

# Surface Mount High Isolation Switch

50Ω SPST, Absorptive DC to 2000 MHz

KSWHA-1-20+



CASE STYLE: XX112  
PRICE: \$34.95 ea. QTY (1-9)

+ RoHS compliant in accordance with EU Directive (2002/95/EC)

The +Suffix has been added in order to identify RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications.

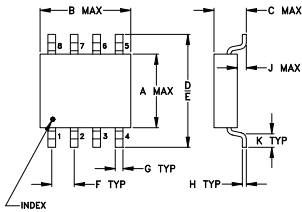
## Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 150°C
Input Power	see Table & Note1
Control Current	see Table
Permanent damage may occur if any of these limits are exceeded.	

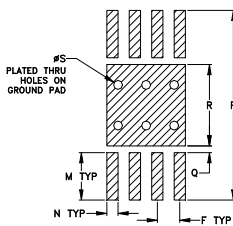
## Pin Connections

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

## Outline Drawing



PCB Land Pattern

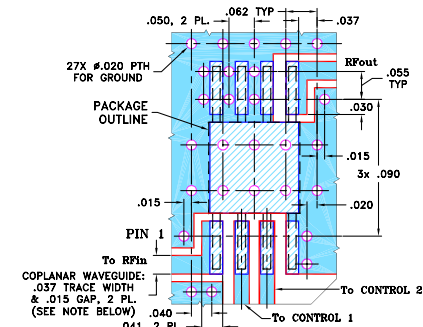


Suggested Layout, Tolerance to be within ±.002

## Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H	
.180	.180	.070	.400	.350	.050	.015	.005	
4.57	4.57	1.78	10.16	8.89	1.27	0.38	0.13	
J	K	M	N	P	Q	R	S	wt.
.005	.070	.105	.025	.420	.015	.180	.020	grams
0.13	1.78	2.67	0.64	10.67	0.38	4.57	0.51	0.15

Demo Board MCL P/N: TB-206  
Suggested PCB Layout (PL-218)



- NOTE: 1. TRACE WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020" ± .0015"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH & GAP 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 2000 MHz
- low insertion loss, 1.3 dB typ.
- low video leakage, 30 mVp-p typ.
- hermetically sealed glass-metal package
- aqueous washable

## Applications

- PCN
- cellular
- antenna switching

## Electrical Specifications

FREQ. (MHz)	INSERTION LOSS (dB)						1dB COMPR. (dBm)			IN-OUT ISOLATION (dB)						
	DC-100 MHz		100-1000 MHz		1000-2000 MHz		DC-100 MHz	100-1000 MHz	1000-2000 MHz	DC-100 MHz	100-1000 MHz	1000-2000 MHz	Typ.	Min.		
f <sub>L</sub>	f <sub>U</sub>	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Typ.	Typ.	Typ.	Typ.	Min.	Typ.	Min.	
DC	2000	0.8	1.2	1.3	1.7	1.3	1.7	19	19	26	75	60	65	58	65	58

## Additional Specifications

Control Voltage, volts	-0.2 to 0			
Low State				
High State (negative) for compression specs	-8			
for other specs	-5 to 8			
Control Current, mA	0.2 Max. to -8V 0.5 Max. at -9V to -12V Typ.			
VSWR (:1)	DC-0.2 GHz	0.2-2 GHz		
ON, all ports	1.25 Max.	1.5 Max.		
OFF, Input	1.25 Max.	1.5 Max.		
OFF, Output	1.4 Max.	1.5 Max.		
Rise/Fall Time (10%-90%), ns	3 Typ., 5 Max.			
Switching Time, 50% of control to 90% RF (Turn-on), ns	7 Typ., 10 Max.			
10% RF (Turn-off), ns	3 Typ., 10 Max.			
Video Leakage <sup>3</sup> , mVp-p	30 Typ., 50 Max.			
RF Power Input Max. <sup>1</sup>	DC-.02	.02-5	.5-2	GHz
Steady State 0/-8V control	+23	+30	+33	dBm
As Modulator <sup>2</sup>	+14.5	+20	+27	dBm

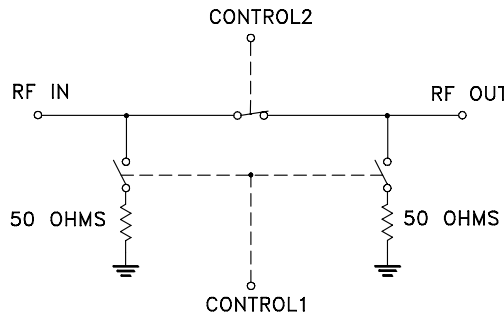
## Notes:

- Above 20° C derate power linearly to zero at 150°C
- In modulator service, unrestricted switching is permitted with RF applied.
- Video leakage or break through is defined as leakage of switching signal to RF output ports.
- All RF pins must be DC blocked or held at 0V DC.

## CONTROL LOGIC

CONTROL LOGIC		
Control Ports	RF output	
1	2	
-V	0	ON
0	-V	OFF

## Electrical Schematic



**Mini-Circuits**  
ISO 9001 ISO 14001 AS 9100 CERTIFIED

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For detailed performance specs & shopping online see web site

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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-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).

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## Typical Performance Data

FREQ. (MHz)	ON INSERTION LOSS (dB) (ctrl1 @ -8V, ctrl2 @ 0V) IN-OUT		OFF ISOLATION (dB) (ctrl1 @ 0V, ctrl2 @ -8V) IN-OUT		VSWR		
	$\bar{x}$	$\sigma$	$\bar{x}$	$\sigma$	IN $\bar{x}$	OUT	
						ON $\bar{x}$	OFF $\bar{x}$
0.30	0.62	0.01	90.61	3.68	1.15	1.15	1.03
5.30	0.63	0.01	85.48	6.29	1.16	1.15	1.03
10.30	0.69	0.01	83.23	4.25	1.16	1.15	1.03
100.29	0.79	0.01	67.92	1.22	1.15	1.15	1.03
280.26	0.85	0.01	66.96	1.83	1.15	1.14	1.03
390.24	0.92	0.00	67.09	1.35	1.15	1.14	1.03
445.23	0.90	0.01	67.05	1.41	1.16	1.15	1.03
610.21	0.96	0.01	65.89	1.85	1.16	1.15	1.04
780.18	0.99	0.01	64.48	1.97	1.17	1.16	1.05
890.17	1.02	0.01	63.58	2.32	1.18	1.16	1.06
945.16	1.04	0.01	63.07	2.05	1.18	1.16	1.07
1000.15	0.99	0.00	62.55	1.47	1.18	1.15	1.08
1165.13	1.09	0.02	61.49	2.35	1.18	1.15	1.09
1335.10	1.11	0.02	61.45	1.70	1.17	1.14	1.12
1445.08	1.14	0.02	61.66	1.64	1.16	1.13	1.13
1500.08	1.09	0.02	62.32	2.10	1.16	1.12	1.14
1665.05	1.17	0.01	60.72	1.78	1.15	1.10	1.17
1835.03	1.13	0.01	60.34	0.70	1.14	1.07	1.20
1945.01	1.22	0.03	60.54	1.60	1.13	1.06	1.22
2000.00	1.17	0.01	61.08	1.47	1.13	1.05	1.23

