

# RSEL-2001M

## RELIABILITY DATA

DWG. No. SC-575-RSEL-2001M-001			
QA	Engineering		
APPROVED BY	APPROVED BY	CHECKED BY	DRAWN BY
H. Sasaki 31, Oct., 2014	S. Kitahara 31, Oct., 2014	T. Arasawa. 31, Oct., 2014	T. Horie 31, Oct., 2014



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The following data are typical values. As all units have nearly the same characteristics, the data to be considered as ability values.

**RSEL-2001M**

## 1. Calculated Values of MTBF

MODEL : RSEL-2001M

## (1) Calculating Method

Calculated based on parts stress reliability projection of MIL-HDBK-217F NOTICE2.

Individual failure rates  $\lambda_G$  is given to each part and MTBF is calculated by the count of each part.

$$MTBF = \frac{1}{\lambda_{equip}} = \frac{1}{\sum_{i=1}^n N_i (\lambda_G \pi_Q)_i} \times 10^6 \text{ (hours)}$$

$\lambda_{equip}$  : Total equipment failure rate (Failure /  $10^6$  Hours)

$\lambda_G$  : Generic failure rate for the  $i$ th generic part (Failure/  $10^6$  Hours)

$N_i$  : Quantity of  $i$ th generic part

$N$  : Number of different generic part categories

$\pi_Q$  : Generic quality factor for the  $i$ th generic part ( $\pi_Q=1$ )

## (2) MTBF Values

$G_F$  : Ground, Fixed

$$\underline{MTBF = 10,202,000 \text{ (Hours)}}$$

**RSEL-2001M****2. Vibration Test**

MODEL: RSEL-2001M (Representation Product : RSEL-2005M)

**(1) Vibration Test Class**

Frequency Variable Endurance Test

**(2) Equipment Used**

Controller VS-1000-6, Vibrator 905-FN (IMV CORP.)

**(3) The Number of D.U.T. (Device Under Test)**

5 units

**(4) Test Condition**

Frequency : 10~55Hz

Amplitude : 1.5mm, Sweep for 1 min.

Dimension and times : X,Y and Z directions for 2 hours each.

**(5) The Method**

Fix the D.U.T. on the fitting-stage

**(6) Test Results**

PASS

**Typical Sample Data**

Check item	Spec.		Before Test	After Test
Attenuation(dB)	Differential Mode : 25dB min.	0.3 MHz	32.16	33.02
		30 MHz	53.15	55.32
	Common Mode: 20dB min.	0.2 MHz	33.87	32.77
		30 MHz	34.27	35.00
Leakage Current (mA)	1.0mA max. (250V, 60Hz)	Line1	0.387	0.381
		Line2	0.388	0.376
DC Resistance (mΩ)	200 mΩ max.		100.12	100.45
Test Voltage	L-L : 1075Vdc 5sec. L-E : 2500Vac 60sec.		OK	OK
Isolation Resistance(MΩ)	100 MΩ min.(500Vdc 60sec.)		366.6 x 10 <sup>3</sup>	317.5 x 10 <sup>3</sup>

**RSEL-2001M**

3. Heat Cycle Test

MODEL: RSEL-2001M (Representation Product : RSEL-2005M)

(1)Equipment Used

TEMPERATURE CHAMBER TSA-71H-W (ESPEC CORP.)

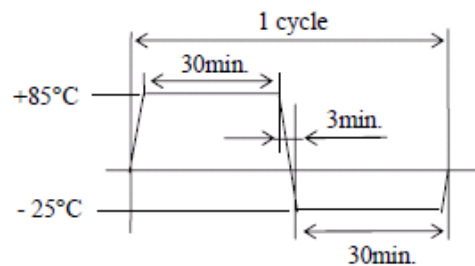
(2)The Number of D.U.T. (Device Under Test)

5 units

(3)Test Conditions

Ambient Temperature : -25~+85°C

Test Cycles: 100 cycles



(4)The Method

Before the test check if there is no abnormal characteristics and put the D.U.T. in the testing chamber. Then test it in the above cycles, After the test is completed leave it for 1 hour at room temperature and check it if there is no abnormal each characteristics.

(5)Test Results

PASS

Typical Sample Data

Check item	Spec.	Before Test	After Test	
Attenuation(dB)	Differential Mode : 25dB min.	0.3 MHz	32.29	32.22
		30 MHz	61.18	74.33
	Common Mode: 20dB min.	0.2 MHz	31.94	31.36
		30 MHz	32.51	33.09
Leakage Current (mA)	1.0mA max. (250V, 60Hz)	Line1	0.394	0.397
		Line2	0.402	0.400
DC Resistance (mΩ)	200 mΩ max.	100.55	101.22	
Test Voltage	L-L : 1075Vdc 5sec. L-E : 2500Vac 60sec.	OK	OK	
Isolation Resistance(MΩ)	100 MΩ min.(500Vdc 60sec.)	268.7 x 10 <sup>3</sup>	271.4 x 10 <sup>3</sup>	

**RSEL-2001M**

## 4. Humidity Test

MODEL: RSEL-2001M (Representation Product : RSEL-2005M)

## (1)Equipment Used

TEMP. &amp; HUMID. CHAMBER PR-4KT (ESPEC CORP.)

## (2)The Number of D.U.T. (Device Under Test)

5 units

## (3)Test Conditions

Ambient Temperature : +40°C

Test Times: 500 hours

Ambient Humidity: 90~95%RH No Dewdrop

## (4)The Method

Before the test check if there is no abnormal characteristics and put the D.U.T. in the testing chamber. Then test it in the above conditions. After the test is completed leave it for 1 hour at room temperature and check it if there is no abnormal each characteristics.

## (5)Test Results

PASS

## Typical Sample Data

Check item	Spec.		Before Test	After Test
Attenuation(dB)	Differential Mode : 25dB min.	0.3 MHz	31.84	31.74
		30 MHz	65.55	58.34
	Common Mode: 20dB min.	0.2 MHz	32.95	27.93
		30 MHz	32.42	32.88
Leakage Current (mA)	1.0mA max. (250V, 60Hz)	Line1	0.398	0.397
		Line2	0.393	0.393
DC Resistance (mΩ)	200 mΩ max.		101.69	97.50
Test Voltage	L-L : 1075Vdc 5sec. L-E : 2500Vac 60sec.		OK	OK
Isolation Resistance(MΩ)	100 MΩ min.(500Vdc 60sec.)		260.6 x 10 <sup>3</sup>	260.0 x 10 <sup>3</sup>

**RSEL-2001M****5. High Temperature Resistance Test**

MODEL: RSEL-2001M (Representation Product : RSEL-2005M)

**(1)Equipment Used**

TEMPERATURE CHAMBER PHH-300 (ESPEC CORP.)

**(2)The Number of D.U.T. (Device Under Test)**

5 units

**(3)Test Conditions**

Ambient Temperature : +55°C

Test Times: 500 hours

Operating: DC 5A

**(4)The Method**

Before the test check if there is no abnormal characteristics and put the D.U.T. in the testing chamber. Then test it in the above conditions. After the test is completed leave it for 1 hour at room temperature and check it if there is no abnormal each characteristics.

**(5)Test Results**

PASS

**Typical Sample Data**

Check item	Spec.		Before Test	After Test
Attenuation(dB)	Differential Mode : 25dB min.	0.3 MHz	32.27	33.84
		30 MHz	61.28	62.70
	Common Mode: 20dB min.	0.2 MHz	33.31	32.46
		30 MHz	29.51	33.56
Leakage Current (mA)	1.0mA max. (250V, 60Hz)	Line1	0.389	0.378
		Line2	0.391	0.380
DC Resistance (mΩ)	200 mΩ max.		100.22	94.93
Test Voltage	L-L : 1075Vdc 5sec. L-E : 2500Vac 60sec.		OK	OK
Isolation Resistance(MΩ)	100 MΩ min.(500Vdc 60sec.)		255.4 x 10 <sup>3</sup>	272.1 x 10 <sup>3</sup>

**RSEL-2001M****6. Low Temperature Storage Test**

MODEL: RSEL-2001M (Representation Product : RSEL-2005M)

**(1)Equipment Used**

TEMPERATURE CHAMBER PG-2FT (ESPEC CORP.)

**(2)The Number of D.U.T. (Device Under Test)**

5 units

**(3)Test Conditions**

Ambient Temperature : -25°C

Test Times: 500 hours

**(4)The Method**

Before the test check if there is no abnormal characteristics and put the D.U.T. in the testing chamber. Then test it in the above conditions. After the test is completed leave it for 1 hour at room temperature and check it if there is no abnormal each characteristics.

**(5)Test Results**

PASS

**Typical Sample Data**

Check item	Spec.		Before Test	After Test
Attenuation(dB)	Differential Mode : 25dB min.	0.3 MHz	32.22	32.65
		30 MHz	58.37	68.18
	Common Mode: 20dB min.	0.2 MHz	32.65	32.71
		30 MHz	34.51	31.50
Leakage Current (mA)	1.0mA max. (250V, 60Hz)	Line1	0.386	0.376
		Line2	0.393	0.368
DC Resistance (mΩ)	200 mΩ max.		100.05	99.44
Test Voltage	L-L : 1075Vdc 5sec.		OK	OK
	L-E : 2500Vac 60sec.			
Isolation Resistance(MΩ)	100 MΩ min.(500Vdc 60sec.)		259.9 x 10 <sup>3</sup>	250.9 x 10 <sup>3</sup>