



# Test Report: RSD-100C-12

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100W Single Output DC-DC Converter

## ■ 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

### OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1 : 120 mVp-p (Max)	I/P : 48VDC O/P : FULL LOAD Ta : 25°C	V1 : 99.2 mVp-p (Max)	P
2	OUTPUT VOLTAGE TOLERANCE	V1 : 2%~ -2% (Max)	I/P : 28.8 VDC / 67.2VDC O/P : FULL/ MIN LOAD Ta : 25°C	V1 : 0.11 %~ -0.11 %	P
3	LINE REGULATION	V1 : 0.3%~ -0.3% (Max)	I/P : 28.8VDC ~ 67.2VDC O/P : FULL LOAD Ta : 25°C	V1 : 0.05 %~ -0.05 %	P
4	LOAD REGULATION	V1 : 1%~ -1% (Max)	I/P : 48VDC O/P : FULL ~MIN LOAD Ta : 25°C	V1 : 0.1 %~ -0.1 %	P
5	SET UP TIME	48VDC : 800 ms (Max)	I/P : 48VDC O/P : FULL LOAD Ta : 25°C	48VDC/ 24 ms	P
6	RISE TIME	48VDC : 50 ms (Max)	I/P : 48VDC O/P : FULL LOAD Ta : 25°C	48VDC/ 7 ms	P
7	HOLD UP TIME	48VDC : 3 ms (Typ.)	I/P : 48VDC O/P : FULL LOAD Ta : 25°C	48VDC/ 9.2 ms	P
8	OVER/UNDERSHOOT TEST	< ±5%	I/P : 48VDC O/P : FULL LOAD Ta : 25°C	TEST : <5 %	P
9	DYNAMIC LOAD	V1 : 1200 mVp-p	I/P : 48VDC (1).O/P : FULL /Min LOAD 90%DUTY/ 1KHZ (2).O/P : FULL /Min LOAD 50%DUTY/ 120HZ Ta : 25°C	(1)212 mVp-p (2)344 mVp-p	P

### INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	28.8VDC~67.2VDC	I/P : TESTING O/P : FULL LOAD Ta : 25°C	25.4 VDC~67.2VDC	P
			I/P : LOW-LINE=28.6V HIGH-LINE=70.56 V O/P : FULL/MIN LOAD ON : 30 Sec . OFF : 30 Sec 10MIN ( DC POWER ON/OFF NO DAMAGE )	TEST : OK	
2	EFFICIENCY	91 % (TYP)	I/P : 48VDC O/P : FULL LOAD Ta : 25°C	92.73 %	P
3	INPUT CURRENT	48VDC/ 2.4 A (TYP)	I/P : 48VDC O/P : FULL LOAD Ta : 25°C	I = 2.25 A/ 48VDC	P
4	INRUSH CURRENT	48VDC/ 30 A (TYP)  COLD START	I/P : 48VDC O/P : FULL LOAD Ta : 25°C	I = 24 A/ 48VDC	P

### PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105 % ~ 135 %	I/P : 48VDC O/P : TESTING Ta : 25°C	119 %/ 48VDC Constant Current Limiting	P
2	OVER VOLTAGE PROTECTION	CH1 : 13.8 V ~ 16.2 V	I/P : 48VDC O/P : MIN LOAD Ta : 25°C	14.665 V/ 48VDC Shut down Re- power on to recover	P
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P : 67.2VDC O/P : FULL LOAD Ta : 25°C	NO DAMAGE Constant Current Limiting recover automatically after fault condition is removed	

### COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q 2 Rated : SM2A01NF 65A/200V	I/P : High-Line +3V =70.2V O/P : (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25°C	(1) 139 V (2) 114 V (3) 110 V	P
2	Diode Peak Voltage	Q104 Rated : IRFB3607PBF 80A/75V	I/P : High-Line +3V = 70.2V O/P : (1)Full Load Turn on (2)Output Short (3)Full load continue Ta : 25°C	(1) 74 V (2) 73 V (3) 73 V	P
3	Input Capacitor Voltage	C5 Rated : 330u/100V L10Kh 16*25 YXF	I/P : High-Line +3V = 70.2V O/P : (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta : 25°C	(1) 70.31 V (2) 70.61 V (3) 70.1 V	P
4	Control IC Voltage Test	U 1 Rated : PWM LM5026MT 7.3V~16V	I/P : High-Line +3V = 70.2V O/P : (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta : 25°C	(1) 14.396 V (2) 14.386 V (3) 14.405 V	P

## ■ SAFETY & E.M.C. TEST

### SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P : 4 KVDC/min I/P-FG : 2.5 KVDC/min O/P-FG : 2.5 KVDC/min	I/P-O/P : 4.4 KVDC/min I/P-FG : 3 KVDC/min O/P-FG : 3 KVDC/min Ta : 25°C	I/P-O/P : 0.002 mA I/P-FG : 0.002 mA O/P-FG : 0.002 mA 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 /70%RH	I/P-O/P : 30 GΩ I/P-FG : 30 GΩ O/P-FG : 30 GΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta : 25°C / 70%RH	14 mΩ	P
4	APPROVAL	TUV : Certificate NO : UL : File NO :			N/A

**E.M.C TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RADIATION	EN55022 CLASS B	I/P : 48VDC O/P : FULL LOAD Ta : 25°C	PASS Test by certified Lab	P
2	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR : 8KV / Contact : 4KV	I/P : 48VDC O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
3	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT : 0.5KV	I/P : 48VDC O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
4	SURGE	IEC61000-4-5 MEDICAL LIGHT INDUSTRY L-N : 0.5KV L,N-PE : 0.5KV	I/P : 48VDC O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
5	Test by certified Lab & Test Report Prepare				

## RELIABILITY TEST

### ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	TEMPERATURE RISE TEST	MODEL : RSD-100B-5 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 24VDC O/P : FULL LOAD Ta=28.7℃ ℃ 2. HIGH AMBIENT BURN-IN : 16 HRS I/P : 24VDC O/P : FULL LOAD Ta=50.9℃ ℃			P
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR ( MIN )	I/P : 48VDC O/P : 118 % LOAD Ta : 25℃	TEST : OK	P
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 33.6VDC/62.4VDC O/P : 100 % LOAD Ta= -40 ℃	TEST : OK	P
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 55 ℃ NO DAMAGE	I/P : 62.4 VDC O/P : FULL LOAD Ta=55℃ HUMIDITY= 95%R.H	TEST : OK	P
5	TEMPERATURE COEFFICIENT	± 0.03 % (0~50℃)	I/P : 48VDC O/P : FULL LOAD	± 0.009 % (0~50℃)	P
6	STORAGE TEMPERATURE TEST	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 : 5 CYCLE 5. Input/Output condition : STATIC		OK	P
7	THERMAL SHOCK TEST	1. Thermal shock Temperature : -45℃~ +55℃ 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 : 48VDC/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 : 5G (5) Test Time : 60min in each axis (X.Y.Z) (6) Ta : 25°C	TEST : OK	P
9	CAPACITOR LIFE CYCLE	RSD-100B-5.SUPPOSE C105 IS THE MOST CRITICAL COMPONENT (1) I/P : 24VDC O/P : FULL LOAD Ta= 25 °C LIFE TIME (2) I/P : 24VDC O/P : FULL LOAD Ta= 55 °C LIFE TIME (3) I/P : 24VDC O/P : 75% LOAD Ta= 55 °C LIFE TIME (4) I/P : 24VDC O/P : 50% LOAD Ta= 55 °C LIFE TIME	(1) 95232HRS (2) 13920HRS (3) 39456HRS (4) 95904HRS	P
10	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE : 254.1K HRS		P
11	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure(Expected Life) : 30,000 hours @ TA 55°C		P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2011/2/9	RD SAMPLE	PASS	SANFORD SU	VINCENT TSENG
2011/4/6	PRODUCT SAMPLE	PASS	SANFORD SU	VINCENT TSENG

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