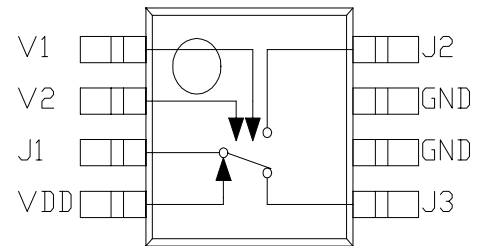


# SPDT High Power T/R Switch ITTS501AJ

## PRELIMINARY INFORMATION

### FEATURES

- MSOP-8 package
- Positive Control
- Self-Aligned MSAG®-Switch MESFET Process



### Description

The ITT501AJ is a high power SPDT switch in a very small plastic MSOP package for commercial applications. The switch operates +3 to +8 volts.

### Maximum Ratings (T<sub>A</sub> = 25 °C unless otherwise noted)

| Rating               | Symbol             | Value       | Unit |
|----------------------|--------------------|-------------|------|
| RF input power       | J <sub>1,2,3</sub> | 4.5         | W    |
| Supply Voltage       | V <sub>DD</sub>    | 10          | V    |
| Control Voltage      | V <sub>1,2</sub>   | 10          | V    |
| Junction Temperature | T <sub>J</sub>     | +150        | °C   |
| Storage Temperature  | T <sub>STG</sub>   | -40 to +150 | °C   |

### ELECTRICAL CHARACTERISTICS V<sub>DD</sub>= +5V T<sub>A</sub>=25 °C

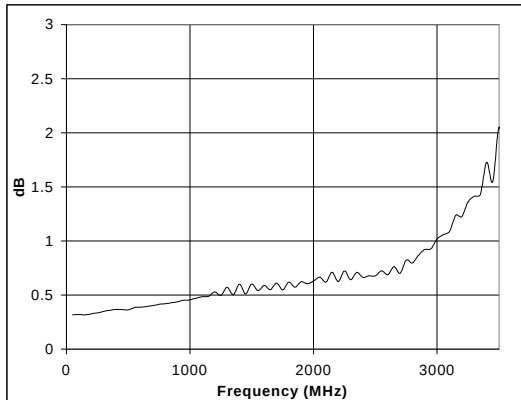
| Parameter                             | Test Conditions                               | Min | Typ  | Max | Unit |
|---------------------------------------|-----------------------------------------------|-----|------|-----|------|
| Insertion Loss                        | DC-1.0 GHz                                    |     | 0.5  |     | dB   |
|                                       | DC-2.0 GHz                                    |     | 0.6  |     | dB   |
|                                       | DC-2.5 GHz                                    |     | 0.7  |     | dB   |
|                                       | DC-3.0 GHz                                    |     | 1.0  |     | dB   |
| Isolation                             | DC-1.0 GHz                                    |     | 25   |     | dB   |
|                                       | DC-2.0 GHz                                    |     | 26   |     | dB   |
|                                       | DC-2.5 GHz                                    |     | 21   |     | dB   |
|                                       | DC-3.0 GHz                                    |     | 17   |     | dB   |
| Return Loss                           | DC-1.0 GHz                                    |     | 20   |     | dB   |
|                                       | DC-2.0 GHz                                    |     | 20   |     | dB   |
|                                       | DC-2.5 GHz                                    |     | 22   |     | dB   |
|                                       | DC-3.0 GHz                                    |     | 19   |     | dB   |
| T <sub>RISE</sub> , T <sub>FALL</sub> | 10% to 90% RF, 90% to 10% RF                  |     | 15   |     | nS   |
| T <sub>ON</sub> , T <sub>OFF</sub>    | 50% Control to 90% RF, 50 % Control to 10% RF |     | 24   |     | nS   |
| 1dB Compression Point                 | 0/5V control 0.5-1.0 GHz                      |     | 36.5 |     | dBm  |
|                                       | (Table Page 2) 0.5- 2.5 GHz                   |     | 35.5 |     | dBm  |
| Third Order Intercept                 | 0/5V control 0.5-1.0 GHz                      |     | 47   |     | dBm  |
|                                       | 0.5-2.0 GHz                                   |     | 43   |     | dBm  |

Specifications Subject to Change Without Notice

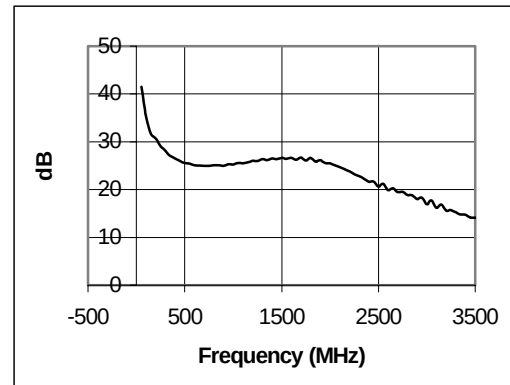
902214 C, September 1999



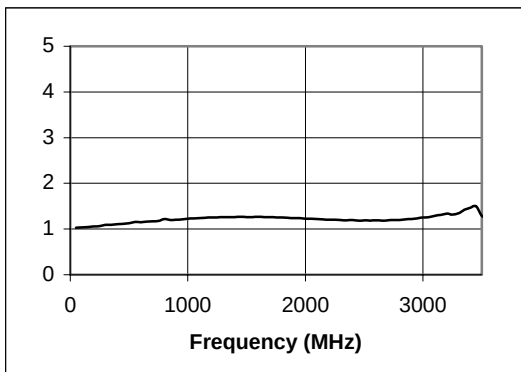
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**Insertion Loss vs Frequency**



**Isolation vs Frequency**



**VSWR vs Frequency**

**Input Power for P1dB Compression  
Pulsed (10% duty cycle)**

| Vdd | 1GHz  | 2.5GHz |
|-----|-------|--------|
|     | (dBm) | (dBm)  |
| 3V  | 29    | 29     |
| 5V  | 36.5  | 35.5   |
| 8V  | 40    | 38     |

**Input Power for P1dB Comp**

| CW  |      |         |
|-----|------|---------|
| Vdd | 1GHz | 2.0 GHz |
| 3V  | 28.5 | 27.5    |
| 5V  | 34   | 33      |

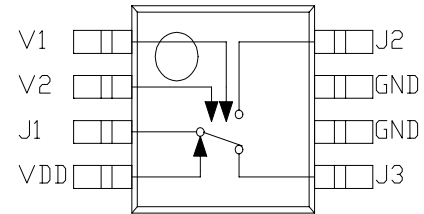
Caution: Do not operate in 1dB compression at power levels greater than +35 dBm.

# SPDT High Power T/R Switch ITTS501AJ

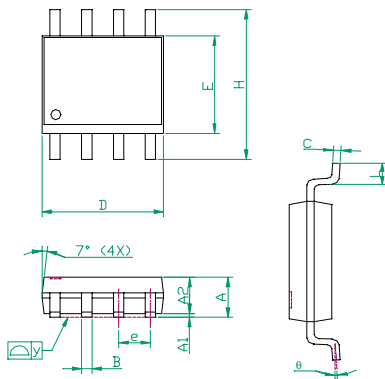
**PRELIMINARY  
INFORMATION**

## Truth Table

| Vdd | V1  | V2  | J1 to J2       | J1 to J3       |
|-----|-----|-----|----------------|----------------|
| 3   | Vdd | 0   | Isolation      | Insertion Loss |
| 3   | 0   | Vdd | Insertion Loss | Isolation      |
| 5   | Vdd | 0   | Isolation      | Insertion Loss |
| 5   | 0   | Vdd | Insertion Loss | Isolation      |
| 8   | Vdd | 0   | Isolation      | Insertion Loss |
| 8   | 0   | Vdd | Insertion Loss | Isolation      |



## 8L MSOP OUTLINE (SUFFIX "AJ/GJ")



## DIMENSION TABLE

| SYMBOLS | DIMENSIONS IN MILLIMETERS |      |      | DIMENSIONS IN INCHES |       |       |
|---------|---------------------------|------|------|----------------------|-------|-------|
|         | MIN                       | NOM  | MAX  | MIN                  | NOM   | MAX   |
| A       | 0.81                      | 1.02 | 1.22 | 0.032                | 0.040 | 0.048 |
| A1      | 0.05                      | —    | 0.20 | 0.002                | —     | 0.008 |
| A2      | 0.75                      | 0.86 | 0.97 | 0.030                | 0.034 | 0.038 |
| b       | 0.25                      | 0.30 | 0.40 | 0.010                | 0.012 | 0.015 |
| C       | 0.13                      | 0.15 | 0.23 | 0.005                | 0.006 | 0.009 |
| D       | 2.90                      | 3.00 | 3.10 | 0.114                | 0.118 | 0.122 |
| E       | 4.80                      | 4.90 | 5.00 | 0.189                | 0.193 | 0.197 |
| E1      | 2.90                      | 3.00 | 3.10 | 0.114                | 0.118 | 0.122 |
| e       | —                         | 0.65 | —    | —                    | 0.026 | —     |
| L       | 0.40                      | 0.53 | 0.70 | 0.016                | 0.021 | 0.026 |
| y       | —                         | —    | 0.10 | —                    | —     | 0.004 |
| θ       | 0°                        | —    | 6°   | 0°                   | —     | 6°    |

## NOTES:

1. Package body sizes exclude mold flash and gate burrs
2. Dimension L is measured in the gage plane
3. Tolerance 0.10mm unless otherwise specified
4. Controlling dimension is millimeter. Converted inch dimensions are not necessarily exact.
5. Package will meet JEDEC Standards.