



# Test Report: EDR-120-48

---

120W Single Output Industrial DIN RAIL

## ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Component Stress Test

## ■ SAFETY & E.M.C. TEST

Safety Test

E.M.C. Test

## ■ RELIABILITY TEST

ENVIRONMENT TEST

## ■ DESIGN VERIFY TEST

MODEL : EDR-120-48

DVT TEST

### OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 150 mVp-p (Max)	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	V1: 46.2 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 48V~55V	I/P: 230VAC/115VAC O/P: MIN LOAD Ta: 25°C	46.89V~57.71V/230VAC 46.89V~57.71V/115VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1: 1%~ -1% (Max)	I/P: 100VAC / 264VAC O/P: FULL / MIN. LOAD Ta: 25°C	V1: -0.012%~ -0.037%	P
4	LINE REGULATION	V1: 0.5%~ -0.5% (Max)	I/P: 100VAC~264VAC O/P: FULL LOAD Ta: 25°C	V1: 0%~ 0.012%	P
5	LOAD REGULATION	V1: 1%~ -1% (Max)	I/P: 230VAC O/P: FULL ~ MIN LOAD Ta: 25°C	V1: -0.012%~ -0.037%	P
6	SET UP TIME	230VAC/1200ms (Max) 115VAC/2500ms (Max)	I/P: 230VAC/115VAC O/P: FULL LOAD Ta: 25°C	230VAC/721.035ms 115VAC/1577.984ms	P
7	RISE TIME	230VAC/60ms (Max) 115VAC/60ms (Max)	I/P: 230VAC/115VAC O/P: FULL LOAD Ta: 25°C	230VAC/39.107ms 115VAC/39.458ms	P
8	HOLD UP TIME	230VAC/16ms (TYP.) 115VAC/10ms (TYP.)	I/P: 230VAC/115VAC O/P: FULL LOAD Ta: 25°C	230VAC/62.265ms 115VAC/13.687ms	P
9	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	<5%	P
10	DYNAMIC LOAD	V1: 4800 mVp-p	I/P: 230VAC O/P(1) FULL / Min LOAD 90% DUTY / 1KHZ (2) (1) FULL / Min LOAD 90% DUTY / 3KHZ (3) FULL / Min LOAD 90% DUTY / 5KHZ (4) FULL / Min LOAD 50% DUTY / 120HZ Ta: 25°C	219mVp-p 195mVp-p 182mVp-p 368mVp-p	P

### INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	90VAC~264 VAC 127VDC ~ 370VDC	I/P: TESTING O/P: FULL LOAD Ta: 25°C	(1) 66.043 V ~ 264V (2) 114.26Vdc ~ 370Vdc / FULL LOAD 114.25Vdc ~ 370Vdc / 50% LOAD (3) 114.26Vdc ~ 370Vdc / FULL LOAD 114.26Vdc ~ 370Vdc / 50% LOAD	P
			I/P: (1) LOW-LINE - 3V = 87 V HIGH-LINE + 15% = 300 V O/P: FULL / MIN LOAD ON: 30 Sec OFF: 30 Sec 10MIN (2) 230Vac ON: 0.5 Sec OFF: 0.5 Sec 20MIN (3) 230Vac ON: 3Sec OFF: 3Sec 12HOURS (POWER ON/OFF NO DAMAGE)	TEST: OK	
2	INPUT FREQUENCY RANGE	47HZ ~ 63 HZ NO DAMAGE OSC	I/P: 100 VAC ~ 264 VAC O/P: FULL ~ MIN LOAD Ta: 25°C	TEST: OK	P
4	EFFICIENCY	88.5% (Typ)	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	90.31%	P
5	INPUT CURRENT	230V/ 1.3A (Typ) 115V/ 2.25 A (Typ)	I/P: 230 VAC/115VAC O/P: FULL LOAD Ta: 25°C	I = 0.97A/ 230VAC I = 1.91A/ 115VAC	P
6	INRUSH CURRENT	230V/35A (Typ) 115V/20A (Typ) COLD START	I/P: 230VAC/115VAC O/P: FULL LOAD Ta: 25°C	I = 33.554A/ 230VAC I = 17.573A/ 115VAC	P

## PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105%~130% RATED OUTPUT POWER	I/P: 264VAC I/P: 230VAC I/P: 100VAC O/P: TESTING Ta: 25°C	116.0%/ 264VAC 115.6%/ 230VAC 116.8%/100VAC Protection type : Constant current limiting, recovers automatically after fault condition is removed	P
2	OVER VOLTAGE PROTECTION	CH: 56V~65V(Typ)	I/P: 264VAC I/P: 230VAC I/P: 90VAC O/P: MIN LOAD Ta: 25°C	62.16V/ 264VAC 62.35V/ 230VAC 62.37V/90VAC Protection type : Shut down o/p voltage, re-power on to recover	P
3	OVER TEMPERATURE PROTECTION	SPEC: NO DAMAGE	I/P: 230 VAC O/P: FULL LOAD	O.T.P. Active Shut down o/p voltage, re-power on to recover	P
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264VAC O/P: FULL LOAD Ta: 25°C	NO DAMAGE Constant Current Limiting	P

## COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor ( D to S) or (C to E) <b>Peak Voltage</b>	Q1 Rated 11 A/600 V	I/P:High-Line +3V =267V O/P: (1)Full Load input on/off (2)Output Short (3)FULL LOAD CONTINUE Ta:25°C	(1)510V (2)390V (3)502V	P
2	Diode <b>Peak Voltage</b>	D100 Rated 20A/300V	I/P:High-Line +3V =267 V O/P: (1)Full Load input on/off (2)Output Short (3)FULL LOAD CONTINUE Ta:25°C	(1) 274V (2)- 251V (3) 249V	P
3	<b>Input Capacitor Voltage</b>	C5 Rated: 180U/400V	I/P:High-Line +3V =267 V O/P: (1)Full Load input on/off (2) Min load input on /Off (3)Burn-IN 1Hour Ta:25°C	(1)366V (2)366V (3)362V	P
4	<b>Control IC Voltage Test</b>	PWM IC U1 1380 Rated 28 V(MAX) 9 V(MIN.)	I/P:High-Line +3V =267 V O/P:(1)FULL LOAD (2) Output Short (3)NO LOAD VR 下限.LOW LINE Ta:25°C	(2) 17.2V (3) 17.0V (4) 17.4V	P

## SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	EN 60950 I/P-O/P: 3KVAC/min I/P-FG: 2 KVAC/min O/P-FG:0.5KVAC/min	I/P-O/P: 3.6 KVAC/min I/P-FG: 2.4 KVAC/min O/P-FG:0.6 KVAC/min Ta:25°C	I/P-O/P:3.188mA I/P-FG:3.69mA O/P-FG:3.93m A NO DAMAGE	P
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ I/P-FG: 500VDC>100MΩ O/P-FG:500VDC>100MΩ	I/P-O/P: 500 VDC I/P-FG: 500 VDC O/P-FG: 500 VDC Ta:25°C	I/P-O/P: 9999MΩ I/P-FG: 9999MΩ O/P-FG: 9999MΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	EN 60950 FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25°C	15mΩ BY CASE	P
4	LEAKAGE CURRENT	EN 60950 1mA< 240VAC	I/P:240 VAC O/P:Min LOAD Ta:25°C	L-FG:0.295mA N-FG:0.295:Ma	P

## E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
----	-----------	---------------	----------------	--------	---------

1	HARMONIC	BS EN/EN61000-3-2 CLASS A	I/P:230VAC/50HZ O/P:100%LOAD Ta:25°C	PASS	P
2	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	P
3	E.F.T	BS EN/EN61000-4-4 INDUSTRY INPUT: 2KV	I/P: 230VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A	P
4	SURGE	BS EN/EN61000-4-5 INDUSTRY L-N :2KV L,N-PE:4KV	I/P: 230VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A	P

## RELIABILITY TEST

### ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																								
1	TEMPERATURE RISE TEST	MODEL : EDR-120-12 1. ROOM AMBIENT BURN-IN : 1HRS I/P : 230VAC O/P : FULL LOAD Ta=23.0°C 2. HIGH AMBIENT BURN-IN : 1 HRS I/P : 230VAC O/P : FULL LOAD Ta=43.5°C	<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=23.0°C</th> <th>HIGH AMBIENT Ta=43.5°C</th> </tr> </thead> <tbody> <tr><td>1</td><td>U1</td><td>55.6°C</td><td>75.2°C</td></tr> <tr><td>2</td><td>U107</td><td>50.0°C</td><td>70.9°C</td></tr> <tr><td>3</td><td>C5</td><td>53.0°C</td><td>73.0°C</td></tr> <tr><td>4</td><td>Q1</td><td>71.2°C</td><td>91.3°C</td></tr> <tr><td>5</td><td>T1</td><td>83.7°C</td><td>103.5°C</td></tr> <tr><td>6</td><td>C105</td><td>65.7°C</td><td>86.8°C</td></tr> <tr><td>7</td><td>D5</td><td>95.3°C</td><td>115.9°C</td></tr> <tr><td>8</td><td>C36</td><td>76.3°C</td><td>95.4°C</td></tr> <tr><td>9</td><td>BD1</td><td>58.7°C</td><td>78.8°C</td></tr> <tr><td>10</td><td>D100</td><td>68.3°C</td><td>88.1°C</td></tr> <tr><td>11</td><td>D101</td><td>73.3°C</td><td>93.9°C</td></tr> <tr><td>12</td><td>RTH2</td><td>74.3°C</td><td>94.9°C</td></tr> <tr><td>13</td><td>LF2</td><td>78.5°C</td><td>98.4°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta=23.0°C	HIGH AMBIENT Ta=43.5°C	1	U1	55.6°C	75.2°C	2	U107	50.0°C	70.9°C	3	C5	53.0°C	73.0°C	4	Q1	71.2°C	91.3°C	5	T1	83.7°C	103.5°C	6	C105	65.7°C	86.8°C	7	D5	95.3°C	115.9°C	8	C36	76.3°C	95.4°C	9	BD1	58.7°C	78.8°C	10	D100	68.3°C	88.1°C	11	D101	73.3°C	93.9°C	12	RTH2	74.3°C	94.9°C	13	LF2	78.5°C	98.4°C		P
NO	Position	ROOM AMBIENT Ta=23.0°C	HIGH AMBIENT Ta=43.5°C																																																										
1	U1	55.6°C	75.2°C																																																										
2	U107	50.0°C	70.9°C																																																										
3	C5	53.0°C	73.0°C																																																										
4	Q1	71.2°C	91.3°C																																																										
5	T1	83.7°C	103.5°C																																																										
6	C105	65.7°C	86.8°C																																																										
7	D5	95.3°C	115.9°C																																																										
8	C36	76.3°C	95.4°C																																																										
9	BD1	58.7°C	78.8°C																																																										
10	D100	68.3°C	88.1°C																																																										
11	D101	73.3°C	93.9°C																																																										
12	RTH2	74.3°C	94.9°C																																																										
13	LF2	78.5°C	98.4°C																																																										
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR ( MIN )	I/P : 230 VAC O/P : 108% LOAD Ta : 25°C	TEST : OK	P																																																								
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 264VAC/100VAC O/P : 100 % LOAD Ta= -20°C	TEST : OK	P																																																								



# 120W Single Output Industrial DIN RAIL EDR-120 series

4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL45°C NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta=45°C HUMIDITY= 95 %R.H	TEST : OK	P
5	TEMPERATURE COEFFICIENT	±0.03%/°C (0~50°C)	I/P : 230 VAC O/P : FULL LOAD	0%/°C (0~50°C)	P
6	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -40°C~ +85°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 5 CYCLE 5. Input/Output condition : STATIC		OK	P
7	THERMAL SHOCK TEST	1. Thermal shock Temperature : -20°C~ +70°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 : 230VAC/Full Load AC ON/OFF TEST turn on 58sec ; turn off 2sec		OK	P
8	VIBRATION TEST	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 12min/sweep cycle (4) Acceleration : 2G (5) Test Time : 60min in each axis (X.Y.Z) (6) Ta : 25°C		TEST : OK	P
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=45°C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta=45°C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta=45°C LIFE TIME		(1) 132585HRS (2) 32658HRS (3) 48474HRS (4) 93765HRS	P
10	MTBF	2718.3K hrs min. Telcordia SR-332 (Bellcore) ; 474.7K hrs min. MIL-HDBK-217F (25°C)			P
11	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): Above 50,000 hours @ TA 50°C			P

SAMPLE	TESTER	APPROVAL
PRODUCT SAMPLE	FRANK	WANGDZ

2007/3/20 A50-S014