# XX1007-BD

## Doubler
## 13.5-17.0/27.0-34.0 GHz

Rev. V1

Mimix Broadband

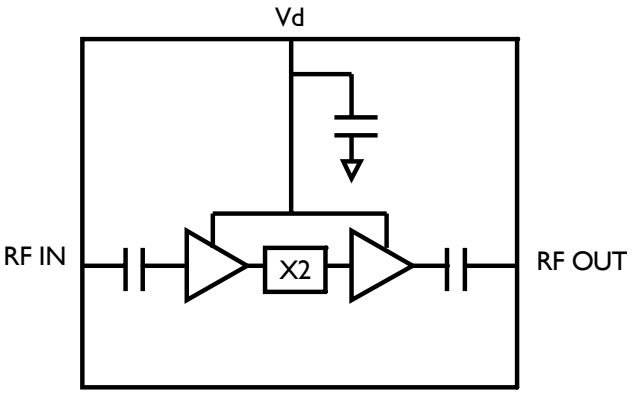
### Features

- Integrated Gain, Doubler and Driver Stages
- Self-biased Architecture
- +21.0 dBm Output Saturated Power
- 40.0 dBc Fundamental Suppression
- On-Chip ESD Protection
- 100% On-Wafer RF, DC & Output Power Testing
- 100% Visual Inspection to MIL-STD-883 Method 2010
- RoHS* Compliant and 260°C Reflow Compatible

### Description

M/A-COM Tech's 13.5-17.0 / 27.0-34.0 GHz GaAs MMIC doubler integrates a gain stage, passive doubler and driver amplifier onto a single device. The XX1007-BD has a self-biased architecture requiring a single positive supply (+5V) only and integrated on-chip bypassing capacitor eliminating the need for external capacitor. This MMIC uses M/A -COM Tech's GaAs PHEMT device model technology, and is based upon electron beam lithography to ensure high repeatability and uniformity. The chip has integrated ESD structures for protection and surface passivation to protect and provide a rugged part with backside via holes and gold metallization to allow either a conductive epoxy or eutectic solder die attach process. This device is well suited for Millimeter wave Point-to-Point Radio, LMDS, SATCOM and VSAT applications.

### Functional Block Diagram




### Absolute Maximum Ratings

| Parameter | Absolute Max. |
|---|---|
| Supply Voltage (Vd) | +6.0 VDC |
| Supply Current (Id) | 300 mA |
| Gate Bias Voltage (Vg) | +0.3 VDC |
| Input Power (RF Pin) | TBD |
| Storage Temperature (Tstg) | -65 to +165 ºC |
| Operating Temperature (Ta) | -55 to MTTF Table[1] |
| Channel Temperature (Tch) | MTTF Table[1] |

(1) Channel temperature directly affects a device's MTTF. It is recommended to keep channel temperature as low as possible to maximize lifetime.

### Ordering Information

| Part Number | Package |
|---|---|
| XX1007-BD-000V | "V" - vacuum release gel paks |
| XX1007-BD-EV1 | evaluation module |





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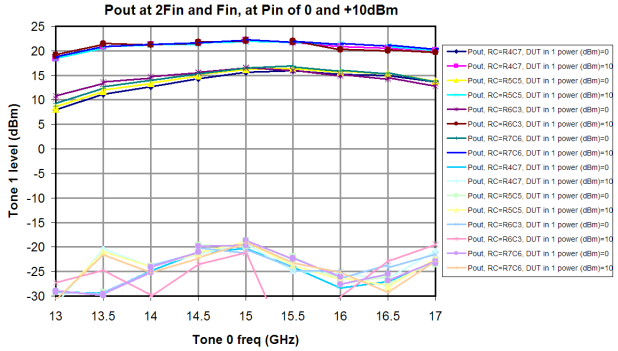
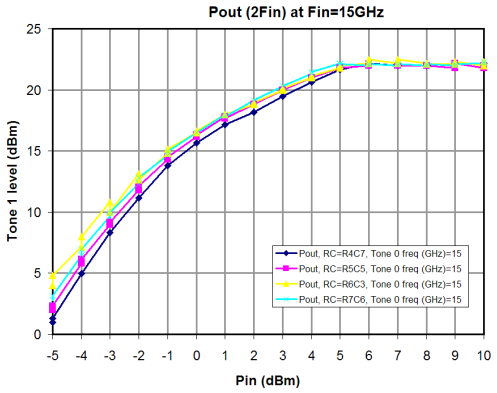
Visit www.macomtech.com for additional data sheets and product information.

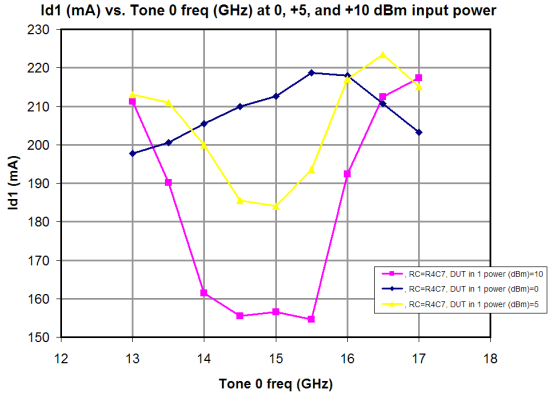
## Electrical Specifications: 13.5-17 GHz (fin) (Ambient Temperature T = 25°C)

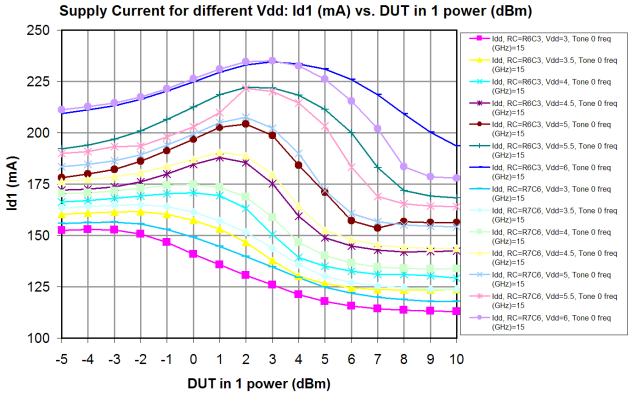
| Parameter | Units | Min. | Typ. | Max. |
|---|---|---|---|---|
| Output Frequency Range (fout) | GHz | 27.0 | - | 34.0 |
| Input Return Loss (S11) | dB | - | -8.0 | - |
| Output Return Loss (S22) | dB | - | -10.0 | - |
| Fundamental Level at the Output | dBc | -28.0 | -35.0 | - |
| RF Input Power (RF Pin) | dBm | - | +8.0 | - |
| Output Power at 8.0 dBm Pin (Pout) | dBm | +16.0 | +21.0 | - |
| Drain Bias Voltage (Vd) | VDC | - | +5.0 | +5.5 |
| Supply Current (Id1,2,3) (Vd=5.0V Typical) | mA | - | 200 | 240 |

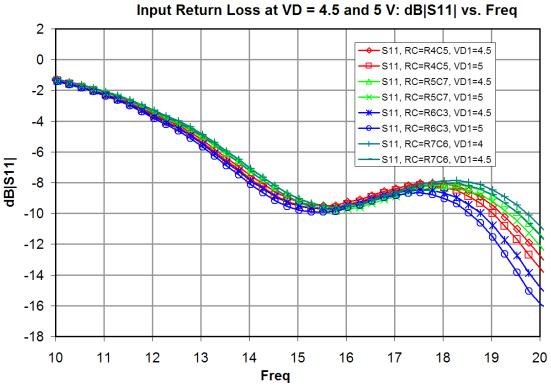
## Typical Performance Curves

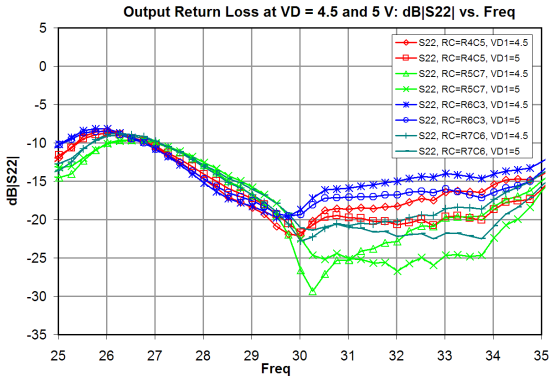


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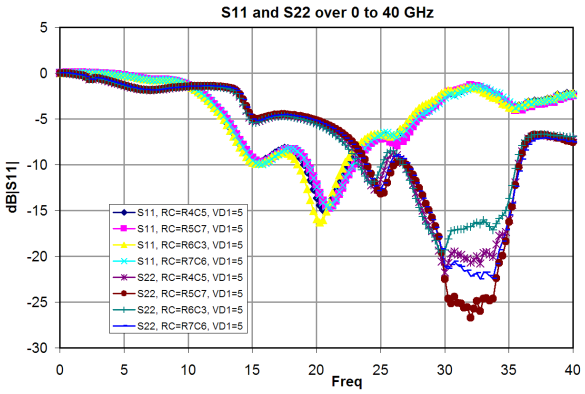
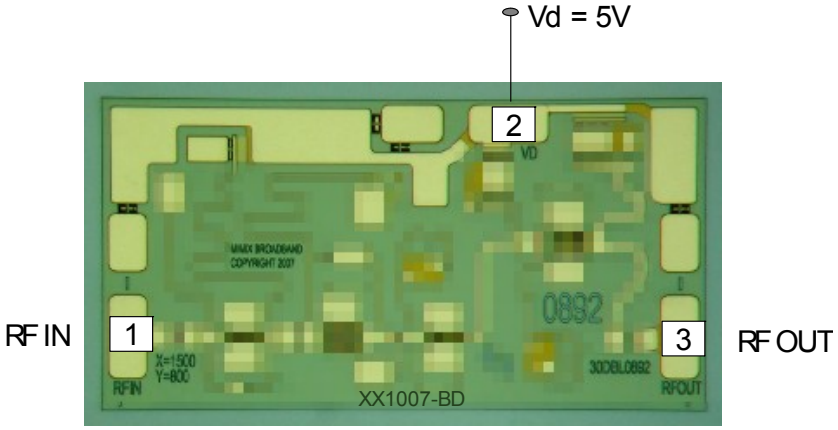
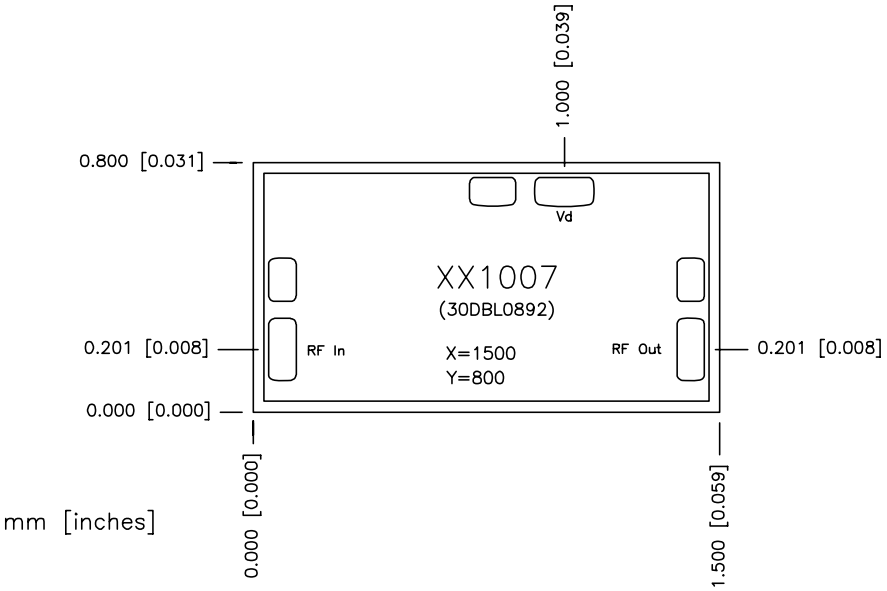


## Bias Arrangement




## Physical Dimensions



## MTTF Tables (TBD)

These numbers were calculated based on accelerated life test information and thermal model analysis received from the fabricating foundry.

| Backplate Temperature | Channel Temperature | Rth | MTTF Hours | FITs |
|---|---|---|---|---|
| 55 deg Celsius | deg Celsius | C/W | E+ | E+ |
| 75 deg Celsius | deg Celsius | C/W | E+ | E+ |
| 95 deg Celsius | deg Celsius | C/W | E+ | E+ |

**Bias Conditions:** Vd=5.0V, Id=200mA

## Handling Procedures

Please observe the following precautions 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 class 2 devices.