



Test Report: XDR-150E-12

150W 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

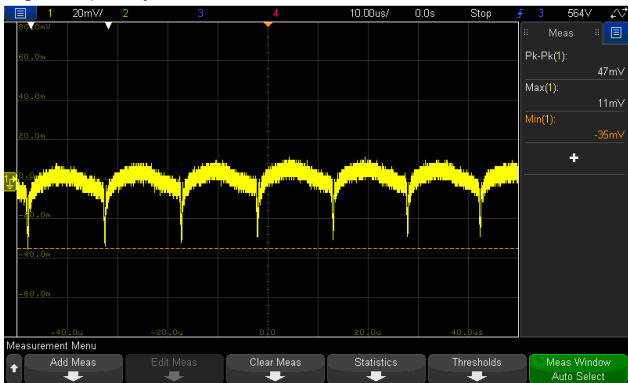
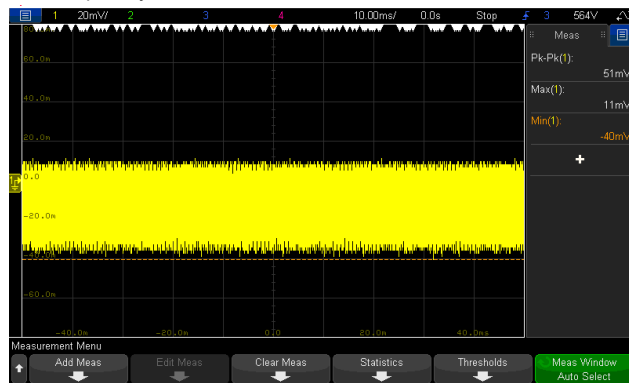
E.M.C. Test

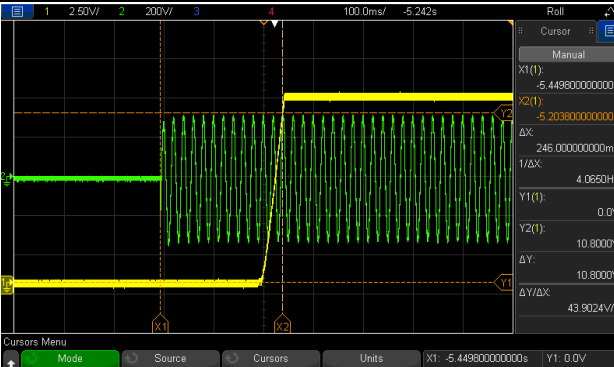
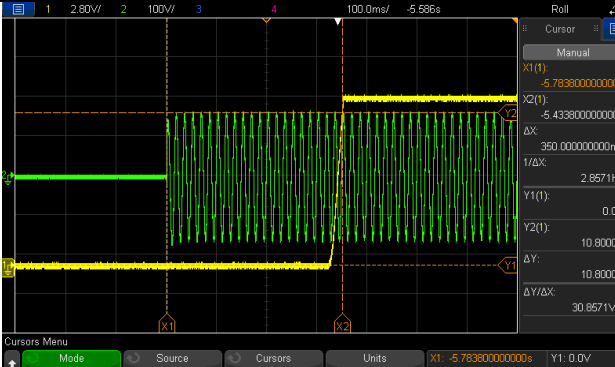
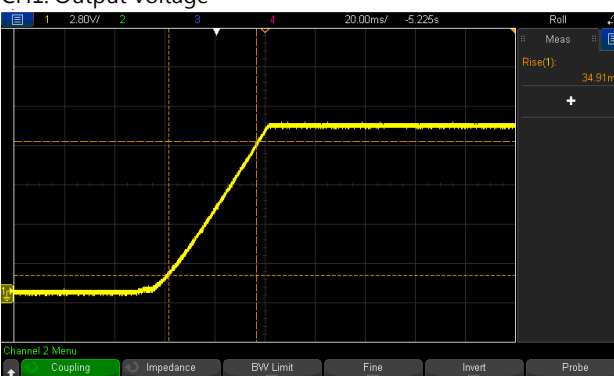
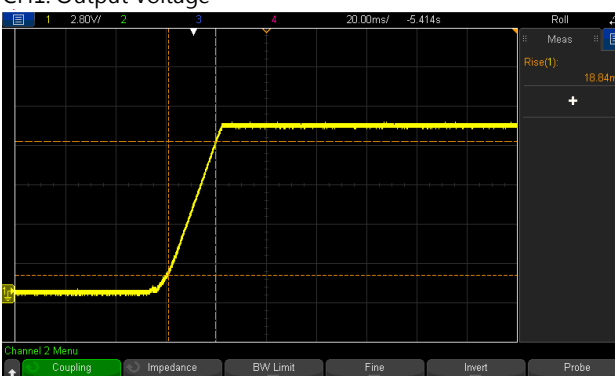
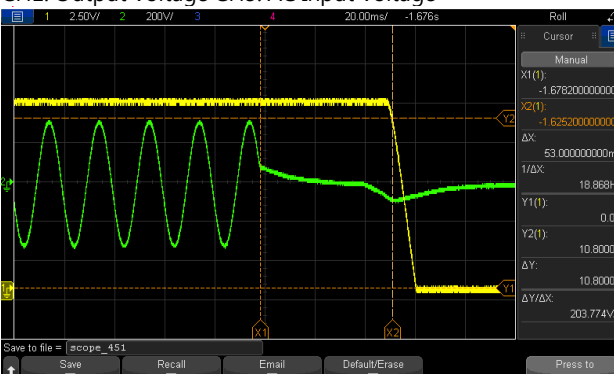
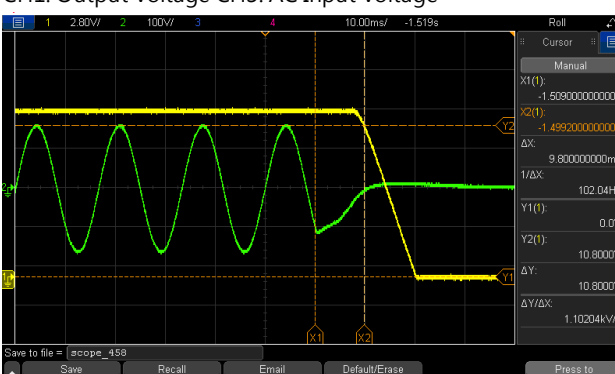
■ RELIABILITY TEST

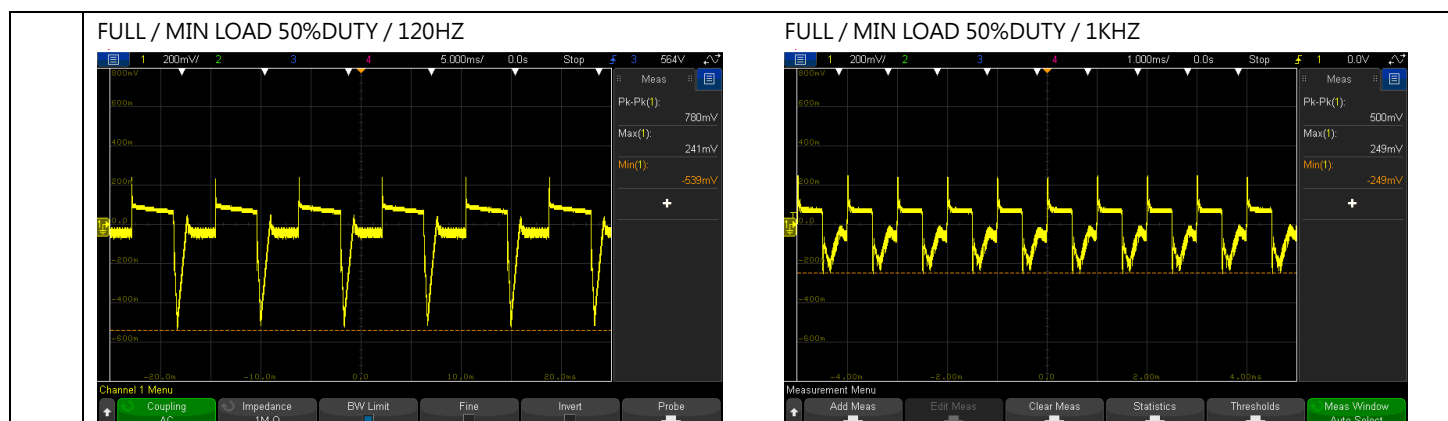
ENVIRONMENT TEST

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°C	10.914V~15.779V/230VAC 10.918V~15.779V/115VAC
2	OUTPUT VOLTAGE TOLERANCE	V1: -2% ~ +2%	I/P: 85VAC~ 264VAC O/P:FULL~ MIN. LOAD Ta:25°C	V1: -0.284% ~ 0.284%
3	LINE REGULATION	V1: -0.5% ~ +0.5%	I/P: 85VAC~ 264VAC O/P:FULL LOAD Ta:25°C	V1: 0% ~ 0.184%
4	LOAD REGULATION	V1: -1% ~ +1%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: -0.284% ~ 0.284%
5	OVER/UNDERSHOOT TEST	<±5%	I/P: 230VAC O/P:FULL LOAD / NO LOAD Ta:25°C	1.17% →FULL LOAD 1.65% →NO LOAD
6	RIPPLE & NOISE (Max)	V1: 100mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25°C	V1: 47mVp-p / high frequency 51mVp-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°C	230VAC/ 246ms 115VAC/ 350ms
INPUT=230VAC/50HZ @ FULL LOAD CH1: Output Voltage CH3: AC Input Voltage			INPUT=115VAC/60HZ @ FULL LOAD CH1: Output Voltage CH3: AC Input Voltage	

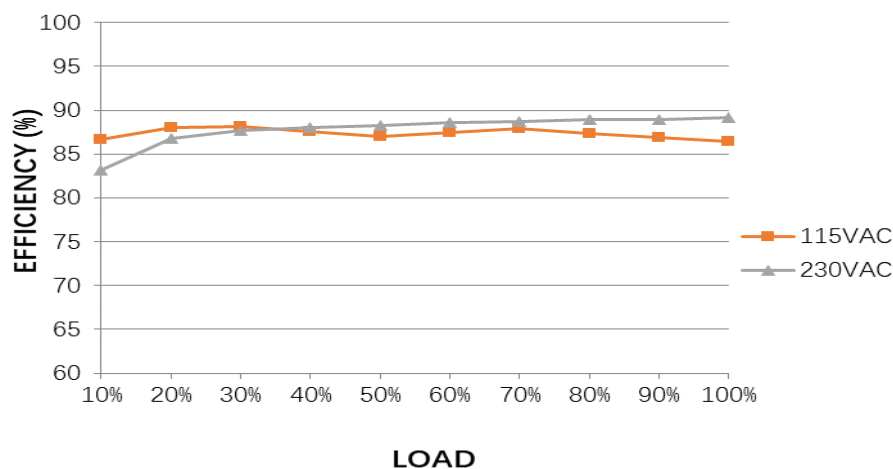
				
8	RISE TIME (Max)	230VAC/60ms 115VAC/60ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 34.91ms 115VAC/ 18.84ms
INPUT=230VAC/50HZ @ FULL LOAD CH1: Output Voltage				
		INPUT=115VAC/60HZ @ FULL LOAD CH1: Output Voltage		
				
9	HOLD UP TIME (Typ.)	230VAC/ 16ms 115VAC/ 8ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 53.0ms 115VAC/ 9.8ms
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: 1200mVp-p	I/P: 230VAC O/P: (1) FULL/ MIN LOAD 50%DUTY / 120HZ (2) FULL/ MIN LOAD 50%DUTY / 1KHZ Ta:25°C	780mVp-p 500mVp-p



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 / 80% LOAD/ 70% LOAD (2) I/P: DC TESTING (L: + N: -) O/P: FULL / 80% LOAD/ 70% LOAD (3) I/P: DC TESTING (L: - N: +) O/P: FULL / 80% LOAD/ 70% 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) 79.8V~264V/ FULL LOAD 76.8V~264V/ 90% LOAD 67.5V~264V/ 70% LOAD (2) 94.8Vdc~370Vdc/FULL LOAD 94.3Vdc~370Vdc/90% LOAD 94.3Vdc~370Vdc/70% LOAD (3) 94.6Vdc~370Vdc/FULL LOAD 94.3Vdc~370Vdc/90% LOAD 94.2Vdc~370Vdc/70% 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/ 1.6A 115V/ 2.6A	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I =1.2728A/ 230VAC I =2.03A/ 115VAC
4	LEAKAGE CURRENT	< 1mA / 240 VAC	I/P : 240 VAC/60HZ O/P : Min LOAD Ta : 25°C	0.6934 mA
5	NO LOAD CONSUMPTION	< 0.9W	I/P : 230VAC I/P : 115VAC O/P : NO LOAD Ta : 25°C	0.724W/ 230VAC 0.371W/ 115VAC
6	EFFICIENCY(Typ.)	89%	I/P:230 VAC O/P:FULL LOAD Ta:25°C	89.11%

EFFICIENCY vs LOAD



7

INRUSH CURRENT(Typ.)

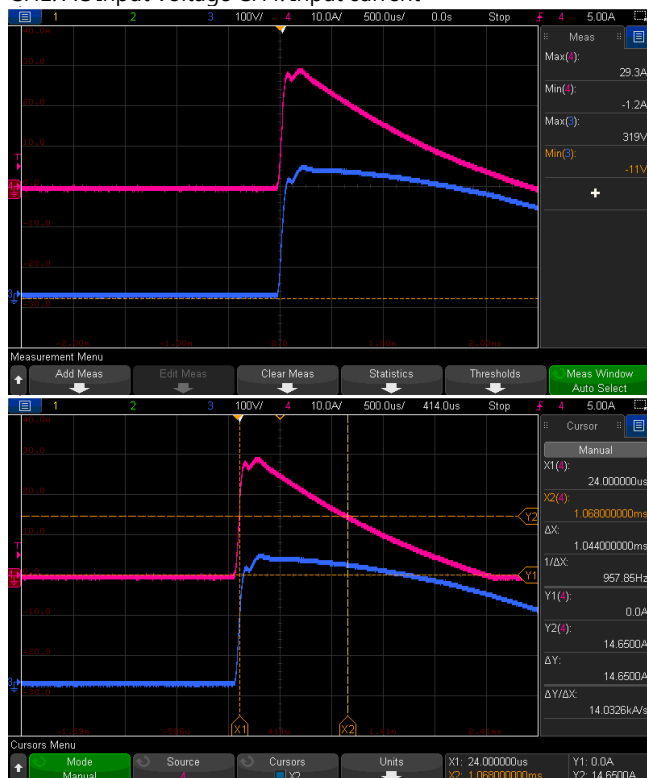
230V/40A
115V/20A
COLD START

I/P : 230 VAC
I/P : 115 VAC
O/P : FULL LOAD
Ta : 25°C

I =29.3A/ 230VAC
I =13.2A/ 115VAC
T50=1044 us/230V

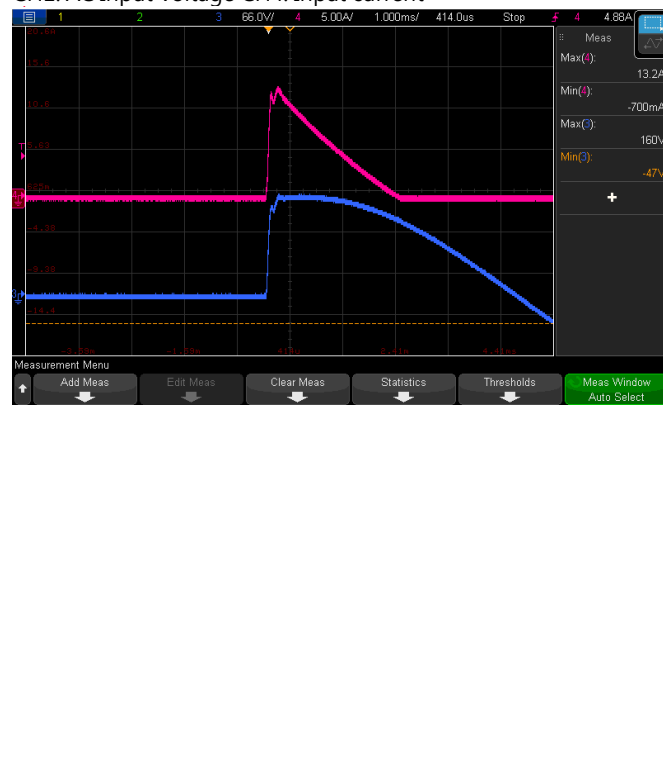
INPUT=230VAC/50HZ @ FULL LOAD

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/230VAC 105%~150% rated output power/115VAC Protection type: Constant current limiting without shutdown, recovers automatically after fault condition is removed	I/P: 264VAC I/P: 230VAC I/P: 175VAC I/P: 165VAC I/P: 115VAC I/P: 100VAC O/P: TESTING Ta:25°C	110.55%/ 264VAC 111.09%/ 230VAC 110.55%/ 175VAC 121.8%/ 165VAC 121.6%/ 115VAC 121.7%/ 100VAC PROTECTION TYPE : Constant current limiting without shutdown, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	15V~18V Protection type: Shut down o/p voltage, re-power on to recover	I/P: 264VAC I/P: 85VAC O/P: MIN LOAD Ta:25°C	16.20V/ 264VAC 16.20V/ 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 fault condition is removed	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 fault condition is removed
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE Protection type: Constant current limiting without shutdown, recovers automatically after fault condition is removed	I/P: 264VAC I/P: 85VAC O/P: FULL LOAD Ta:25°C	NO DAMAGE PROTECTION TYPE : Constant current limiting without shutdown, 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>

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E)	Q1 Rated :	AC ON/OFF I/P: High-Line +3V =267V	VDS: (1) 604V

	Peak Voltage	700V/13A	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	(2) 608V (3) 624V (4) 628V (5) 628V (6) 624V (7) 624V
2	Diode Peak Voltage	Q100 : Rated : 76A/100V	AC ON/OFF I/P: High-Line +3V =267 V <u>VO=V_{Omax}</u> 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 <u>VO=V_{normal}</u> O/P: (1) Full Load Ta:25°C	<u>VO=V_{Omax}</u> VDS: (1) 61.3V (2) 66.1V (3) 61.3V (4) 61.3V (5) 61.9V (6) 61.3V (7) 64.9V (8) 61.9V <u>VO=V_{normal}</u> (1) 65.5V
3	Input Capacitor Voltage	C5 Rated: 180μ / 400V	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) 376V (2) 380V (3) 380V (4) 372V
4	Control IC Voltage Test	PWM IC U1 Rated : 9.5V~ 27V O/P IC U100 Rated : -0.3V~14V IC U107 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°C	U1 (1) 17.8V (2) 17.7V (3) 17.8V (4) 17.7V (5) 17.8V U107 (1) 11.53V (2) 11.62V (3) 11.98V (4) 11.62V (5) 11.53V U100 (1) 9.1V (2) 9.14V (3) 9.14V

				(4) 9.06V (5) 9.06V
5	Clamp Diode Peak Voltage	D10 : DISA0162AF Rated : 620V/1A	AC ON/OFF I/P : High-Line +3V = 267 V O/P : (1) Dynamic Load 90%Duty/1KHz (2) Full load continue Ta : 25°C	(1) 467V (2) 459V

■ 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 : 6.50 mA I / P - F G : 5.43 mA O / P - F G : 6.5 mA O / P - DC OK: 0.006 mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P: 500 VDC>100MΩ O/P-FG: 500 VDC>100MΩ I/P - F G : 500 VDC >100MΩ	I/P-O/P: 600 VDC I/P - F G : 600 VDC O/P-FG: 600 VDC Ta:25°C	I/P - O / P : 50 GΩ I / P - F G : 50 GΩ O / P - F G : 50 GΩ NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25°C	11mΩ

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
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°C	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°C	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°C	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°C	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°C	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-150E-12 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta= 25.0 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta= 49.6 °C																																																																																		
		<table><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta= 25 °C</th><th>HIGH AMBIENT Ta= 49.6 °C</th></tr><tr><td>1</td><td>C1</td><td>42.9°C</td><td>69.5°C</td></tr><tr><td>2</td><td>LF2</td><td>54.1°C</td><td>83.3°C</td></tr><tr><td>3</td><td>RTH2</td><td>78°C</td><td>94.8°C</td></tr><tr><td>4</td><td>RTH1</td><td>66.5°C</td><td>91.2°C</td></tr><tr><td>5</td><td>R6</td><td>63°C</td><td>82.8°C</td></tr><tr><td>6</td><td>BD1</td><td>50.6°C</td><td>74.7°C</td></tr><tr><td>7</td><td>C5</td><td>51.5°C</td><td>77.5°C</td></tr><tr><td>8</td><td>R50</td><td>63.9°C</td><td>87.6°C</td></tr><tr><td>9</td><td>C34</td><td>54.3°C</td><td>78.4°C</td></tr><tr><td>10</td><td>Q1</td><td>61.9°C</td><td>95.5°C</td></tr><tr><td>11</td><td>T1 Coil</td><td>68°C</td><td>98°C</td></tr><tr><td>12</td><td>T1 Core</td><td>53.7°C</td><td>77.5°C</td></tr><tr><td>13</td><td>RTH3</td><td>54.2°C</td><td>88.1°C</td></tr><tr><td>14</td><td>C118</td><td>63.3°C</td><td>87°C</td></tr><tr><td>15</td><td>C107</td><td>68.5°C</td><td>92.7°C</td></tr><tr><td>16</td><td>C105</td><td>71.1°C</td><td>92.2°C</td></tr><tr><td>17</td><td>Q101</td><td>64°C</td><td>89.3°C</td></tr><tr><td>18</td><td>J110</td><td>78.9°C</td><td>103°C</td></tr><tr><td>19</td><td>U100</td><td>63.6°C</td><td>87.8°C</td></tr></table>			NO	Position	ROOM AMBIENT Ta= 25 °C	HIGH AMBIENT Ta= 49.6 °C	1	C1	42.9°C	69.5°C	2	LF2	54.1°C	83.3°C	3	RTH2	78°C	94.8°C	4	RTH1	66.5°C	91.2°C	5	R6	63°C	82.8°C	6	BD1	50.6°C	74.7°C	7	C5	51.5°C	77.5°C	8	R50	63.9°C	87.6°C	9	C34	54.3°C	78.4°C	10	Q1	61.9°C	95.5°C	11	T1 Coil	68°C	98°C	12	T1 Core	53.7°C	77.5°C	13	RTH3	54.2°C	88.1°C	14	C118	63.3°C	87°C	15	C107	68.5°C	92.7°C	16	C105	71.1°C	92.2°C	17	Q101	64°C	89.3°C	18	J110	78.9°C	103°C	19	U100	63.6°C	87.8°C
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7	C5	51.5°C	77.5°C																																																																																	
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18	J110	78.9°C	103°C																																																																																	
19	U100	63.6°C	87.8°C																																																																																	

			NO	Position	ROOM AMBIENT Ta= 25 °C	HIGH AMBIENT Ta= 49.6 °C
			20	U107	54.1°C	78.1°C
			21	Q200	77.3°C	98.5°C
			22	D102	57°C	89.6°C
			23	U2	51.1°C	75°C
			24	U1	52.9°C	76.9°C
			25	D7	61.7°C	84.5°C
			26	Q2	64.4°C	87.5°C
			27	D6	77°C	100.7°C
			28	D14	53°C	76.9°C
			29	Q100	71.9°C	94.9°C
			30	ZNR1	42.5°C	67.9°C
			31	LF1	44.9°C	70.6°C
			32	LF100	64.7°C	89.5°C
			33	RY1	55.5°C	79.6°C
			34	TB2	56.3°C	80.4°C
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 111.9 % LOAD Ta : 25°C	TEST : OK		
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 264VAC/100VAC O/P : 100 % LOAD Ta= -30 °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	± 0.015 %/°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	-30~50°C	1. Thermal shock Temperature : -35°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 C107 IS THE MOST CRITICAL COMPONENT (1) I/P : 230VAC O/P : FULL LOAD Ta= 25 °C LIFE TIME (1) 140004.2 HRS (2) I/P : 230VAC O/P : FULL LOAD Ta= 50 °C LIFE TIME (2) 25445.3 HRS (3) I/P : 230VAC O/P : 75% LOAD Ta= 50 °C LIFE TIME (3) 60983.5 HRS (4) I/P : 230VAC O/P : 50% LOAD Ta= 50 °C LIFE TIME (4) 123380.4 HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 2201.7K hrs min. Telcordia SR-332 (Bellcore) ; 440.4K 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