

# Surface Mount High Isolation Switch

## M3SWA-2-50DR+

50Ω SPDT, Absorptive DC to 4500 MHz



CASE STYLE: DL805  
PRICE: \$4.95 ea. QTY (20)

### Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
Supply V, Input Power	see notes
Permanent damage may occur if any of these limits are exceeded.	

### Pin Connections

RF IN	6
RF OUT 1	1
RF OUT 2	4
TTL IN	2
+5V	5
-5V	7
TTL GND	3
GND	8
GND	PADDLE

### Features

- high isolation, 65 dB typ. at 1 GHz
- low insertion loss, 0.7 dB typ.
- integral TTL driver
- miniature case style DL805

### Applications

- automated switching networks
- transmitters/receivers

**+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**

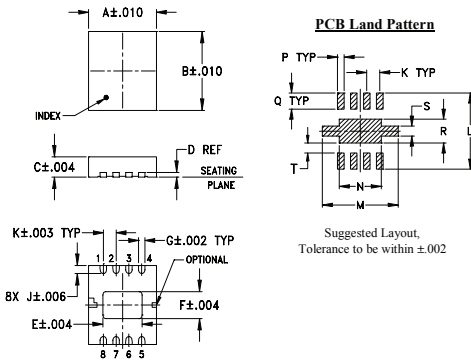
Reel Size	Devices/Reel
7"	20, 50, 100, 200, 500, 1000

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

FREQ. (MHz)	INSERTION LOSS (dB)				1dB COMPR. (dBm)				IN-OUT ISOLATION (dB)											
	DC-100 MHz	100-1000 MHz	1000-2000 MHz	2000-4500 MHz	DC-100 MHz	100-1000 MHz	1000-2000 MHz	2000-4500 MHz	DC-100 MHz	100-1000 MHz	1000-2000 MHz	2000-4500 MHz								
f <sub>i</sub>	Typ.	Max.	Typ.	Max.	Typ.	Typ.	Typ.	Typ.	Typ.	Min.	Typ.	Min.	Typ.	Min.						
DC 4500	0.6	1.0	0.7	1.2	0.9	1.4	1.4	2.0	20 <sup>1</sup>	25	25	20	80	65	65	53	57	45	36	30

<sup>1</sup>drops to 17.0 dBm at 10 MHz

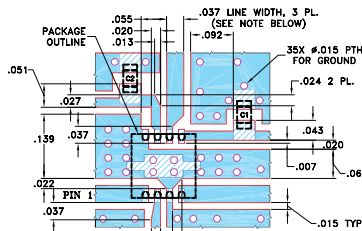
### Outline Drawing



### Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H	J	K
0.128	0.128	0.035	0.008	0.080	0.047	0.013	--	0.014	0.026
3.25	3.25	0.89	0.20	2.03	1.19	0.33	--	0.36	0.66
L	M	N	P	Q	R	S	T	wt	
0.158	0.158	0.084	0.013	0.030	0.048	0.020	0.025	grams	
4.01	4.01	2.13	0.33	0.76	1.22	0.51	0.64	0.02	

### Demo Board MCL P/N: TB-159 Suggested PCB Layout (PL-120)



- 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

### 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-Circuit's 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-Circuit's website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp)

### Additional Specifications

Power Supply Voltage @ -40°C to 85°C	@ -55°C to 100°C	Current, mA
+4.80 to +5.25V	+4.90 to +5.25V	9 max.
-5.25 to -4.80V	-5.25 to -4.90V	9 max.
TTL Control low threshold	Voltage, V	Current, mA
high threshold	0 min., 0.8 max.	0.2 max.
	2 min., 5 max.	5 max.
VSWR* (:1)	1.1 Typ. to 2GHz, 1.25 Typ. to 4.5 GHz	
Rise/Fall Time, ns	5 Typ., 10 Max.	
Switching Time, ns turn on/off	10 Typ., 15 Max.	
Video Leakage*, mVp-p	30 Typ.	

\* For all states of absorptive switch

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

1. Absolute maximum power and voltage rating:

RF input power, 250mW  
Supply voltage: ±6V DC

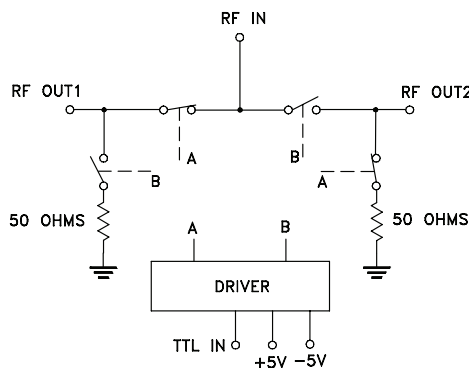
2. All RF pins must be DC blocked or held at 0V DC

3. ESD ratings

Human Body Model (HBM): Class 1C(1000 to <2000V) in accordance with ESD STM5.1-2001  
Machine Model(MM): Class M1(<100V) in accordance with ESD STM5.2-1999

TTL	CONTROL LOGIC	
	RF1	RF2
LOW	ON	OFF
HIGH	OFF	ON

### Electrical Schematic

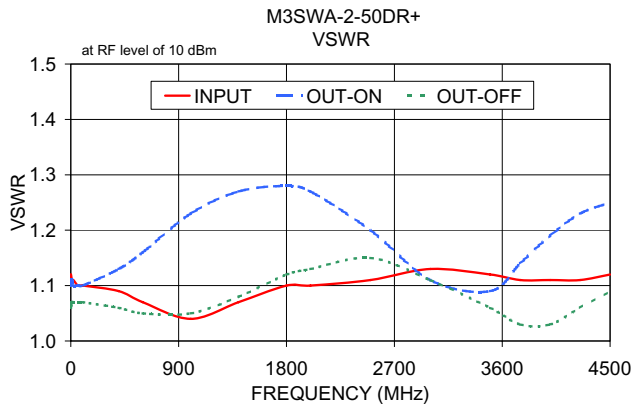
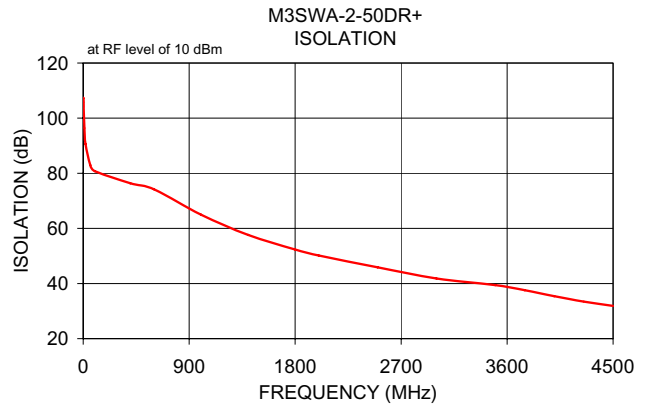
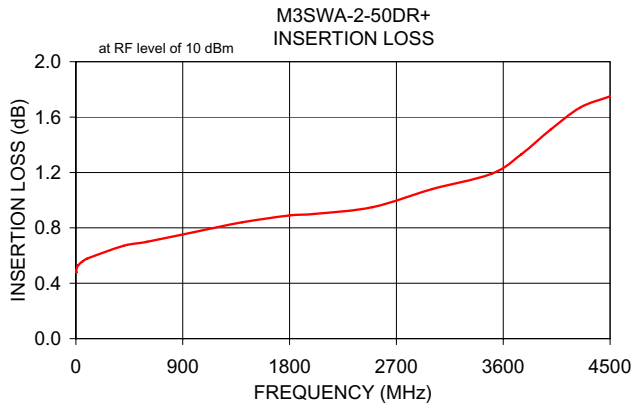


[www.minicircuits.com](http://www.minicircuits.com) P.O. Box 35166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com

REV. J  
M136360  
M3SWA-2-50DR+  
ED-9656A  
RS/TD/CP/AM  
120716  
Page 1 of 2

## Typical Performance Data

FREQ. (MHz)	ON INSERTION LOSS (dB) IN-OUT		OFF ISOLATION (dB) IN-OUT		IN $\bar{x}$	VSWR	
	$\bar{x}$	$\sigma$	$\bar{x}$	$\sigma$		ON $\bar{x}$	OUT $\bar{x}$
0.30	0.49	0.01	103.98	6.45	1.11	1.10	1.07
0.50	0.48	0.00	105.78	6.54	1.11	1.11	1.07
1.00	0.48	0.01	107.21	4.74	1.12	1.11	1.06
10.00	0.52	0.00	96.42	1.62	1.11	1.11	1.07
20.00	0.53	0.01	90.58	2.13	1.11	1.10	1.07
60.00	0.56	0.01	82.97	2.47	1.10	1.10	1.07
100.00	0.58	0.01	80.77	1.90	1.10	1.10	1.07
400.00	0.67	0.01	76.40	4.07	1.09	1.13	1.06
600.00	0.70	0.01	74.22	3.92	1.07	1.16	1.05
1000.00	0.77	0.01	64.99	2.65	1.04	1.23	1.05
1400.00	0.84	0.01	57.65	1.44	1.07	1.27	1.08
1800.00	0.89	0.01	52.33	1.01	1.10	1.28	1.12
2000.00	0.90	0.01	50.16	0.87	1.10	1.27	1.13
2500.00	0.95	0.01	45.87	0.68	1.11	1.20	1.15
3000.00	1.08	0.01	41.83	0.59	1.13	1.11	1.11
3500.00	1.19	0.01	39.43	0.53	1.12	1.09	1.06
3750.00	1.33	0.01	37.59	0.52	1.11	1.14	1.03
4000.00	1.51	0.02	35.39	0.43	1.11	1.19	1.03
4250.00	1.67	0.02	33.43	0.33	1.11	1.23	1.06
4500.00	1.75	0.03	31.86	0.29	1.12	1.25	1.09



### 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)

