Constant current limiting without shutdown within 30%~100% rated output voltage, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	Max. 63V Protection type: Hiccup mode, recovers automatically after fault condition is removed	I/P: 264VAC I/P: 85VAC O/P:MIN LOAD Ta:25℃	59.6V/ 264VAC 59.6V/ 85VAC PROTECTION TYPE： Hiccup mode, recovers automatically after fault condition is removed。
3	OVER TEMPERATURE PROTECTION	Protection type: Shut down o/p voltage, recovers automatically after temperature	I/P: 264VAC I/P: 85VAC O/P:FULL LOAD	O.T.P. Active OK Protection type : Shut down o/p voltage, recovers

		goes down		automatically after temperature goes down
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE Protection type: Hiccup mode, recovers automatically after fault condition is removed。	I/P: 264VAC I/P: 85VAC O/P: FULL LOAD Ta:25℃	NO DAMAGE OK PROTECTION TYPE : Hiccup mode, recovers automatically after fault condition is removed。

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	DC OK CONTACT RATINGS	30VDC/1A 30VAC/0.5A RESISTIVE LOAD	I/P:230VAC O/P:FULL LOAD Ta:25℃	TEST : OK

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q5/Q6 Rated : 650V/15A	AC ON/OFF I/P: High-Line +3V =267V 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℃	Q5 Q6 VDS: VDS: (1) 446V (1) 418V (2) 462V (2) 446V (3) 430V (3) 422V (4) 430V (4) 422V (5) 438V (5) 422V (6) 426V (6) 418V (7) 442V (7) 430V
2	P.F.C Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated: 26A/ 600V	AC ON/OFF I/P: High-Line +3V =267V VDS: O/P: (1)Full Load (2)Output Short (3) Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4) Dynamic Load Full Load/	VDS: (1) 434V (2) 438V (3) 438V (4) 430V (5) 434V (6) 426V (7) 418V

			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℃		
3	P.F.C DIODE	D1 Rated: 4A/ 650V	I/P: High-Line +3V =267V 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℃	(1) 417V (2) 433V (3) 421V (4) 425V	
4	Diode Peak Voltage	Q100/Q101 Rated： 76A/ 150V	AC ON/OFF I/P: High-Line +3V =267 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) burst Mode 脫離前 VO=Vnormal O/P: (1) Full Load Ta:25℃	Q100： VO=Vomax VDS: (1) 123.5V (2) 123.9V (3) 124.7V (4) 123.9V (5) 123.9V (6) 124.7V (7) 123.9V (8) 122.3V (9) 121.5V VO=Vnormal (1) 114.3V	Q101： VO=Vomax VDS: (1) 126.3V (2) 126.3V (3) 127.1V (4) 127.1V (5) 127.1V (6) 133.6V (7) 125.2V (8) 126.0V (9) 126.0V VO=Vnormal (1) 117.5V
5	Input Capacitor Voltage	C5 Rated: 100μ/ 450V	I/P: High-Line +3V =267V 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℃	(1) 422V (2) 414V (3) 430V (4) 418V	
6	Control IC Voltage Test	PFC /PWM IC U1 Rated： 12.5V~ 27.9V O/P IC U101 Rated:	AC ON/OFF I/P: High-Line +3V =267 V O/P: (1) FULL LOAD (2) Output Short (3) O.L.P (4) O.V.P.	U1 (1) 19.1V (2) 19.1V (3) 19.1V (4) 19.1V (5) 14.1V	U100/U102 (1) 13.6V (2) 13.6V (3) 13.6V (4) 13.6V (5) 13.5V

		4.75V~38V IC U100/U102 Rated : 3V~30V	(5) NO LOAD VRmin (LOW LINE) Ta:25℃	U101 (1) 13.6V (2) 19.1V (3) 13.6V (4) 13.5V (5) 13.5V	

■ SAFETY& E.M.C. TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 4 K VAC/min I/P-FG : 2 K VAC/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: 4.14 mA I/P-FG: 3.46 mA O/P-FG: 7.46 mA O/P-DC OK: 0.007 mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P: 500 VDC>100MΩ O/P-FG: 500 VDC>100MΩ I/P-FG: 500 VDC >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: 50 GΩ O/P-FG: 50 GΩ NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25℃	2mΩ

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：8KV / Contact：4KV	I/P： 230 VAC/50HZ O/P：FULL LOAD Ta：25℃	CRITERIA A

5	E.F.T	BS EN/EN61000-4-4 INDUSTRY INPUT：2KV	I/P： 230 VAC/50HZ O/P：FULL LOAD Ta：25℃	CRITERIA A
6	SURGE	BS EN/EN61000-4-5 INDUSTRY Line-Line：2KV Line-Line-Chassis：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

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	TEMPERATURE RISE TEST	MODEL：XDR-240E-48 1. ROOM AMBIENT BURN-IN： 2 HRS I/P： 230VAC O/P： FULL LOAD Ta= 25.2 ℃ 2. HIGH AMBIENT BURN-IN： 2 HRS I/P： 230VAC O/P： FULL LOAD Ta= 50.3 ℃		

NO	Position	ROOM AMBIENT Ta= 25.2℃	HIGH AMBIENT Ta= 50.3 ℃
1	RY1	39.7℃	65.8℃
2	R10	41.1℃	67.1℃
3	RTH1	40℃	66.1℃
4	L2	41℃	66.8℃
5	Q1	44.1℃	70.1℃
6	C6	43.6℃	69.1℃
7	C5	43.2℃	68.7℃
8	RTH2	45.9℃	70.9℃
9	C49	44℃	69.6℃
10	T1 Coil	57.2℃	82.2℃
11	T1 Core	51.2℃	76.2℃
12	C26	46.6℃	71.7℃
13	C114	46.6℃	72.1℃
14	C105	45.5℃	70.8℃
15	C108	46.5℃	71.8℃
16	C107	44.1℃	69.6℃
17	C110	40.7℃	66.1℃
18	RY2	48.6℃	73.2℃
19	ZNR1	38℃	64.1℃
20	LF2	40.8℃	67℃

		<table><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta= 25.2℃</th><th>HIGH AMBIENT Ta= 50.3 ℃</th></tr><tr><td>21</td><td>LF1</td><td>40.8℃</td><td>66.7℃</td></tr><tr><td>22</td><td>C1</td><td>44.7℃</td><td>70.2℃</td></tr><tr><td>23</td><td>LF100</td><td>42.9℃</td><td>68.3℃</td></tr><tr><td>24</td><td>U4</td><td>44.6℃</td><td>69.8℃</td></tr><tr><td>25</td><td>BD1</td><td>51.9℃</td><td>77℃</td></tr><tr><td>26</td><td>BD2</td><td>50.8℃</td><td>76℃</td></tr><tr><td>27</td><td>U1</td><td>52.2℃</td><td>77.7℃</td></tr><tr><td>28</td><td>Q6</td><td>46.6℃</td><td>72.9℃</td></tr><tr><td>29</td><td>U101</td><td>50℃</td><td>75.3℃</td></tr><tr><td>30</td><td>Q101</td><td>48.5℃</td><td>74.3℃</td></tr><tr><td>31</td><td>Q100</td><td>47.9℃</td><td>73.5℃</td></tr><tr><td>32</td><td>D1</td><td>53.6℃</td><td>79.6℃</td></tr><tr><td>33</td><td>U100</td><td>45.9℃</td><td>71.1℃</td></tr></table>		
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P： 230 VAC O/P： 120.4 % LOAD Ta：25℃	TEST：OK
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P： 264VAC/100VAC O/P： 100% LOAD Ta= -30 ℃	TEST：OK
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50 ℃/95 %R.H NO DAMAGE	I/P： 272 VAC O/P：FULL LOAD Ta= 50 ℃ HUMIDITY= 95 %R.H	TEST：OK
5	TEMPERATURE COEFFICIENT	± 0.03 %/℃(0~50℃)	I/P： 230 VAC O/P：FULL LOAD	± 0.008 %/℃(0~50℃)
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	-30~50℃	1. Thermal shock Temperature： -35℃~ +55℃ 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= 50 ℃ LIFE TIME (3) I/P： 230VAC O/P：75% LOAD Ta= 50 ℃ LIFE TIME (4) I/P： 230VAC O/P：50% LOAD Ta= 50 ℃ LIFE TIME	 (1) 429883.3 HRS (2) 74947.1 HRS (3) 99349 HRS (4) 127041.6 HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 1723.2K hrs min. Telcordia SR-332 (Bellcore) ; 324.4K hrs min. MIL-HDBK-217F (25℃)	
11	Ongoing Reliability Test	I/P：230VAC O/P：FULL LOAD TA=50℃ Demonstration Mean Time Between Failure : 30,000 hours	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	YUWEI	LIUTT	WANGD

2020.10.1 TAG-QA-009