Raytheon

RMM2080
2-18 GHz Wideband Variable-Gain Driver Amplifier

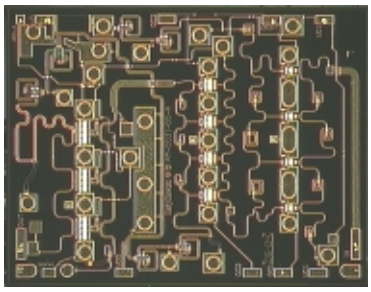
PRODUCT INFORMATION

Description

The Raytheon RMM2080 GaAs MMIC device is a three-stage distributed medium-power amplifier with gain control capability. The circuit incorporates ion-implanted, 0.5-µm gate MESFET devices fabricated on a semi-insulating GaAs substrate. The first two stages are 4-cell distributed amplifiers utilizing dual-gate FETs for improved gain per stage and to facilitate gain control (4x125µm & 4x250µm). The third stage is a 3-cell distributed dual-gate FET amplifier designed for high output power and efficiency (3x500µm). The RMM2080 amplifier is designed for interconnection with microstrip transmission media using fully automatic assembly techniques.

Features

- 2-18 GHz Bandwidth
- 24 dB Typical Gain
- ±2 dB Gain Flatness
- 20 dBm Output Power Typical
- Three Stages of Distributed Amplification
- Gain Control of up to 70 dB range
- Dual-Gate Ion-Implanted 0.5 µm FETs
- Chip Size: 4.14mm x 3.22mm x 0.1mm



Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Positive Drain DC Voltage (+7V typ)	Vd	+8	V
Negative DC Voltage	Vg	-2	V
Simultaneous (Vd-Vg)	Vgd	10	V
Positive DC Current	Id	400	mA
RF Input Power (from 50 Ω source)	P_{IN}(CW)	+8	dBm
Operating Baseplate Temperature	T_{case}	-30 to 85	°C
Storage Temperature Range	$T_{storage}$	-55 to 125	°C
Thermal Resistance (channel to backside)	R_{jc}	22	°C/W

Electrical Characteristics

(At 25°C)
50 Ω system,
Vd=+7 V,
Quiescent current (Idq) =300 mA
GC1, GC2= +1.5 V

Parameter	Min	Typ	Max	Unit
Frequency Range	2	-	18	GHz
Gate Supply Voltage (Vg)[1]		-0.7		Volts
RF Output Power @ -1 dBc		20		dBm
Small Signal Gain	18	24		dB
Gain Flatness vs. Freq.		± 2		dB
Input/Output Return Loss		7		dB

Parameter	Min	Typ	Max	Unit
Gain Control Range	70			dB
Gain Control Voltage, GC1&2[2]	-5		+1.5	Volts

Notes:
1. Typical range of the negative gate voltage is -0.9 to 0.0V to set typical Idq of 300 mA.
2. GC1 and GC2 of +1.5V and VG23=open corresponds to maximum gain and power.

Characteristic performance data and specifications are subject to change without notice.

Raytheon RF Components
362 Lowell Street
Andover, MA 01810

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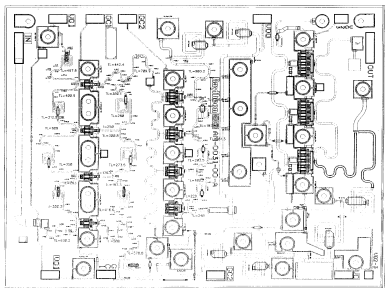
Figure 1
Block Diagram and Circuit Schematic



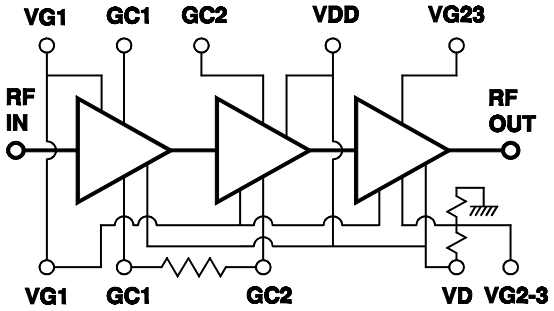


Figure 2
Location and Size of Bonding Pads

Dimensions in inches

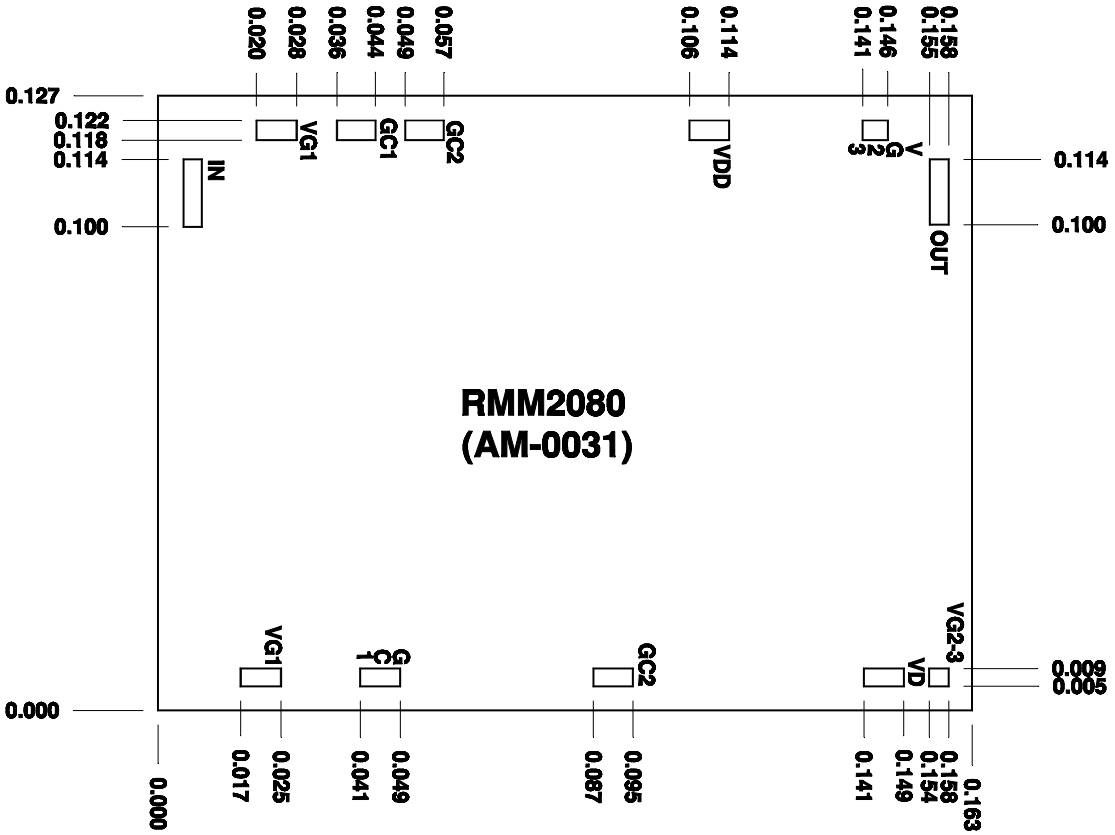


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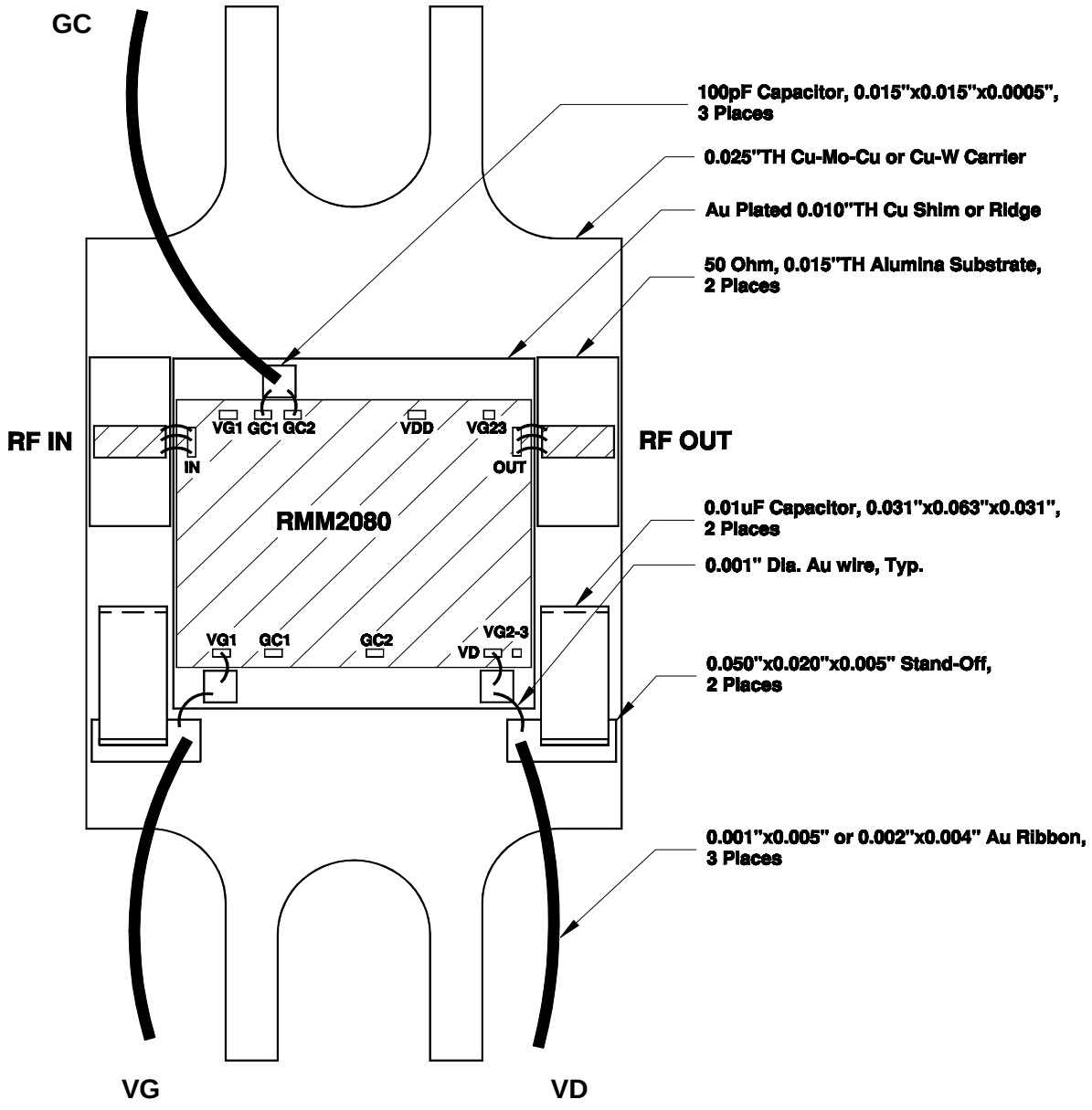
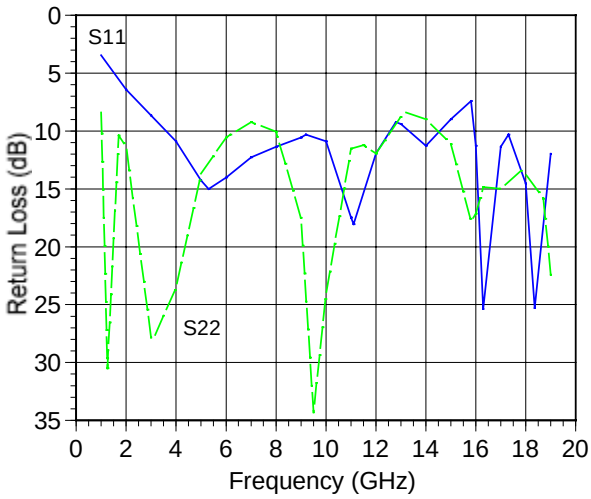
Figure 3
Example of
Assembled Module

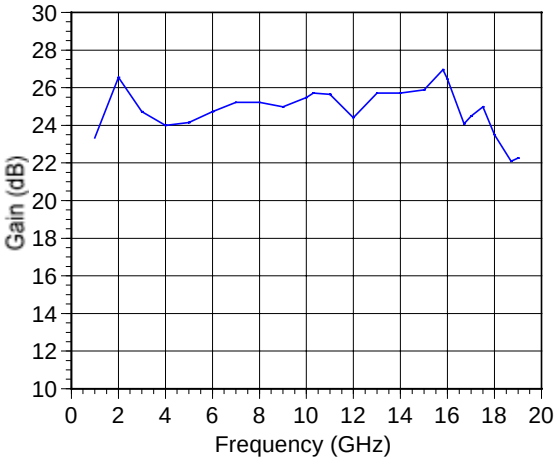


Performance Data

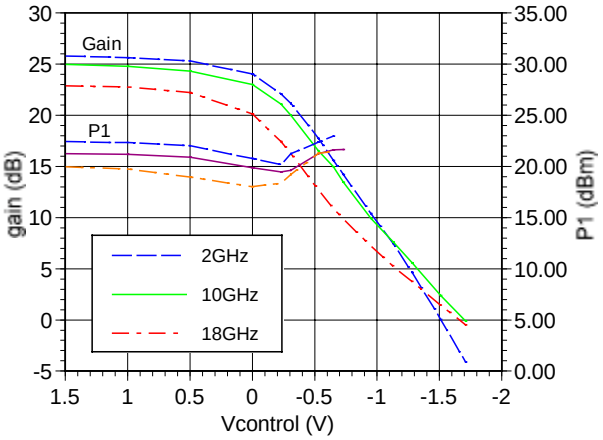
Input & Output Return Loss
Vd=7.0V, Id=0.3A, GC1,2=1.5V



Small Signal Gain
Vd=7.0V, Id=0.3A, GC1,2=1.5V



Gain & Pout vs, Control Voltage
Vd=7.0V, Id=0.3A @ GC1,2=1.5V



The above data is derived from fixtured measurements which include 3 parallel, 1 mil diameter, 15 mil long, gold bond wires connected to the RF input and output.

The Id @ 1 dB compression increases to approximately 0.45 A. The dc supply should be able to support the required current to achieve the above performance.

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