

## GaAs MMIC x2 ACTIVE FREQUENCY MULTIPLIER MODULE, 24 - 33 GHz OUTPUT

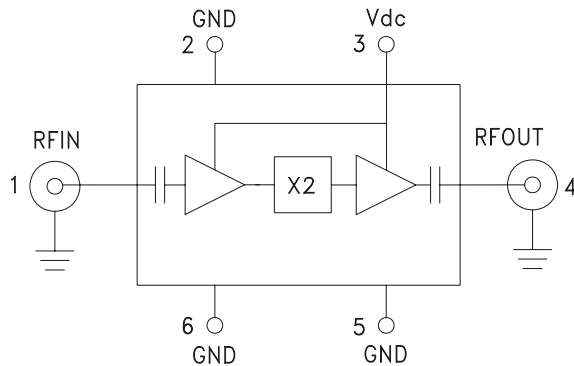


### Typical Applications

The HMC-C033 is suitable for:

- Clock Generation Applications:  
SONET OC-192 & SDH STM-64
- Point-to-Point & VSAT Radios
- Military EW/Radar
- Space

### Functional Diagram



### Features

- High Output Power: +17 dBm
- Low Input Power Drive: 0 to +6 dBm
- 100 KHz SSB Phase Noise: -132 dBc/Hz
- Single Supply: +5V@ 81 mA
- Hermetically Sealed Module
- Field Replaceable 2.92mm Connectors
- 55° to +85°C Operating Temperature

### General Description

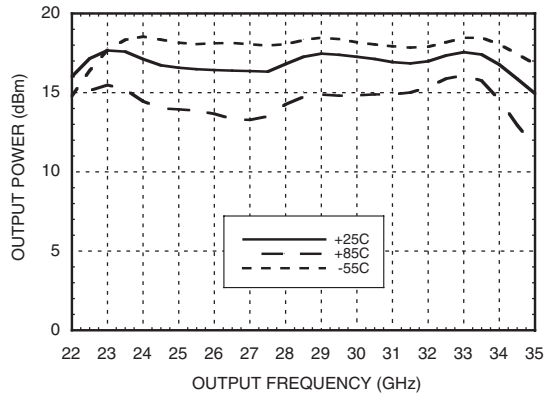
The HMC-C033 is a x2 active broadband frequency multiplier utilizing GaAs PHEMT technology in a miniature hermetic module. When driven by a 3 dBm signal, the multiplier provides +17 dBm typical output power from 24 to 33 GHz. The Fo and 3Fo isolations are >20 dBc and >30 dBc respectively at 28 GHz with respect to output signal level. This frequency multiplier features DC blocked I/O's, and 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, $T_A = +25^\circ C$ , $V_{dc} = +5V$ , 3 dBm Drive Level

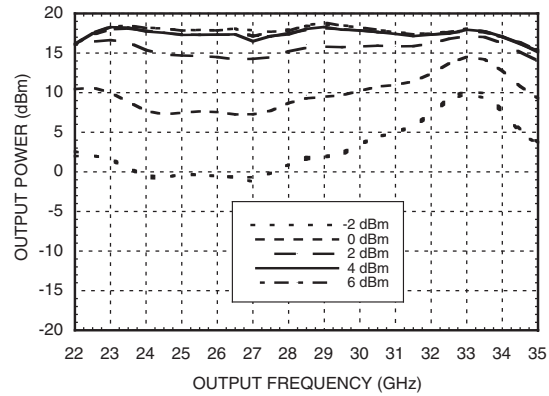
Parameter	Min.	Typ.	Max.	Units
Frequency Range, Input	12 - 16.5			GHz
Frequency Range, Output	24 - 33			GHz
Output Power	14	17		dBm
Fo Isolation (with respect to output level)		20		dBc
3Fo Isolation (with respect to output level)		30		dBc
Input Return Loss		13		dB
Output Return Loss		20		dB
SSB Phase Noise (100 kHz Offset)		-132		dBc/Hz
Supply Current		81		mA

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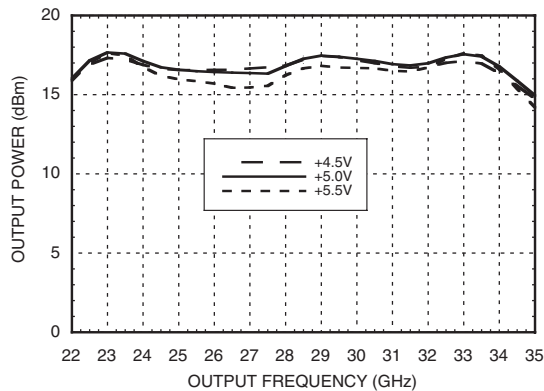
**Output Power vs. Temperature @ 3 dBm Drive Level**



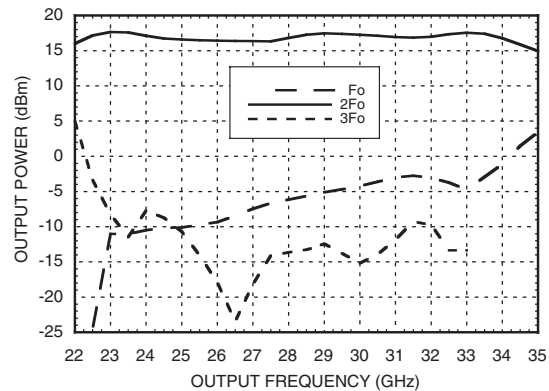
**Output Power vs. Drive Level**



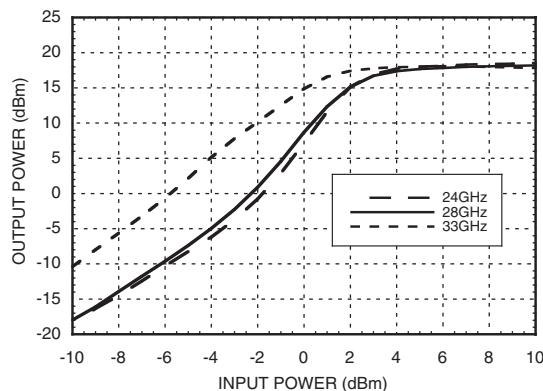
**Output Power vs. Supply Voltage @ 3 dBm Drive Level**



**Isolation @ 3 dBm Drive Level**

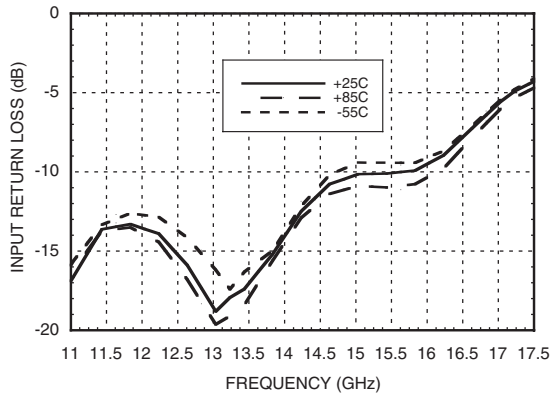


**Output Power vs. Input Power**

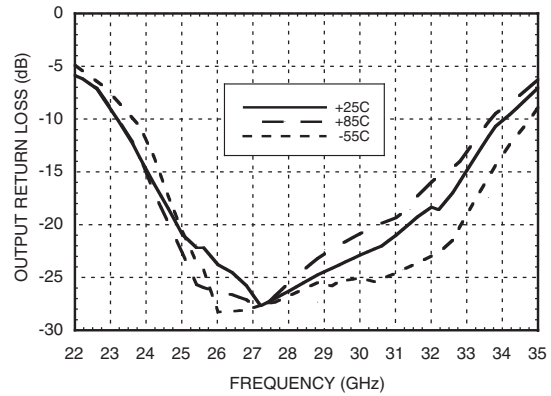


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**Input Return Loss vs. Temperature @ 0 dBm Drive Level**



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



**Absolute Maximum Ratings**

RF Input (Vdc = +5V)	+13 dBm
Bias Supply Voltage (Vdc)	+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	81
5.0	81
5.5	81

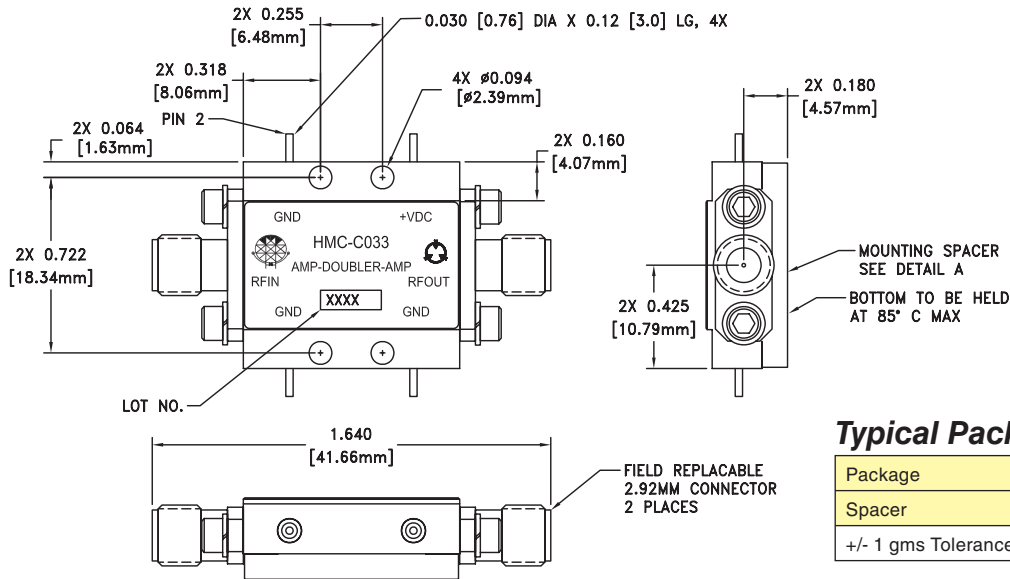
Note:  
Multiplier will operate over full voltage range shown above.



**ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS**

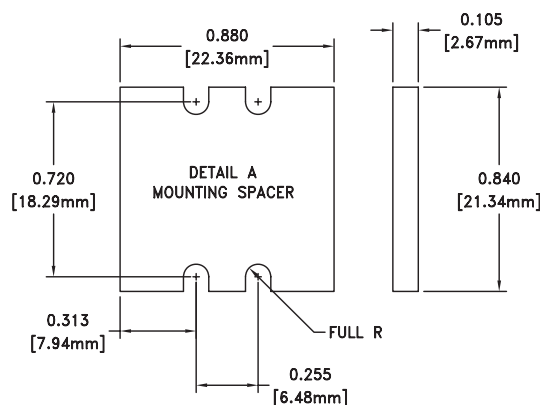
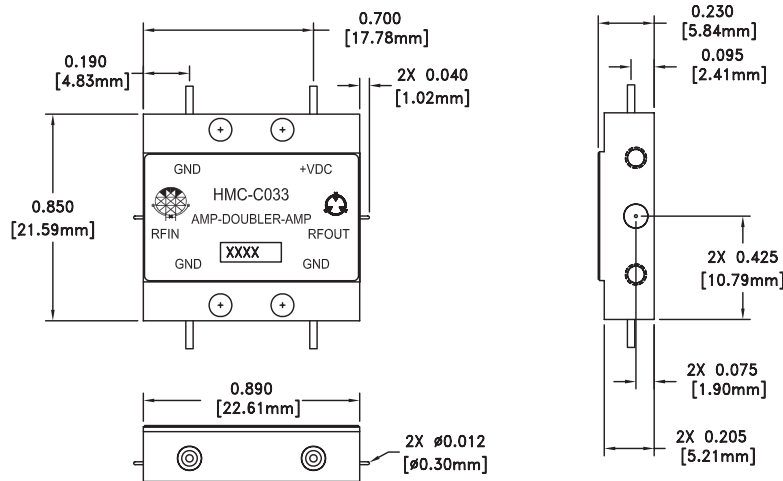
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**Outline Drawing**



**Typical Package Weight**

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



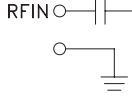

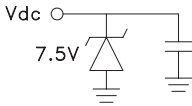
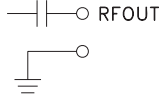
**NOTES:**

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

For price, delivery, and to place orders, please contact Hittite Microwave Corporation:  
20 Alpha Road Chelmsford, MA 01824 Phone: 978-250-3343 Fax: 978-250-3373  
Order Online at [www.hittite.com](http://www.hittite.com)

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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 12 - 16.5 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 a 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 24 - 33 GHz. RFOUT uses a female 2.92mm field replaceable connector.	

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**Notes:**