



Test Report: DDR-120C-48

120W DC-DC DIN Rail Power Supply

■ 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

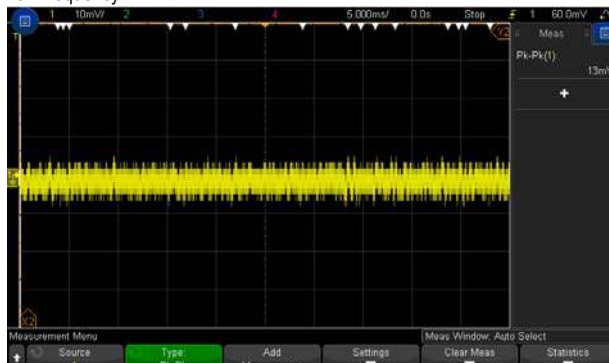
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1:48 V~56 V	I/P : 48 VDC O/P : MIN LOAD Ta : 25°C	47.1V~57.5V
2	OUTPUT VOLTAGE TOLERANCE (Max)	V1: -1 %~1 %	I/P:33.6VDC /67.2VDC O/P:FULL/ MIN. LOAD Ta:25°C	V1: -0.08%~0.15 %
3	LINE REGULATION (Max)	V1: -0.5 %~0.5 %	I/P: 33.6VDC / 67.2 VDC O/P:FULL LOAD Ta:25°C	V1: -0.08%~0.08%
4	LOAD REGULATION (Max)	V1: -1 %~ 1 %	I/P:48VDC O/P:FULL ~MIN LOAD Ta:25°C	V1: -0.08%~0.15 %
5	OVER/UNDERSHOOT TEST	< ±5%	I/P: 48VDC O/P:FULL LOAD Ta:25°C	TEST: 1.2%
6	RIPPLE & NOISE (Max)	V1: 50mVp-p	I/P: 48VDC O/P:FULL LOAD Ta:25°C	V1: 13 mVp-p

high frequency :



low frequency :

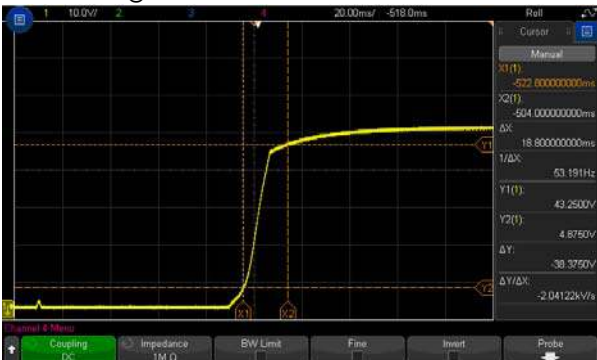
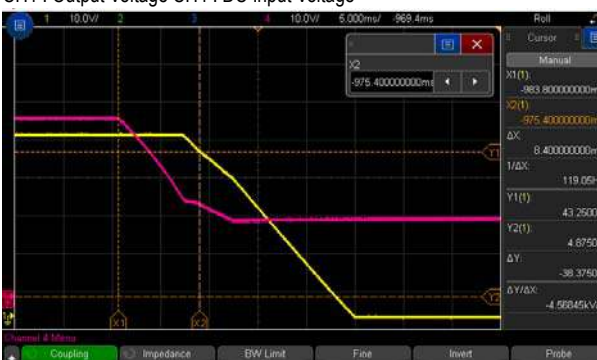
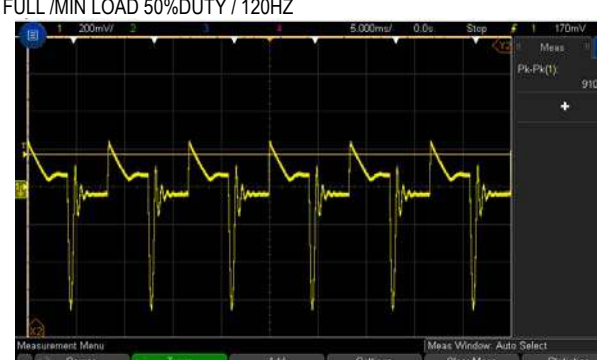


7	SET UP TIME (Max)	48VDC/ 500 ms	I/P: 48VDC O/P:FULL LOAD Ta:25°C	48VDC/ 371 ms
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INPUT=48VDC @ FULL LOAD

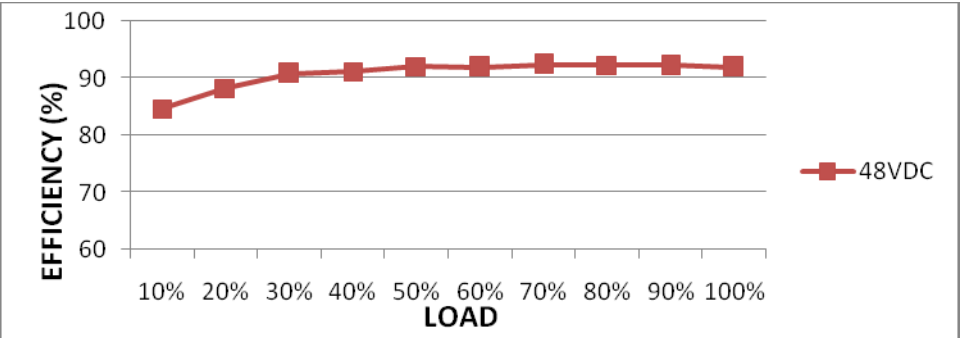
CH1 : Output Voltage CH4 : DC Input Voltage



8	RISE TIME (Max)	48VDC/ 60 ms	I/P: 48 VDC O/P: FULL LOAD Ta: 25°C	48VDC/ 18.8 ms
	INPUT=48VDC @ FULL LOAD 			
9	HOLD UP TIME (TYP)	48VDC/ 6 ms @FULL LOAD 48VDC/ 10ms@60%LOAD	I/P: 48VDC O/P: FULL LOAD Ta: 25°C	48VDC/8.4 ms@FULL LOAD 48VDC/ 11.8ms@60%
	INPUT=48VDC @ FULL LOAD CH1 : Output Voltage CH4 : DC Input Voltage 			
10	DYNAMIC LOAD	V1: 1200 mVp-p	I/P: 48VDC O/P: (1) FULL / MIN LOAD 50% DUTY / 120HZ (2) FULL / MIN LOAD 50% DUTY / 1KHZ Ta: 25°C	910mVp-p 1650mVp-p
	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	33.6VDC~ 67.2VDC	I/P: TESTING O/P: FULL LOAD Ta: 25°C	28.715V~67.2V

			I/P: LOW-LINE-0.2= 33.4 V HIGH-LINE+3V= 70.2 V 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 CURRENT(TYP)	48VDC/ 2.8 A	I/P: 48VDC O/P:FULL LOAD Ta:25°C	I =2.687 A/ VDC
3	EFFICIENCY(TYP)	92 %	I/P: 48VDC O/P:FULL LOAD Ta:25°C	92.10%
EFFICIENCY vs LOAD 				
4	INRUSH CURRENT(TYP)	48VDC/ 5A COLD START	I/P: 48VDC O/P:FULL LOAD Ta:25°C	I = 3.75A/ 48VDC
INPUT=48VDC @ FULL LOAD 				

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	105%~135%RATED OUTPUT POWER	I/P: 67.2VDC I/P: 48VDC I/P: 33.6VDC O/P:TESTING Ta:25°C	121.28%/ 67.2VDC 122.1%/48VDC 123.98%/ 33.6VDC PROTECTION TYPE : Normally works within 105~150% rated output power for more than 3 seconds and then constant current protection with auto-recovery >150% rated power ,constant current limiting with auto-recovery
2	OVER VOLTAGE PROTECTION	CH: 57.6 V~67.2V	I/P: 67.2VDC I/P: 48VDC I/P: 33.6VDC O/P:MIN LOAD Ta:25°C	61.7V/67.2VDC 61.7V/48 VDC 61.3V/ 33.6 VDC PROTECTION TYPE : Shut down O/P voltage,re-power on to recover

3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 67.2 VDC O/P: FULL LOAD Ta:25°C	NO DAMAGE PROTECTION TYPE : Normally works within 105~150% rated output power for more than 3 seconds and then constant current protection with auto-recovery >150% rated power ,constant current limiting with auto-recovery
4	INPUT REVERSE	POWER OK	I/P:67.2 VDC O/P: NO LOAD Ta:25°C	NO DAMAGE

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q 5 Rated : 200 V Q 6 Rated : -200 V	I/P:High-Line +3V =70.2V DC ON/OFF VDS: O/P: (1)Full Load (2)Output Short (3)Full Load Continue Ta:25°C	Q5 VDS: (1) 113.6V (2) 91.9V (3) 107.9V Q6 VDS: (1) -109.6V (2)- 82.2V (3) -103.1V
2	Diode Peak Voltage	Q100 Rated : 400V Q101 Rated : 400V	I/P:High-Line +3V =70.2 V DC ON/OFF O/P: (1)Full Load (2)Output Short (3)Full Load Continue Ta:25°C	Q100: VDS: (1) 197V (2) 75.8V (3) 91.1V Q101 VDS: (1)292 V (2) 308V (3)292V
3	Input Capacitor Voltage	C5 Rated: : 330 μ / 80 V	I/P:High-Line +3V =70.2 V 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	C5: (1) 71.7V (2)71.7 V (3) 71.3V (4) 71.3V
4	Control IC Voltage Test	PWM IC U1 Rated -0.3V~16V	I/P:High-Line +3V =70.2 V DC ON/OFF O/P(1)FULL LOAD (2) Output Short (3)O.L.P (4)O.V.P. Ta:25°C	U1: (1) 14.7 V (2) 14.5 V (3) 14.7 V (4) 14.7V

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P:4KVDC/min I/P-FG:2.5 KVDC/min O/P-FG:2.5 KVDC/min	I/P-O/P: 4.4KVDC/min I/P-FG: 3 KVDC/min O/P-FG:3KVDC/min Ta:25°C	I/P-O/P: 0 mA I/P-FG: 0 mA O/P-FG: 0 mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100M Ω I/P-FG: 500VDC>100M Ω O/P-FG:500VDC>100M Ω	I/P-O/P: 500 VDC I/P-FG: 500 VDC O/P-FG: 500 VDC Ta:25°C	I/P-O/P: 9999M Ω I/P-FG: 9999 M Ω O/P-FG:9999 M Ω NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 m Ω	40A / 2min Ta:25°C	10m Ω



E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	RADIATION	☒ EN55032 ☐ EN55011 ☐ CLASS A ☒ CLASS B	I/P: 48 VDC O/P: FULL LOAD Ta: 25°C	☒ PASS ☐ FAIL Test by certified Lab
2	CONDUCTION	☒ EN55032 ☐ EN55011 ☐ CLASS A ☒ CLASS B	I/P: 48 VDC O/P: FULL LOAD Ta: 25°C	☒ PASS ☐ FAIL Test by certified Lab
3	E.S.D	EN61000-4-2 ☐ Din rail Model; AIR: 8KV / Contact: 6KV	I/P: 48 VDC O/P: FULL LOAD Ta: 25°C	☒ CRITERIA A ☐ CRITERIA B
4	E.F.T	EN61000-4-4 ☐ INDUSTRY INPUT: 2KV	I/P: 48 VDC O/P: FULL LOAD Ta: 25°C	☒ CRITERIA A ☐ CRITERIA B
5	SURGE	IEC61000-4-5 ☐ INDUSTRY L-N : 1KV L,N-FG: 2KV	I/P: 48 VDC O/P: FULL LOAD Ta: 25°C	☒ CRITERIA A ☐ CRITERIA B
6	Test by certified Lab & Test Report Prepare			

■ RELIABILITY TEST

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	TEMPERATURE RISE TEST	MODEL : DDR-120C-12 1. ROOM AMBIENT BURN-IN : 1 HRS I/P : 48VDC O/P : FULL LOAD Ta= 23.1 °C 2. HIGH AMBIENT BURN-IN : 1 HRS I/P : 48VDC O/P : FULL LOAD Ta= 50.8 °C		

			NO	Position	ROOM AMBIENT Ta= 23.1 °C	HIGH AMBIENT Ta= 50.8 °C
			1	LF1	50.5°C	81.6°C
			2	LF2	46.6°C	77.3°C
			3	LF100	60.5°C	90.7°C
			4	T1	58.2°C	88.4°C
			5	T2	53.2°C	83.5°C
			6	Q1	48.1°C	79.3°C
			7	Q2	48.3°C	79.5°C
			8	Q5	56.3°C	88.7°C
			9	Q6	54.6°C	85.3°C
			10	Q100	61.4°C	94.1°C
			11	Q101	63.6°C	95.9°C
			12	L100	64.8°C	96.0°C
			13	C1	49.7°C	80.7°C
			14	C5	47.2°C	78.6°C
			15	C6	48.3°C	78.4°C
			16	C7	51.6°C	81.6°C
			17	C101	61.6°C	91.7°C
			18	C102	61.1°C	91.7°C
			19	C104	56.3°C	85.8°C
			20	C106	56.0°C	87.3°C
			21	ZNR1	44.0°C	74.6°C
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 48 VDC O/P : 119% LOAD Ta : 25°C		TEST : OK	
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 43.2 VDC/ 67.2 VDC O/P : 100 % LOAD Ta= -45 °C		TEST : OK	
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 55 °C NO DAMAGE	I/P : 70.2 VDC O/P : FULL LOAD Ta= 55 °C HUMIDITY= 95 %R.H		TEST : OK	
5	TEMPERATURE COEFFICIENT	± 0.03 %(0~55°C)	I/P : 48 VDC O/P : FULL LOAD		± 0.003 %(0~55°C)	
6	STORAGE TEMPERATURE TEST	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			TEST : OK	
7	THERMAL SHOCK TEST	1. Thermal shock Temperature : -45°C~ +60°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 : 48VDC/Full Load DC ON/OFF TEST turn on 3sec ; turn off 1sec@15cycle\ 48VDC/Full Load DC ON@1cycle			TEST : OK	
8	VIBRATION TEST	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 10min/sweep cycle (4) Acceleration : 5G (5) Test Time : 60min in each axis (X.Y.Z) (6) Ta : 25°C			TEST : OK	



120W DC-DC DIN Rail Power Supply

DDR-120C series

		<table><tr><td colspan="3">2 Din Rail</td></tr><tr><td></td><td>Displacement</td><td>Acceleration</td></tr><tr><td>2 (+3/-0) Hz up to 15Hz</td><td>± 2.5mm</td><td>-----</td></tr><tr><td>15Hz up to 50Hz</td><td>-----</td><td>2.3g</td></tr><tr><td>Sweep rate</td><td colspan="2">Max 1 Octave/minute</td></tr></table>	2 Din Rail				Displacement	Acceleration	2 (+3/-0) Hz up to 15Hz	± 2.5mm	-----	15Hz up to 50Hz	-----	2.3g	Sweep rate	Max 1 Octave/minute		
2 Din Rail																		
	Displacement	Acceleration																
2 (+3/-0) Hz up to 15Hz	± 2.5mm	-----																
15Hz up to 50Hz	-----	2.3g																
Sweep rate	Max 1 Octave/minute																	
9	CAPACITOR LIFE CYCLE	SUPPOSE C102 IS THE MOST CRITICAL COMPONENT (1) I/P : 48VDC O/P : FULL LOAD Ta= 25 °C LIFE TIME (2) I/P : 48VDC O/P : FULL LOAD Ta= 55 °C LIFE TIME (3) I/P : 48VDC O/P : 75% LOAD Ta= 55 °C LIFE TIME (4) I/P : 48VDC O/P : 50% LOAD Ta= 55 °C LIFE TIME	(1) 150348.4 HRS (2) 21758.8 HRS (3) 50933.8 HRS (4) 120805 HRS															
10	MTBF	Conducted by Parts Stress Analysis Prediction 214.6K hrs min. MIL-HDBK-217F (25°C)																
11	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): Above 30,000 hours @ TA 55°C																

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	LIUTT		WANGDZ

12.10.30 A50-F031