

# Surface Mount Switch

50Ω SPDT, Absorptive DC<sup>3</sup> to 2.0 GHz

# MSWA-2-20+



Generic photo used for illustration purposes only

CASE STYLE: XX211

**+RoHS Compliant**

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



Available Tape and Reel at no extra cost

Reel Size	Devices/Reel
7"	20, 50, 100, 200, 500, 1000
13"	2000

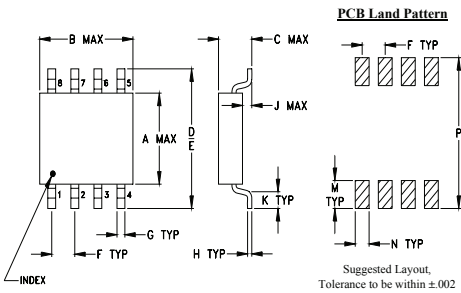
## Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Input Power	see Note 1
Control Current	see Note 2
Permanent damage may occur if any of these limits are exceeded.	

## Pin Connections

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

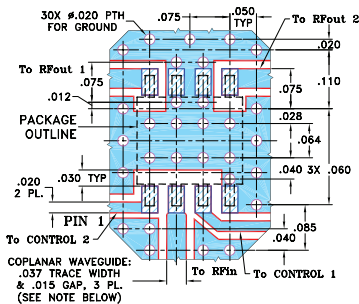
## Outline Drawing



## Outline Dimensions (inch/mm)

A	B	C	D	E	F	G
.163	.210	.077	.250	.220	.050	.017
4.14	5.33	1.96	6.35	5.59	1.27	0.43
H	J	K	M	N	P	wt
.009	.025	.030	.050	.030	.270	grams
0.23	0.64	0.76	1.27	0.76	6.86	0.10

## Demo Board MCL P/N: TB-205 Suggested PCB Layout (PL-219)



- NOTE:
- COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .020" ± .0015"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH & GAP 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

## 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](http://www.minicircuits.com/MCLStore/terms.jsp)

## Features

- wideband, DC to 2.0 GHz
- low video leakage, 8 mVp-p typ.
- very fast switching, 5ns typ.

## Applications

- cellular
- PCN
- 2-way radio
- receiver antenna switching

## Electrical Specifications

FREQ. <sup>3</sup> (GHz)	INSERTION LOSS (dB)				1dB COMPR. (dBm)				IN-OUT ISOLATION (dB)											
	DC-100 MHz	100-500 MHz	500-1000 MHz	1000-2000 MHz	DC-100 MHz	100-500 MHz	500-1000 MHz	1000-2000 MHz	DC-100 MHz	100-500 MHz	500-1000 MHz	1000-2000 MHz								
f <sub>L</sub>	Typ.	Max.	Typ.	Max.	Typ.	Typ.	Typ.	Typ.	Typ.	Min.	Typ.	Min.	Typ.	Min.						
DC 2.0	0.65	0.9	0.9	1.2	0.95	1.3	1.20	1.5	20	24	27	29	60	50	45	37	40	32	30	25

## Additional Specifications

Control Voltage	-8/0 for compression spec, -8 to -5/0 for all other specs	
Control Current, mA	0.2 max to -8V, 0.02 max at 0 to -0.2V	
VSWR:(1)	DC-1GHz 1.2 typ.	1-2GHz 1.4 typ.
Rise/Fall time (10%-90%), ns	3 typ.	
Switching time, 50% of Control to 90% RF(Turn-on), ns	9 typ	
10% RF(Turn-off), ns	3 typ	
**Video Leakage, mVp-p 0/-5V Control	19 typ.	

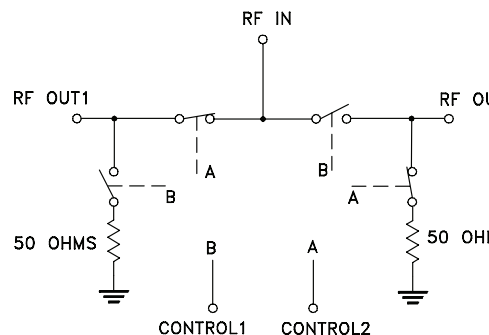
## CONTROL LOGIC

Control Ports		RF outputs	
1	2	1	2
0	-V	Off	On
-V	0	On	Off

\*\* Video leakage or break through is defined as leakage of switching signal to RF output ports.

- RF Power Input (dBm), Max. DC-100MHz 100-500 MHz 500-2000MHz
  - Steady State Control 0/-8V 24 27 33
  - As a Modulator 12 17 23
- Control Current, 500µA (occurs at -9V to -12V typ.)
- All RF connections must be DC blocked or held at 0V DC.

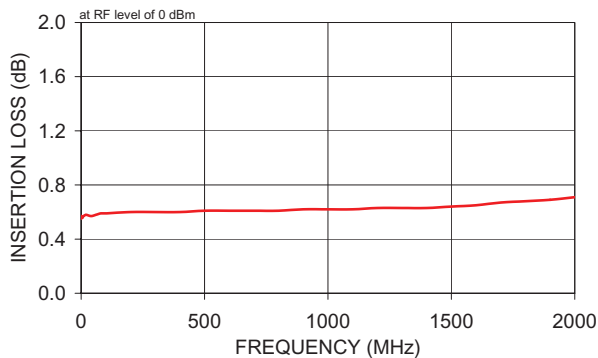
## Electrical Schematic



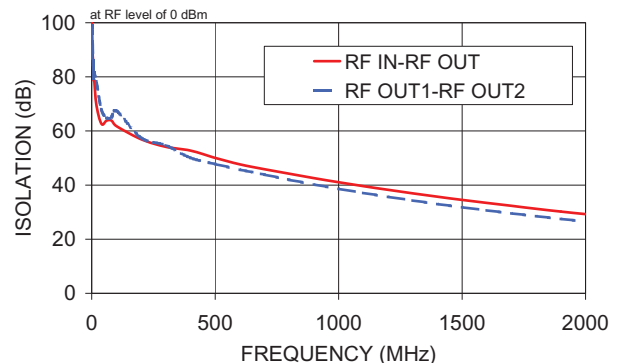
## Typical Performance Data

FREQ. (MHz)	ON INSERTION LOSS (dB) Control @ 0V/-5V)		OFF ISOLATION (dB) Control @ 0V/-5V)		VSWR	
	RF IN-RF OUT		RF IN - RF OUT	RF OUT 1-RF OUT 2	RF IN	RF OUT
	0.3	0.55	86.64	87.15	1.11	1.11
10.0	0.57	78.95	81.46	1.09	1.10	
100.0	0.59	61.84	67.44	1.07	1.08	
200.0	0.60	56.95	57.49	1.08	1.09	
300.0	0.60	54.13	54.74	1.09	1.10	
400.0	0.60	52.77	50.08	1.09	1.10	
500.0	0.61	50.05	47.79	1.09	1.10	
600.0	0.61	47.67	45.68	1.09	1.10	
700.0	0.61	45.86	43.87	1.10	1.11	
800.0	0.61	44.23	41.94	1.09	1.11	
900.0	0.62	42.57	40.21	1.09	1.12	
1000.0	0.62	41.06	38.64	1.09	1.13	
1100.0	0.62	39.61	37.10	1.08	1.14	
1200.0	0.63	38.25	35.67	1.07	1.15	
1300.0	0.63	36.95	34.30	1.06	1.16	
1400.0	0.63	35.70	33.02	1.05	1.16	
1500.0	0.64	34.52	31.82	1.04	1.16	
1600.0	0.65	33.41	30.67	1.04	1.15	
1700.0	0.67	32.34	29.57	1.04	1.15	
1800.0	0.68	31.24	28.52	1.05	1.15	
1900.0	0.69	30.21	27.51	1.06	1.15	
2000.0	0.71	29.26	26.54	1.08	1.16	

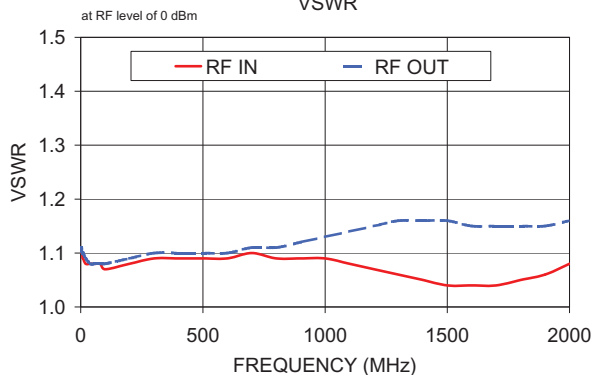
MSWA-2-20+  
INSERTION LOSS



MSWA-2-20+  
ISOLATION



MSWA-2-20+  
VSWR



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