

RoHS Compliant



SW-137-PIN V3

GaAs SPDT Reflective Switch, 0.01 - 3.0 GHz

Features

• Isolation: 48 dB Typical at 1 GHz

• High Intercept Point Over Wide Bandwidth

Trise, Tfall: 5 nS Typical

DIP Package

• Integral TTL Driver (CMOS Compatible)

• 50 Ohm Nominal Impedance

Description

M/A-COM's SW-137 is a GaAs MMIC SPDT reflective switch with an integral Silicon ASIC driver. This device is in a 14-lead DIP package. These switches offer high intercept points over a wide bandwidth of operation, while maintaining low DC power dissipation. These switches exhibit excellent performance and repeatability from 0.01 to 3.0 GHz. The SW-137 is ideally suited for RF/IF communications applications. Contact the factory for environmental screening.

Ordering Information

Part Number	Package
SW-137-PIN	DI-1

Note: Reference Application Note M513 for reel size

information.

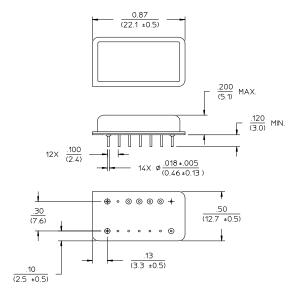
Note: Die quantity varies.

Absolute Maximum Ratings ²

Parameter	Absolute Maximum
Max Input Power 0.05 GHz 0.5 - 3.0 GHz	+27 dBm +34 dBm
Supply Voltages Vcc Vee	-0.5V to +16.5 V -16.5V to +0.5V
Control Voltage	-0.5V to V _{CC} to +0.5V
Operating Temperature	-55°C to +125°C
Storage Temperature	-65°C to +150°C

Operation of this device above any one of these parameters may cause permanent damage.

Functional Block Diagram



Dimensions in () are in mm Unless Otherwise Noted: XXX = ± 0.010 (XX = ± 0.25) XX = ± 0.02 (X = ± 0.5) WEIGHT (APPROX): 0.14 OUNCES 4 GRAMS

Truth Table

Control Inputs	Condition of Switch RF Common to each RF Port			
C1	RF1	RF2		
Low	On	Off		
High	Off	On		

Current (mA)

	± 9V	± 12V	± 15V
Vcc	8	11	15
Vee	4	7	9

^{*} Restrictions on Hazardous Substances, European Union Directive 2002/95/EC.

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Electrical Specifications: $T_A = -55^{\circ}C$ to $+85^{\circ}C^{-1}$

Parameter	Test Conditions	Frequency	Units	Min	Тур	Max
Reference Insertion Loss	_	0.01 - 0.5 GHz 0.01 - 1.0 GHz 0.01 - 2.0 GHz 0.01 - 3.0 GHz	dB dB dB dB	_ _ _ _	_ _ _	0.9 1.0 1.4 1.6
Isolation	_	0.01 - 0.5 GHz 0.01 - 1.0 GHz 0.01 - 2.0 GHz 0.01 - 3.0 GHz	dB dB dB dB	48 43 37 32	_ _ _	_ _ _ _
VSWR	_	0.01 - 0.5 GHz 0.01 - 1.0 GHz 0.01 - 2.0 GHz 0.01 - 3.0 GHz	Ratio Ratio Ratio Ratio	_ _ _ _	_ _ _	1.25:1 1.4:1 1.7:1 2.0:1
Trise, Tfall Ton, Toff Transients	10% to 90% 1.3V Control to 90/10% RF In-band (peak-peak)	_ _ _	nS nS mV		5 22 45	
1 dB Compression		0.01 - 3.0 GHz	dBm	_	+25	_
Input IP ₃	For two-tone Input power up to +5 dBm	0.01 - 3.0 GHz	dBm	_	+46	_
Input IP ₂	For two-tone Input power up to +5 dBm	0.01 - 3.0 GHz	dBm	_	+76	_

^{1.} All specifications apply when operated with bias voltages of +9V to +15V for Vcc and –9 to –15V for Vee and 50 Ohm impedance at all RF ports unless otherwise specified.

Electrical Specifications: $T_A = 25$ °C

Parameter	Test Conditions	Frequency	Units	Min	Тур	Max
Vcc Vee			V	+9 -15	+12 -12	+15 -9
lcc	Vcc = +9 to +15V	_	mA	_	_	20.0
lee	Vee = -9 to -15V	_	mA	_	_	15.0
Vctl Vctl	Low High	_	V V	0.0 2.0	_	0.8 5.0
Input Leakage Current (Low)	0 to 0.8V	_	μА	_	_	1.0
Input Leakage Current (High)	2.0 to 5.0V	_	μА	_	_	1.0

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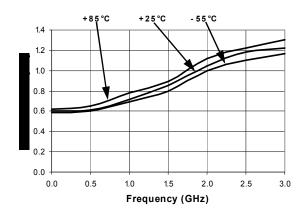


SW-137-PIN

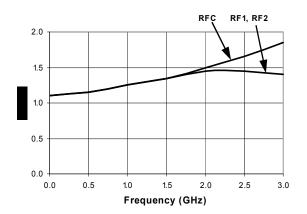
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Typical Performance Curves

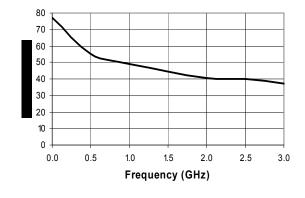
Insertion Loss vs. Frequency



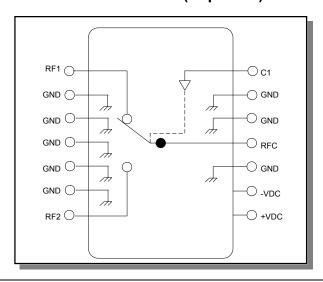
VSWR vs. Frequency



Isolation vs. Frequency



Functional Schematic (Top View)



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