

40GHz 2.92mm 10 Watt Fixed Attenuator Power Handling Test

1. Test Purpose

To evaluate and determine the power handling capability of 40GHz 10W 2.92mm Fixed Attenuator from RF ONE.

2. DUT Product Information

Product Name	40GHz 2.92mm 10W 30dB Attenuator	
P/N	RFH4030KD10A	
Specification	Frequency Range: DC-40 GHz VSWR: 1.3 max Attenuation: 10dB, accuracy: -1.2/+1.2dB Avg Power Handling: 10 Watts	
Qty	1 PC	

3. Test Instrument and Tools

No.	Instrument	Model
1	Solid State Power Amplifier	3871D (2GHz~18GHz)
2	Synthesized Signal Generator	AV1464A
3	Infrared Thermometer	UTi260B
4	Vector Network Analyzer	AV3672E(10MHz-67GHz)

4. Test Description

At $25 \pm 2^{\circ}\text{C}$, the DUT attenuator is input 10W RF power for 60 minutes continuously through the solid power amplifier and signal generator, with natural air convection. During the entire test process, DUT case temperature is measured and recorded by infrared thermometer.

Before and after the power test, the DUT attenuator accuracy and VSWR are measured and recorded by VNA.

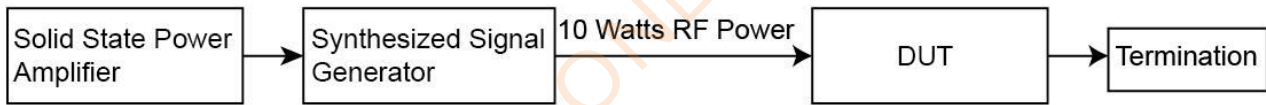


Diagram 1 Power Test Set-up

5. Test Procedures

5.1 Before power test, measure and record the attenuator accuracy and VSWR by VNA.

5.2 At ambient temperature $25 \pm 2^{\circ}\text{C}$, input 10W RF power to the DUT attenuator with natural air convection condition, refer to Pic 1.



Synthesized Signal Generator Solid State Power Amplifier Input 10W RF power

Pic 1 Input 10W RF power to the DUT

5.3 Measure and record the attenuator case temperature by infrared thermometer from test beginning to test duration 60 minutes, refer to Pic 3.



Pic 2 Measure case temperature of DUT

5.4 Measure and record the attenuator accuracy and VSWR by VNA.

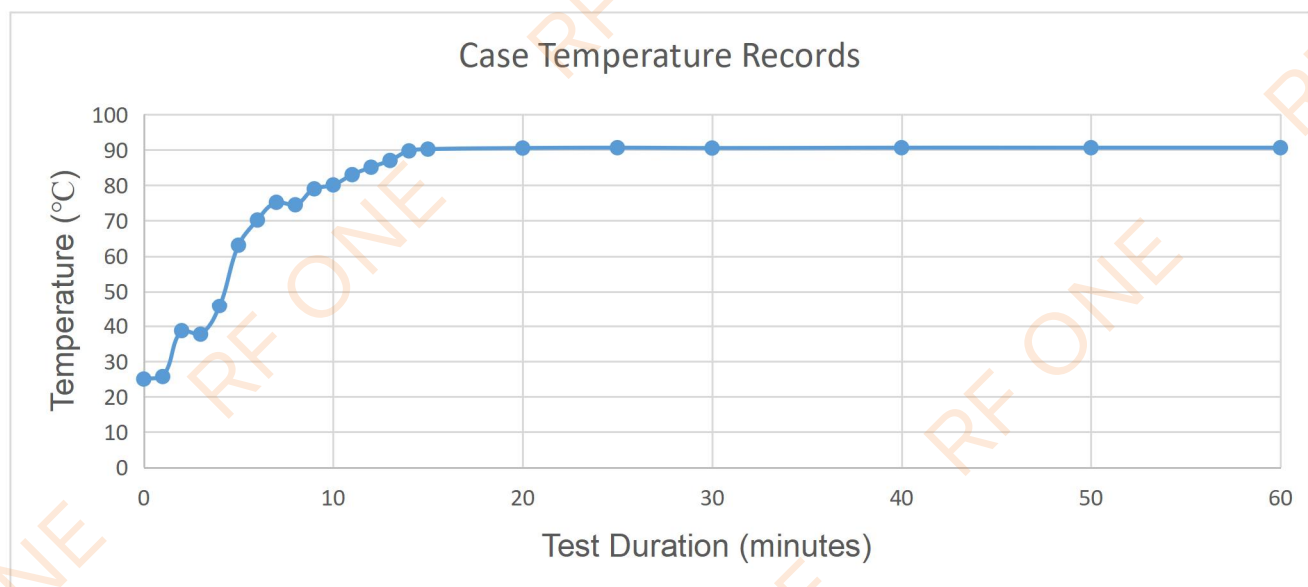
6. Test Results

6.1 Case Temperature Records

Input 10 Watt CW RF power, recorded case temperature of DUT Attenuator.

Test Duration (minutes)	0	1	2	3	4	5	6	7	8	9	10
Temperature (°C)	25.0	25.7	38.7	37.7	45.8	63.1	70.2	75.2	74.5	79	80.1
Test Duration (minutes)	11	12	13	14	15	20	25	30	40	50	60
Temperature (°C)	83.0	85.1	87.0	89.7	90.2	90.5	90.6	90.5	90.6	90.6	90.6

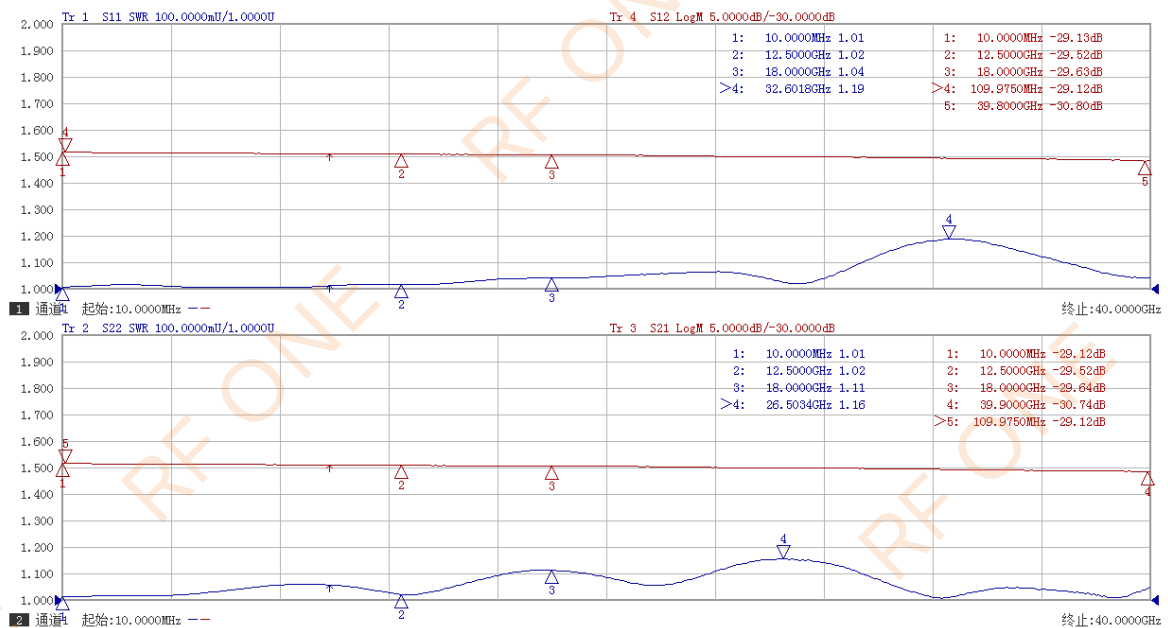
Note: The temperature reached a heat equilibrium after 30 minutes since power test began.



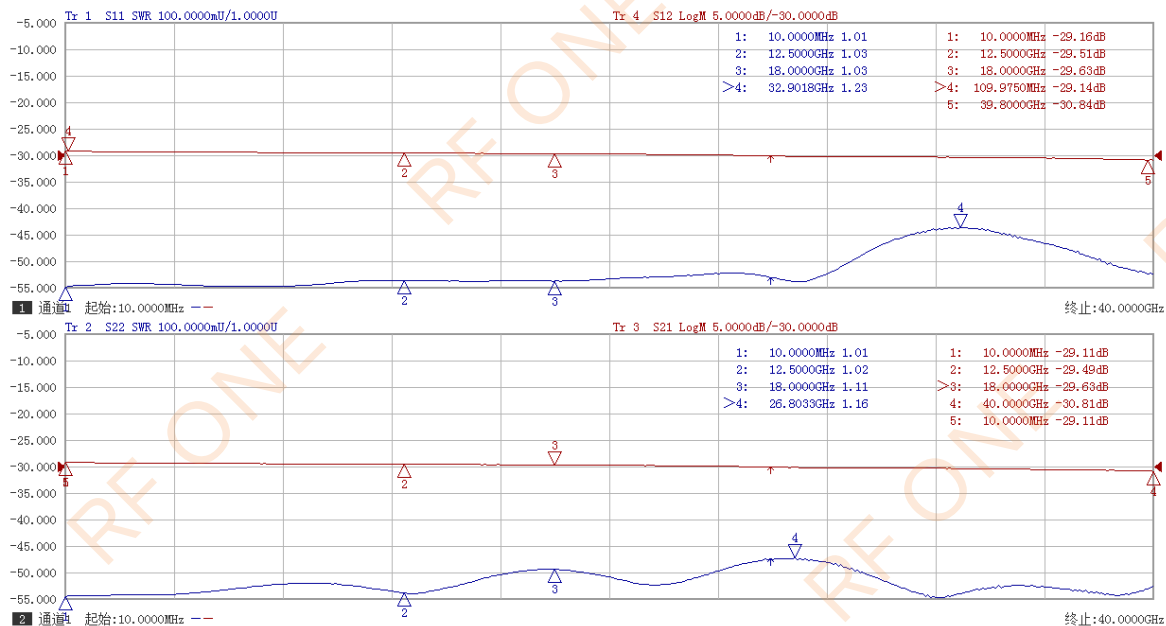
6.2 S Parameter Measurement Before and After Power Test

Specification: DC-40 GHz, VSWR 1.26 max							
VSWR@ Frequency	10MHz	6GHz	12.5GHz	18GHz	26.5GHz	40GHz	VSWR max
Before Power Test	1.01	1.02	1.02	1.04	1.16	1.04	1.19
After Power Test	1.01	1.02	1.03	1.03	1.16	1.04	1.23

Specification: DC-40 GHz, Attenuation 40±1.0 dB							
Attenuation@ Frequency, dB	10MHz	6GHz	12.5GHz	18GHz	26.5GHz	40GHz	
Before Power Test	29.13	29.28	29.52	29.64	30.22	30.74	
After Power Test	29.16	29.26	29.51	29.63	30.26	30.84	



Before Power Test



After Power Test

7. Conclusion

This attenuator can handle full power 10W continuously at room temperature under natural air convection condition.

About Fixed Attenuators from RF ONE

RF ONE offers a wide range of coax fixed attenuators from 2 W to 2000 W, available in 1GHz to 67GHz operating frequency ranges. Power handling tests are implemented across our low power, medium power and high power attenuator series to ensure the delivered attenuators will operate safely and reliably at specified power levels. To check more please visit our website at www.rfone.cn or contact us at sales@rfone.cn.