Test Report: XDR-240E-12

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

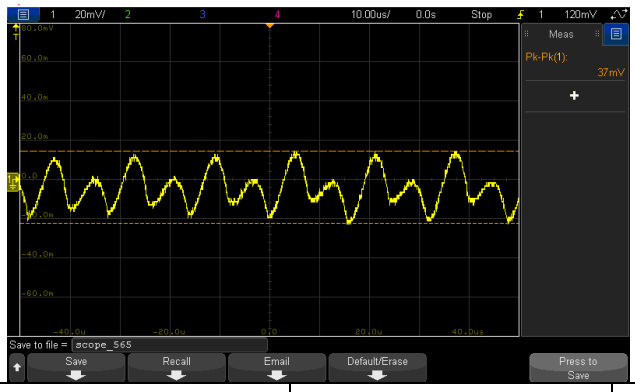
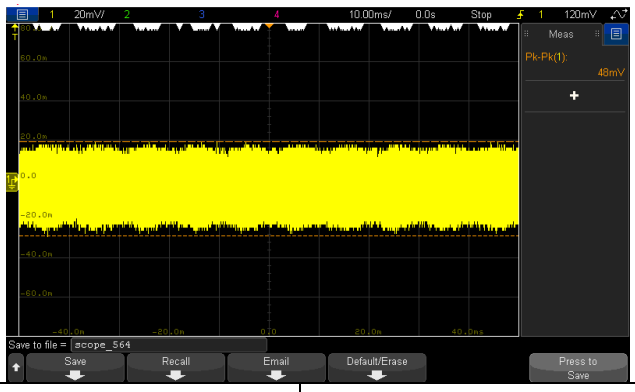
Safety Test
E.M.C. Test

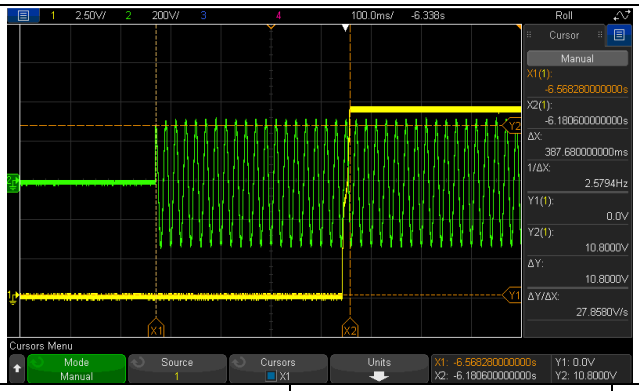
■ RELIABILITY TEST

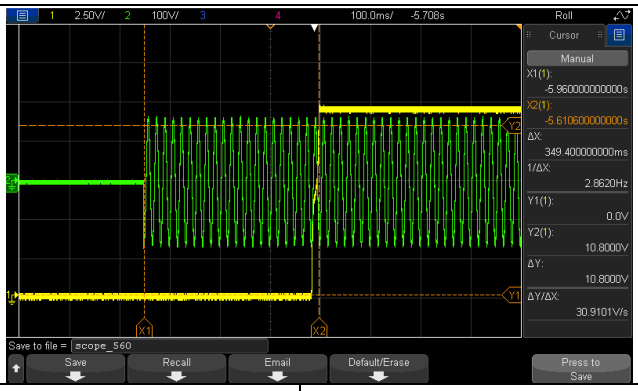
ENVIRONMENT TEST

■ DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

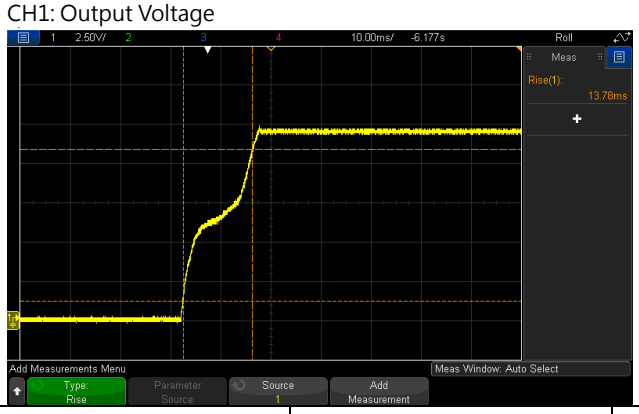
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 12V~15V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25℃	11.297V~15.372V/230VAC 11.296V~15.369V/115VAC
2	OUTPUT VOLTAGE TOLERANCE	V1: -2% ~ +2%	I/P: 85VAC~ 264VAC O/P:FULL~ MIN. LOAD Ta:25℃	V1: -0.441 % ~ 0.425%
3	LINE REGULATION	V1: -0.5% ~ +0.5%	I/P: 85VAC~ 264VAC O/P:FULL LOAD Ta:25℃	V1: 0.0% ~0.126 %
4	LOAD REGULATION	V1: -1% ~ +1%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25℃	V1: -0.441 % ~ 0.425%
5	OVER/UNDERSHOOT TEST	<±5%	I/P: 230VAC O/P:FULL LOAD / NO LOAD Ta:25℃	2.1%
6	RIPPLE & NOISE (Max)	V1: 100mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25℃	V1: 37mVp-p / high frequency 48mVp-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/ 387.68ms 115VAC/ 349.4ms
	INPUT=230VAC/50HZ @ FULL LOAD CH1: Output Voltage CH3: AC Input Voltage		INPUT=115VAC/60HZ @ FULL LOAD CH1: Output Voltage CH3: AC Input Voltage	



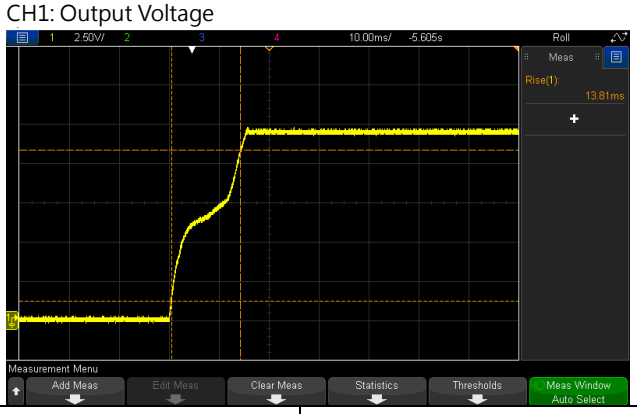


8	RISE TIME (Max)	230VAC/60ms 115VAC/150ms	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	230VAC/ 13.78ms 115VAC/ 13.81ms

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

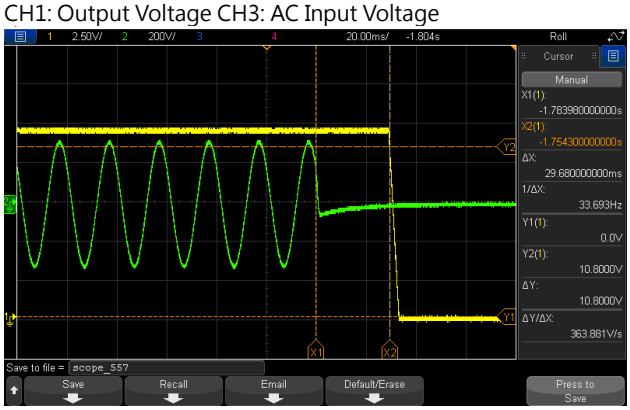


INPUT=115VAC/60HZ @ FULL LOAD
CH1: Output Voltage

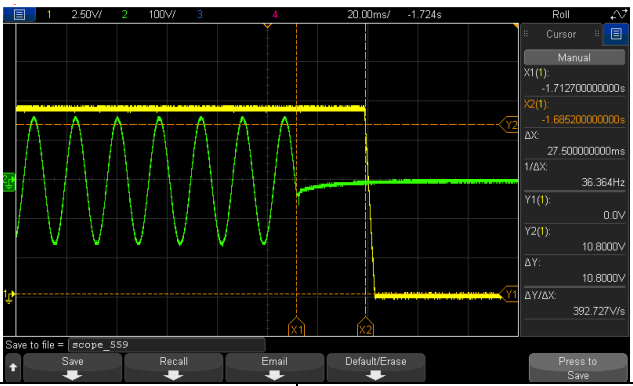


9	HOLD UP TIME (Typ.)	230VAC/ 20ms 115VAC/ 20ms	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	230VAC/ 29.68ms 115VAC/ 27.5ms

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

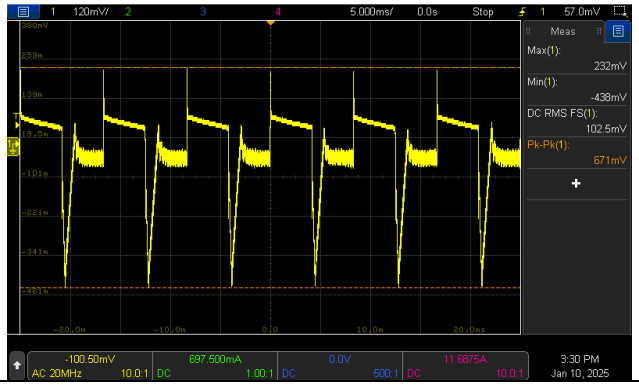


INPUT=115VAC/60HZ @ FULL LOAD
CH1: Output Voltage CH3: AC Input Voltage

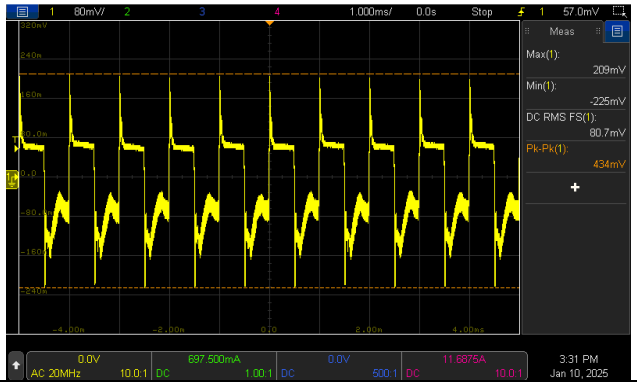


10	DYNAMIC LOAD	V1: 1200mVp-p	I/P: 230VAC O/P: (1) FULL/ MIN LOAD 50%DUTY / 120HZ (2) FULL/ MIN LOAD 50%DUTY / 1KHZ Ta:25℃	671 mVp-p 434 mVp-p

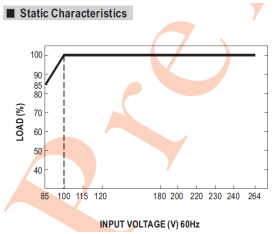
FULL / MIN LOAD 50%DUTY / 120HZ

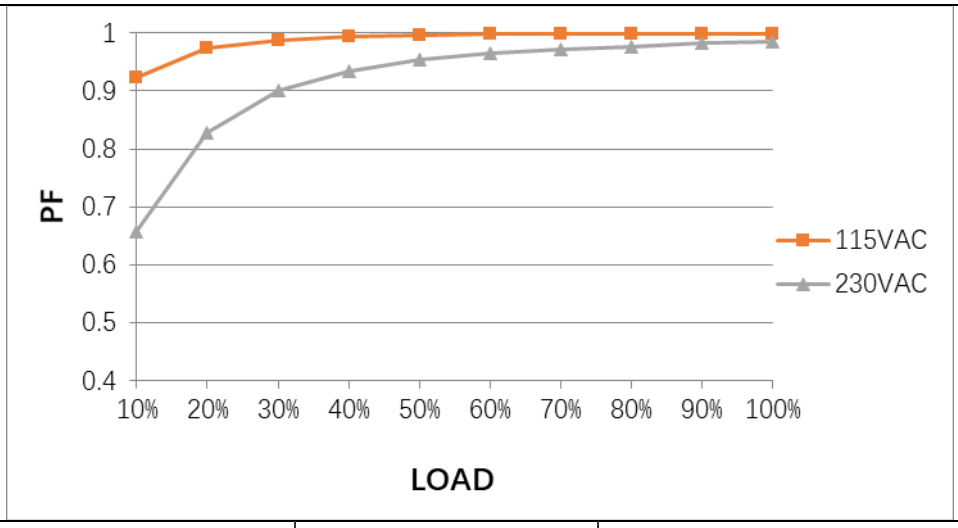


FULL / MIN LOAD 50%DUTY / 1KHZ



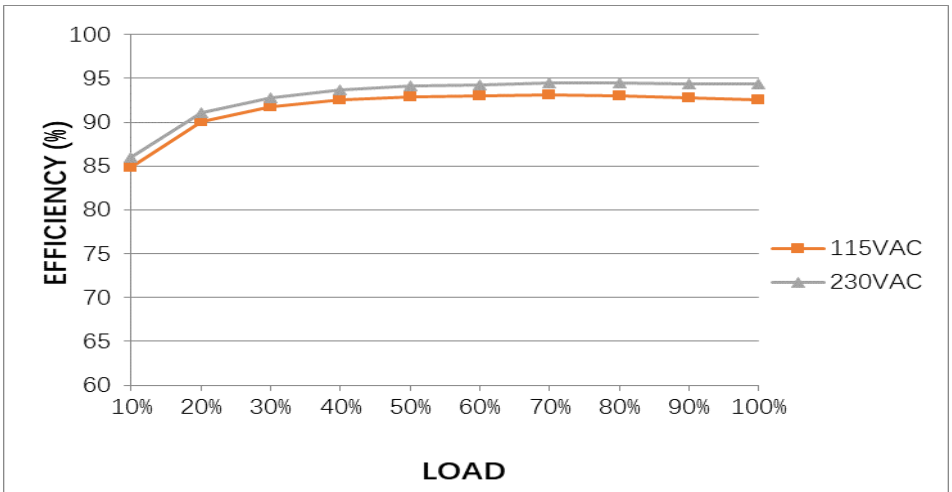
INPUT FUNCTION TEST

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) 74.8V~264V/ FULL LOAD 74.4V~264V/ 85% LOAD (2) 104.8Vdc~370Vdc/FULL LOAD 104.7Vdc~370Vdc/85% LOAD (3) 104.7Vdc~370Vdc/FULL LOAD 104.6Vdc~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)	TEST：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 =1.117A/ 230VAC I =2.250A/ 115VAC
4	LEAKAGE CURRENT	< 1mA / 240 VAC	I/P： 240 VAC/60HZ O/P：Min LOAD Ta：25℃	0.5148mA
5	NO LOAD CONSUMPTION	< 1W	I/P：230VAC I/P：115VAC O/P：NO LOAD Ta：25℃	0.89611W/ 230VAC 0.72761W/ 115VAC
6	POWER FACTOR (Typ.)	0.95/ 230VAC 0.98/115VAC	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	PF=0.9852/230VAC PF=0.9986/115VAC
	P.F vs LOAD			



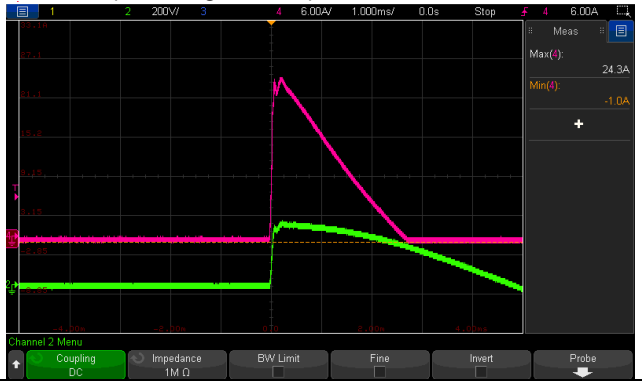
7	EFFICIENCY(Typ.)	94%	I/P:230 VAC O/P:FULL LOAD Ta:25℃	94.17%

EFFICIENCY vs LOAD

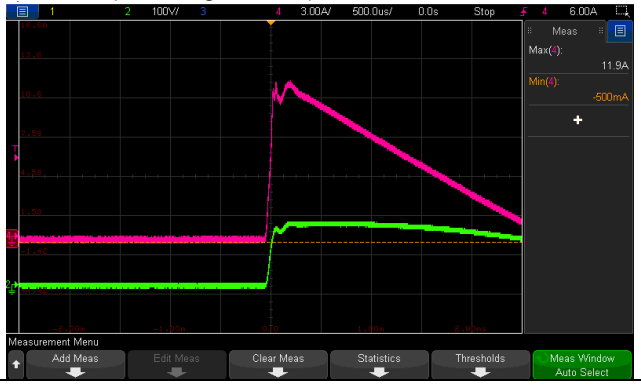


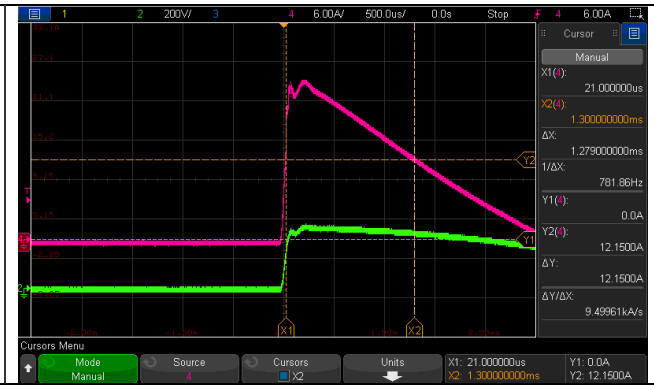
8	INRUSH CURRENT(Typ.)	230V/30A 115V/15A COLD START	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	I =24.3A/ 230VAC I =11.9A/ 115VAC T50= 1279us/230V

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℃	122%/ 264VAC 122.15%/ 230VAC 121.95%/ 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. 18V Protection type: Hiccup mode, recovers automatically after fault condition is removed	I/P: 264VAC I/P: 85VAC O/P:MIN LOAD Ta:25℃	16.4V/ 264VAC 16.3V/ 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 goes down	I/P: 264VAC 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: 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 VDS: (1) 430V (2) 446V (3) 430V (4) 426V (5) 438V (6) 434V (7) 438V Q6 VDS: (1) 422V (2) 434V (3) 414V (4) 418V (5) 418V (6) 418V (7) 426V
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/ 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℃	VDS: (1) 442V (2) 426V (3) 430V (4) 442V (5) 434V (6) 426V (7) 414V
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	(1) 414V (2) 418V (3) 414V (4) 414V

			(4) Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz Ta:25℃		
4	Diode Peak Voltage	Q100/Q101 Rated： 130A/ 60V	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) 35.6V (2) 35.6V (3) 36.0V (4) 35.6V (5) 35.6V (6) 35.6V (7) 35.6V (8) 35.2V (9) 35.6V VO=Vnormal (1) 30.4V	Q101： VO=Vomax VDS: (1) 33.6V (2) 33.2V (3) 34.0V (4) 34.0V (5) 34.0V (6) 34.0V (7) 33.2V (8) 33.2V (9) 32.8V VO=Vnormal (1) 29.2V
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) 418V (2) 414V (3) 430V (4) 414V	
6	Control IC Voltage Test	PFC /PWM IC U1 Rated： 12.5V~ 27.9V O/P IC U101 Rated： 8V~24V IC U100/U102 Rated： 3V~30V	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. (5) NO LOAD VRmin (LOW LINE) Ta:25℃	U1 (1) 19.0V (2) 19.0V (3) 19.0V (4) 19.0V (5) 19.0V U100/U102 (1) 14.2V (2) 13.7V (3) 13.7V (4) 13.7V (5) 13.6V	U101 (1) 13.7V (2) 14.4V (3) 13.7V (4) 13.7V (5) 13.6V

■ 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: 3.49 mA O/P-FG: 7.49 mA O/P-DC OK: 0.005 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 MΩ O/P-FG: 50 GΩ NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25℃	3mΩ

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

<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-240E-12
1. ROOM AMBIENT BURN-IN： 2 HRS
I/P： 230VAC O/P： FULL LOAD Ta= 25 ℃
2. HIGH AMBIENT BURN-IN： 2 HRS
I/P： 230VAC O/P： FULL LOAD Ta= 50.0 ℃</td></tr>
</table>

NO	Position	ROOM AMBIENT Ta= 25 ℃	HIGH AMBIENT Ta= 50 ℃
1	RY1	41.6℃	69.2℃
2	RTH1	40.7℃	68.3℃
3	R10	41.1℃	68.6℃
4	L2	40.5℃	68.3℃
5	C10	44.8℃	72.2℃
6	L1	51.2℃	77.9℃
7	RTH2	49.3℃	76℃
8	C6	47℃	73.8℃
9	C5	47.7℃	74.3℃
10	Q1	46.7℃	73.6℃
11	T1 Coil	64℃	91.1℃
12	T1 Core	50.7℃	77.3℃
13	C26	50.6℃	77℃
14	C49	46.7℃	74℃
15	C106	58℃	85.5℃
16	C105	56.8℃	84.1℃
17	D20	48.4℃	75.4℃
18	C114	52.6℃	79.6℃
19	C110	62℃	89.3℃
20	BD1	50.4℃	77.7℃
21	BD2	50.3℃	77℃
22	D1	54.2℃	81.6℃
23	R6	47.3℃	73.8℃
24	U1	55.9℃	82.6℃
25	Q5	47.5℃	74.7℃
26	U4	49.9℃	76.4℃
27	Q6	49℃	75.9℃
28	U100	54.1℃	80.6℃
29	D9	53.5℃	79.4℃
30	Q101	59.1℃	86.4℃
31	J100	64.2℃	91℃
32	Q100	58.9℃	85.6℃
33	U101	66℃	93℃

		<table><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta= 25 ℃</th><th>HIGH AMBIENT Ta= 50 ℃</th></tr><tr><td>34</td><td>Q108</td><td>72.9℃</td><td>93.5℃</td></tr><tr><td>35</td><td>ZNR1</td><td>39.4℃</td><td>66.8℃</td></tr><tr><td>36</td><td>LF1</td><td>42℃</td><td>69.4℃</td></tr><tr><td>37</td><td>C1</td><td>42.5℃</td><td>69.8℃</td></tr><tr><td>38</td><td>LF2</td><td>46.7℃</td><td>73.9℃</td></tr><tr><td>39</td><td>LF100</td><td>75.6℃</td><td>103.7℃</td></tr><tr><td>40</td><td>Q3</td><td>63.1℃</td><td>88.5℃</td></tr><tr><td>41</td><td>D108</td><td>58℃</td><td>84.4℃</td></tr><tr><td>42</td><td>R100</td><td>59.3℃</td><td>84.9℃</td></tr><tr><td>43</td><td>RY2</td><td>60.2℃</td><td>88.2℃</td></tr></table>		
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： 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	± 0.014 %/℃(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) 373437.8 HRS (2) 55511.9 HRS (3) 111118.5 HRS (4) 190148.8 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	WANGZD

2020.10.1 TAG-QA-009