

Broadband Standard Product SWSPDT-000300-55 SPDT Absorptive RF Switch

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www.aeroflex.com/bband



FEATURES

- Input RF power +32dBm
- High input to output isolation of > 55 dB @ 3 GHz
- Low Insertion Loss of 2.5 dB @ 3 GHz
- DC to 3.0 GHz operating frequency
- 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 +6V or GND to +7V
- Operating temperature range -55°C to +95°C
- Hermetic metal flat package – .530L x .295W x .245height
- Compact size
- Designed for commercial, industrial and aerospace applications
- Available in Class K
- Custom packaging available – contact factory

DESCRIPTION

The Aeroflex SWSPDT-000300-55 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 ¹

| PARAMETER | MAX | UNITS |
|--|-------------|-------|
| Positive Supply Voltage (VDD) | +6.0 | V |
| Negative Supply Voltage (VSS) | -7.0 | V |
| V _{IN} Digital Logic 0 | -0.6 | V |
| V _{IN} Digital Logic 1 | +5.5 | V |
| Maximum Input Power | 32 | dBm |
| ESD Voltage | 400 | V |
| Operating Temperature – Case | -55 to +95 | °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

Results @ VDD = +5.0 ±10%, VSS = -5.0V ±10%, Tc = -55°C to +95°C, unless otherwise stated, Zo = 50 ohms
Contact Aeroflex for relative performance at other supply configurations

| PARAMETER | TEST CONDITION | FREQUENCY | MIN | TYP | MAX | UNITS | |
|------------------|--|------------------|--------------|-------|-------|-------|----|
| Insertion Loss | V _{SS} = GND V _{SS} = -5V | DC – 1.0 GHz | - | 1.9 | 2.5 | dB | |
| | | 3.0 GHz | - | 2.5 | 3.0 | dB | |
| Isolation | | Input to Output | DC – 1.0 GHz | 60 | 65 | - | dB |
| | | | 3.0 GHz | 52 | 55 | - | dB |
| | | Output to Output | DC – 1.0 GHz | 60 | 65 | - | dB |
| | | | 3.0 GHz | 52 | 55 | - | dB |
| VSWR* | V _{SS} = GND V _{SS} = -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 _{SS} = GND V _{SS} = -5V | 1.0 GHz | - | 19 | - | dBm | |
| | | 1.0 GHz | - | 28 | - | dBm | |
| Input IP3* | Two-Tone Inputs Up To +5 dBm V _{SS} = GND V _{SS} = -5V | 2.0 GHz | - | 35 | - | dBm | |
| | | 2.0 GHz | - | 35 | - | dBm | |
| TRISE, TFALL* | 10% To 90% | | - | 20 | - | nS | |
| TONP1P2 | 50% Cntl To 90% RF | | - | 35 | - | nS | |
| TOFFP1 | 50% Cntl To 10% RF | | - | 35 | 200 | nS | |
| TOFFP2 | | | - | | | | |
| Transients | In-Band | | - | 10 | - | mV | |

* Guaranteed by design.

DC ELECTRICAL CHARACTERISTICS

VDD = 5.0 ±10%, VSS = -5.0V ±10%, Tc = -55°C to +95°C, unless otherwise stated

| PARAMETER | MIN | TYP | MAX | UNITS |
|----------------------|-----------------------|------|-----|-------|
| VDD | 3.3 | 5.0 | 6.0 | V |
| VSS | -7 | -5.0 | GND | V |
| CMOS Logic Level (0) | 0 | - | 0.8 | V |
| CMOS Logic Level (1) | V _{DD} - 0.9 | - | 5.5 | V |

DC ELECTRICAL CHARACTERISTICS

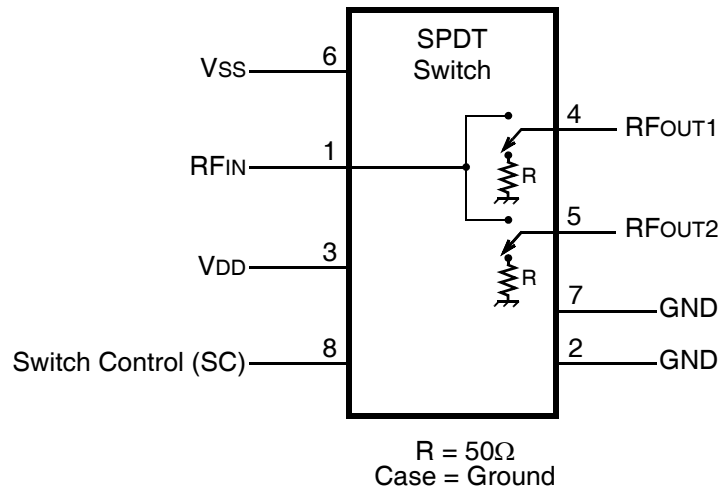
$V_{DD} = 5.0 \pm 10\%$, $V_{SS} = -5.0V \pm 10\%$, $T_c = -55^\circ\text{C}$ to $+95^\circ\text{C}$, unless otherwise stated

| PARAMETER | MIN | TYP | MAX | UNITS |
|-----------------------|-----|-----|-----|---------------|
| Input Leakage Current | - | - | 250 | μA |

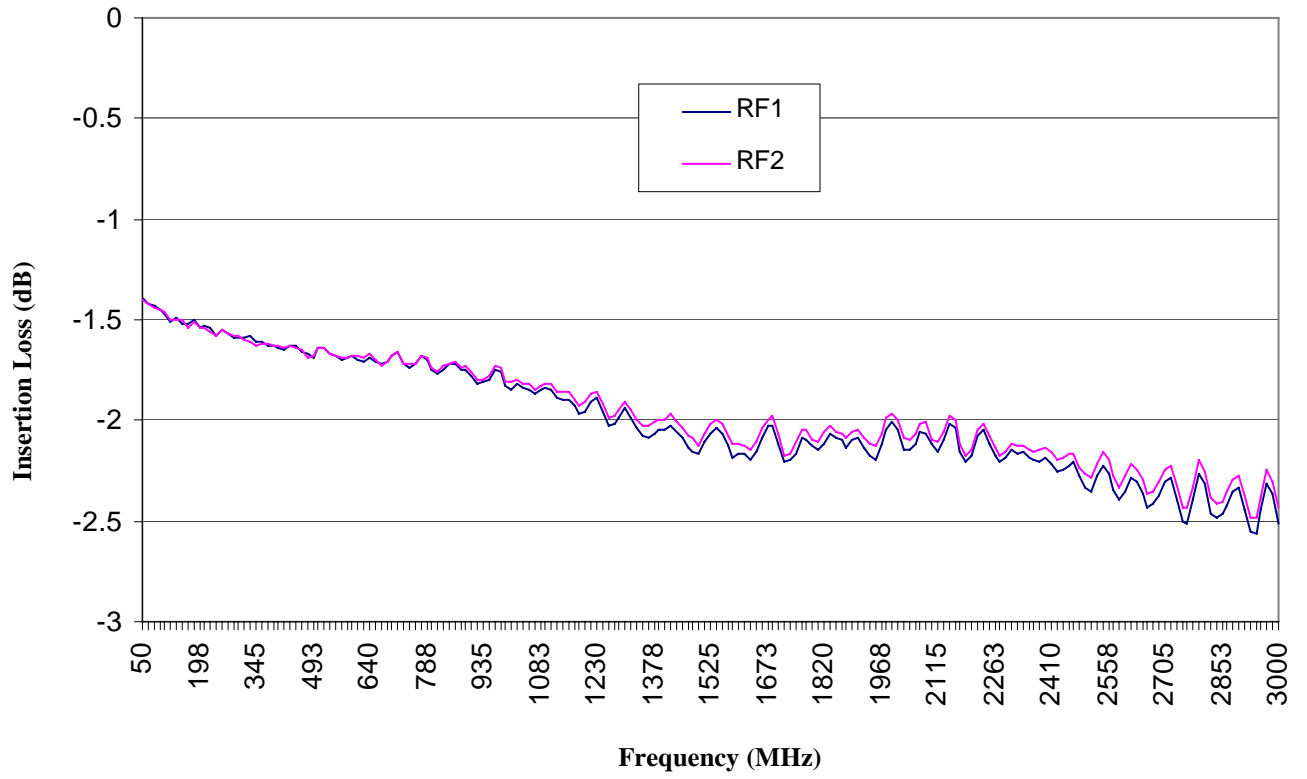
TRUTH TABLE

| CONTROL INPUT | CONDITION OF SWITCH |
|---------------|---------------------|
| | R_{FIN} to |
| 1 | R_{FOUT1} |
| 0 | R_{FOUT2} |

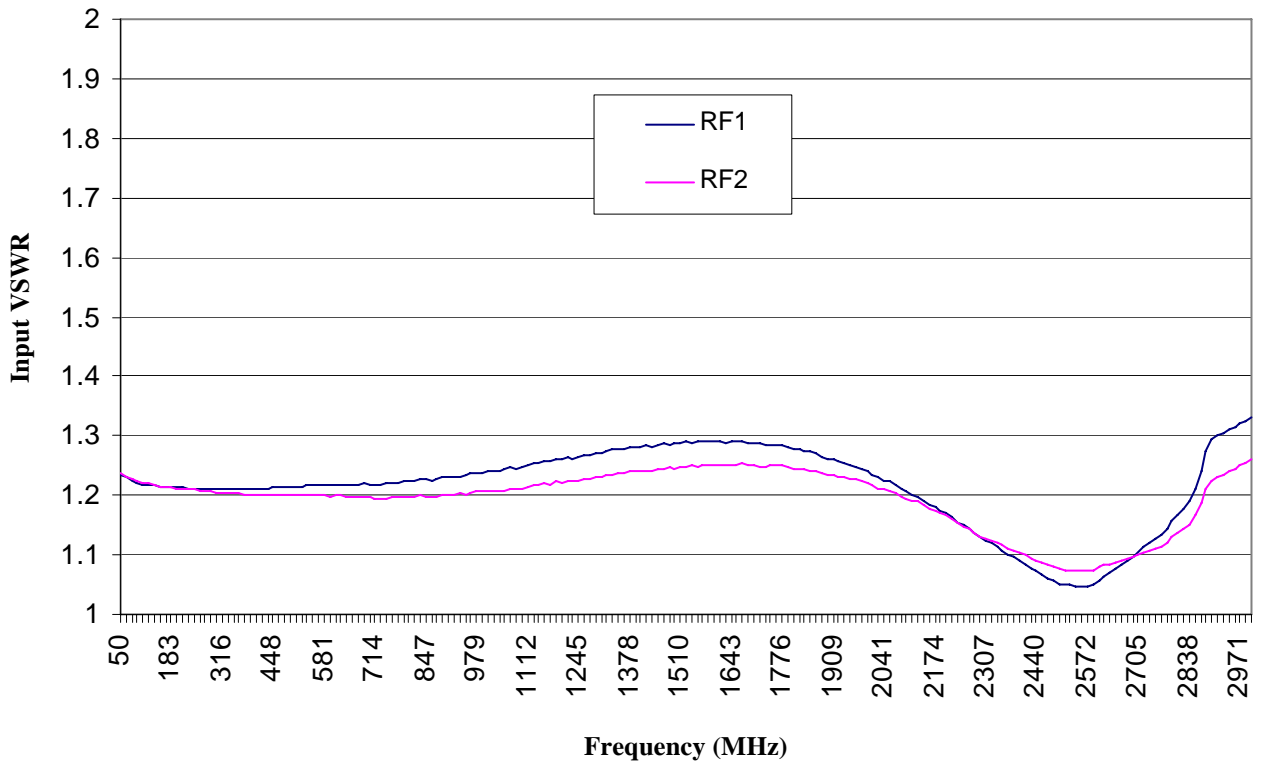
BLOCK DIAGRAM



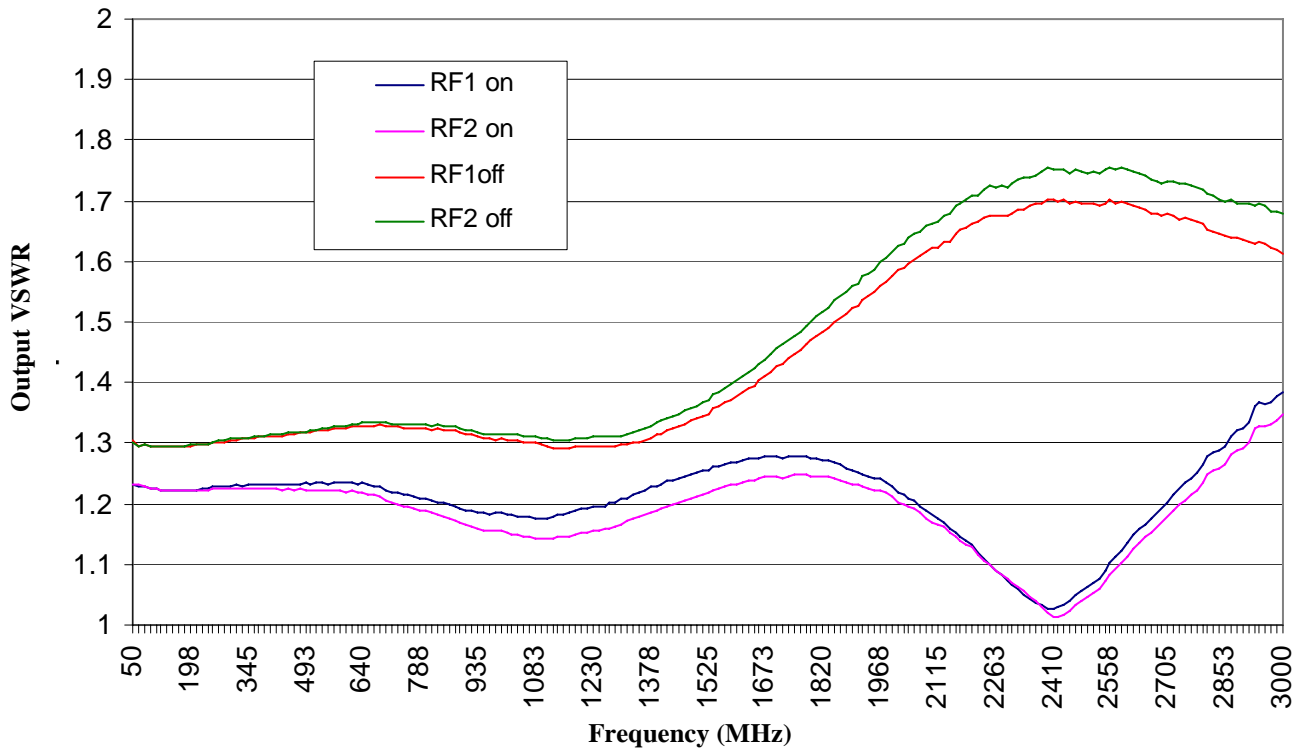
INSERTION LOSS vs FREQUENCY



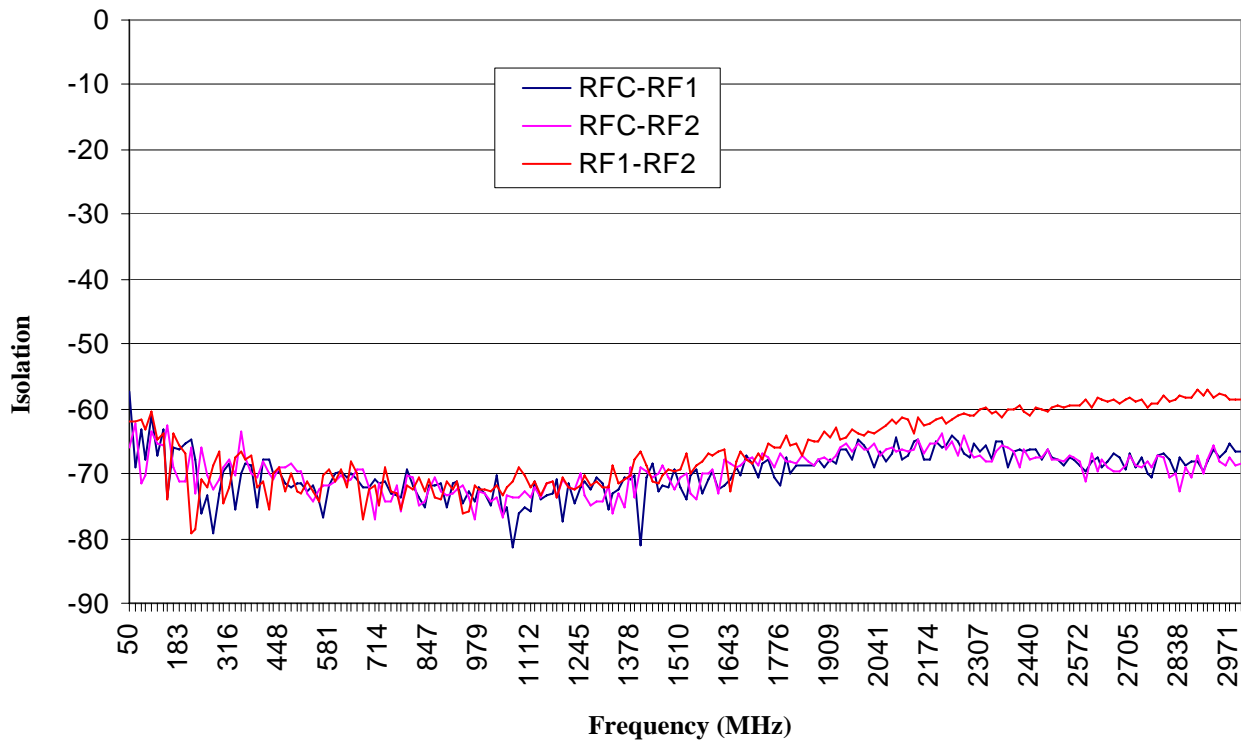
INPUT VSWR vs FREQUENCY



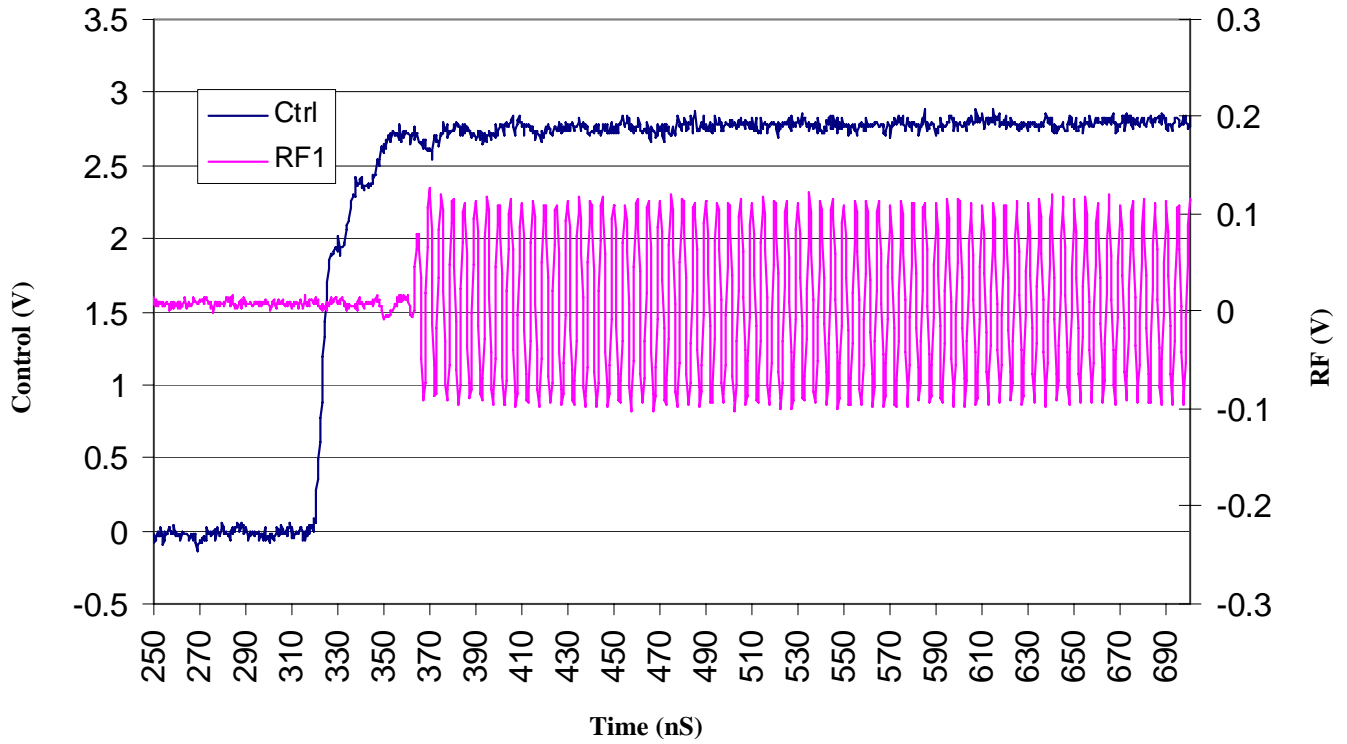
OUTPUT VSWR vs FREQUENCY



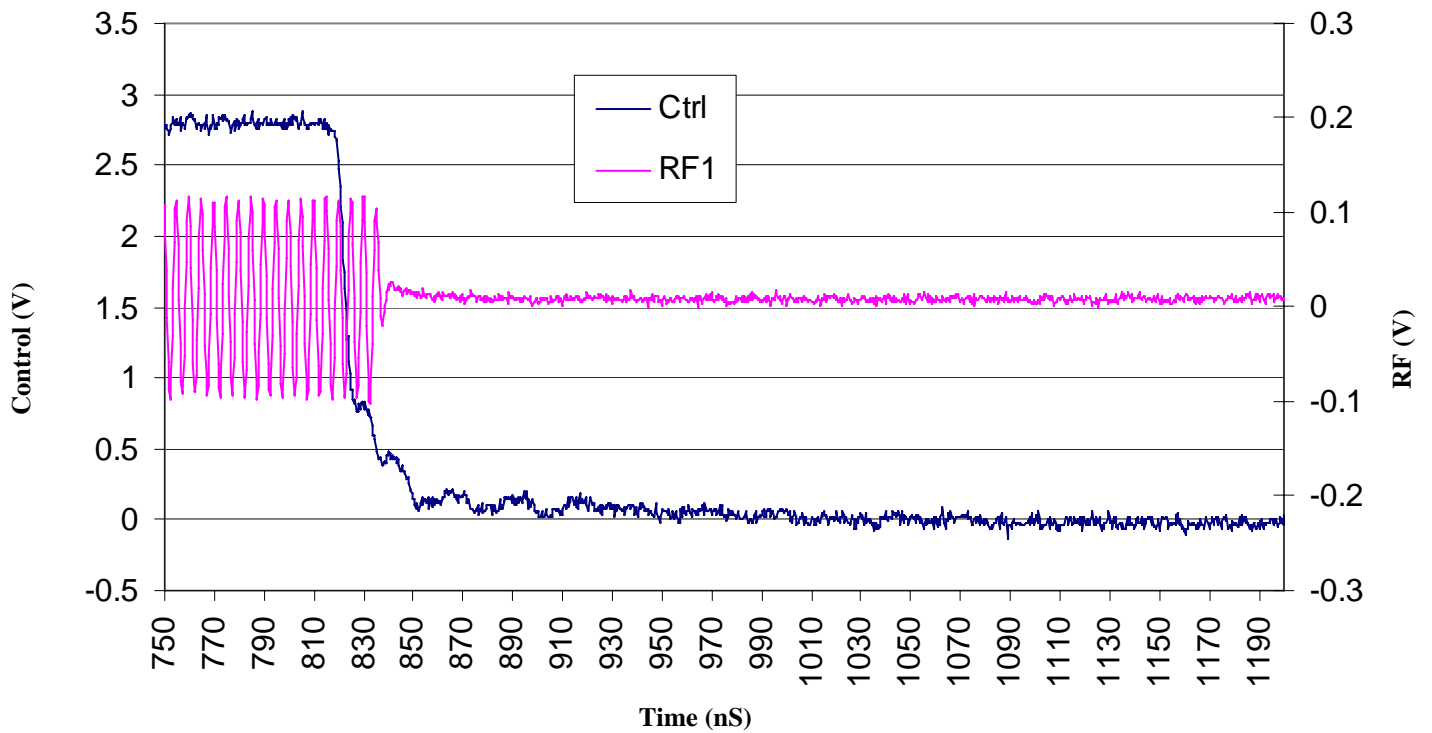
OUTPUT TO OUTPUT ISOLATION vs FREQUENCY



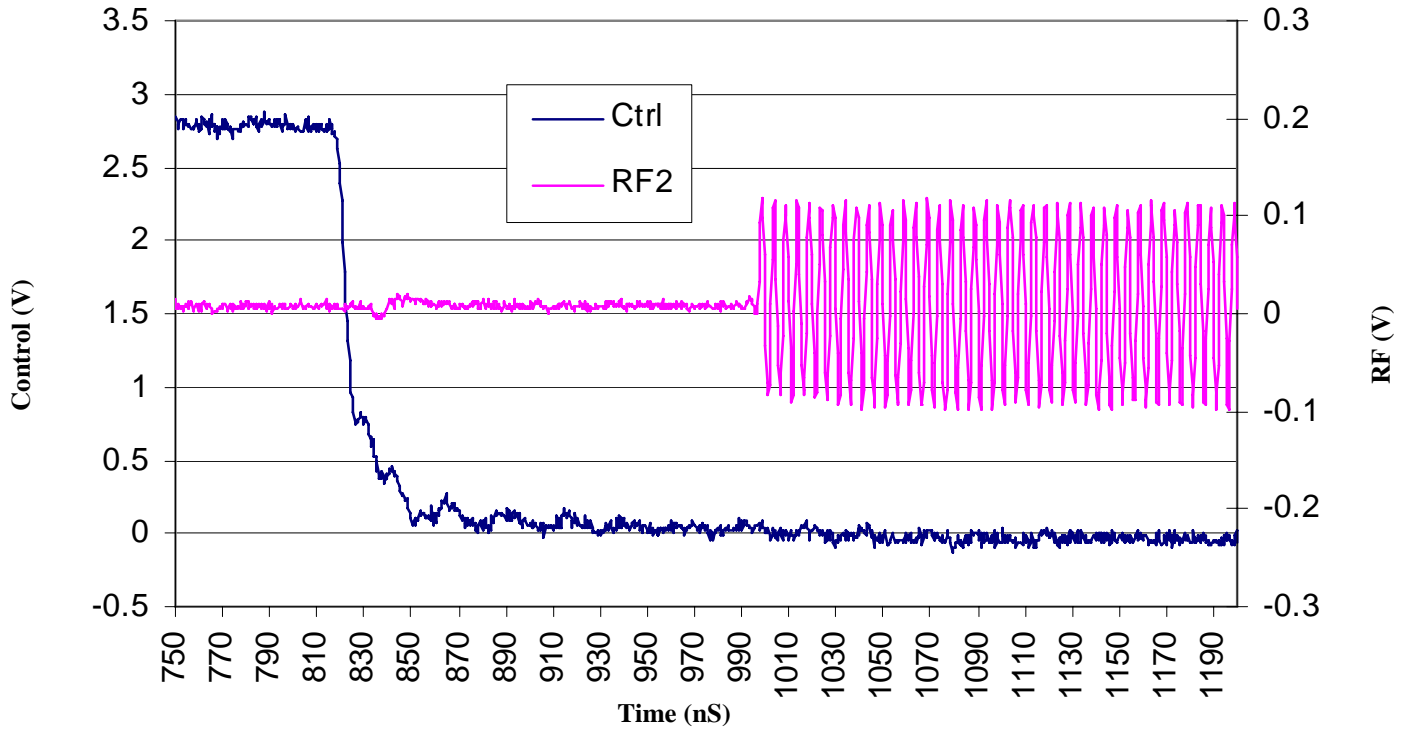
TYPICAL PORT 1 & 2 TURN ON TIME < 35 ns



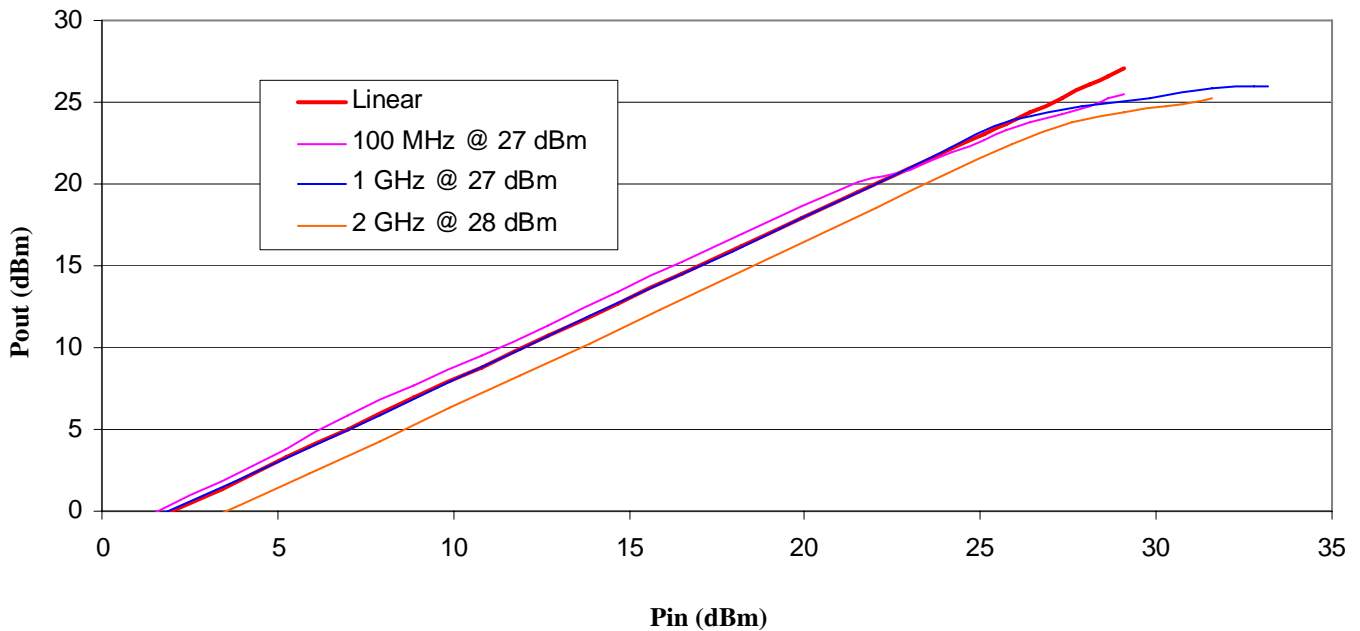
TYPICAL PORT 1 (P1) TURN OFF TIME < 35 ns



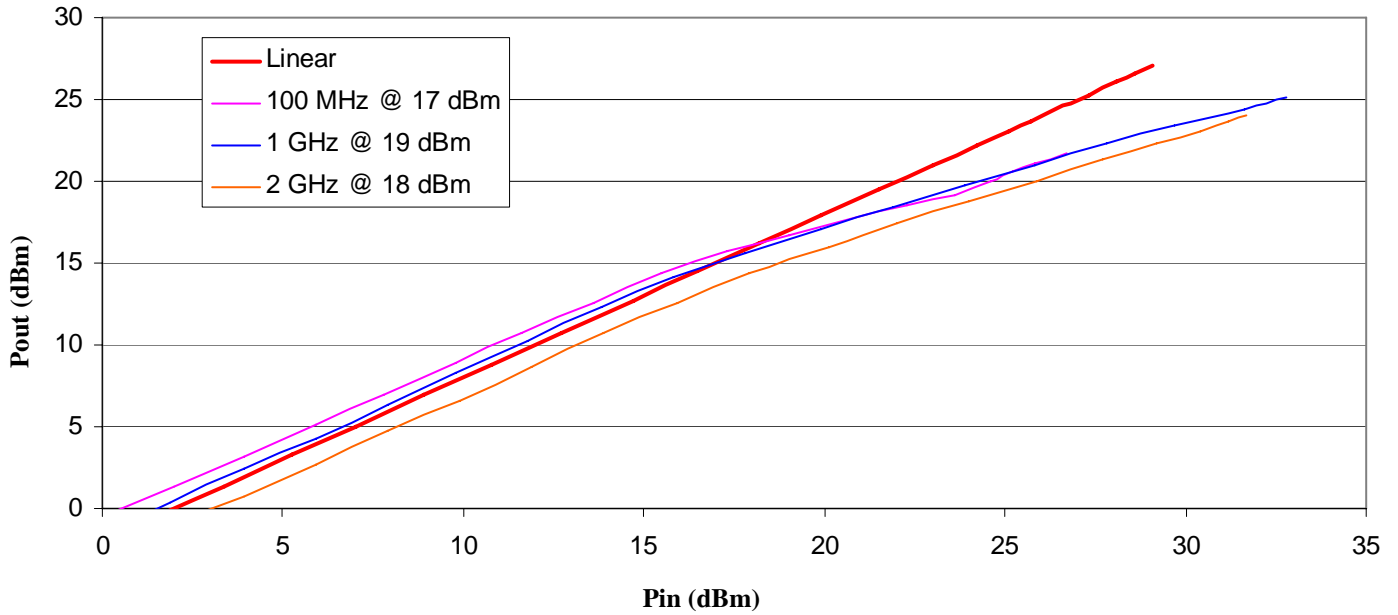
TYPICAL PORT 2 (P2) TURN OFF TIME < 200 ns



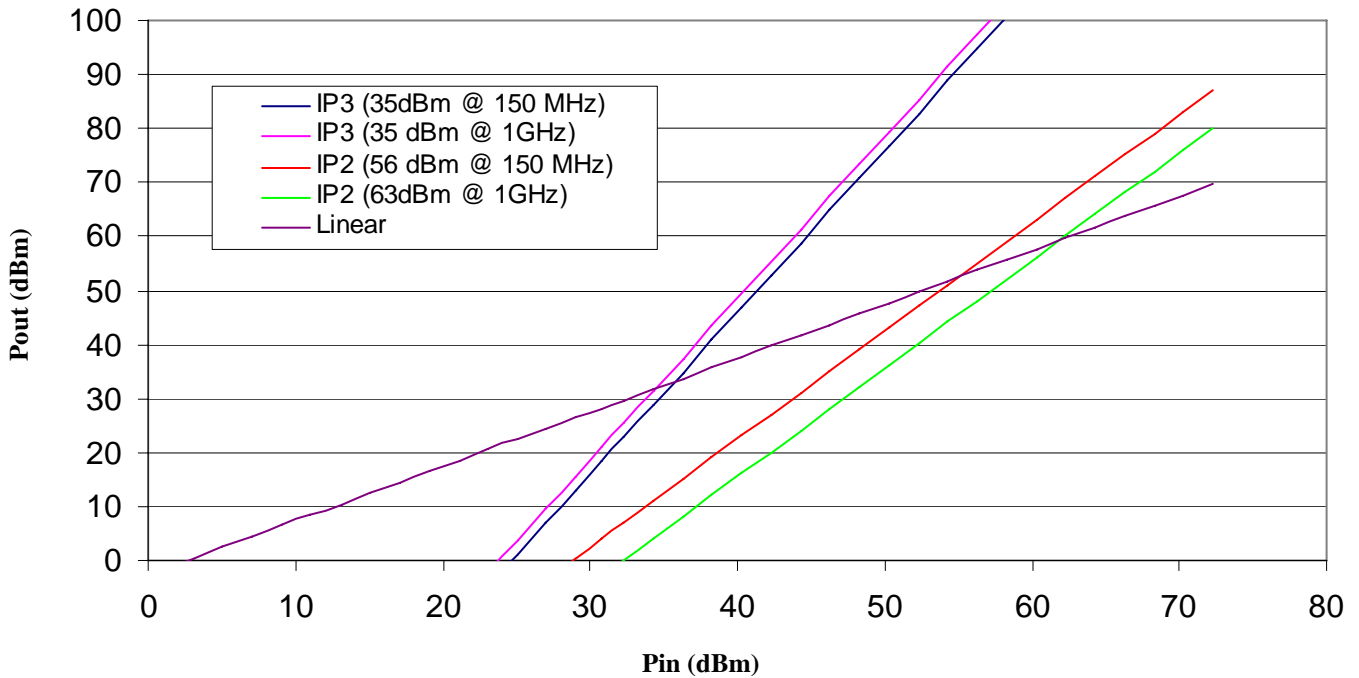
P1 dB VDD = +5V, VSS = -5V



P1 dB VDD = +5V, VSS = GND



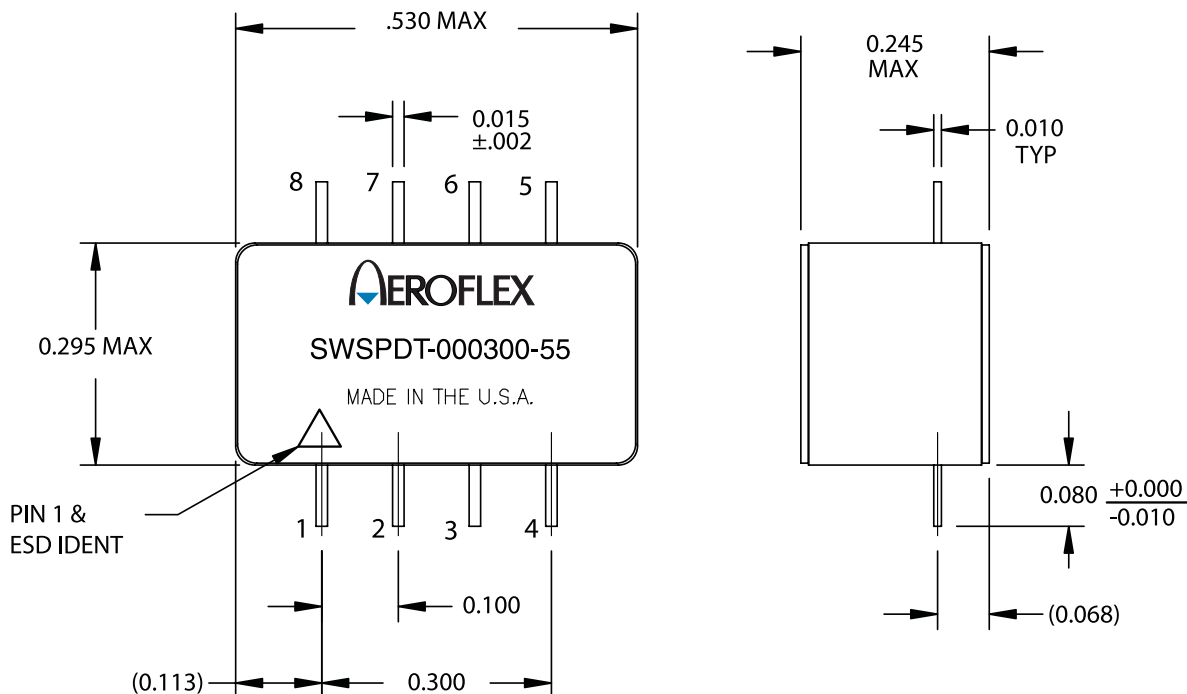
IP3 VDD = +5V, VSS = GND, -5V



ORDERING INFORMATION

| MODEL NUMBER | HERMETICITY | PACKAGE |
|------------------|-------------|------------------------|
| SWSPDT-000300-55 | Hermetic | .530L x .295W x .245Ht |

OUTLINE DRAWING



PIN CONNECTIONS

| PIN | FUNCTION | PIN | FUNCTION |
|-----------|-----------------|-----|-----------------|
| 1 | RFIN | 5 | RFOUT2 |
| 2 | GND | 6 | V _{SS} |
| 3 | V _{DD} | 7 | GND |
| 4 | RFOUT1 | 8 | SC |
| Case: GND | | | |

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