

## 15 WATT POWER AMPLIFIER MODULE, 1.8 - 2.2 GHz

### Features

P1dB Output Power: 15 Watts from 1.8 to 2.2 GHz  
Gain: 40 dB min  
Noise Figure: 6 dB  
Thermally Compensated and Protected  
Reverse Polarity Protected  
TTL DC Power Enable  
Unconditionally Stable  
Heat Sink/Fan Accessories Available

### Typical Applications

Test applications for:

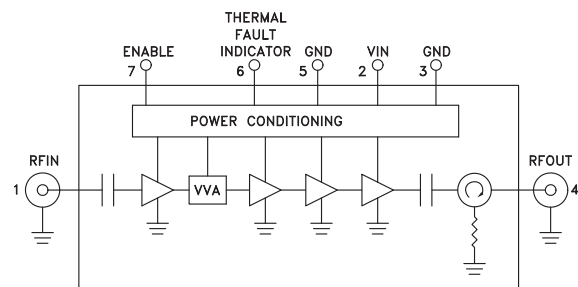
- Cellular/PCS/3G Infrastructure
- Automated Test Equipment (ATE)
- Laboratory Use

### General Description

The HMC-C008 is a 15 Watt Power Amplifier Module suitable for Cellular/3G repeaters, laboratory use and ATE applications. The unit includes DC power sequencing, enable and conditioning, as well as an output circulator for load mismatch protection. Thermal protection/fault circuitry automatically turns off DC power at base temperatures exceeding +75 °C and restores power at < +55 °C.



### Functional Diagram



### Electrical Specifications, $T_A = +25^\circ \text{C}$ , $V_{IN} = +12\text{V}$

| Parameter                                                                     | Min.      | Typ. | Max. | Units |
|-------------------------------------------------------------------------------|-----------|------|------|-------|
| Frequency Range                                                               | 1.8 - 2.2 |      |      | GHz   |
| Gain                                                                          | 40        | 42   |      | dB    |
| Noise Figure                                                                  |           | 6    | 8    | dB    |
| Input Return Loss                                                             |           | 12   |      | dB    |
| Output Return Loss                                                            |           | 12   |      | dB    |
| Output Power for 1 dB Compression (P1dB)                                      | 15        |      |      | W     |
| Saturated Output Power (Psat)                                                 |           | 43   |      | dBm   |
| Output Third Order Intercept (IP3) (Two-tone Input Power = -28 dBm each tone) |           | 52   |      | dBm   |
| Channel Output Power for -50 dBc ACPR (CDMA 2000, 1960 MHz)                   |           | 36   |      | dBm   |
| Channel Output Power for -50 dBc ACPR (W-CDMA, 2110 MHz)                      |           | 33   |      | dBm   |
| Second Harmonic at Output P1dB                                                |           | -55  |      | dBc   |
| Third Harmonic at Output P1dB                                                 |           | -55  |      | dBc   |
| Spurious at Output P1dB                                                       |           | -65  |      | dBc   |
| Supply Current                                                                |           | 6.5  | 7.0  | A     |

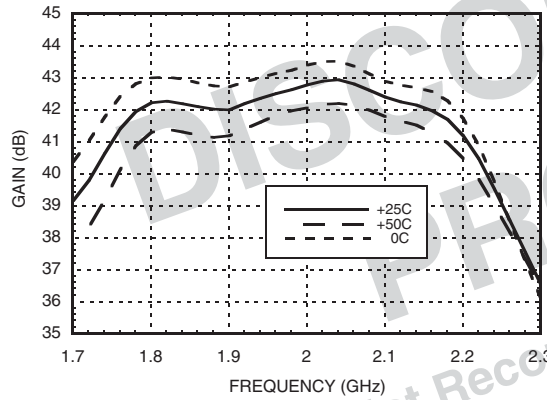
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20 Alpha Road Chelmsford, MA 01824 Phone: 978-250-3343 Fax: 978-250-3373  
Order Online at [www.hittite.com](http://www.hittite.com)

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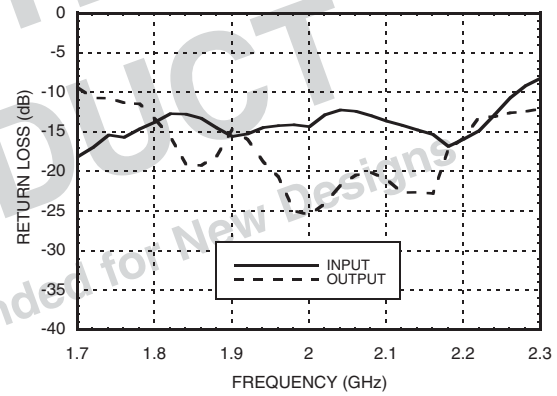
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AMPLIFIERS

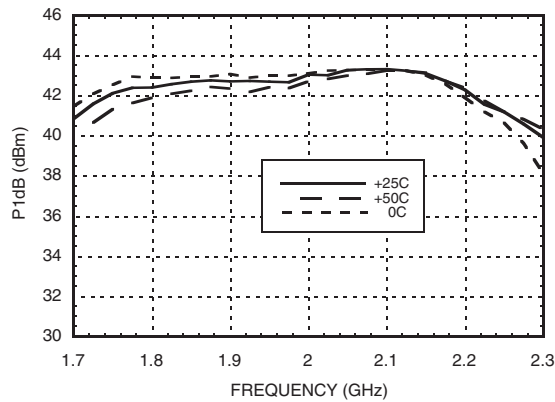
**Gain vs. Temperature**



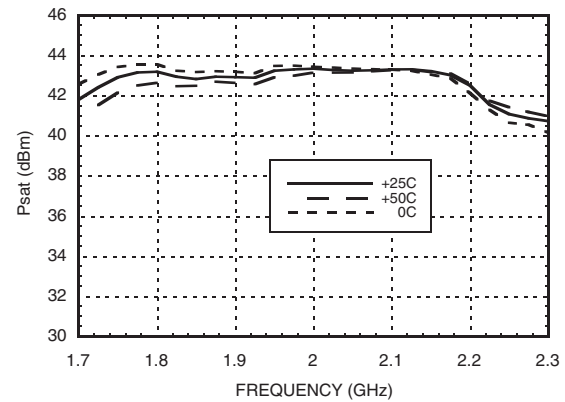
**Input & Output Return Loss**



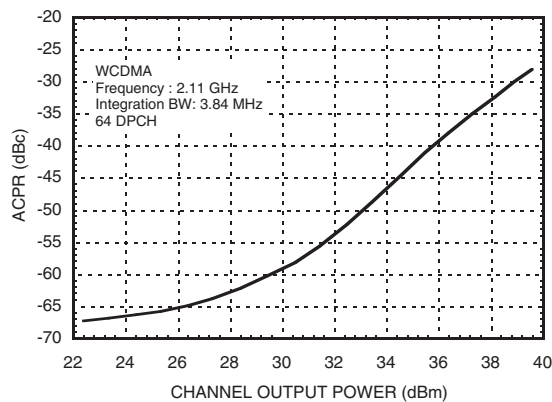
**P1dB vs. Temperature**



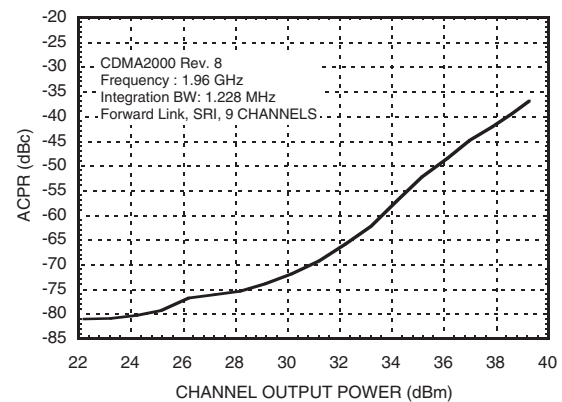
**Psat vs. Temperature**



**ACPR @ 2110 MHz, W-CDMA**

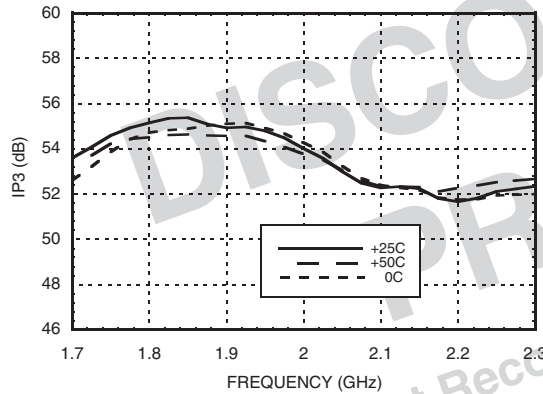


**ACPR @ 1960 MHz, CDMA-2000**

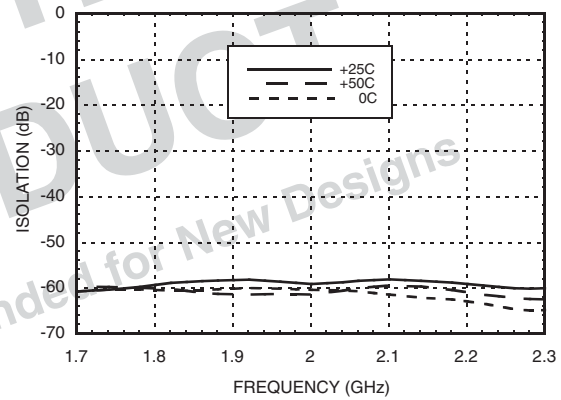


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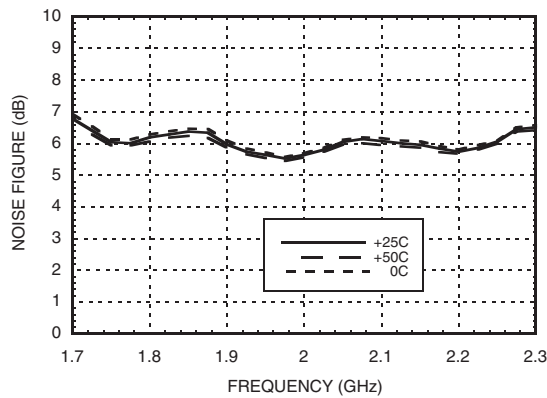
**Output IP3 vs. Temperature**



**Reverse Isolation vs. Temperature**



**Noise Figure vs. Temperature**



**Absolute Maximum Ratings**

|                                                                 |               |
|-----------------------------------------------------------------|---------------|
| Supply Voltage (VIN)                                            | +13 Vdc       |
| RF Input Power (RFIN)                                           | +10 dBm       |
| Storage Temperature                                             | -40 to +70 °C |
| Operating Temperature                                           | 0 to +50 °C   |
| RF Output Isolator Max Dissipation                              | 20 W          |
| Thermal Fault Indicator Max Pdis (derate 1.8 mW/°C above 50 °C) | 180 mW        |
| Enable Vmax                                                     | 6 V           |



**ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS**

**Thermal Fault Indicator  
Characteristics**

| Parameter                                  | Min. | Typ. | Max. | Units |
|--------------------------------------------|------|------|------|-------|
| I <sub>OUT</sub> (V <sub>OUT</sub> > 2V)   |      | 350  |      | mA    |
| R <sub>ON</sub> (I <sub>OUT</sub> = 50 mA) |      |      | 7.5  | Ohms  |
| R <sub>OFF</sub> (V <sub>OUT</sub> = 30 V) |      | 1    |      | MOhm  |

**Enable Input Characteristics**

| Parameter                  | Min. | Typ.   | Max. | Units |
|----------------------------|------|--------|------|-------|
| V <sub>IH</sub>            | 3.5  |        |      | V     |
| V <sub>IL</sub>            |      |        | 1.6  | V     |
| I <sub>IL</sub> @ VIN = 0V |      | -0.5   |      | mA    |
| I <sub>IH</sub> @ 5V       |      | < ± 50 |      | μA    |

**Recommended Biasing Procedure**

**TURN-ON**

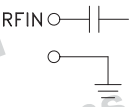
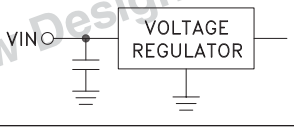
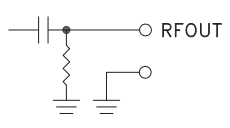
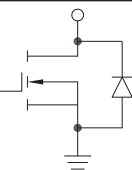
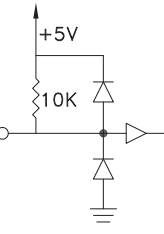
1. Connect RF input and output
2. Apply Supply Voltage VIN (+12 Vdc)
3. Set Enable low
4. Apply RF input signal

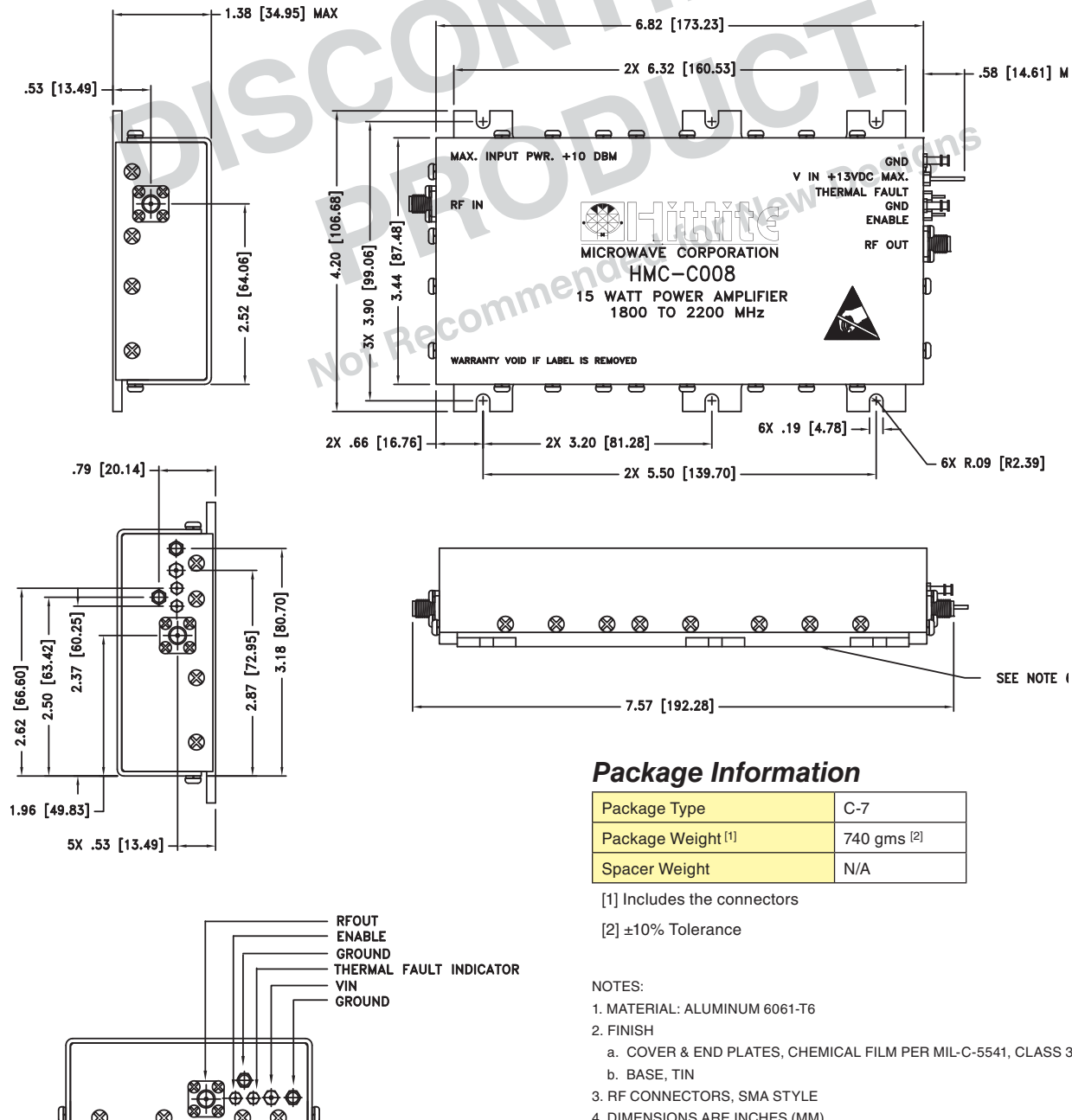
**TURN-OFF**

1. Remove RF input signal
2. Remove Supply Voltage VIN

**15 WATT POWER AMPLIFIER  
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**Pin Descriptions**

| Pin Number | Function                | Description                                                                                                                                                 | Interface Schematic                                                                   |
|------------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 1          | RFIN & RF Ground        | RF input connector, SMA female. This pin is AC coupled and matched to 50 Ohms.                                                                              |    |
| 2          | VIN                     | Power supply voltage for the amplifier.                                                                                                                     |    |
| 3          | GND                     | Power supply ground.                                                                                                                                        |    |
| 4          | RFOUT & RF Ground       | RF output connector, SMA female. This pin is isolator protected and matched to 50 Ohms.                                                                     |    |
| 5          | GND                     | Ground for thermal fault indicator and enable circuit.                                                                                                      |    |
| 6          | Thermal Fault Indicator | Open drain output. High impedance for base plate temperatures less than 55 °C. Low impedance for base plate temperatures exceeding 75 °C.                   |   |
| 7          | Enable                  | TTL compatible supply voltage (VIN) shutdown. If enable feature is not required, short this pin to DC ground.<br><br>TTL "High" Disable<br>TTL "Low" Enable |  |

**15 WATT POWER AMPLIFIER  
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**Outline Drawing**

**Package Information**

|                               |                        |
|-------------------------------|------------------------|
| Package Type                  | C-7                    |
| Package Weight <sup>[1]</sup> | 740 gms <sup>[2]</sup> |
| Spacer Weight                 | N/A                    |

[1] Includes the connectors

[2] ±10% Tolerance

**NOTES:**

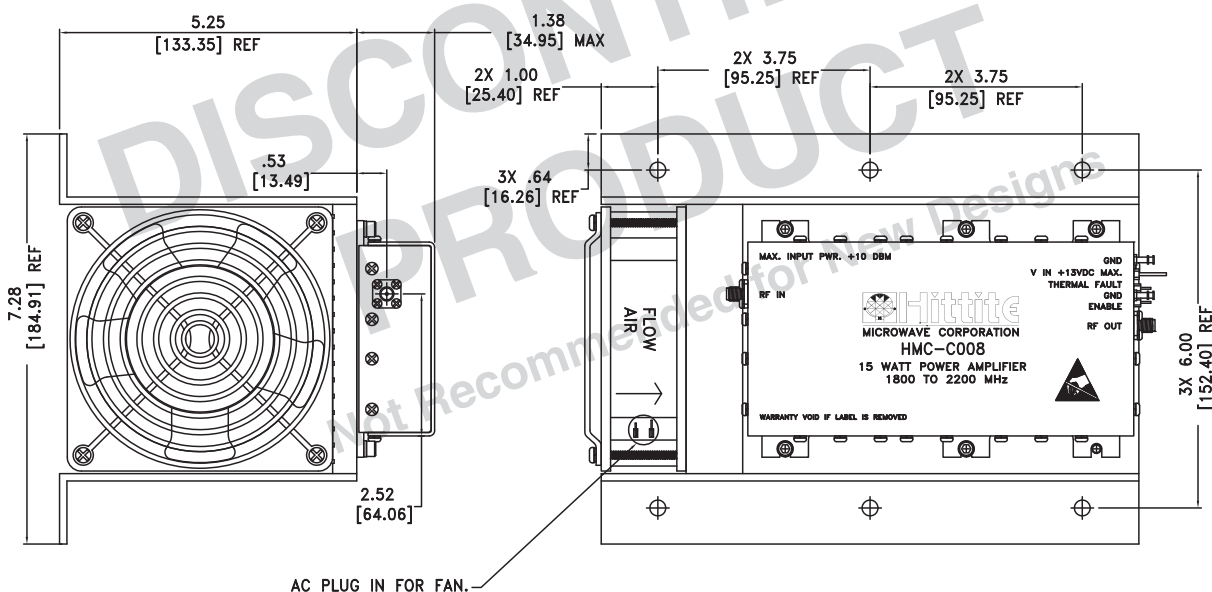
1. MATERIAL: ALUMINUM 6061-T6
2. FINISH
  - a. COVER & END PLATES, CHEMICAL FILM PER MIL-C-5541, CLASS 3
  - b. BASE, TIN
3. RF CONNECTORS, SMA STYLE
4. DIMENSIONS ARE INCHES (MM)
5. TOLERANCES .X±.1 (2.54mm)  
.XX±.02 (0.50mm)
6. BASE MUST BE GROUNDED AND MOUNTED TO HEAT SINK  
CAPABLE OF DISSIPATING 100W (50 °C)

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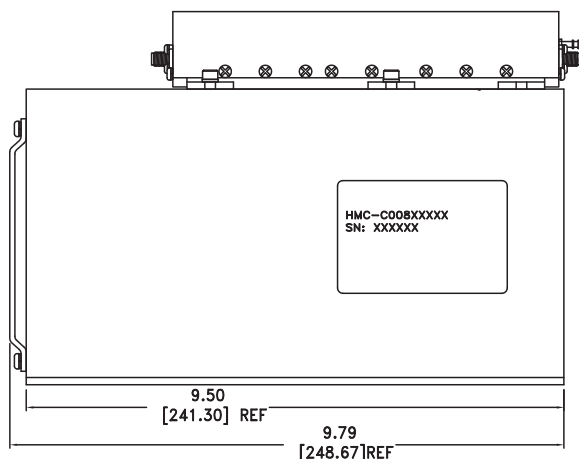
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### HMC-C008 Heatsink/Fan Outline Drawing



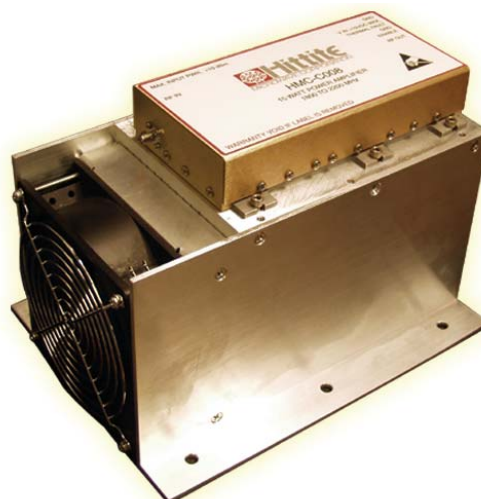
#### NOTES:

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3. RF CONNECTORS, SMA STYLE
4. DIMENSIONS ARE INCHES (MM)
5. TOLERANCES .X±.1 (2.54mm)  
.XX±.02 (0.50mm)



### HMC-C008 Ordering Information

| Part Number   | Description                                                                |
|---------------|----------------------------------------------------------------------------|
| HMC-C008      | 15 Watt Power Amplifier Module, 1.8 - 2.2 GHz                              |
| HMC-C008HV115 | 15 Watt Power Amplifier Module with heat sink, 115 Vac fan and power cord. |
| HMC-C008HV230 | 15 Watt Power Amplifier Module with heat sink, 230 Vac fan and power cord. |





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