



# Test Report: SD-25A-24

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25W Single Output DC-DC Converter

## ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function 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: 23V~30V	I/P : 12 VDC O/P : MIN LOAD Ta : 25°C	19.98V~33.84V
2	OUTPUT VOLTAGE(Max) TOLERANCE	V1: -1.0%~1.0%	I/P:9.2VDC ~18VDC O/P:FULL/ MIN. LOAD Ta:25°C	V1 : -0.03%~0.00%
3	LINE REGULATION (Max)	V1: -0.2%~0.2%	I/P: 9.2VDC ~18VDC O/P:FULL LOAD Ta:25°C	V1 : -0.00%~0.00%
4	LOAD REGULATION(Max)	V1: -0.2%~0.2%	I/P:12 VDC O/P:FULL ~MIN LOAD Ta:25°C	V1 : -0.03%~0.00%
5	RIPPLE & NOISE(Max )	V1: 150mVp-p	I/P: 12 VDC O/P:FULL LOAD Ta:25°C	V1: 12mVp-p
6	SET UP TIME(Max)	12VDC/2500ms	I/P : 12 VDC O/P : FULL LOAD Ta : 25°C	248.47ms
7	RISE TIME (Max)	12VDC/50ms	I/P : 12 VDC O/P : FULL LOAD Ta : 25°C	8.917ms

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	9.2VDC ~18VDC	I/P:TESTING O/P:FULL LOAD Ta:25°C	8.4VDC~18VDC
2	INPUT CURRENT (Typ.)	12V/ 3.2A	I/P : 12 VDC O/P : FULL LOAD Ta : 25°C	I =2.77A/ 12VDC
3	EFFICIENCY(Typ.)	75%	I/P: 12 VDC O/P:FULL LOAD Ta:25°C	75.6%
4	INRUSH CURRENT(Typ.)	NONE	I/P : 12 VDC O/P : FULL LOAD Ta : 25°C	I =29.5 A/ 12VDC

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	105%~150% rated output power	I/P: 12VDC O/P:TESTING Ta:25°C	136.8%/ 12VDC PROTECTION TYPE : Hiccup mode, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	31.5V~37.5V	I/P: 12VDC O/P:10% LOAD Ta:25°C	33.98V/ 12VDC PROTECTION TYPE : Hiccup mode, recovers automatically after fault condition is removed

3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 12VDC O/P: FULL LOAD Ta:25°C	NO DAMAGE PROTECTION TYPE : Hiccup mode, recovers automatically after fault condition is removed
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## SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 1.5KVAC/min I/P-FG:2 KVAC/min O/P-FG: 0.5KVAC/min	I/P-O/P: 1.5 KVAC/min I/P- FG: 2.0 KVAC/min O/P - FG: 0.5 KVAC/min Ta:25°C	PASS NO DAMAGE
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 Ta:25°C	PASS NO DAMAGE

## E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONDUCTION	EN55032 CLASS B	I/P : 12 VDC O/P : FULL/50% LOAD Ta : 25°C	PASS Test by certified Lab
2	RADIATION	EN55032 CLASS B	I/P : 12 VDC O/P : FULL LOAD Ta : 25°C	PASS Test by certified Lab
3	E.S.D	EN61000-4-2 AIR: 8KV / Contact: 4KV	I/P : 12 VDC O/P : FULL LOAD Ta : 25°C	CRITERIA A
4	E.F.T	EN61000-4-4 INPUT : 1KV	I/P : 12 VDC O/P : FULL LOAD Ta : 25°C	CRITERIA A
5	SURGE	IEC61000-4-5 L-N : 1KV	I/P : 12 VDC O/P : FULL LOAD Ta : 25°C	CRITERIA A
6	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 : SD-25A-5 1. ROOM AMBIENT BURN-IN : 1.5 HRS I/P : 12VDC O/P : FULL LOAD Ta= 25 °C 2. HIGH AMBIENT BURN-IN : 1.5 HRS I/P : 12VDC O/P : FULL LOAD Ta= 40.5 °C		



# 25W Single Output DC-DC Converter

# RD-25 series

		NO	Position	ROOM AMBIENT Ta= 25 °C	HIGH AMBIENT Ta= 40.5 °C
		1	LF1	57.6°C	74.2°C
		2	T1	67.5°C	83.3°C
		3	Q1	83.8°C	97.4°C
		4	C5	73.2°C	86.9°C
		5	U1	64.4°C	79.5°C
		6	C33	51.4°C	67.6°C
		7	D11	85.1°C	99.6°C
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR ( MIN )		I/P : 12 VDC O/P : 127% LOAD Ta : 25°C	TEST : OK
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR		I/P : 9.2VDC/18VDC O/P : 100 % LOAD Ta= -10 °C	TEST : OK
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 40°C / 95 %R.H NO DAMAGE		I/P : 18 VDC O/P : FULL LOAD Ta= 40 °C HUMIDITY= 95 %R.H	TEST : OK
5	TEMPERATURE COEFFICIENT	± 0.03%/°C (0~50°C)		I/P : 12 VDC O/P : FULL LOAD	± 0.0023 %/°C (0~50°C)
6	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -25°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 : -25°C~ +45°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:12V/ FULL LOAD AC ON 3sec/AC OFF 1sec TEST 1cycle:12V/ FULL LOAD Burn In Test			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 : 2G (5) Test Time : 180min in each axis (X.Y.Z) (6) Ta : 25°C			TEST : OK
9	CAPACITOR LIFE CYCLE	SUPPOSE C33 IS THE MOST CRITICAL COMPONENT (1) I/P : 12VDC O/P : FULL LOAD Ta= 25 °C LIFE TIME (2) I/P : 12VDC O/P : FULL LOAD Ta= 40 °C LIFE TIME (3) I/P : 12VDC O/P : 75% LOAD Ta= 40 °C LIFE TIME (4) I/P : 12VDC O/P : 50% LOAD Ta= 40 °C LIFE TIME			(1) 205348 HRS (2) 69163 HRS (3) 85742 HRS (4) 105561 HRS
10	MTBF	3682.6K hrs min. Telcordia SR-332 (Bellcore) ; 528.8K hrs min. MIL-HDBK-217F (25°C)			
11	Ongoing Reliability Test	I/P : 12 VDC O/P : FULL LOAD TA=50°C Demonstration Mean Time Between Failure : 30,000 hours			

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	LIUTT		WANGDZ

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