



Test Report: XDR-120E-12

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

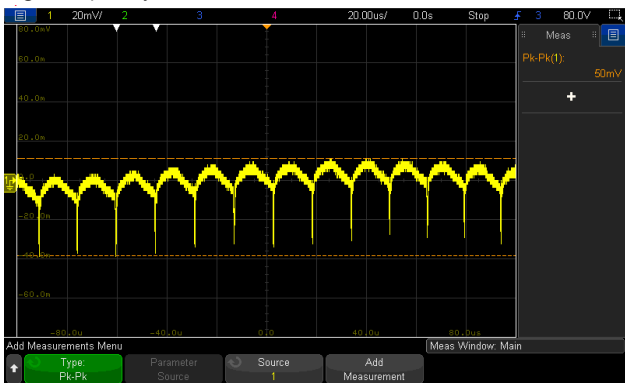
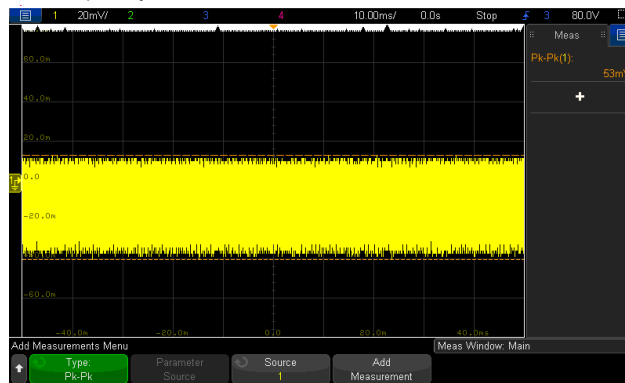
E.M.C. Test

■ RELIABILITY TEST

ENVIRONMENT TEST

DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

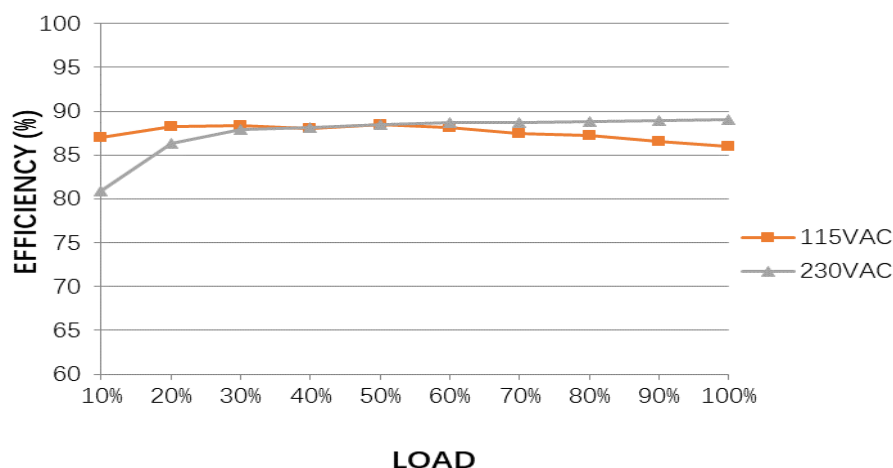
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 12V~15V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	11.268V~15.881V/230VAC 11.268V~15.881V/115VAC
2	OUTPUT VOLTAGE TOLERANCE	V1: -2% ~ +2%	I/P: 85VAC~ 264VAC O/P:FULL~ MIN. LOAD Ta:25°C	V1: -0.20% ~ 0.21%
3	LINE REGULATION	V1: -0.5% ~ +0.5%	I/P: 85VAC~ 264VAC O/P:FULL LOAD Ta:25°C	V1: 0% ~0.11 %
4	LOAD REGULATION	V1: -1% ~ +1%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: -0.20% ~ 0.21%
5	OVER/UNDERSHOOT TEST	<±5%	I/P: 230VAC O/P:FULL LOAD / NO LOAD Ta:25°C	-1.36%
6	RIPPLE & NOISE (Max)	V1: 100mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25°C	50mVp-p / high frequency 53mVp-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/197ms 115VAC/266 ms
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/ 20.72ms 115VAC/ 22.06ms
	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/56ms 115VAC/9.2ms
	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	545mVp-p 316mVp-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) 87V~264V/ FULL LOAD 68V~264V/ 75% LOAD (2) 95.5Vdc~370Vdc/FULL LOAD 95.2Vdc~370Vdc/75% LOAD (3) 95.5Vdc~370Vdc/FULL LOAD 95.2Vdc~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 =1.151A/ 230VAC I =1.907A/ 115VAC
4	LEAKAGE CURRENT	< 1mA / 240 VAC	I/P : 240 VAC/60HZ O/P : Min LOAD Ta : 25°C	0.827mA
5	NO LOAD CONSUMPTION	< 0.9W	I/P : 230VAC I/P : 115VAC O/P : NO LOAD Ta : 25°C	0.687W/ 230VAC 0.368W/ 115VAC
6	EFFICIENCY(Typ.)	89%	I/P:230 VAC O/P:FULL LOAD Ta:25°C	89.03%
	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 =30.9A/ 230VAC I =15.9A/ 115VAC T50=1040us/230V
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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	117.5%/ 264VAC 117.5%/ 230VAC 114.5%/ 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	16.4V/ 264VAC 16.4V/ 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: 100VAC 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 OK 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) Peak Voltage	Q1 Rated : 700V/13A	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) 580V (2) 572V (3) 580V (4) 580V (5) 580V (6) 580V (7) 576V
2	Diode Peak Voltage	Q100 Rated : 100V/94A	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	<u>VO=Vomax</u> VDS: (1) 78.9V (2) 84.0V (3) 76.1V (4) 81.2V (5) 76.1V

			(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=Vnormal</u> O/P: (1) Full Load Ta:25°C	(6) 68.2V (7) 83.4V (8) 64.8V <u>VO=Vnormal</u> (1) 72.7V
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) 375V (2) 375V (3) 375V (4) 371V
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) 17.2V (5) 17.2V U107 (1) 11.8V (2) 11.8V (3) 11.8V (4) 11.8V (5) 9.1V U100 (1) 9.1V (2) 9.1V (3) 9.1V (4) 9.1V (5) 7.9V
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) 470V (2) 466V

■ 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: 6.30 mA I/P - F G : 5.09 mA O/P - F G : 6.93 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 - 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	13mΩ

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-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= 50.0 °C																																																																																																																																										
		<table><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta= 25.0°C</th><th>HIGH AMBIENT Ta= 50.0°C</th></tr><tr><td>1</td><td>C1</td><td>39.8 °C</td><td>65.2 °C</td></tr><tr><td>2</td><td>LF2</td><td>53.9 °C</td><td>78.6 °C</td></tr><tr><td>3</td><td>RTH1</td><td>71.7 °C</td><td>90.5 °C</td></tr><tr><td>4</td><td>RTH2</td><td>78.9 °C</td><td>96.7 °C</td></tr><tr><td>5</td><td>R6</td><td>59.9 °C</td><td>81.4 °C</td></tr><tr><td>6</td><td>BD1</td><td>50.4 °C</td><td>74.1 °C</td></tr><tr><td>7</td><td>C5</td><td>51.8 °C</td><td>75.6 °C</td></tr><tr><td>8</td><td>C34</td><td>55.2 °C</td><td>79 °C</td></tr><tr><td>9</td><td>R50</td><td>62.6 °C</td><td>86.3 °C</td></tr><tr><td>10</td><td>Q1</td><td>60.5 °C</td><td>85.3 °C</td></tr><tr><td>11</td><td>RTH3</td><td>62 °C</td><td>85.3 °C</td></tr><tr><td>12</td><td>T1 Core</td><td>53.3 °C</td><td>77.1 °C</td></tr><tr><td>13</td><td>T1 Coil</td><td>78.3 °C</td><td>101.9 °C</td></tr><tr><td>14</td><td>C115</td><td>57.4 °C</td><td>81.2 °C</td></tr><tr><td>15</td><td>LF100</td><td>63 °C</td><td>87.2 °C</td></tr><tr><td>16</td><td>LF1</td><td>45 °C</td><td>70 °C</td></tr><tr><td>17</td><td>ZNR1</td><td>42.2 °C</td><td>67.4 °C</td></tr><tr><td>18</td><td>U2</td><td>51.4 °C</td><td>75.1 °C</td></tr><tr><td>19</td><td>U1</td><td>53.2 °C</td><td>77 °C</td></tr><tr><td>20</td><td>D10</td><td>78.1 °C</td><td>102.6 °C</td></tr><tr><td>21</td><td>Q2</td><td>68.7 °C</td><td>91.9 °C</td></tr><tr><td>22</td><td>C118</td><td>63.4 °C</td><td>87.2 °C</td></tr><tr><td>23</td><td>C107</td><td>63.3 °C</td><td>87.4 °C</td></tr><tr><td>24</td><td>C105</td><td>65.3 °C</td><td>89.7 °C</td></tr><tr><td>25</td><td>D14</td><td>52.4 °C</td><td>76.2 °C</td></tr><tr><td>26</td><td>C106</td><td>72.3 °C</td><td>96.8 °C</td></tr><tr><td>27</td><td>Q101</td><td>63.4 °C</td><td>88.4 °C</td></tr><tr><td>28</td><td>U100</td><td>76.1 °C</td><td>101 °C</td></tr><tr><td>29</td><td>U107</td><td>55.6 °C</td><td>79.4 °C</td></tr><tr><td>30</td><td>D102</td><td>70.9 °C</td><td>95.3 °C</td></tr><tr><td>31</td><td>Q200</td><td>78.3 °C</td><td>101.8 °C</td></tr><tr><td>32</td><td>D7</td><td>60.6 °C</td><td>83.9 °C</td></tr><tr><td>33</td><td>Q100</td><td>63.4 °C</td><td>88.1 °C</td></tr></table>			NO	Position	ROOM AMBIENT Ta= 25.0°C	HIGH AMBIENT Ta= 50.0°C	1	C1	39.8 °C	65.2 °C	2	LF2	53.9 °C	78.6 °C	3	RTH1	71.7 °C	90.5 °C	4	RTH2	78.9 °C	96.7 °C	5	R6	59.9 °C	81.4 °C	6	BD1	50.4 °C	74.1 °C	7	C5	51.8 °C	75.6 °C	8	C34	55.2 °C	79 °C	9	R50	62.6 °C	86.3 °C	10	Q1	60.5 °C	85.3 °C	11	RTH3	62 °C	85.3 °C	12	T1 Core	53.3 °C	77.1 °C	13	T1 Coil	78.3 °C	101.9 °C	14	C115	57.4 °C	81.2 °C	15	LF100	63 °C	87.2 °C	16	LF1	45 °C	70 °C	17	ZNR1	42.2 °C	67.4 °C	18	U2	51.4 °C	75.1 °C	19	U1	53.2 °C	77 °C	20	D10	78.1 °C	102.6 °C	21	Q2	68.7 °C	91.9 °C	22	C118	63.4 °C	87.2 °C	23	C107	63.3 °C	87.4 °C	24	C105	65.3 °C	89.7 °C	25	D14	52.4 °C	76.2 °C	26	C106	72.3 °C	96.8 °C	27	Q101	63.4 °C	88.4 °C	28	U100	76.1 °C	101 °C	29	U107	55.6 °C	79.4 °C	30	D102	70.9 °C	95.3 °C	31	Q200	78.3 °C	101.8 °C	32	D7	60.6 °C	83.9 °C	33	Q100	63.4 °C	88.1 °C
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 118 % 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 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) 226866.5 HRS (2) 41807.8 HRS (3) 84569.9 HRS (4) 160195 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