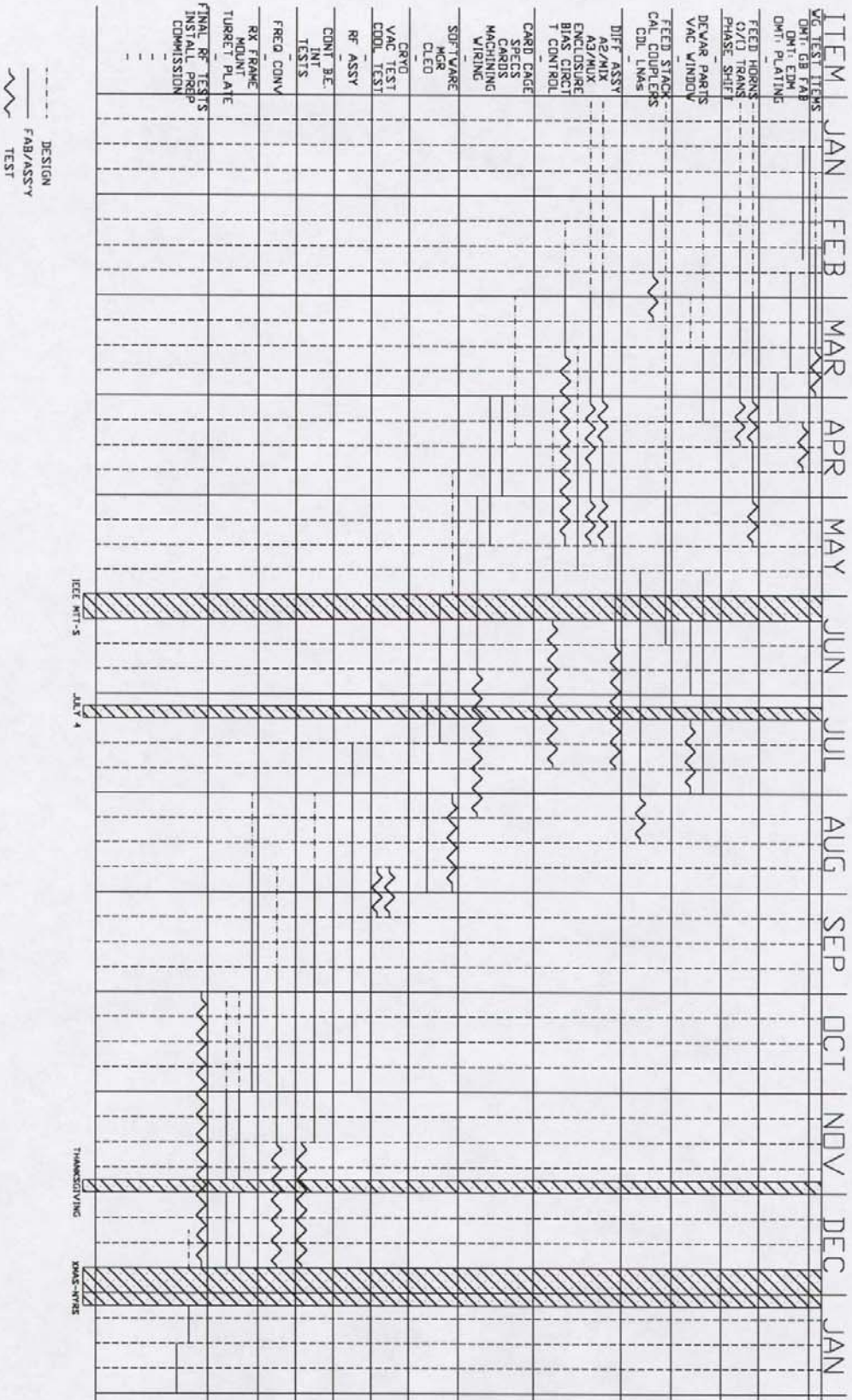


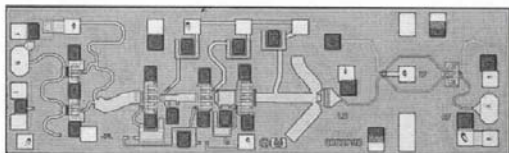




Agilent HMMC-3040

20–43 GHz Double-Balanced Mixer and LO-Amplifier

Data Sheet



Chip Size: 2520 x 730 μm (99.2 x 28.7 mils)
 Chip Size Tolerance: $\pm 10 \mu\text{m}$ (± 0.4 mils)
 Chip Thickness: $127 \pm 15 \mu\text{m}$ (5.0 ± 0.6 mils)

Features

- Both up and downconverting functions
- Harmonic LO mixing capability
- Large bandwidth:
 RF port: 20–43 GHz
 LO port match: DC–43 GHz
 LO amplifier: 20–43 GHz
 IF port: DC–5 GHz
- Repeatable conversion loss:
 9.5 dB typical at 30 GHz
- Low LO drive required
- 50 Ω port matching networks

Description

The HMMC-3040 is a broadband MMIC Double-Balanced Mixer (DBM) with an integrated high-gain LO amplifier. It can be used as either an up-converter or as a down-converter in microwave/millimeter-wave transceivers. If desired, the LO amplifier can be biased to function as a frequency multiplier to enable harmonic mixing of a LO source.

This three-port device has input and output matching circuitry for use in 50 ohm environments. The MMIC provides repeatable conversion loss (requiring no tuning), thereby making it suitable for automated assembly processes.

Absolute Maximum Ratings^[1]

Symbol	Parameters/Conditions	Units	Min.	Max.
$V_{D1,2}$	Drain Supply Voltages	V		5
$V_{G1,2}$	Gate Supply Voltages	V	-3.0	0.5
I_{DD}	Total Drain Current	mA		400
P_{in}	RF Input Power	dBm		21
T_{ch}	Channel Temperature ^[2]	$^{\circ}\text{C}$		160
T_A	Backside Ambient Temperature	$^{\circ}\text{C}$	-55	+75
T_{st}	Storage Temperature	$^{\circ}\text{C}$	-65	+165
T_{max}	Max. Assembly Temperature	$^{\circ}\text{C}$		300

Notes:

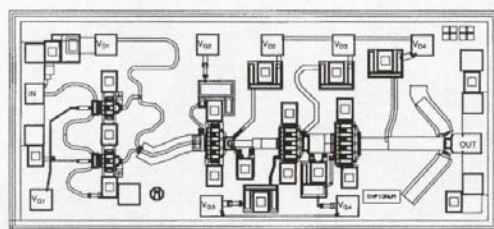
1. Absolute maximum ratings for continuous operation unless otherwise noted.
2. Refer to DC Specifications/Physical Properties table for derating information.



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Agilent HMMC-5040 20–40 GHz Amplifier Data Sheet



Chip Size: 1720 x 760 μm (67.7 x 29.9 mils)
 Chip Size Tolerance: $\pm 10 \mu\text{m}$ (± 0.4 mils)
 Chip Thickness: $127 \pm 15 \mu\text{m}$ (5.0 ± 0.6 mils)
 Pad Dimensions: $80 \times 80 \mu\text{m}$ (3.1×3.1 mils)

Features

- **Large bandwidth:**
20–44 GHz typical
21–40 GHz specified
- **High gain:**
22 dB typical
- **Saturated output power:**
21 dBm typical
- **Supply bias:**
 ≤ 4.5 volts @ ≤ 300 mA

Description

The HMMC-5040 is a high-gain broadband MMIC amplifier designed for both military applications and commercial communication systems. This four stage amplifier has input and output matching circuitry for use in 50 ohm environments. It is fabricated using a PHEMT integrated circuit structure that provides exceptional broadband performance. The backside of the chip is both RF and DC ground. This helps simplify the assembly process and reduces assembly related performance variations and costs. This MMIC is a cost effective alternative to hybrid (discrete-FET) amplifiers that require complex tuning and assembly processes.

Absolute Maximum Ratings^[1]

Symbol	Parameters/Conditions	Units	Min.	Max.
$V_{D1,2-3-4}$	Drain Supply Voltages	V		5
$V_{G1,2-3-4}$	Gate Supply Voltages	V	-3.0	0.5
I_{DD}	Total Drain Current	mA		400
P_{in}	RF Input Power	dBm		21
T_{ch}	Channel Temperature ^[2]	$^{\circ}\text{C}$		+160
T_A	Backside Ambient Temp.	$^{\circ}\text{C}$	-55	+75
T_{STG}	Storage Temperature	$^{\circ}\text{C}$	-65	+165
T_{max}	Maximum Assembly Temp.	$^{\circ}\text{C}$		+300

Notes:

1. Absolute maximum ratings for continuous operation unless otherwise noted.
2. Refer to DC Specifications/Physical Properties table for derating information.



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