

# Broad Band Voltage Variable Attenuator

## MVA-2000+

50Ω 10 to 2000 MHz

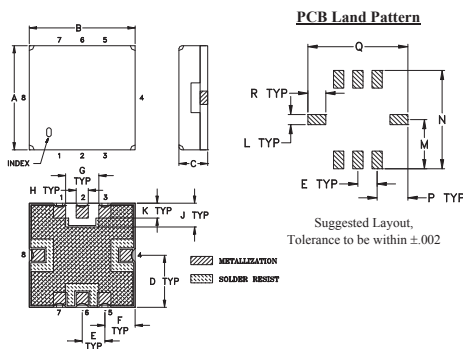
### Maximum Ratings

Operating Temperature	-55°C to 85°C
Storage Temperature	-55°C to 85°C
Absolute Max. Supply Voltage(V+)	7V
Absolute Max. Control Voltage(Vctrl)	14V
Absolute Max. RF Input Level	+19 dBm
Permanent damage may occur if any of these limits are exceeded.	

### Pin Connections

RF IN	6
RF OUT	2
V CONTROL	4
V+	8
GROUND	1,3,5,7

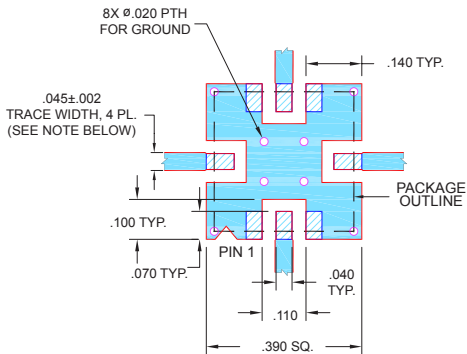
### Outline Drawing



### Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H	J
.350	.350	.100	.175	.075	.100	.110	.040	.080
8.89	8.89	2.54	4.45	1.93	2.54	2.79	1.02	2.03
K	L	M	N	P	Q	R	wt.	
.050	.040	.195	.390	.120	.390	.070	grams	
1.27	1.02	4.95	9.91	3.05	9.91	1.78	0.25	

### Demo Board MCL P/N: TB-286 Suggested PCB Layout (PL-154)



- NOTES:
- TRACE WIDTH IS SHOWN FOR FR4 WITH DIELECTRIC THICKNESS .025 ± .002; 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

### Features

- Broadband, 10-2000 MHz
- Low Insertion Loss, 1.9 dB typ.
- IP3, +45 dBm Typ.
- Small phase deviation over attenuation range
- No external bias and RF matching network required
- Shielded case
- Aqueous washable

### Applications

- Power level control
- Feed forward amplifiers
- CATV



CASE STYLE: GP731

### +RoHS Compliant

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

Reel Size	Devices/Reel
7"	10, 20, 50, 100, 200
13"	500, 1000

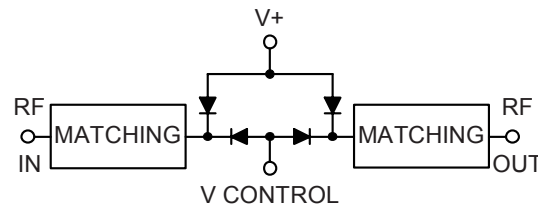
### Electrical Specifications (T<sub>AMB</sub> = 25°C)

FREQ. (MHz)	MIN. INSERTION LOSS, dB (+12V)		MAX. ATTENUATION dB (0V)		INPUT POWER (dBm)	CONTROL Voltage Current (V) (mA)		IP3 (dBm)	RETURN LOSS (dB)	POWER SUPPLY Voltage Current (V) (mA)	
	Min.	Max.	Typ.	Max.		Typ.	Max.			Typ.	Max.
10 - 500	1.7	2.7	43	25	+19	0 - 12	15	43	23	+3 to +5	5
500 - 1000	1.9	2.8	28	20	+19	0 - 12	15	48	23	+3 to +5	5
1000 - 2000	2.1	3.0	23	15	+19	0 - 12	15	50	23	+3 to +5	5

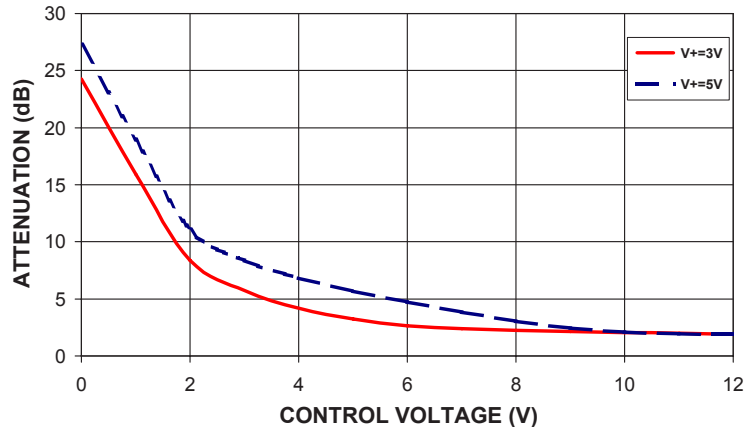
### Notes:

- Rise/Fall time: 17µSec/10µSec Typ.
- Switching Time, turn on/off: 20µSec. Typ.
- Improved R.Loss in/out performance can be achieved at certain frequencies by choosing a V+ between +3V to +5V

### Equivalent Schematic



### MVA-2000+ TYPICAL ATTENUATION AT 1000MHz

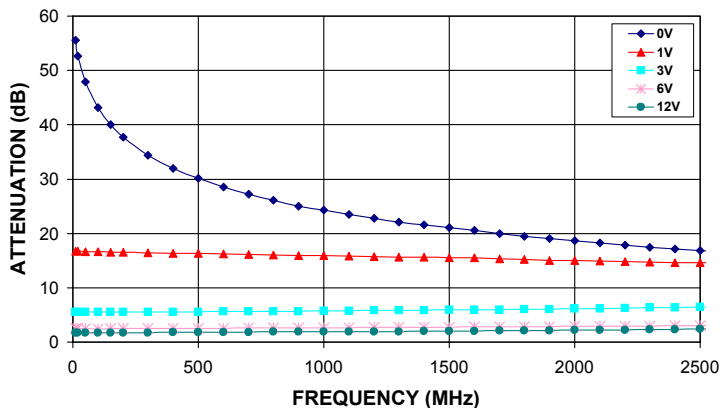


### Notes

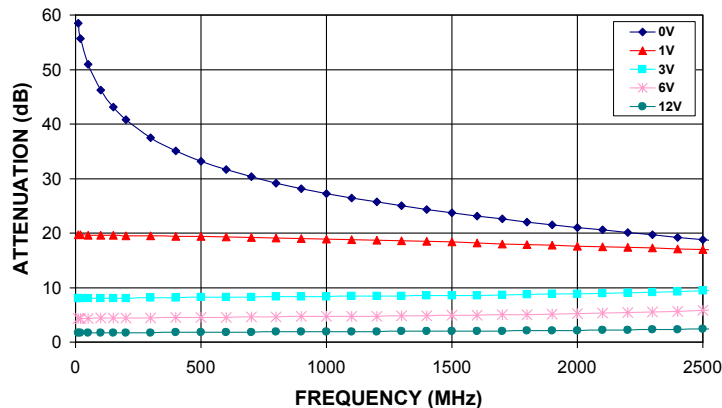
- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuits' 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](http://www.minicircuits.com/MCLStore/terms.jsp)



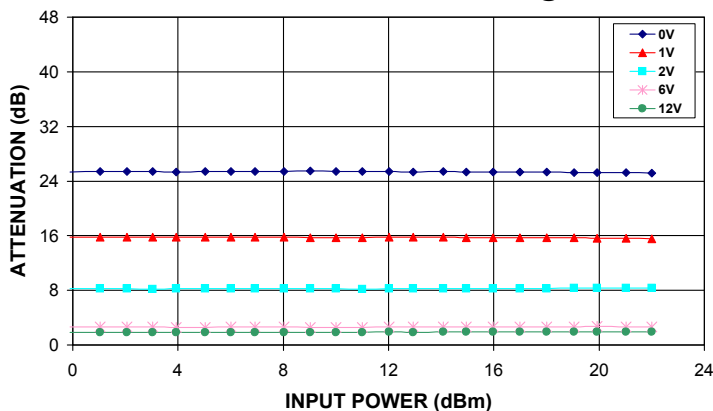
**MVA-2000+**  
ATTENUATION Vs. FREQUENCY  
OVER CONTROL VOLTAGES @ V+=3V



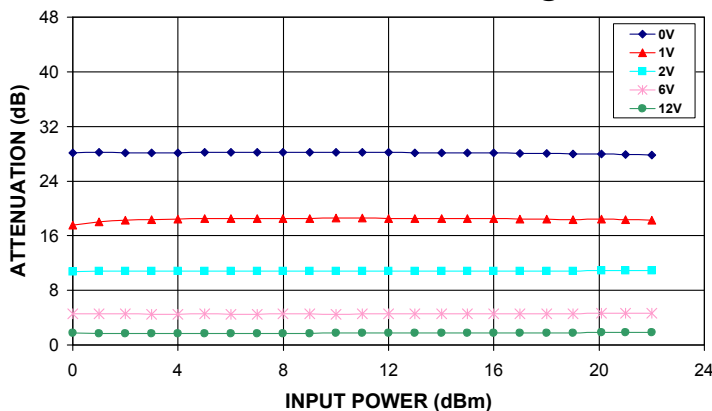
**MVA-2000+**  
ATTENUATION Vs. FREQUENCY  
OVER CONTROL VOLTAGES @ V+=5V



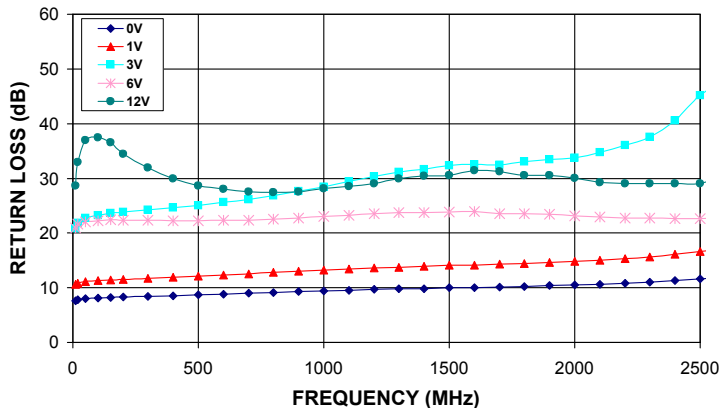
**MVA-2000+**  
ATTENUATION Vs. INPUT POWER  
OVER CONTROL VOLTAGES AT 1000MHz @ V+=3V



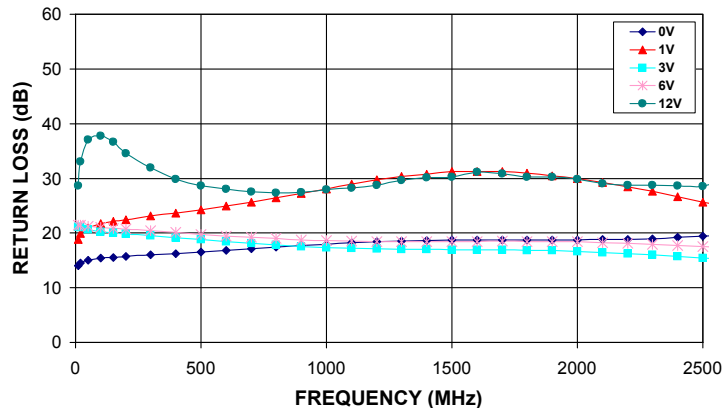
**MVA-2000+**  
ATTENUATION Vs. INPUT POWER  
OVER CONTROL VOLTAGES AT 1000MHz @ V+=5V



**MVA-2000+**  
INPUT RETURN LOSS Vs. FREQUENCY  
OVER CONTROL VOLTAGES @ V+=3V



**MVA-2000+**  
INPUT RETURN LOSS Vs. FREQUENCY  
OVER CONTROL VOLTAGES @ V+=5V

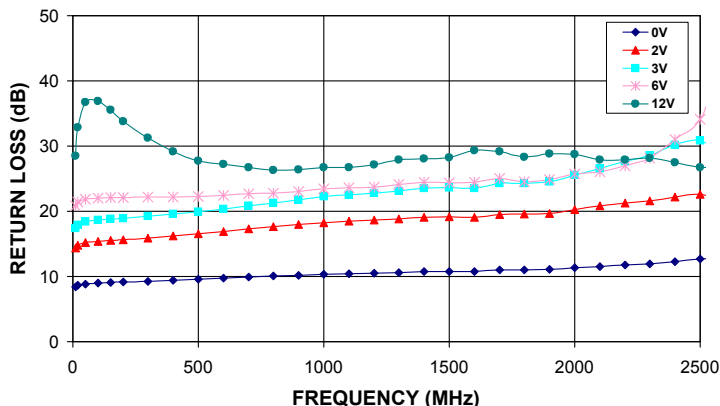


**Notes**

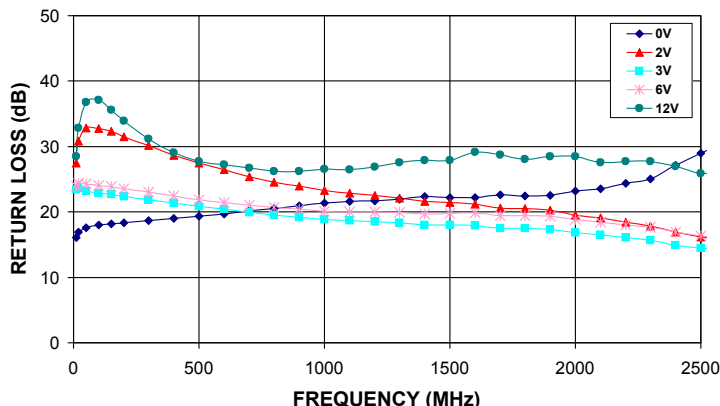
- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- C. 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](http://www.minicircuits.com/MCLStore/terms.jsp)



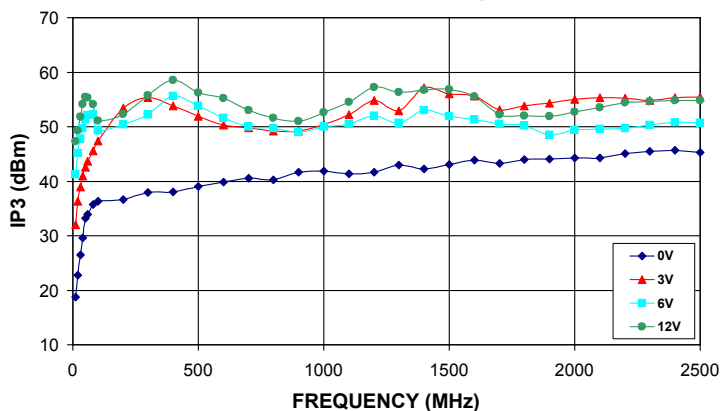
**MVA-2000+**  
**OUTPUT RETURN LOSS Vs. FREQUENCY**  
**OVER CONTROL VOLTAGES @ V+=3V**



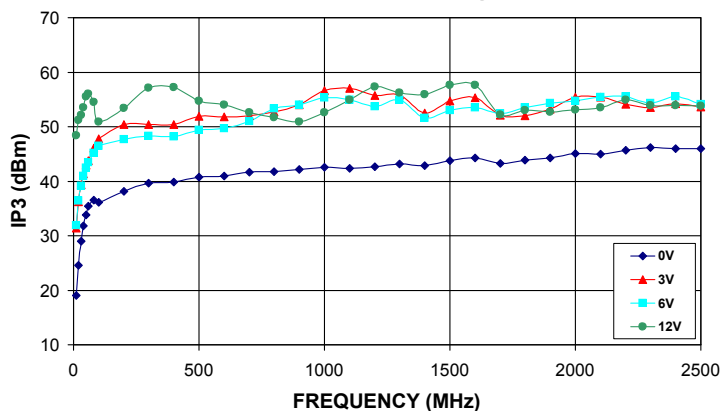
**MVA-2000+**  
**OUTPUT RETURN LOSS Vs. FREQUENCY**  
**OVER CONTROL VOLTAGES @ V+=5V**



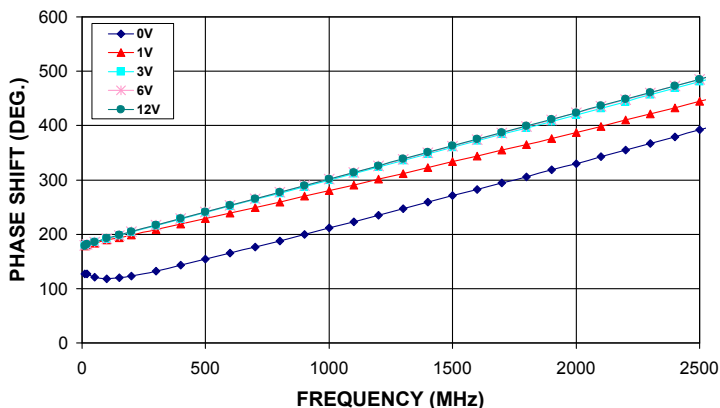
**MVA-2000+**  
**IP3 Vs. FREQUENCY**  
**OVER CONTROL VOLTAGES @ V+=3V**



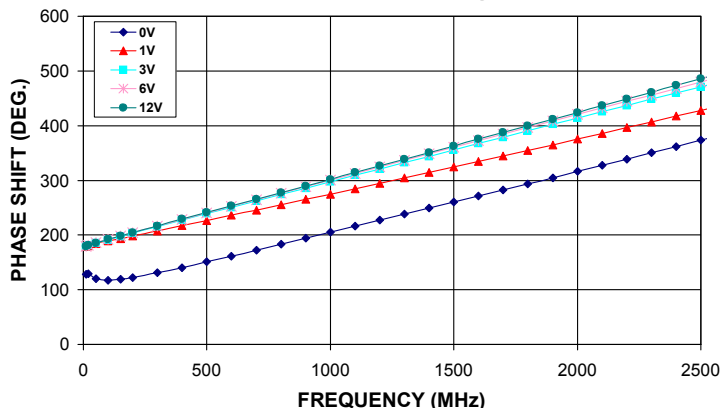
**MVA-2000+**  
**IP3 Vs. FREQUENCY**  
**OVER CONTROL VOLTAGES @ V+=5V**



**MVA-2000+**  
**PHASE SHIFT Vs. FREQUENCY**  
**OVER CONTROL VOLTAGES @ V+=3V**



**MVA-2000+**  
**PHASE SHIFT Vs. FREQUENCY**  
**OVER CONTROL VOLTAGES @ V+=5V**



**Notes**

- A. 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.
- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- C. 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](http://www.minicircuits.com/MCLStore/terms.jsp)

