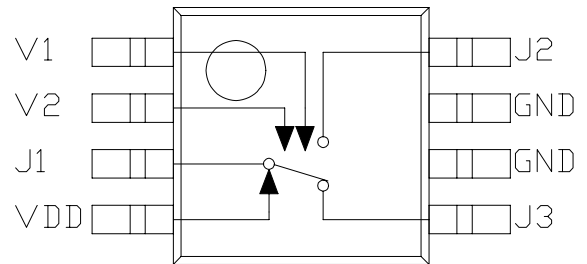


# SPDT High Power T/R Switch, DC TO 3.5 GHz ITTS502AJ

## PRELIMINARY INFORMATION

### FEATURES

- DC - 3.5 GHz Operation
- Low insertion loss
- Positive 3 to 5 volt control
- Small MSOP8 package



### Description

The ITTS502AJ is a high power SPDT switch in a miniature MSOP8 package for commercial applications. The switch operates +3 to +5 volts. This switch is ideal for Cellular, WLAN, Wireless Local Loop and other wireless applications.

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

| Rating (CW)          | Symbol             | Value       | Unit |
|----------------------|--------------------|-------------|------|
| RF input power       | J <sub>1,2,3</sub> | 2.5         | W    |
| Supply Voltage       | V <sub>DD</sub>    | 6           | V    |
| Control Voltage      | V <sub>1,2</sub>   | 6           | 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

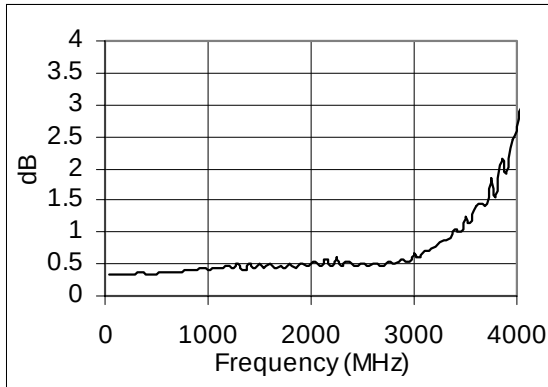
| Parameter                             | Test Conditions                               | Min | Typ | Max | Unit |
|---------------------------------------|-----------------------------------------------|-----|-----|-----|------|
| Insertion Loss                        | DC-1.0 GHz                                    |     | 0.5 |     | dB   |
|                                       | DC-2.0 GHz                                    |     | 0.6 |     | dB   |
|                                       | DC-2.5 GHz                                    |     | 0.7 |     | dB   |
|                                       | DC-3.5 GHz                                    |     | 1.5 |     | dB   |
| Isolation                             | DC-1.0 GHz                                    |     | 28  |     | dB   |
|                                       | DC-2.0 GHz                                    |     | 27  |     | dB   |
|                                       | DC-2.5 GHz                                    |     | 22  |     | dB   |
|                                       | DC-3.5 GHz                                    |     | 15  |     | dB   |
| Return Loss                           | DC-1.0 GHz                                    |     | 20  |     | dB   |
|                                       | DC-2.0 GHz                                    |     | 21  |     | dB   |
|                                       | DC-2.5 GHz                                    |     | 24  |     | dB   |
|                                       | DC-3.5 GHz                                    |     | 18  |     | 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                 | 0/3V control DC to 1.0 GHz                    |     | 30  |     | dBm  |
|                                       | 0/3V control DC to 3.5 GHz                    |     | 26  |     | dBm  |
|                                       | 0/5V control DC to 1.0 GHz                    |     | 36  |     | dBm  |
|                                       | 0/5V control DC to 3.5 GHz                    |     | 33  |     | dBm  |
| Third Order Intercept                 | 0/3V control DC to 3.5 GHz                    |     | 42  |     | dBm  |
|                                       | 0/5V control DC to 3.5 GHz                    |     | 41  |     | dBm  |

Specifications Subject to Change Without Notice

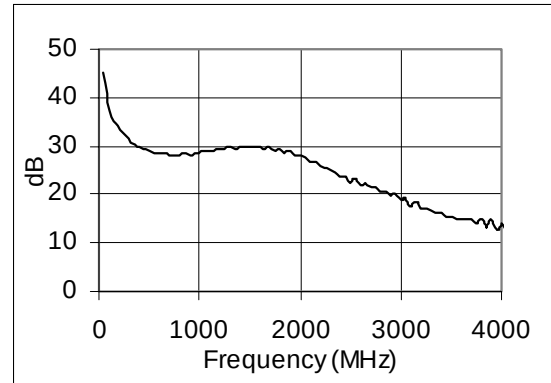
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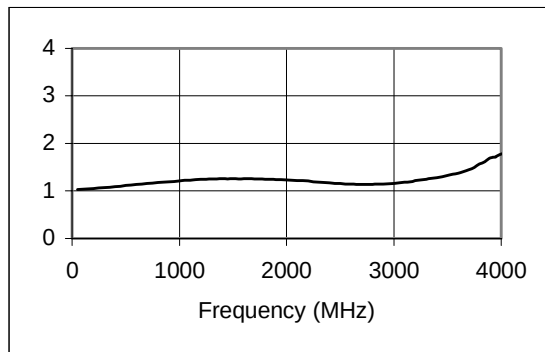
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**Insertion Loss vs Frequency**



**Isolation vs Frequency**



**VSWR vs Frequency**

**Input Power for P1dB Compression**  
Pulsed (10% duty cycle, 100 $\mu$ s)

| Vdd        | 1GHz   | 2.5GHz  |
|------------|--------|---------|
|            | (dBm)  | (dBm)   |
| 3V         | 30     | 29      |
| 5V         | 37     | 36      |
| 8V         | 40     | 40      |
| <b>TOI</b> |        |         |
| <b>CW</b>  |        |         |
| Vdd        | 2.5GHz | 3.5 GHz |
| 3V         | 44     | 41      |
| 5V         | 45     | 42      |

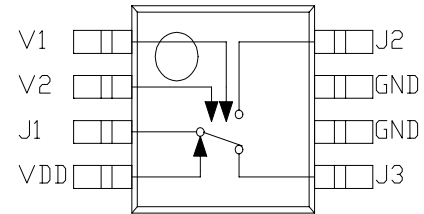
Caution: Do not operate CW at power levels greater than +35 dBm.

# SPDT High Power T/R Switch, DC TO 3.5 GHz ITTS502AJ

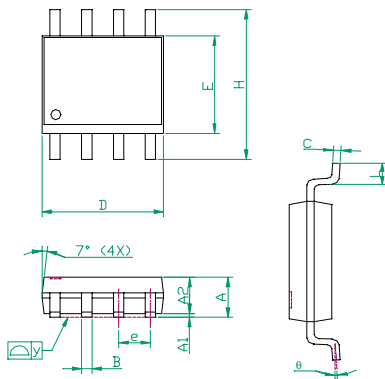
**PRELIMINARY  
INFORMATION**

## 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.
6. For reference only. See document 900923 for more details.