

GaAs SPDT Switch DC - 3.0 GHz

Rev. V2

Electrical Specifications: $T_A = 25^\circ\text{C}$, $V_C = 0\text{ V} / 3\text{ V}$, $Z_0 = 50\ \Omega$ ⁵

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss ⁶	1.0 GHz	dB	—	0.3	—
	2.4 GHz	dB	—	0.4	0.5
Isolation	1.0 GHz	dB	—	24	—
	2.4 GHz	dB	25	27	—
VSWR	0.05 - 3.0 GHz	Ratio	—	1.2:1	—
IP2	Two Tone, +5 dBm / Tone, 5 MHz Spacing 2.4 GHz	dBm	—	80	—
IP3	Two Tone, +5 dBm / Tone, 5 MHz Spacing 2.4 GHz	dBm	—	48	—
Linear Pout	2.5 GHz, OFDM, QAM-64, 54Mbps, EVM=2.5%				
	3.0 V	dBm	—	22.5	—
	3.3 V	dBm	—	24.0	—
	5.0 V	dBm	—	28.5	—
P1dB	—	dBm	—	28	—
Trise, Tfall	10% to 90% RF and 90% to 10% RF	ns	—	35	—
Ton, Toff	50% control to 90% RF, 50% control to 10% RF	ns	—	40	—
Transients	—	mV	—	10	—
Current	$V_C = 3.0\text{ V}$	μA	—	5	10
R_{ON}	$t > 10\text{ ms}$ after OFF to ON Switching (settled)	Ω	—	1.5	2.5
Gate Lag	$ \Delta R_{on} $ between 200 μs and 10 ms after OFF to ON Switching	Ω	—	0.15	0.25

5. For positive voltage control, external DC blocking capacitors are required on all RF ports.

6. Insertion Loss can be optimized by varying the DC blocking capacitor value, e.g. 1000 pF for 100 MHz – 1.0 GHz, 39 pF for 0.5 - 3.0 GHz.

Truth Table^{7,8}

Control V1	Control V2	RFC-RF1	RFC-RF2
0	1	On	Off
1	0	Off	On

7. Differential voltage, $V(\text{state } 1) - V(\text{state } 0)$, must be $\pm 2.3\text{ V}$ minimum and must not exceed 8.5 V .

8. 0 = $0\text{ V} \pm 0.2\text{ V}$, 1 = $\pm 2.5\text{ V}$ to 5.0 V

Qualification

Qualified to M/A-COM specification REL-201, Process Flow –2.

Handling Procedures

The following precautions should be observed to avoid damage:

Static Sensitivity

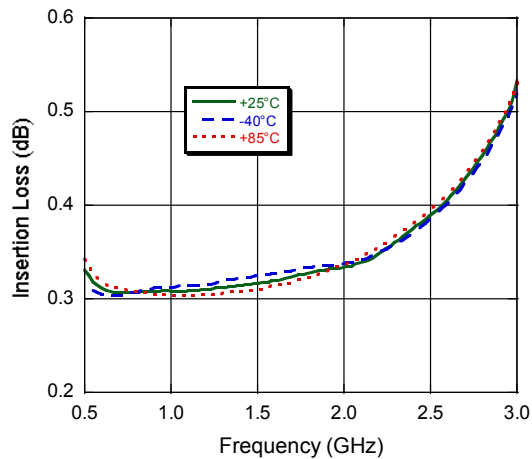
Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

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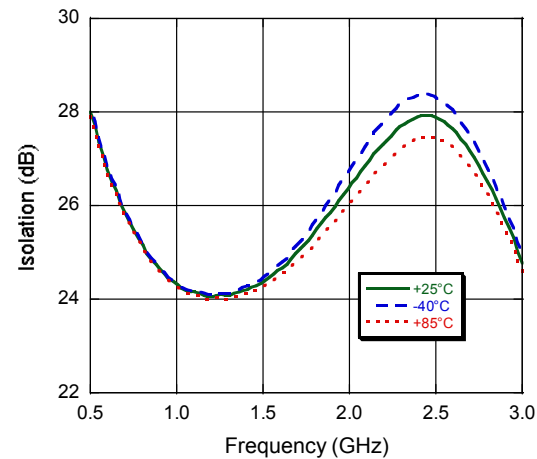
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Typical Performance Curves

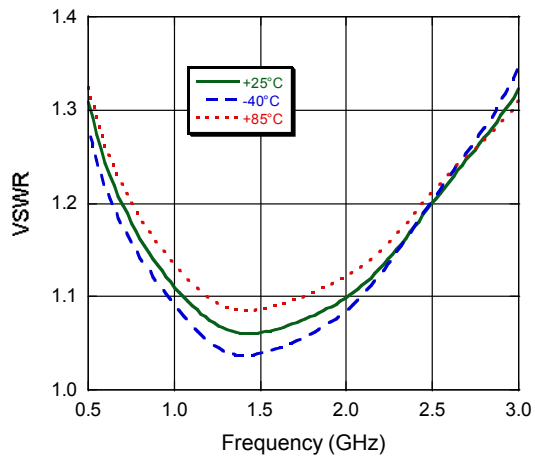
Insertion Loss



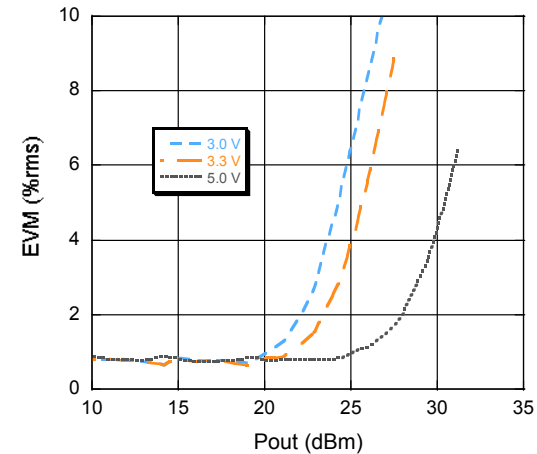
Isolation



VSWR



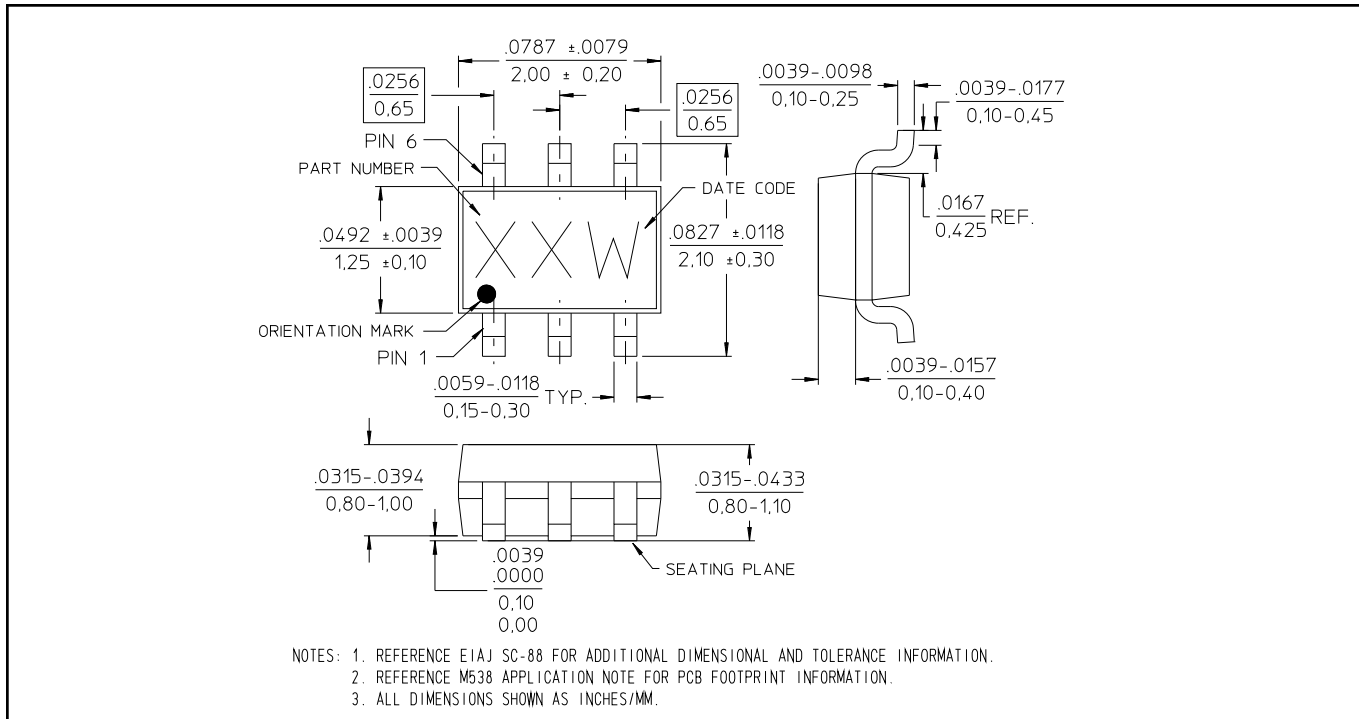
EVM vs. Pout @ 2.5 GHz



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Lead-Free SC70-6LD (SOT-363)[†]



† Reference Application Note M538 for lead-free solder reflow recommendations.
Meets JEDEC moisture sensitivity level 1 requirements.