

R595443110 Datasheet



| | |
|------------------------------|---|
| DiGi Electronics Part Number | R595443110-DG |
| Manufacturer | Radiall USA, Inc. |
| Manufacturer Product Number | R595443110 |
| Description | IC RF SWITCH SPDT 20GHZ |
| Detailed Description | RF Switch IC General Purpose SPDT 50Ohm |

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Purchase and inquiry

Manufacturer Product Number:

R595443110

Series:

-

RF Type:

General Purpose

Circuit:

SPDT

Isolation:

65dB (min)

Test Frequency:

20GHz

IIP3:

-

Impedance:

50Ohm

Operating Temperature:

-25°C ~ 75°C

Supplier Device Package:

-

Manufacturer:

Radiall USA, Inc.

Product Status:

Active

Topology:

-

Frequency Range:

0Hz ~ 20GHz

Insertion Loss:

0.2dB (max)

P1dB:

-

Features:

-

Voltage - Supply:

20V ~ 32V

Package / Case:

Module

Environmental & Export classification

Moisture Sensitivity Level (MSL):

Not Applicable

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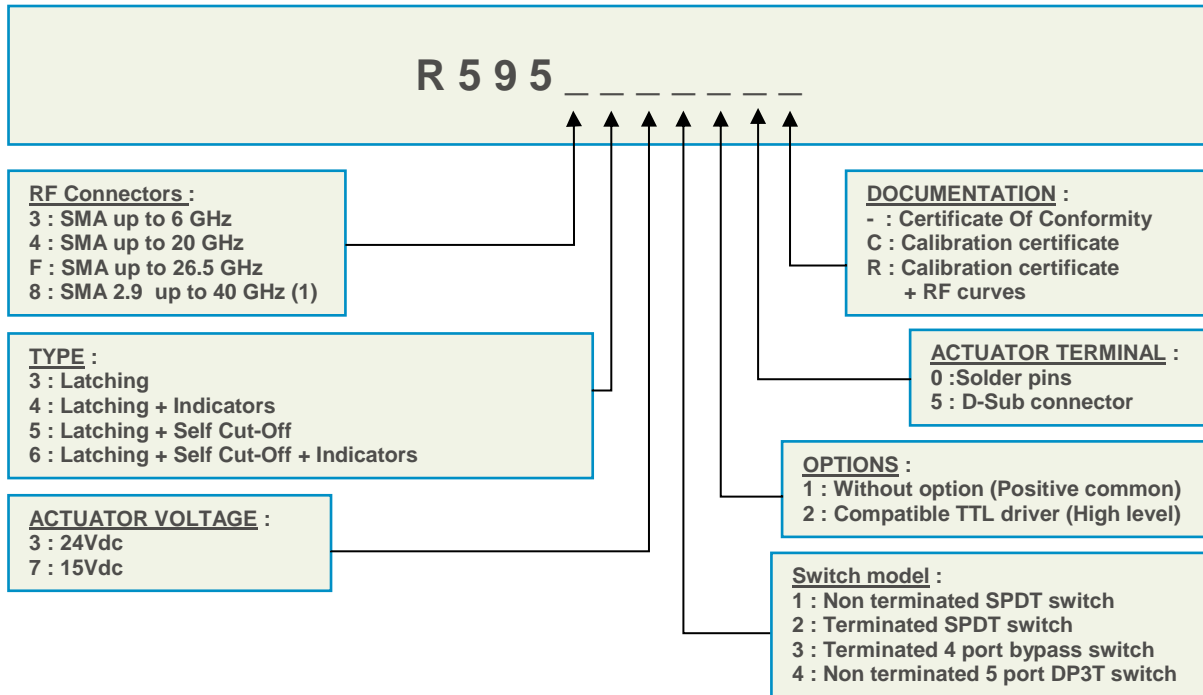
SERIES DP3T/SPDT

PART NUMBER R595 XXX XXX

DP3T-SPDT Coaxial Switches DC to 6 GHz, DC to 20 GHz, DC to 26.5 GHz, DC to 40 GHz

Radiall's PLATINUM SERIES switches are optimized to perform at a high level over an extended life span. With outstanding RF performances, and a guaranteed Insertion Loss repeatability of 0.03 dB over a life span of 10 million switching cycles. PLATINUM SERIES switches are perfect for automated test and measurement equipment, as well as signal monitoring devices.

PART NUMBER SELECTION



(1) Connector SMA2.9 is equivalent to "K Connector[®]", registered trademark of Anritsu

PICTURE

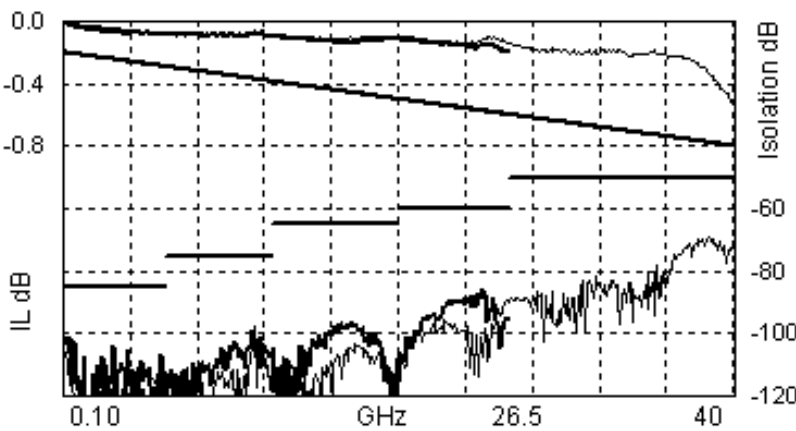




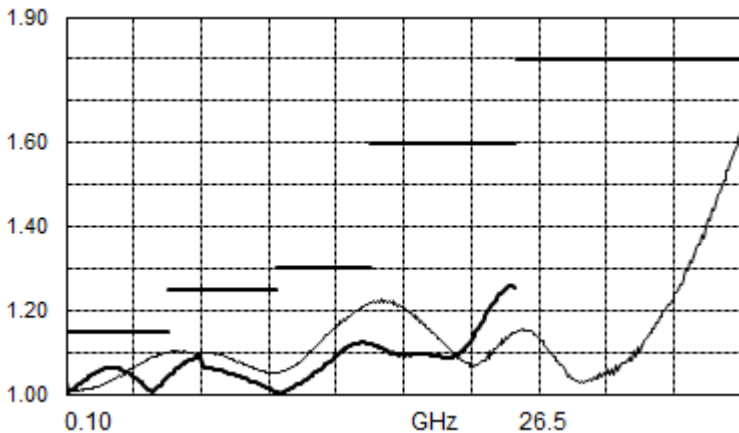
RF PERFORMANCES

| PART NUMBER | R5953----- | R5954----- | R595F----- | R5958----- |
|--|--|---|--|---|
| Frequency Range GHz | DC to 6 | DC to 20 | DC to 26.5 | DC to 40 |
| Impedance Ohms | 50 | | | |
| Insertion Loss dB (Maximum) | 0.20 + (0.45 / 26.5) x frequency (GHz) | | | |
| Isolation dB (Minimum) | 85 | DC to 6 GHz : 85 6 to 12.4 GHz : 75 12.4 to 20 GHz : 65 | DC to 6 GHz : 85 6 to 12.4 GHz : 75 12.4 to 20 GHz : 65 20 to 26.5 GHz : 60 | DC to 6 GHz : 85 6 to 12.4 GHz : 75 12.4 to 20 GHz : 65 20 to 26.5 GHz : 60 26.5 to 40 GHz : 55 |
| V.S.W.R. (Maximum) | 1.15 | DC to 6 GHz : 1.15 6 to 12.4 GHz : 1.25 12.4 to 20 GHz : 1.30 | DC to 6 GHz : 1.15 6 to 12.4 GHz : 1.25 12.4 to 20 GHz : 1.30 20 to 26.5 GHz : 1.60 | DC to 6 GHz : 1.15 6 to 12.4 GHz : 1.25 12.4 to 20 GHz : 1.30 18 to 26.5 GHz : 1.60 26.5 to 40 GHz : 1.80 |
| Third order Inter Modulation | -120 dBc typical (2 carriers 20W) | | | |
| Repeatability (up to 10 million cycles measured at 25°C) | 0.03 dB maximum | | | 0.05 dB maximum |

TYPICAL RF PERFORMANCES



Insertion Loss and Isolation :
 — 26.5GHz model with SMA connector
 - - 40GHz model with SMA2.9 connector



V.S.W.R. :
 — 26.5GHz model with SMA connector
 - - 40GHz model with SMA2.9 connector



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SERIES DP3T/SPDT

PART NUMBER R595 XXX XXX

ADDITIONAL SPECIFICATIONS

| Operating mode | | Latching | |
|---|----------------------------------|---|--------------------------------|
| Nominal operating voltage (Vdc) (across operating temperature) | | | 24 (20 / 32) 15 (12 / 20) |
| Coil resistance (+/-10%) (Ohms) | | SPDT | 350 120 |
| | | Terminated SPDT, DP3T, Bypass | 175 60 |
| Nominal operating current at 23°C (mA) | | SPDT | 68 125 |
| | | Terminated SPDT, DP3T, Bypass | 140 250 |
| Average power | All models | RF path Cold switching : See Power Rating Chart on final page Hot switching : 1 Watt CW | |
| | Terminated model | Internal terminations 1 Watt average into 50Ω | |
| | | External terminations 0.5 Watt average into 50Ω | |
| TTL input | High Level | 3 to 7 V | 800 μA max at 7 V |
| | Low Level | 0 to 0.8 V | 20 μA max at 0.8V |
| Switching time max (ms) | | 15 | |
| Life min for | SMA | 10 million cycles | |
| | SMA 2.9 | 5 million cycles | |
| Connectors | | SMA – SMA 2.9 | |
| Actuator terminal | | D-Sub pin female Solder pins | |
| Weight max (g) | SPDT | < 60 | |
| | Terminated SPDT, DP3T, Bypass | < 100 | |

ENVIRONMENTAL SPECIFICATIONS

| | |
|---|-----------------------------------|
| Operating temperature range (°C) | -25 to +75 |
| Storage temperature range (°C) | -55 to +85 |
| Temperature cycling (MIL-STD-202 , Method 107D , Cond.A) (°C) | -55 to +85 (10 cycles) |
| Sine vibration operating (MIL STD 202 , Method 204D , Cond.D) | 10-2000 Hz, 20g |
| Random vibration operating | 16.91g (rms) 50–2000 Hz 3min/axis |
| Shock operating (MIL STD 202 , Method 213B , Cond.G) | 50g / 11 ms, sawtooth |
| Humidity operating | 15 to 95% relative humidity |
| Humidity storage (MIL STD 202 , Method 106E , Cond.E) | 65°C, 95% RH, 10 days |
| Altitude operating | 15,000 feet (4,600 meters) |
| Altitude storage (MIL STD 202 , Method 105C , Cond.B) | 50,000 feet (15,240 meters) |

SWITCH MODEL 1: NON TERMINATED SPDT SWITCH

The non-terminated SPDT switch is a single pole double throw switch. This switch is "break before make".

RF SCHEMATIC DIAGRAM



INDICATORS POSITION

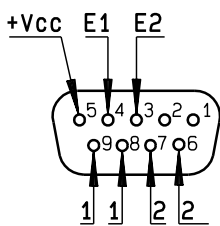


Standard drive option "1" (Positive common):

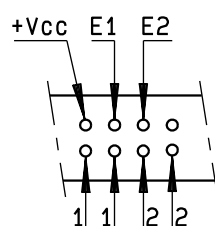
- Connect pin +Vcc to supply
- Select desired RF path by applying ground to the corresponding "Close" pin (Ex: ground pin E1 to switch to position E1. RF path 1-2 closed and RF path 2-3 open).
- To open desired path and close the new RF path, connect ground to the corresponding "close" pin (Ex: ground pin E2 to open RF path 1-2 and close RF path 2-3)

TTL drive option "2"

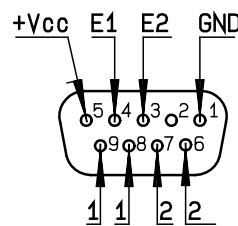
- Connect pin GND to ground.
- Connect pin +Vcc to supply
- Select (close) desired RF path by applying TTL "High" to the corresponding "drive" pin (Ex: apply TTL "High" to pin E1 to switch to position E1. RF path 1-2 closed and RF path 2-3 open).
- To open desired path and close the new RF path, apply TTL "High" to the "drive" pin which corresponds to the desired RF path. (Ex: apply TTL "High" to pin E2 to open RF path 1-2 and close RF path 2-3).



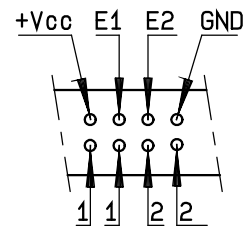
D-Sub connector



Solder pins



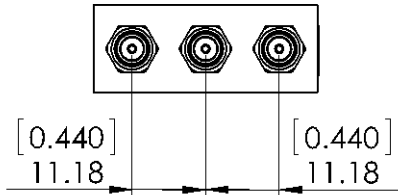
D-Sub connector



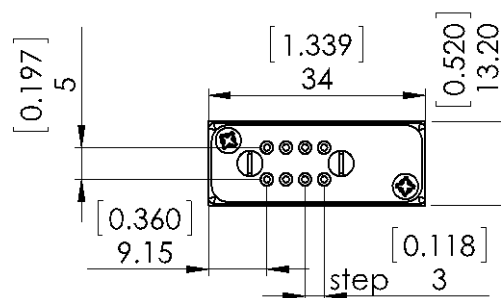
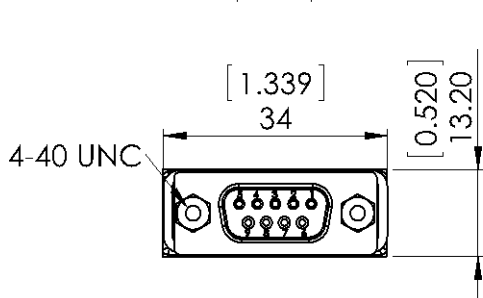
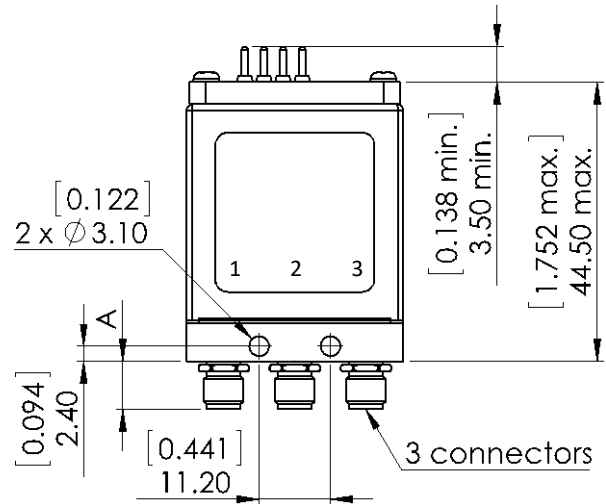
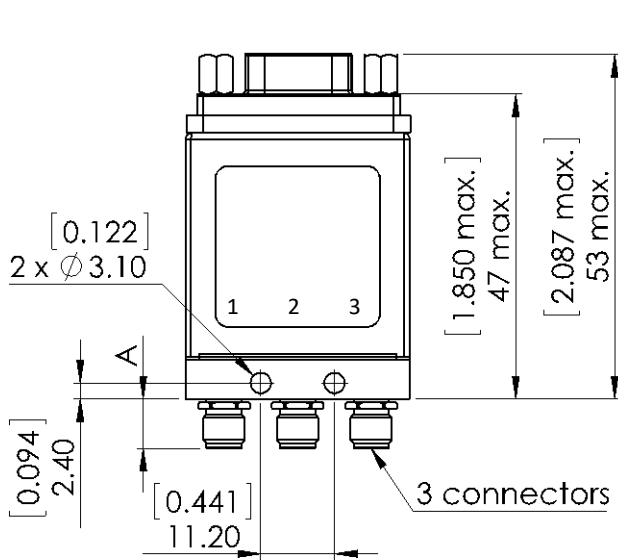
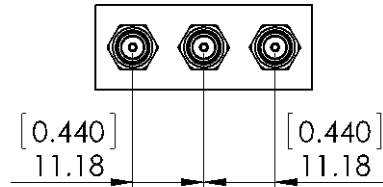
Solder pins

All dimensions are in millimeters [inches].

With D-Sub connector



With solder pins

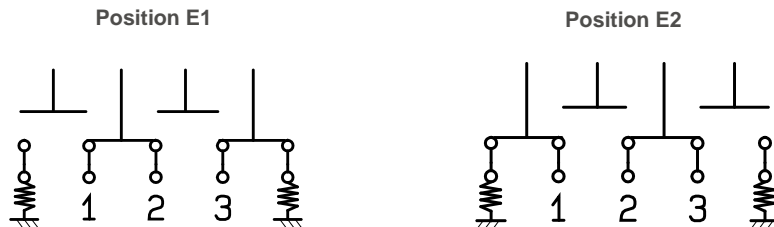


| Connectors | A max mm [inches] |
|---------------------|-------------------|
| SMA up to 26.5GHz | 7.7 [0.303] |
| SMA 2.9 up to 40GHz | 6.7 [0.264] |

SWITCH MODEL 2: TERMINATED SPDT SWITCH

The-terminated SPDT switch is a single pole double throw switch. The unused ports are terminated into 50ohms. This switch is “break before make”.

RF SCHEMATIC DIAGRAM



INDICATORS POSITION

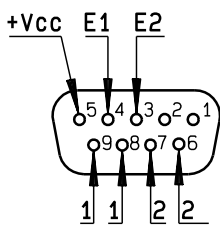


Standard drive option “1” (Positive common):

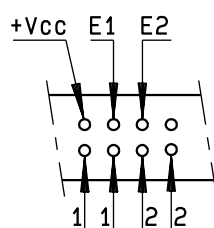
- Connect pin +Vcc to supply
- Select desired RF path by applying ground to the corresponding "Close" pin (Ex: ground pin E1 to switch to position E1. RF path 1-2 closed and RF path 2-3 open).
- To open desired path and close the new RF path, connect ground to the corresponding “close” pin (Ex: ground pin E2 to open RF path 1-2 and close RF path 2-3)

TTL drive option “2”

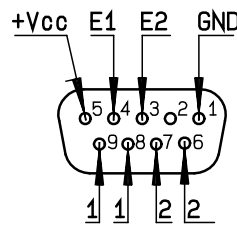
- Connect pin GND to ground.
- Connect pin +Vcc to supply
- Select (close) desired RF path by applying TTL "High" to the corresponding "drive" pin (Ex: apply TTL "High" to pin E1 to switch to position E1. RF path 1-2 closed and RF path 2-3 open).
- To open desired path and close the new RF path, apply TTL "High" to the "drive" pin which corresponds to the desired RF path.
(Ex: apply TTL "High" to pin E2 to open RF path 1-2 and close RF path 2-3).



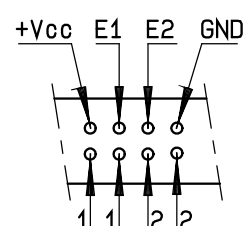
D-Sub connector



Solder pins



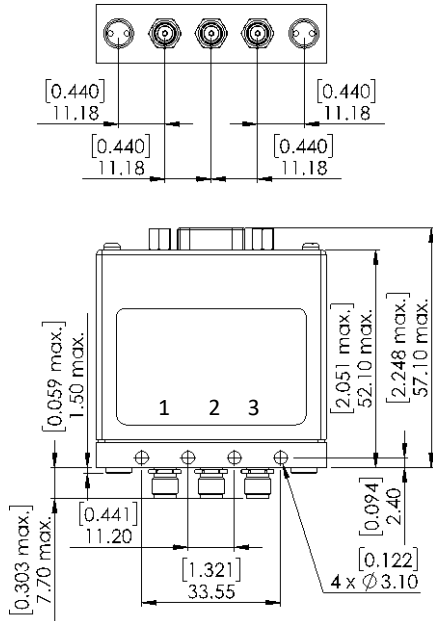
D-Sub connector



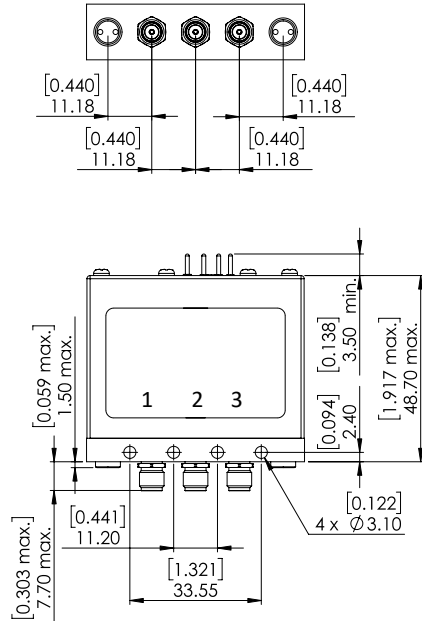
Solder pins

All dimensions are in millimeters [inches].

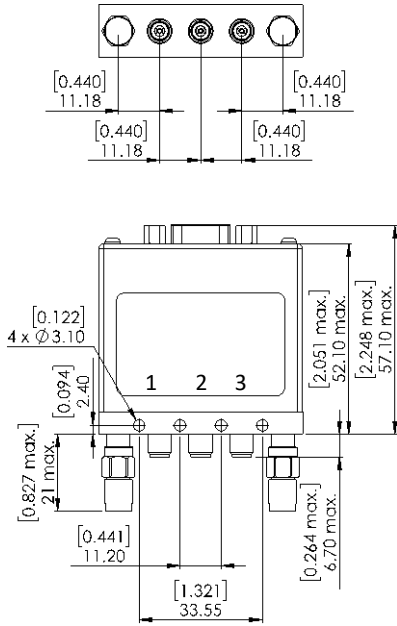
Model SMA with D-Sub connector



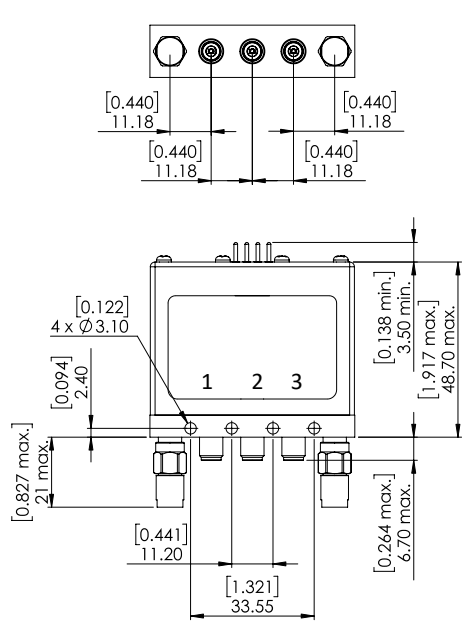
Model SMA with solder pins



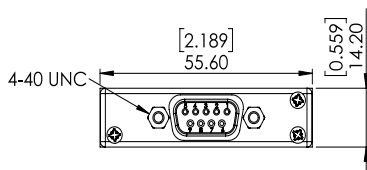
Model SMA2.9 with D-Sub connector



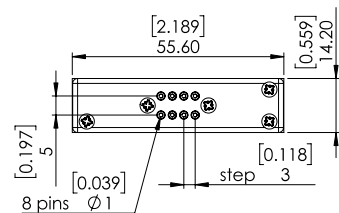
Model SMA2.9 with solder pins



TOP view - D-Sub connector



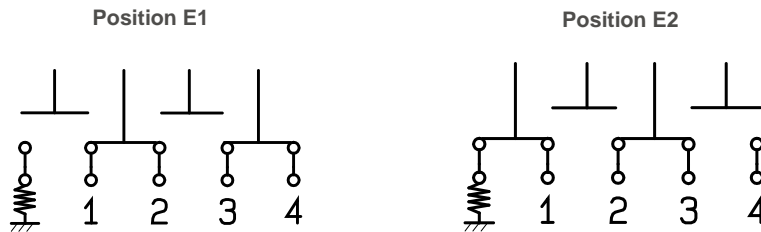
TOP view - solder pins



SWITCH MODEL 3: TERMINATED 4 PORT BYPASS SWITCH

The terminated 4 port bypass switch can terminate into 50 ohms the device under test. These switches are “break before make”.

RF SCHEMATIC DIAGRAM



INDICATORS POSITION

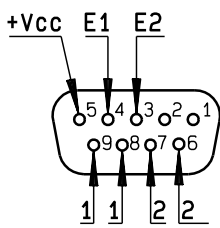


Standard drive option “1” (Positive common):

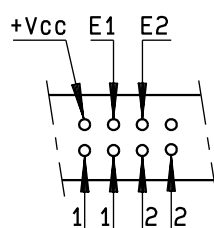
- Connect pin +Vcc to supply
- Select desired RF path by applying ground to the corresponding "Close" pin (Ex: ground pin E1 to switch to position E1. RF path 1-2 closed and RF path 2-3 open).
- To open desired path and close the new RF path, connect ground to the corresponding “close” pin (Ex: ground pin E2 to open RF path 1-2 and close RF path 2-3)

TTL drive option “2”

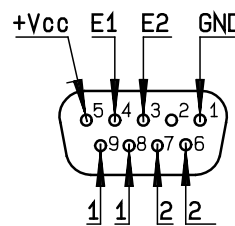
- Connect pin GND to ground.
- Connect pin +Vcc to supply
- Select (close) desired RF path by applying TTL "High" to the corresponding "drive" pin (Ex: apply TTL "High" to pin E1 to switch to position E1. RF path 1-2 closed and RF path 2-3 open).
- To open desired path and close the new RF path, apply TTL "High" to the "drive" pin which corresponds to the desired RF path.
(Ex: apply TTL "High" to pin E2 to open RF path 1-2 and close RF path 2-3).



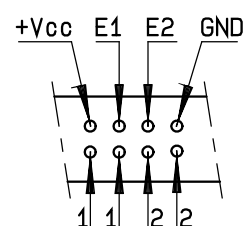
D-Sub connector



Solder pins



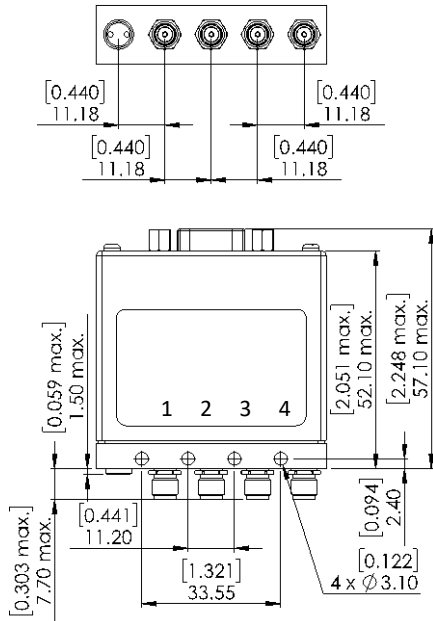
D-Sub connector



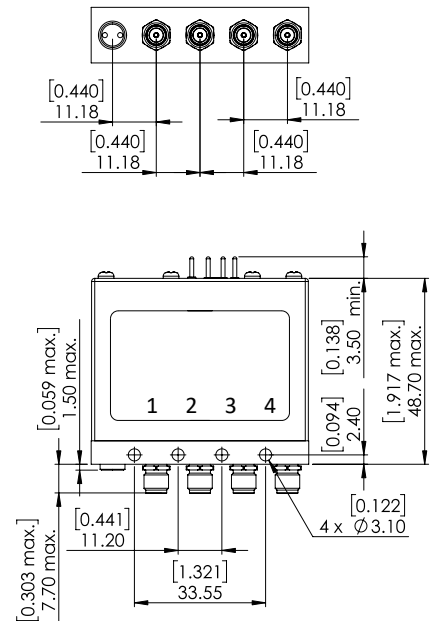
Solder pins

All dimensions are in millimeters [inches].

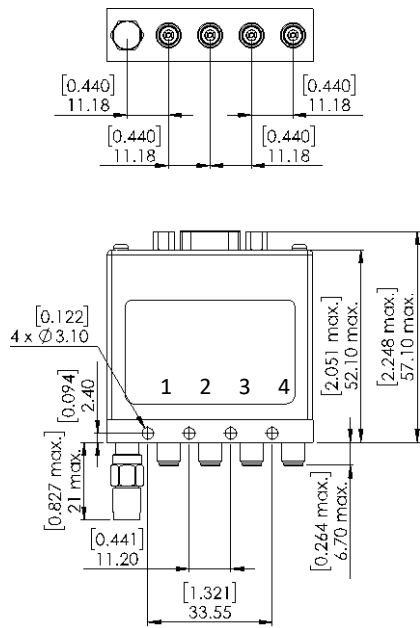
Model 26.5 GHz with D-Sub connector



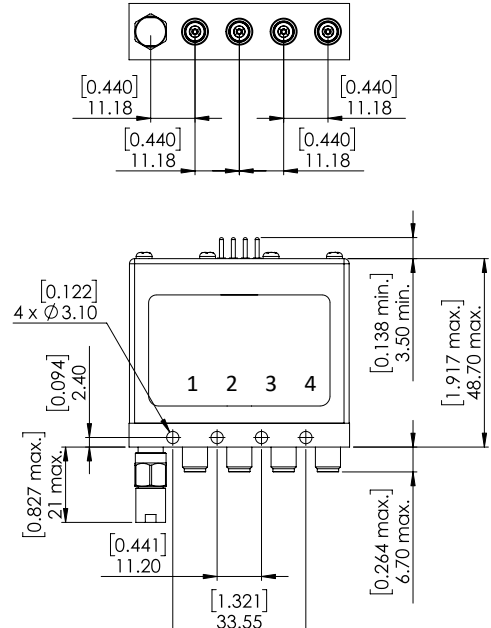
Model 26.5 GHz with solder pins



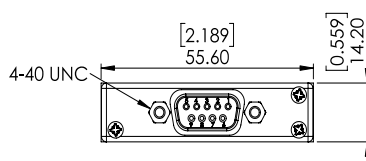
Model 40 GHz with D-Sub connector



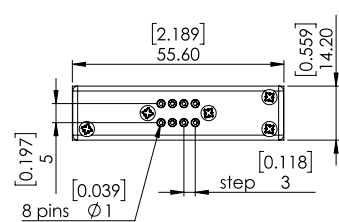
Model 40 GHz with solder pins



TOP view - D-Sub connector



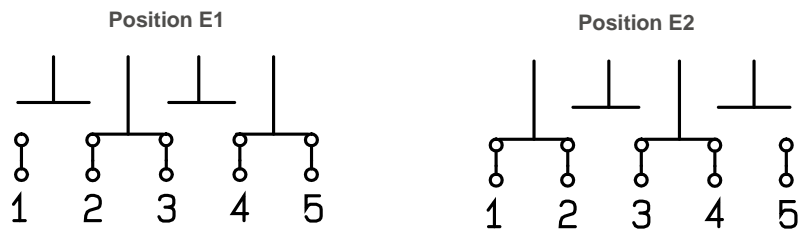
TOP view - solder pins



SWITCH MODEL 4: NON TERMINATED 5 PORT DP3T SWITCH

The non-terminated 5 port DP3T switch can be used as SPDT with high power terminations, as a bypass switch. In this application, the fifth port can be terminated externally with a high power termination. These switches are "break before make".

RF SCHEMATIC DIAGRAM



INDICATORS POSITION

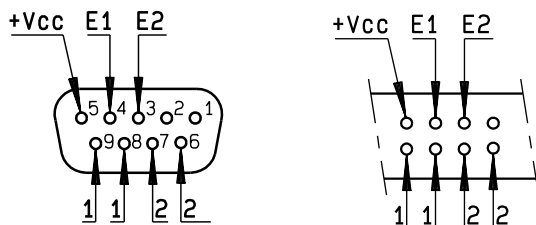


Standard drive option "1" (Positive common):

- Connect pin +Vcc to supply
- Select desired RF path by applying ground to the corresponding "Close" pin (Ex: ground pin E1 to switch to position E1. RF path 2-3 and RF path 4-5 open).
- To open desired path and close the new RF path, connect ground to the corresponding "close" pin (Ex: ground pin E2 to open RF path 2-3 and 4-5 and close RF path 1-2 and 3-4)

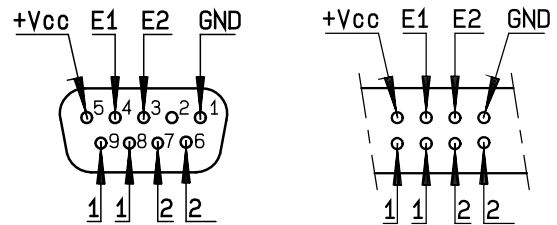
TTL drive option "2"

- Connect pin GND to ground.
- Connect pin +Vcc to supply
- Select (close) desired RF path by applying TTL "High" to the corresponding "drive" pin (Ex: apply TTL "High" to pin E1 to switch to position E1. RF path 2-3 and RF path 4-5 closed and RF path 1-2 and 3-4 open).
- To open desired path and close the new RF path, apply TTL "High" to the "drive" pin which corresponds to the desired RF path.
(Ex: apply TTL "High" to pin E2 to open RF path 2-3 and 4-5 and close RF path 1-2 and 3-4).



D-Sub connector

Solder pins



D-Sub connector

Solder pins

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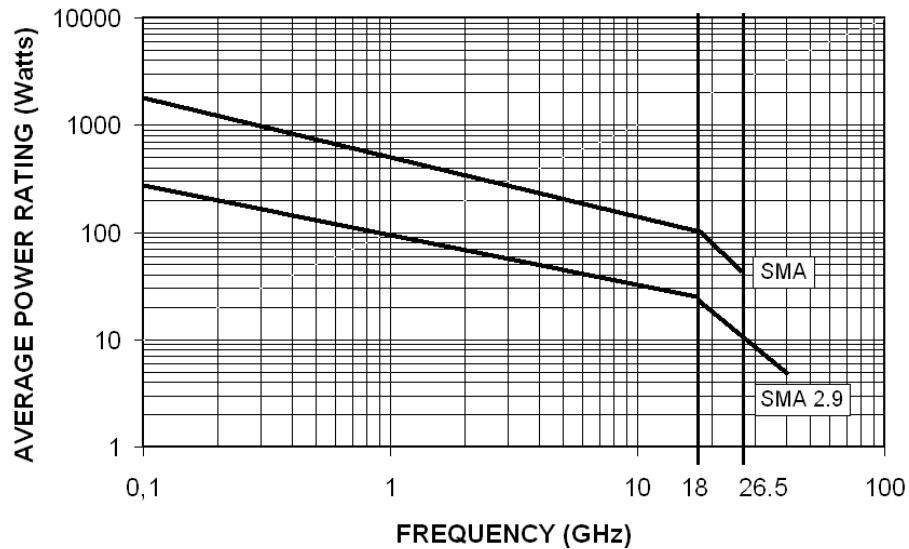
SERIES DP3T/SPDT

PART NUMBER R595 XXX XXX

POWER RATING CHART

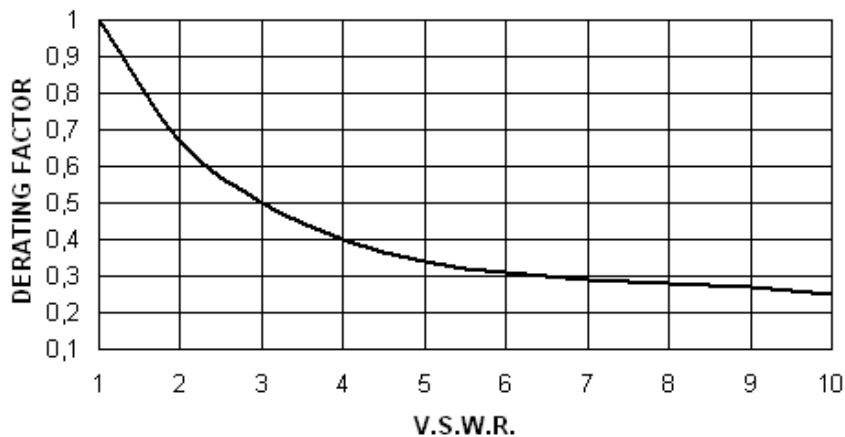
This graph is based on the following conditions:

- Ambient temperature: + 25°C
- Sea level
- V.S.W.R.: 1 and cold switching



DERATING FACTOR VERSUS V.S.W.R.

The average power input must be reduced for load V.S.W.R. above 1.



OUR CERTIFICATE

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