

## GaAs MMIC x2 ACTIVE FREQUENCY MULTIPLIER MODULE, 18 - 29 GHz OUTPUT

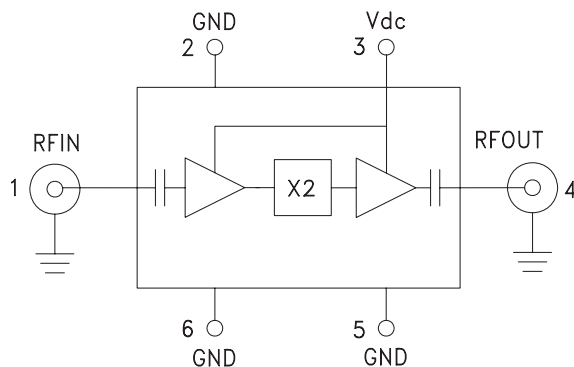


### Typical Applications

The HMC-C032 is suitable for:

- Clock Generation Applications:  
SONET OC-192 & SDH STM-64
- Point-to-Point & VSAT Radios
- Test Instrumentation
- Military & Space

### Functional Diagram



### Features

- High Output Power: +16 dBm
- Low Input Power Drive: 0 to +6 dBm
- Fo Isolation: >20 dBc @ Fout= 24 GHz
- 100 KHz SSB Phase Noise: -132 dBc/Hz
- Single Supply: +5V@ 82 mA
- Hermetically Sealed Module
- Field Replaceable 2.92mm Connectors
- 55 to +85°C Operating Temperature

### General Description

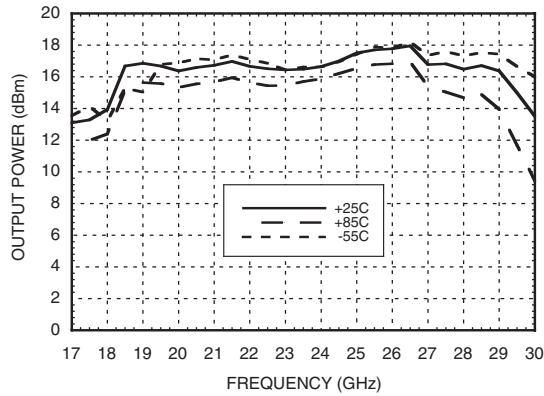
The HMC-C032 is a x2 active broadband frequency multiplier utilizing GaAs PHEMT technology in a miniature hermetic module. When driven by a +3 dBm signal, the multiplier provides +16 dBm typical output power from 18 to 29 GHz. The Fo and 3Fo isolations are >20 dBc at 24 GHz. The HMC-C032 is ideal for use in LO multiplier chains for Pt to Pt & VSAT Radios yielding reduced parts count vs. traditional approaches. The low additive SSB Phase Noise of -132 dBc/Hz at 100 kHz offset helps maintain good system noise performance.

### Electrical Specifications, $T_A = +25^\circ \text{C}$ , $V_{dc} = +5\text{V}$ , 3 dBm Drive Level

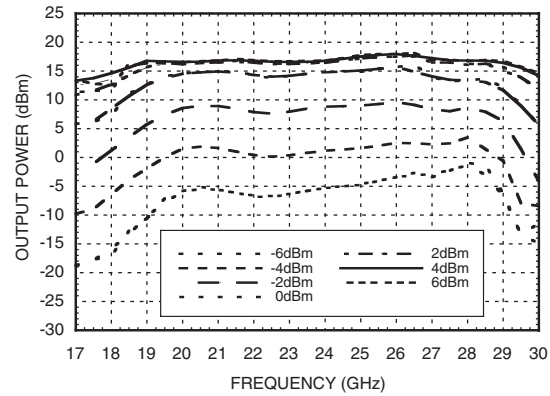
| Parameter                                    | Min.     | Typ. | Max. | Units  |
|----------------------------------------------|----------|------|------|--------|
| Frequency Range, Input                       | 9 - 14.5 |      |      | GHz    |
| Frequency Range, Output                      | 18 - 29  |      |      | GHz    |
| Output Power                                 | 11       | 16   |      | dBm    |
| Fo Isolation (with respect to output level)  |          | 20   |      | dBc    |
| 3Fo Isolation (with respect to output level) |          | 20   |      | dBc    |
| Input Return Loss                            |          | 10   |      | dB     |
| Output Return Loss                           |          | 10   |      | dB     |
| SSB Phase Noise (100 kHz Offset)             |          | -132 |      | dBc/Hz |
| Supply Current                               |          | 82   |      | mA     |

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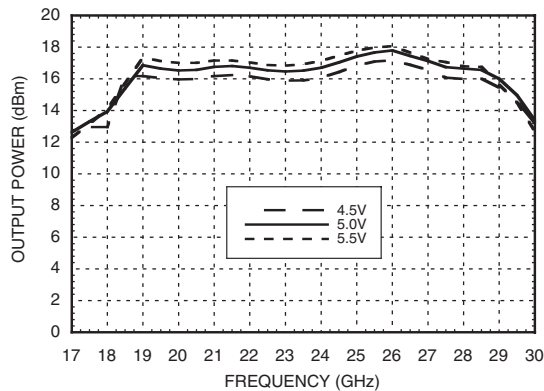
**Output Power vs.  
Temperature @ 3 dBm Drive Level**



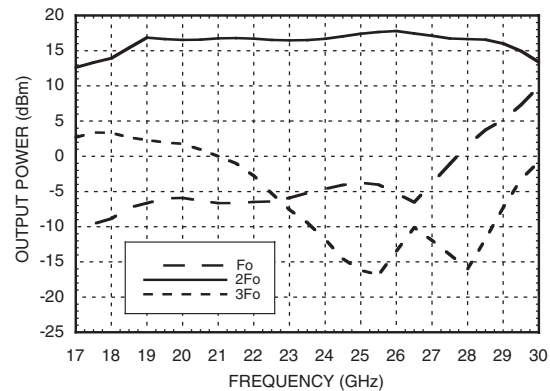
**Output Power vs. Drive Level**



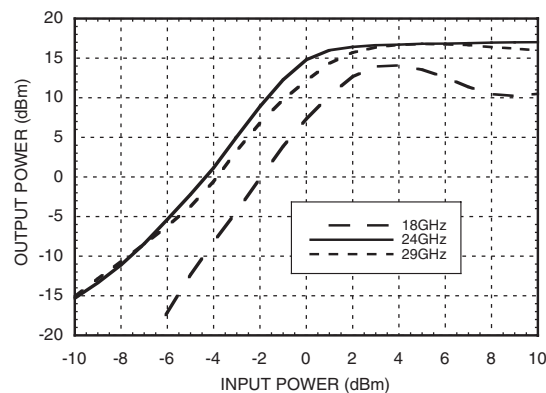
**Output Power vs.  
Supply Voltage @ 3 dBm Drive Level**



**Isolation @ 3 dBm Drive Level**

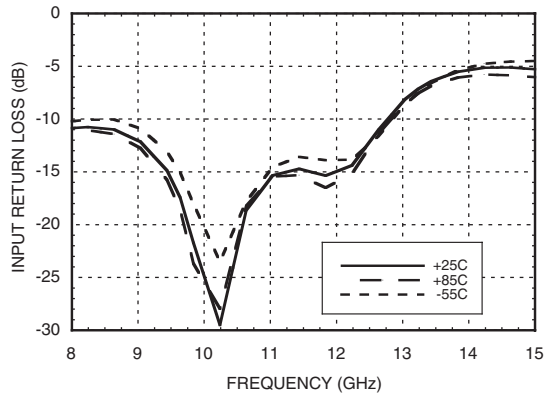


**Output Power vs. Input Power**

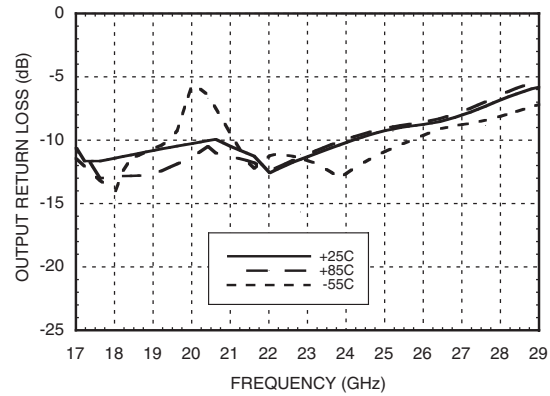


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**Input Return Loss vs.  
Temperature @ 0 dBm Drive Level**



**Output Return Loss vs.  
Temperature @ 0 dBm Drive Level**



**Absolute Maximum Ratings**

|                       |                |
|-----------------------|----------------|
| RF Input (Vdd = +5V)  | +13 dBm        |
| Supply Voltage (Vdd)  | +6.0 Vdc       |
| Storage Temperature   | -65 to +150 °C |
| Operating Temperature | -55 to +85 °C  |

**Typical Supply Current vs. Vdd**

| Vdd (Vdc) | Idd (mA) |
|-----------|----------|
| 4.5       | 82       |
| 5.0       | 82       |
| 5.5       | 83       |

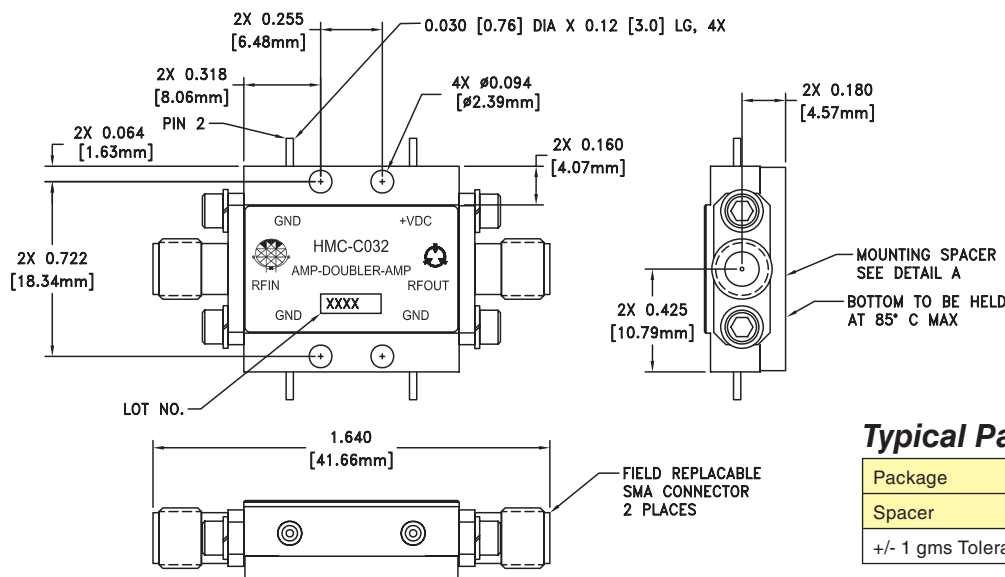
Note:  
Multiplier will operate over full voltage range shown above.



**ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS**

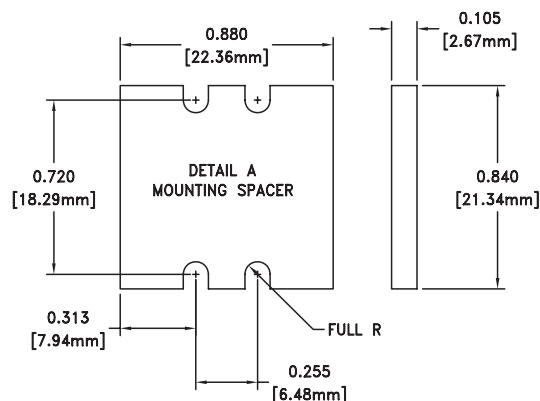
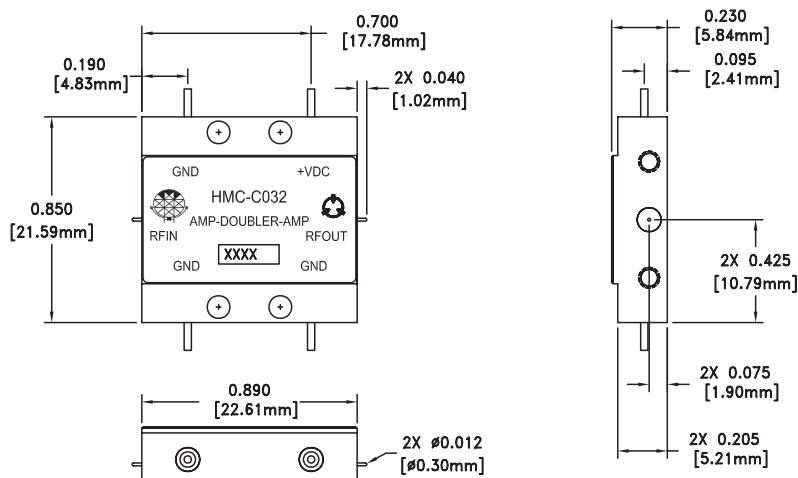
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**Outline Drawing**



**Typical Package Weight**

|                     |          |
|---------------------|----------|
| Package             | 18.7 gms |
| Spacer              | 3.3 gms  |
| +/- 1 gms Tolerance |          |

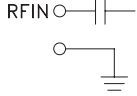
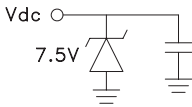
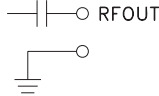


**NOTES:**

1. PACKAGE, LEADS, COVER MATERIAL: KOVAR
2. PLATING: ELECTROLYTIC GOLD 50 MICROINCHES MIN., OVER ELECTROLYTIC NICKEL 75 MICROINCHES MIN.
3. MOUNTING SPACER: NICKEL PLATED ALUMINUM
4. ALL DIMENSIONS ARE IN INCHES [MILLIMETERS]
5. TOLERANCES: 0.010 [0.25] UNLESS OTHERWISE SPECIFIED

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**Pin Description**

| Pin Number | Function            | Description                                                                                                        | Interface Schematic                                                                 |
|------------|---------------------|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 1          | RFIN and RF Ground  | Pin is AC coupled and matched to 50 Ohms from 9 - 14.5 GHz. RFIN uses a female 2.92mm field replaceable connector. |  |
| 2, 5, 6    | GND                 | One of these pins must be connected to power supply ground.                                                        |  |
| 3          | Vdc                 | Power supply voltage for the amplifier includes 7.5V zener diode for over voltage and negative voltage protection  |  |
| 4          | RFOUT and RF Ground | Pin is AC coupled and matched to 50 Ohms from 18 - 29 GHz. RFOUT uses a female 2.92mm field replaceable connector. |  |

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**Notes:**