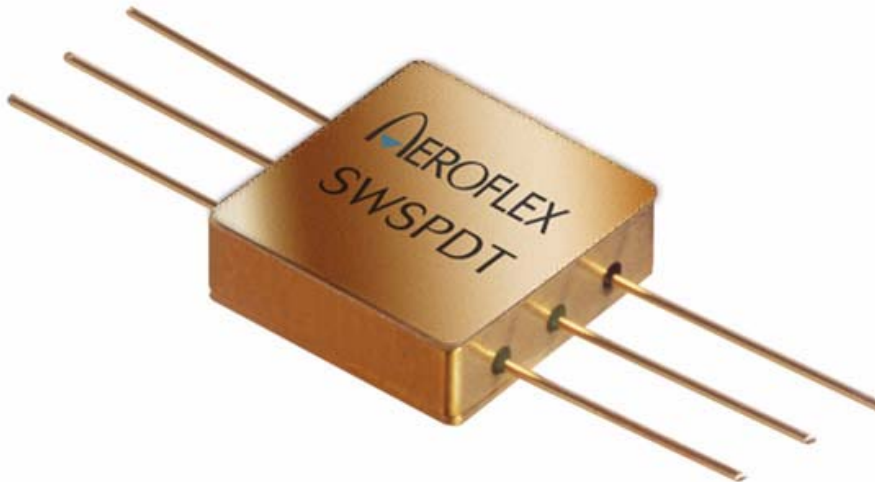


# Broadband Standard Product SWSPDT-000030-45 SPDT Absorptive RF Switch

March 28, 2007

[www.aeroflex.com/bband](http://www.aeroflex.com/bband)

**AEROFLEX**  
A passion for performance.



## FEATURES

- Input RF power +32dBm
- High input to output isolation of > 45 dB @ 3 GHz
- Low Insertion Loss of 1.5 dB @ 3 GHz
- DC to 3.0 GHz operating frequency
- Replacement for M/A-com SW-225
- Integrated CMOS or TTL control logic available
- Impedance matched for 50 Ohm systems
- ESD protection on control line
- Bipolar or single supply voltages – range -7V to +7V or GND to +7V
- Operating temperature range -55°C to +85°C
- Hermetic metal flat package – .25square x .125height
- Compact size
- Designed for commercial, industrial and aerospace applications
- Available in Class K
- Custom packaging available – contact factory

## DESCRIPTION

The Aeroflex SWSPDT-000030-45 is a high performance single pole double throw (SPDT) absorptive RF switch that is ideal for use in high reliability switched filter banks, transceivers and aerospace applications.

Our team of engineers can custom design switches using the latest simulation software and proprietary technology to meet even the most demanding specifications.

## ABSOLUTE MAXIMUM RATINGS <sup>1</sup>

PARAMETER	MAX	UNITS
Positive Supply Voltage (VDD)	+7.0	V
Negative Supply Voltage (VSS)	-7.0	V
V <sub>IN</sub> Digital Logic 0	-0.6	V
V <sub>IN</sub> Digital Logic 1	+5.5	V
Maximum Input Power	32	dBm
ESD Voltage	400	V
Operating Temperature – Case	-55 to +85	°C
Storage Temperature – Case	-65 to +125	°C
Lead Temperature (soldering, 10 seconds)	260	°C

1. Stresses above those listed under "Absolute Maximums Rating" may cause permanent damage to the device.

## RF ELECTRICAL CHARACTERISTICS @ +25°C

Results @ VDD = +5.0 ±10%, VSS = -5.0V ±10% unless otherwise stated, Z<sub>0</sub> = 50 ohms  
Contact Aeroflex for relative performance at other supply configurations

PARAMETER	TEST CONDITION	FREQUENCY	MIN	TYP	MAX	UNITS	
Insertion Loss	V <sub>ss</sub> = GND V <sub>ss</sub> = -5V	DC – 1.0 GHz	-	1.0	1.4	dB	
		3.0 GHz	-	1.5	2.3	dB	
Isolation		Input to Output	DC – 1.0 GHz	55	60	-	dB
			3.0 GHz	45	50	-	dB
		Output to Output	DC – 1.0 GHz	45	50	-	dB
			3.0 GHz	30	35	-	dB
VSWR*	V <sub>ss</sub> = GND V <sub>ss</sub> = -5V	DC – 1.0 GHz	-	1.4:1	-	Ratio	
		1.0 – 3.0 GHz	-	1.8:1	2.0:1	Ratio	
1dB Compression*	Input Power V <sub>ss</sub> = GND V <sub>ss</sub> = -5V	1.0 GHz	-	19	-	dBm	
		1.0 GHz	-	28	-	dBm	
Input IP3*	Two-Tone Inputs Up To +5 dBm V <sub>ss</sub> = GND V <sub>ss</sub> = -5V	2.0 GHz	-	35	-	dBm	
		2.0 GHz	-	35	-	dBm	
Trise, Tfall*	10% To 90%		-	20	-	nS	
Ton, Toff	50% Cntl To 90%/10%RF		-	35	-	nS	
Transients	In-Band		-	10	-	mV	

\* Guaranteed by design.

## DC ELECTRICAL CHARACTERISTICS @ +25°C

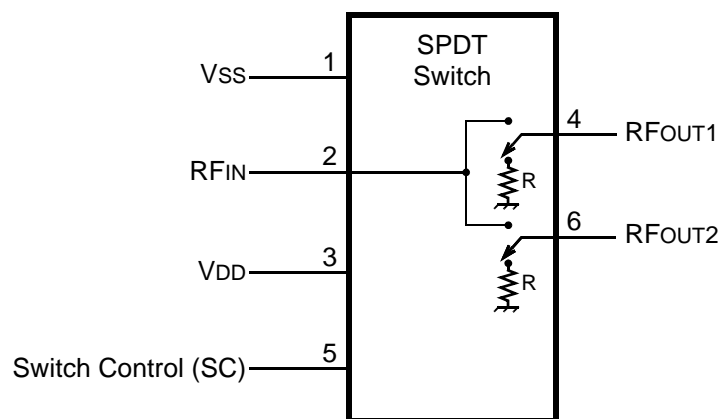
VDD = 5.0 ±10%, VSS = -5.0V ±10% unless otherwise stated

PARAMETER	MIN	TYP	MAX	UNITS
VDD	3.3	5.0	7.0	V
VSS	-7	-5.0	GND	V
CMOS Logic Level (0)	0	-	0.7	V
CMOS Logic Level (1)	V <sub>DD</sub> - 0.9	-	5.5	V
Input Leakage Current	-	-	10	µA

### TRUTH TABLE

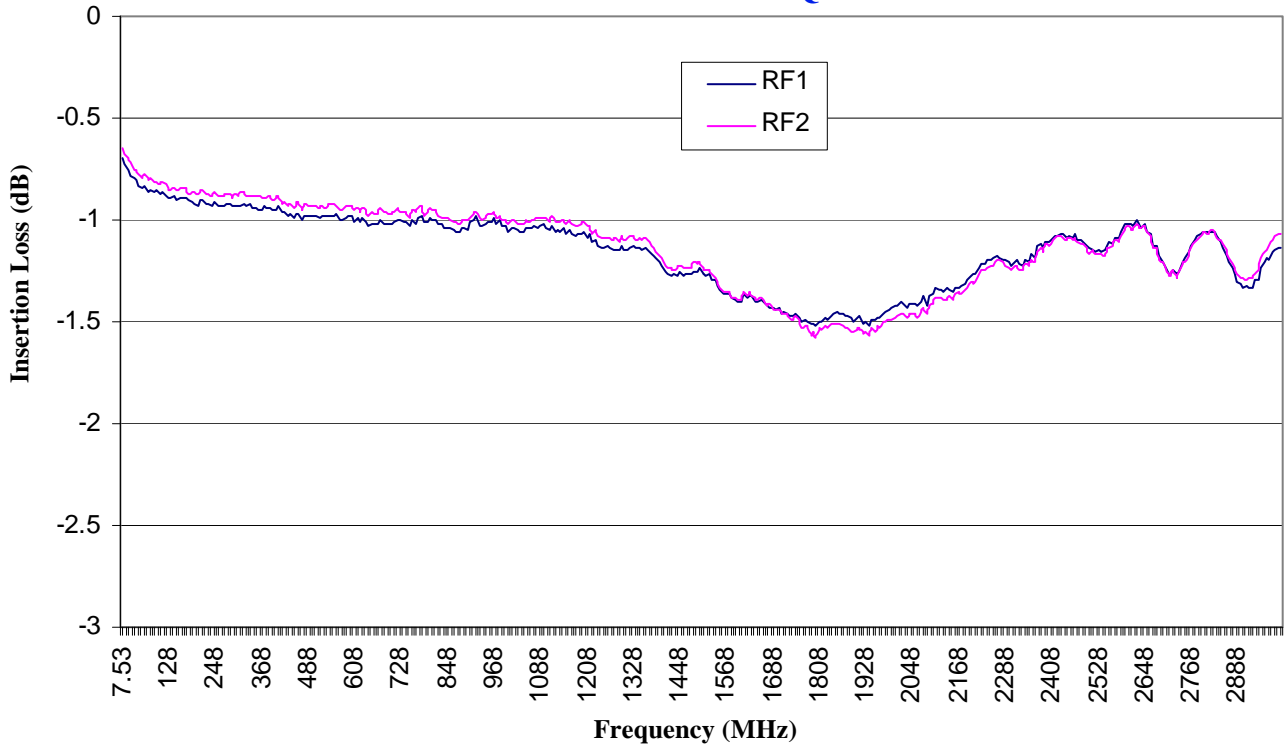
CONTROL INPUT	CONDITION OF SWITCH
	R <sub>FIN</sub> TO
1	R <sub>FOUT1</sub>
0	R <sub>FOUT2</sub>

### BLOCK DIAGRAM

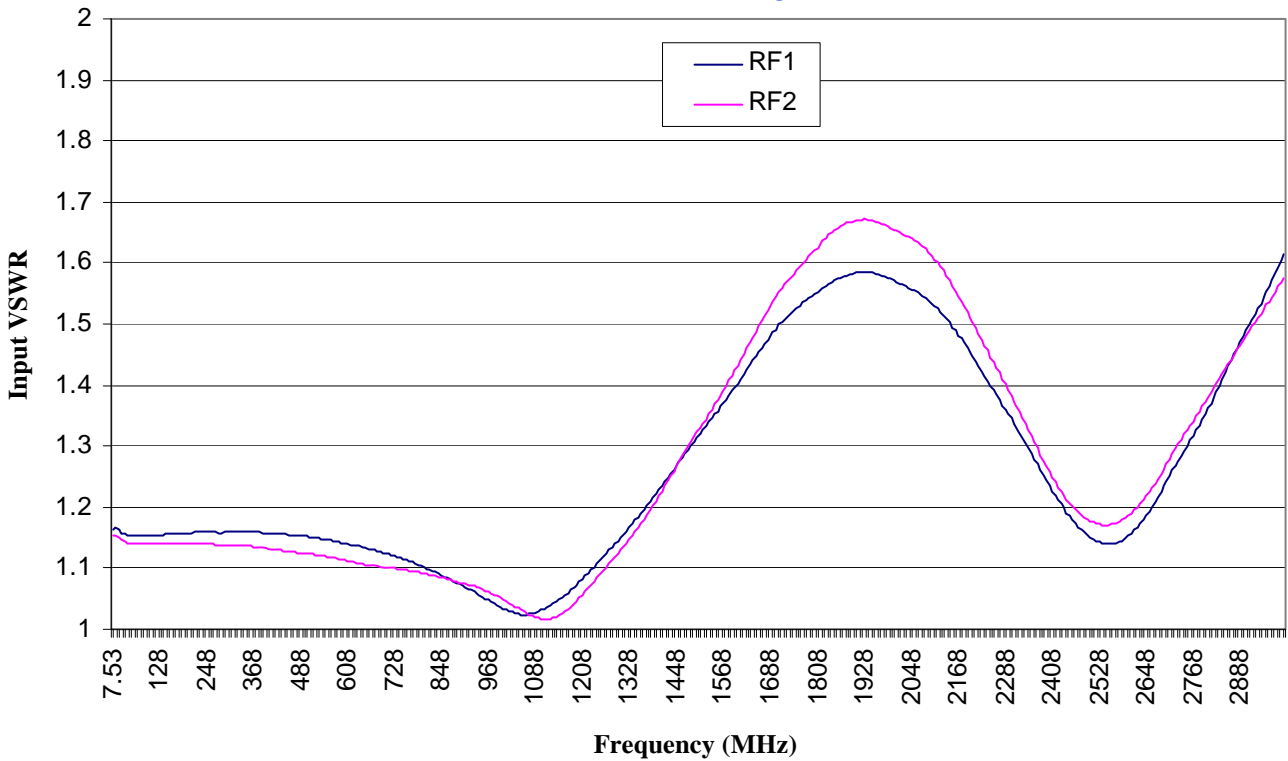


R = 50Ω  
Case = AC Ground

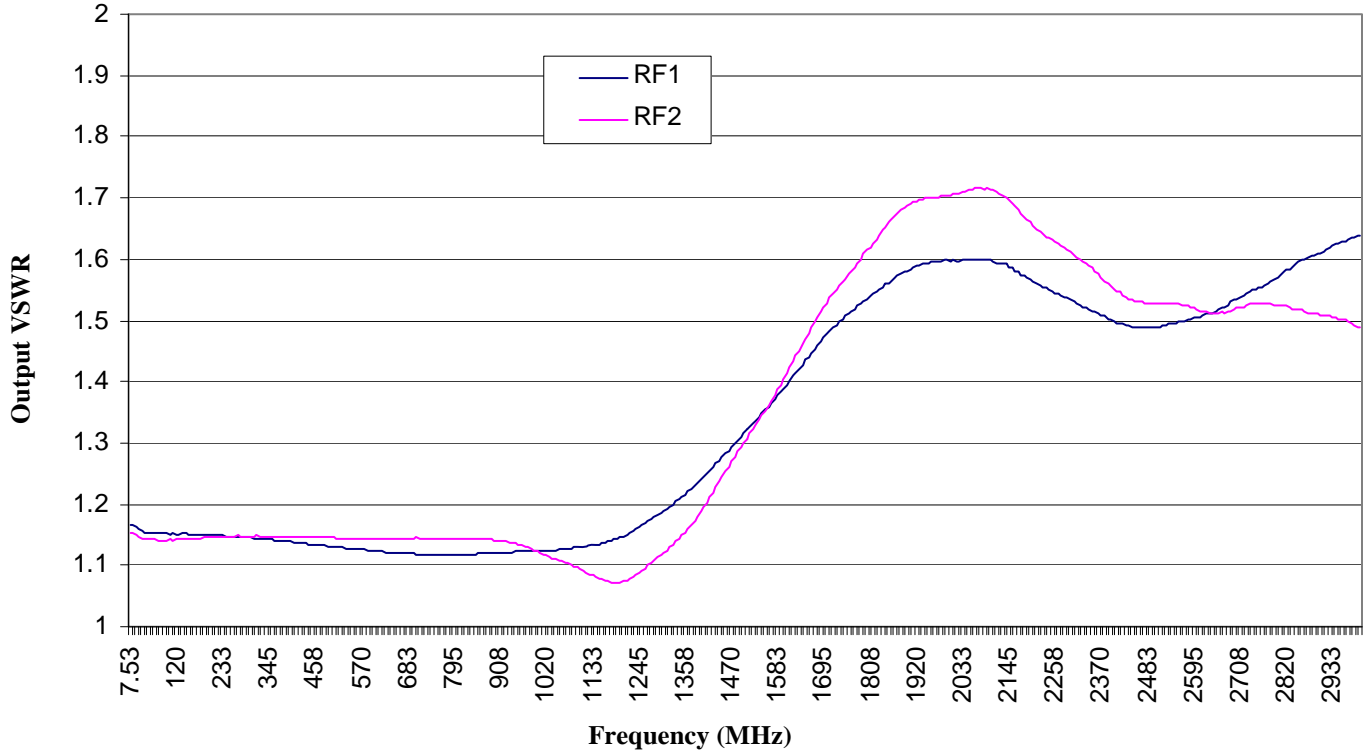
### INSERTION LOSS vs FREQUENCY



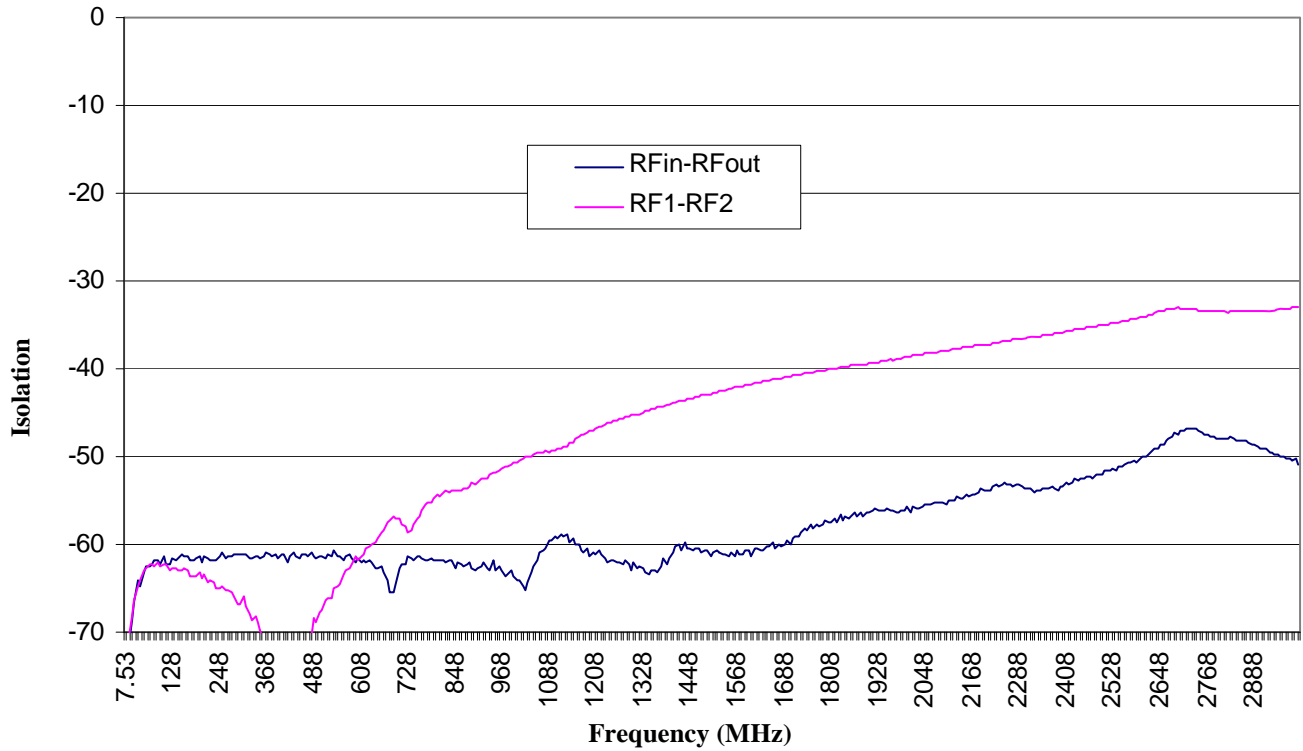
### INPUT VSWR vs FREQUENCY



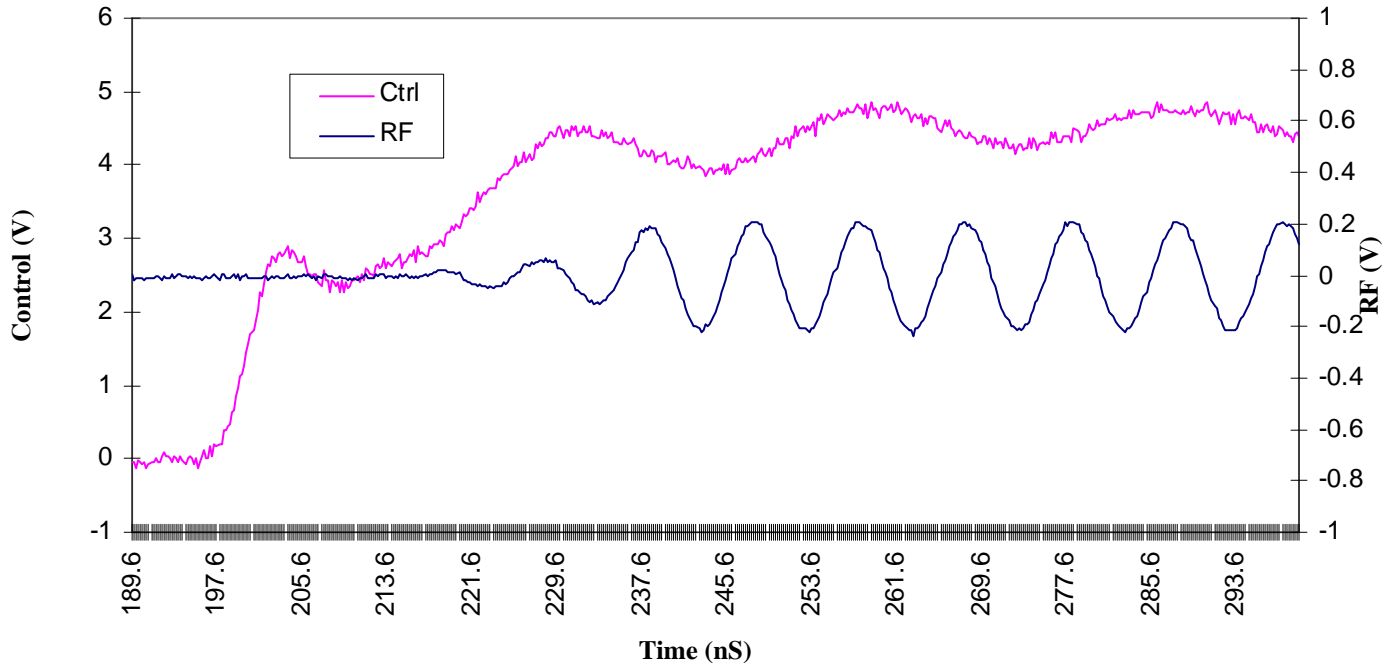
### OUTPUT VSWR vs FREQUENCY



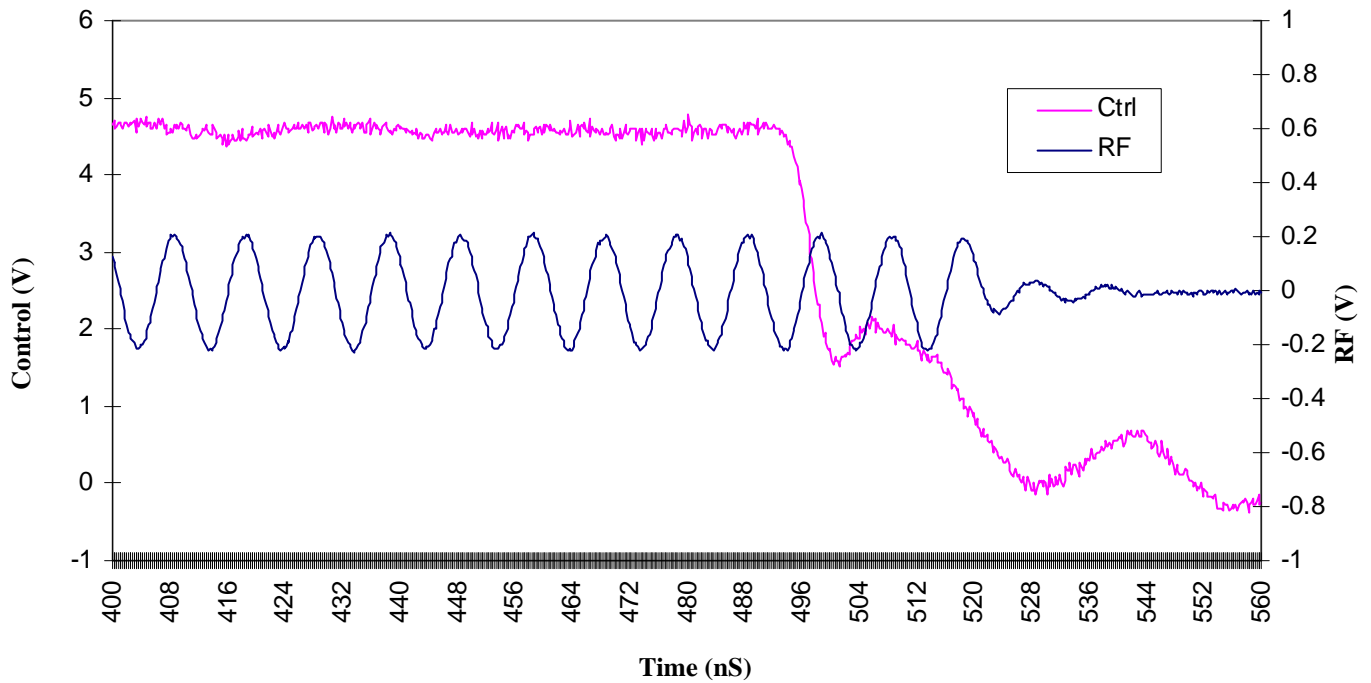
### OUTPUT TO OUTPUT ISOLATION vs FREQUENCY



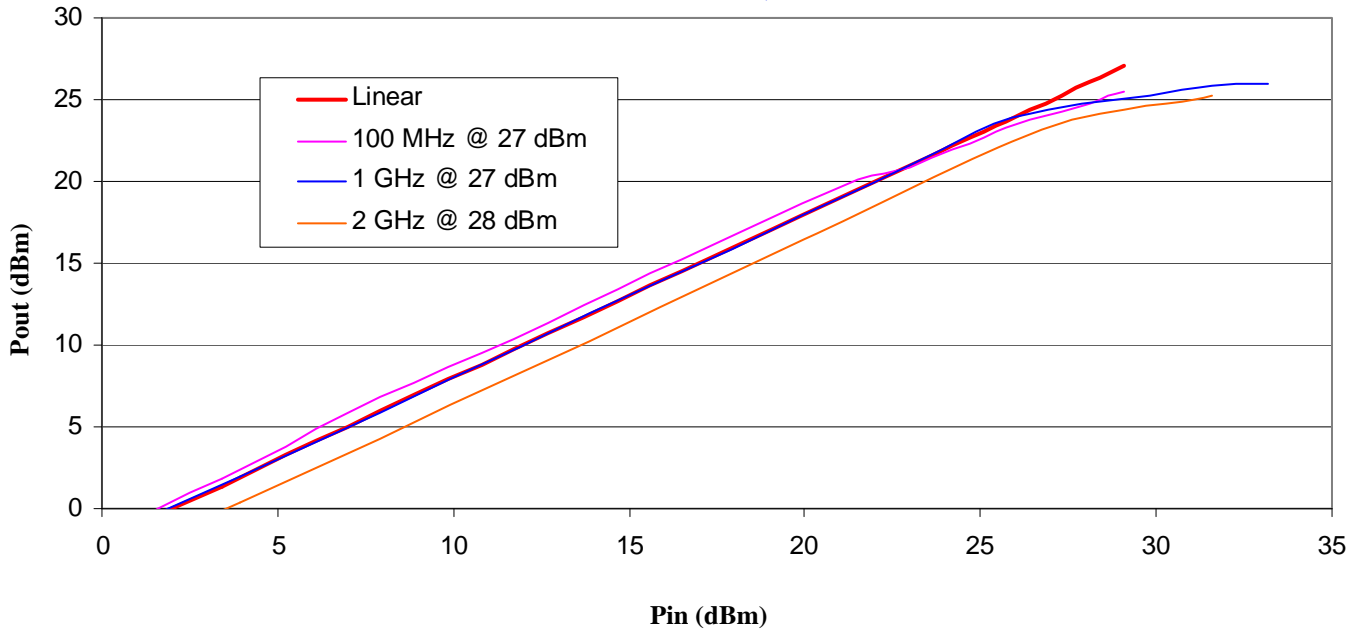
### TYPICAL TURN ON TIME < 35 ns



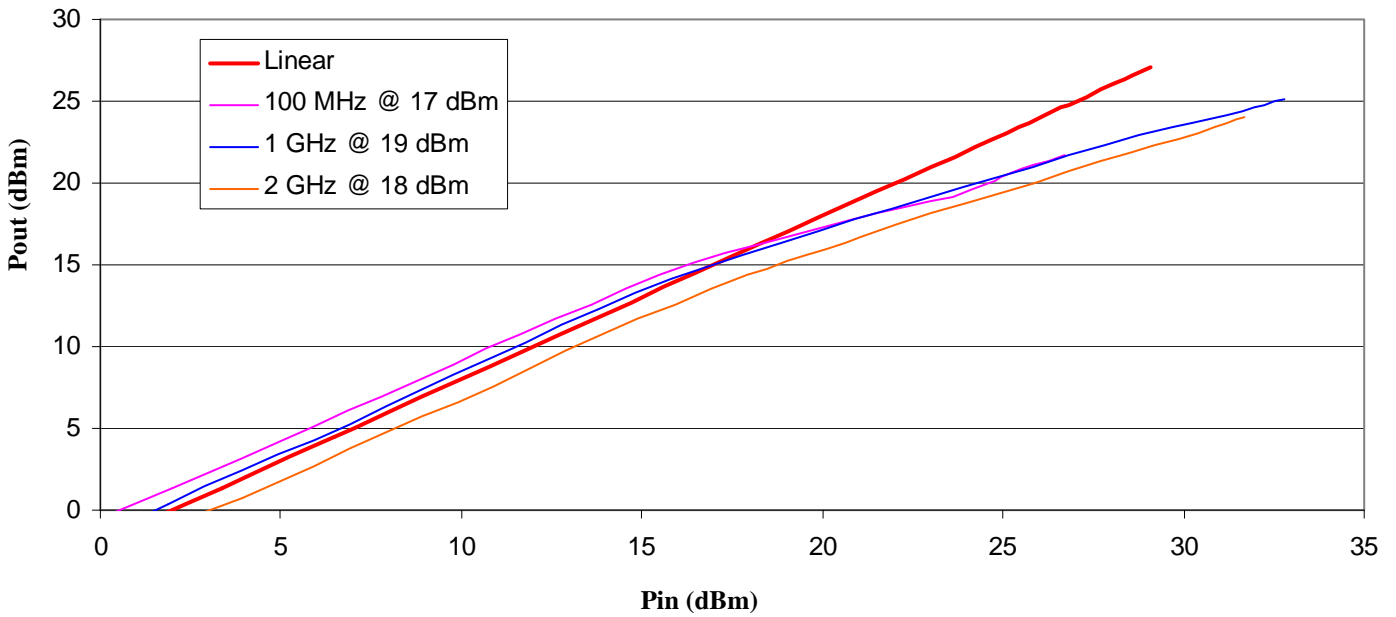
### TYPICAL TURN OFF TIME < 35 ns



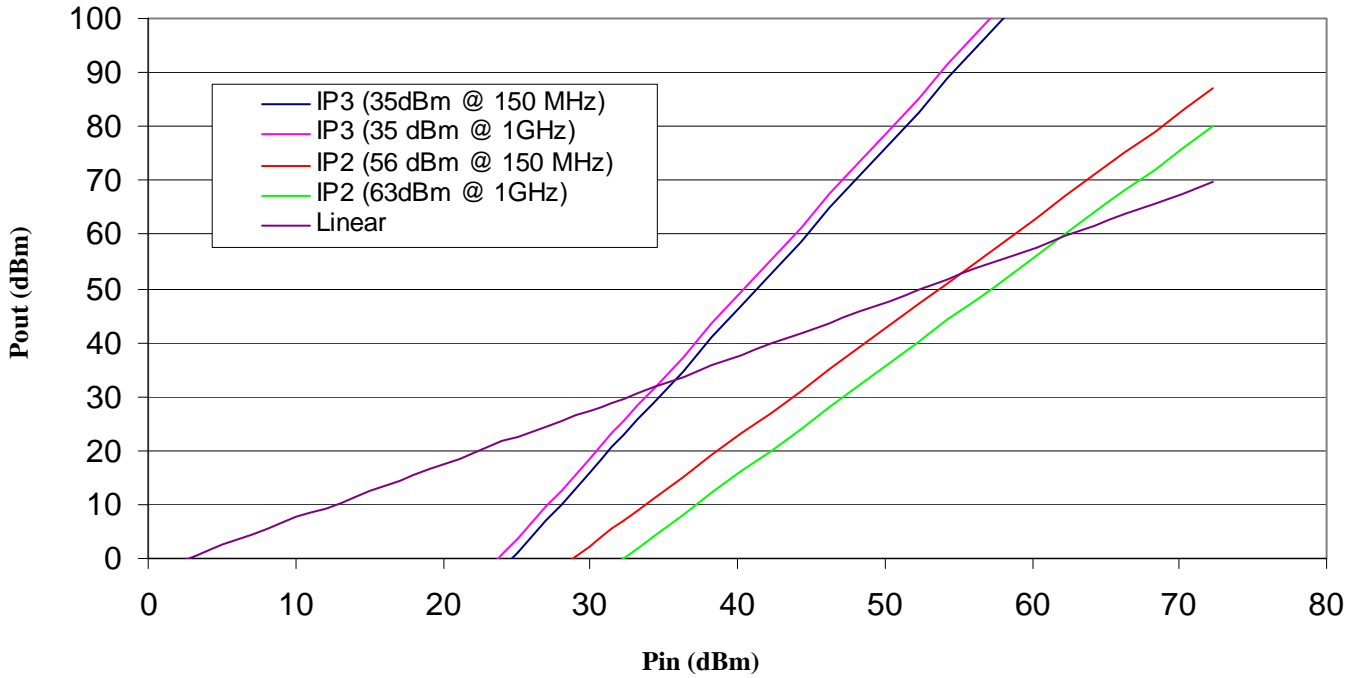
**P1 dB VDD = +5V, VSS = -5V**



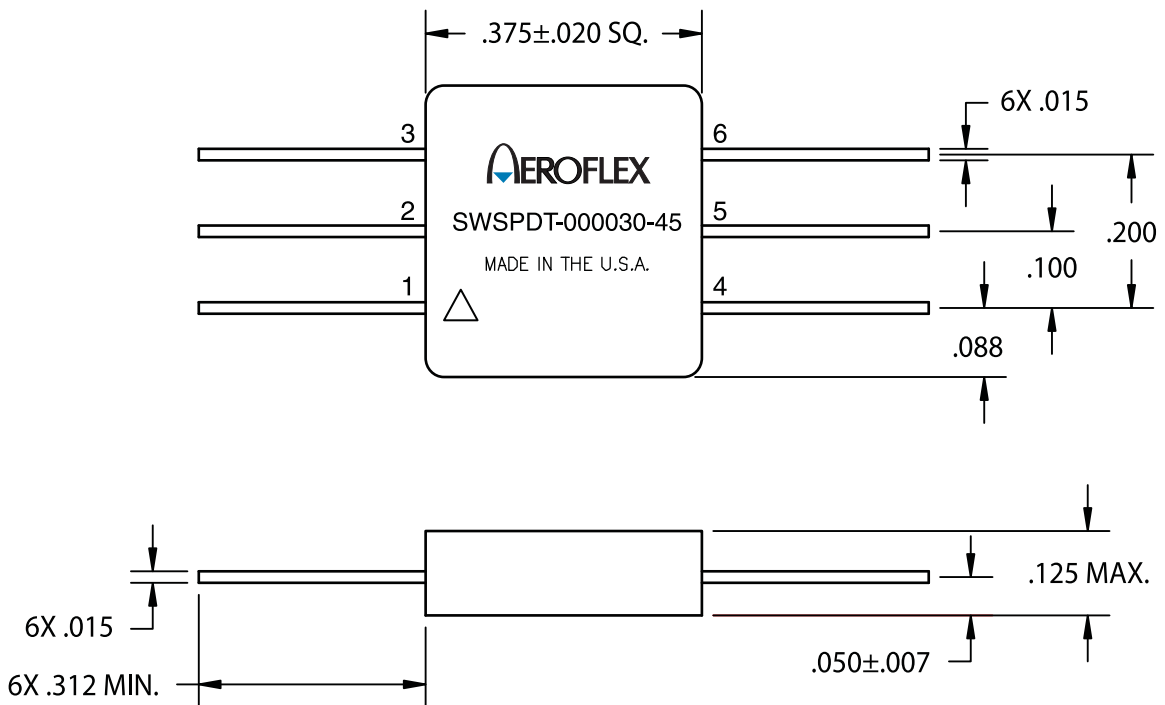
**P1 dB VDD = +5V, VSS = GND**



**IP3 VDD = +5V, VSS = GND, -5V**



**OUTLINE DRAWING**



## ORDERING INFORMATION

MODEL NUMBER	HERMETICITY	PACKAGE
SWSPDT-000030-45	Hermetic	.375L x .375W x .125Ht

## PIN CONNECTIONS

PIN	FUNCTION
1	$V_{SS}$
2	RF <sub>IN</sub>
3	$V_{DD}$
4	RF <sub>OUT1</sub>
5	SC
6	RF <sub>OUT2</sub>
Case AC GND	

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