

# Voltage Variable Attenuator

## EVA-1500+

50Ω 100 to 1500 MHz



CASE STYLE: HE1354

### The Big Deal

- Broad band, 100 to 1500 MHz
- IP2 +85 dBm typ., IP3 +49 dBm typ.
- Well matched in/out ports, return loss 18.5 dB typ.
- Minimal phase deviation over attenuation range
- Drop-in, no external matching circuits required

### Product Overview

The EVA-1500+ is a Voltage Variable 50Ω matched Attenuator built into a shielded (0.394" x 0.394" x 0.15") case. The model utilizes well matched PIN diodes, carefully biased in order to enable very low insertion loss with very low supply and control current consumption.

### Key Features

Feature	Advantages
Insertion loss of 1.5 dB up to 500MHz	Low insertion loss means very less power dissipation, so SNR will be maintained without much degradation.
Low power consumption: <ul style="list-style-type: none"><li>• Supply voltage +3 V</li><li>• Supply current 0.5 mA max.</li><li>• Control voltage 0 - 5 V</li><li>• Control current 7 mA max.</li></ul>	Needs very little current for adjusting the attenuation range so that a wide range of drivers can be chosen to control attenuation.
IP3 +49 dBm typ. IP2 +85 dBm typ.	Low distortion enabling improved system performance.
Minimal phase deviation over attenuation range	Can provide low signal distortion over attenuation range.

#### 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)



# Surface Mount Voltage Variable Attenuator

# EVA-1500+

50Ω 100 to 1500 MHz

## Maximum Ratings

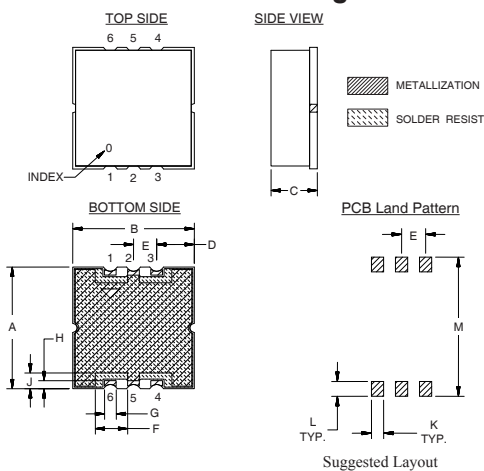
Operating Temperature	-45°C to 85°C
Storage Temperature	-55°C to 100°C
Absolute Max. Supply Voltage(V+)	6V
Absolute Max. Control Voltage(Vctrl)	10V
Absolute Max. RF Input Level	+20dBm

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

## Pin Connections

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

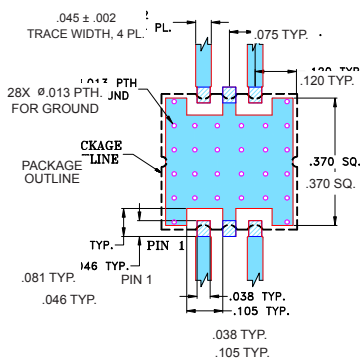
## Outline Drawing



## Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H	J	K	L	M	wt. grams
.394	.394	.150	.122	.075	.098	.038	.026	.051	.038	.046	.434	0.7
10.01	10.01	3.81	3.10	1.90	2.49	0.97	0.66	1.29	0.97	1.17	11.02	

## Demo Board MCL P/N: TB-474+ Suggested PCB Layout (PL-285)



- NOTES:  
 1. 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.  
 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

### Notes

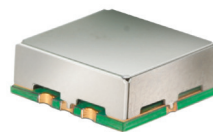
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## Features

- Frequency range, 100-1500 MHz
- Low current consumption
- Low insertion loss
- IP2 +85 dBm typ.
- IP3 +49 dBm typ.
- Minimal phase deviation over attenuation range
- No external bias and RF matching network required
- Shielded case
- Aqueous washable

## Applications

- Power level control
- Feed forward amplifier
- Test equipment
- VHF



CASE STYLE: HE1354

## +RoHS Compliant

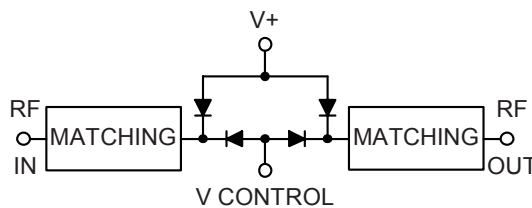
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

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

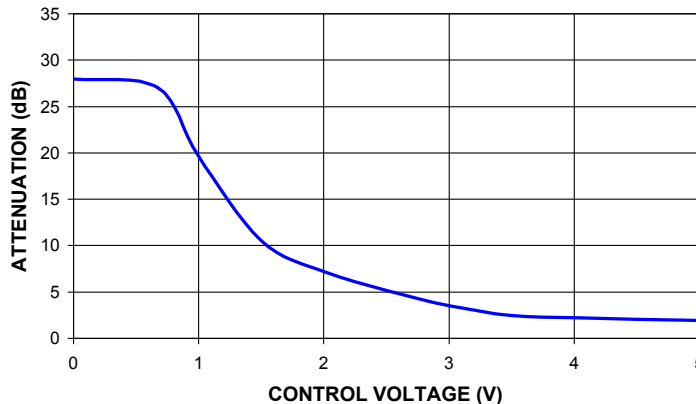
FREQ. (MHz)	MIN. INSERTION LOSS, dB (+5V)		MAX. ATTEN. dB (0V)		INPUT POWER (dBm)		CONTROL Voltage Current (V) (mA)		IP3* (dBm)	IP2* (dBm)	RETURN LOSS (dB)	POWER SUPPLY Voltage Current (V) (mA)	
	Min.	Max.	Typ.	Max.	Typ.	Min.	Max.	Max.	Typ.	Typ.		Typ.	V
100 - 500	1.5	2.5	35	25	+20	0 - 5	7	47	80	17	+3	0.5	
500 - 1000	1.7	3.0	30	20	+20	0 - 5	7	50	85	20	+3	0.5	
1000 - 1500	2.0	3.5	25	17	+20	0 - 5	7	50	85	20	+3	0.5	

- Notes:  
 Rise/Fall time: 13 μSec / 15 μSec Typ.  
 Switching Time, turn on/off: 15 μSec / 25 μSec Typ.  
 \* Typical IP2 & IP3 at Vc=5V

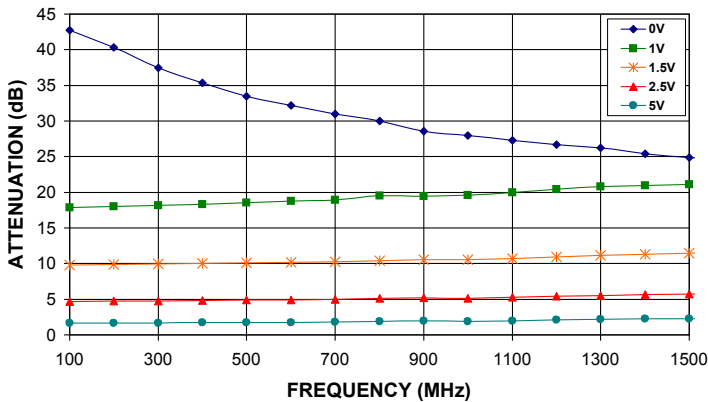
## Equivalent Schematic



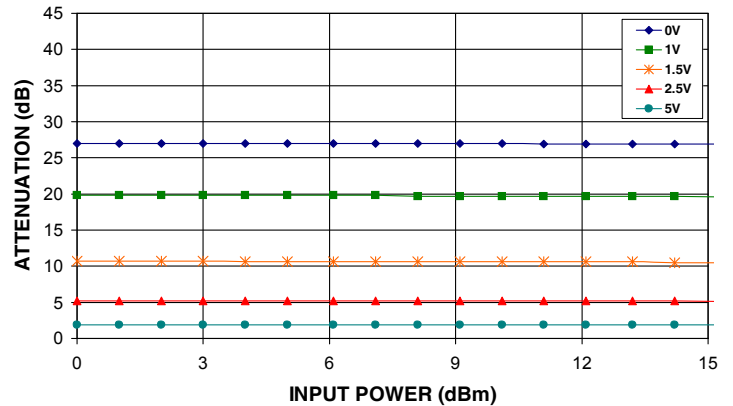
## EVA-1500+ TYPICAL ATTENUATION AT 1000 MHz



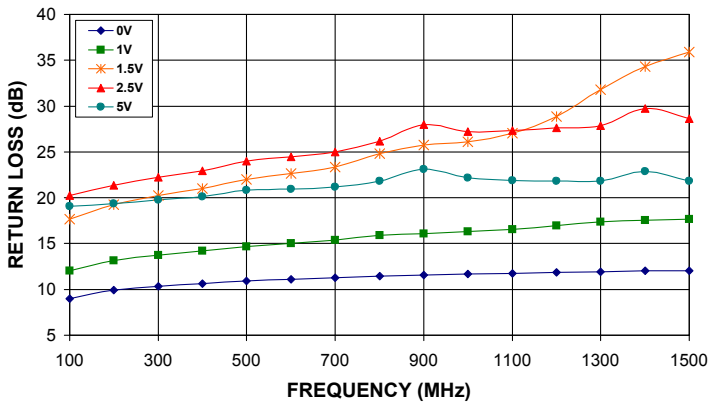
**EVA-1500+**  
**ATTENUATION Vs. FREQUENCY**  
**OVER CONTROL VOLTAGES**



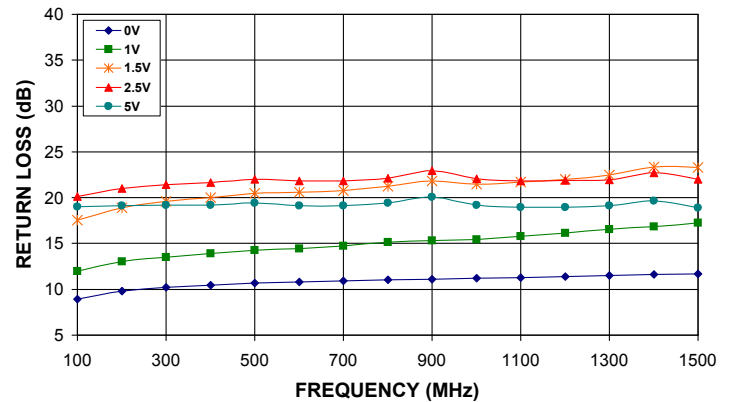
**EVA-1500+**  
**ATTENUATION Vs. INPUT POWER**  
**OVER CONTROL VOLTAGES AT 1000 MHz**



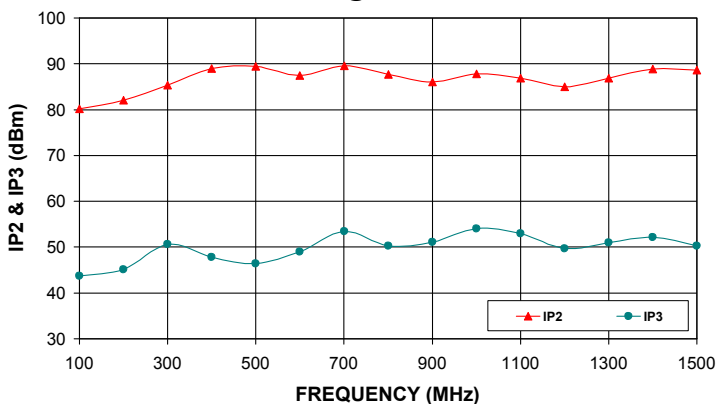
**EVA-1500+**  
**INPUT RETURN LOSS Vs. FREQUENCY**  
**OVER CONTROL VOLTAGES**



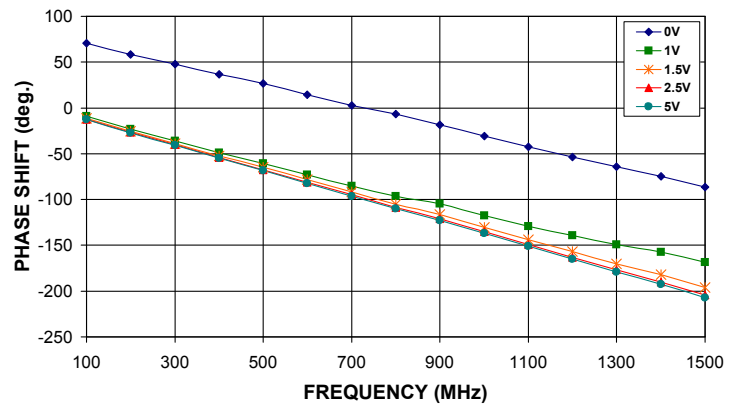
**EVA-1500+**  
**OUTPUT RETURN LOSS Vs. FREQUENCY**  
**OVER CONTROL VOLTAGES**



**EVA-1500+**  
**IP2 & IP3 Vs. FREQUENCY**  
**@ Vc=5V**



**EVA-1500+**  
**PHASE SHIFT Vs. FREQUENCY**  
**OVER CONTROL VOLTAGES**



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