



Test Report: XDR-120E-24

120W 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

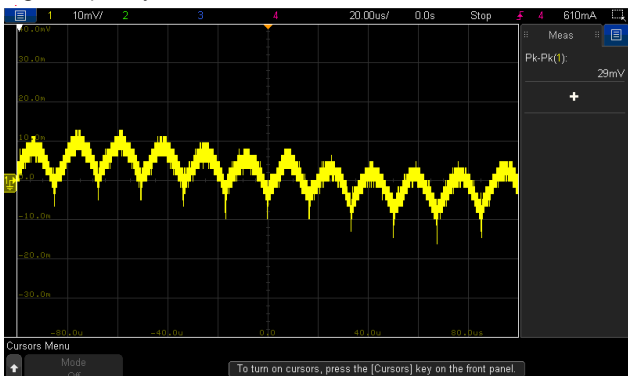
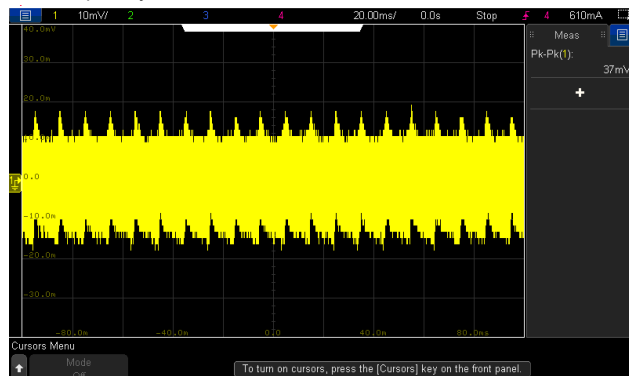
E.M.C. Test

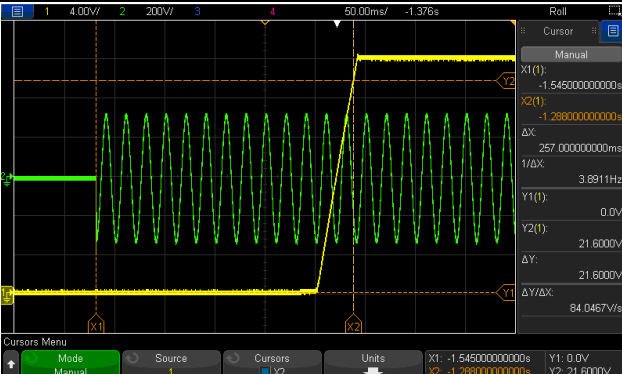
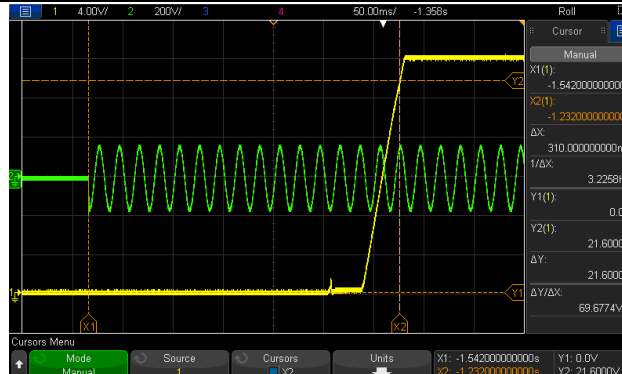
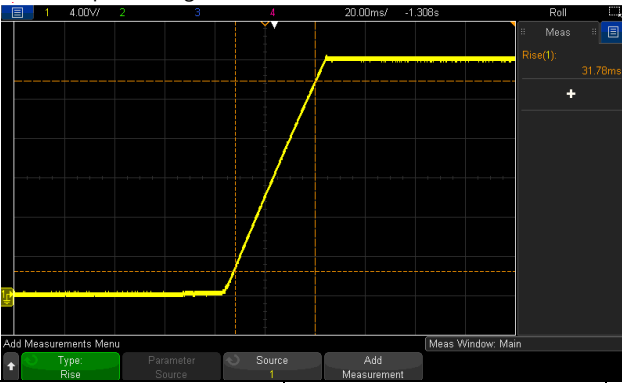
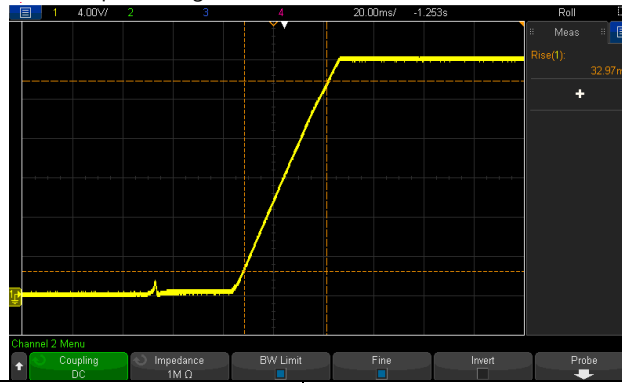
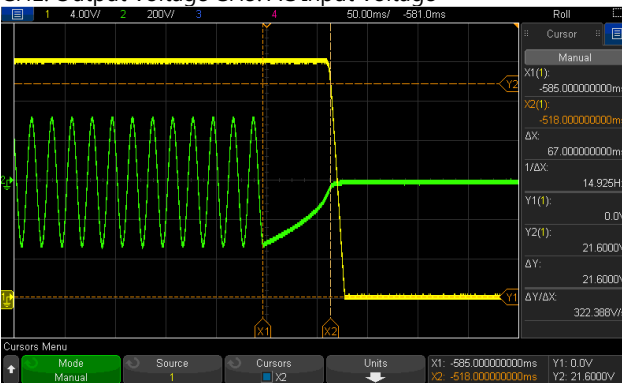
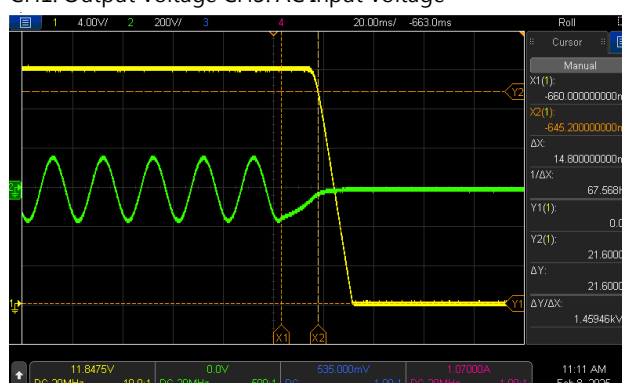
■ RELIABILITY TEST

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	22.275V~29.799V/230VAC 22.275V~29.799V/115VAC
2	OUTPUT VOLTAGE TOLERANCE	V1: -1% ~ +1%	I/P: 85VAC~ 264VAC O/P:FULL~ MIN. LOAD Ta:25°C	V1: -0.06% ~ 0.05%
3	LINE REGULATION	V1: -0.5% ~ +0.5%	I/P: 85VAC~ 264VAC O/P:FULL LOAD Ta:25°C	V1: -0.01% ~ 0.03%
4	LOAD REGULATION	V1: -1% ~ +1%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: -0.06% ~ 0.05%
5	OVER/UNDERSHOOT TEST	<±5%	I/P: 230VAC O/P:FULL LOAD / NO LOAD Ta:25°C	2.1%
6	RIPPLE & NOISE (Max)	V1: 120mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25°C	V1: 29mVp-p / high frequency 37mVp-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/ 257ms 115VAC/ 310ms
INPUT=230VAC/50HZ @ FULL LOAD CH1: Output Voltage CH3: AC Input Voltage		INPUT=115VAC/60HZ @ FULL LOAD CH1: Output Voltage CH3: AC Input Voltage		

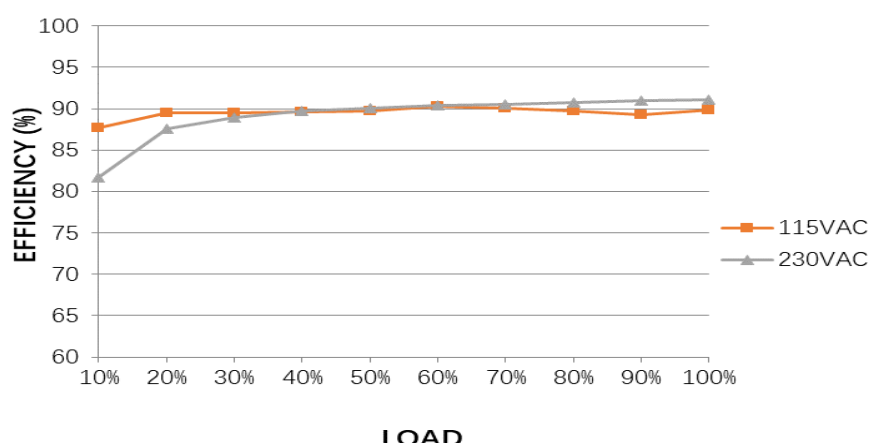
				
8	RISE TIME (Max)	230VAC/60ms 115VAC/60ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 31.78ms 115VAC/ 32.97ms
INPUT=230VAC/50HZ @ FULL LOAD CH1: Output Voltage				
		INPUT=115VAC/60HZ @ FULL LOAD CH1: Output Voltage		
				
9	HOLD UP TIME (Typ.)	230VAC/ 16ms 115VAC/ 8ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 67ms 115VAC/ 14.8ms
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°C	318mVp-p 223mVp-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 / 75% LOAD (2) I/P: DC TESTING (L: + N: -) O/P: FULL / 75% LOAD (3) I/P: DC TESTING (L: - N: +) O/P: FULL / 75% LOAD Ta:25°C	(1) 79V~264V/ FULL LOAD 70V~264V/ 75% LOAD (2) 95Vdc~370Vdc/FULL LOAD 95Vdc~370Vdc/75% LOAD (3) 95Vdc~370Vdc/FULL LOAD 95Vdc~370Vdc/75% 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°C	TEST : OK
3	INPUT CURRENT (Typ.)	230V/ 1.3A 115V/ 2.25A	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I =1.131A/ 230VAC I =1.966A/ 115VAC
4	LEAKAGE CURRENT	< 1mA / 240 VAC	I/P : 240 VAC/60HZ O/P : Min LOAD Ta : 25°C	0.782mA
5	NO LOAD CONSUMPTION	< 1W	I/P : 230VAC I/P : 115VAC O/P : NO LOAD Ta : 25°C	0.731W/ 230VAC 0.465W/ 115VAC
6	EFFICIENCY(Typ.)	91%	I/P:230 VAC O/P:FULL LOAD Ta:25°C	91.05%

EFFICIENCY vs LOAD



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INRUSH CURRENT(Typ.)

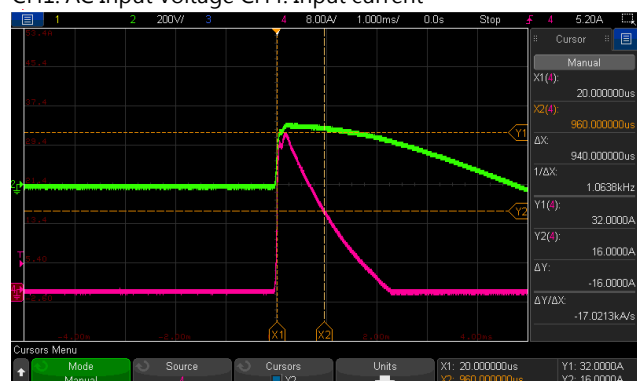
230V/40A
115V/20A
COLD START

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

I =32.0A/ 230VAC
I =16.5A/ 115VAC
T50= 940us/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: Constant current limiting without shutdown, recovers automatically after fault condition is removed	I/P: 264VAC I/P: 230VAC I/P: 100VAC O/P: TESTING Ta:25°C	117.4%/ 264VAC 117.4%/ 230VAC 116.6%/ 100VAC PROTECTION TYPE : Constant current limiting without shutdown, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	30V~34V 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	32.2V/ 264VAC 32.2V/ 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, recovers automatically after fault condition is removed	I/P: 264VAC I/P: 85VAC O/P: FULL LOAD Ta:25°C	NO DAMAGE OK PROTECTION TYPE : Constant current limiting, 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: OK

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated : 650V/14A	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	VDS: (1) 555V (2) 555V (3) 559V (4) 555V (5) 559V (6) 559V (7) 555V
2	Diode Peak Voltage	Q100 Rated : 50A/150V	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/ 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/	<u>VO=Vomax</u> VDS: (1) 124.1V (2) 123.3V (3) 124.9V (4) 124.9V (5) 125.7V (6) 124.9V (7) 125.7V (8) 125.7V <u>VO=Vnormal</u>

			Min. Load 50%Duty/120Hz (7)0%→400% Load. (8).NO LOAD <u>VO=Vnormal</u> O/P: (1)Full Load Ta:25°C	(1) 119.3V
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) 374V (2) 374V (3) 374V (4) 370V
4	Control IC Voltage Test	PWM IC U1 Rated : 9.5V~ 27V O/P IC U100 Rated : 4V~13V 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) 17.3V (2) 17.3V (3) 17.3V (4) 17.4V (5) 17.3V U107 (1) 11.85V (2) 11.85V (3) 11.85V (4) 11.53V (5) 6.46V U100 (1) 9.03V (2) 9.03V (3) 9.03V (4) 9.03V (5) 5.58V
5	Clamp Diode Peak Voltage	D10 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) 469V (2) 465V

■ 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°C	I/P-O/P: 6.40 mA I/P-FG: 5.19 mA O/P-FG: 6.98 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°C	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 < 100mΩ	40A / 2min Ta:25°C	8mΩ
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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-120E-24 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= 50.0 °C		

			NO	Position	ROOM AMBIENT Ta= 25.0°C	HIGH AMBIENT Ta= 50.0°C
			1	C118	55.9°C	79.9°C
			2	C107	51.6°C	76.2°C
			3	C105	52.3°C	77.1°C
			4	D14	46.5°C	71.2°C
			5	C106	55.8°C	80.6°C
			6	J110	59°C	83.4°C
			7	U2	46°C	70.5°C
			8	U1	47.3°C	72.2°C
			9	D10	62.1°C	87.3°C
			10	Q2	59.2°C	82.5°C
			11	Q1	56.3°C	81.3°C
			12	RTH3	54.8°C	78.4°C
			13	T1 Core	46.6°C	70.9°C
			14	T1 Coil	60.7°C	85°C
			15	C115	45.2°C	69.8°C
			16	LF100	47.8°C	72.7°C
			17	RY1	47.3°C	71.8°C
			18	LF1	41.3°C	67.1°C
			19	ZNR1	38.8°C	64.8°C
			20	R6	59.7°C	82.2°C
			21	BD1	44.7°C	69.6°C
			22	C5	46.4°C	71.4°C
			23	C34	47.3°C	72.3°C
			24	R50	56.5°C	81.3°C
			25	C1	38.9°C	65.1°C
			26	LF2	49.3°C	76.1°C
			27	RTH2	73.1°C	93.9°C
			28	RTH1	75.7°C	92.2°C
			29	R5	50.9°C	74.9°C
			30	Q101	58.3°C	83.9°C
			31	U100	57.4°C	80.9°C
			32	U107	48.8°C	73.1°C
			33	D102	59°C	83.4°C
			34	Q200	62.8°C	86°C
			35	D7	55.5°C	79°C
			36	R12	66.8°C	90.8°C
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 117.4% 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	$\pm 0.03 \text{ }^{\circ}\text{C}(0\sim 50^{\circ}\text{C})$	I/P : 230 VAC O/P : FULL LOAD	$\pm 0.012 \text{ }^{\circ}\text{C}(0\sim 50^{\circ}\text{C})$
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 C106 IS THE MOST CRITICAL COMPONENT (1) I/P : 230VAC O/P : FULL LOAD Ta= 25.0 °C LIFE TIME (2) I/P : 230VAC O/P : FULL LOAD Ta= 50.0 °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) 419849.2 HRS (2) 75255.6 HRS (3) 120069.5 HRS (4) 188521 HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 2223.1K 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	LIUTT	LIUTT	WANGZD

2020.10.1 TAG-QA-009