

Surface Mount Voltage Variable Attenuator

50Ω 600 to 1200 MHz

VACC-09+

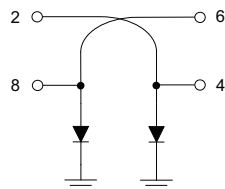
Maximum Ratings

Operating Temperature	-45°C to 85°C
Storage Temperature	-55°C to 100°C
Absolute Max. Control Current	10mA
Absolute Max. RF Input Level	+15 dBm
Permanent damage may occur if any of these limits are exceeded.	

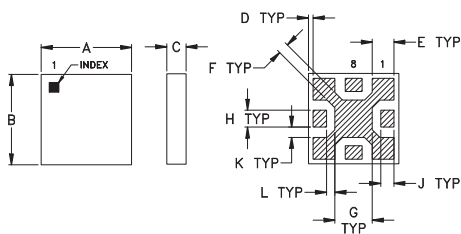
Pin Connections

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

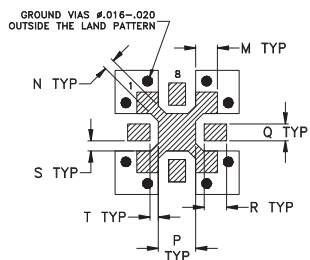
Equivalent schematic of DUT



Outline Drawing



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H	J	
.150	.150	.065	.008	.036	.018	.062	.028	.022	
3.81	3.81	1.65	0.20	0.91	0.46	1.57	0.71	0.56	
K	L	M	N	P	Q	R	S	T	WT.
.017	.014	.036	.018	.062	.028	.037	.017	.014	GRAM
0.43	0.36	0.91	0.46	1.57	0.71	0.94	0.43	0.36	.06

Features

- frequency range, 600-1200 MHz
- IP3, 48 dBm typ.
- minimum current at min. attenuation
- low insertion loss
- protected by US patent 7,030,713

Applications

- variable gain amplifier
- feed forward amps
- ALC circuits



CASE STYLE: GF995
PRICE: \$3.95 ea. QTY (25)

+RoHS Compliant

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

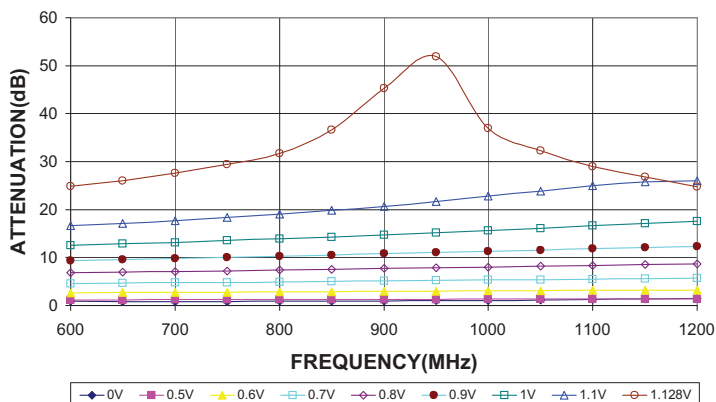
Electrical Specifications

FREQ (MHz)	INSERTION LOSS (dB)		ATTENUATION (dB)		IP3* (dBm)		RETURN LOSS (dB)		CONTROL VOLTAGE** (V)
	Min.	Max.	Typ.	Min.	Typ.	Min.	Input Typ.	Output Typ.	
600-1200			1.0	2.2	25	20	48	40	0-6

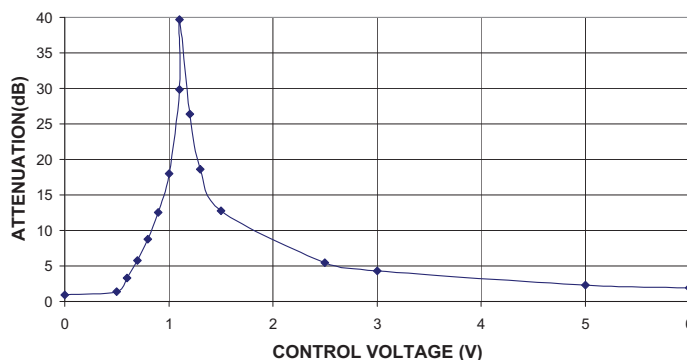
* Input IP3 tested with two tones separated by 1 MHz at 7 dBm each and 0V control voltage.

** Using recommended control port biasing.

VACC-09+ ATTENUATION Vs. FREQUENCY Vs. CONTROL VOLTAGE



VACC-09+ TYPICAL ATTENUATION AT 900MHz



Mini-Circuits®
ISO 9001 ISO 14001 AS 9100 CERTIFIED
The Design Engineers Search Engine Provides ACTUAL Data Instantly at minicircuits.com
IF/RF MICROWAVE COMPONENTS

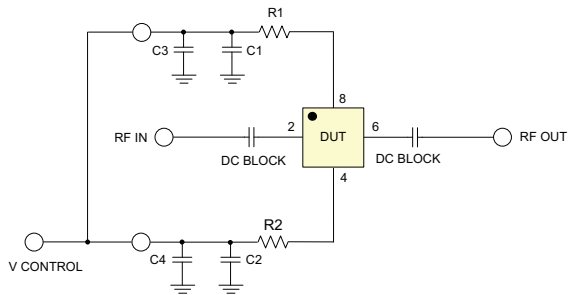
For detailed performance specs
& shopping online see web site

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 The Design Engineers Search Engine Provides ACTUAL Data Instantly at minicircuits.com

Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. 2. Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. 3. The parts covered by this specification sheet 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.

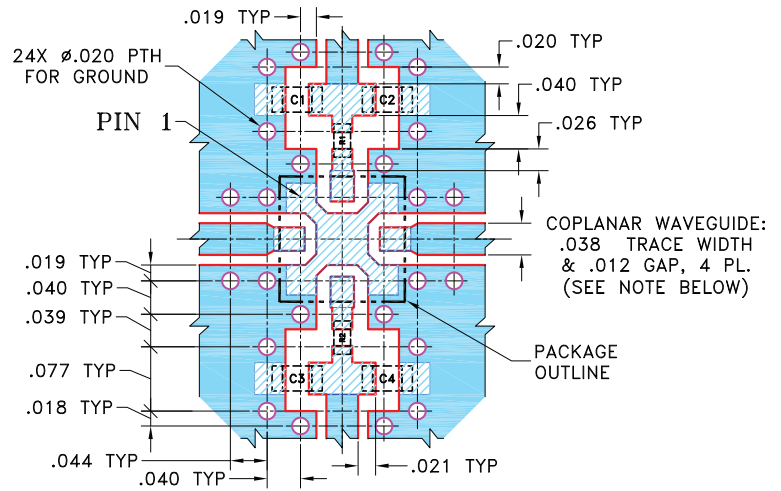
REV. B
M108294
VACC-09+
EDB-040303
BCELL/RS/CP
121024
Page 1 of 3

Recommended control port biasing configuration



R1, R2: 2K OHM CHIP RESISTOR (0402, AS CLOSE AS POSSIBLE TO THE DEVICE)
C1, C2: 0.01 UF CHIP CAPACITOR (0603)
C3, C4: 6.8 PF CHIP CAPACITOR (0603)

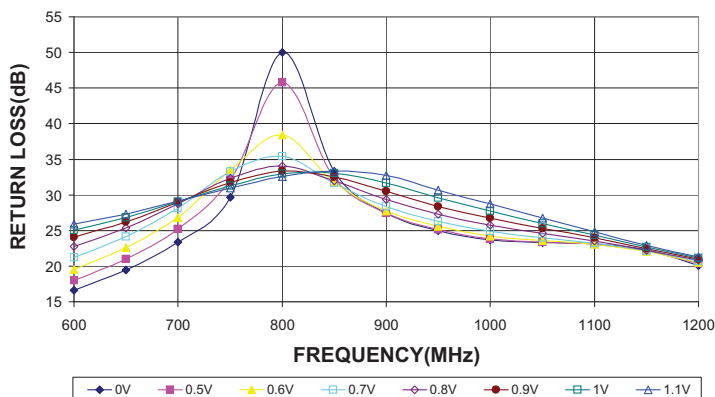
Demo Board MCL P/N: TB-250 Suggested PCB Layout (PL-148)



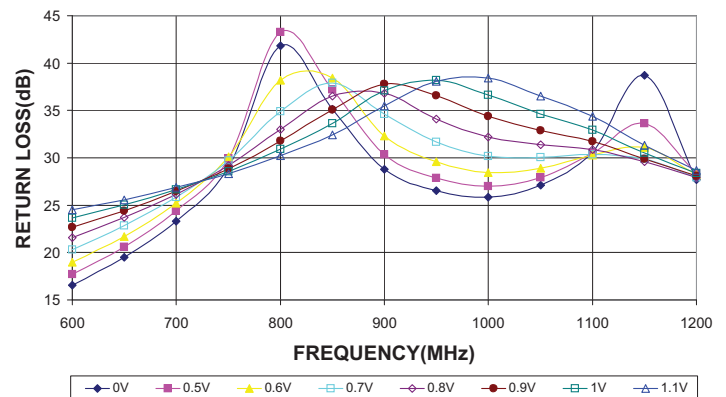
CAPACITORS C1,C3: .01 uF, 0603 SIZE
CAPACITORS C2,C4: 6.8 pF, 0603 SIZE
RESISTORS R1,R2: 2 KOhm, 0402 SIZE

- NOTES:**
1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020" $\pm$.0015"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
 2. IF YOUR PCB DESIGN RULES ALLOW, GROUND VIAS SHOULD BE PLACED UNDER THE LAND PATTERN FOR BETTER RF PERFORMANCE.
 3. 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

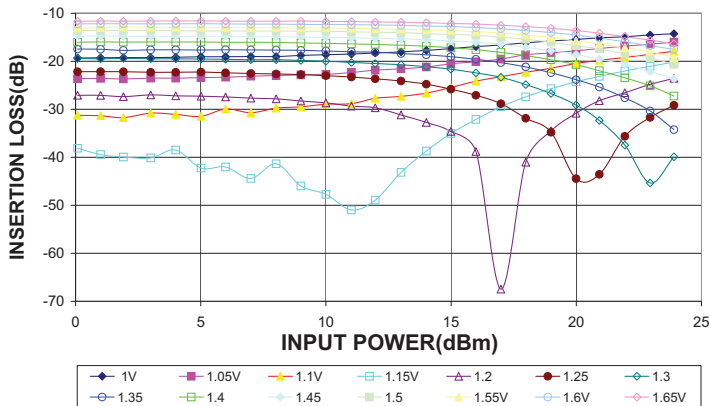
VACC-09+ INPUT RETURN LOSS Vs. FREQUENCY Vs. CONTROL VOLTAGE



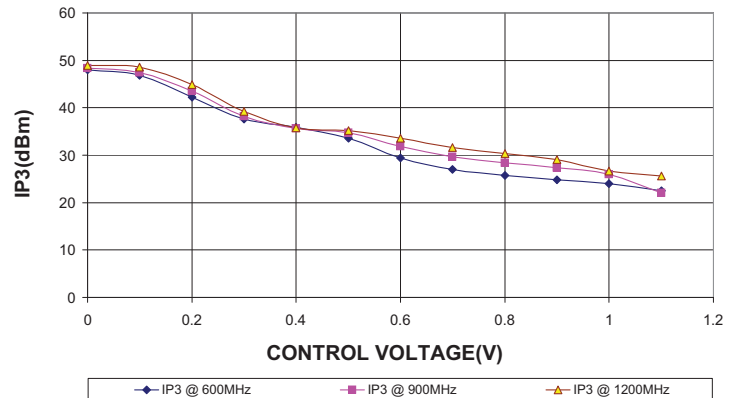
VACC-09+ OUTPUT RETURN LOSS Vs. FREQUENCY Vs. CONTROL VOLTAGE



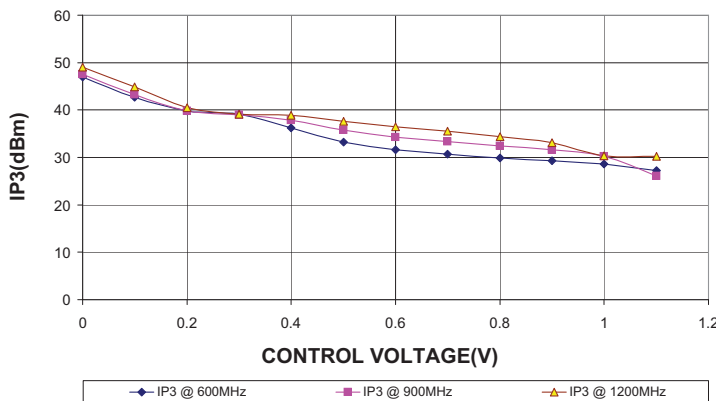
VACC-09+
INSERTION LOSS Vs. INPUT POWER @ 900MHz



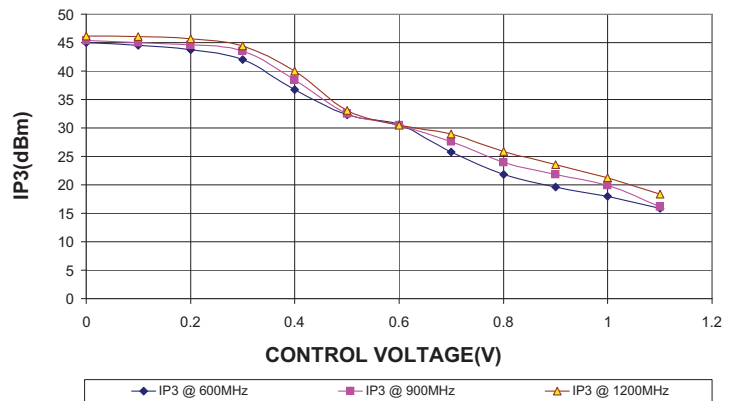
VACC-09+
IP3 Vs. CONTROL VOLTAGE
Vs. FREQUENCY @ 25°C



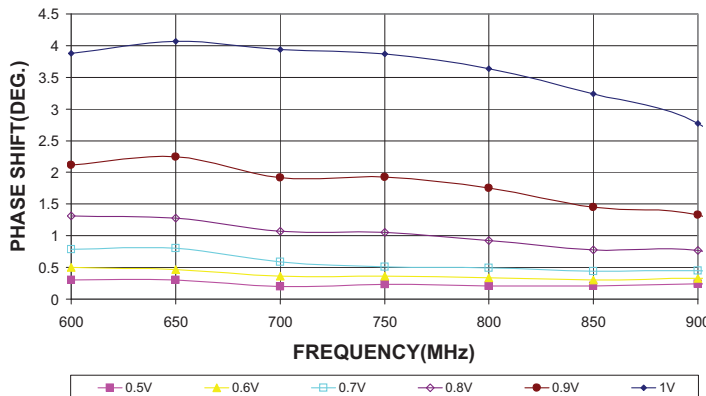
VACC-09+
IP3 Vs. CONTROL VOLTAGE
Vs. FREQUENCY @ 85°C



VACC-09+
IP3 Vs. CONTROL VOLTAGE
Vs. FREQUENCY @ -45°C



VACC-09+
PHASE SHIFT Vs. FREQUENCY Vs. CONTROL VOLTAGE
600-900MHz (WITH RELATION TO 0V CONTROL VOLTAGE)



VACC-09+
PHASE SHIFT Vs. FREQUENCY Vs. CONTROL VOLTAGE
900-1200MHz (WITH RELATION TO 0V CONTROL VOLTAGE)

