

## GaAs MMIC x2 ACTIVE FREQUENCY MULTIPLIER, 22 - 42 GHz OUTPUT

### Typical Applications

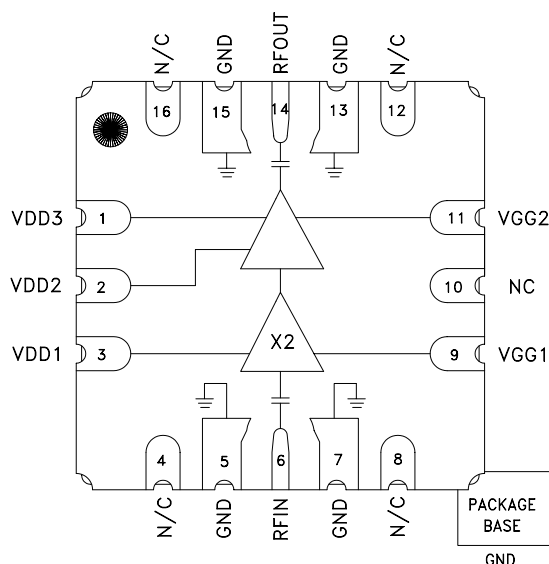
The HMC8342LS6 is ideal for:

- Clock Generation Applications:  
OC-768 & SDM STM-256
- Point-to-Point & VSAT Radios
- Test Instrumentation
- Military & Space

### Features

- High Output Power: +17 dBm
- Low Input Power Drive: 0 to +10 dBm
- Fo Isolation: 30dBc @ Fout = 30 GHz
- 16 Lead 6x6mm LCC Package: 36mm<sup>2</sup>

### Functional Diagram



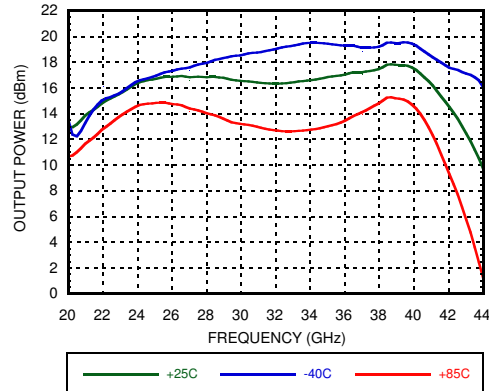
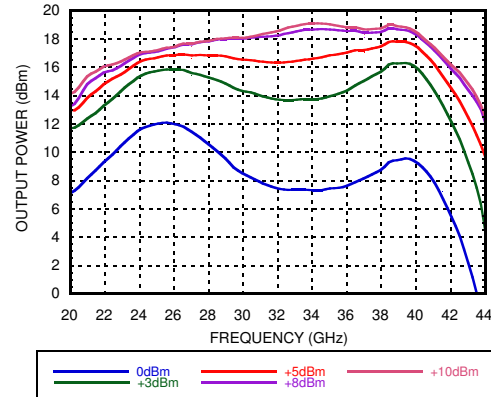
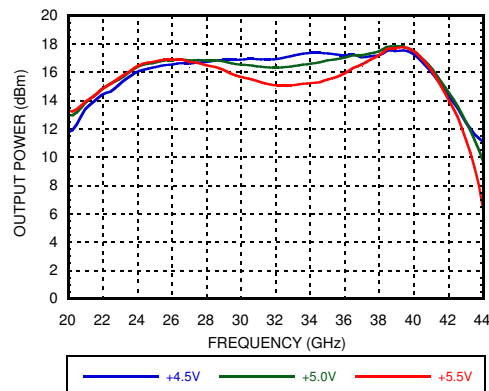
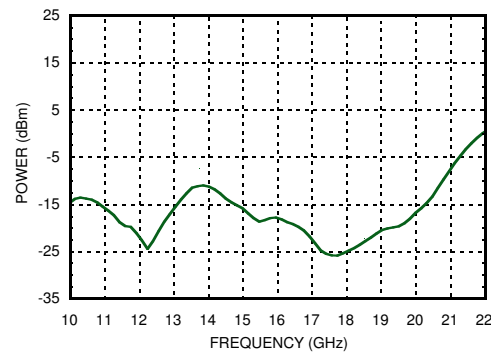
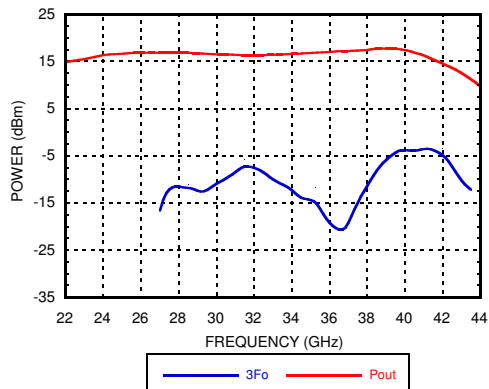
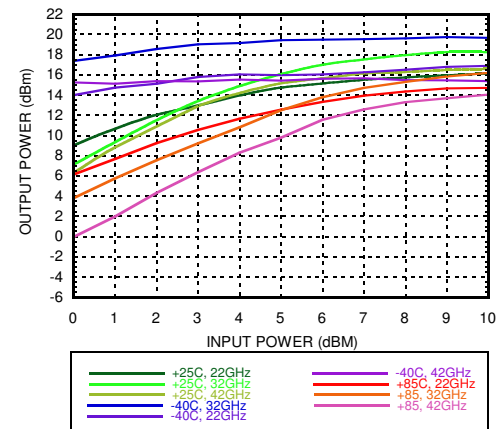
### General Description

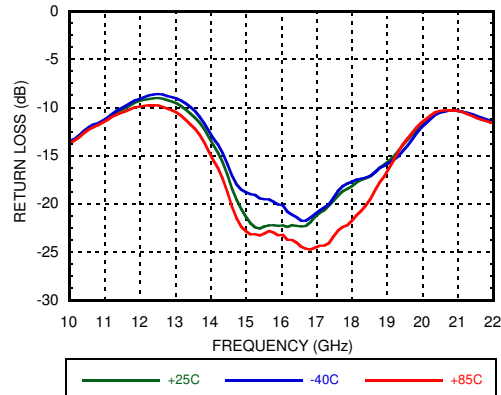
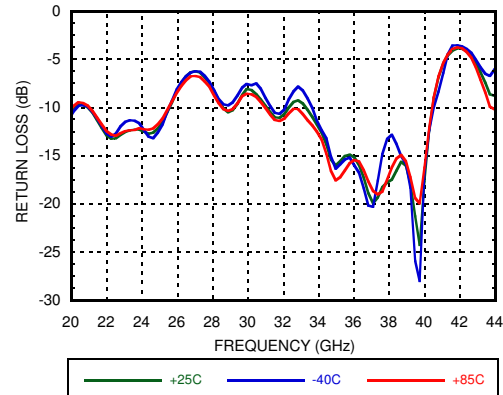
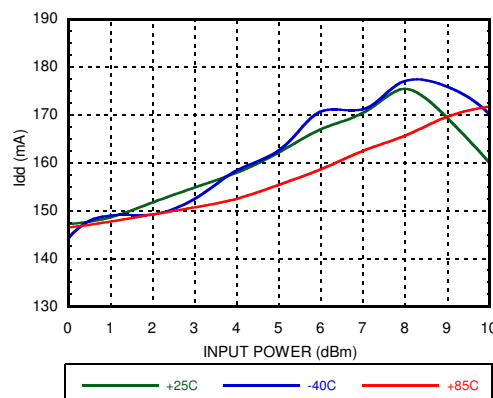
The HMC8342LS6 is a x2 active broadband frequency multiplier utilizing GaAs PHEMT technology. When driven by a +5 dBm signal, the multiplier provides +17 dBm typical output power from 22 to 42 GHz and the Fo and 3Fo isolations are 30 dBc and 25 dBc respectively at 30 GHz. The HMC8342LS6 is ideal for use in LO multiplier chains for Point to Point and VSAT radios yielding reduced parts count versus traditional design approaches.

### Electrical Specifications

$T_A = -40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ , Vdd1, 2, 3 = +5V, Vgg1 = -1.25V, Vgg2 = -0.8V, 5 dBm Drive Level

| Parameter                                    | Min. | Typ.    | Max. | Units |
|----------------------------------------------|------|---------|------|-------|
| Frequency Range, Input                       |      | 11 - 21 |      | GHz   |
| Frequency Range, Output                      |      | 22 - 42 |      | GHz   |
| Output Power                                 | 7    | 17      |      | dBm   |
| Fo Isolation (with respect to output level)  |      | 30      |      | dBc   |
| 3Fo Isolation (with respect to output level) |      | 25      |      | dBc   |
| Input Return Loss                            |      | 20      |      | dB    |
| Output Return Loss                           |      | 23      |      | dB    |
| Supply Current (Idd Total)                   |      | 175     |      | mA    |

**GaAs MMIC x2 ACTIVE FREQUENCY  
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**Output Power vs.  
Temperature @ 5 dBm Drive Level**

**Output Power vs. Drive Level**

**Output Power vs.  
Supply Voltage @ 5 dBm Drive Level**

**Fo Isolation @ 5 dBm Drive Level**

**Pout vs. 3Fo Isolation @ 5dBm  
Drive Level**

**Output Power vs. Input Power**


**GaAs MMIC x2 ACTIVE FREQUENCY  
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**Input Return Loss vs. Temperature**

**Output Return Loss vs. Temperature**

**Supply Current vs. Input Power**

**Absolute Maximum Ratings**

|                                            |                |
|--------------------------------------------|----------------|
| RF Input (Vdd1, 2, 3 = +5V)                | +10 dBm        |
| Supply Voltage (Vdd1,2, 3)                 | +6 Vdc         |
| Channel Temperature                        | 175 °C         |
| Nominal Channel Temperature (T = 85 °C)    | 154 °C         |
| Thermal Resistance (channel to die bottom) | 79 °C/W        |
| Storage Temperature                        | -65 to +150 °C |
| Operating Temperature                      | -40 to +85 °C  |
| ESD Sensitivity (HBM)                      | 0B             |
| ESD Sensitivity (FICDM)                    | C0B            |

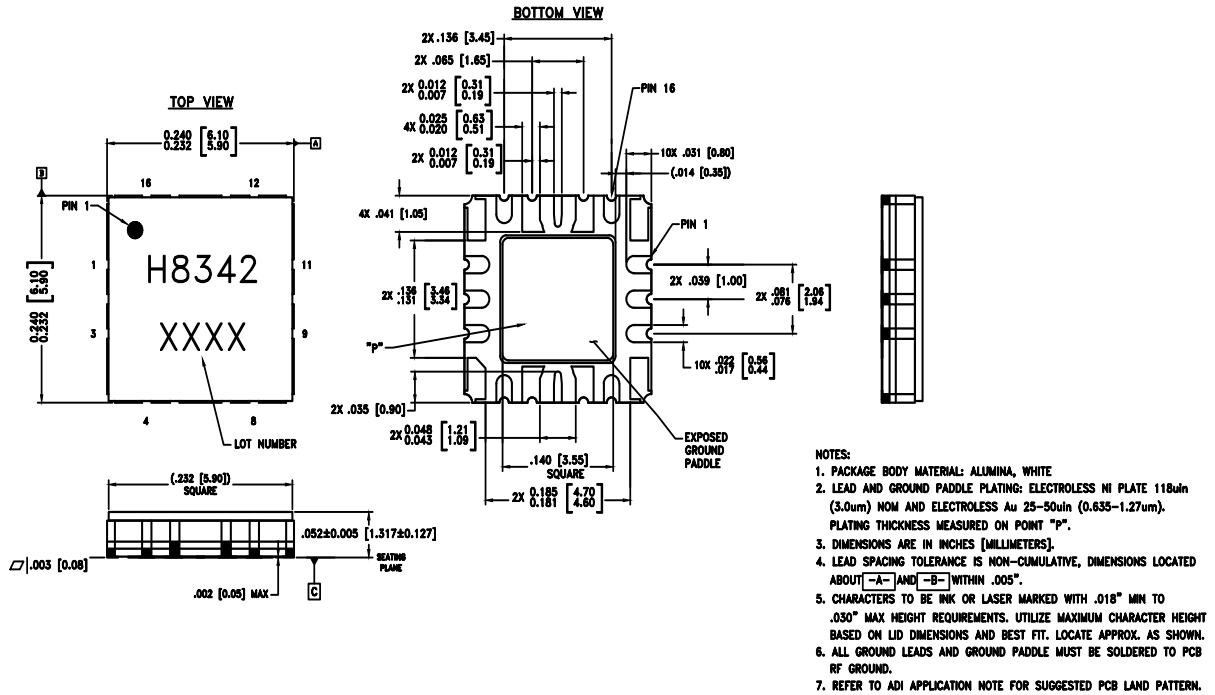
**Typical Supply Current vs.  
Vdd1, Vdd2, Vdd3**

| Vdd1, 2, 3 (Vdc) | Idd1 + Idd2 + Idd3(mA) |
|------------------|------------------------|
| 4.5              | 170                    |
| 5.0              | 175                    |
| 5.5              | 180                    |

Note:

Multiplier will operate over full voltage range shown above.


**ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS**

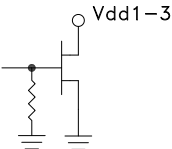
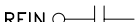
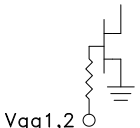
**GaAs MMIC x2 ACTIVE FREQUENCY  
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**Outline Drawing**

**Package Information**

| Part Number | Package Body Material  | Lead Finish | MSL Rating          | Package Marking <sup>[2]</sup> |
|-------------|------------------------|-------------|---------------------|--------------------------------|
| HMC8342LS6  | Alumina Ceramic, White | Au          | MSL3 <sup>[1]</sup> | H8342<br>XXXX                  |

[1] Max peak reflow temperature of 260°C

[2] 4-Digit lot number XXXX

**GaAs MMIC x2 ACTIVE FREQUENCY  
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**Pin Description**

| Pin Number       | Function                 | Description                                                                                                                 | Interface Schematic                                                                   |
|------------------|--------------------------|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 4, 8, 10, 12, 16 | Not internally connected | Pins may be connected to RF/DC ground, performance will not be affected.                                                    |                                                                                       |
| 5, 7, 13, 15     | GND                      | These pins must be connected to RF/DC ground                                                                                |    |
|                  | EP                       | Exposed Paddle. The package bottom has an exposed metal paddle that must be connected to RF/DC ground.                      |    |
| 1 - 3            | Vdd3, Vdd2, Vdd1         | Power supply voltage.                                                                                                       |    |
| 6                | RFIN                     | Pin is AC coupled and matched to 50 Ohms.                                                                                   |    |
| 9, 11            | Vgg1, Vgg2               | Gate control for multiplier. Vgg1 (-1.25V) and Vgg2 (-0.8V) must be applied before application of Vdd1, Vdd2, Vdd3, +5.0V). |   |
| 14               | RFOUT                    | Pin is AC coupled and matched to 50 Ohms.                                                                                   |  |

**GaAs MMIC x2 ACTIVE FREQUENCY  
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