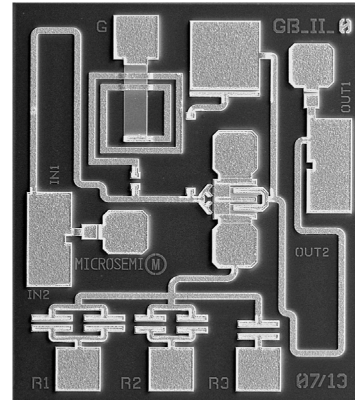
DC-16GHz, Power-Selectable Wideband Amplifier

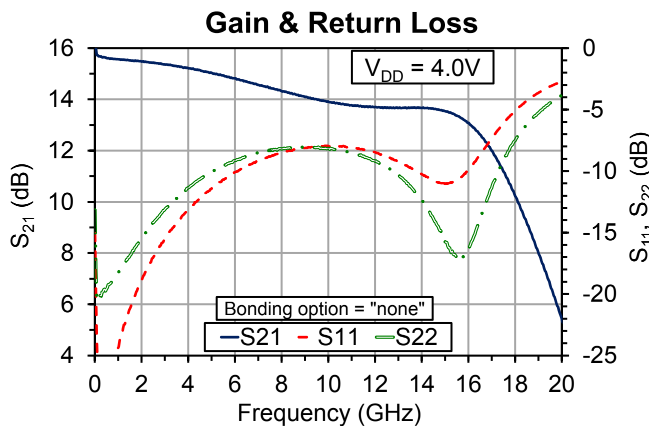
Features

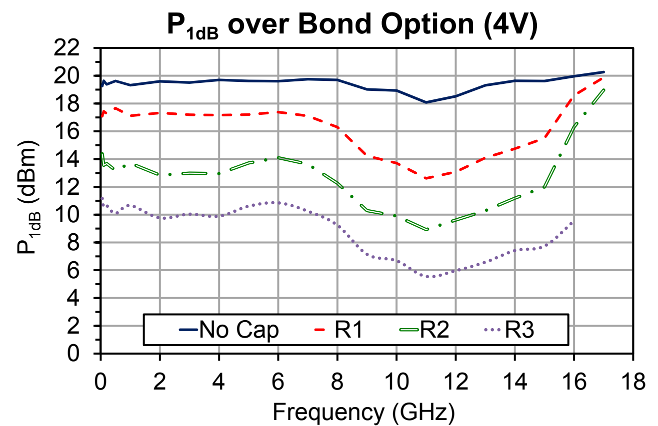
- Power-selectable from 7 to 19dBm P_{1dB} and 16-21dBm P_{3dB} by choosing bond option
- Gain of 13-16dB and 29dBm OIP3 at the highest power option
- Gain varies <1.4dB from -40°C to +85°C
- Self-biased with single positive supply
- Input and Output matched to 50Ω
- 0.76mm x 0.66mm x 0.1mm die size



Applications

- Instrumentation
- Electronic warfare
- Microwave communications
- Radar





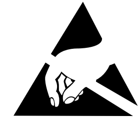
RF Specifications (CW, Typical Device, RF Probe): T_A = 25°C, V_{DD} = 4V

Bond Option	ID	Gain	P1dB	OIP3
None	80	14.5	19	29
R1 to Ground	45	12.5	15	25
R2 to Ground	32	11.5	12	22
R3 to Ground	24	10.5	8	18

Table 1: Absolute Maximum Ratings, Not Simultaneous

Parameter	Value	Units
Drain Voltage (V_D)	+4.5	V
Input Power (P_{IN})	TBD (est +20)	dBm
Operating Channel Temperature	150[1]	°C
Operating Ambient Temperature (T_A)	-55 to +85	°C
Storage Temperature	-65 to 150	°C
Thermal Resistasnce, Channel to Die Backside	TBD	°C/W

[1] MTTF > 10^8 hours at T_C = 150°C

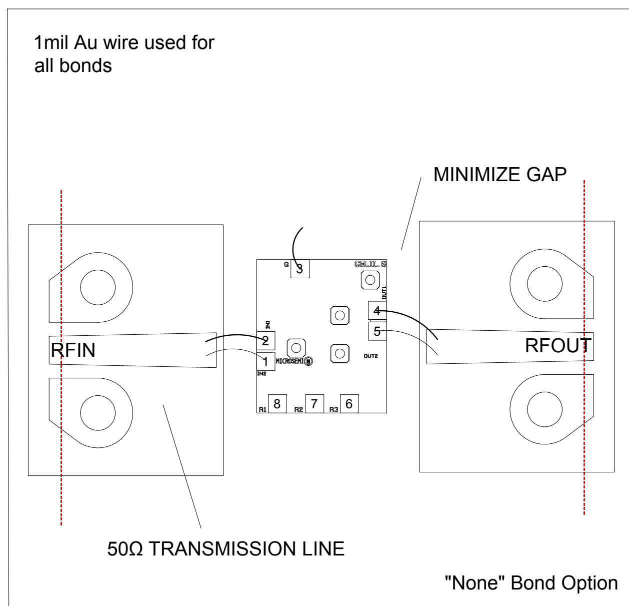


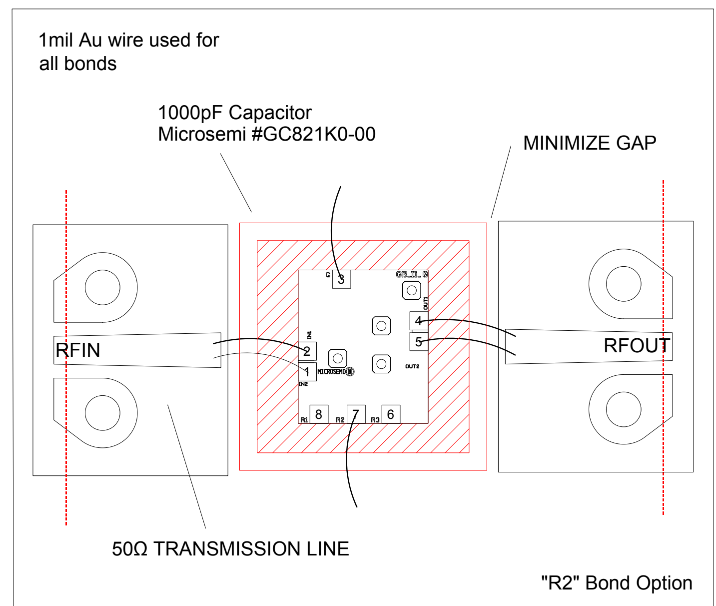
Caution, ESD Sensitive Device

Table 2: Specifications (CW, 100% Test): T_A = 25°C, V_{DD} = 4V

Parameter	Min	Typ	Max	Units
I_{DD}, bond option = “none”	45	80	115	mA

RF Probe Measurement Set-Up With Reference Planes[2]





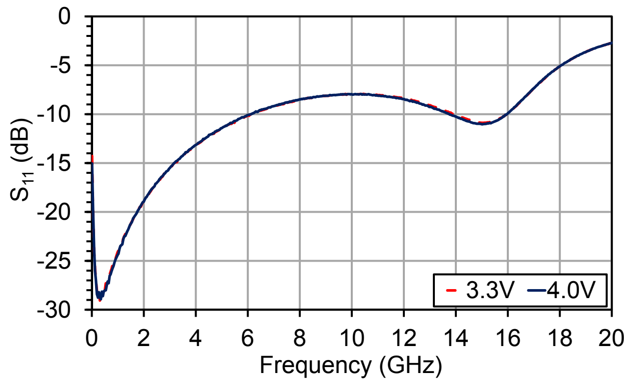
To use the “none” bonding option, attach the die directly to the baseplate.

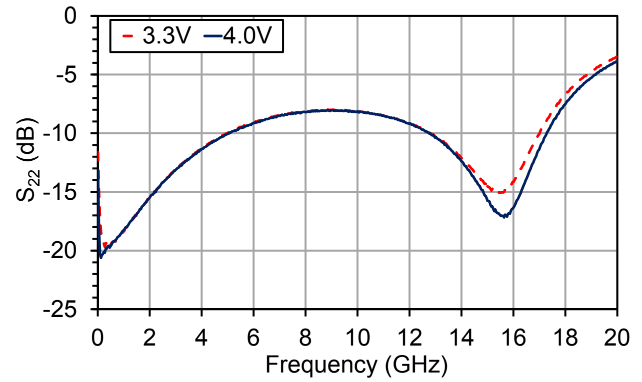
To use the “R1”, “R2” or “R3” bonding options, mount the die on top of a capacitor to float the source and bond the appropriate pad to ground.

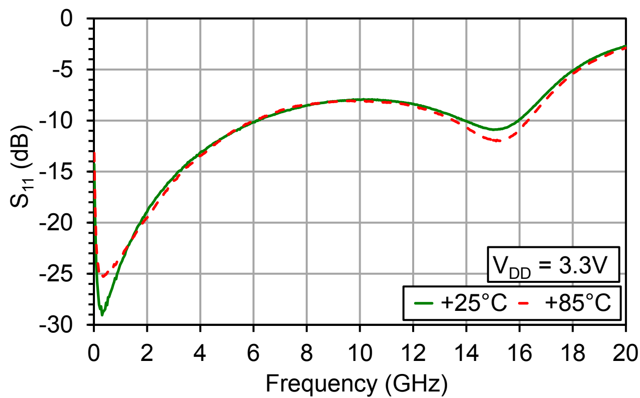
[2] Reference planes are the same for S-parameter files downloadable on www.microsemi.com/mmics

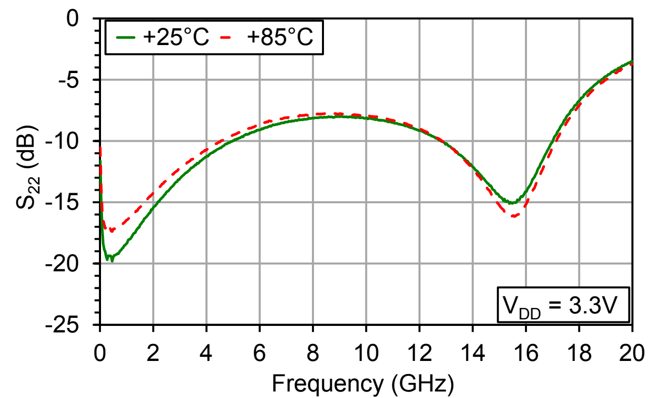
Typical Performance, RF Probe

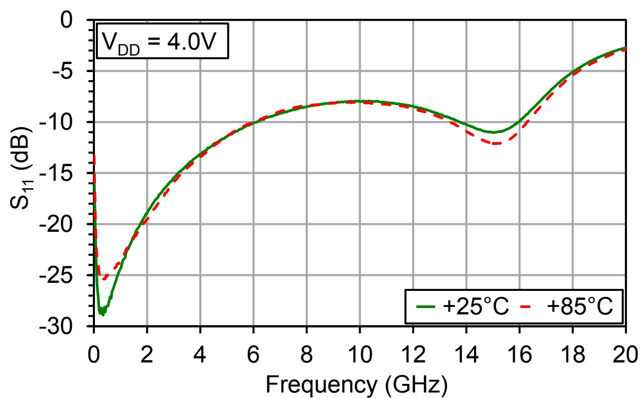
V_{DD} = 4V, I_{DD} = 80mA, T_A = 25°C, bond option = "none" unless otherwise noted

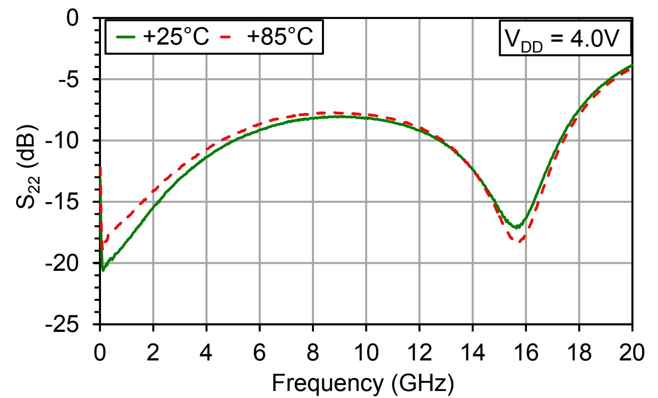






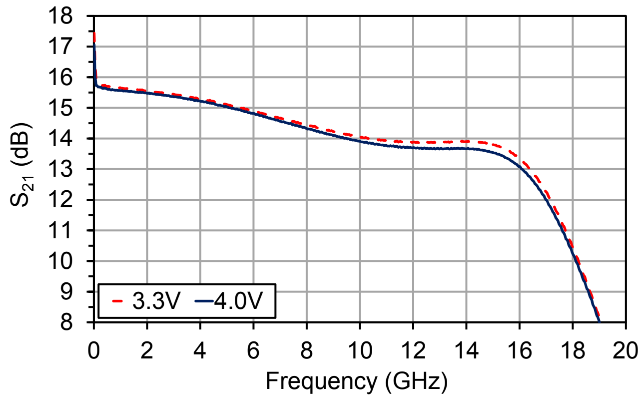


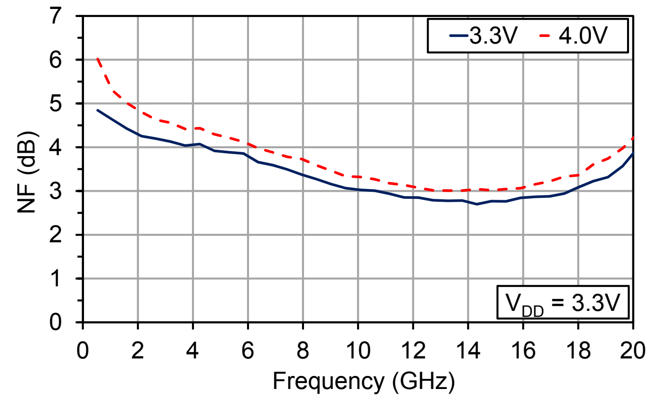


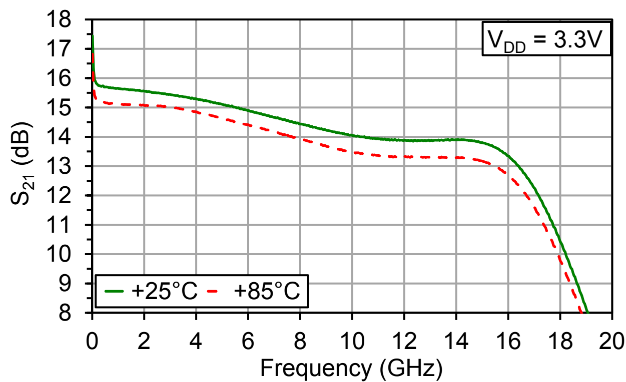


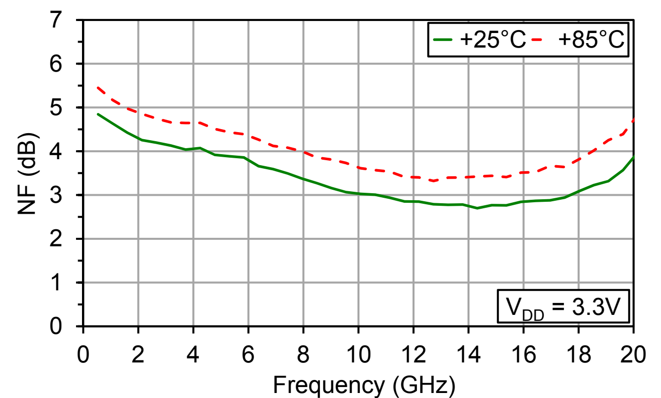
Typical Performance, RF Probe

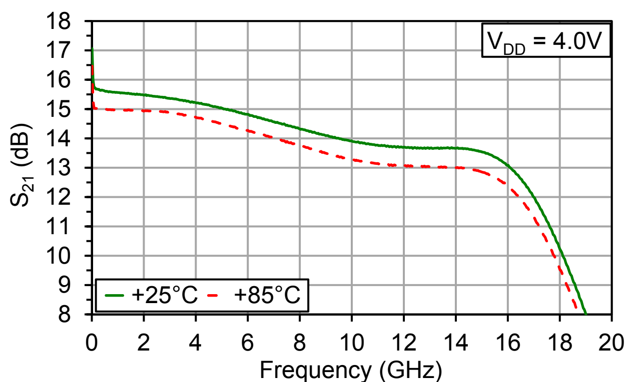
V_{DD} = 4V, I_{DD} = 80mA, T_A = 25°C, bond option = “none” unless otherwise noted

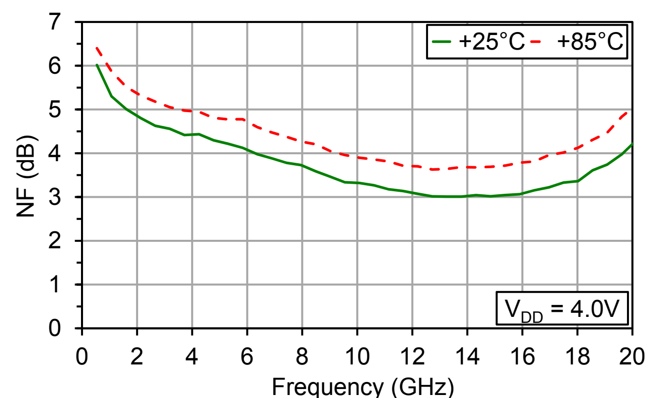






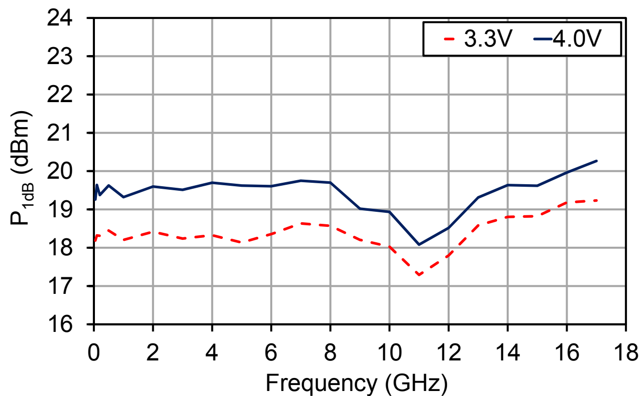


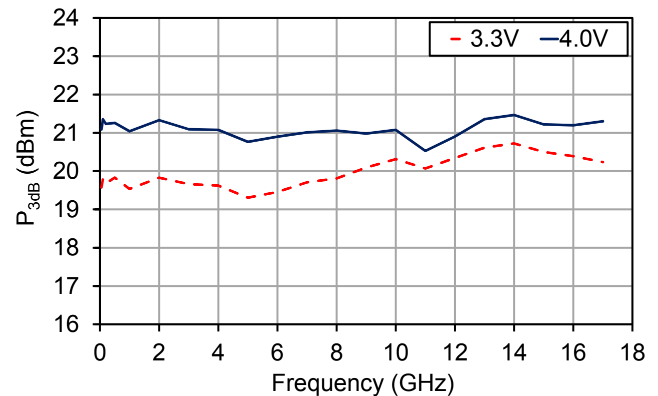


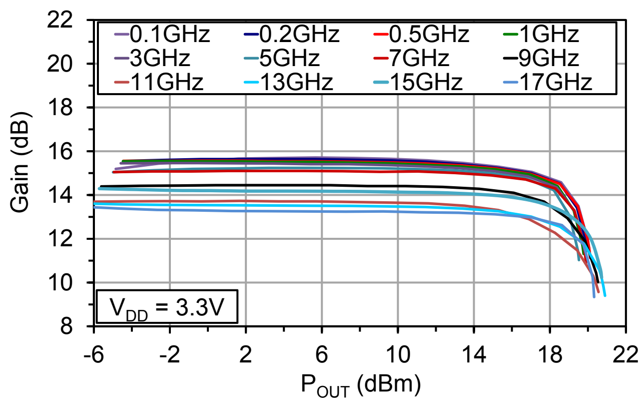


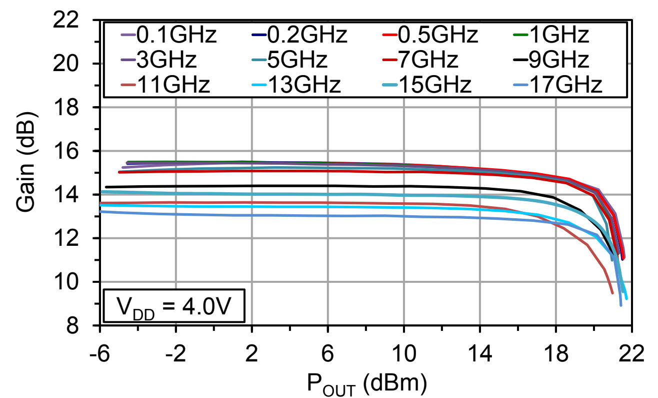
Typical Performance, RF Probe

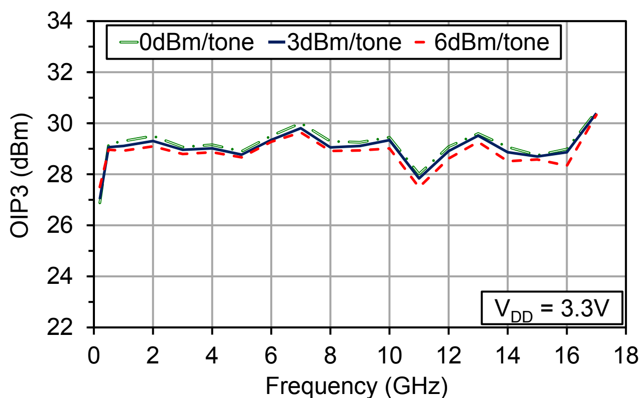
V_{DD} = 4V, I_{DD} = 80mA, T_A = 25°C, bond option = “none” unless otherwise noted

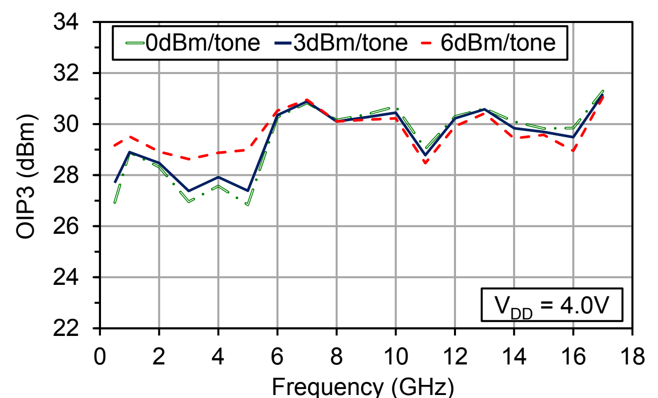






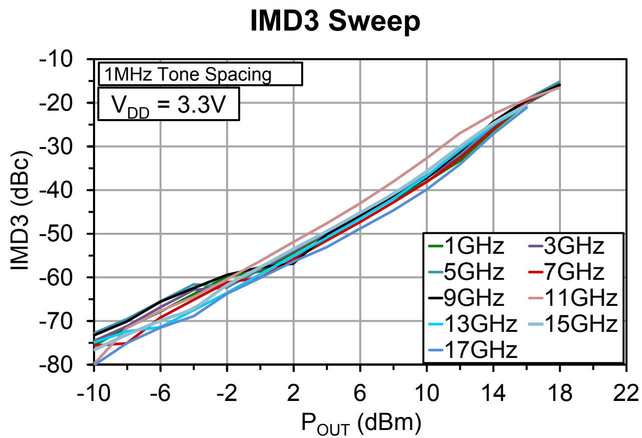


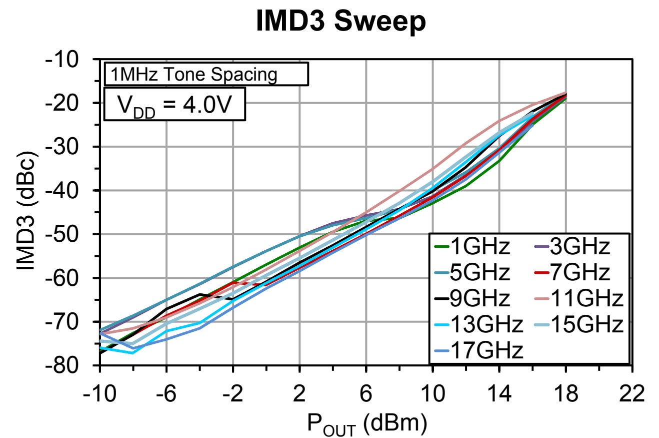




Typical Performance, RF Probe

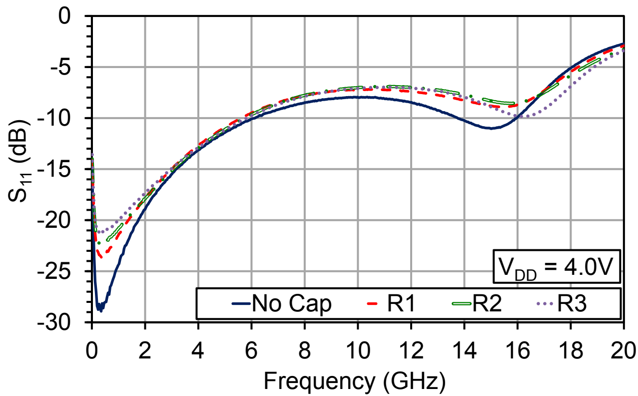
V_{DD} = 4V, I_{DD} = 80mA, T_A = 25°C, bond option = “none” unless otherwise noted

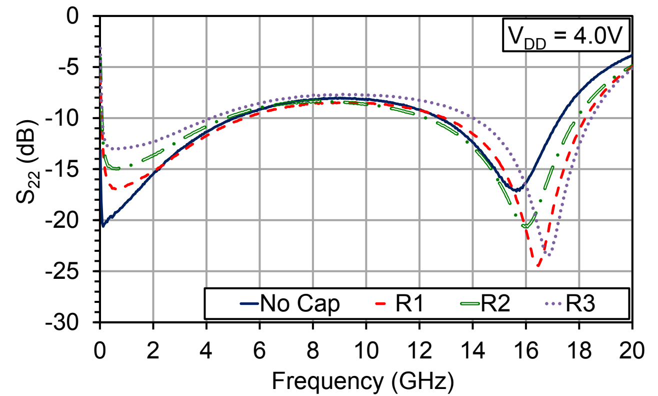


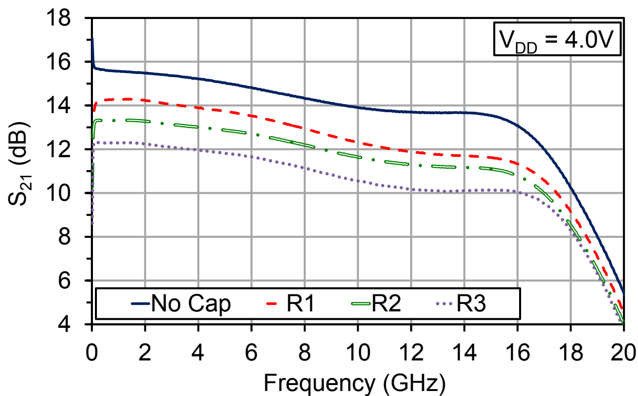


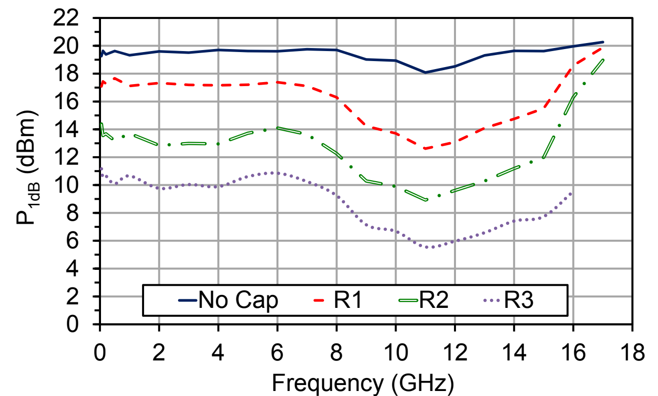
Typical Performance, RF Probe

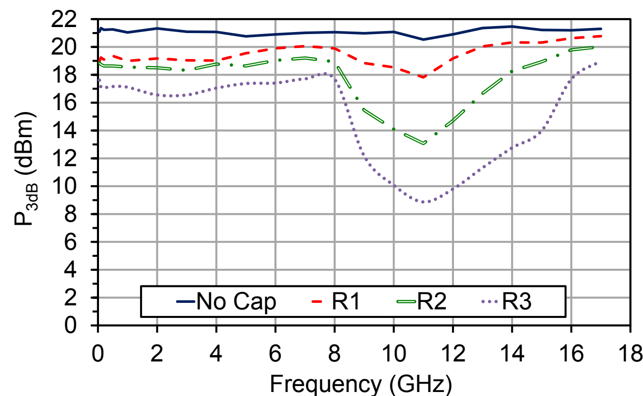
V_{DD} = 4V, I_{DD} = 80mA, T_A = 25°C, performance over bond option





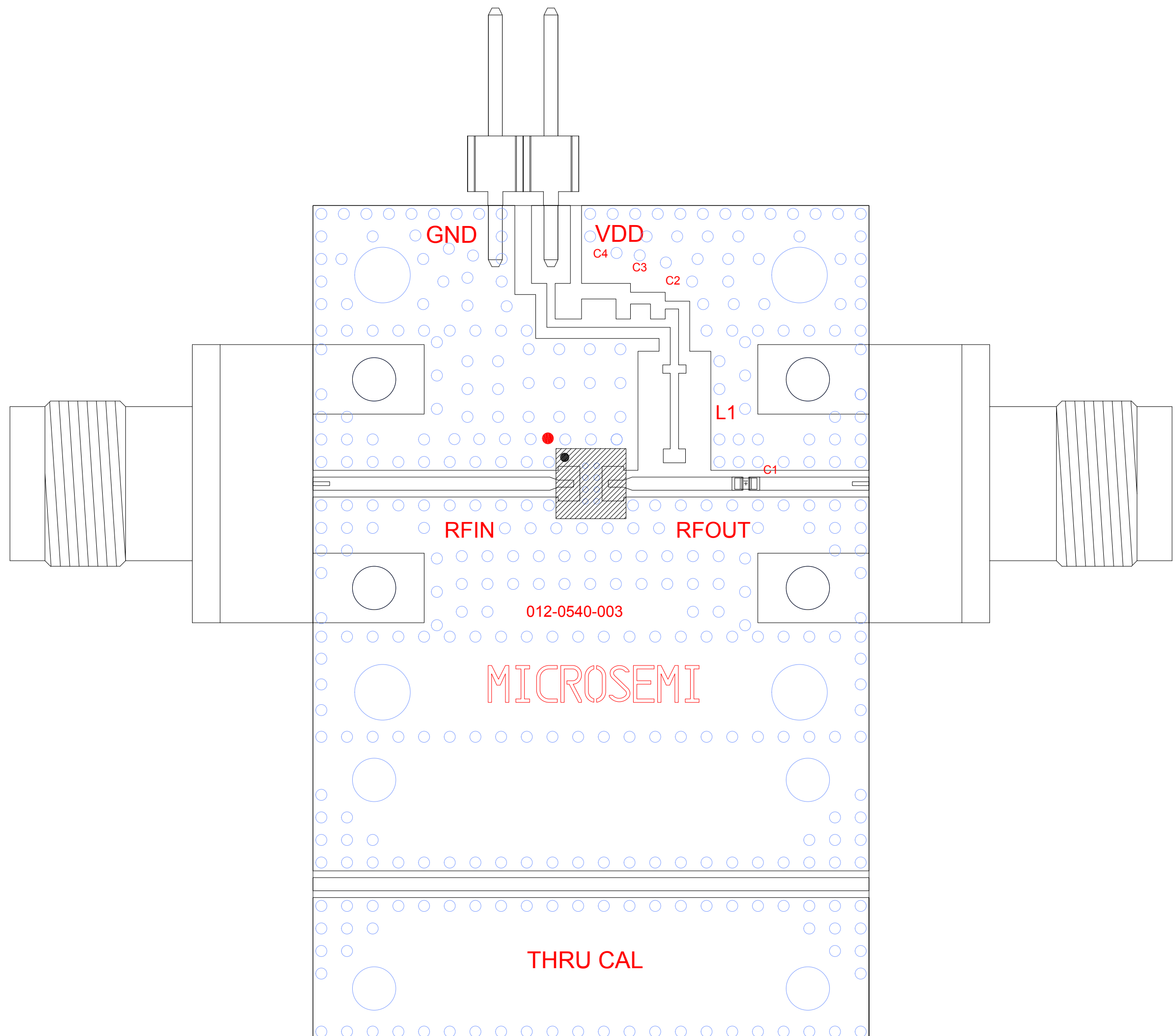






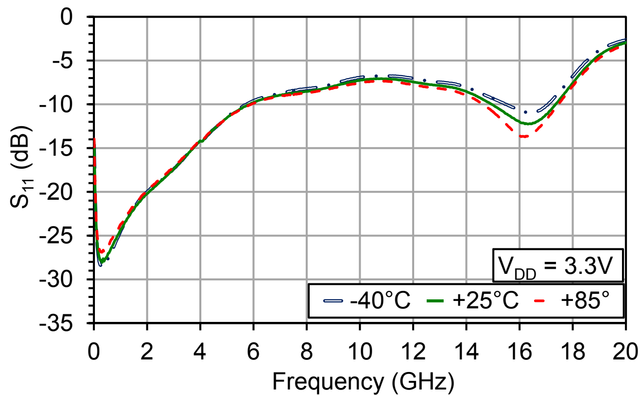
Connectorized Test Fixture

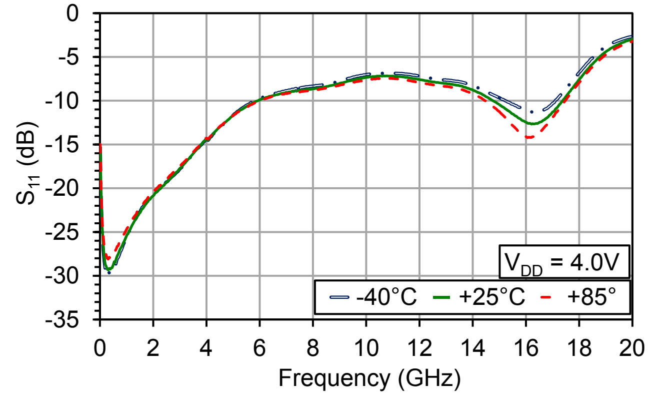
With SMK 2.92mm Connectors

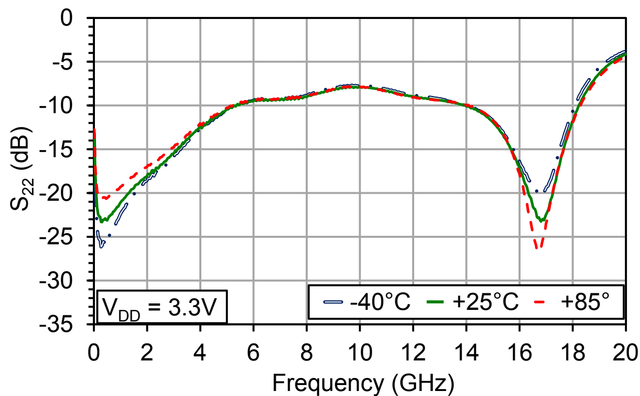


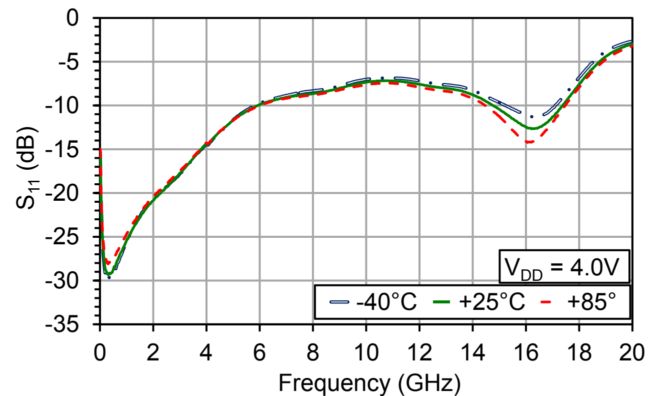
Typical Performance, Connectorized Test Fixture

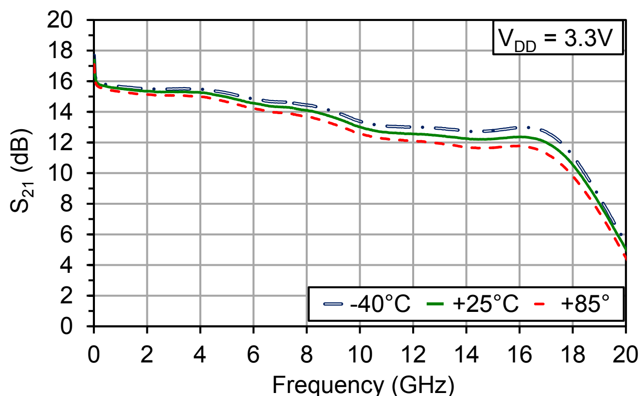
V_{DD} = 4V, I_{DD} = 80mA, T_A = 25°C, bond option = “none” unless otherwise noted

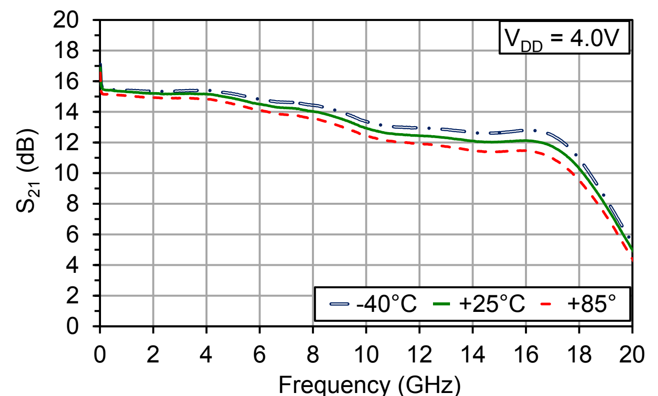






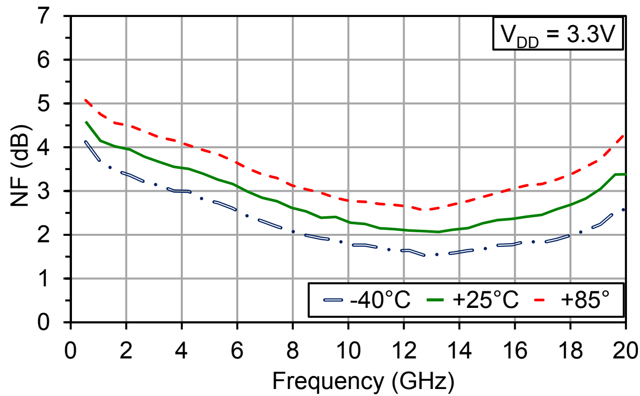


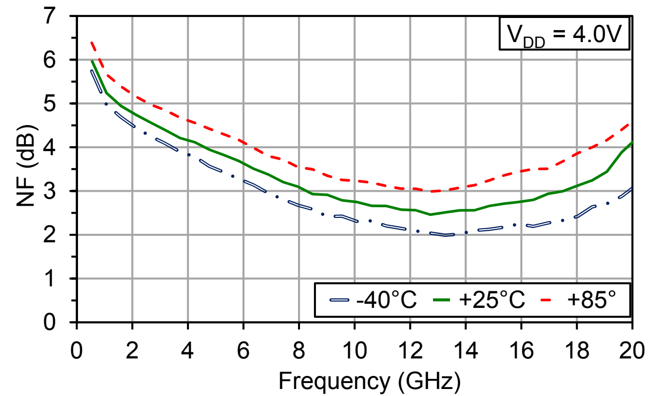


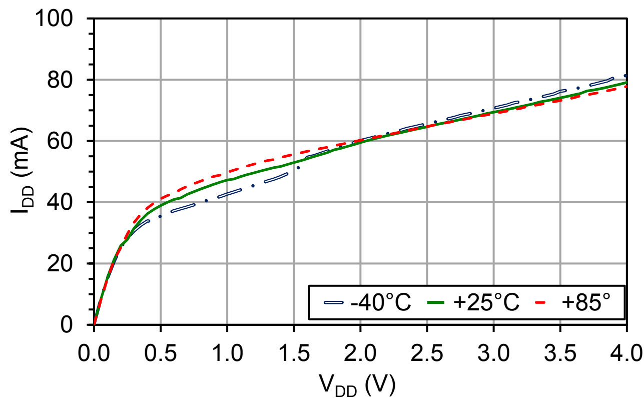


Typical Performance, Connectorized Test Fixture

V_{DD} = 4V, I_{DD} = 80mA, T_A = 25°C, bond option = “none” unless otherwise noted







Chip layout showing pad locations.

All dimensions are in microns. Die thickness is 100 microns. Backside metal is gold, bond pad metal is gold. Refer to Die Handling Application Note MM-APP-0001 (visit www.microsemi.com/mmics).

See Page 2 for example bonding configurations.

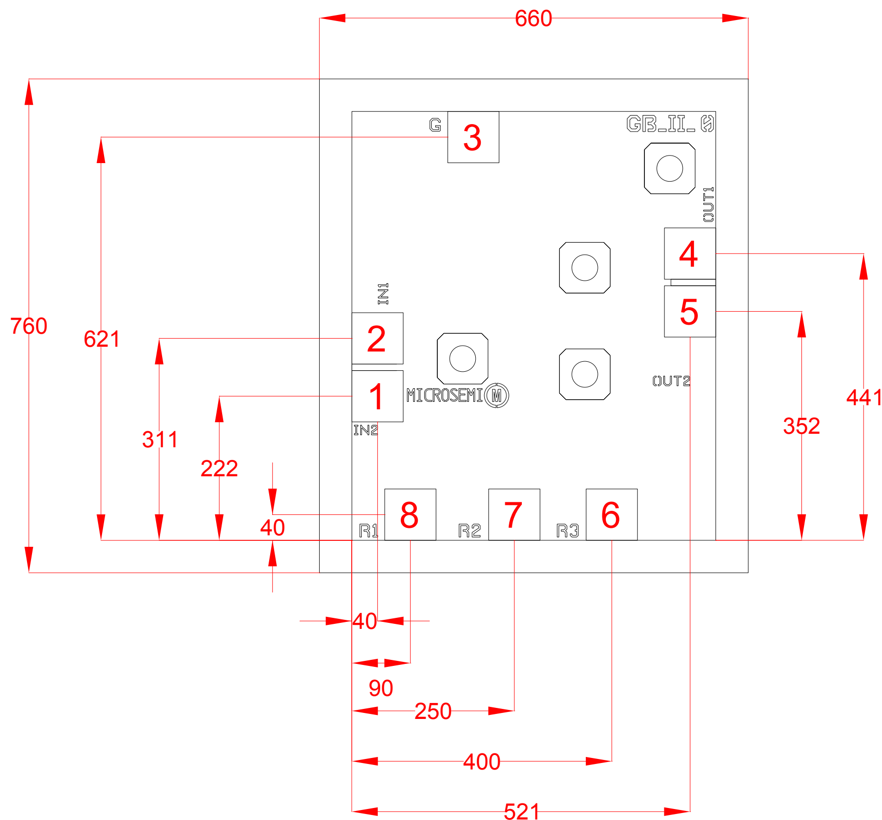


Table 3: Pad Descriptions

Pad #	Description	Pad Dimensions (µm)
1, 2	RF_{IN}, DC coupled	75 x 75
3	Ground	75 x 75
4, 5	RF_{OUT}, coupled	75 x 75
6	R3 bond option	75 x 75
7	R2 bond option	75 x 75
8	R1 bond option	75 x 75
Die Backside	Refer to bonding option on page 2	-

Biasing

MMA016AA is a self-biased device with a single positive supply. Apply V_{DD} RF_{OUT}.

Information contained in this document is proprietary to Microsem. This document may not be modified in any way without the express written consent of Microsemi. Product processing does not necessarily include testing of all parameters. Microsemi reserves the right to change the configuration and performance of the product and to discontinue product at any time.

Microsemi Corporate Headquarters
One Enterprise, Aliso Viejo CA 92656 USA
Within the USA: +1 (949) 380-6100
Sales: +1 (949) 380-6136
Fax: +1 (949) 215-4996

Microsemi Corporation (Nasdaq: MSCC) offers a comprehensive portfolio of semiconductor and system solutions for communications, defense and security, aerospace, and industrial markets. Products include high-performance and radiation-hardened analog mixed-signal integrated circuits, FPGAs, SoCs, and ASICs; power management products; timing and synchronization devices and precise time solutions, setting the world's standard for time; voice processing devices; RF solutions; discrete components; security technologies and scalable anti-tamper products; Power-over-Ethernet ICs and midspans; as well as custom design capabilities and services. Microsemi is headquartered in Aliso Viejo, Calif. and has approximately 3,400 employees globally. Learn more at **www.microsemi.com**.

© 2014 Microsemi Corporation. All rights reserved. Microsemi and the Microsemi logo are trademarks of Microsemi Corporation. All other trademarks and service marks are the property of their respective owners.