



Test Report: XDR-480E-24

480W 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

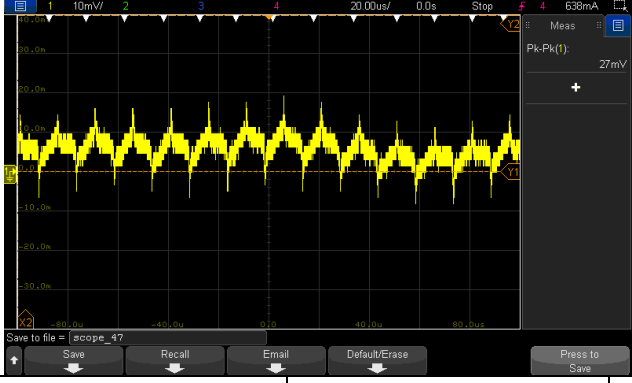
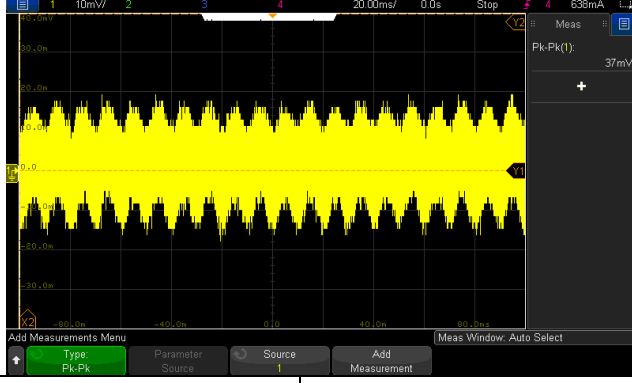
E.M.C. Test

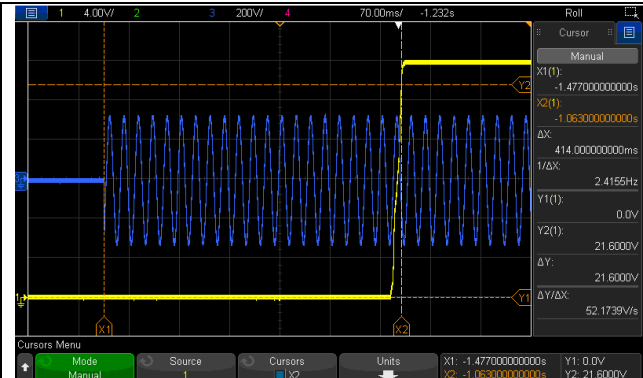
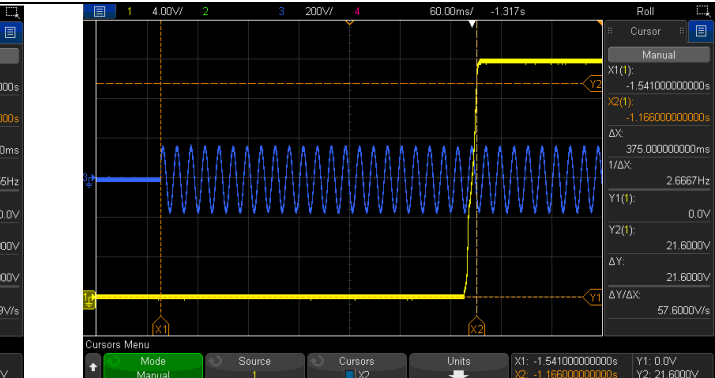
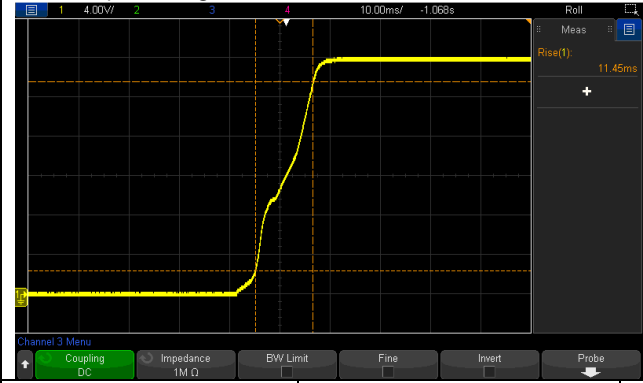
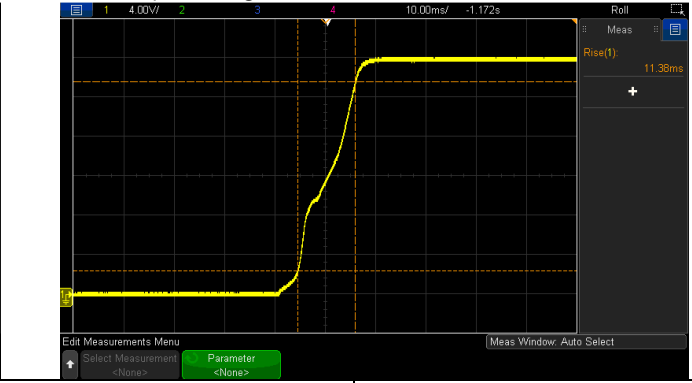
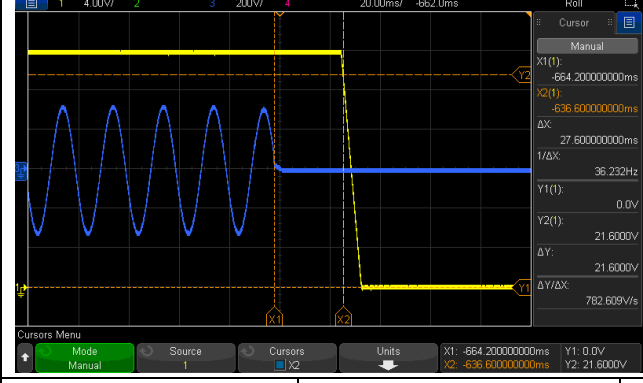
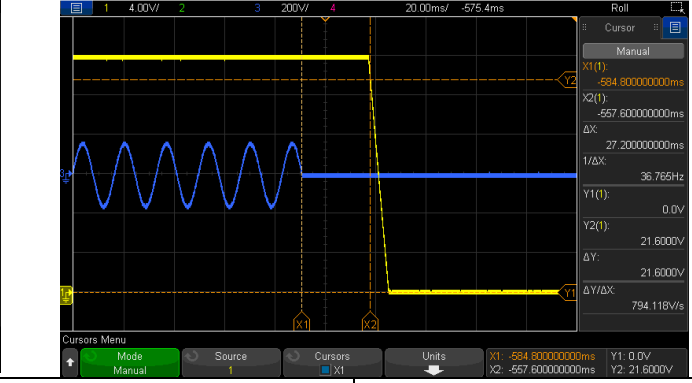
■ RELIABILITY TEST

ENVIRONMENT TEST

■ DESIGN VERIFY TEST

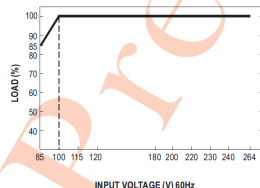
OUTPUT FUNCTION TEST

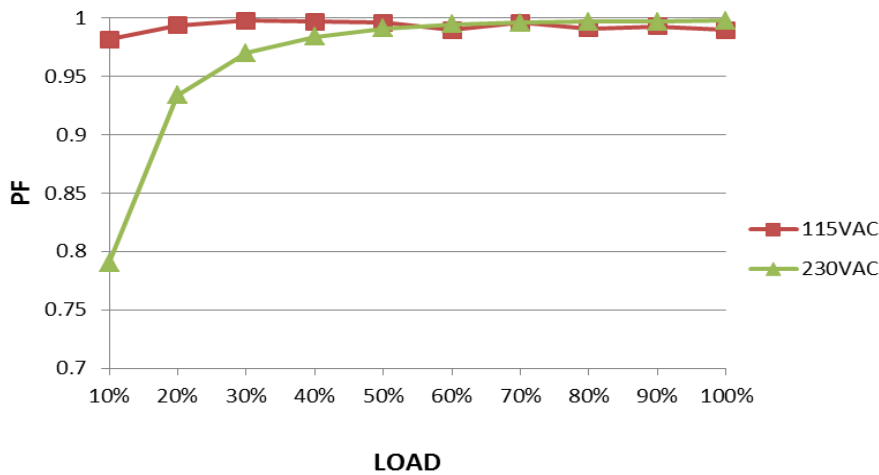
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 24V~29V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	23.113V~29.855V/230VAC 23.113V~29.855V/115VAC
2	OUTPUT VOLTAGE TOLERANCE	V1: -1.0% ~ +1.0%	I/P: 85VAC~ 264VAC O/P:FULL~ MIN. LOAD Ta:25°C	V1: -0.12 % ~0.10 %
3	LINE REGULATION	V1: -0.5% ~ +0.5%	I/P: 85VAC~ 264VAC O/P:FULL LOAD Ta:25°C	V1: -0.02% ~0.01 %
4	LOAD REGULATION	V1: -1.0% ~ +1.0%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: -0.12 % ~0.10 %
5	OVER/UNDERSHOOT TEST	<±5%	I/P: 230VAC O/P:FULL LOAD / NO LOAD Ta:25°C	1.33%
6	RIPPLE & NOISE (Max)	V1: 120mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25°C	V1: 27mVp-p / high frequency 37mVp-p / low frequency
high frequency :  low frequency : 				
7	SET UP TIME(Max)	230VAC/1500ms 115VAC/3000ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 414ms 115VAC/ 375ms
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/150ms 115VAC/150ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C
	INPUT=230VAC/50HZ @ FULL LOAD CH1: Output Voltage 	INPUT=115VAC/60HZ @ FULL LOAD CH1: Output Voltage 
9	HOLD UP TIME (Typ.) 230VAC/ 15ms 115VAC/ 15ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C
	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°C



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°C 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)	(1) 74.0V~264V/ FULL LOAD 74.0V~264V/ 85% LOAD (2) 111Vdc~370Vdc/FULL LOAD 108Vdc~370Vdc/85% LOAD (3) 111Vdc~370Vdc/FULL LOAD 108Vdc~370Vdc/85% LOAD TEST : OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P:85VAC ~264 VAC O/P:FULL~MIN LOAD Ta:25°C	TEST : OK
3	INPUT CURRENT (Typ.)	230V/ 3A 115V/ 6A	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I =2.19A/ 230VAC I =4.57A/ 115VAC
4	LEAKAGE CURRENT	< 1mA / 240 VAC	I/P : 240 VAC/60HZ O/P : Min LOAD Ta : 25°C	0.45mA
5	NO LOAD CONSUMPTION	< 1W	I/P : 230VAC I/P : 115VAC O/P : NO LOAD Ta : 25°C	0.719W/ 230VAC 0.686W/ 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°C	PF=0.9977/230VAC PF=0.9903/115VAC
	P.F vs LOAD			



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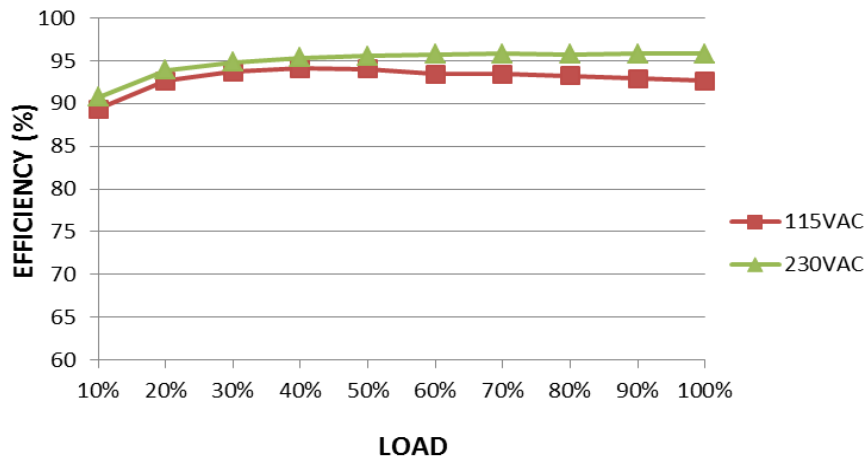
EFFICIENCY(Typ.)

95.5%

I/P:230 VAC
O/P:FULL LOAD
Ta:25°C

95.8%

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°C

I =26.4A/ 230VAC
I =12.8A/ 115VAC
T50= 1200us/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°C	116.4%/ 264VAC 116.4%/ 230VAC 116.4%/ 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. 35V Protection type: Hiccup mode, recovers automatically after fault condition is removed	I/P: 264VAC I/P: 85VAC O/P: MIN LOAD Ta: 25°C	31.9V/ 264VAC 31.9V/ 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°C	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°C	TEST : <u>OK</u>
2	PARALLEL	Up to 1920W (3+1) units	I/P : 230 VAC O/P : TESTING LOAD Ta : 25°C	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	Q5Q6 : Rated: 33A/600 V	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°C	Q5 VDS: (1) 504V (2) 516V (3) 504V (4) 504V (5) 504V (6) 504V (7) 508V	Q6 VDS: (1) 475V (2) 496V (3) 475V (4) 475V (5) 475V (6) 471V (7) 475V
2	P.F.C Transistor (D to S) or (C to E) Peak Voltage	Q1/Q2: Rated: 34A/600 V	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°C	Q1 : VDS: (1) 500V (2) 475V (3) 496V (4) 496V (5) 500V (6) 487V (7) 443V	
3	P.F.C DIODE	D1 : Rated: 6A/ 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°C	(1) 435V (2) 435V (3) 427V (4) 423V	
4	Diode Peak Voltage	Q102/Q104 : Rated : 145A/80V	AC ON/OFF I/P: High-Line +3V =267 V <u>Vo=Vomax</u> O/P: (1)Full Load (2)Output Short (3) Dynamic Load Full Load/	Q102 : <u>VO=Vomax</u> VDS: (1) 64.3V (2) 63.7V (3) 65.4V	Q104 : <u>VO=Vomax</u> VDS: (1) 66.0V (2) 66.0V (3) 66.6V

			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 <u>Vo=Vnormal</u> O/P: (1) Full Load Ta:25°C	(4) 63.7V (5) 63.7V (6) 64.9V (7) 63.7V (8) 63.7V (9) 63.7V <u>Vo=Vnormal</u> (1) 59.2V	(4) 65.4V (5) 65.4V (6) 66.0V (7) 64.3V (8) 63.7V (9) 63.7V <u>Vo=Vnormal</u> (1) 56.4V
5	Input Capacitor Voltage	C5 : Rated : 150u/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°C	(1) 415V (2) 419V (3) 435V (4) 415V	
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°C	U1 (1) 19.1V (2) 19.1V (3) 19.2V (4) 20.7V (5) 11.6V	U101 (1) 11.6V (2) 11.6V (3) 11.6V (4) 11.6V (5) 9.2V

■ 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 K VAC/min O/P-DC OK: 0.5 K VAC/min	I/P-O/P: 4.4 K VAC/min I/P-FG: 2.4 K VAC/min O/P-FG: 1.8 K VAC/min O/P-DC OK: 0.6 K VAC/min Ta:25°C	I/P-O/P: 3.79 mA I/P - F G : 3.04 mA O/P-FG: 6.11 m A O/P-DC OK: 0.006 m A 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°C	I/P-O/P: 50 GΩ I/P - F G : 50 GΩ O/P-FG: 50 GΩ NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25°C	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°C	■ 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°C	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°C	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°C	■ 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°C	■ 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 Ta : 25°C	■ 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-480E-24 1. ROOM AMBIENT BURN-IN : 2HRS I/P : 230VAC O/P : FULL LOAD Ta= 26.6 °C 2. HIGH AMBIENT BURN-IN : 2HRS I/P : 230VAC O/P : FULL LOAD Ta= 50.4 °C <table><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta= 26.6°C</th><th>HIGH AMBIENT Ta= 50.4 °C</th></tr><tr><td>1</td><td>R6</td><td>57.7°C</td><td>81.7°C</td></tr><tr><td>2</td><td>D10</td><td>62.5°C</td><td>86.3°C</td></tr><tr><td>3</td><td>R47</td><td>62.7°C</td><td>87.1°C</td></tr><tr><td>4</td><td>RY100</td><td>59.6°C</td><td>84.0°C</td></tr><tr><td>5</td><td>Q6</td><td>69.0°C</td><td>95.6°C</td></tr></table>			NO	Position	ROOM AMBIENT Ta= 26.6°C	HIGH AMBIENT Ta= 50.4 °C	1	R6	57.7°C	81.7°C	2	D10	62.5°C	86.3°C	3	R47	62.7°C	87.1°C	4	RY100	59.6°C	84.0°C	5	Q6	69.0°C	95.6°C
NO	Position	ROOM AMBIENT Ta= 26.6°C	HIGH AMBIENT Ta= 50.4 °C																									
1	R6	57.7°C	81.7°C																									
2	D10	62.5°C	86.3°C																									
3	R47	62.7°C	87.1°C																									
4	RY100	59.6°C	84.0°C																									
5	Q6	69.0°C	95.6°C																									

NO	Position	ROOM AMBIENT Ta= 26.6°C	HIGH AMBIENT Ta= 50.4 °C
6	U1	69.4°C	92.8°C
7	D2	53.5°C	77.5°C
8	Q5	67.7°C	94.9°C
9	D1	77.5°C	104.2°C
10	U4	54.6°C	78.7°C
11	D14	61.0°C	84.7°C
12	U101	67.7°C	91.8°C
13	Q8	61.5°C	85.2°C
14	U202	63.3°C	87.1°C
15	LF2	55.5°C	79.9°C
16	C1	50.8°C	75.4°C
17	L5	50.4°C	75.1°C
18	LF1	51.7°C	76.5°C
19	ZNR1	48.0°C	73.2°C
20	RY1	49.0°C	73.6°C
21	RTH1	50.4°C	75.1°C
22	Q108	78.4°C	102.1°C
23	R10	47.5°C	72.4°C
24	L2	52.9°C	77.9°C
25	T1core	69.5°C	93.3°C
26	T1coil	57.8°C	81.5°C
27	C26	56.3°C	81.1°C
28	C49	56.5°C	80.8°C
29	C105	64.3°C	89.1°C
30	C107	58.3°C	83.3°C
31	BD1	58.6°C	82.2°C
32	C109	56.3°C	80.4°C
33	LF100	63.0°C	87.7°C
34	U102	57.3°C	81.2°C
35	Q103	66.8°C	91.9°C
36	Q101	64.6°C	89.5°C
37	J101	73.0°C	97.5°C
38	C6	52.4°C	76.3°C
39	C5	54.6°C	78.4°C
40	L1	56.8°C	80.6°C
41	Q1	54.6°C	78.5°C
42	Q2	55.2°C	79.2°C
43	RTH2	60.1°C	83.7°C
44	D104	61.1°C	85.2°C

2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 116 %LOAD Ta : 25°C	TEST : OK
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3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 264VAC/100VAC O/P : 100 %LOAD@-30 °C 80%LOAD@-40 °C	TEST : OK
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50°C/95 %R.H NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta= 50 °C HUMIDITY= 95 %R.H	TEST : OK
5	TEMPERATURE COEFFICIENT	± 0.03 %/°C(0~50°C)	I/P : 230 VAC O/P : FULL LOAD	0.021 %/°C(0~50°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	-40~50°C	1. Thermal shock Temperature : -45°C~ +55°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 C105 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= 50 °C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta= 50 °C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta= 50 °C LIFE TIME		(1) 225072.1HRS (2) 37123.1HRS (3) 81287.6HRS (4) 150120.7HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 1482.0K hrs min. Telcordia SR-332 (Bellcore) ; 258.3K 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 : 30,000 hours		

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	Yuwei	Liutt	Wangzd

2020.10.1 TAG-QA-009