Voltage Variable Attenuator RVA-33+

50Ω 20 to 3000 MHz

The Big Deal

- Broad band, 20 to 3000 MHz
- High linearity: IP2 +85 dBm, IP3 +50 dBm
- Well matched in/out ports, return loss 18 dB
- Drop-in, no external matching circuits required

CASE STYLE: DV874

Product Overview

The RVA-33+ is a Voltage Variable 50Ω matched Attenuator built into a shielded (0.500" x 0.500" x 0.195") case. The model utilizes well matched PIN diodes, carefully biased in order to enable over 40 dB of attenuation range control while maintaining very good input & output port matching.

Key Features

Feature	Advantages
High Linearity: IP2 +85 dBm typ. IP3 +50 dBm typ.	Low distortion enabling improved system performance.
Minimal phase deviation over attenuation range	Can provide low signal distortion over attenuation range.
Return Loss	18 dB typ return loss across frequency and control voltage ranges provides an excellent match under all operating conditions allowing for straightforward cascading.
Attenuation 40 dB typ. up to 1500 MHz	Very useable for adjusting signal strength and increasing dynamic range.

Broad Band

Voltage Variable Attenuator

RVA-33+

50Ω 20 to 3000 MHz

Maximum Ratings

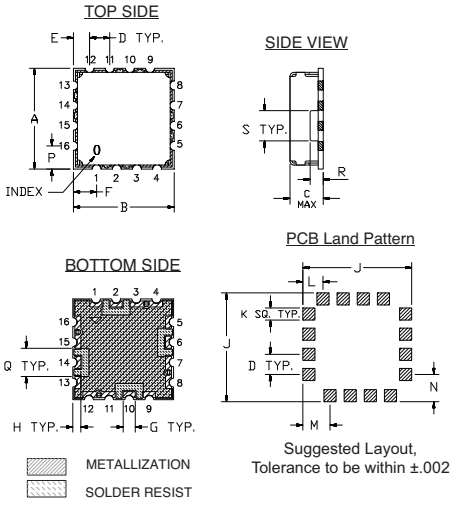
Operating Temperature	-55°C to 85°C
Storage Temperature	-55°C to 85°C
Absolute Max. Supply Voltage(V+)	6.0V
Absolute Max. Control Voltage(Vctrl)	5.5V
Absolute Max. RF Input Level	+23dBm

Permanent damage may occur if any of these limits are exceeded.

Pin Connections

RF IN	2
RF OUT	10
V CONTROL	6
V+	14
GROUND	1,3,4,5,7,8,9,11,12,13,15,16

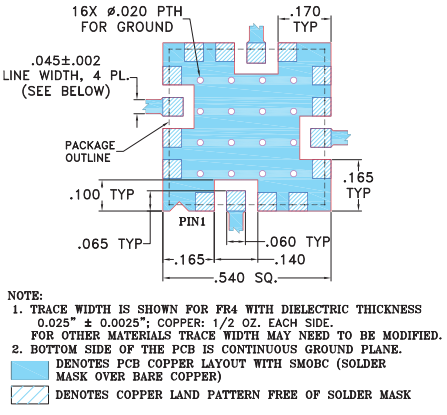
Outline Drawing



Outline Dimensions (inch / mm)

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

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



NOTE:
1. TRACE WIDTH IS SHOWN FOR FR4 WITH DIELECTRIC THICKNESS 0.025" ± 0.0025"; COPPER: 1/2 OZ. 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

Features

- Broadband, 20-3000 MHz
- 40 dB attenuation @1500 MHz
- IP3, +50 dBm typ.
- IP2, +85 dBm typ.
- Minimal phase deviation over attenuation range
- No external bias and RF matching network required
- Shielded case
- Aqueous washable

Applications

- WiMAX 2.5GHz
- Power level control
- Feed forward amplifier
- Test equipment

CASE STYLE: DV874
PRICE: $11.95 ea. QTY (10-49)

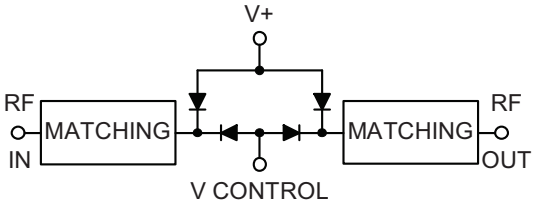
+RoHS Compliant
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Electrical Specifications (T_{AMB} = 25°C)

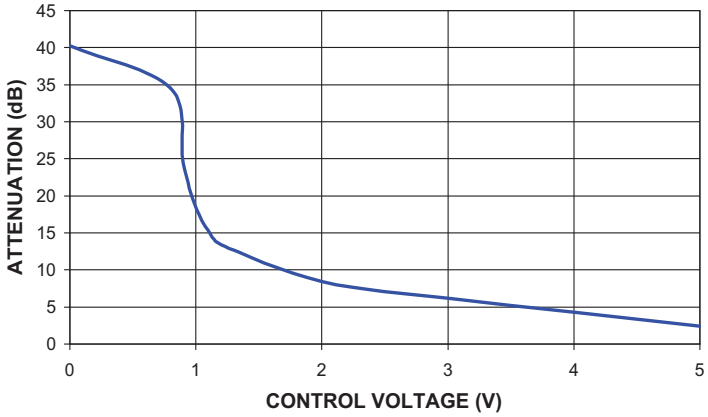
FREQ. (MHz)		MIN. INSERTION LOSS, dB (+5V)		MAX. ATTEN. dB (0V)		INPUT POWER (dBm)	CONTROL Voltage (V)	CONTROL Current (mA)	IP3* (dBm)	IP2* (dBm)	RETURN LOSS (dB)	POWER SUPPLY Voltage (V)	POWER SUPPLY Current (mA)
Min.	Max.	Typ.	Max.	Typ.	Min.	Max.		Max.	Typ.	Typ.	Typ.		Max.
20 -	500	2.3	3.5	55	40	+23	0 - 5	45	48	75	21	+5	5
500 -	1500	2.3	3.5	43	35	+23	0 - 5	45	55	90	19	+5	5
1500 -	3000	3.0	4.5	37	30	+23	0 - 5	45	55	92	16	+5	5

Notes:
Rise/Fall time: 12 / 3 μSec Typ.
Switching Time, turn on/off time: 15 / 55 μSec. Typ.
* Typical IP2 & IP3 @ Vc = 5V

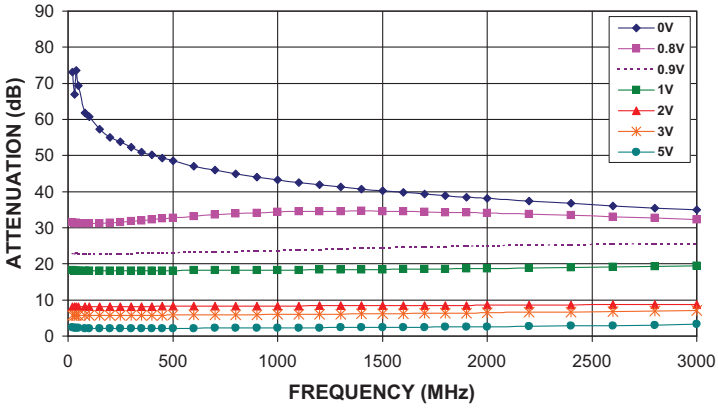
Equivalent Schematic



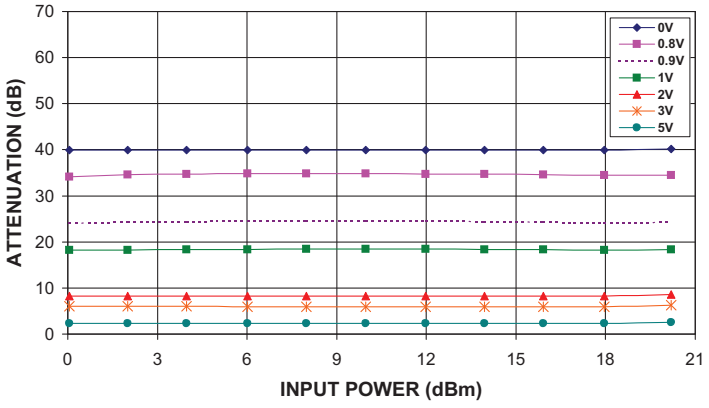
RVA-33+ TYPICAL ATTENUATION AT 1500 MHz



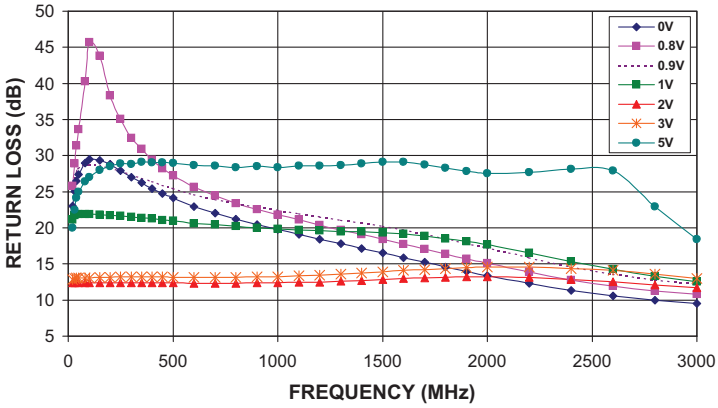
RVA-33+
ATTENUATION Vs. FREQUENCY
OVER CONTROL VOLTAGES



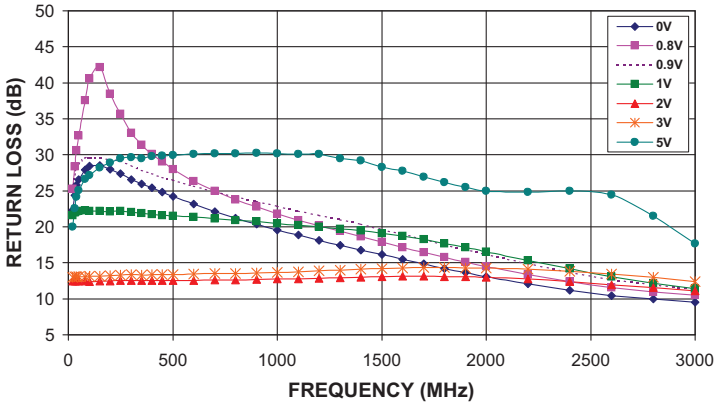
RVA-33+
ATTENUATION Vs. INPUT POWER
OVER CONTROL VOLTAGES AT 1500 MHz



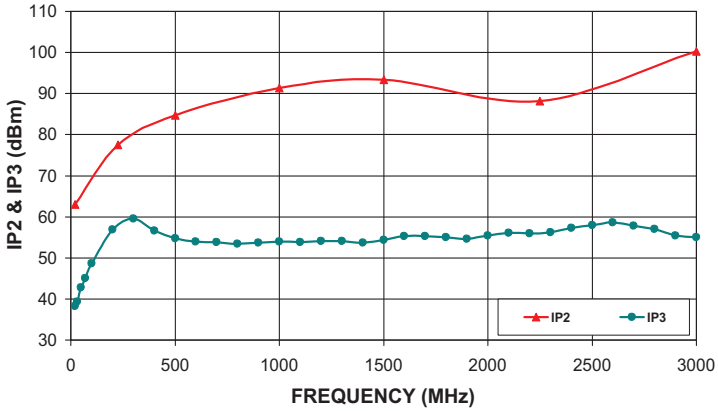
RVA-33+
INPUT RETURN LOSS Vs. FREQUENCY
OVER CONTROL VOLTAGES



RVA-33+
OUTPUT RETURN LOSS Vs. FREQUENCY
OVER CONTROL VOLTAGES



RVA-33+
IP2 & IP3 Vs. FREQUENCY
@ Vc=5V



RVA-33+
PHASE SHIFT Vs. FREQUENCY
OVER CONTROL VOLTAGES