Test Report: XDR-240E-36

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

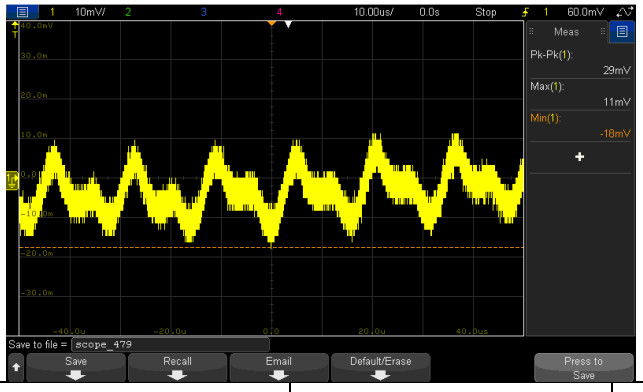
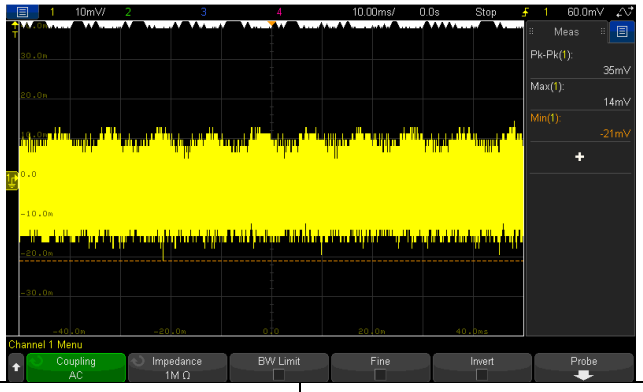
Safety Test
E.M.C. Test

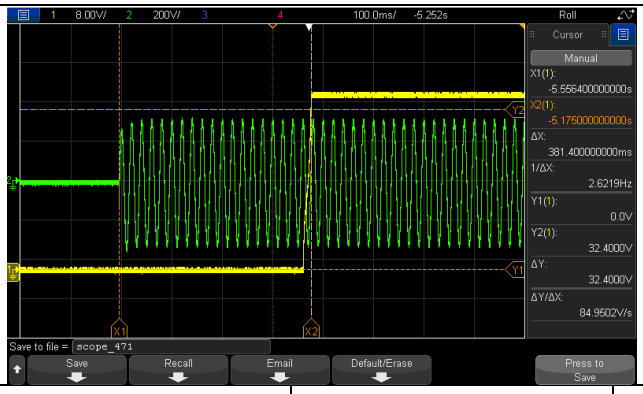
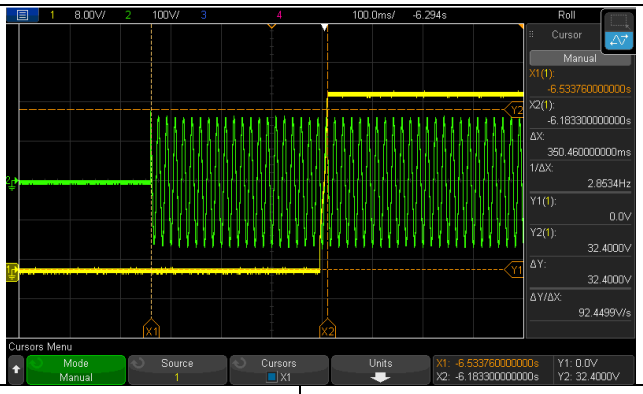
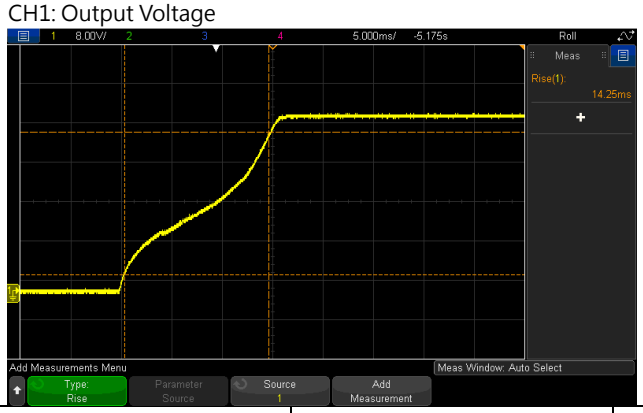
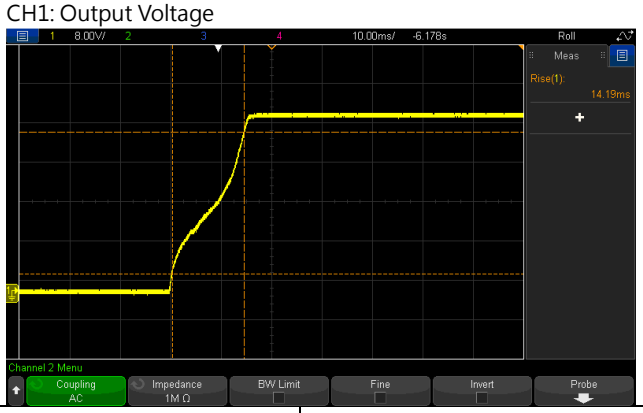
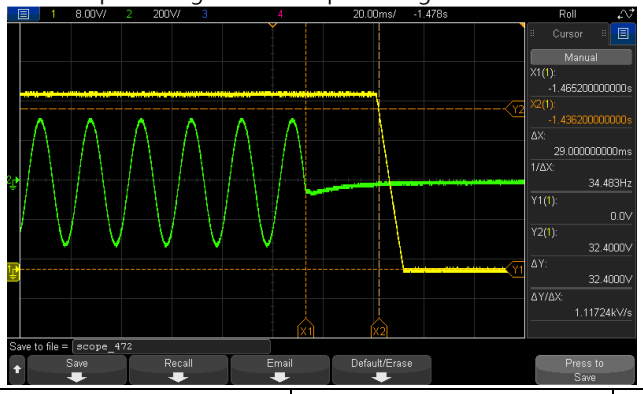
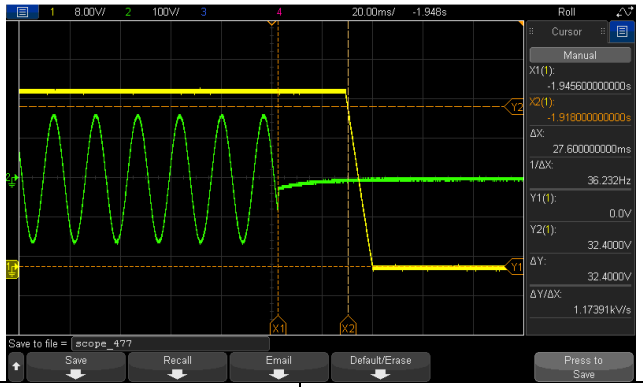
■ RELIABILITY TEST

ENVIRONMENT TEST

■ DESIGN VERIFY TEST

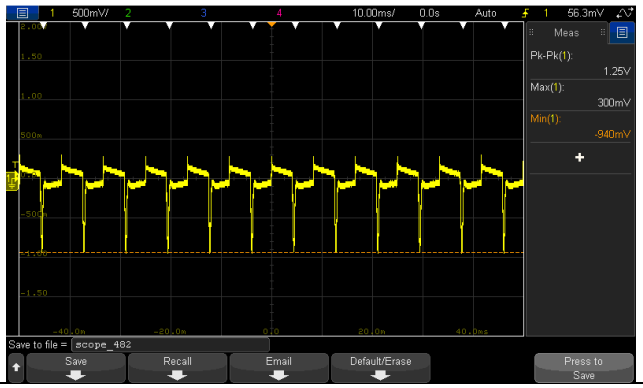
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 36V~42V	I/P： 230 VAC I/P： 115 VAC O/P：MIN LOAD Ta：25℃	34.638V~42.881V/230VAC 34.658V~42.882V/115VAC
2	OUTPUT VOLTAGE TOLERANCE	V1: -1% ~ +1%	I/P: 85VAC~ 264VAC O/P:FULL~ MIN. LOAD Ta:25℃	V1: -0.045% ~0.073 %
3	LINE REGULATION	V1: -0.5% ~ +0.5%	I/P: 85VAC~ 264VAC O/P:FULL LOAD Ta:25℃	V1: -0.009% ~ 0.0195%
4	LOAD REGULATION	V1: -1% ~ +1%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25℃	V1: -0.045% ~0.073 %
5	OVER/UNDERSHOOT TEST	<±5%	I/P: 230VAC O/P:FULL LOAD / NO LOAD Ta:25℃	1.7% →FULL LOAD 1.1% →NO LOAD
6	RIPPLE & NOISE (Max)	V1: 120mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25℃	V1: 29mVp-p / high frequency 35mVp-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/381.4ms 115VAC/ 350.46ms
	INPUT=230VAC/50HZ @ FULL LOAD CH1: Output Voltage CH3: AC Input Voltage		INPUT=115VAC/60HZ @ FULL LOAD CH1: Output Voltage CH3: AC Input Voltage	

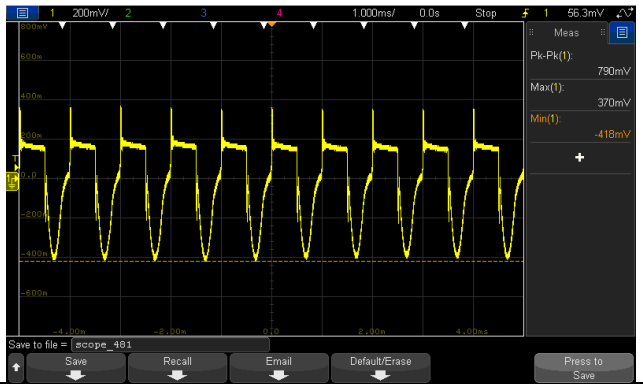
<table>
<tr><td></td><td colspan="4"> 
 </td></tr>
<tr><td>8</td><td>RISE TIME (Max)</td><td>230VAC/60ms
115VAC/150ms</td><td>I/P： 230 VAC
I/P： 115 VAC
O/P：FULL LOAD
Ta：25℃</td><td>230VAC/ 14.25ms
115VAC/ 14.19ms</td></tr>
<tr><td></td><td colspan="4">INPUT=230VAC/50HZ @ FULL LOAD
CH1: Output Voltage
 
INPUT=115VAC/60HZ @ FULL LOAD
CH1: Output Voltage
  </td></tr>
<tr><td>9</td><td>HOLD UP TIME (Typ.)</td><td>230VAC/ 20ms
115VAC/ 20ms</td><td>I/P： 230 VAC
I/P： 115 VAC
O/P：FULL LOAD
Ta：25℃</td><td>230VAC/ 29.0ms
115VAC/ 27.6ms</td></tr>
<tr><td></td><td colspan="4">INPUT=230VAC/50HZ @ FULL LOAD
CH1: Output Voltage CH3: AC Input Voltage
 
INPUT=115VAC/60HZ @ FULL LOAD
CH1: Output Voltage CH3: AC Input Voltage
  </td></tr>
<tr><td>10</td><td>DYNAMIC LOAD</td><td>V1: 3600mVp-p</td><td>I/P: 230VAC
O/P:
(1) FULL/ MIN LOAD 50%DUTY / 120HZ
(2) FULL/ MIN LOAD 50%DUTY /</td><td>1250mVp-p
790mVp-p</td></tr>
</table>

			1KHZ Ta:25℃	

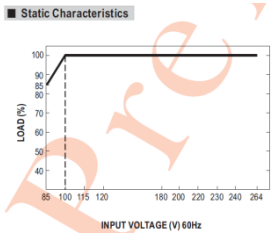
FULL / MIN LOAD 50%DUTY / 120HZ

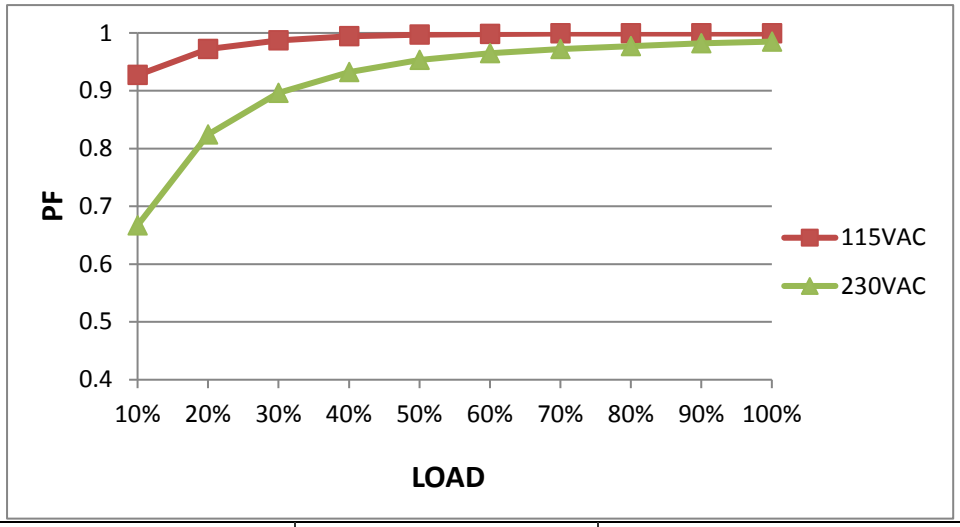
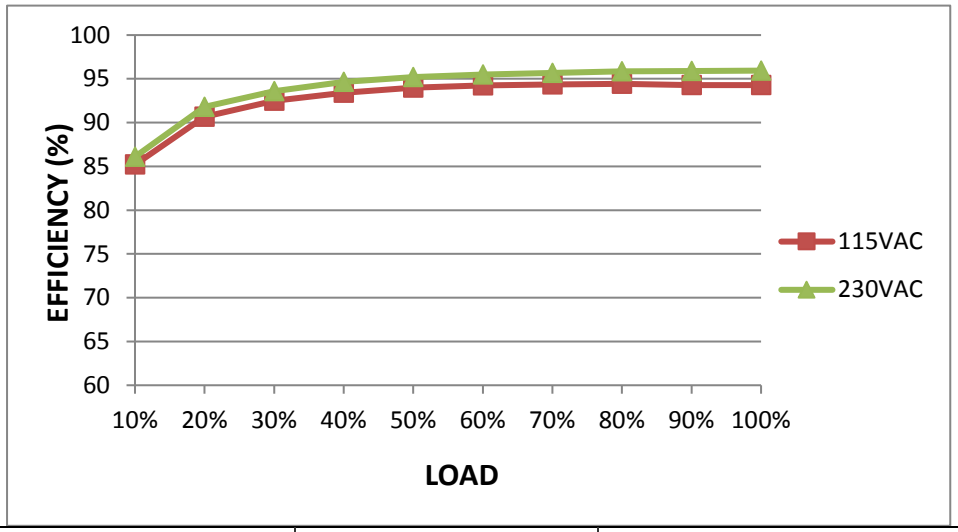


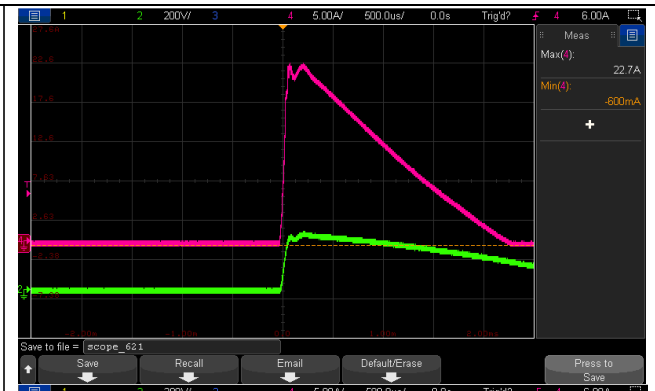
FULL / MIN LOAD 50%DUTY / 1KHZ

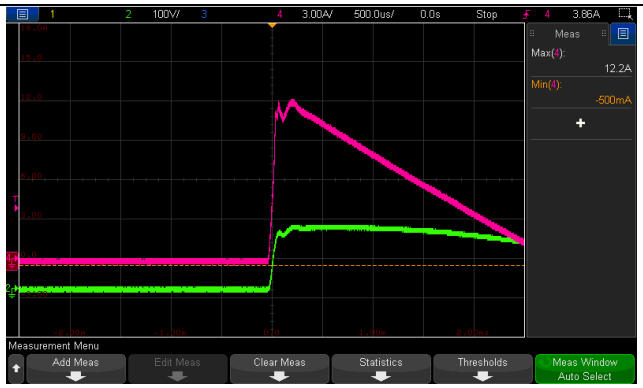


INPUT FUNCTION TEST

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) 76.4V~264V/ FULL LOAD 74.1V~264V/ 85% LOAD (2)104.7 Vdc~370Vdc/FULL LOAD 104.6Vdc~370Vdc/85% LOAD (3) 104.6Vdc~370Vdc/FULL LOAD 104.4Vdc~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 =1.0993A/ 230VAC I =2.2126A/ 115VAC
4	LEAKAGE CURRENT	< 1mA / 240 VAC	I/P： 240 VAC/60HZ O/P：Min LOAD Ta：25℃	0.5072mA
5	NO LOAD CONSUMPTION	< 1.2W	I/P：230VAC I/P：115VAC O/P：NO LOAD Ta：25℃	1.0119W/ 230VAC 0.976W/ 115VAC
6	POWER FACTOR (Typ.)	0.95/ 230VAC	I/P： 230 VAC	0.9849/230VAC

		0.98/115VAC	I/P： 115 VAC O/P：FULL LOAD Ta：25℃	0.9986/115VAC
	P.F vs LOAD  			
7	EFFICIENCY(Typ.)	95.5%	I/P:230 VAC O/P:FULL LOAD Ta:25℃	96.09 %
	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 =22.7A/ 230VAC I =12.2A/ 115VAC T50= 1071us/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℃	120.57%/ 264VAC 120.27%/ 230VAC 120.42%/ 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. 50V Protection type: Hiccup mode, recovers automatically after fault condition is removed	I/P: 264VAC I/P: 85VAC O/P:MIN LOAD Ta:25℃	45.7V/ 264VAC 45.7V/ 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) 432V (1) 418V (2) 464V (2) 442V (3) 436V (3) 418V (4) 432V (4) 422V (5) 432V (5) 418V (6) 428V (6) 418V (7) 440V (7) 418V
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) 442V (2) 438V (3) 430V (4) 438V (5) 434V (6) 434V (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) 419V (2) 431V (3) 419V (4) 419V	
4	Diode Peak Voltage	Q100/Q101 Rated： 86A/ 120V	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℃	Q101： VO=Vomax VDS: (1) 94.7V (2) 94.7V (3) 95.5V (4) 95.5V (5) 95.5V (6) 96.4V (7) 95.5V (8) 95.5V (9) 95.5V VO=Vnormal (1) 87.0V	Q100： VO=Vomax VDS: (1) 93.4V (2) 93.4V (3) 93.4V (4) 93.4V (5) 93.4V (6) 95.0V (7) 92.6V (8) 92.6V (9) 92.6V VO=Vnormal (1) 86.2V
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) 422V (2) 418V (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) 19.2V (2) 19.2V (3) 19.1V (4) 19.2V (5) 19.1V	U100/U101 (1) 13.6V (2) 17.4V (3) 13.6V (4) 13.6V (5) 13.6V

		4.75V~38V IC U100/U102 Rated : 3V~30V	(5) NO LOAD VRmin (LOW LINE) Ta:25℃		

■ 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: 7.43 m A O/P-DC OK: 0.07 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℃	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
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-36 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	36.8℃	63.1℃
2	R10	38.8℃	65.3℃
3	RTH1	37℃	63.7℃
4	L1	42.7℃	68.8℃
5	L2	36.4℃	63℃
6	Q1	43.8℃	69.6℃
7	C6	43.5℃	69.2℃
8	C5	43.7℃	69.3℃
9	RTH2	45.9℃	71.5℃
10	C49	45.3℃	71℃
11	T1 Coil	58.3℃	83.6℃
12	T1 Core	46.6℃	72.4℃
13	C26	47.7℃	72.9℃
14	C114	47.5℃	73.4℃
15	C105	46.3℃	72.1℃
16	C107	45℃	71.1℃
17	C108	47.1℃	72.8℃
18	C110	42.3℃	67.9℃
19	RY2	49.1℃	74.4℃
20	ZNR1	38.4℃	64.9℃

		<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>LF2</td><td>44.9℃</td><td>70.8℃</td></tr><tr><td>22</td><td>LF1</td><td>40.9℃</td><td>67.4℃</td></tr><tr><td>23</td><td>C1</td><td>40.9℃</td><td>67.4℃</td></tr><tr><td>24</td><td>LF100</td><td>44.8℃</td><td>70.7℃</td></tr><tr><td>25</td><td>U4</td><td>44.6℃</td><td>69.9℃</td></tr><tr><td>26</td><td>BD1</td><td>50.7℃</td><td>75.8℃</td></tr><tr><td>27</td><td>BD2</td><td>50.1℃</td><td>75.1℃</td></tr><tr><td>28</td><td>U1</td><td>52.6℃</td><td>78.2℃</td></tr><tr><td>29</td><td>Q6</td><td>48.4℃</td><td>74.5℃</td></tr><tr><td>30</td><td>U101</td><td>52.8℃</td><td>78.2℃</td></tr><tr><td>31</td><td>Q101</td><td>49.4℃</td><td>75.2℃</td></tr><tr><td>32</td><td>Q100</td><td>49.6℃</td><td>75.7℃</td></tr><tr><td>33</td><td>D1</td><td>52.1℃</td><td>78℃</td></tr><tr><td>34</td><td>U100</td><td>45.7℃</td><td>71.2℃</td></tr></table>		
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P： 230 VAC O/P： 120.57 % 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	± 0.009 %/℃(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 C108 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) 407125.7 HRS (2) 69038.6 HRS (3) 100016.8 HRS (4) 132017.1 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