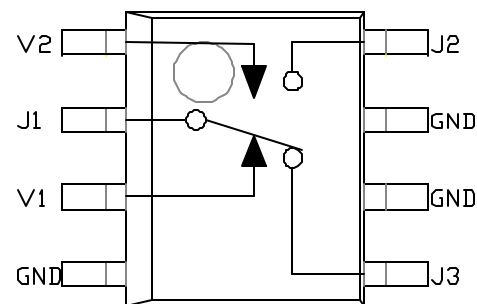


# SPDT Non-Reflective Switch – High Isolation ITTS250AB

Preliminary

## FEATURES

- -3V CONTROL VOLTAGE
- SOIC-8 package
- Non-Reflective
- High Isolation (37dB @ 1 GHz)
- Usable to 4 GHz
- Low DC Power Consumption
- Positive Control when “floated” with capacitors
- Self-Aligned MSAG® MESFET Process



## DESCRIPTION

The ITTS250AB is a low loss SPDT non-reflective switch in a plastic SOIC-8 package for commercial applications. The switch operates with -3 or -5V control, but will operate with +3 or +5V when device is “floated.”

## TRUTH TABLE (NEGATIVE CONTROL)

| V1 | V2 | J1-J2          | J1-J3          |
|----|----|----------------|----------------|
| -3 | 0  | Isolation      | Insertion Loss |
| 0  | -3 | Insertion Loss | Isolation      |

## ELECTRICAL SPECIFICATIONS AT 25°C (0, -3 V)

| Parameter         | Test Conditions <sup>1</sup> | Min | Typ   | Max | Unit |
|-------------------|------------------------------|-----|-------|-----|------|
| Insertion Loss    | DC <sup>2</sup> -0.5 GHz     |     | 0.7   |     | dB   |
|                   | DC-1.0 GHz                   |     | 0.85  |     | dB   |
|                   | DC-2.0 GHz                   |     | 1.2   |     | dB   |
|                   | DC-2.5 GHz                   |     | 1.5   |     | dB   |
| Isolation         | DC-0.5 GHz                   |     | 44    |     | dB   |
|                   | DC-1.0 GHz                   |     | 38    |     | dB   |
|                   | DC-2.0 GHz                   |     | 30    |     | dB   |
|                   | DC-2.5 GHz                   |     | 27    |     | dB   |
| VSWR <sup>3</sup> | DC-2.0 GHz                   |     | 1.1:1 |     |      |
|                   | DC-2.5 GHz                   |     | 1.1:1 |     |      |

1. All measurements made in a 50  $\Omega$  system, unless otherwise specified.
2. DC = 50 MHz
3. Insertion loss state.
4. Video feedthru measured with 1 ns rise



Specifications Subject to Change Without Notice

902512 A, July 1999



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# SPDT Non-Reflective Switch – High Isolation ITTS250AB

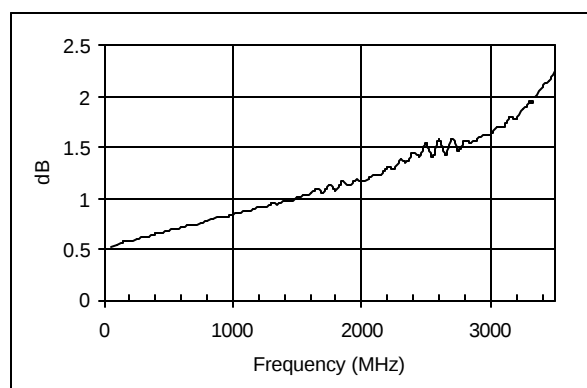
Preliminary

## OPERATING CHARACTERISTICS AT 25°C (0, -3 V)

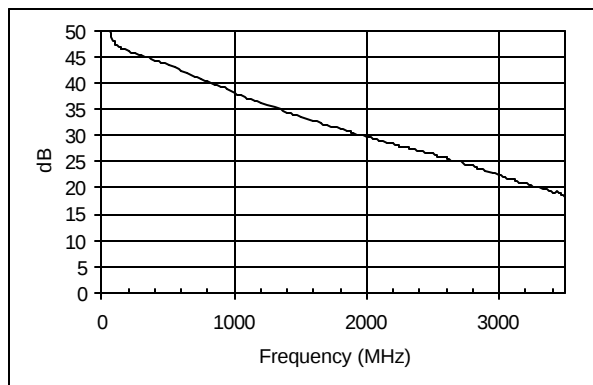
| Parameter                             | Condition                       | Frequency     | Min | Typ  | Max | Units   |
|---------------------------------------|---------------------------------|---------------|-----|------|-----|---------|
| Switching Characteristics             | Rise, Fall (10/90% or 90/10%)   |               |     | 33   |     | ns      |
|                                       | On, Off (50% CTL to 90/10% RF)  |               |     | 30   |     | ns      |
|                                       | Video Feedthru <sup>4</sup>     |               |     | 2.5  |     | mV      |
| Input Power for 1 dB Compression      | $V_{HIGH} = -3V$                | 0.5 – 2.0 GHz |     | 20.5 |     | dBm     |
|                                       | $V_{HIGH} = -5V, V_{DD} = -5V$  | 0.5 – 2.0 GHz |     | 26   |     | dBm     |
| Intermodulation Intercept Point (IP3) | For two-tone Input Power +5 dBm | 0.5 – 2.0 GHz |     | 41   |     | dBm     |
| Control Voltages                      | $V_{Low} = 0.0$                 |               |     |      | 20  | $\mu A$ |
|                                       | $V_{High} = -3 V$               |               |     |      | 20  | $\mu A$ |
|                                       | $V_{High} = -5 V$               |               |     |      | 200 | $\mu A$ |

## MAXIMUM RATINGS

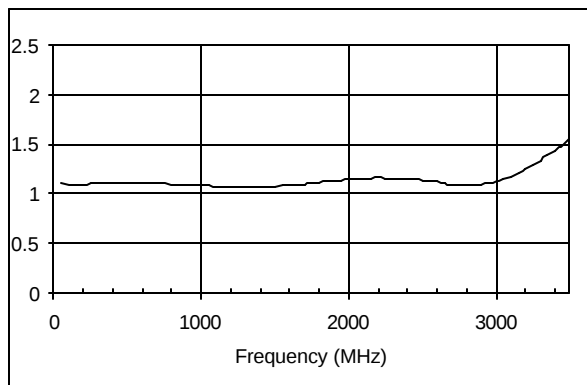
| Rating                           | Symbol      | Value                        |
|----------------------------------|-------------|------------------------------|
| RF input power<br>DC input power | $J_{1,2,3}$ | 2.0W @ 1 GHz<br>0.5W @ 1 GHz |
| Control Voltage                  | $V_{1,2}$   | +0, -5 V                     |
| Junction Temperature             | $T_J$       | +150 °C                      |
| Storage Temperature              | $T_{STG}$   | -40 °C to +150 °C            |



Insertion Loss vs Frequency



Isolation vs Frequency



VSWR vs Frequency

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**TRUTH TABLE (POSITIVE CONTROL)**

| V1 | V2 | J1-J2          | J1-J3          |
|----|----|----------------|----------------|
| 0  | +3 | Insertion Loss | Isolation      |
| +3 | 0  | Isolation      | Insertion Loss |

**POSITIVE CONTROL CIRCUITRY**

