

Surface Mount Voltage Control Phase Shifter 2GHz-4GHz



Features

- Wide Band Operation 2-4GHz
- 360° Phase Shift
- Low Insertion Loss and Phase Error
- Single Control Operation

Product Description

RVPT0204GBC-D is a voltage control phase shifter with a frequency range of 2 to 4GHz.

The phase shifter's adjustment range 360 degrees with phase flatness of ± 10 deg. The insertion loss is 5.5dB with a typical VSWR of 2.5:1.

Phase shifters are devices used to adjust transmission phase in a system. RF-Lambda phase shifters provide low insertion loss, and equal amplitude (or loss) in all phase states.

The working temperature of this product is between - 40°C and + 85°C.

Typical Applications

- Wireless Infrastructure
- Military and Aerospace Applications
- Test Instrumentation
- Radar Systems
- 5G Wireless Communications
- Microwave Radio Systems
- TR Modules
- Research and Development
- Cellular Base Stations

Electrical Specifications (T_A=+25°C)

Parameter	Min	Typ	Max	Units
Frequency Range	2		4	GHz
Phase Range	360	420		deg
Phase Flatness		± 10	± 17	deg
Insertion Loss		5.5	7.0	dB
Insertion Loss Temperature Coefficient		0.01		dB/ °C
Input VSWR		2.5	3.0	:1
Output VSWR		2.5	3.0	:1
Input Ip3		30		dBm
Control Voltage	0	10		V
Current		5		mA
Weight		0.005 Max.		lbs.
Impedance		50		Ohms
Input / Output Connectors	SMD			
Package	Epoxy Sealed (Standard)			
	Hermetically Sealed (Optional)			

Absolute Maximum Ratings

Parameter	Rating
Bias Voltage	0~ +15V
RF Input Power	+27dBm

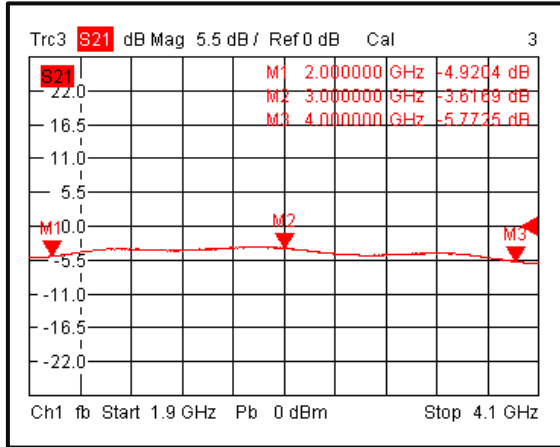
Environmental Specifications and Test Standards

Parameter	Description
Operational Temperature	-40°C to +85°C (Case Temperature)
Storage Temperature	-50°C to +105°C
Thermal Shock	-40°C → +85°C (5 Cycles / 10 hours)
**Random Vibration	MIL-STD-202G Table 214-I, Test Condition Letter C 1.5 Hours Per Axis
High Temperature Burn In	Temperature +85°C for 72 Hours
Shock	1. Weight >20g, 50g half sine wave for 11ms, Speed variation 3.44m/s 2. Weight <=20g, 100g Half sine wave for 6ms, Speed variation 3.75m/s 3. Total 18 times (6 directions, 3 repetitions per direction).
Altitude	Standard: 30,000 Ft (Epoxy Sealed Controlled Environment) Optional: Hermetically Sealed (60,000 ft. 1.0 PSI min)
Hermetically Sealed (Optional)	MIL-STD-883 (For Hermetically Sealed Units)

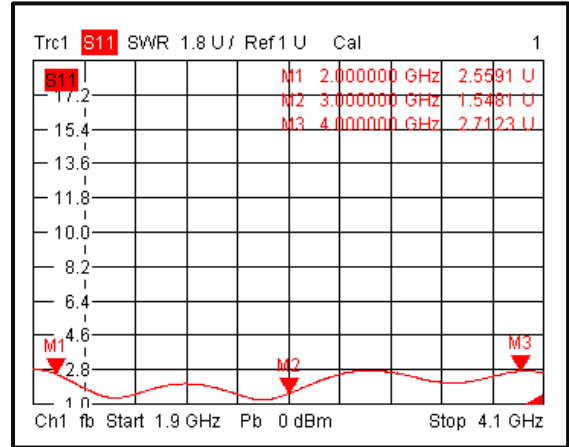
**For vibration testing details please see additional information section.

Typical Performance Plots

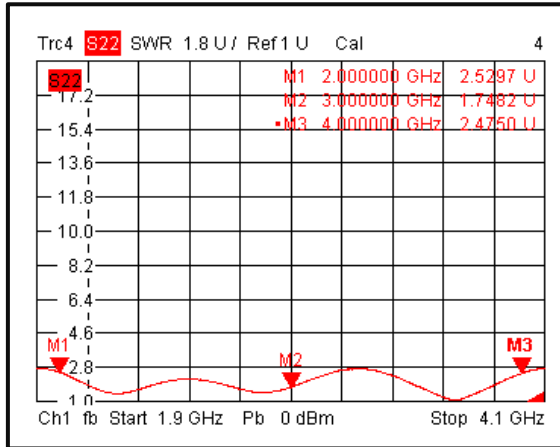
Insertion Loss@+25°C



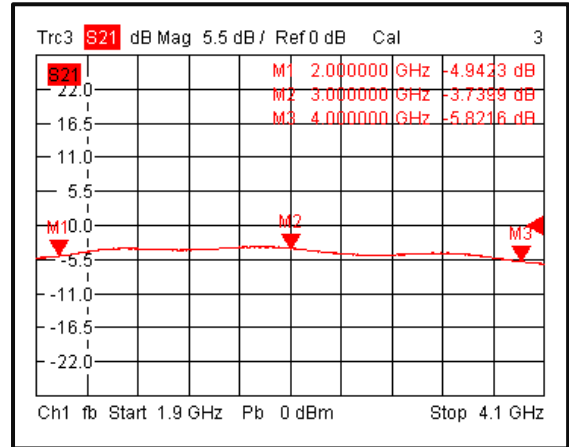
Input VSWR@+25°C



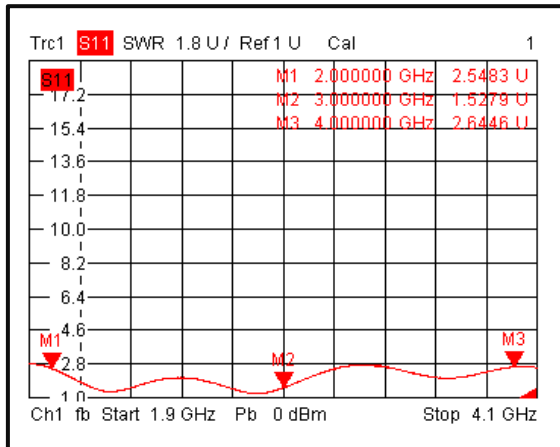
Output VSWR@+25°C



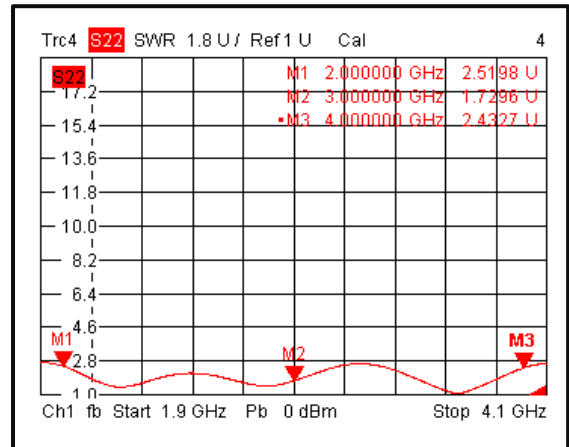
Insertion Loss@-40°C



Input VSWR@-40°C

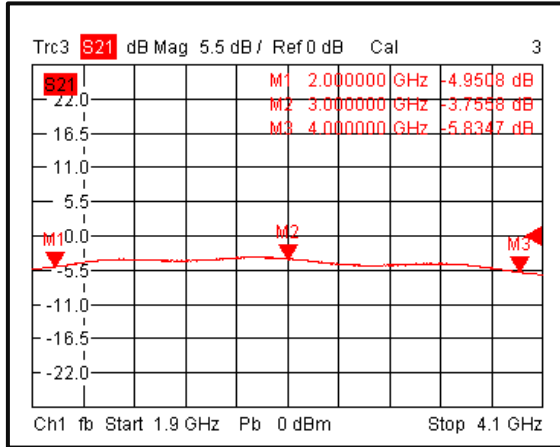


Output VSWR@-40°C

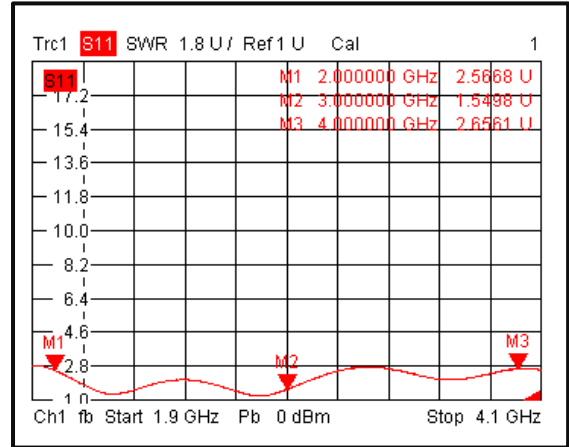


Typical Performance Plots

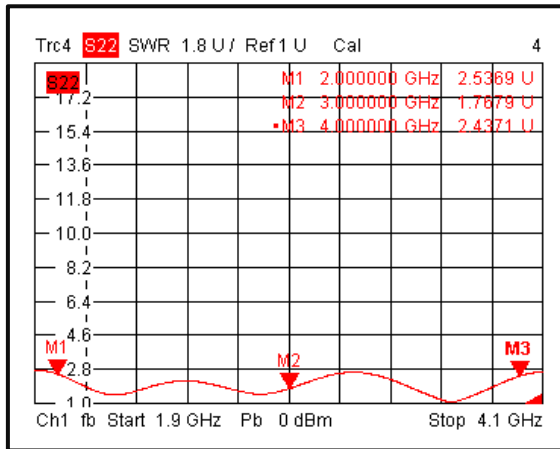
Insertion Loss@+85°C



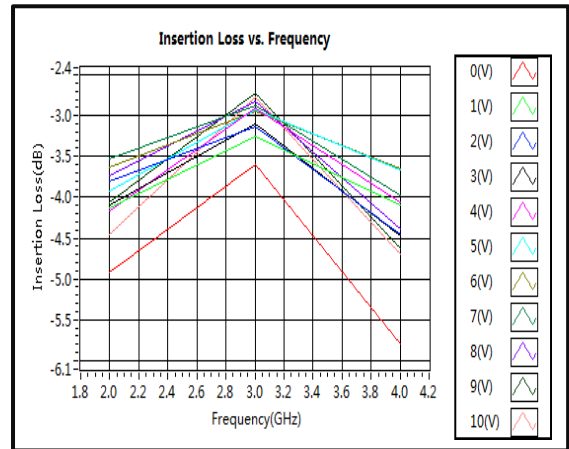
Input VSWR@+85°C



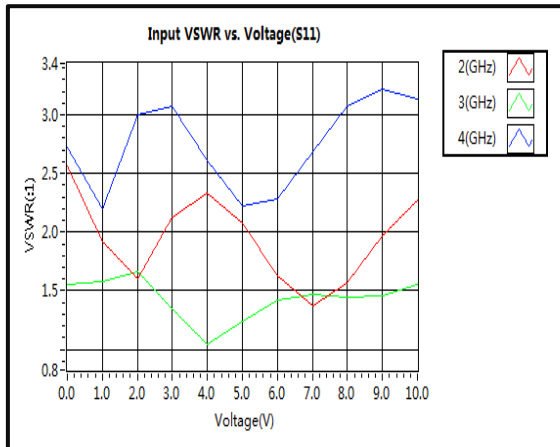
Output VSWR@+85°C



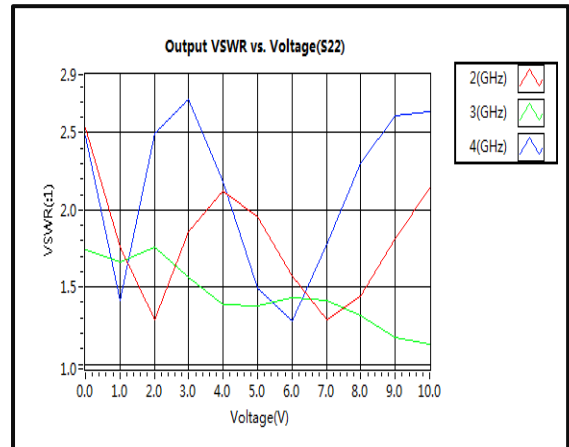
Insertion Loss vs. Frequency



Input VSWR vs. Voltage(s11)

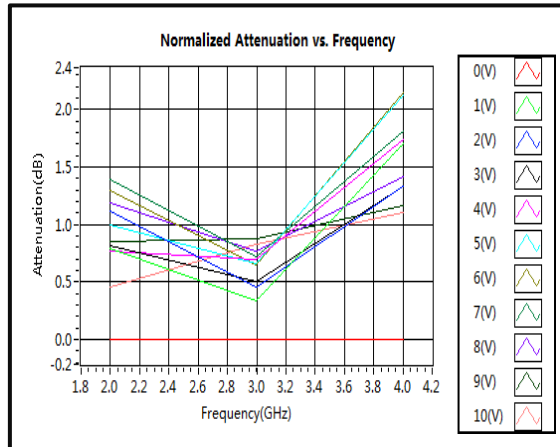


Output VSWR vs. Voltage(s22)

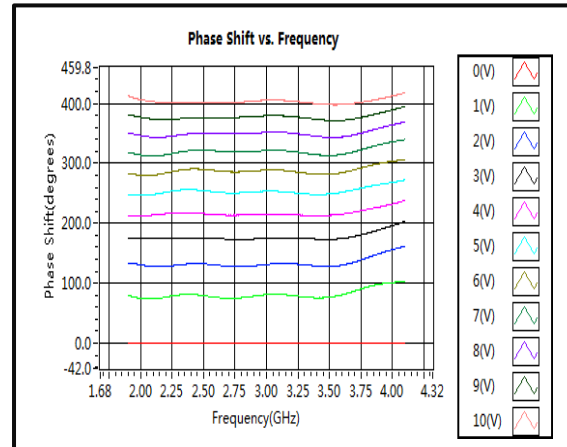


Typical Performance Plots

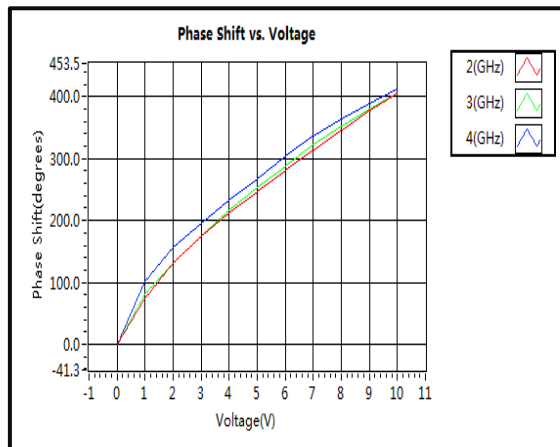
Normalized Attenuation vs. Frequency



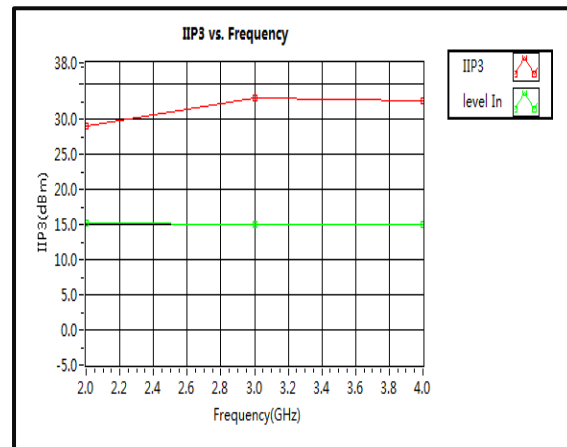
Phase Shift vs. Frequency



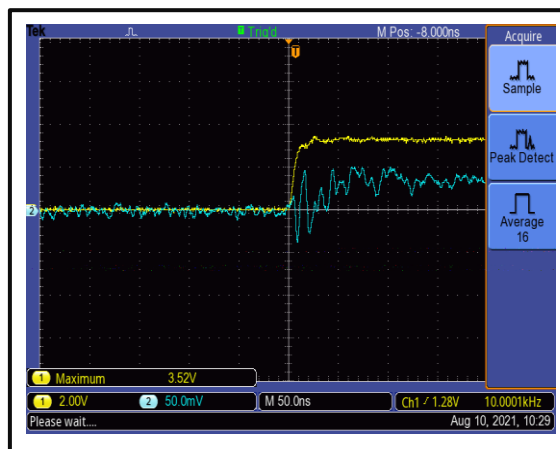
Phase Shift vs. Voltage



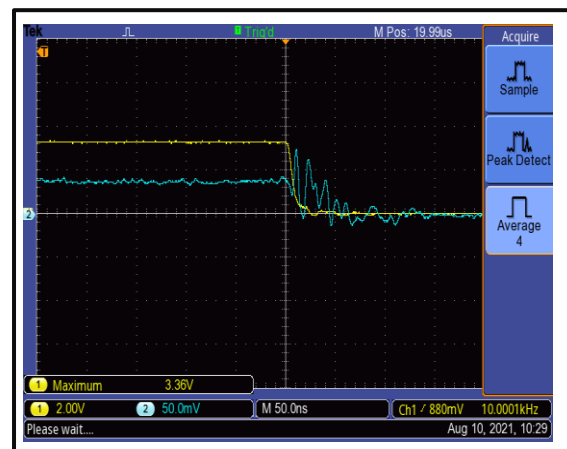
IIP3



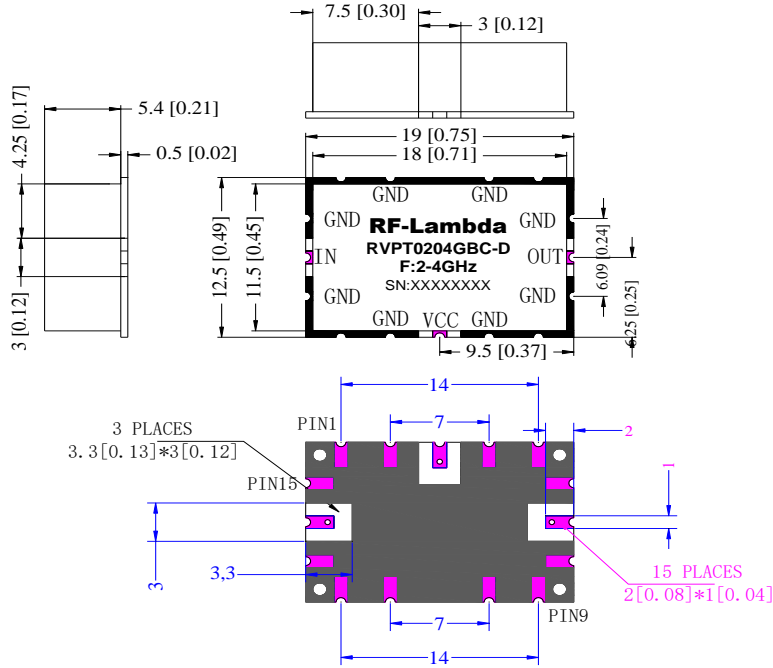
Speed



Speed



Outline Drawing

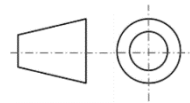


PIN DEFINITION

- RF IN :14
- RF OUT :7
- VCC :3
- GND:1,2,4,5,6,
8,9,10,11,
12,13,15

Notes:

1. Package Material: Aluminum.
2. Finish: Nickel Plated.
3. All dimensions are in millimeters [inches].
4. Housing Tolerances ± 0.1 [0.004] unless otherwise specified.

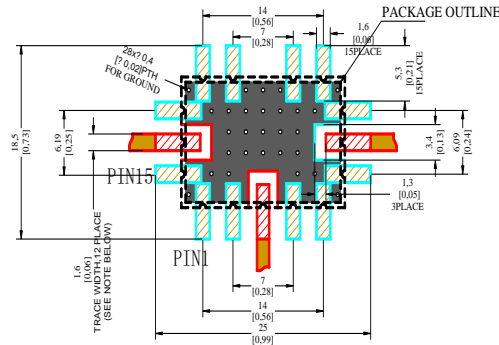


Additional Information

Documentation	Webpage
ESD Policy	https://rflambda.com/pdf/rflambda_esd_control.pdf
Connector Torque Specifications	https://www.rflambda.com/pdf/Torque_Specifications.pdf
Random Vibration Test Standard	https://www.rflambda.com/pdf/rflambda_random_vibration_MIL-STD-202G.pdf

Outline Drawing

Recommended PCB Footprint



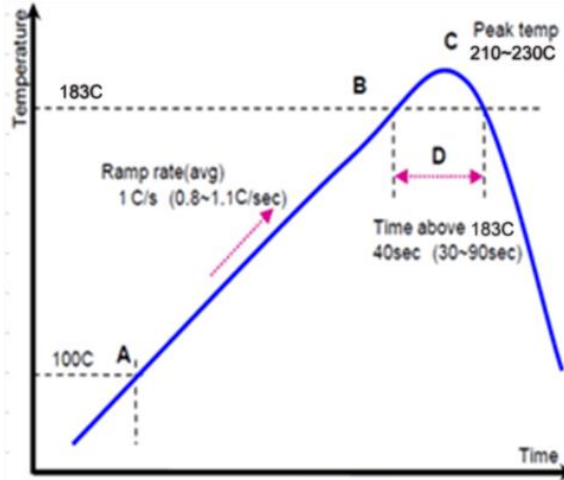
NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.030" ±0.002", COPPER : 0.50 Z. EACH SIDE.
FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

■ DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

■ DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Recommended Reflow Temperature Profile



Point	Standard	Upper	Lower	
A	Pre-heat start point	100C	-	-
B	Pre-heat end point	183C	-	-
A-B	Pre-heat time	100sec	150sec	80sec
	Ramp up rate to Peak temp	1 C/sec	0.8C/sec	1.1C/sec
C	Peak temperature	220C	230C	210C
D	Time above 220C	40sec	90sec	30sec

Notes:

1. All dimensions are in millimeters [inches].
2. Tolerances ±0.13 [0.005] unless otherwise specified.

Ordering Information

Part Number	Modification	Description
RVPT0204GBC-D	SMD	2GHz-4GHz Voltage Control Phase Shifter

Important Notice

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