Test Report: XDR-240E-24

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

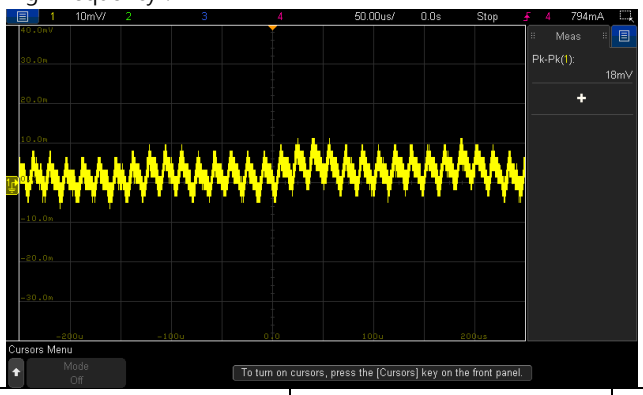
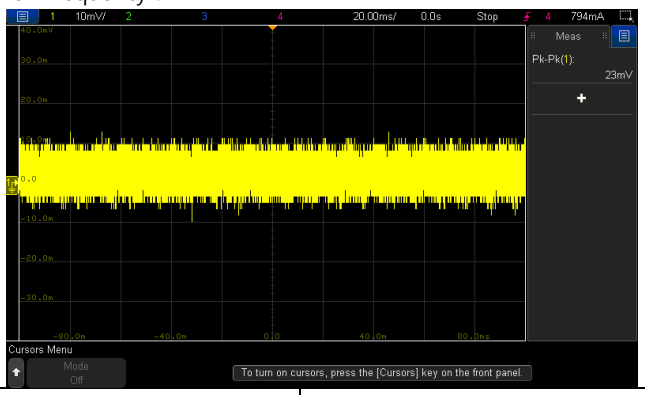
Safety Test
E.M.C. Test

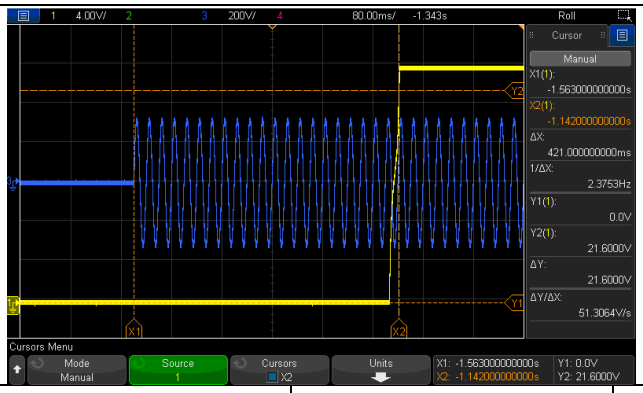
■ RELIABILITY TEST

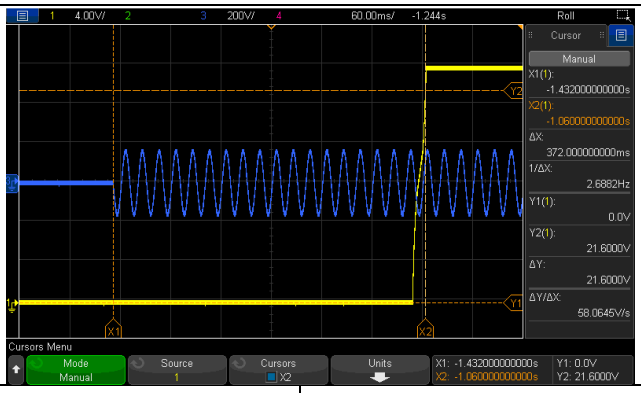
ENVIRONMENT TEST

■ DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

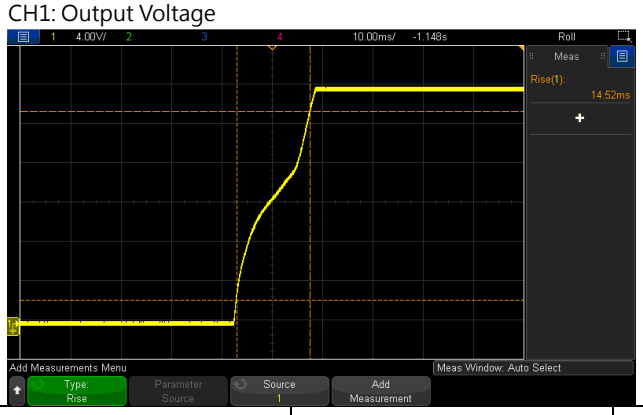
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 24V~29V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25℃	23.318V~29.739V/230VAC 23.318V~29.739V/115VAC
2	OUTPUT VOLTAGE TOLERANCE	V1: -1% ~ +1%	I/P: 85VAC~ 264VAC O/P:FULL~ MIN. LOAD Ta:25℃	V1: -0.10% ~0.11%
3	LINE REGULATION	V1: -0.5% ~ +0.5%	I/P: 85VAC~264VAC O/P:FULL LOAD Ta:25℃	V1: 0% ~ 0.0%
4	LOAD REGULATION	V1: -1% ~ +1%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25℃	V1: -0.10% ~0.11%
5	OVER/UNDERSHOOT TEST	<±5%	I/P: 230VAC O/P:FULL LOAD / NO LOAD Ta:25℃	0.83% →NO LOAD
6	RIPPLE & NOISE (Max)	V1: 100mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25℃	18mVp-p / high frequency 23mVp-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/ 421ms 115VAC/ 372ms
	INPUT=230VAC/50HZ @ FULL LOAD CH1: Output Voltage CH3: AC Input Voltage		INPUT=115VAC/60HZ @ FULL LOAD CH1: Output Voltage CH3: AC Input Voltage	



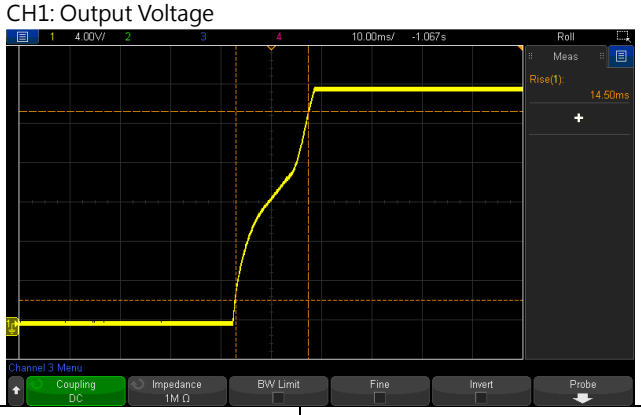


8	RISE TIME (Max)	230VAC/60ms 115VAC/150ms	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	230VAC/ 14.52ms 115VAC/ 14.50ms

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

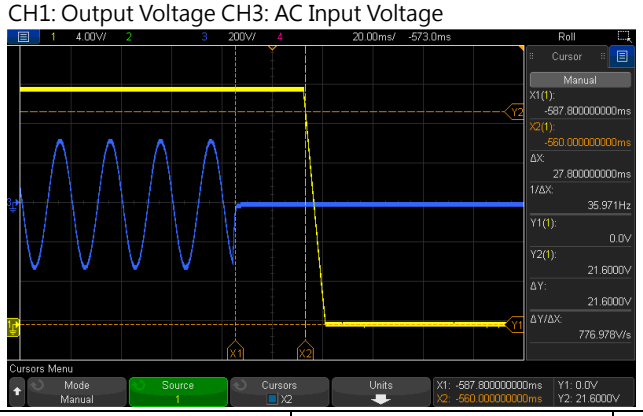


INPUT=115VAC/60HZ @ FULL LOAD
CH1: Output Voltage

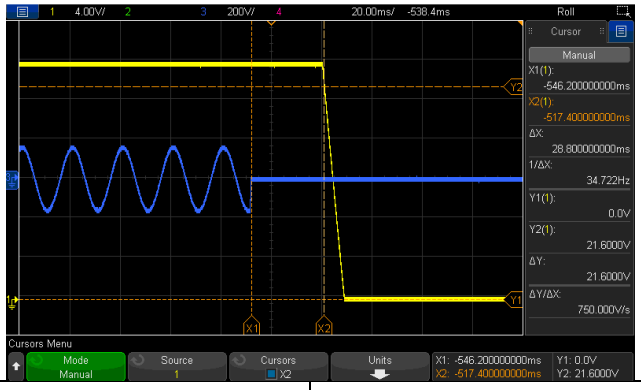


9	HOLD UP TIME(Typ.)	230VAC/20ms 115VAC/20ms	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	230VAC/27.8ms 115VAC/28.8ms

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

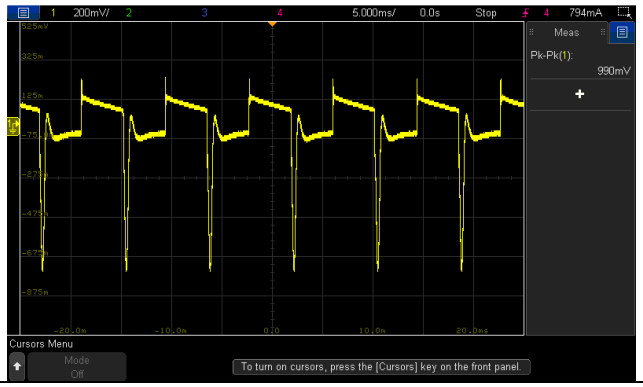


INPUT=115VAC/60HZ @ FULL LOAD
CH1: Output Voltage CH3: AC Input Voltage

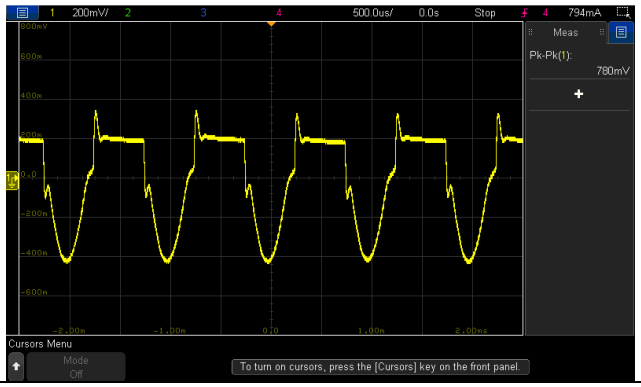


10	DYNAMIC LOAD	V1: 2400mVp-p	I/P: 230VAC O/P: (1) FULL/ MIN LOAD 50%DUTY / 120HZ (2) FULL/ MIN LOAD 50%DUTY / 1KHZ Ta:25℃	990mVp-p 780mVp-p

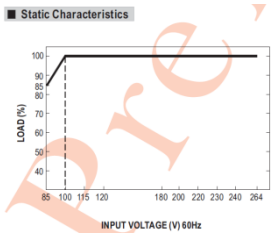
FULL / MIN LOAD 50%DUTY/120HZ

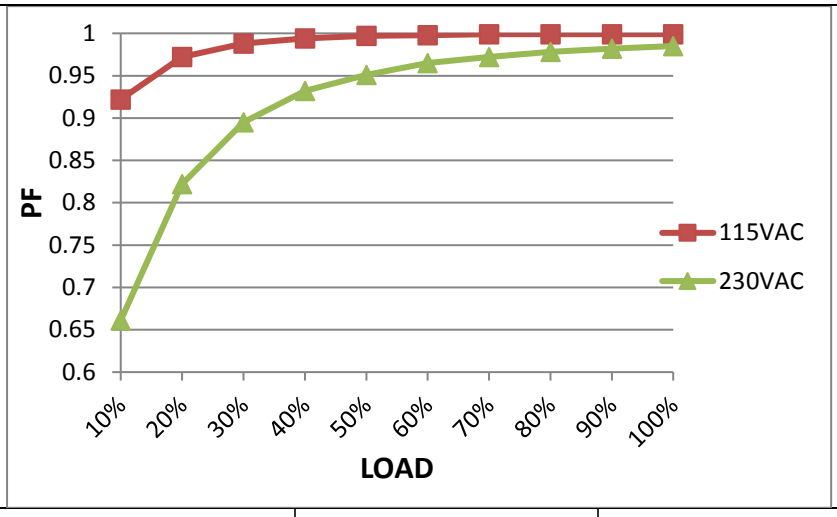


FULL / MIN LOAD 50%DUTY/ 1KHZ



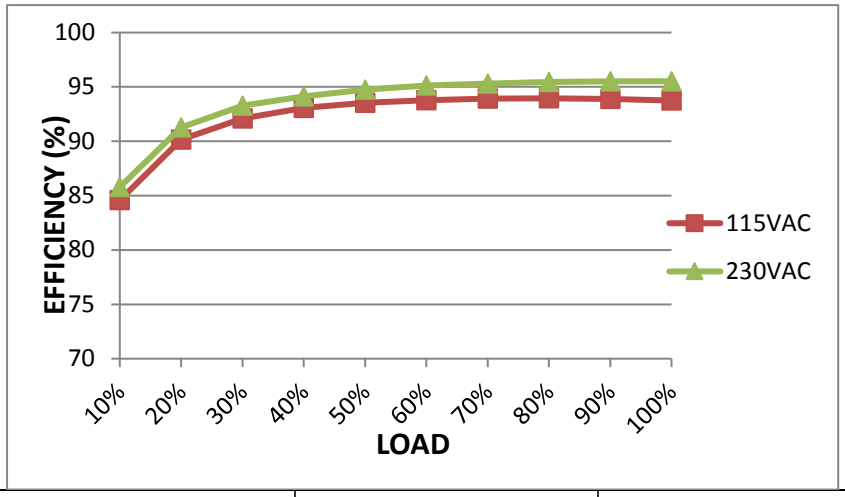
INPUT FUNCTION TEST

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) 75.0V~264V/ FULL LOAD 75.0V~264V/ 85% LOAD (2) 105.5Vdc~370Vdc/FULL LOAD 105.2Vdc~370Vdc/85% LOAD (3) 105.5Vdc~370Vdc/FULL LOAD 105.3Vdc~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 =1.11A/ 230VAC I =2.24A/ 115VAC
4	LEAKAGE CURRENT	<1mA / 240 VAC	I/P： 240 VAC/60HZ O/P：Min LOAD Ta：25℃	0.485mA
5	NO LOAD CONSUMPTION	<1W	I/P：230VAC I/P：115VAC O/P：NO LOAD Ta：25℃	0.755W/ 230VAC 0.524W/ 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=0.9863/230VAC PF=0.9981/115VAC
	P.F vs LOAD			



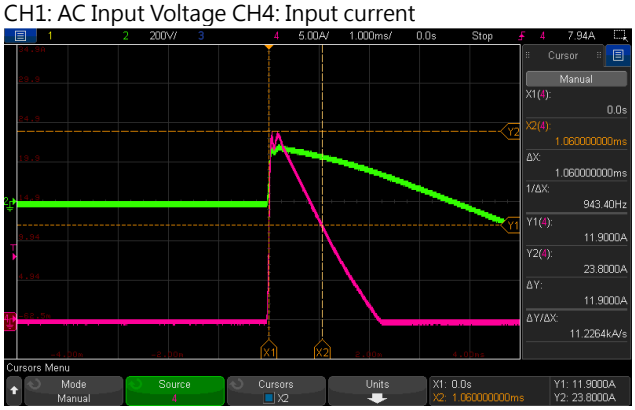
7	EFFICIENCY(Typ.)	95.2%	I/P:230 VAC O/P:FULL LOAD Ta:25℃	95.5%

EFFICIENCY vs LOAD

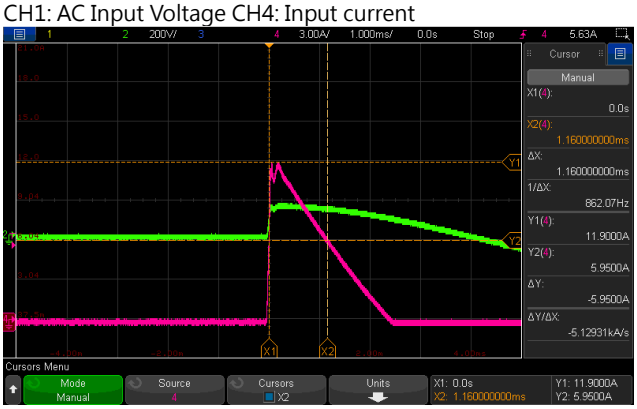


8	INRUSH CURRENT(Typ.)	230V/30A 115V/15A COLD START	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	I =23.8A/ 230VAC I =11.9A/ 115VAC T50=1060 us/230V

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 LOADPROTECTION	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℃	123. 6%/ 264VAC 123.6%/ 230VAC 123.6%/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. 35V Protection type: Hiccup mode, recovers automatically after fault condition is removed	I/P: 264VAC I/P:85VAC O/P:MIN LOAD Ta:25℃	32.6V/264VAC 32.6V/ 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 goes down	I/P: 264VAC I/P: 85VAC O/P:FULL LOAD	O.T.P. Active 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 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 : 15A/650V	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) 454V (3) 430V (4) 430V (5) 434V (6) 430V (7) 438V	Q6 VDS: (1) 422V (2) 442V (3) 422V (4) 426V (5) 426V (6) 422V (7) 440V
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) 434V (3) 438V (4) 438V (5) 434V (6) 446V (7) 418V	
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) 421V (2) 425V (3) 425V (4) 421V	
4	Diode PeakVoltage	Q100/Q101 : Rated : 64A/ 80V	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/	Q100 : V Vo=Vomax VDS: (1) 64.2V (2) 64.2V (3) 64.7V	Q101 : Vo=Vomax VDS: (1) 64.2V (2) 64.7V (3) 64.7V

			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 Vo=Vnormal O/P: (1) Full Load Ta:25℃	(4) 64.2V (5) 64.2V (6) 65.2V (7) 63.3V (8) 63.3V (9) 63.7V Vo=Vnormal (1) 56.0V	(4) 64.2V (5) 64.2V (6) 64.7V (7) 64.7V (8) 64.7V (9) 64.2V Vo=Vnorma (1) 55.0V
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)418V (3)430V (4)418V	
6	Control IC Voltage Test	PFC /PWM IC U1: Rated：10.4V~ 27.9V O/P IC U101： Rated：4.75V~38V	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) 19.3V (2) 19.3V (3) 19.3V (4) 19.3V (5) 19.1V	U100 (1) 13.7V (2) 13.7V (3) 13.7V (4) 13.7V (5) 13.7V

■ SAFETY& E.M.C. TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTANDVOLTAGE	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: 0.5KVAC/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: 3.49 mA I/P-FG: 2.86 mA O/P-FG: 6.05 m A O/P-DC OK: 0.004m A NO DAMAGE
2	ISOLATIONRESISTANCE	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	GROUNDINGCONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25℃	4 mΩ

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 □FAIL
2	CONDUCTION	BS EN/EN55032 (CISPR32) / BS EN/EN61204-3 / CNS15936 CLASS B	I/P： 230 VAC (50HZ)/115 VAC (60HZ) O/P：FULL/50% LOAD/10% 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)/115 VAC (60HZ) O/P：FULL/50% LOAD/10% LOAD Ta：25℃	PASS Test by certified Lab
4	E.S.D	BS EN/EN61000-4-2 AIR：8KV / Contact：4KV	I/P： 230 VAC/50HZ O/P：FULL LOAD Ta：25℃	■CRITERIA A □CRITERIA B
5	E.F.T	BS EN/EN61000-4-4 INPUT： 2KV	I/P： 230 VAC/50HZ O/P：FULL LOAD Ta：25℃	■CRITERIA A □CRITERIA B
6	SURGE	BS EN/EN61000-4-5 2KV/Line-Line 4KV/Line-Line-Chassis	I/P： 230 VAC/50HZ O/P：MIN/FULL LOAD D Ta：25℃	■CRITERIA A □CRITERIA B
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-24 1. ROOM AMBIENT BURN-IN： 2HRS I/P： 230VAC O/P： FULL LOAD Ta= 29.3 ℃ 2. HIGH AMBIENT BURN-IN： 2HRS I/P： 230VAC O/P： FULL LOAD Ta= 50.2℃		

NO	Position	ROOM AMBIENTTa= 29.3 ℃	HIGH AMBIENT Ta= 50.2 ℃
1	C108	57.2℃	78.8℃
2	RY1	49.6℃	71.0℃
3	RTH1	50.3℃	71.9℃
4	R10	50.3℃	71.9℃
5	L2	50.3℃	71.9℃

NO	Position	ROOM AMBIENTTa= 29.3 ℃	HIGH AMBIENT Ta= 50.2 ℃
6	C10	52.6℃	74.1℃
7	L1	58.3℃	79.2℃
8	RTH2	55.6℃	76.7℃
9	C6	55.6℃	76.7℃
10	C5	54.9℃	76.0℃
11	Q1	52.8℃	74.3℃
12	ZNR1	44.1℃	66.0℃
13	LF1	47.8℃	69.8℃
14	C1	47.3℃	69.5℃
15	LF2	53.1℃	74.9℃
16	LF100	61.3℃	83.1℃
17	Q104	66.1℃	88.2℃
18	J100	66.8℃	88.0℃
19	Q102	66.4℃	88.1℃
20	U101	67.0℃	88.3℃
21	Q108	73.6℃	93.9℃
22	T1coil	60.8℃	82.0℃
23	T1core	69.7℃	91.1℃
25	C26	55.3℃	76.5℃
26	C49	55.4℃	76.5℃
27	C106	60.9℃	82.4℃
28	C105	59.9℃	81.6℃
29	D20	57.6℃	78.9℃
30	RY10	61.6℃	82.5℃
31	C114	57.3℃	79.0℃
32	Q5	54.4℃	76.3℃
33	U4	54.7℃	75.8℃
34	Q6	55.6℃	77.3℃
35	U100	56.7℃	77.8℃
36	D9	56.1℃	77.0℃
37	BD1	58.3℃	79.1℃
38	BD2	58.1℃	79.4℃
39	D1	62.2℃	83.4℃
40	R6	54.3℃	75.9℃
41	U1	61.6℃	83.3℃
42	R100	63.8℃	85.1℃
43	D108	64.6℃	85.3℃
44	Q3	64.4℃	84.8℃

2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 123%LOAD Ta : 25℃	TEST : OK

3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 264VAC/100VAC O/P : 100 %LOAD@-30 ℃ 80%LOAD@-40 ℃	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	0.012%/℃(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	-40~50℃	1. Thermal shock Temperature : -45℃~ +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 C06 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) 398331.1HRS (2) 67547.2HRS (3) 119426.8HRS (4) 188650HRS
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