

Connectorized Millimeter Wave Reflective SPST Switch with TTL Driver, 1 - 26.5 GHz



MASW-011138-CS02xx

Rev. V3

Features

- Hermetic SPST Reflective Switch
- 2.4 mm Field Replaceable RF Connectors
- +5 V, -10 V, TTL Driver
- 2.0 dB Insertion Loss at 26.5 GHz
- 50 dB Isolation at 26.5 GHz
- 1.9:1 VSWR at 26.5 GHz
- 37 ns T_{ON} Switching Speed
- Weight: 28 grams (CS0292) / 29 grams (CS0240)
- Non-RoHS Part



Applications

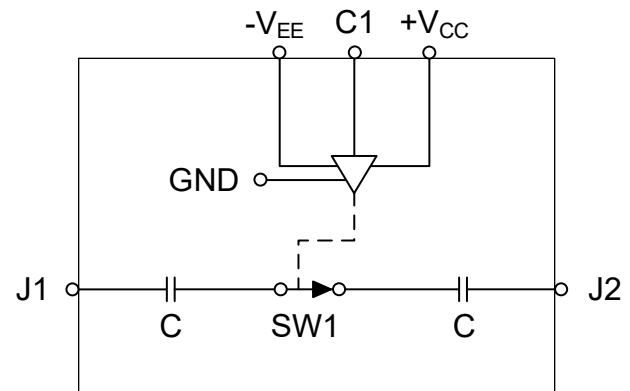
- Aerospace and Defense
- Space

Description

The MASW-011138 is a 1.0 - 26.5 GHz reflective SPST that uses 2.4 mm RF replaceable connectors with an integrated TTL driver operating with +5 VDC and -10 VDC. This product provides an exceptional isolation to insertion loss ratio, with 37 ns switching speed in a compact 1.2" x 1.0" x 0.5" metal housing. It is ideally suited for applications requiring hermetic hardware enclosures.

Upon request available as a fully RoHS compliant module for commercial applications.

Functional Schematic



Ordering Information

Part Number	Package
MASW-011138-CS0292	bulk
MASW-011138-CS0240	bulk

Port Configuration¹

Port Description	Function
J1	RF Input
J2	RF Output
C1	TTL Logic Control
+V _{CC}	+5 VDC
-V _{EE}	-10 VDC
GND	RF & DC Voltage Ground Return

1. The RF ground is provided through the RF connectors and the metal housing. The driver ground is provided through the DC feedthrus and the metal housing.

* Restrictions on Hazardous Substances, compliant to current RoHS EU directive.

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**Electrical Specifications: $T_A = 25^\circ\text{C}$, $P_{IN} = 0\text{ dBm}$ (unless otherwise defined),
 $Z_0 = 50\ \Omega$, DC Power = +5V @ +32 mA, -10 V @ -0.4 mA**

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss (J1-J2)	1.0 - 26.5 GHz	dB	—	2	2.5
Return Loss (J1-J2)	1.0 - 26.5 GHz	dB	—	11	—
Isolation (J1-J2)	1.0 - 26.5 GHz	dB	37	49	—
Switching Speed (T_{ON})	F = 10 GHz, 100 kHz TTL repetition rate (50% Control Voltage - 90% RF Voltage)	ns	—	37	—
Switching Speed (T_{OFF})	F = 10 GHz, 100 kHz TTL repetition rate (50% Control Voltage - 10% RF Voltage)	ns	—	32	—
CW Incident Power ²	12 GHz	dBm	—	30	—
Input IP2	F1 = 2.000 GHz, F2 = 2.010 GHz P1 = P2 Input Tone Power = 10 dBm	dBm	—	71	—
Input IP3	F1 = 2.000 GHz, F2 = 2.010 GHz P1 = P2 Input Tone Power = 10 dBm	dbm	—	38	—

2. Maximum source and load VSWR = 1.2:1

Nominal Operating Conditions⁵

Parameter	Nominal Value
CW Input Power	+30 dBm @ +25°C +27 dBm @ +85°C
DC Operating Voltage +V _{CC} -V _{EE}	+5 V -10 V
TTL Logic Voltage "0" "1"	0.0 V to 0.8 V 2.0 V to 5.0 V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

- Exceeding any one or combination of these limits may cause permanent damage to this device.
- MACOM does not recommend sustained operation near ANY of these maximum survivability limits.
- Operating at nominal conditions with $T_J \leq +175^\circ\text{C}$ will ensure MTTF > 1 x 10⁶ hours.

Maximum Survivability Ratings^{3,4}

Parameter	Absolute Maximum
CW Input Power	+25 dBm @ +95°C
DC Operating Voltage +V _{CC} -V _{EE}	+4.5 V to +5.5 V -15 V to -10 V
TTL Logic Voltage "0" "1"	0.0 V to 0.8 V 2.0 V to 5.0 V
Operating Temperature	-55°C to +95°C
Storage Temperature	-65°C to +150°C

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TTL Logic to RF Truth Table

(Logic 0 = 0 V, Logic 1 = +5 V)

Insertion Loss Bias State = -10 V @ -0.4 mA

Isolation Bias State = +5 V @ +32 mA

RF State	TTL Logic Control (C1)
J1-J2 Insertion Loss	1
J1-J2 Isolation	0

IMPORTANT:

The TTL driver in the MASW-011138 SPST does NOT use reverse polarity protection for the +V_{CC} and -V_{EE} voltage inputs. The MASW-011138 can be damaged if +V_{CC} and -V_{EE} voltage inputs are reversed.

Handling Procedures

Please observe the following precautions to avoid damage:

Static Sensitivity

These electronic devices are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. This product is defined as Class 2. Proper ESD control techniques should be used when handling these devices.

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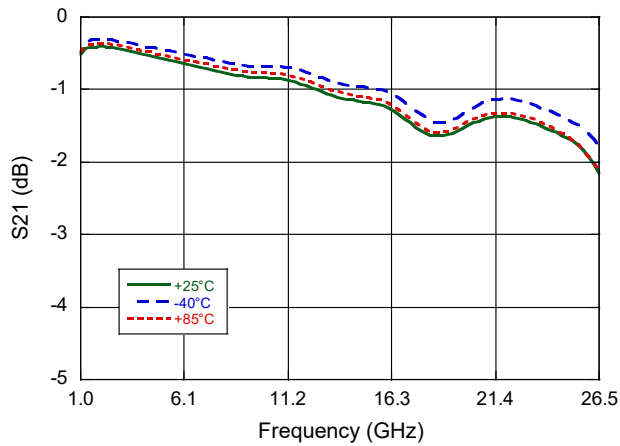


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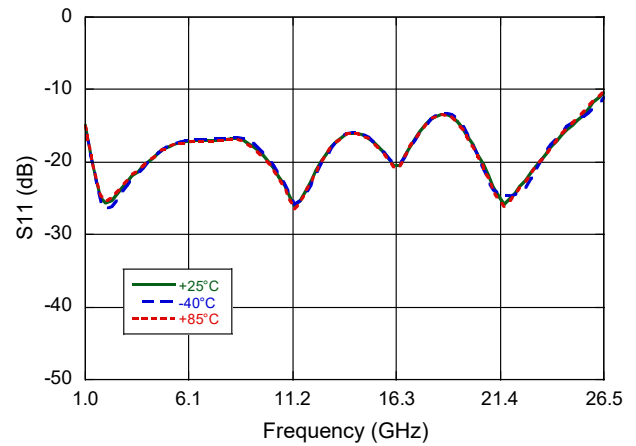
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Typical Performance Curves

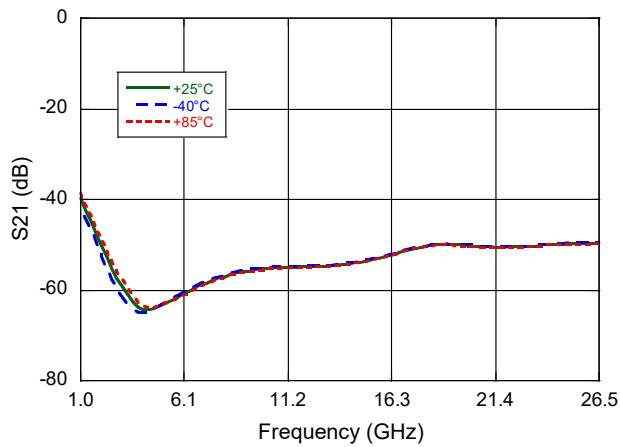
Insertion Loss (J1-J2)



Return Loss (J1-J2)



Isolation (J1-J2)



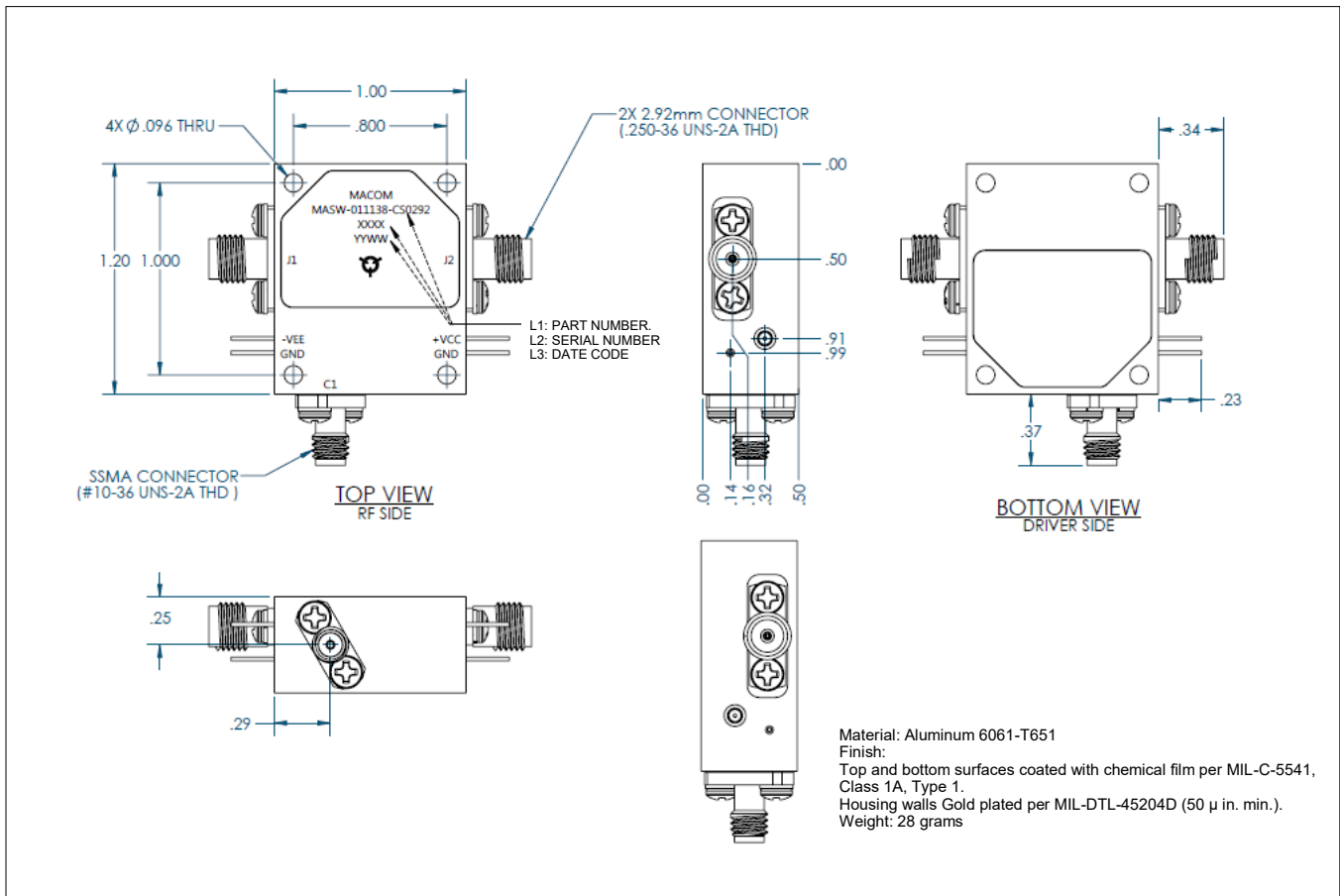
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Outline Drawing: CS0292



† Meets JEDEC moisture sensitivity level (MSL) 1 requirements.

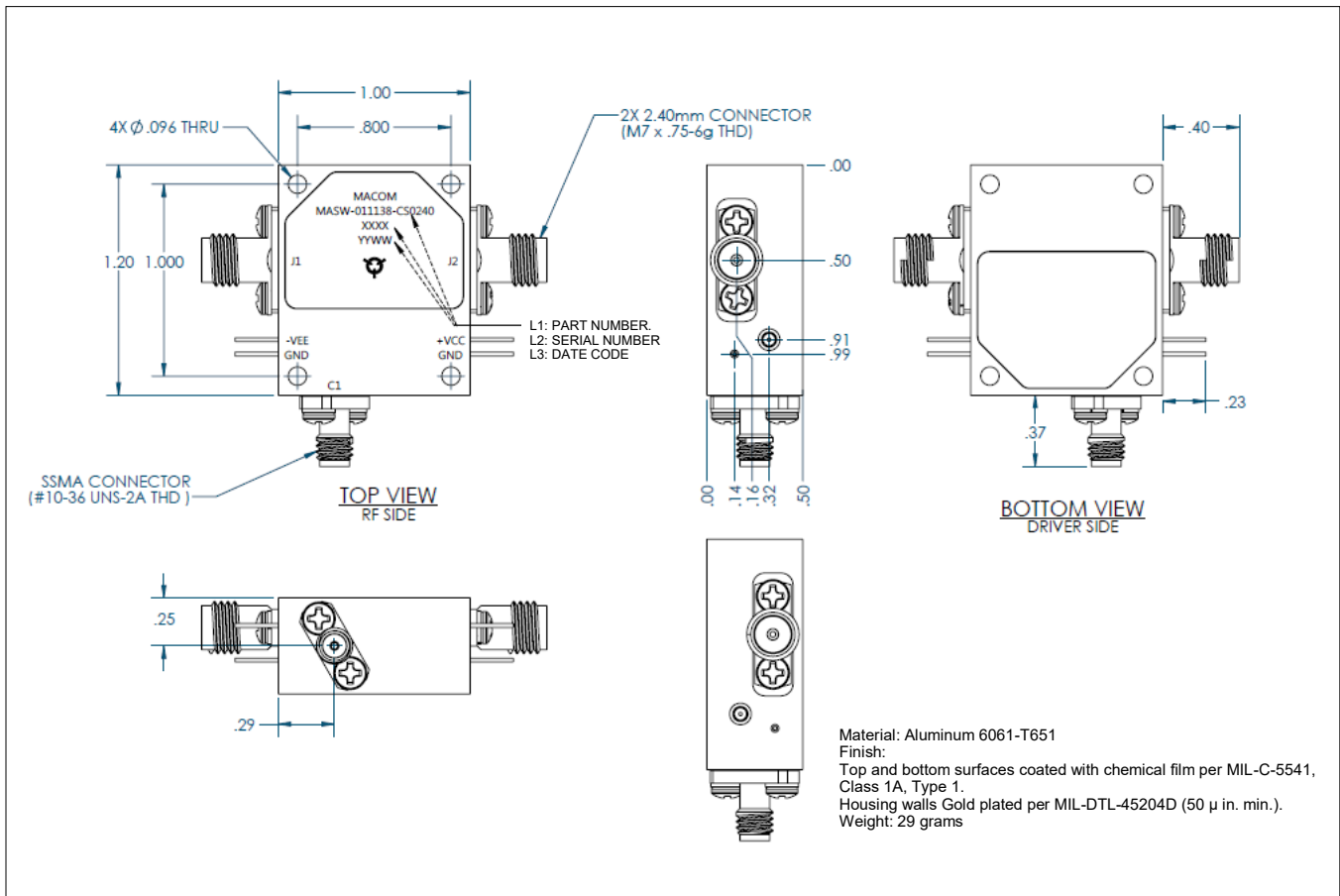
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Outline Drawing: CS0240



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