



**THE DATASHEET OF  
MSW-2-20+**



# Surface Mount Switch

50Ω SPDT, Reflective DC<sup>4</sup> to 2.0 GHz

## MSW-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

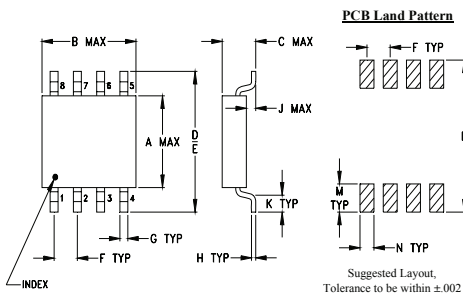
### Maximum Ratings

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

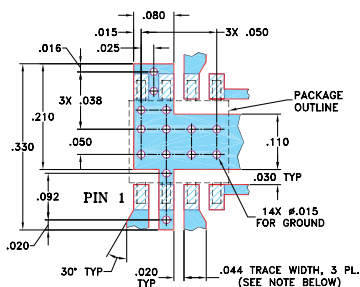
### Outline Drawing



### 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-203 Suggested PCB Layout (PL-108)



- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.020" ± 0.0015"; 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

### Features

- wideband, DC to 2.0 GHz
- very fast switching, 4ns typ.
- low insertion loss, 0.5 dB typ.
- low video leakage, 15 mVp-p typ.

### Applications

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

### Electrical Specifications

FREQ. <sup>4</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>i</sub> f <sub>o</sub>	Typ. Max.	Typ. Max.	Typ. Max.	Typ. Max.	Typ.	Typ.	Typ.	Typ.	Typ.	Min.	Typ.	Min.	Typ.	Min.
DC 2.0	0.30 0.8	0.4 0.9	0.50 1.0	0.75 1.3	22	23	24	25	55	50	43	36	34	28

### 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	1-2GHz
	1.2 typ.	1.4 typ.
Rise/Fall time (10%-90%), ns	4 typ.	
Switching time, 50% of Control to 90% RF(Turn-on), ns	10 typ	
10% RF(Turn-off), ns	4 typ	
**Video Leakage, mVp-p 0/-5V Control	19 typ.	

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

1. RF Power Input(dBm), Max.DC-100MHz100-500MHz500-2000MHz

• Steady State Control 0/-8V 23 27 31

• As a Modulator 11 17 21

2. Control Current, 500µA (occurs at -9V to -12V typ)

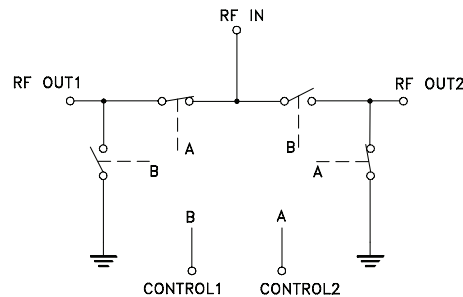
3. OFF state of RF output is low impedance

4. All RF connections must be DC blocked or held at 0V DC.

### CONTROL LOGIC

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

### Electrical Schematic



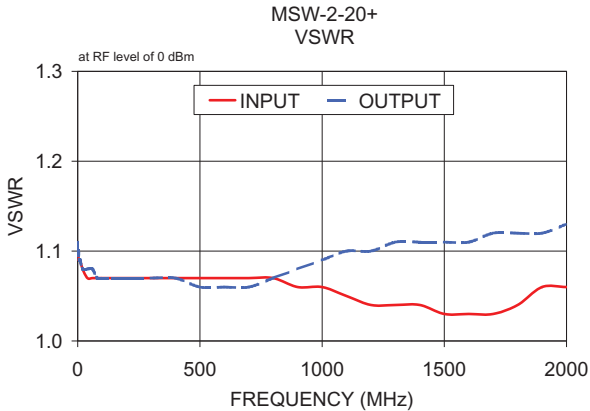
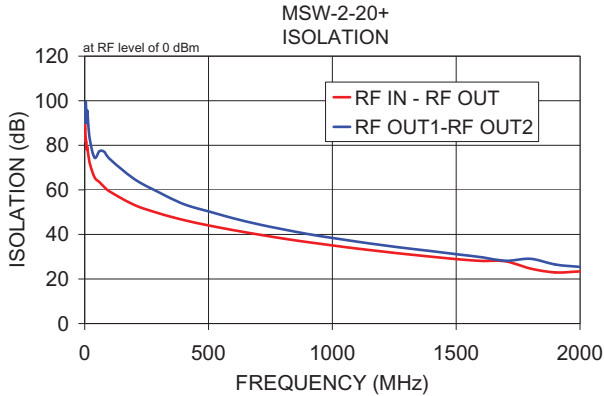
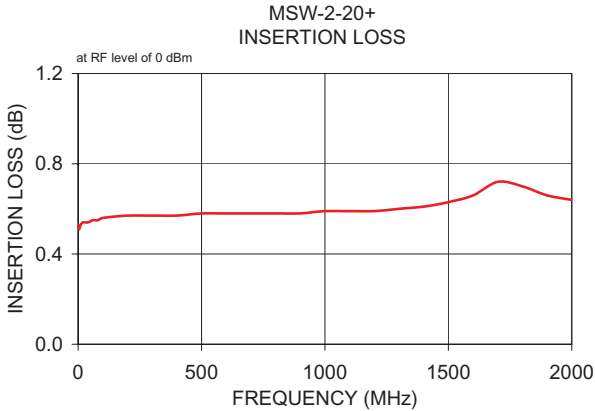
### Notes

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## Typical Performance Data

FREQ. (MHz)	ON INSERTION LOSS (dB) Control @ 0V/-5V		OFF ISOLATION (dB) Control @ 0V/-5V		VSWR	
	RF IN-RF OUT		IN-OUT		RF IN	RF OUT
	RF IN-RF OUT	RF IN-RF OUT	RF OUT1-RF OUT2		(ON PORT)	
0.3	0.52	81.93	93.30	1.10	1.11	
1.0	0.52	97.26	97.90	1.10	1.10	
100.0	0.56	59.31	73.94	1.07	1.07	
200.0	0.57	53.23	64.89	1.07	1.07	
300.0	0.57	49.47	58.85	1.07	1.07	
400.0	0.57	46.44	53.61	1.07	1.07	
500.0	0.58	44.05	50.36	1.07	1.06	
600.0	0.58	41.90	47.22	1.07	1.06	
700.0	0.58	39.98	44.58	1.07	1.06	
800.0	0.58	38.20	42.30	1.07	1.07	
900.0	0.58	36.54	40.21	1.06	1.08	
1000.0	0.59	35.06	38.40	1.06	1.09	
1100.0	0.59	33.66	36.75	1.05	1.10	
1200.0	0.59	32.36	35.21	1.04	1.10	
1400.0	0.61	29.98	32.49	1.04	1.11	
1500.0	0.63	28.91	31.14	1.03	1.11	
1600.0	0.66	28.12	29.80	1.03	1.11	
1800.0	0.70	24.70	29.05	1.04	1.12	
1900.0	0.66	22.96	26.48	1.06	1.12	
2000.0	0.64	23.40	25.43	1.06	1.13	



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