



3 Watt Cellular T/R and Antenna Changeover Switch, DC - 3.0 GHz



Features

- Low Cost Plastic SOT-26 Package
- Low Insertion Loss <0.6dB @ 1900 MHz
- Low Power Consumption <20 μ A @ +3V
- Very High Intercept Point: 53 dBm IP₃
- Both Positive and Negative 2.5 to 8 V Control
- For CDMA, W-CDMA, TDMA, GSM, PCS and DCS Applications

Description

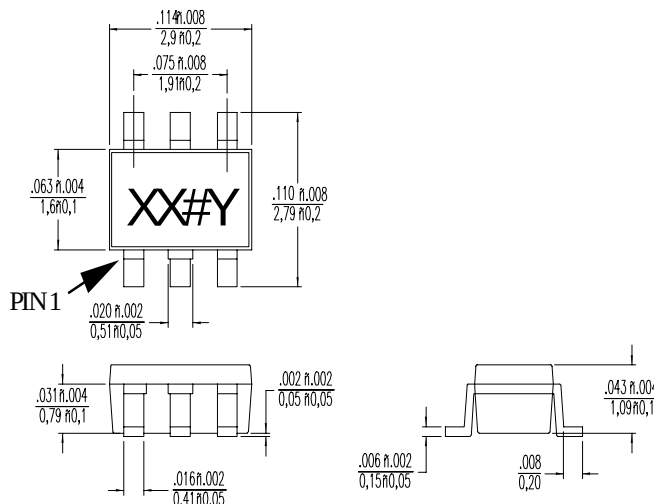
M/A-COM's SW-425 is a GaAs monolithic switch in a low cost SOT-26 surface mount plastic package. The SW-425 is ideally suited for applications where very low power consumption (<10 μ A@5V), low intermodulation products and very small size are required. Typical applications include Internal/External antenna select switch for portable telephones and data radios. In addition, because of its low loss, good isolation and inherent speed, the SW-425 can be used as a conventional T/R switch or as an antenna diversity switch. The SW-425 can be used in power applications up to 3 watts in systems such as cellular PCS, CDMA, W-CDMA, TDMA, GSM and other analog/digital wireless communications systems.

The SW-425 is fabricated using a new 0.5 micron gate length GaAs PHEMT process. The process features full chip passivation for increased performance and reliability.

Electrical Specifications $T_A = 25^\circ\text{C}$

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss	DC - 1 GHz	dB		0.4	0.5
Insertion Loss	1- 2 GHz	dB		0.55	0.65
Insertion Loss	2 - 3 GHz	dB		0.7	0.8
Isolation	DC - 1 GHz	dB	18	20	
Isolation	1 - 2 GHz	dB	13	15	
Isolation	2 - 3 GHz	dB	10	12	
VSWR	DC - 3 GHz			1.2:1	1.4:1
P _{1dB} (3V supply)	500 MHz - 3 GHz	dBm	32	34	
P _{1dB} (5V supply)	500 MHz - 3 GHz	dBm	34	36	
Input IP ₂	2-Tone, 5 MHz spacing, 0.9 GHz +10 dBm (+13 dBm total) V _{CTL} =3V	dBm	62	70	
Input IP ₃	2-Tone, 5 MHz spacing, 0.9 GHz +10 dBm (+13 dBm total) V _{CTL} =3V	dBm	48	53	
Harmonics 2 nd 3 rd	Pin 30 dBm V _{CTL} = 3V	dBc	65 45	70 48	
Harmonics 2 nd 3 rd	Pin 33 dBm V _{CTL} = 5V	dBc	65 65	75 75	
T _{rise} , T _{fall}	10% to 90% RF, 90% to 10% RF	nS		60	
T _{on} , T _{off}	50% Control to 90% RF, Control to 10% RF	nS		20	
Transients	In-Band	mV		20	
Gate Leakage Current	V _{CTL} = 3 V	μ A		10	20

SOT-26 Plastic Package



Ordering Information

Part Number	Package
SW-425 PIN	SOT-26 Plastic Package
SW-425TR	Forward Tape and Reel ¹
SW-425RTR	Reverse Tape and Reel ¹

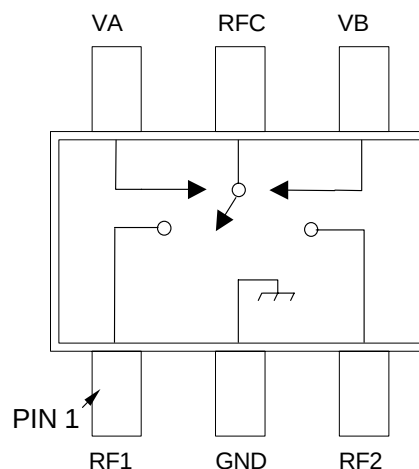
1. Reference Application Note M513 for reel size information.

Absolute Maximum Ratings¹

Parameter	Absolute Maximum
Max. Input Power (0.5 - 3.0 GHz)	
3 V Control	+36 dBm
5 V Control	+38 dBm
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

1. Exceeding any one or combination of these limits may cause permanent damage.

Functional Diagram



Truth Table

Mode (Control)	Control A	Control B	RFC - RF1	RFC - RF2
Positive ¹	0±0.2V	+2.5 to +8V	Off	On
	+2.5 to +8V	0±0.2V	On	Off
Postitive/ Negative ^{1,2}	-Vc±0.2V	+Vc	Off	On
	+Vc	-Vc±0.2V	On	Off
Negative ³	0±0.2V	-2.5V to -8V	On	Off
	-2.5V to -8V	0±0.2V	Off	On

- External DC blocking capacitors are required on all RF ports. 39pF capacitors used for positive control voltage.
- $|V_{CTL}|, V_{CTL} \leq 8V$
- If negative control is used, DC blocking capacitors are not required on RF Ports.

PIN Configuration

PIN No.	Function	Description
1	RF1	RF in/out
2	GND	RF Ground
3	RF2	RF in/out
4	VB	V Control B
5	RFC	RF COMMON
6	VA	V Control A

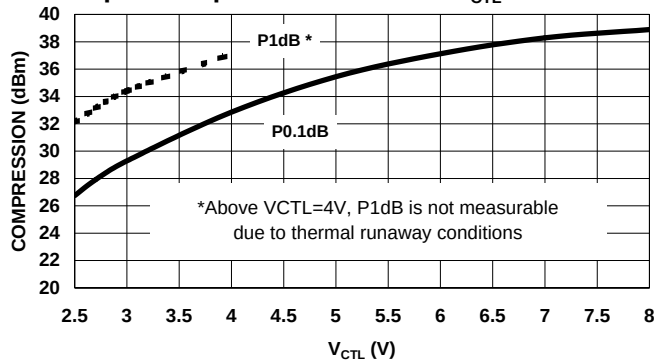
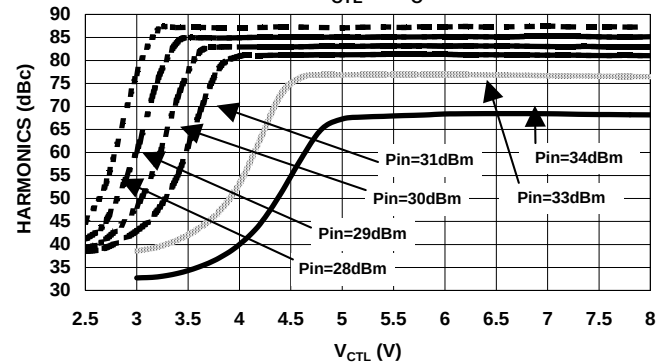
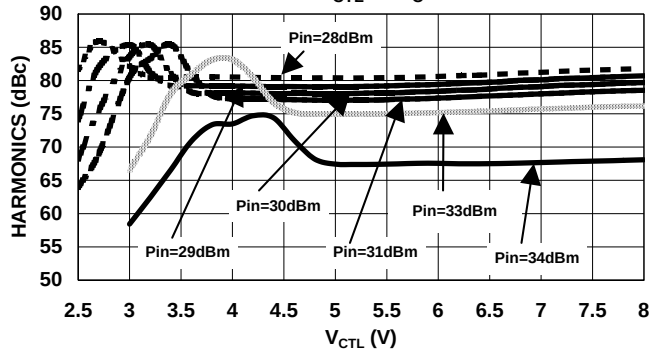
Handling Procedures

The following precautions should be observed to avoid damage:

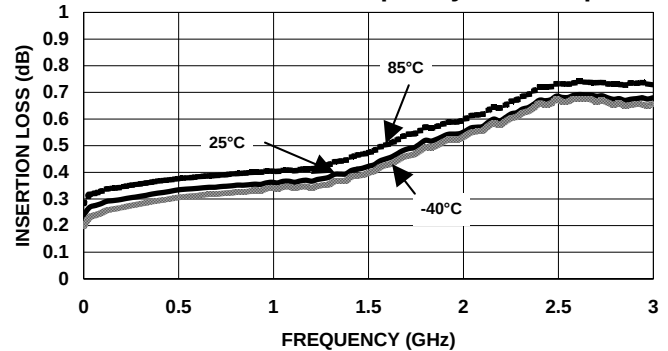
Static Sensitivity

Gallium arsenide Integrated Circuits are ESD sensitive and can be damaged by static electricity. Proper ESD techniques should be used when handling these devices.

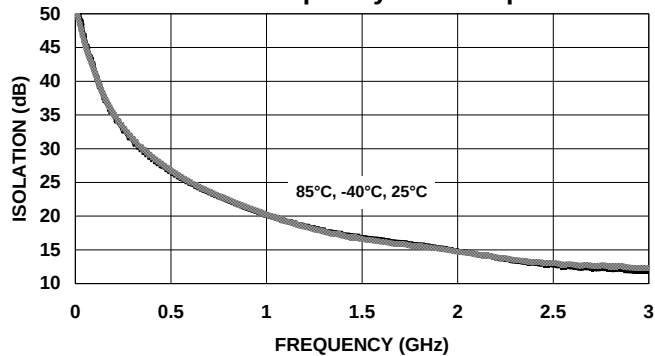
Typical Performance Curves

Input Compression Point vs. V_{CTL} at 900 MHz3rd Harmonic vs. V_{CTL} at $f_o = 900$ MHz2nd Harmonic vs. V_{CTL} at $f_o = 900$ MHz

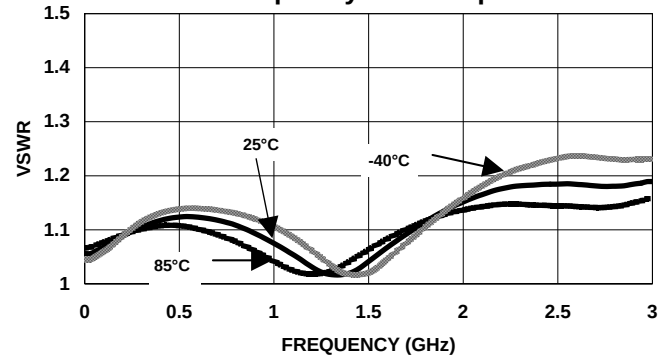
Insertion Loss vs. Frequency and Temperature



Isolation vs. Frequency and Temperature



VSWR vs. Frequency and Temperature



V2.00