

Broad Band

Voltage Variable Attenuator

RVA-3000R+

50Ω 20 to 3000 MHz



CASE STYLE: DV874

The Big Deal

- Wideband, 20-3000MHz, usable up to 6000 MHz
- High IP3, 53 dBm
- Minimal phase deviation
- No external matching circuits required

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Typical Applications

- Power level control
- Feed forward amplifiers

Product Overview

The RVA-3000R+ of voltage variable attenuator provides adjustable attenuation up to over 50 dB with a control voltage of 0 to 17V. The RVA-3000R+ features high linearity (IP3 53 dBm typ) and good matching.

Key Features

Feature	Advantages
Wideband operation, specified from 20 to 3000 MHz	Can be used in multiple applications, reducing part count.
Good VSWR, 1.2:1 typ.	Eases interfacing with adjacent components and results in low amplitude ripple.
High linearity	Low distortion enabling improved system performance
Minimal phase deviation over attenuation range	Can provide low signal distortion over attenuation range



www.minicircuits.com P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com

REV. OR
M175645
EDR-11787
RVA-3000R+
RAV
190718
Page 1 of 5

RF Electrical Specifications, 20-3000 MHz, $T_{AMB}=25^{\circ}\text{C}$, $V_{+}=+5\text{V}$, 50Ω

Parameter	Freq. Range (MHz)	Min.	Typ.	Max.	Units
Insertion Loss @ $V_{\text{CONTROL}}=+17\text{V}$	20 - 500	—	2.5	3.5	dB
	500 - 1500	—	2.8	4.0	
	1500 - 3000	—	3.5	5.0	
Max Attenuation @ $V_{\text{CONTROL}}=0\text{V}$	20 - 500	39	56	—	dB
	500 - 1500	34	44	—	
	1500 - 3000	26	35	—	
Max Input Power @ $V_{\text{CONTROL}}=0\text{V}$ to 17V	20 - 3000	+26	—	—	dBm
Return Loss @ $V_{\text{CONTROL}}=0\text{V}$ to 17V	20 - 500	—	23	—	dB
	500 - 1500	—	26	—	
	1500 - 3000	—	18	—	
Input IP3 @ $V_{\text{CONTROL}}=0\text{V}$ to 17V	20 - 500	—	48	—	dBm
	500 - 1500	—	56	—	
	1500 - 3000	—	57	—	
Supply current @ $V_{\text{CONTROL}}=0\text{V}$ to 17V	20 - 3000	—	—	10	mA
Control current @ $V_{\text{CONTROL}}=0\text{V}$ to 17V	20 - 3000	—	—	30	mA

Switching Specifications

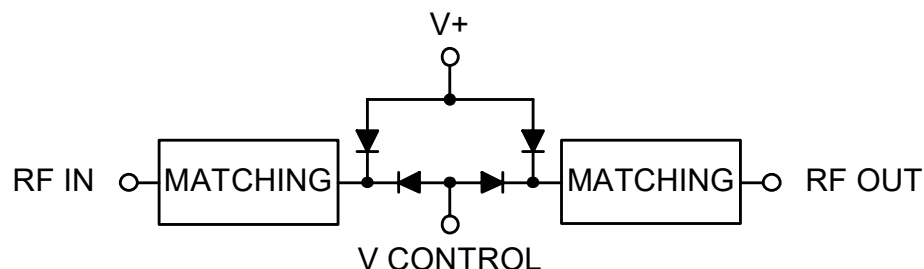
Parameter	Min.	Typ.	Max.	Units
Switching Speed, 50% Control to 0.5dB of Attenuation Value	—	5.5	—	μSec
Rise time, 10% to 90% of Attenuation Value	—	2	—	μSec
Fall time, 90% to 10% of Attenuation Value	—	3.5	—	μSec

Absolute Maximum Ratings

Parameter	Ratings
Operating Temperature	-55°C to $+85^{\circ}\text{C}$
Storage Temperature	-55°C to $+85^{\circ}\text{C}$
V_{+}	12V Max.
V_{CONTROL}	20V Max.
Input Power	+26 dBm

Permanent damage may occur if any of these limits are exceeded. Operation between max operating and absolute max input power will result in reduced reliability.

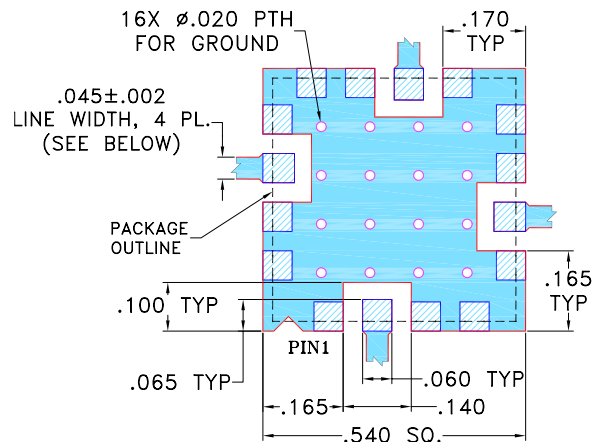
Equivalent Schematic



Pin Description

Function	Pin Number	Description
GND	1	Ground connection
RF in	2	RF in port
GND	3	Ground connection
GND	4	Ground connection
GND	5	Ground connection
V _{CNTRL}	6	Control Voltage
GND	7	Ground connection
GND	8	Ground connection
GND	9	Ground connection
RF out	10	RF out port)
GND	11	Ground connection
GND	12	Ground connection
GND	13	Ground connection
V+	14	Supply Voltage
GND	15	Ground connection
GND	16	Ground connection

Demo Board MCL P/N: TB-163 Suggested PCB Layout (PL-040)



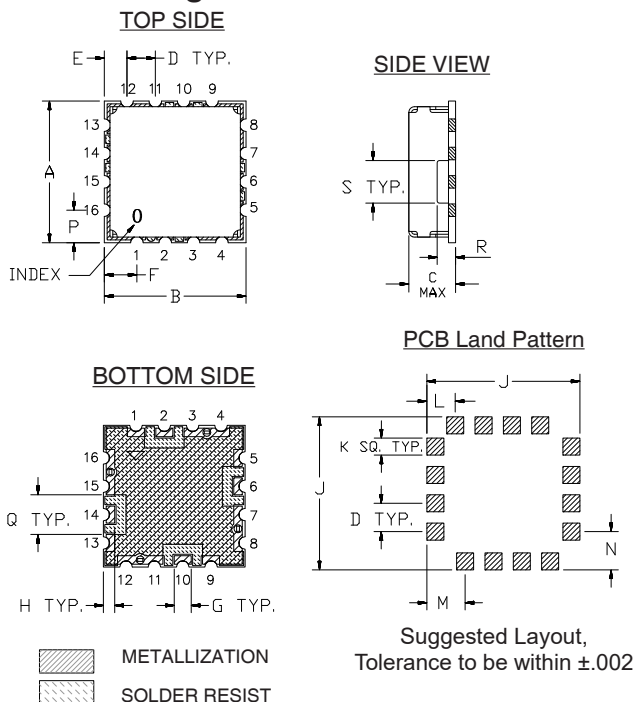
NOTE:

- TRACE WIDTH IS SHOWN FOR FR4 WITH DIELECTRIC THICKNESS 0.025" $\pm$ 0.0025"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
- 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

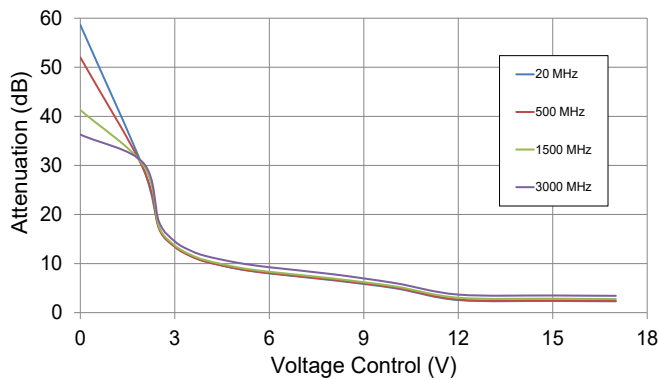
Outline Drawing



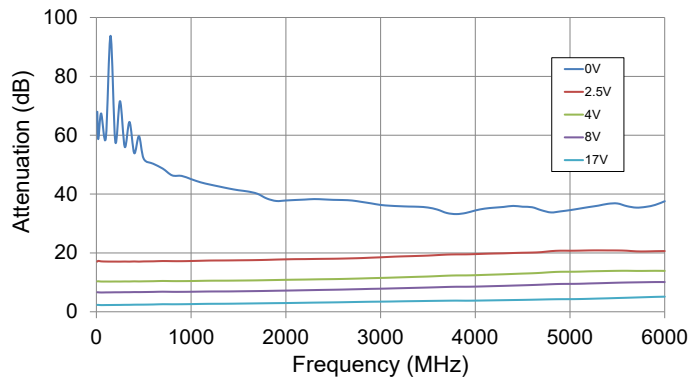
Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	wt.
.500	.500	.195	.100	.080	.115	.060	.040	.540	.060	.100	.135	.135	.115	.140	.070	.150	grams
12.70	12.70	4.95	2.54	2.03	2.92	1.52	1.02	13.72	1.52	2.54	3.43	3.43	2.92	3.56	1.78	3.81	1.0

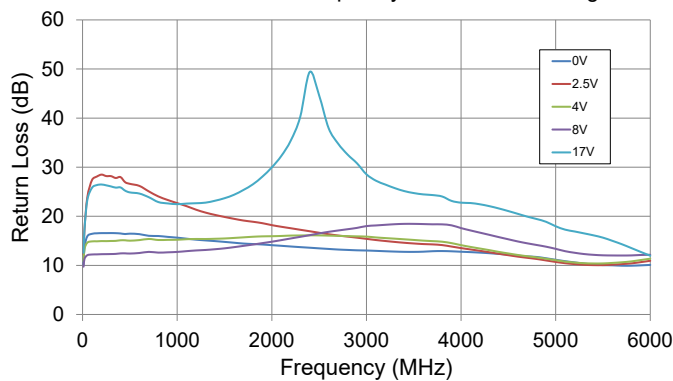
RVA-3000R+
Typical Attenuation at Frequencies



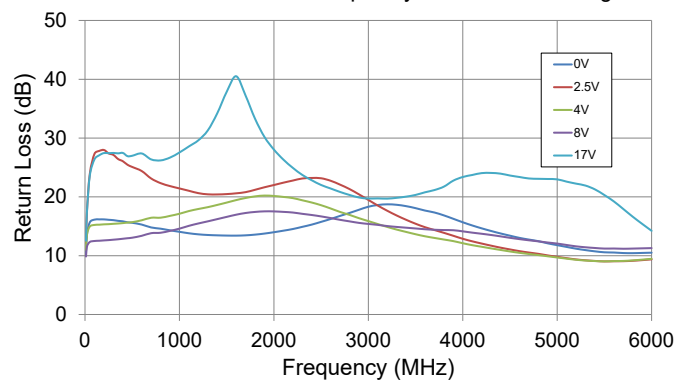
RVA-3000R+
Attenuation vs. Frequency over Control Voltages



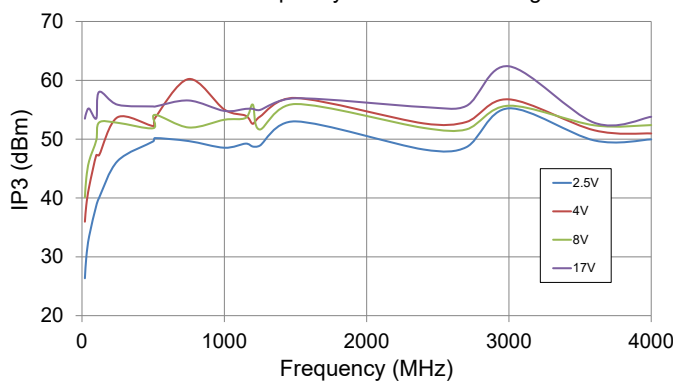
RVA-3000R+
Return Loss In vs. Frequency over Control Voltages



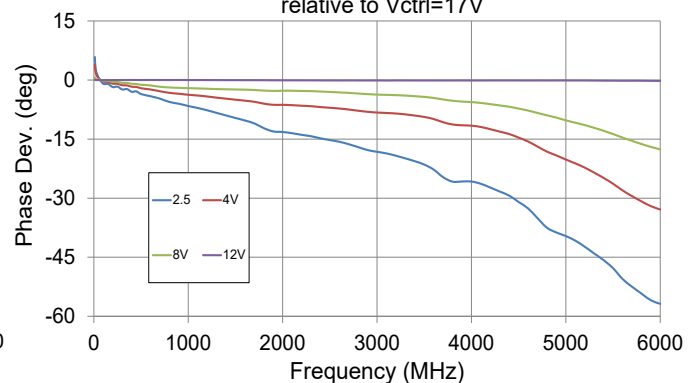
RVA-3000R+
Return Loss Out vs. Frequency over Control Voltages



RVA-3000R+
IP3 vs. Frequency over Control Voltages



RVA-3000R+
Phase Deviation vs. Frequency over Control Voltages,
relative to Vctrl=17V



Additional Detailed Technical Information

additional information is available on our dash board. To access this information [click here](#)

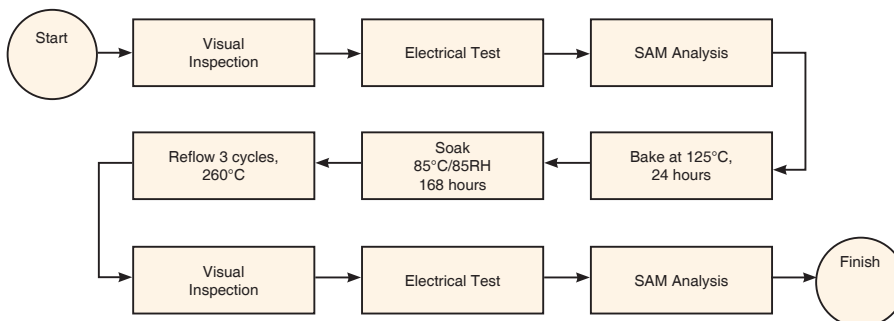
Performance Data	Data Table
	Swept Graphs
	S-Parameter (S2P Files) Data Set (.zip file)
Case Style	DV874 Metal package, lead finish: NiAu alloy
Tape & Reel Standard quantities available on reel	F37 7" reels with 10, 20, 50, or 100 devices 13" reels with 200 or 500 devices
Suggested Layout for PCB Design	PL-040
Evaluation Board	TB-163
Environmental Ratings	ENV65T3

ESD Rating

Human Body Model (HBM): Class 2 (up to 2000V) in accordance with ANSI / ESDA / JEDEC JS-001.

MSL Rating

Moisture Sensitivity: MSL1 in accordance with IPC / JEDEC J-STD-020D

MSL Test Flow Chart**Additional Notes**

- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Mini-Circuits:](#)

[RVA-3000R+](#)