

Ceramic, Hermetic

# SPDT RF Switch

50Ω 500-6000 MHz

Absorptive RF Switch with internal driver.

Single Supply Voltage, +3V to +5V

## Product Features

- Wide bandwidth, 500 to 6000 MHz
- High Isolation, 65 dB typ. at 1 GHz
- Low insertion loss, 1.0 dB typ.
- Internal CMOS driver
- Fast switching, Rise/fall time, 30 ns typ.
- Built rugged for tough environments
- Hermetically sealed
- Wide operating temperature, -55°C to 125°C



## CSWA2-63DR+

CASE STYLE: DG1293

**MIL screening available**  
Please consult Applications Dept.

## Typical Applications

- Automated switching networks
- Cellular
- PCN
- ISM, WCDMA, WiMAX
- Military

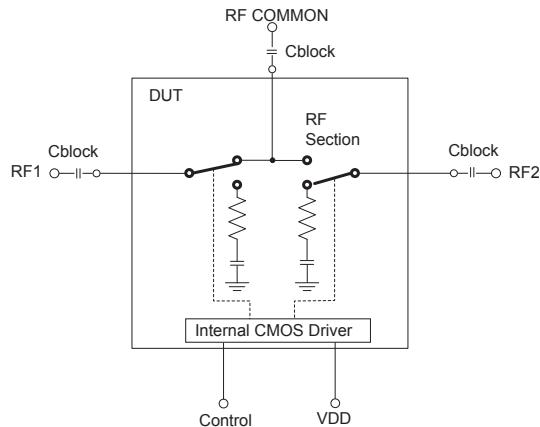
### +RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

## General Description

The CSWA2-63DR+ is a 50Ω high isolation, absorptive SPDT RF switch designed for wireless applications, covering a broad frequency range from 500 to 6000 MHz with low insertion loss. In non absorptive mode, the switch is usable down to 0.3 MHz. It may also be used in 75Ω systems over 0.3-3000 MHz. The CSWA2-63DR+ operates on a single supply voltage in the range of +3V to +5V. This unit includes an internal CMOS driver. The CSWA2-63DR+ switch comes in a low profile hermetic very small size package, 4mm x 4mm x 1.2mm. Expected MTBF is 373 years at 85°C case temperature. This switch is capable of meeting MIL requirements for gross leak, fine leak, thermal shock, vibration, acceleration, mechanical shock, and HTOL. The testing can be done if requested.

## Schematic and Application Circuit



Cblock should be free of resonance over frequency of operation.

| Frequency (MHz) | Cblock (Suggested value) |
|-----------------|--------------------------|
| 0.3-500         | 0.1µF                    |
| 500-6000        | 47pF                     |

### Notes

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CSWA2-63DR+  
ED-13004  
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## SPDT RF Switch

# CSWA2-63DR+

### RF Electrical Specifications<sup>(1)</sup>, 500 - 6000 MHz, T<sub>AMB</sub>=25°C, V<sub>DD</sub>= +3V to +5V

| Parameter                                       |                                      | Min. | Typ. | Max. | Units |
|---|--------------------------------------|------|------|------|-------|
| Frequency Range                                 |                                      | 500  |      | 6000 | MHz   |
| Insertion Loss                                  | 0.3 to 500 MHz                       |      | 1.0  |      | dB    |
|   | 500 to 2000 MHz                      |      | 1.0  | 1.3  |       |
|   | 2000 to 3000 MHz                     |      | 1.1  | 1.4  |       |
|   | 3000 to 4000 MHz                     |      | 1.2  | 1.5  |       |
|   | 4000 to 6000 MHz                     |      | 1.5  | 1.8  |       |
| Isolation between Common port and RF1/RF2 Ports | 0.3 to 500 MHz                       | —    | 60   |      | dB    |
|   | 500 to 2000 MHz                      | 50   | 60   |      |       |
|   | 2000 to 3000 MHz                     | 47   | 52   |      |       |
|   | 3000 to 4000 MHz                     | 45   | 50   |      |       |
|   | 4000 to 6000 MHz                     | 40   | 44   |      |       |
| Isolation between RF1 and RF2 ports             | 0.3 to 500 MHz                       | —    | 70   |      | dB    |
|   | 500 to 2000 MHz                      | 52   | 60   |      |       |
|   | 2000 to 3000 MHz                     | 47   | 52   |      |       |
|   | 3000 to 4000 MHz                     | 44   | 50   |      |       |
|   | 4000 to 6000 MHz                     | 36   | 44   |      |       |
| Return Loss (ON STATE)                          | 0.3 to 500 MHz                       |      | 20   |      | dB    |
|   | 100 to 2000 MHz                      |      | 20   |      |       |
|   | 2000 to 3000 MHz                     |      | 15   |      |       |
|   | 3000 to 4000 MHz                     |      | 15   |      |       |
|   | 4000 to 6000 MHz                     |      | 15   |      |       |
| Return Loss @ RF1/RF2 ports (OFF STATE)         | 500 to 2000 MHz                      |      | 13   |      | dB    |
|   | 2000 to 3000 MHz                     |      | 13   |      |       |
|   | 3000 to 4000 MHz                     |      | 14   |      |       |
|   | 4000 to 6000 MHz                     |      | 14   |      |       |
|   | V <sub>DD</sub> =3V, 500 to 2000 MHz |      | 47   |      |       |
| Input IP3                                       | 2000 to 6000 MHz                     |      | 40   |      | dBm   |
|   | V <sub>DD</sub> =5V, 500 to 2000 MHz |      | 50   |      |       |
| Input 1dB Compression <sup>(2)</sup>            | 2000 to 6000 MHz                     |      | 45   |      | dBm   |
|   | V <sub>DD</sub> =3V, 500 to 2000 MHz |      | 24   |      |       |
|   | 2000 to 6000 MHz                     |      | 24   |      |       |
|   | V <sub>DD</sub> =5V, 500 to 2000 MHz |      | 30   |      |       |
|   | 2000 to 6000 MHz                     |      | 27   |      |       |

### DC Electrical Specifications

| Parameter  |  | Min.               | Typ. | Max.            | Units |
|--|--|--------------------|------|-----------------|-------|
| V <sub>DD</sub> , Supply Voltage                     |  | 3                  |      | 5               | V     |
| Supply Current (V <sub>DD</sub> = 5V) <sup>(3)</sup> |  |                    | 50   |                 | µA    |
| Control Voltage Low                                  |  | 0                  |      | 0.5             | V     |
| Control Voltage High <sup>(4)</sup>                  |  | 2.7 <sup>(5)</sup> |      | V <sub>DD</sub> | V     |
| Control Current                                      |  |                    | 5    |                 | µA    |

Notes:

1. Insertion loss values are deembedded from test board loss. Tested using Agilent's N5230A network analyzer with internal DC blocks, except for IP3 and compression.
2. Note absolute maximum rating for input and dissipated power. At 5V, over 2000-6000 MHz, 0.2 dB compression.
3. Increases with switching repetition rate. See graph.
4. CMOS interface latch-up condition may occur when logic high signal is applied prior to power supply.
5. 3.5V for V<sub>DD</sub>=4 to 5V

### Switching Specifications at V<sub>DD</sub>=5V

| Parameter   |  | Min. | Typ. | Max. | Units             |
|---|--|------|------|------|-------------------|
| Rise/Fall Time (10 to 90% or 90 to 10% RF)        |  |      | 23   |      | nSec              |
| Switching Time (50% CTRL to 90/10% RF)            |  |      | 35   |      | nSec              |
| Video Feedthrough (Control 0-5V, Frequency 1 MHz) |  |      | 25   |      | mV <sub>P-P</sub> |

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**Absolute Maximum Ratings**

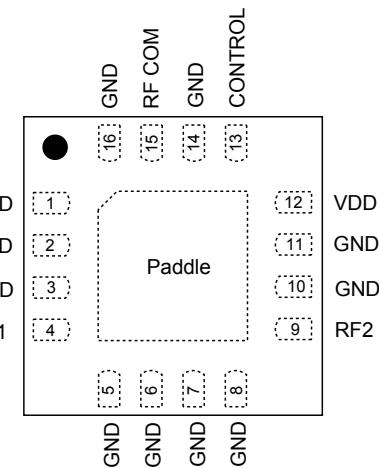
| Parameter                        | Ratings                                   |
|----------------------------------|---|
| Operating Temperature            | -55°C to 125°C                            |
| Storage Temperature              | -65°C to 150°C                            |
| V <sub>DD</sub> , Supply Voltage | 2.7 to 5.5V                               |
| Voltage Control                  | -0.2V Min. V <sub>DD</sub> Max.           |
| RF input power                   | 1Watt                                     |
| Dissipated Power at 25°C         | 370mW                                     |
| ESD, HBM                         | Class 1A (250 to <500V) per JESD22-A114   |
| ESD, MM                          | Class A (passes 50V) per JESD22-A115      |
| ESD, CDM                         | Class III (500 to <1000V) per JESD22-C101 |

**Truth Table** (State of control voltage selects the desired switch state)

| State of Control Voltage                             | Switch State - RF Common to |     |
|--|-----------------------------|-----|
|  | RF1                         | RF2 |
| Low  | ON                          | OFF |
| High   | OFF                         | ON  |
| ON- low insertion loss state<br>OFF- Isolation State |                             |     |

**Pad Connections**

| Function | Pad Number                            | Description          |
|----------|---------------------------------------|----------------------|
| RF COM   | 15                                    | RF Common/ SUM Port  |
| RF1      | 4                                     | RF Out #1/In Port #1 |
| RF2      | 9                                     | RF Out #1/In Port #2 |
| Control  | 13                                    | CMOS Control IN      |
| VDD      | 12                                    | Supply Voltage       |
| GND      | 1,2,3,5,6,7,8,10,<br>11,14,16, paddle | RF Ground            |

**Pad Configuration (Top View)****Notes**

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## Product Marking



## Additional Detailed Technical Information

Additional information is available on our web site. To access this information enter the model number on our web site home page.

### Performance data, graphs

#### Case Style: DG1293

Ceramic, finish: gold over nickel

#### Tape & Reel: F70

Standard quantities available on reel: 7" reels with 20, 50, 100, 200, 500, 1K devices.  
13" reels with 2K devices.

#### Suggested Layout for PCB Design: PL-279

#### Evaluation Board: TB-461+

#### Environmental Ratings: ENV40

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# RF Switch SPDT

**CSWA2-63DR+**

## Typical Performance Data

| RF FREQ<br>(MHz) | INSERTION LOSS (dB) |            |            |            | RF FREQ<br>(MHz) | ISOLATION (dB) |            |            |            |                       |                        |                       |                        |  |
|------------------|---------------------|------------|------------|------------|------------------|----------------|------------|------------|------------|-----------------------|------------------------|-----------------------|------------------------|--|
|                  | VDD=+3V             |            | VDD=+5V    |            |                  | VDD=+3V        |            | VDD=+5V    |            | VDD=+3V               |                        | VDD=+5V               |                        |  |
|                  | RF COM-RF1          | RF COM-RF2 | RF COM-RF1 | RF COM-RF2 |                  | RF COM-RF1     | RF COM-RF2 | RF COM-RF1 | RF COM-RF2 | RF1-RF2<br>State LOW* | RF1-RF2<br>State HIGH* | RF1-RF2<br>State LOW* | RF1-RF2<br>State HIGH* |  |
| 0.3              | 0.95                | 0.96       | 0.97       | 1.00       | 0.3              | 103.28         | 93.64      | 96.64      | 101.06     | 96.74                 | 84.91                  | 95.19                 | 86.81                  |  |
| 1                | 0.93                | 0.96       | 0.94       | 0.97       | 1                | 113.23         | 103.22     | 95.85      | 98.18      | 100.00                | 99.52                  | 102.25                | 106.48                 |  |
| 5                | 0.88                | 0.94       | 0.90       | 0.96       | 5                | 79.17          | 87.42      | 81.83      | 86.90      | 89.17                 | 80.37                  | 89.30                 | 81.04                  |  |
| 10               | 0.87                | 0.93       | 0.89       | 0.95       | 10               | 72.73          | 82.78      | 74.13      | 83.33      | 83.63                 | 72.75                  | 87.79                 | 75.91                  |  |
| 20               | 0.87                | 0.94       | 0.89       | 0.95       | 20               | 69.52          | 81.06      | 71.13      | 83.55      | 82.05                 | 70.41                  | 82.93                 | 72.36                  |  |
| 30               | 0.87                | 0.95       | 0.89       | 0.96       | 30               | 65.23          | 84.57      | 66.32      | 86.30      | 84.63                 | 66.14                  | 85.39                 | 67.68                  |  |
| 40               | 0.87                | 0.95       | 0.89       | 0.96       | 40               | 62.49          | 82.08      | 63.59      | 83.46      | 82.41                 | 63.50                  | 83.24                 | 64.91                  |  |
| 50               | 0.87                | 0.95       | 0.89       | 0.96       | 50               | 61.03          | 79.81      | 61.97      | 81.07      | 80.41                 | 61.95                  | 82.23                 | 63.10                  |  |
| 60               | 0.87                | 0.95       | 0.89       | 0.97       | 60               | 60.01          | 78.50      | 60.89      | 79.51      | 79.60                 | 60.94                  | 80.74                 | 62.01                  |  |
| 70               | 0.87                | 0.95       | 0.89       | 0.97       | 70               | 59.32          | 76.89      | 60.11      | 78.12      | 77.93                 | 60.28                  | 79.39                 | 61.24                  |  |
| 80               | 0.88                | 0.95       | 0.90       | 0.97       | 80               | 58.86          | 75.69      | 59.57      | 76.51      | 76.47                 | 59.72                  | 78.09                 | 60.65                  |  |
| 90               | 0.88                | 0.94       | 0.90       | 0.96       | 90               | 58.71          | 75.84      | 59.18      | 75.85      | 76.68                 | 59.64                  | 75.89                 | 60.10                  |  |
| 100              | 0.88                | 0.95       | 0.90       | 0.97       | 100              | 58.82          | 75.41      | 59.49      | 76.50      | 76.30                 | 59.65                  | 78.02                 | 60.53                  |  |
| 200              | 0.88                | 0.96       | 0.90       | 0.97       | 200              | 60.05          | 71.74      | 60.28      | 72.37      | 73.13                 | 60.41                  | 74.08                 | 60.85                  |  |
| 300              | 0.88                | 0.97       | 0.90       | 0.98       | 300              | 61.81          | 70.83      | 61.97      | 70.93      | 72.04                 | 61.63                  | 72.91                 | 61.94                  |  |
| 400              | 0.88                | 0.97       | 0.90       | 0.99       | 400              | 62.99          | 69.63      | 63.15      | 69.87      | 71.04                 | 62.43                  | 71.66                 | 62.78                  |  |
| 500              | 0.88                | 0.98       | 0.90       | 0.99       | 500              | 63.73          | 68.70      | 63.79      | 68.71      | 69.93                 | 62.91                  | 70.58                 | 63.33                  |  |
| 600              | 0.87                | 0.98       | 0.90       | 1.00       | 600              | 63.91          | 67.51      | 64.00      | 67.78      | 68.94                 | 63.45                  | 69.23                 | 63.72                  |  |
| 700              | 0.88                | 0.98       | 0.90       | 1.00       | 700              | 63.82          | 66.63      | 63.88      | 66.81      | 68.05                 | 63.90                  | 68.16                 | 64.09                  |  |
| 800              | 0.88                | 0.99       | 0.90       | 1.00       | 800              | 63.45          | 65.80      | 63.52      | 65.82      | 66.98                 | 64.18                  | 67.27                 | 64.29                  |  |
| 900              | 0.89                | 1.00       | 0.91       | 1.01       | 900              | 62.80          | 64.79      | 62.89      | 64.97      | 66.03                 | 64.26                  | 66.18                 | 64.58                  |  |
| 1000             | 0.90                | 1.00       | 0.92       | 1.02       | 1000             | 62.22          | 63.91      | 62.24      | 64.02      | 65.01                 | 64.33                  | 65.10                 | 64.46                  |  |
| 1100             | 0.91                | 1.01       | 0.93       | 1.03       | 1100             | 61.54          | 63.07      | 61.60      | 63.23      | 64.12                 | 64.27                  | 64.13                 | 64.35                  |  |
| 1200             | 0.93                | 1.02       | 0.95       | 1.03       | 1200             | 60.87          | 62.36      | 60.96      | 62.37      | 63.22                 | 64.08                  | 63.30                 | 64.32                  |  |
| 1300             | 0.94                | 1.03       | 0.96       | 1.04       | 1300             | 60.22          | 61.64      | 60.36      | 61.78      | 62.44                 | 64.00                  | 62.54                 | 64.03                  |  |
| 1400             | 0.96                | 1.03       | 0.97       | 1.05       | 1400             | 59.70          | 60.91      | 59.78      | 61.15      | 61.73                 | 63.77                  | 61.86                 | 63.85                  |  |
| 1500             | 0.97                | 1.04       | 0.99       | 1.06       | 1500             | 59.07          | 60.16      | 59.14      | 60.41      | 60.88                 | 63.34                  | 60.97                 | 63.39                  |  |
| 1600             | 0.98                | 1.05       | 1.00       | 1.06       | 1600             | 58.53          | 59.56      | 58.68      | 59.78      | 60.22                 | 62.73                  | 60.19                 | 62.90                  |  |
| 1700             | 0.98                | 1.05       | 1.00       | 1.07       | 1700             | 58.09          | 59.00      | 58.24      | 59.14      | 59.44                 | 62.10                  | 59.46                 | 62.34                  |  |
| 1800             | 0.99                | 1.06       | 1.01       | 1.07       | 1800             | 57.67          | 58.38      | 57.82      | 58.55      | 58.83                 | 61.45                  | 58.85                 | 61.70                  |  |
| 1900             | 0.98                | 1.06       | 1.00       | 1.08       | 1900             | 57.30          | 57.85      | 57.45      | 58.13      | 58.12                 | 60.84                  | 58.27                 | 61.08                  |  |
| 2000             | 0.98                | 1.07       | 1.00       | 1.09       | 2000             | 57.02          | 57.55      | 57.19      | 57.80      | 57.64                 | 60.28                  | 57.75                 | 60.49                  |  |
| 2100             | 0.97                | 1.07       | 0.99       | 1.09       | 2100             | 56.64          | 57.06      | 56.85      | 57.20      | 56.98                 | 59.53                  | 57.07                 | 59.71                  |  |
| 2200             | 0.97                | 1.08       | 0.99       | 1.10       | 2200             | 56.37          | 56.51      | 56.53      | 56.69      | 56.32                 | 58.89                  | 56.36                 | 59.02                  |  |
| 2300             | 0.97                | 1.09       | 0.99       | 1.10       | 2300             | 55.97          | 55.98      | 56.15      | 56.17      | 55.49                 | 58.10                  | 55.65                 | 58.27                  |  |
| 2400             | 0.97                | 1.09       | 0.99       | 1.11       | 2400             | 55.80          | 55.82      | 55.93      | 55.89      | 54.99                 | 57.41                  | 55.12                 | 57.60                  |  |
| 2500             | 0.97                | 1.10       | 1.00       | 1.12       | 2500             | 55.57          | 55.34      | 55.73      | 55.48      | 54.40                 | 56.80                  | 54.50                 | 56.93                  |  |
| 2600             | 0.98                | 1.10       | 1.01       | 1.13       | 2600             | 55.37          | 54.93      | 55.54      | 55.12      | 53.77                 | 56.08                  | 53.84                 | 56.22                  |  |
| 2700             | 0.99                | 1.11       | 1.02       | 1.13       | 2700             | 55.21          | 54.62      | 55.39      | 54.74      | 53.22                 | 55.43                  | 53.29                 | 55.54                  |  |
| 2800             | 1.01                | 1.12       | 1.03       | 1.14       | 2800             | 55.13          | 54.37      | 55.31      | 54.42      | 52.86                 | 54.91                  | 52.86                 | 54.98                  |  |
| 2900             | 1.02                | 1.12       | 1.05       | 1.14       | 2900             | 54.75          | 53.45      | 54.93      | 53.58      | 52.15                 | 54.28                  | 51.96                 | 54.22                  |  |
| 3000             | 1.04                | 1.13       | 1.06       | 1.15       | 3000             | 54.89          | 53.62      | 55.09      | 53.84      | 51.83                 | 53.75                  | 51.90                 | 53.94                  |  |
| 3250             | 1.04                | 1.13       | 1.06       | 1.16       | 3250             | 54.81          | 53.08      | 54.91      | 53.11      | 50.33                 | 52.24                  | 50.35                 | 52.39                  |  |
| 3500             | 1.01                | 1.13       | 1.04       | 1.16       | 3500             | 54.56          | 52.48      | 54.77      | 52.70      | 48.87                 | 50.89                  | 49.20                 | 51.24                  |  |
| 3750             | 1.01                | 1.14       | 1.03       | 1.16       | 3750             | 54.28          | 51.71      | 54.57      | 51.97      | 47.64                 | 49.76                  | 47.94                 | 50.09                  |  |
| 4000             | 1.05                | 1.17       | 1.07       | 1.18       | 4000             | 53.85          | 51.20      | 54.27      | 51.46      | 46.55                 | 48.73                  | 46.82                 | 49.02                  |  |
| 4250             | 1.12                | 1.21       | 1.13       | 1.22       | 4250             | 53.24          | 50.67      | 53.57      | 50.98      | 45.70                 | 47.84                  | 45.91                 | 48.19                  |  |
| 4500             | 1.18                | 1.27       | 1.19       | 1.28       | 4500             | 52.65          | 50.24      | 52.78      | 50.36      | 44.90                 | 47.00                  | 45.11                 | 47.34                  |  |
| 4750             | 1.22                | 1.33       | 1.23       | 1.34       | 4750             | 52.42          | 49.89      | 52.15      | 49.33      | 43.98                 | 46.37                  | 44.25                 | 46.76                  |  |
| 5000             | 1.25                | 1.37       | 1.26       | 1.38       | 5000             | 51.49          | 48.85      | 51.76      | 48.61      | 43.13                 | 45.58                  | 43.35                 | 45.87                  |  |
| 5250             | 1.26                | 1.37       | 1.27       | 1.39       | 5250             | 50.20          | 48.29      | 50.25      | 48.01      | 42.22                 | 44.39                  | 42.78                 | 44.93                  |  |
| 5500             | 1.25                | 1.36       | 1.27       | 1.37       | 5500             | 49.52          | 47.81      | 48.83      | 47.50      | 41.57                 | 43.37                  | 42.23                 | 44.08                  |  |
| 5750             | 1.26                | 1.34       | 1.27       | 1.34       | 5750             | 48.22          | 46.88      | 47.91      | 46.33      | 40.79                 | 42.47                  | 41.39                 | 43.09                  |  |
| 6000             | 1.26                | 1.33       | 1.27       | 1.33       | 6000             | 47.13          | 45.73      | 46.96      | 44.94      | 39.91                 | 41.54                  | 40.41                 | 42.00                  |  |

\*Note:

| State of Control Voltage | RF Common to<br>RF1 | RF2 |
|--------------------------|---------------------|-----|
| LOW                      | ON                  | OFF |
| HIGH                     | OFF                 | ON  |

ON - Low insertion loss state

OFF - Isolation state



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IF/RF MICROWAVE COMPONENTS

REV. OR  
CSWA2-63DR+  
12/24/2008  
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# RF Switch SPDT

**CSWA2-63DR+**

## Typical Performance Data

| RF FREQ<br>(MHz) | VSWR (:1)   |            |             |            |             |            |             |            | RF FREQ<br>(MHz) | VSWR (:1)   |            |             |            |  |
|------------------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|------------------|-------------|------------|-------------|------------|--|
|                  | VDD=+3V     |            |             |            | VDD=+5V     |            |             |            |                  | VDD=+3V     |            | VDD=+5V     |            |  |
|                  | RF COM      |            | RF1         | RF2        | RF COM      |            | RF1         | RF2        |                  | RF1         | RF2        | RF1         | RF2        |  |
| State LOW*       | State HIGH* | State LOW* | State HIGH* | State LOW* | State HIGH* | State LOW* | State HIGH* | State LOW* | State HIGH*      | State HIGH* | State LOW* | State HIGH* | State LOW* |  |
| 0.3              | 1.19        | 1.20       | 1.20        | 1.20       | 1.19        | 1.21       | 1.20        | 1.21       |                  | 500         | 1.65       | 1.67        | 1.67       |  |
| 1                | 1.18        | 1.20       | 1.19        | 1.20       | 1.19        | 1.20       | 1.19        | 1.20       |                  | 600         | 1.59       | 1.62        | 1.61       |  |
| 5                | 1.17        | 1.19       | 1.17        | 1.19       | 1.18        | 1.19       | 1.17        | 1.19       |                  | 700         | 1.55       | 1.58        | 1.57       |  |
| 10               | 1.17        | 1.17       | 1.17        | 1.17       | 1.18        | 1.18       | 1.17        | 1.18       |                  | 800         | 1.52       | 1.56        | 1.54       |  |
| 20               | 1.17        | 1.17       | 1.17        | 1.16       | 1.18        | 1.17       | 1.17        | 1.17       |                  | 900         | 1.51       | 1.55        | 1.53       |  |
| 30               | 1.17        | 1.16       | 1.17        | 1.16       | 1.18        | 1.16       | 1.18        | 1.16       |                  | 1000        | 1.49       | 1.54        | 1.52       |  |
| 40               | 1.17        | 1.15       | 1.17        | 1.15       | 1.18        | 1.16       | 1.18        | 1.16       |                  | 1100        | 1.49       | 1.54        | 1.51       |  |
| 50               | 1.17        | 1.15       | 1.17        | 1.15       | 1.18        | 1.16       | 1.18        | 1.16       |                  | 1200        | 1.48       | 1.54        | 1.51       |  |
| 60               | 1.17        | 1.15       | 1.17        | 1.15       | 1.18        | 1.16       | 1.18        | 1.16       |                  | 1300        | 1.48       | 1.55        | 1.51       |  |
| 70               | 1.18        | 1.15       | 1.17        | 1.15       | 1.18        | 1.16       | 1.18        | 1.16       |                  | 1400        | 1.48       | 1.55        | 1.51       |  |
| 80               | 1.18        | 1.15       | 1.17        | 1.15       | 1.18        | 1.16       | 1.18        | 1.16       |                  | 1500        | 1.48       | 1.56        | 1.51       |  |
| 90               | 1.18        | 1.15       | 1.17        | 1.16       | 1.18        | 1.16       | 1.18        | 1.16       |                  | 1600        | 1.48       | 1.57        | 1.51       |  |
| 100              | 1.18        | 1.15       | 1.17        | 1.15       | 1.18        | 1.16       | 1.18        | 1.16       |                  | 1700        | 1.49       | 1.58        | 1.52       |  |
| 200              | 1.17        | 1.15       | 1.18        | 1.16       | 1.18        | 1.16       | 1.18        | 1.16       |                  | 1800        | 1.49       | 1.59        | 1.52       |  |
| 300              | 1.17        | 1.15       | 1.18        | 1.16       | 1.17        | 1.16       | 1.18        | 1.16       |                  | 1900        | 1.50       | 1.60        | 1.53       |  |
| 400              | 1.16        | 1.15       | 1.18        | 1.16       | 1.16        | 1.16       | 1.18        | 1.17       |                  | 2000        | 1.50       | 1.61        | 1.53       |  |
| 500              | 1.16        | 1.15       | 1.17        | 1.16       | 1.16        | 1.16       | 1.18        | 1.17       |                  | 2100        | 1.51       | 1.63        | 1.54       |  |
| 600              | 1.16        | 1.16       | 1.17        | 1.17       | 1.16        | 1.16       | 1.18        | 1.17       |                  | 2200        | 1.51       | 1.64        | 1.55       |  |
| 700              | 1.16        | 1.16       | 1.17        | 1.17       | 1.16        | 1.16       | 1.18        | 1.18       |                  | 2300        | 1.52       | 1.65        | 1.55       |  |
| 800              | 1.17        | 1.16       | 1.17        | 1.18       | 1.18        | 1.16       | 1.17        | 1.18       |                  | 2400        | 1.52       | 1.65        | 1.56       |  |
| 900              | 1.19        | 1.16       | 1.16        | 1.18       | 1.19        | 1.16       | 1.17        | 1.18       |                  | 2500        | 1.53       | 1.66        | 1.56       |  |
| 1000             | 1.20        | 1.16       | 1.16        | 1.18       | 1.20        | 1.17       | 1.16        | 1.19       |                  | 2600        | 1.53       | 1.67        | 1.57       |  |
| 1100             | 1.22        | 1.17       | 1.15        | 1.18       | 1.22        | 1.17       | 1.16        | 1.19       |                  | 2700        | 1.54       | 1.68        | 1.57       |  |
| 1200             | 1.22        | 1.17       | 1.15        | 1.18       | 1.22        | 1.17       | 1.15        | 1.19       |                  | 2800        | 1.54       | 1.68        | 1.57       |  |
| 1300             | 1.23        | 1.18       | 1.14        | 1.18       | 1.23        | 1.17       | 1.14        | 1.18       |                  | 2900        | 1.54       | 1.68        | 1.58       |  |
| 1400             | 1.23        | 1.18       | 1.13        | 1.18       | 1.24        | 1.18       | 1.13        | 1.18       |                  | 3000        | 1.54       | 1.68        | 1.58       |  |
| 1500             | 1.23        | 1.18       | 1.12        | 1.17       | 1.23        | 1.18       | 1.13        | 1.18       |                  | 3250        | 1.54       | 1.68        | 1.58       |  |
| 1600             | 1.23        | 1.17       | 1.11        | 1.17       | 1.23        | 1.17       | 1.12        | 1.18       |                  | 3500        | 1.53       | 1.67        | 1.57       |  |
| 1700             | 1.23        | 1.17       | 1.11        | 1.17       | 1.23        | 1.17       | 1.11        | 1.18       |                  | 3750        | 1.51       | 1.64        | 1.55       |  |
| 1800             | 1.22        | 1.17       | 1.10        | 1.17       | 1.23        | 1.17       | 1.11        | 1.17       |                  | 4000        | 1.48       | 1.60        | 1.52       |  |
| 1900             | 1.22        | 1.16       | 1.11        | 1.17       | 1.23        | 1.16       | 1.12        | 1.18       |                  | 4250        | 1.45       | 1.54        | 1.49       |  |
| 2000             | 1.23        | 1.16       | 1.11        | 1.18       | 1.23        | 1.16       | 1.12        | 1.19       |                  | 4500        | 1.41       | 1.48        | 1.45       |  |
| 2100             | 1.23        | 1.15       | 1.12        | 1.19       | 1.23        | 1.16       | 1.13        | 1.20       |                  | 4750        | 1.37       | 1.42        | 1.41       |  |
| 2200             | 1.23        | 1.14       | 1.13        | 1.20       | 1.24        | 1.15       | 1.15        | 1.22       |                  | 5000        | 1.33       | 1.35        | 1.37       |  |
| 2300             | 1.23        | 1.14       | 1.15        | 1.22       | 1.24        | 1.15       | 1.16        | 1.24       |                  | 5250        | 1.30       | 1.29        | 1.33       |  |
| 2400             | 1.23        | 1.14       | 1.16        | 1.24       | 1.24        | 1.16       | 1.18        | 1.26       |                  | 5500        | 1.27       | 1.23        | 1.31       |  |
| 2500             | 1.24        | 1.15       | 1.18        | 1.27       | 1.25        | 1.16       | 1.20        | 1.28       |                  | 5750        | 1.24       | 1.19        | 1.28       |  |
| 2600             | 1.23        | 1.15       | 1.20        | 1.29       | 1.24        | 1.17       | 1.22        | 1.31       |                  | 6000        | 1.23       | 1.17        | 1.27       |  |
| 2700             | 1.23        | 1.16       | 1.22        | 1.31       | 1.24        | 1.17       | 1.24        | 1.33       |                  |             |            |             |            |  |
| 2800             | 1.22        | 1.16       | 1.23        | 1.33       | 1.23        | 1.18       | 1.26        | 1.35       |                  |             |            |             |            |  |
| 2900             | 1.21        | 1.17       | 1.25        | 1.34       | 1.22        | 1.19       | 1.27        | 1.37       |                  |             |            |             |            |  |
| 3000             | 1.20        | 1.17       | 1.25        | 1.36       | 1.21        | 1.19       | 1.28        | 1.38       |                  |             |            |             |            |  |
| 3250             | 1.17        | 1.17       | 1.26        | 1.36       | 1.18        | 1.19       | 1.29        | 1.39       |                  |             |            |             |            |  |
| 3500             | 1.18        | 1.17       | 1.24        | 1.34       | 1.19        | 1.19       | 1.27        | 1.37       |                  |             |            |             |            |  |
| 3750             | 1.24        | 1.21       | 1.20        | 1.29       | 1.25        | 1.23       | 1.23        | 1.33       |                  |             |            |             |            |  |
| 4000             | 1.33        | 1.30       | 1.16        | 1.26       | 1.33        | 1.30       | 1.19        | 1.30       |                  |             |            |             |            |  |
| 4250             | 1.41        | 1.42       | 1.18        | 1.28       | 1.41        | 1.42       | 1.20        | 1.30       |                  |             |            |             |            |  |
| 4500             | 1.50        | 1.55       | 1.23        | 1.33       | 1.50        | 1.55       | 1.25        | 1.34       |                  |             |            |             |            |  |
| 4750             | 1.60        | 1.65       | 1.29        | 1.38       | 1.60        | 1.66       | 1.30        | 1.39       |                  |             |            |             |            |  |
| 5000             | 1.66        | 1.71       | 1.33        | 1.41       | 1.67        | 1.71       | 1.34        | 1.42       |                  |             |            |             |            |  |
| 5250             | 1.67        | 1.70       | 1.34        | 1.40       | 1.68        | 1.71       | 1.35        | 1.40       |                  |             |            |             |            |  |
| 5500             | 1.62        | 1.64       | 1.34        | 1.35       | 1.64        | 1.66       | 1.35        | 1.36       |                  |             |            |             |            |  |
| 5750             | 1.55        | 1.56       | 1.30        | 1.29       | 1.56        | 1.58       | 1.33        | 1.31       |                  |             |            |             |            |  |
| 6000             | 1.49        | 1.49       | 1.28        | 1.23       | 1.50        | 1.49       | 1.30        | 1.25       |                  |             |            |             |            |  |

\*Note:

| State of Control Voltage | RF Common to RF1 | RF2 |
|--------------------------|------------------|-----|
| LOW                      | ON               | OFF |
| HIGH                     | OFF              | ON  |

ON - Low insertion loss state  
OFF - Isolation state



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IF/RF MICROWAVE COMPONENTS

REV. OR  
CSWA2-63DR+  
12/24/2008  
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# RF Switch SPDT

**CSWA2-63DR+**

## Typical Performance Data

| RF FREQ<br>(MHz) | INPUT IP3<br>(dBm) |            |            |            | RF FREQ<br>(MHz) | INPUT 1dB COMPRESSION<br>(dBm) |          | RF FREQ<br>(MHz) | COMPRESSION (dB)<br>@ FIXED POWER FOR<br>PIN=27dBm |            |  |
|------------------|--------------------|------------|------------|------------|------------------|--------------------------------|----------|------------------|--|------------|--|
|                  | VDD=+3V            |            | VDD =+5V   |            |                  | VDD=+3V                        | VDD =+5V |                  | VDD=+3V  | VDD =+5V   |  |
|                  | RF COM-RF1         | RF COM-RF2 | RF COM-RF1 | RF COM-RF2 |                  | Pin                            | Pin      |                  | RF COM-RF1   | RF COM-RF2 |  |
| 500              | 48.31              | 48.44      | 51.09      | 52.07      | 500              | 23.96                          | 30.61    | 2000             | 0.11   | 0.08       |  |
| 550              | 47.68              | 47.89      | 50.11      | 51.10      | 600              | 23.87                          | 30.60    | 2200             | 0.06   | 0.03       |  |
| 600              | 47.90              | 48.19      | 50.34      | 51.35      | 700              | 23.73                          | 30.52    | 2400             | 0.03   | 0.03       |  |
| 650              | 48.50              | 48.80      | 51.18      | 52.39      | 800              | 23.78                          | 30.45    | 2600             | 0.04   | 0.02       |  |
| 700              | 49.00              | 49.44      | 51.06      | 52.09      | 900              | 23.57                          | 30.34    | 2800             | 0.05   | 0.03       |  |
| 750              | 48.30              | 48.59      | 50.48      | 51.59      | 1000             | 23.41                          | 30.20    | 3000             | 0.04   | 0.03       |  |
| 800              | 46.96              | 47.26      | 49.21      | 50.01      | 1100             | 23.81                          | 30.31    | 3100             | 0.04   | 0.02       |  |
| 850              | 46.26              | 46.60      | 48.80      | 49.28      | 1200             | 23.76                          | 30.33    | 3200             | 0.04   | 0.03       |  |
| 900              | 46.38              | 46.65      | 49.09      | 49.57      | 1300             | 23.88                          | 30.43    | 3300             | 0.05   | 0.03       |  |
| 950              | 46.22              | 46.57      | 49.39      | 50.23      | 1400             | 24.03                          | 30.43    | 3400             | 0.07   | 0.04       |  |
| 1000             | 47.01              | 47.71      | 50.54      | 51.48      | 1500             | 24.24                          | 30.64    | 3500             | 0.07   | 0.04       |  |
| 1250             | 45.16              | 45.75      | 48.62      | 49.35      | 1600             | 24.23                          | 30.67    | 3600             | 0.06   | -0.04      |  |
| 1500             | 46.04              | 46.37      | 49.04      | 49.61      | 1700             | 24.46                          | 30.79    | 3625             | 0.04   | 0.03       |  |
| 1750             | 45.22              | 45.78      | 48.69      | 49.15      | 1800             | 24.35                          | 30.60    | 3650             | 0.06   | 0.03       |  |
| 2000             | 43.41              | 44.05      | 46.53      | 47.23      | 1900             | 24.30                          | 30.48    | 3675             | 0.06   | 0.03       |  |
| 2250             | 43.00              | 43.88      | 46.43      | 47.21      | 2000             | 24.29                          | 30.62    | 3700             | 0.04   | 0.03       |  |
| 2500             | 41.60              | 42.73      | 45.28      | 46.29      |                  |                                |          | 3725             | 0.05   | 0.03       |  |
| 2750             | 42.22              | 42.86      | 45.72      | 46.54      |                  |                                |          | 3750             | 0.07   | 0.03       |  |
| 3000             | 42.10              | 42.79      | 45.65      | 46.61      |                  |                                |          | 3775             | 0.05   | 0.03       |  |
| 3250             | 40.72              | 41.34      | 44.19      | 45.24      |                  |                                |          | 3800             | 0.04   | -0.03      |  |
| 3500             | 40.91              | 41.27      | 44.62      | 45.61      |                  |                                |          | 3900             | 0.07   | 0.04       |  |
| 3750             | 41.21              | 40.94      | 45.35      | 45.62      |                  |                                |          | 4000             | 0.09   | 0.06       |  |
| 4000             | 40.58              | 39.35      | 44.60      | 43.72      |                  |                                |          | 4100             | 0.14   | 0.06       |  |
| 4250             | 40.61              | 40.00      | 44.58      | 44.15      | 0.0005           | 0.75                           | 6.38     | 4200             | 0.09   | 0.05       |  |
| 4500             | 39.55              | 38.99      | 43.36      | 43.13      | 1                | 62.50                          | 93.75    | 4300             | 0.04   | 0.03       |  |
| 4750             | 38.62              | 38.58      | 42.49      | 42.76      | 2                | 121.25                         | 176.00   | 4400             | 0.04   | 0.04       |  |
| 5000             | 39.17              | 39.38      | 43.01      | 43.36      | 3                | 175.25                         | 252.50   | 4500             | 0.04   | 0.04       |  |
| 5250             | 38.69              | 38.86      | 43.10      | 43.11      | 4                | 233.50                         | 334.00   | 4600             | 0.09   | 0.06       |  |
| 5500             | 37.95              | 37.69      | 42.12      | 41.84      | 5                | 282.50                         | 409.25   | 4700             | 0.10   | 0.06       |  |
| 5750             | 37.84              | 37.60      | 41.68      | 41.62      | 6                | 319.00                         | 462.00   | 4800             | 0.06   | 0.04       |  |
| 6000             | 36.56              | 36.50      | 41.02      | 41.21      | 7                | 386.50                         | 559.50   | 4900             | 0.05   | 0.04       |  |
|                  |                    |            |            |            | 8                | 432.75                         | 614.75   | 5000             | 0.14   | 0.10       |  |
|                  |                    |            |            |            | 9                | 491.00                         | 729.50   | 5200             | 0.13   | 0.10       |  |
|                  |                    |            |            |            | 10               | 540.50                         | 776.75   | 5400             | 0.11   | 0.08       |  |
|                  |                    |            |            |            |                  |                                |          | 5600             | 0.19   | 0.17       |  |
|                  |                    |            |            |            |                  |                                |          | 5800             | 0.24   | 0.24       |  |
|                  |                    |            |            |            |                  |                                |          | 6000             | 0.36   | 0.41       |  |



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# RF Switch SPDT

CSWA2-63DR+

## Typical Performance Data

| RF FREQ<br>(MHz) | INSERTION LOSS (dB) @ VDD=+5V OVER TEMPERATURE |       |        |            |       |        | ISOLATION (dB) @ VDD=+5V OVER TEMPERATURE |        |        |            |       |        |                       |        |        |                        |       |        |       |
|------------------|--|-------|--------|------------|-------|--------|---|--------|--------|------------|-------|--------|-----------------------|--------|--------|------------------------|-------|--------|-------|
|                  | RF COM-RF1                                     |       |        | RF COM-RF2 |       |        | RF COM-RF1                                |        |        | RF COM-RF2 |       |        | RF1-RF2<br>State LOW* |        |        | RF1-RF2<br>State HIGH* |       |        |       |
|                  | -55°C  | +25°C | +125°C | -55°C      | +25°C | +125°C | -55°C                                     | +25°C  | +125°C | -55°C      | +25°C | +125°C | -55°C                 | +25°C  | +125°C | -55°C                  | +25°C | +125°C |       |
| 0.3              | 0.89   | 0.99  | 1.12   | 0.90       | 1.06  | 1.28   | 0.3                                       | 114.58 | 103.24 | 109.08     | 91.98 | 94.71  | 96.46                 | 92.44  | 85.71  | 92.70                  | 88.38 | 82.51  | 84.99 |
| 1                | 0.82   | 0.94  | 1.07   | 0.84       | 1.01  | 1.20   | 1   | 112.53 | 99.44  | 92.55      | 97.40 | 99.53  | 94.85                 | 101.27 | 97.14  | 98.18                  | 99.06 | 104.32 | 91.86 |
| 5                | 0.77   | 0.89  | 1.05   | 0.83       | 0.98  | 1.17   | 5   | 80.75  | 80.86  | 81.87      | 86.35 | 87.84  | 87.65                 | 80.66  | 80.99  | 83.16                  | 86.43 | 87.41  | 88.37 |
| 10               | 0.75   | 0.88  | 1.04   | 0.83       | 0.97  | 1.14   | 10  | 76.31  | 75.90  | 75.89      | 85.30 | 84.87  | 90.57                 | 76.57  | 76.84  | 76.96                  | 85.61 | 90.90  | 85.91 |
| 20               | 0.75   | 0.88  | 1.04   | 0.85       | 0.97  | 1.12   | 20  | 66.49  | 67.28  | 67.74      | 73.27 | 76.05  | 78.36                 | 67.09  | 68.04  | 68.99                  | 73.24 | 76.27  | 78.92 |
| 30               | 0.75   | 0.88  | 1.04   | 0.84       | 0.96  | 1.12   | 30  | 67.50  | 66.64  | 66.26      | 74.99 | 79.13  | 83.09                 | 68.67  | 68.14  | 68.17                  | 74.96 | 78.59  | 81.17 |
| 40               | 0.75   | 0.88  | 1.04   | 0.85       | 0.97  | 1.12   | 40  | 66.54  | 64.89  | 64.28      | 79.18 | 86.24  | 86.24                 | 67.97  | 66.57  | 66.29                  | 78.27 | 81.96  | 84.90 |
| 50               | 0.75   | 0.88  | 1.04   | 0.86       | 0.98  | 1.13   | 50  | 63.94  | 62.72  | 62.69      | 85.33 | 85.77  | 82.63                 | 65.34  | 64.39  | 64.50                  | 81.44 | 84.63  | 83.64 |
| 60               | 0.75   | 0.88  | 1.04   | 0.87       | 0.98  | 1.13   | 60  | 62.25  | 61.47  | 61.69      | 86.80 | 82.89  | 80.30                 | 63.58  | 63.12  | 63.47                  | 83.09 | 83.61  | 81.89 |
| 70               | 0.75   | 0.88  | 1.04   | 0.87       | 0.98  | 1.14   | 70  | 61.04  | 60.57  | 61.02      | 84.02 | 80.55  | 78.46                 | 62.42  | 62.08  | 62.75                  | 82.63 | 81.07  | 80.59 |
| 80               | 0.74   | 0.88  | 1.04   | 0.87       | 0.98  | 1.14   | 80  | 60.20  | 59.95  | 60.63      | 80.80 | 78.70  | 77.11                 | 61.56  | 61.49  | 62.34                  | 81.68 | 80.87  | 79.40 |
| 90               | 0.74   | 0.88  | 1.04   | 0.87       | 0.99  | 1.14   | 90  | 59.77  | 59.72  | 60.41      | 79.07 | 77.29  | 76.51                 | 60.99  | 61.11  | 62.18                  | 79.78 | 79.02  | 78.36 |
| 100              | 0.74   | 0.88  | 1.04   | 0.87       | 0.99  | 1.14   | 100                                       | 59.31  | 59.42  | 60.36      | 77.82 | 75.92  | 75.62                 | 60.44  | 60.71  | 61.92                  | 78.70 | 78.07  | 77.66 |
| 200              | 0.74   | 0.88  | 1.05   | 0.86       | 0.99  | 1.14   | 200                                       | 59.56  | 60.44  | 61.92      | 72.92 | 72.70  | 72.81                 | 60.25  | 61.24  | 62.90                  | 74.49 | 74.71  | 75.13 |
| 300              | 0.72   | 0.88  | 1.06   | 0.85       | 0.98  | 1.15   | 300                                       | 60.94  | 61.95  | 63.62      | 71.03 | 71.19  | 71.68                 | 61.05  | 62.22  | 64.00                  | 73.06 | 73.07  | 73.88 |
| 400              | 0.71   | 0.88  | 1.07   | 0.83       | 0.98  | 1.16   | 400                                       | 62.11  | 63.27  | 64.53      | 69.65 | 69.79  | 70.66                 | 61.64  | 62.88  | 64.81                  | 71.41 | 72.04  | 72.77 |
| 500              | 0.71   | 0.88  | 1.07   | 0.82       | 0.98  | 1.16   | 500                                       | 62.94  | 63.88  | 64.85      | 68.68 | 68.95  | 69.73                 | 62.21  | 63.51  | 65.21                  | 70.24 | 70.77  | 71.92 |
| 600              | 0.70   | 0.88  | 1.07   | 0.82       | 0.98  | 1.17   | 600                                       | 63.27  | 64.01  | 64.80      | 67.49 | 67.75  | 68.67                 | 62.55  | 63.76  | 65.53                  | 69.07 | 69.64  | 70.75 |
| 700              | 0.69   | 0.88  | 1.08   | 0.80       | 0.97  | 1.17   | 700                                       | 63.41  | 63.90  | 64.54      | 66.44 | 66.87  | 67.46                 | 62.80  | 63.91  | 65.67                  | 67.92 | 68.53  | 69.59 |
| 800              | 0.69   | 0.88  | 1.09   | 0.80       | 0.98  | 1.18   | 800                                       | 63.03  | 63.51  | 63.91      | 65.42 | 65.91  | 66.56                 | 62.85  | 64.04  | 65.75                  | 66.72 | 67.52  | 68.46 |
| 900              | 0.69   | 0.89  | 1.10   | 0.80       | 0.99  | 1.19   | 900                                       | 62.71  | 63.04  | 63.29      | 64.53 | 64.86  | 65.64                 | 63.01  | 64.43  | 65.85                  | 65.54 | 66.38  | 67.37 |
| 1000             | 0.69   | 0.89  | 1.11   | 0.80       | 0.99  | 1.20   | 1000                                      | 62.10  | 62.32  | 62.55      | 63.58 | 63.95  | 64.73                 | 62.87  | 64.11  | 65.81                  | 64.73 | 65.38  | 66.55 |
| 1100             | 0.70   | 0.91  | 1.13   | 0.81       | 1.00  | 1.22   | 1100                                      | 61.35  | 61.50  | 61.90      | 62.77 | 63.11  | 63.81                 | 62.91  | 63.94  | 65.67                  | 63.95 | 64.50  | 65.49 |
| 1200             | 0.71   | 0.92  | 1.14   | 0.81       | 1.01  | 1.24   | 1200                                      | 60.71  | 61.00  | 61.30      | 61.80 | 62.40  | 63.01                 | 62.62  | 63.71  | 65.17                  | 62.90 | 63.58  | 64.69 |
| 1300             | 0.71   | 0.93  | 1.16   | 0.82       | 1.02  | 1.25   | 1300                                      | 60.09  | 60.31  | 60.66      | 60.85 | 61.51  | 62.35                 | 62.33  | 63.42  | 65.08                  | 62.09 | 62.72  | 64.07 |
| 1400             | 0.72   | 0.94  | 1.17   | 0.82       | 1.03  | 1.26   | 1400                                      | 59.42  | 59.70  | 60.20      | 60.31 | 60.78  | 61.59                 | 62.13  | 63.09  | 64.67                  | 61.38 | 61.95  | 63.19 |
| 1500             | 0.71   | 0.95  | 1.18   | 0.82       | 1.04  | 1.27   | 1500                                      | 58.79  | 59.06  | 59.56      | 59.38 | 59.96  | 60.76                 | 61.60  | 62.54  | 63.97                  | 60.18 | 61.03  | 62.07 |
| 1600             | 0.71   | 0.95  | 1.18   | 0.82       | 1.05  | 1.29   | 1600                                      | 58.07  | 58.43  | 58.96      | 58.63 | 59.29  | 60.35                 | 60.94  | 61.99  | 63.33                  | 58.77 | 59.99  | 60.82 |
| 1700             | 0.71   | 0.96  | 1.19   | 0.82       | 1.06  | 1.30   | 1700                                      | 57.63  | 58.13  | 58.61      | 57.85 | 58.65  | 59.56                 | 60.86  | 61.78  | 63.05                  | 58.30 | 59.18  | 60.50 |
| 1800             | 0.72   | 0.96  | 1.20   | 0.83       | 1.06  | 1.31   | 1800                                      | 57.02  | 57.70  | 58.09      | 57.95 | 58.60  | 59.74                 | 59.98  | 61.19  | 61.84                  | 58.19 | 58.92  | 60.22 |
| 1900             | 0.71   | 0.96  | 1.21   | 0.82       | 1.06  | 1.32   | 1900                                      | 57.05  | 57.56  | 58.13      | 58.35 | 58.73  | 59.11                 | 59.71  | 60.49  | 61.64                  | 58.33 | 58.71  | 59.73 |
| 2000             | 0.71   | 0.96  | 1.21   | 0.81       | 1.06  | 1.32   | 2000                                      | 56.35  | 57.07  | 57.39      | 57.10 | 58.12  | 58.46                 | 58.69  | 59.70  | 60.48                  | 57.79 | 58.53  | 59.59 |
| 2100             | 0.70   | 0.96  | 1.21   | 0.81       | 1.06  | 1.32   | 2100                                      | 56.25  | 56.82  | 57.46      | 56.35 | 57.43  | 57.65                 | 58.78  | 59.11  | 60.43                  | 56.37 | 57.43  | 58.41 |
| 2200             | 0.70   | 0.96  | 1.21   | 0.80       | 1.06  | 1.32   | 2200                                      | 56.07  | 56.61  | 57.23      | 57.37 | 57.86  | 58.63                 | 57.72  | 58.20  | 59.14                  | 55.85 | 56.51  | 57.32 |
| 2300             | 0.69   | 0.96  | 1.22   | 0.80       | 1.06  | 1.32   | 2300                                      | 55.68  | 56.31  | 57.01      | 56.48 | 57.02  | 58.05                 | 56.96  | 57.70  | 58.40                  | 55.46 | 55.90  | 56.89 |
| 2400             | 0.69   | 0.96  | 1.22   | 0.80       | 1.06  | 1.33   | 2400                                      | 55.32  | 55.92  | 56.63      | 55.90 | 56.51  | 57.61                 | 56.44  | 57.03  | 57.85                  | 54.91 | 55.53  | 56.47 |
| 2500             | 0.69   | 0.96  | 1.22   | 0.80       | 1.06  | 1.34   | 2500                                      | 55.24  | 55.69  | 56.97      | 55.05 | 56.10  | 56.59                 | 55.98  | 56.46  | 57.15                  | 54.05 | 54.88  | 54.88 |
| 2600             | 0.69   | 0.97  | 1.24   | 0.81       | 1.08  | 1.35   | 2600                                      | 54.85  | 55.74  | 56.46      | 54.67 | 55.44  | 56.20                 | 55.29  | 55.90  | 56.53                  | 53.89 | 54.04  | 54.97 |
| 2700             | 0.70   | 0.98  | 1.25   | 0.82       | 1.10  | 1.37   | 2700                                      | 54.90  | 55.55  | 56.53      | 54.17 | 55.02  | 55.75                 | 55.11  | 55.55  | 56.24                  | 52.87 | 53.61  | 54.34 |
| 2800             | 0.70   | 0.98  | 1.26   | 0.83       | 1.11  | 1.39   | 2800                                      | 54.84  | 55.47  | 56.76      | 54.29 | 54.79  | 55.14                 | 54.44  | 54.97  | 56.01                  | 52.01 | 53.08  | 53.47 |
| 2900             | 0.71   | 1.00  | 1.28   | 0.84       | 1.12  | 1.40   | 2900                                      | 54.49  | 55.55  | 56.13      | 54.03 | 55.34  | 55.07                 | 53.84  | 54.25  | 54.81                  | 52.53 | 52.28  | 53.45 |
| 3000             | 0.72   | 1.01  | 1.29   | 0.85       | 1.13  | 1.42   | 3000                                      | 54.03  | 55.30  | 55.79      | 53.30 | 54.68  | 54.83                 | 53.25  | 53.71  | 54.26                  | 51.72 | 51.75  | 52.87 |
| 3250             | 0.71   | 1.01  | 1.31   | 0.84       | 1.13  | 1.43   | 3250                                      | 53.49  | 55.06  | 55.35      | 52.70 | 54.01  | 55.22                 | 51.74  | 52.22  | 52.17                  | 50.17 | 50.34  | 50.74 |
| 3500             | 0.68   | 0.99  | 1.30   | 0.81       | 1.11  | 1.42   | 3500                                      | 53.25  | 54.53  | 56.00      | 51.60 | 53.05  | 53.54                 | 50.57  | 51.13  | 51.65                  | 48.45 | 49.25  | 49.02 |
| 3750             | 0.67   | 0.99  | 1.31   | 0.80       | 1.10  | 1.42   | 3750                                      | 52.79  | 53.70  | 54.41      | 50.92 | 52.40  | 53.34                 | 49.53  | 50.06  | 50.28                  | 46.60 | 48.20  | 48.13 |
| 4000             | 0.68   | 1.02  | 1.34   | 0.82       | 1.14  | 1.46   | 4000                                      | 52.41  | 53.89  | 54.69      | 51.69 | 51.39  | 51.66                 | 48.98  | 49.60  | 49.90                  | 46.94 | 47.61  | 48.02 |
| 4250             | 0.74   | 1.08  | 1.40   | 0.88       | 1.20  | 1.52   | 4250                                      | 52.42  | 54.19  | 53.50      | 50.41 | 51.64  | 50.87                 | 48.84  | 49.51  | 49.11                  | 47.41 | 47.48  | 47.13 |
| 4500             | 0.80   | 1.14  | 1.47   | 0.95       | 1.27  | 1.60   | 4500                                      | 54.19  | 53.65  | 56.77      | 51.93 | 51.28  | 52.12                 | 49.12  | 48.67  | 50.16                  | 46.30 | 46.20  | 46.77 |
| 4750             | 0.83   | 1.19  | 1.53   | 0.99       | 1.32  | 1.65   | 4750                                      | 50.93  | 51.46  | 51.05      | 51.01 | 50.15  | 50.11                 | 47.26  | 46.91  | 46.85                  | 45.22 | 44.92  | 45.00 |
| 5000             | 0.83   | 1.21  | 1.57   | 0.99       | 1.33  | 1.69   | 5000                                      | 49.30  | 50.55  | 51.03      | 48.47 | 48.48  | 48.25                 | 45.86  | 45.97  | 46.32                  | 43.43 | 43.78  | 44.06 |
| 5250             | 0.82   | 1.21  | 1.60   | 0.98       | 1.34  | 1.72   | 5250                                      | 49.53  | 49.47  | 49.40      | 46.56 | 47.42  | 46.86                 | 45.84  | 45.17  | 45.33                  | 42.93 | 42.98  | 42.83 |
| 5500             | 0.81   | 1.21  | 1.63   | 0.95       | 1.33  | 1.74   | 5500                                      | 47.21  | 47.87  | 48.06      | 45.55 | 46.65  | 46.78                 | 43.67  | 43.87  | 43.32                  | 41.21 | 41.85  | 41.85 |
| 5750             | 0.   |       |        |            |       |        |   |        |        |            |       |        |                       |        |        |                        |       |        |       |

# RF Switch SPDT

**CSWA2-63DR+**

## Typical Performance Data

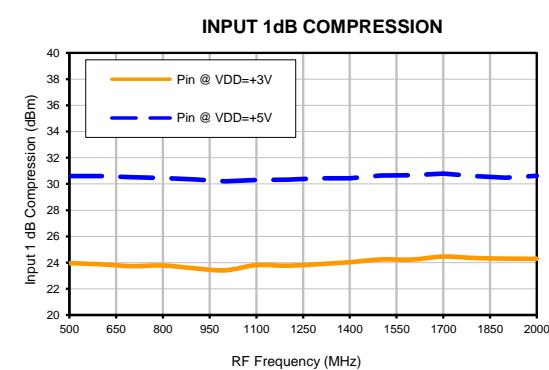
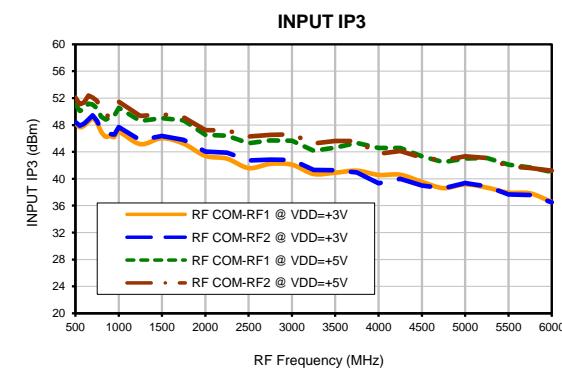
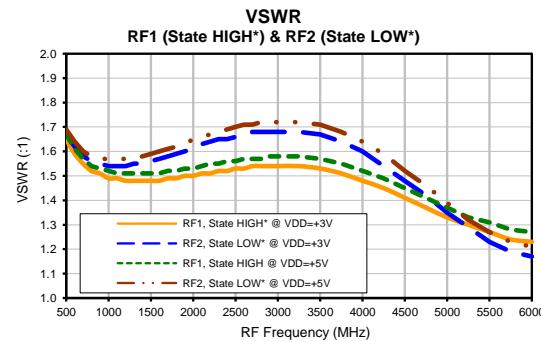
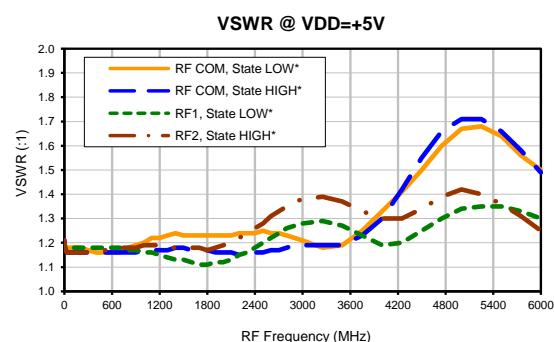
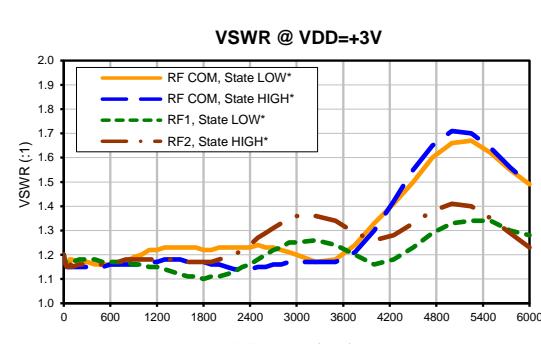
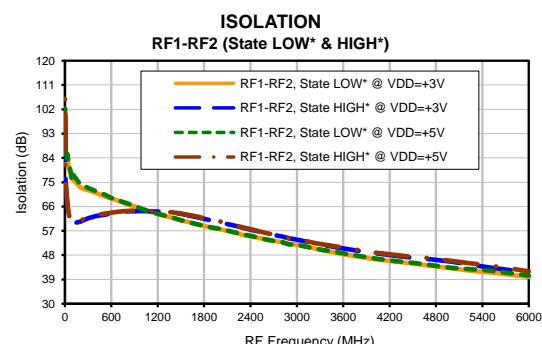
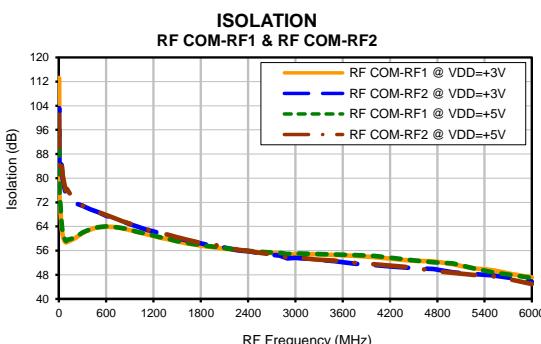
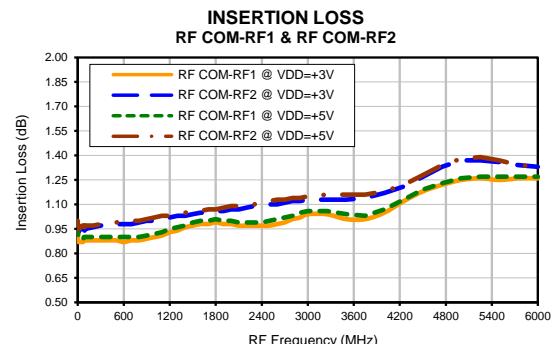
| RF FREQ<br>(MHz) | VSWR (:1) @ VDD=+5V OVER TEMPERATURE |       |        |             |       |        |            |       |        |             |       |        | RF FREQ<br>(MHz) | VSWR (:1) @ VDD=+5V OVER TEMPERATURE |       |        |            |       |        |  |
|------------------|--------------------------------------|-------|--------|-------------|-------|--------|------------|-------|--------|-------------|-------|--------|------------------|--------------------------------------|-------|--------|------------|-------|--------|--|
|                  | RF COM                               |       |        |             |       |        | RF1        |       |        | RF2         |       |        |                  | RF1                                  |       |        | RF2        |       |        |  |
|                  | State LOW*                           |       |        | State HIGH* |       |        | State LOW* |       |        | State HIGH* |       |        |                  | State HIGH*                          |       |        | State LOW* |       |        |  |
|                  | -55°C                                | +25°C | +125°C | -55°C       | +25°C | +125°C | -55°C      | +25°C | +125°C | -55°C       | +25°C | +125°C |                  | -55°C                                | +25°C | +125°C | -55°C      | +25°C | +125°C |  |
| 0.3              | 1.16                                 | 1.19  | 1.22   | 1.16        | 1.20  | 1.25   | 1.17       | 1.20  | 1.22   | 1.17        | 1.21  | 1.26   | 500              | 1.59                                 | 1.67  | 1.86   | 1.62       | 1.70  | 1.89   |  |
| 1                | 1.16                                 | 1.19  | 1.22   | 1.16        | 1.20  | 1.25   | 1.16       | 1.18  | 1.22   | 1.16        | 1.20  | 1.25   | 600              | 1.51                                 | 1.62  | 1.82   | 1.55       | 1.64  | 1.84   |  |
| 5                | 1.15                                 | 1.18  | 1.22   | 1.16        | 1.20  | 1.24   | 1.14       | 1.17  | 1.21   | 1.16        | 1.19  | 1.23   | 700              | 1.46                                 | 1.57  | 1.80   | 1.50       | 1.60  | 1.83   |  |
| 10               | 1.14                                 | 1.18  | 1.22   | 1.15        | 1.18  | 1.22   | 1.14       | 1.17  | 1.21   | 1.15        | 1.18  | 1.22   | 800              | 1.43                                 | 1.55  | 1.78   | 1.47       | 1.59  | 1.83   |  |
| 20               | 1.15                                 | 1.18  | 1.22   | 1.14        | 1.17  | 1.21   | 1.14       | 1.17  | 1.21   | 1.13        | 1.17  | 1.21   | 900              | 1.41                                 | 1.54  | 1.78   | 1.46       | 1.58  | 1.82   |  |
| 30               | 1.15                                 | 1.18  | 1.22   | 1.14        | 1.17  | 1.21   | 1.14       | 1.17  | 1.22   | 1.13        | 1.16  | 1.21   | 1000             | 1.39                                 | 1.52  | 1.77   | 1.45       | 1.57  | 1.82   |  |
| 40               | 1.15                                 | 1.18  | 1.22   | 1.14        | 1.17  | 1.21   | 1.14       | 1.17  | 1.21   | 1.13        | 1.16  | 1.20   | 1100             | 1.38                                 | 1.51  | 1.76   | 1.44       | 1.57  | 1.83   |  |
| 50               | 1.14                                 | 1.18  | 1.22   | 1.13        | 1.16  | 1.21   | 1.14       | 1.17  | 1.21   | 1.13        | 1.16  | 1.20   | 1200             | 1.37                                 | 1.51  | 1.77   | 1.44       | 1.57  | 1.84   |  |
| 60               | 1.14                                 | 1.18  | 1.22   | 1.13        | 1.16  | 1.21   | 1.14       | 1.17  | 1.21   | 1.12        | 1.16  | 1.20   | 1300             | 1.37                                 | 1.51  | 1.78   | 1.43       | 1.57  | 1.84   |  |
| 70               | 1.15                                 | 1.18  | 1.22   | 1.13        | 1.16  | 1.21   | 1.14       | 1.18  | 1.21   | 1.12        | 1.16  | 1.20   | 1400             | 1.37                                 | 1.51  | 1.77   | 1.44       | 1.58  | 1.85   |  |
| 80               | 1.15                                 | 1.18  | 1.22   | 1.13        | 1.16  | 1.21   | 1.14       | 1.18  | 1.21   | 1.12        | 1.16  | 1.20   | 1500             | 1.36                                 | 1.51  | 1.77   | 1.44       | 1.59  | 1.87   |  |
| 90               | 1.15                                 | 1.18  | 1.22   | 1.13        | 1.16  | 1.21   | 1.14       | 1.18  | 1.21   | 1.12        | 1.16  | 1.20   | 1600             | 1.36                                 | 1.52  | 1.78   | 1.45       | 1.60  | 1.88   |  |
| 100              | 1.15                                 | 1.18  | 1.22   | 1.13        | 1.16  | 1.21   | 1.14       | 1.17  | 1.21   | 1.12        | 1.16  | 1.20   | 1700             | 1.37                                 | 1.52  | 1.79   | 1.45       | 1.60  | 1.88   |  |
| 200              | 1.15                                 | 1.18  | 1.22   | 1.12        | 1.16  | 1.21   | 1.15       | 1.17  | 1.21   | 1.12        | 1.16  | 1.20   | 1800             | 1.37                                 | 1.52  | 1.79   | 1.46       | 1.61  | 1.89   |  |
| 300              | 1.14                                 | 1.18  | 1.22   | 1.11        | 1.15  | 1.20   | 1.15       | 1.18  | 1.22   | 1.13        | 1.16  | 1.20   | 1900             | 1.37                                 | 1.53  | 1.80   | 1.47       | 1.63  | 1.92   |  |
| 400              | 1.14                                 | 1.17  | 1.22   | 1.11        | 1.15  | 1.19   | 1.14       | 1.17  | 1.21   | 1.13        | 1.16  | 1.21   | 2000             | 1.38                                 | 1.53  | 1.81   | 1.48       | 1.64  | 1.93   |  |
| 500              | 1.14                                 | 1.17  | 1.22   | 1.11        | 1.15  | 1.19   | 1.13       | 1.16  | 1.20   | 1.12        | 1.16  | 1.20   | 2100             | 1.38                                 | 1.53  | 1.79   | 1.48       | 1.64  | 1.92   |  |
| 600              | 1.13                                 | 1.17  | 1.22   | 1.11        | 1.15  | 1.20   | 1.13       | 1.16  | 1.20   | 1.12        | 1.16  | 1.20   | 2200             | 1.39                                 | 1.55  | 1.81   | 1.50       | 1.66  | 1.93   |  |
| 700              | 1.14                                 | 1.17  | 1.22   | 1.11        | 1.15  | 1.20   | 1.13       | 1.16  | 1.20   | 1.13        | 1.16  | 1.21   | 2300             | 1.40                                 | 1.56  | 1.82   | 1.51       | 1.68  | 1.95   |  |
| 800              | 1.15                                 | 1.18  | 1.23   | 1.12        | 1.16  | 1.21   | 1.13       | 1.15  | 1.19   | 1.13        | 1.17  | 1.22   | 2400             | 1.40                                 | 1.55  | 1.80   | 1.52       | 1.68  | 1.96   |  |
| 900              | 1.15                                 | 1.19  | 1.24   | 1.12        | 1.16  | 1.21   | 1.13       | 1.16  | 1.20   | 1.14        | 1.17  | 1.22   | 2500             | 1.40                                 | 1.55  | 1.80   | 1.53       | 1.69  | 1.95   |  |
| 1000             | 1.16                                 | 1.20  | 1.24   | 1.13        | 1.17  | 1.22   | 1.13       | 1.16  | 1.20   | 1.15        | 1.18  | 1.23   | 2600             | 1.41                                 | 1.57  | 1.82   | 1.54       | 1.70  | 1.96   |  |
| 1100             | 1.18                                 | 1.22  | 1.26   | 1.14        | 1.18  | 1.22   | 1.12       | 1.15  | 1.19   | 1.15        | 1.18  | 1.23   | 2700             | 1.42                                 | 1.57  | 1.82   | 1.55       | 1.71  | 1.98   |  |
| 1200             | 1.19                                 | 1.22  | 1.26   | 1.15        | 1.19  | 1.22   | 1.12       | 1.15  | 1.20   | 1.15        | 1.19  | 1.24   | 2800             | 1.42                                 | 1.56  | 1.80   | 1.56       | 1.71  | 1.97   |  |
| 1300             | 1.20                                 | 1.23  | 1.26   | 1.15        | 1.19  | 1.22   | 1.12       | 1.15  | 1.20   | 1.15        | 1.19  | 1.24   | 2900             | 1.43                                 | 1.59  | 1.82   | 1.55       | 1.71  | 1.95   |  |
| 1400             | 1.21                                 | 1.24  | 1.27   | 1.16        | 1.19  | 1.22   | 1.10       | 1.13  | 1.19   | 1.14        | 1.19  | 1.24   | 3000             | 1.43                                 | 1.58  | 1.80   | 1.56       | 1.71  | 1.95   |  |
| 1500             | 1.21                                 | 1.24  | 1.27   | 1.15        | 1.18  | 1.21   | 1.09       | 1.13  | 1.18   | 1.14        | 1.18  | 1.25   | 3250             | 1.43                                 | 1.58  | 1.80   | 1.57       | 1.71  | 1.93   |  |
| 1600             | 1.21                                 | 1.24  | 1.26   | 1.14        | 1.18  | 1.20   | 1.09       | 1.13  | 1.19   | 1.14        | 1.18  | 1.25   | 3500             | 1.44                                 | 1.57  | 1.77   | 1.57       | 1.71  | 1.93   |  |
| 1700             | 1.21                                 | 1.24  | 1.26   | 1.14        | 1.17  | 1.20   | 1.08       | 1.12  | 1.18   | 1.13        | 1.17  | 1.23   | 3750             | 1.43                                 | 1.54  | 1.74   | 1.56       | 1.67  | 1.86   |  |
| 1800             | 1.21                                 | 1.24  | 1.26   | 1.13        | 1.17  | 1.19   | 1.07       | 1.11  | 1.17   | 1.12        | 1.17  | 1.23   | 4000             | 1.39                                 | 1.51  | 1.70   | 1.55       | 1.65  | 1.81   |  |
| 1900             | 1.21                                 | 1.24  | 1.26   | 1.13        | 1.16  | 1.18   | 1.07       | 1.11  | 1.17   | 1.12        | 1.17  | 1.24   | 4250             | 1.37                                 | 1.48  | 1.67   | 1.50       | 1.59  | 1.74   |  |
| 2000             | 1.21                                 | 1.24  | 1.26   | 1.13        | 1.16  | 1.18   | 1.08       | 1.11  | 1.17   | 1.12        | 1.17  | 1.25   | 4500             | 1.37                                 | 1.45  | 1.64   | 1.46       | 1.53  | 1.66   |  |
| 2100             | 1.21                                 | 1.25  | 1.27   | 1.13        | 1.16  | 1.19   | 1.09       | 1.11  | 1.17   | 1.13        | 1.18  | 1.24   | 4750             | 1.33                                 | 1.41  | 1.57   | 1.41       | 1.47  | 1.59   |  |
| 2200             | 1.21                                 | 1.24  | 1.26   | 1.12        | 1.16  | 1.19   | 1.10       | 1.13  | 1.18   | 1.15        | 1.19  | 1.25   | 5000             | 1.30                                 | 1.39  | 1.53   | 1.35       | 1.39  | 1.52   |  |
| 2300             | 1.22                                 | 1.24  | 1.27   | 1.13        | 1.16  | 1.19   | 1.12       | 1.15  | 1.19   | 1.17        | 1.21  | 1.27   | 5250             | 1.27                                 | 1.34  | 1.50   | 1.29       | 1.33  | 1.45   |  |
| 2400             | 1.22                                 | 1.25  | 1.28   | 1.14        | 1.16  | 1.19   | 1.14       | 1.16  | 1.20   | 1.19        | 1.24  | 1.29   | 5500             | 1.25                                 | 1.31  | 1.44   | 1.23       | 1.27  | 1.39   |  |
| 2500             | 1.22                                 | 1.24  | 1.27   | 1.14        | 1.17  | 1.20   | 1.15       | 1.17  | 1.20   | 1.22        | 1.26  | 1.30   | 5750             | 1.24                                 | 1.29  | 1.42   | 1.19       | 1.22  | 1.35   |  |
| 2600             | 1.23                                 | 1.24  | 1.27   | 1.16        | 1.18  | 1.20   | 1.18       | 1.20  | 1.22   | 1.25        | 1.28  | 1.31   | 6000             | 1.21                                 | 1.27  | 1.41   | 1.14       | 1.21  | 1.35   |  |
| 2700             | 1.24                                 | 1.25  | 1.27   | 1.19        | 1.19  | 1.21   | 1.21       | 1.23  | 1.25   | 1.29        | 1.32  | 1.35   |                  |                                      |       |        |            |       |        |  |
| 2800             | 1.22                                 | 1.23  | 1.25   | 1.19        | 1.19  | 1.20   | 1.24       | 1.24  | 1.25   | 1.33        | 1.35  | 1.37   |                  |                                      |       |        |            |       |        |  |
| 2900             | 1.21                                 | 1.21  | 1.24   | 1.20        | 1.20  | 1.21   | 1.25       | 1.27  | 1.27   | 1.34        | 1.36  | 1.36   |                  |                                      |       |        |            |       |        |  |
| 3000             | 1.21                                 | 1.22  | 1.25   | 1.21        | 1.20  | 1.21   | 1.27       | 1.29  | 1.28   | 1.37        | 1.38  | 1.38   |                  |                                      |       |        |            |       |        |  |
| 3250             | 1.19                                 | 1.19  | 1.23   | 1.20        | 1.19  | 1.20   | 1.28       | 1.29  | 1.28   | 1.38        | 1.39  | 1.38   |                  |                                      |       |        |            |       |        |  |
| 3500             | 1.18                                 | 1.19  | 1.24   | 1.18        | 1.19  | 1.22   | 1.26       | 1.26  | 1.25   | 1.36        | 1.36  | 1.37   |                  |                                      |       |        |            |       |        |  |
| 3750             | 1.21                                 | 1.24  | 1.28   | 1.22        | 1.24  | 1.28   | 1.21       | 1.20  | 1.21   | 1.30        | 1.30  | 1.32   |                  |                                      |       |        |            |       |        |  |
| 4000             | 1.30                                 | 1.33  | 1.36   | 1.31        | 1.33  | 1.36   | 1.16       | 1.16  | 1.17   | 1.29        | 1.28  | 1.29   |                  |                                      |       |        |            |       |        |  |
| 4250             | 1.42                                 | 1.43  | 1.44   | 1.43        | 1.44  | 1.45   | 1.22       | 1.19  | 1.18   | 1.33        | 1.29  | 1.27   |                  |                                      |       |        |            |       |        |  |
| 4500             | 1.53                                 | 1.53  | 1.53   | 1.57        | 1.57  | 1.56   | 1.31       | 1.25  | 1.21   | 1.41        | 1.35  | 1.29   |                  |                                      |       |        |            |       |        |  |
| 4750             | 1.62                                 | 1.63  | 1.64   | 1.67        | 1.68  | 1.67   | 1.38       | 1.32  | 1.26   | 1.49        | 1.42  | 1.33   |                  |                                      |       |        |            |       |        |  |
| 5000             | 1.64                                 | 1.67  | 1.67   | 1.70        | 1.72  | 1.71   | 1.40       | 1.37  | 1.30   | 1.50        | 1.43  | 1.35   |                  |                                      |       |        |            |       |        |  |
| 5250             | 1.64                                 | 1.66  | 1.67   | 1.68        | 1.71  | 1.71   | 1.39       | 1.36  | 1.30   | 1.46        | 1.41  | 1.35   |                  |                                      |       |        |            |       |        |  |
| 5500             | 1.60                                 | 1.63  | 1.64   | 1.60        | 1.64  | 1.67   | 1.36       | 1.32  | 1.28   | 1.37        | 1.35  | 1.31   |                  |                                      |       |        |            |       |        |  |
| 5750             | 1.52                                 | 1.56  | 1.57   | 1.51        | 1.56  | 1.60   | 1.31       | 1.30  | 1.27   | 1.30        | 1.29  | 1.28   |                  |                                      |       |        |            |       |        |  |
| 6000             | 1.46                                 | 1.50  | 1.51   | 1.42        | 1.47  | 1.51   | 1.27       | 1.28  | 1.26   | 1.21        | 1.21  | 1.22   |                  |                                      |       |        |            |       |        |  |

\*Note:

| State of Control Voltage | RF Common to RF1 | RF2 |
|--------------------------|------------------|-----|
| LOW                      | ON               | OFF |
| HIGH                     | OFF              | ON  |

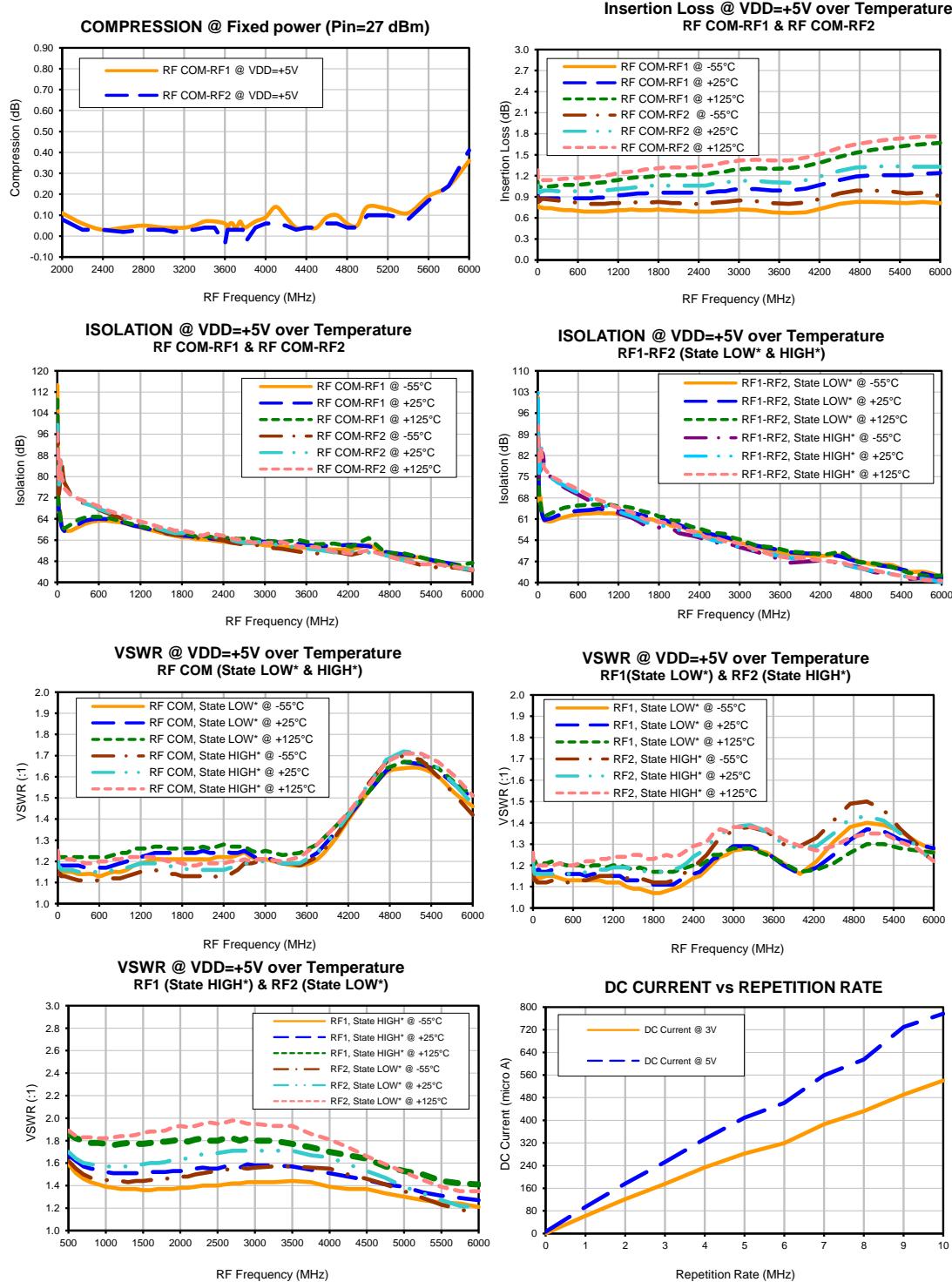
ON - Low insertion loss state  
OFF - Isolation state

## Typical Performance Curves

**\*Note:**

| State of Control Voltage      | RF Common to |     |
|-------------------------------|--------------|-----|
|                               | RF1          | RF2 |
| LOW                           | ON           | OFF |
| HIGH                          | OFF          | ON  |
| ON - Low insertion loss state |              |     |
| OFF - Isolation state         |              |     |

## Typical Performance Curves

**\*Note:**

| State of Control Voltage | RF Common to |     |
|--------------------------|--------------|-----|
|                          | RF1          | RF2 |
| LOW                      | ON           | OFF |
| HIGH                     | OFF          | ON  |

ON - Low insertion loss state  
OFF - Isolation state

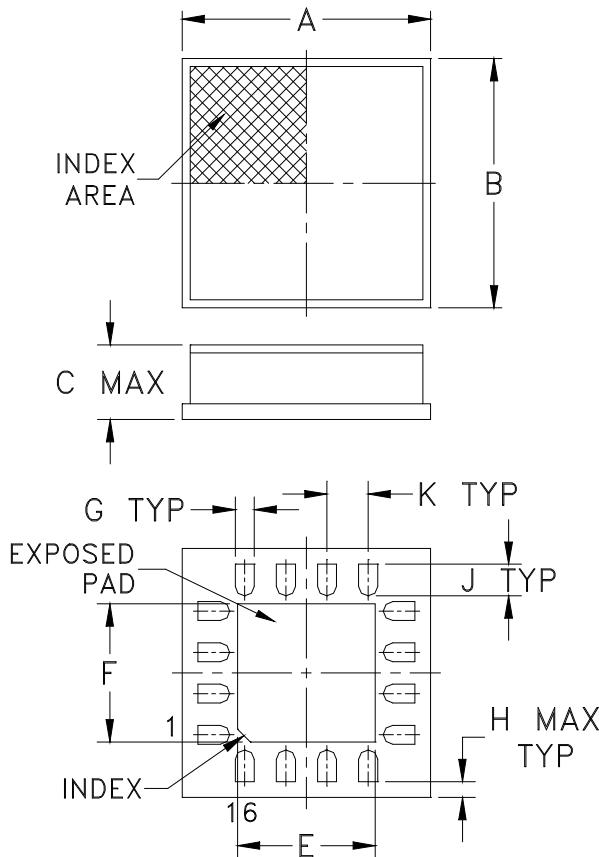


# Case Style

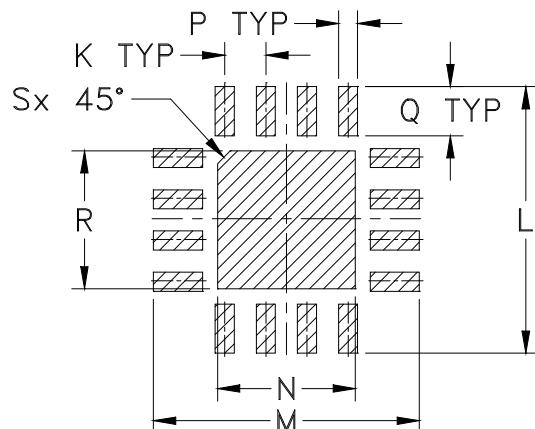
DG

DG1293

## Outline Dimensions



## PCB Land Pattern



Suggested Layout,  
Tolerance to be within  $\pm .002$

| CASE # | A              | B              | C              | D | E              | F              | G              | H               | J              | K              |
|--------|----------------|----------------|----------------|---|----------------|----------------|----------------|-----------------|----------------|----------------|
| DG1293 | .157<br>(4.00) | .157<br>(4.00) | .047<br>(1.20) | - | .087<br>(2.20) | .087<br>(2.20) | .012<br>(0.30) | 0.010<br>(0.25) | .020<br>(0.50) | .026<br>(0.65) |

| CASE # | L              | M              | N              | P              | Q              | R              | S              | WT. GRAM |
|--------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------|
| DG1293 | .169<br>(4.30) | .169<br>(4.30) | .087<br>(2.20) | .012<br>(0.30) | .031<br>(0.80) | .087<br>(2.20) | .008<br>(0.20) | .04      |

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm .01$ ; 3 Pl.  $\pm .005$

### Notes:

1. Case material: Ceramic.
2. Termination finish: Nickel-Palladium-Gold plating.

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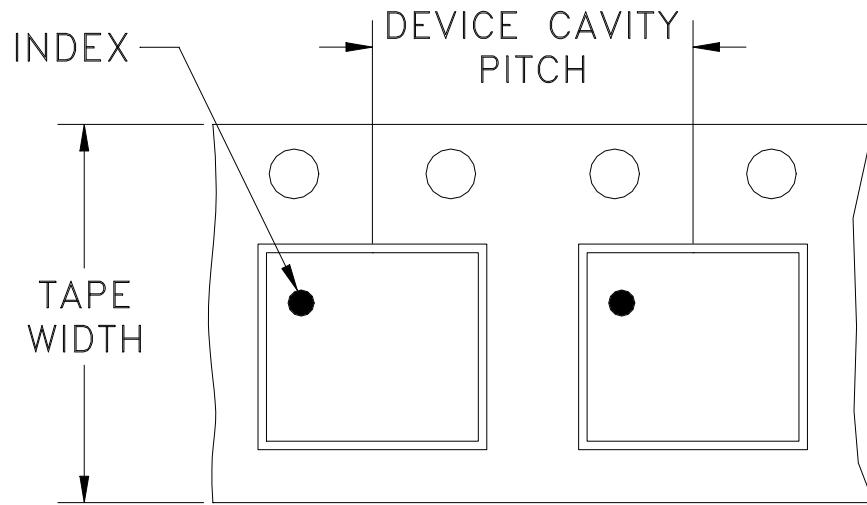


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# Tape & Reel Packaging TR-F68

## DEVICE ORIENTATION IN T&R



## DIRECTION OF FEED



| Tape Width, mm | Device Cavity Pitch, mm | Reel Size, inches | Devices per Reel see note |                        |
|----------------|-------------------------|-------------------|---------------------------|------------------------|
| 12             | 8                       | 7                 | Small quantity standard   | 20<br>50<br>100<br>200 |
|                |                         |                   | 500                       | 500                    |
|                |                         |                   | Standard                  | 1000                   |
|                |                         |                   | Standard                  | 2000                   |
|                |                         | 13                | Standard                  | 3000                   |
|                |                         |                   | Standard                  | 4000                   |
|                |                         |                   |                           |                        |
|                |                         |                   |                           |                        |
|                |                         |                   |                           |                        |

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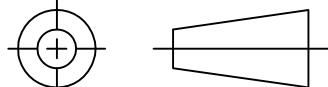
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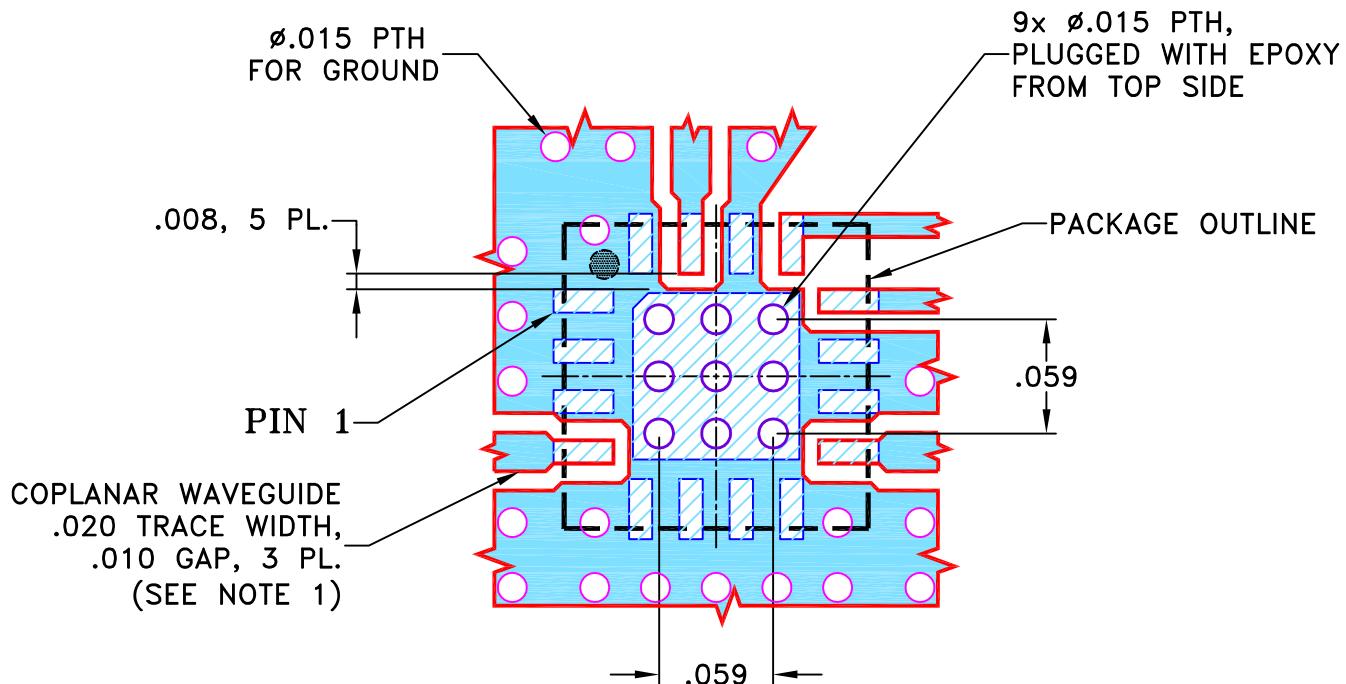
## THIRD ANGLE PROJECTION



## REVISI

| REV | ECN No. | DESCRIPTION                   | DATE     | DR  | AUTH |
|-----|---------|-------------------------------|----------|-----|------|
| OR  | M113105 | NEW RELEASE                   | 08/23/07 | PW  | RD   |
| A   | M114290 | TB-461+ WAS TB-460+ IN TITLE  | 10/31/07 | AV  | WP   |
| B   | M155180 | REDESIGNED (NEW PIN CONNECT.) | 03/01/16 | ITG | BT   |

SUGGESTED MOUNTING CONFIGURATION FOR  
DG1293 CASE STYLE, "16SW01" PIN CONNECTION

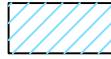


## NOTES:

1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS  $0.010" \pm 0.001"$ . COPPER: 1/2 OZ. ON EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.



DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)



DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

UNLESS OTHERWISE SPECIFIED

INITIALS

DATE

DIMENSIONS ARE IN INCHES

DRAWN

PW

08/16/07

TOLERANCES ON:

CHECKED

AV

08/22/07

2 PL DECIMALS  $\pm$ 

APPROVED

RD

08/23/07

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ASHEETA1.DWG REV:A DATE:01/12/95



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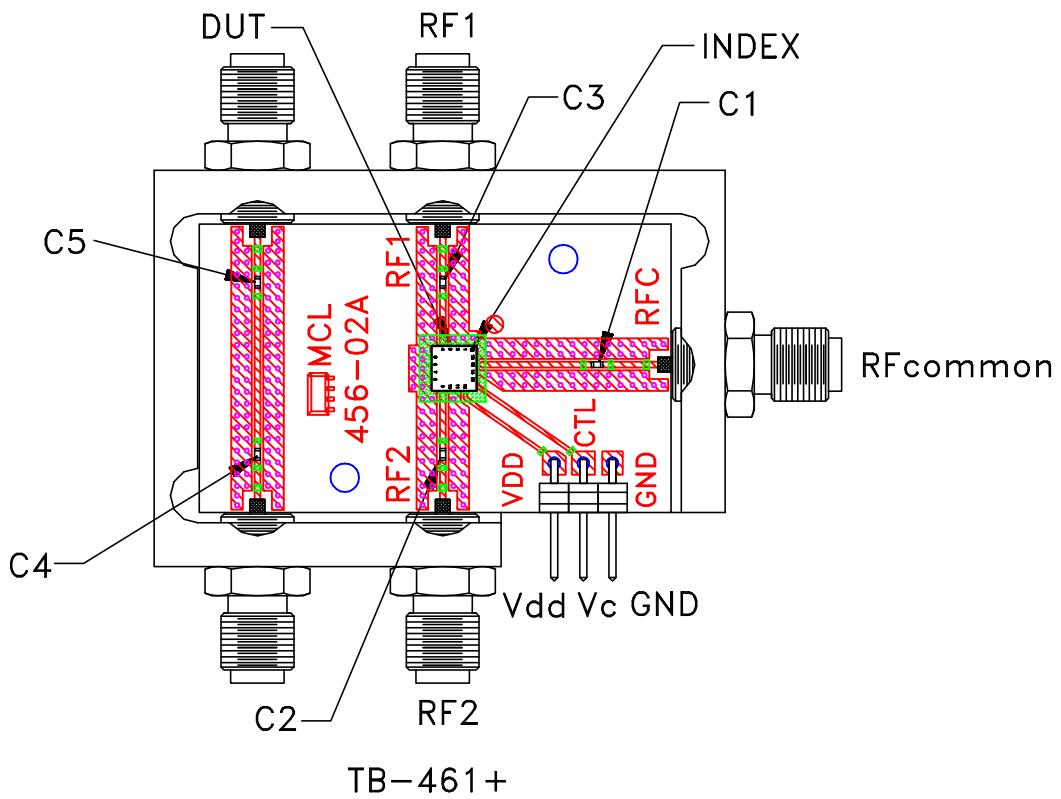
13 Neptune Avenue  
Brooklyn NY 11235

PL, 16SW01, DG1293, CSWA2, TB-461+

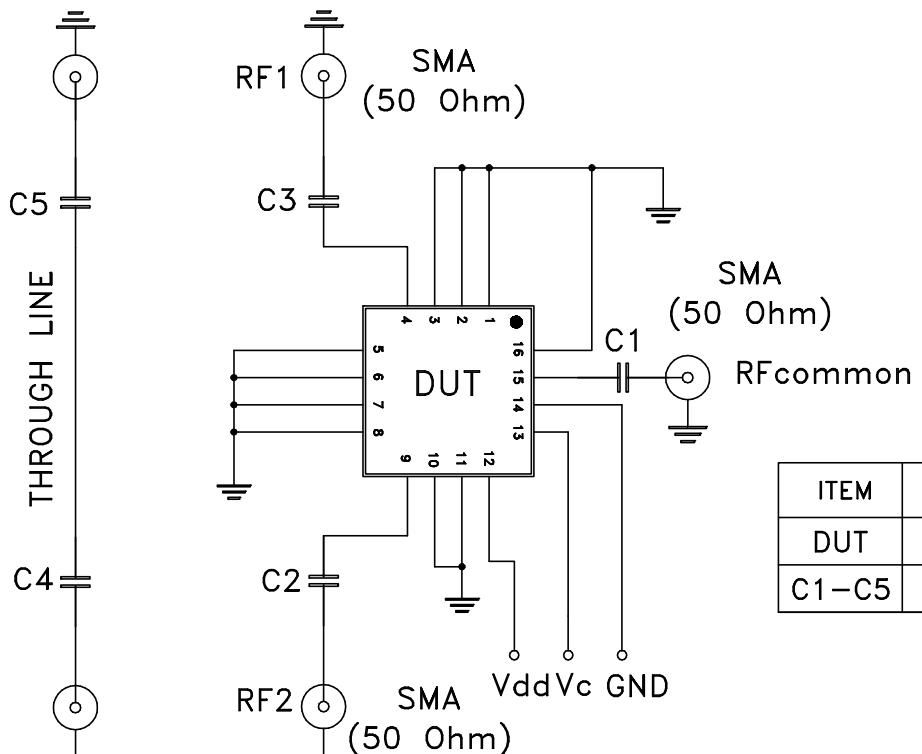
| SIZE | CODE IDENT | DRAWING NO: | REV: |
|------|------------|-------------|------|
| A    | 15542      | 98-PL-279   | B    |

FILE: 98PL279 SCALE: 10:1 SHEET: 1 OF 1

# Evaluation Board and Circuit



TB-461+



| ITEM  | DESCRIPTION | SIZE   |
|-------|-------------|--------|
| DUT   | CSWA2-63DR+ | 4X4 MM |
| C1-C5 | CAP, 47 pF  | 0402   |

Schematic Diagram

## Notes:

1. SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent, Dielectric Constant=3.5, Thickness=.010 inch.

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## Environmental Specifications

## ENV40

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

| Specification                  | Test/Inspection Condition                         | Reference/Spec  |
|--------------------------------|---|---|
| Operating Temperature          | -55° to 125° C<br>Ambient Environment             | Individual Model Data Sheet   |
| Storage Temperature            | -65° to 150° C<br>Ambient Environment             | Individual Model Data Sheet   |
| Temperature Cycling            | -65° to 150°C, 500 cycles                         | JESD22-A104, condition C  |
| Autoclave                      | 121°C, 100% RH, 30 PSIA, 96 hours, unbiased       | JESD22-A102   |
| High Temp Storage              | 150°C 1008 hours                                  | JESD22-A103   |
| Solderability                  | Per Reference Spec                                | JESD22-B102   |
| Resistance to Solvent          | Per Reference Spec                                | MIL-STD-202F Method 215J  |
| Fine and Gross Leak Test       | Per Reference Spec                                | MIL-STD-202F, Method 112 Test, Conditions C, D                          |
| Constant Acceleration          | Y1 plane only, 5 Kg                               | MIL-STD-883, Method 2001, Condition A, except Y1 plane only             |
| Mechanical Shock               | 0.5 ms, 5 shock pulses, Y1 direction only, 1.5 Kg | MIL-STD-883, Method 2002, Condition B, except Y1 direction only, 1.5 Kg |
| Vibration (Variable Frequency) | 50g peak  | MIL-STD-883, Method 2007, Condition B                                   |