

# Surface Mount High Isolation Switch

50Ω SPDT, Reflective DC to 4500 MHz

## SWM-2-50DR+ SWM-2-50DR

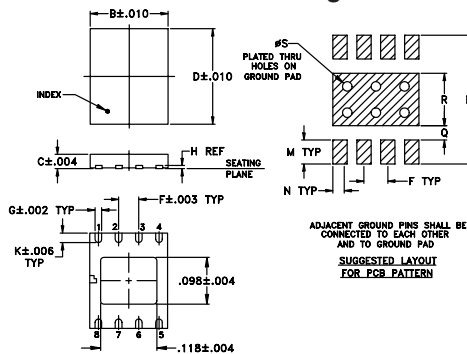
### Maximum Ratings

|                                                                 |                |
|-----------------------------------------------------------------|----------------|
| Operating Temperature                                           | -40°C to 85°C  |
| Storage Temperature                                             | -55°C to 100°C |
| Power and Voltage                                               | see note 1     |
| Permanent damage may occur if any of these limits are exceeded. |                |

### Pin Connections

|          |        |
|----------|--------|
| RF IN    | 6      |
| RF OUT 1 | 1      |
| RF OUT 2 | 4      |
| TTL IN   | 2      |
| +5V      | 5      |
| -5V      | 7      |
| TTL GND  | 3      |
| GND      | 8      |
| GND      | PADDLE |

### Outline Drawing

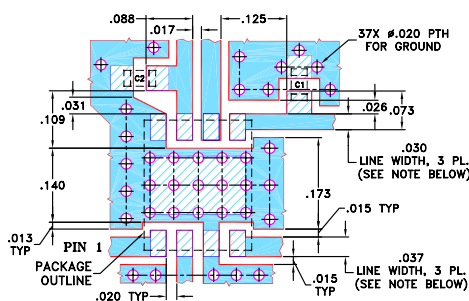


PATTERN TO BE WITHIN ±.002  
TOLERANCES ±.005 UNLESS OTHERWISE SPECIFIED

### Outline Dimensions ( )

| A  | B    | C    | D    | E    | F    | G    | H    | J     | K    |
|----|------|------|------|------|------|------|------|-------|------|
| -- | .193 | .035 | .236 | --   | .050 | .017 | .008 | --    | .024 |
| -- | 4.90 | 0.90 | 6.00 | --   | 1.27 | 0.43 | 0.20 | --    | 0.60 |
| L  | M    | N    | P    | Q    | R    | S    | T    | wt    |      |
| -- | .050 | .030 | .270 | .030 | .110 | .020 | --   | grams |      |
| -- | 1.27 | 0.76 | 6.86 | 0.76 | 2.79 | 0.51 | --   | 0.08  |      |

Demo Board MCL P/N: TB-161  
Suggested PCB Layout (PL-122)



#### NOTE:

- CAPACITORS C1 & C2: 10 ± 2% pF, 0603 SIZE
- TRACE WIDTH IS SHOWN FOR ROGERS RO4350 WITH DIELECTRIC THICKNESS .020" ± .002". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED
  - BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
- DENOTES PCB COPPER LAYOUT  
DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

### Features

- high isolation, 55 dB typ. at 1 GHz
- low insertion loss, 0.7 dB typ.
- integral TTL driver
- aqueous washable

### Applications

- automated switching networks
- transmitters/receiver isolation



CASE STYLE: DL1020  
PRICE: \$5.30 ea. QTY (10-49)

+ RoHS compliant in accordance  
with EU Directive (2002/95/EC)

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

### Electrical Specifications (T<sub>AMB</sub>=25°C)

| FREQ.<br>(MHz) | INSERTION LOSS<br>(dB) |                |               |      |                 |      |                  |      | 1dB COMPR.<br>(dBm) |      |                 |      | IN-OUT ISOLATION<br>(dB) |      |                  |      |                  |      |      |      |    |    |
|----------------|------------------------|----------------|---------------|------|-----------------|------|------------------|------|---------------------|------|-----------------|------|--------------------------|------|------------------|------|------------------|------|------|------|----|----|
|                |                        |                | DC-100<br>MHz |      | 100-1000<br>MHz |      | 1000-2000<br>MHz |      | 2000-4500<br>MHz    |      | DC-100<br>MHz   |      | 100-1000<br>MHz          |      | 1000-2000<br>MHz |      | 2000-4500<br>MHz |      |      |      |    |    |
|                | f <sub>L</sub>         | f <sub>U</sub> | Typ.          | Max. | Typ.            | Max. | Typ.             | Max. | Typ.                | Max. | Typ.            | Typ. | Typ.                     | Typ. | Typ.             | Min. | Typ.             | Min. | Typ. | Min. |    |    |
| DC 4500        |                        |                | 0.6           | 0.9  | 0.7             | 1.2  | 0.9              | 1.4  | 1.6                 | 1.9  | 20 <sup>1</sup> | 25   | 25                       | 24   | 75               | 65   | 55               | 45   | 45   | 37   | 35 | 27 |

\*drops to 17.0 dBm at 10 MHz

### Switching Specifications

|                                |                                        |             |
|--------------------------------|----------------------------------------|-------------|
| Power Supply                   | Current, mA                            |             |
| Voltage                        | 9 max.                                 |             |
| +5V ±.20                       | 9 max.                                 |             |
| -5V ±.20                       | 9 max.                                 |             |
| TTL Control                    | Voltage, V                             | Current, mA |
| low threshold                  | 0 min., 0.8 max.                       | 0.2 max.    |
| high threshold                 | 2 min., 5 max.                         | 5 max.      |
| VSWR* (:1)                     | 1.15 typ. to 2GHz, 1.3 typ. to 4.5 GHz |             |
| Rise/Fall Time, ns             | 5 typ., 15 max.                        |             |
| Switching Time, ns turn on/off | 10 typ., 20 max.                       |             |
| Video leakage**, mV p-p        | 30 typ.                                |             |

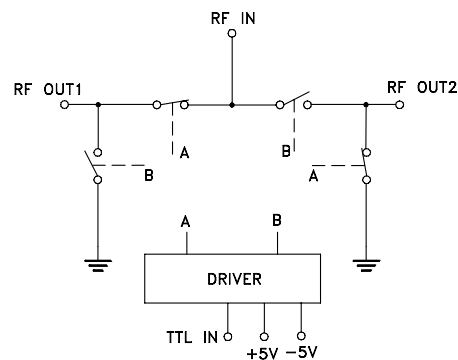
\* For all states of reflective switch in "ON" condition, "OFF port" 5:1 VSWR typ.

\*\* Video leakage or break through is defined as leakage of TTL switching signal to RF output ports

- Absolute maximum power and voltage rating:  
RF input power, 250mW  
Supply voltage: ±6V DC
- OFF state of RF output is low impedance.
- All RF inputs must be DC blocked or held at 0V DC

| TTL  | CONTROL LOGIC |     |
|------|---------------|-----|
|      | RF1           | RF2 |
| LOW  | ON            | OFF |
| HIGH | OFF           | ON  |

### Electrical Schematic



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ISO 9001 ISO 14001 AS 9100 CERTIFIED

IF/RF MICROWAVE COMPONENTS

For detailed performance specs  
& shopping online see web site

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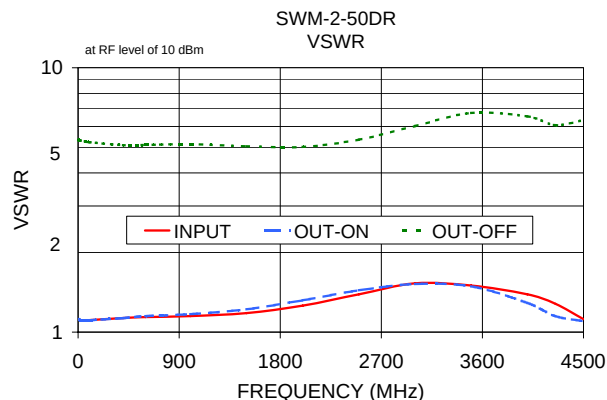
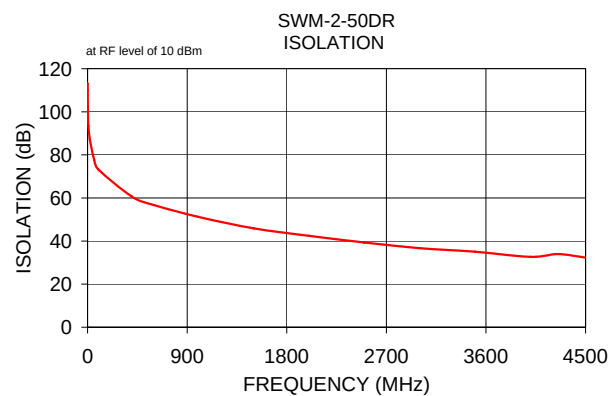
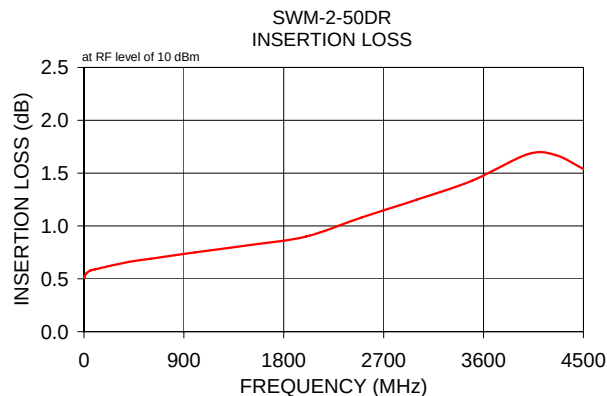
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SWM-2-50DR  
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# SWM-2-50DR+ SWM-2-50DR

Typical Performance Data

| FREQ.<br>(MHz) | ON            |          | INSERTION LOSS (dB) |          | OFF ISOLATION (dB) |  | VSWR            |     |           |
|----------------|---------------|----------|---------------------|----------|--------------------|--|-----------------|-----|-----------|
|                | Control @ -5V |          | Control @ 0V        |          |                    |  | IN              | OUT | OFF       |
|                | IN-OUT        |          | IN-OUT              |          |                    |  |                 |     |           |
|                | $\bar{X}$     | $\sigma$ | $\bar{X}$           | $\sigma$ | $\bar{X}$          |  | ON<br>$\bar{X}$ |     | $\bar{X}$ |
| 0.30           | 0.52          | 0.00     | 113.18              | 10.77    | 1.12               |  | 1.12            |     | 5.30      |
| 0.50           | 0.51          | 0.00     | 113.06              | 3.58     | 1.12               |  | 1.12            |     | 5.33      |
| 0.80           | 0.51          | 0.00     | 109.96              | 6.86     | 1.12               |  | 1.12            |     | 5.34      |
| 1.00           | 0.51          | 0.00     | 107.70              | 6.84     | 1.12               |  | 1.12            |     | 5.34      |
| 4.00           | 0.52          | 0.00     | 97.85               | 1.38     | 1.12               |  | 1.12            |     | 5.33      |
| 8.00           | 0.53          | 0.00     | 93.45               | 0.78     | 1.12               |  | 1.12            |     | 5.32      |
| 20.00          | 0.55          | 0.00     | 87.22               | 1.53     | 1.11               |  | 1.11            |     | 5.31      |
| 60.00          | 0.58          | 0.01     | 77.63               | 1.27     | 1.11               |  | 1.11            |     | 5.27      |
| 100.00         | 0.59          | 0.01     | 73.10               | 1.40     | 1.11               |  | 1.11            |     | 5.23      |
| 400.00         | 0.66          | 0.01     | 60.63               | 1.23     | 1.13               |  | 1.13            |     | 5.10      |
| 600.00         | 0.69          | 0.01     | 56.70               | 1.15     | 1.14               |  | 1.15            |     | 5.11      |
| 1000.00        | 0.75          | 0.01     | 51.22               | 1.02     | 1.15               |  | 1.17            |     | 5.14      |
| 1500.00        | 0.82          | 0.01     | 45.93               | 0.87     | 1.18               |  | 1.22            |     | 5.05      |
| 2000.00        | 0.90          | 0.01     | 42.42               | 0.87     | 1.26               |  | 1.32            |     | 5.02      |
| 2500.00        | 1.08          | 0.02     | 39.36               | 0.87     | 1.39               |  | 1.44            |     | 5.35      |
| 3000.00        | 1.25          | 0.03     | 36.68               | 0.73     | 1.53               |  | 1.52            |     | 6.02      |
| 3500.00        | 1.43          | 0.02     | 35.06               | 0.72     | 1.50               |  | 1.49            |     | 6.75      |
| 4000.00        | 1.68          | 0.02     | 32.67               | 0.53     | 1.39               |  | 1.29            |     | 6.55      |
| 4250.00        | 1.67          | 0.01     | 33.95               | 0.58     | 1.28               |  | 1.15            |     | 6.07      |
| 4500.00        | 1.54          | 0.01     | 32.31               | 0.44     | 1.12               |  | 1.10            |     | 6.34      |



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