

Surface Mount Attenuator/Switch

50Ω Bi-Phase 2 to 400 MHz

RAS-1+
RAS-1



CASE STYLE: TT241
PRICE: \$7.95 ea. QTY. (1-9)

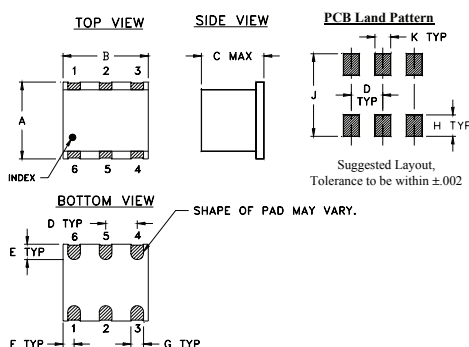
Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Control Current	30mA
Permanent damage may occur if any of these limits are exceeded.	

Pin Connections

INPUT	4
OUTPUT	1
CONTROL	5
GROUND	2,3,6

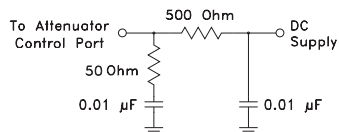
Outline Drawing



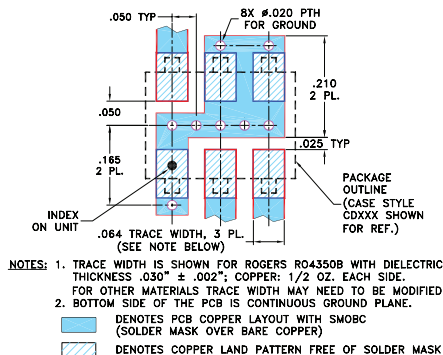
Outline Dimensions (inch/mm)

A	B	C	D	E	F
.250	.31	.275	.100	.050	.055
6.35	7.87	6.99	2.54	1.27	1.40
G	H	J	K	wt	
.040	.070	.270	.050	grams	
1.02	1.78	6.86	1.27	0.50	

suggested control port biasing configuration



Demo Board MCL P/N: TB-03 Suggested PCB Layout (PL-052)



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

Features

- wideband, 2 to 400 MHz
- low conversion loss, 1.6 dB typ.
- excellent phase and amplitude unbalance

Applications

- bi-phase modulator

Attenuator/Switch Electrical Specifications

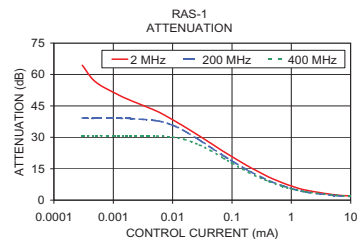
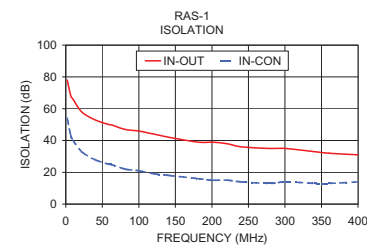
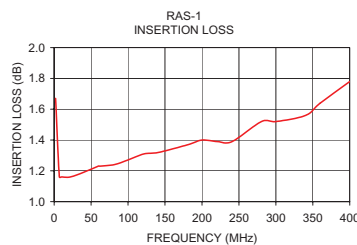
FREQUENCY (MHz)	CON	INSERTION LOSS (dB) ±20 mA		MAX. INPUT PWR (dBm) ±20 mA		IN-OUT ISOLATION (dB) 0 mA		BI-PHASE $\bar{X}$ (±20 mA) Typ.	
		Mid-Band m	Total Range	1 dB compr.	no damage	L	M	Δ AMP (dB)	Phase (deg.) deviation from 180°
		Typ.	Max.	Typ.	Max.	Typ.	Min.	Typ.	Min.
2-400	DC-0.05	1.4	2.4	1.6	3.2	20*	25	65	45
		28	32	22				0.10	0.1
		1.0	2.0						

L = low range [f_L to $10 f_L$] M = mid range [$10 f_L$ to $f_U/2$] U = upper range [$f_U/2$ to f_U] m = [$2 f_L$ to $f_U/2$]
* 15 dBm from 2-10 MHz.

Performance specifications apply for input power up to 10 dB below stated 1 dB compression.

Typical Performance Data

Freq. (MHz)	I. Loss (dB) at 20mA	±Control ΔAMP (dB)	20mA ΔPhase (deg.)	Isolation (dB) (in-out)	(in-con)	Input R. Loss (dB)	Control Current (mA)	Attenuation (dB) 2 MHz 400 MHz	Phase Δ ref at 15mA Ctrl 2 MHz 400 MHz	Input VSWR 2 MHz 400 MHz
	$\bar{X}$	σ	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$				
2.0	1.67	0.000	0.01	179.9	78	54	18.1	0.0000	72.7	39.0
7.0	1.16	0.001	0.00	180.0	68	43	15.4	0.0003	64.4	39.2
10.0	1.16	0.001	0.00	180.0	66	40	27.6	0.0005	56.5	39.0
21.9	1.16	0.001	0.00	180.0	58	33	31.0	0.0012	50.4	39.0
39.8	1.19	0.001	0.00	180.1	53	28	31.9	0.0019	47.8	39.0
59.7	1.23	0.001	0.00	180.1	50	25	32.1	0.0054	42.5	39.0
61.7	1.23	0.001	0.00	180.1	50	25	32.1	0.0100	38.4	35.8
81.6	1.24	0.001	0.00	180.2	47	22	32.2	0.0157	35.1	33.1
99.5	1.27	0.001	0.00	180.2	46	21	32.3	0.0284	30.6	28.7
121.4	1.31	0.001	0.01	180.3	44	19	32.4	0.0433	27.3	25.3
141.3	1.32	0.001	0.01	180.4	42	18	32.4	0.0722	23.2	21.2
181.1	1.37	0.001	0.01	180.6	39	16	32.2	0.1012	20.7	18.6
200.0	1.40	0.001	0.01	180.6	39	15	32.0	0.1898	16.1	14.1
220.9	1.39	0.001	0.01	180.8	38	15	31.6	0.3008	13.1	11.2
240.8	1.39	0.001	0.01	180.9	36	14	30.3	0.4259	10.9	9.2
280.6	1.52	0.001	0.05	181.1	35	13	26.6	0.7017	8.3	6.9
300.5	1.52	0.001	0.04	181.1	35	14	24.8	0.9968	6.8	5.6
340.3	1.56	0.001	0.03	181.4	33	13	21.4	1.7486	4.8	3.9
360.2	1.64	0.002	0.06	181.6	32	13	19.8	5.6920	2.5	2.1
400.0	1.78	0.003	0.09	181.7	31	14	17.1	15.1258	1.8	1.5



electrical schematic

