v00.1204

# HMC-C008

## 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

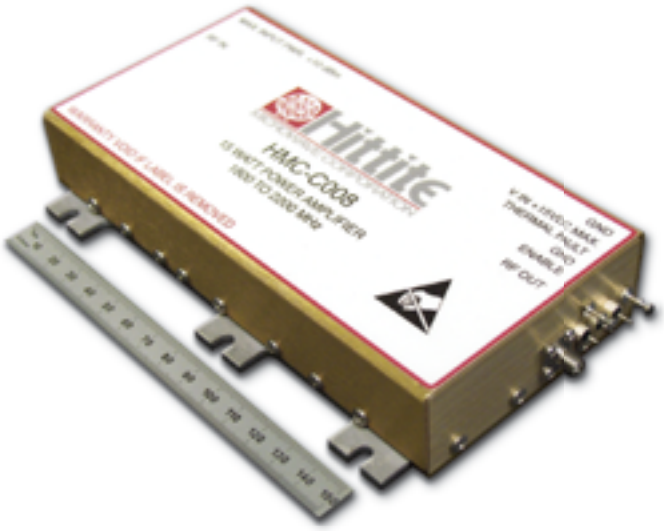
Thermally Compensated and Protected

Reverse Polarity Protected

TTL DC Power Enable

Unconditionally Stable

Heat Sink/Fan Accessories Available



### Typical Applications

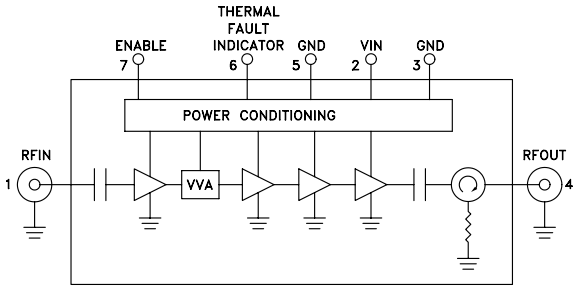
Test applications for:

- 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.

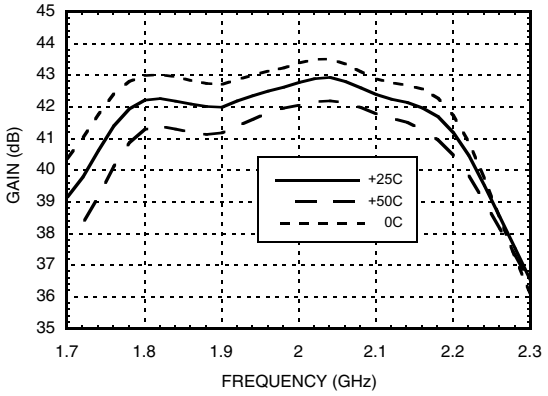
### Functional Diagram



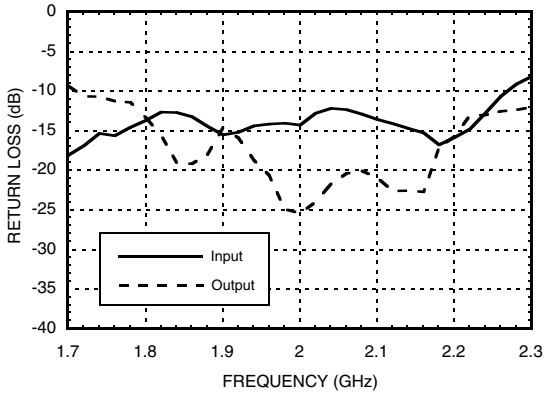

### Electrical Specifications, $T_A$ = +25° C, VIN = +13V to +15Vdc

| 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, 1910 MHz) | | 36 | | dBm |
| Channel Output Power for -50 dBc ACPR (W-CDMA, 2114 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 |

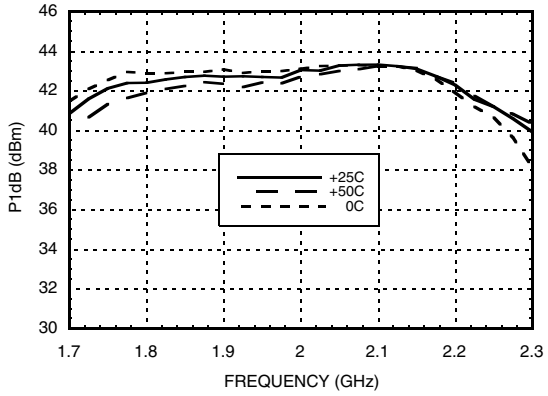
### Gain vs. Temperature



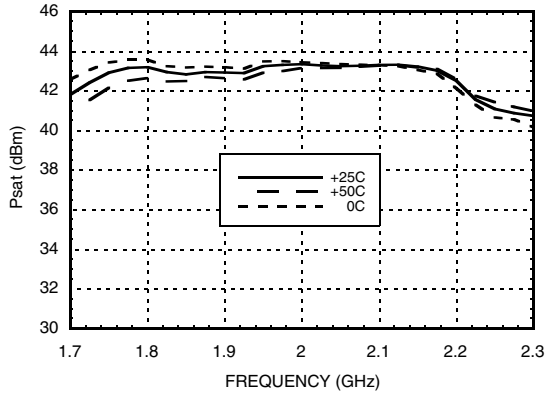

### Input & Output Return Loss



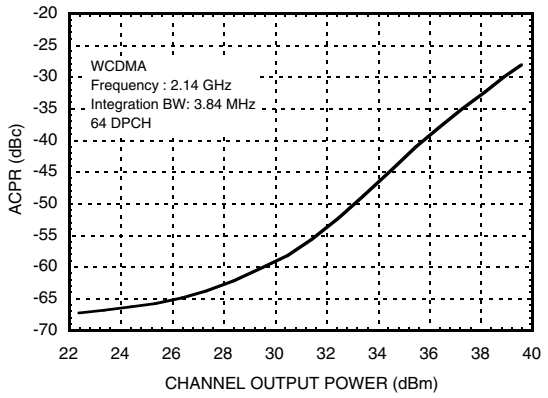

### P1dB vs. Temperature



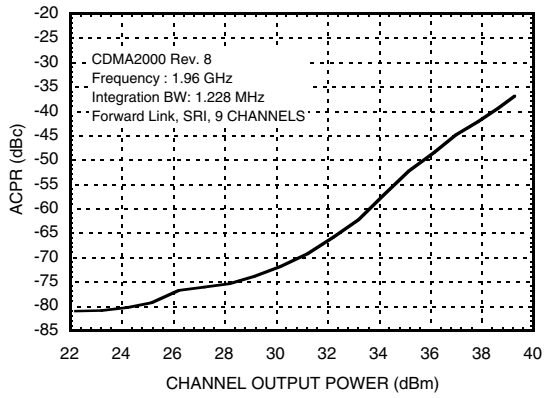

### Psat vs. Temperature




### ACPR @ 2114 MHz, W-CDMA




### ACPR @ 1910 MHz, CDMA-2000



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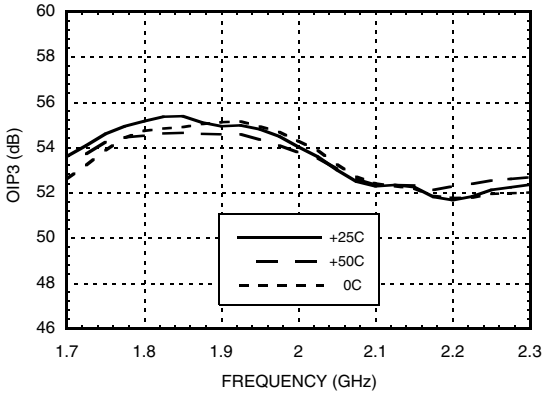
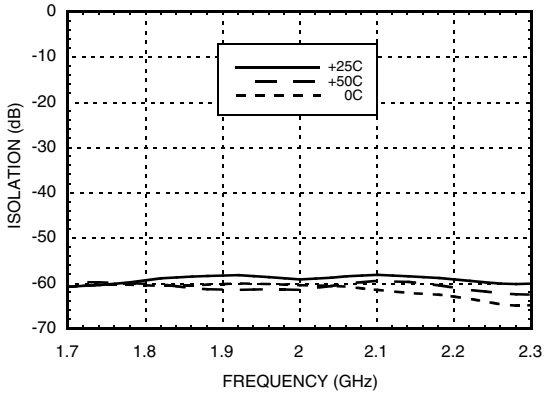
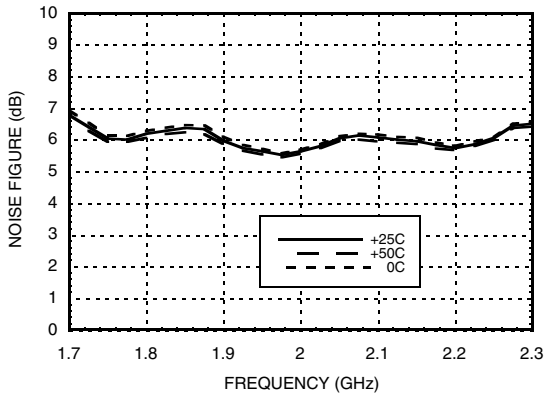
### Output IP3 vs. Temperature




### Reverse Isolation vs. Temperature




### Noise Figure vs. Temperature




### Absolute Maximum Ratings

| | |
|---|---|
| Supply Voltage (VIN) | +15.5 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 Pdiss (derate 1.8 mW/°C above 50 °C) | 180 mW |
| Enable Vmax | 6 V |

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

### Themal Fault Indicator Characteristics

| Parameter | Min. | Typ. | Max. | Units |
|---|---|---|---|---|
| $I_{OUT}$ ($V_{OUT}$ > 2V) | | 350 | | mA |
| $R_{ON}$ ($I_{OUT}$ = 50 mA) | | | 7.5 | Ohms |
| $R_{OFF}$ ($V_{OUT}$ = 30 V) | | | 1 | µA |

### Enable Input Characteristics

| Parameter | Min. | Typ. | Max. | Units |
|---|---|---|---|---|
| $V_{IH}$ | 3.5 | | | V |
| $V_{IL}$ | | | 1.6 | V |
| $I_{IL}$ @ VIN = 0V | | -0.5 | | mA |
| $I_{IH}$ @ 5V | | < ± 50 | | µA |

### Recommended Biasing Procedure

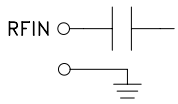
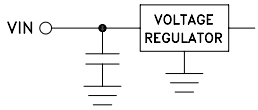
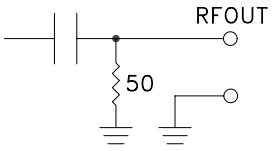
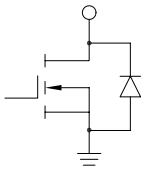
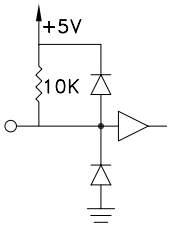
TURN-ON

1. Connect RF input and output
2. Apply Supply Voltage VIN (+14 Vdc)
3. Set Enable low
4. Apply RF input signal

TURN-OFF

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

## 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 from 1.8 - 2.2 GHz. |   |
| 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 from 1.8 - 2.2 GHz. |   |
| 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 |   |

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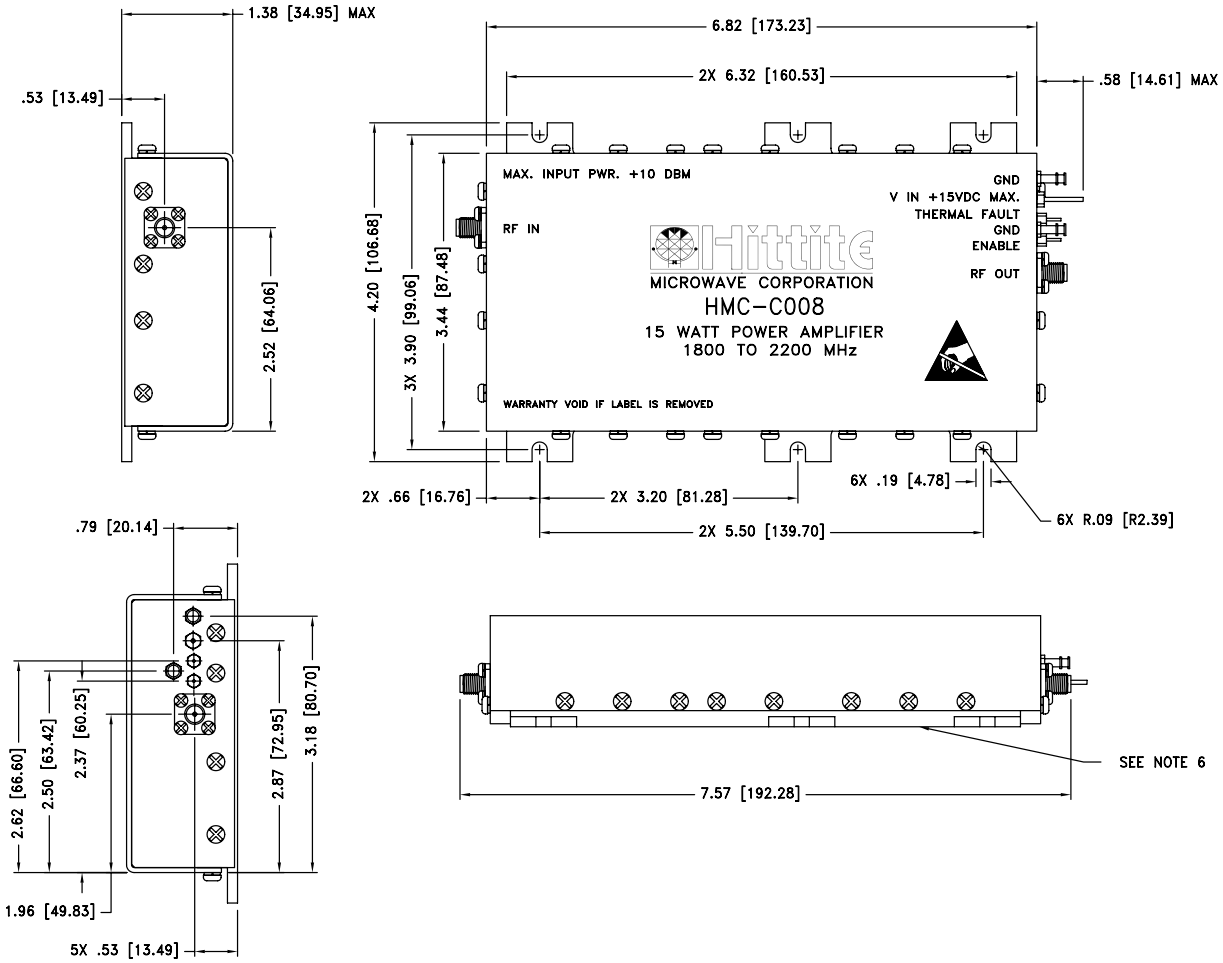
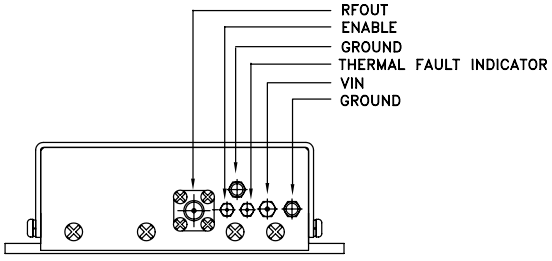
## Outline Drawing

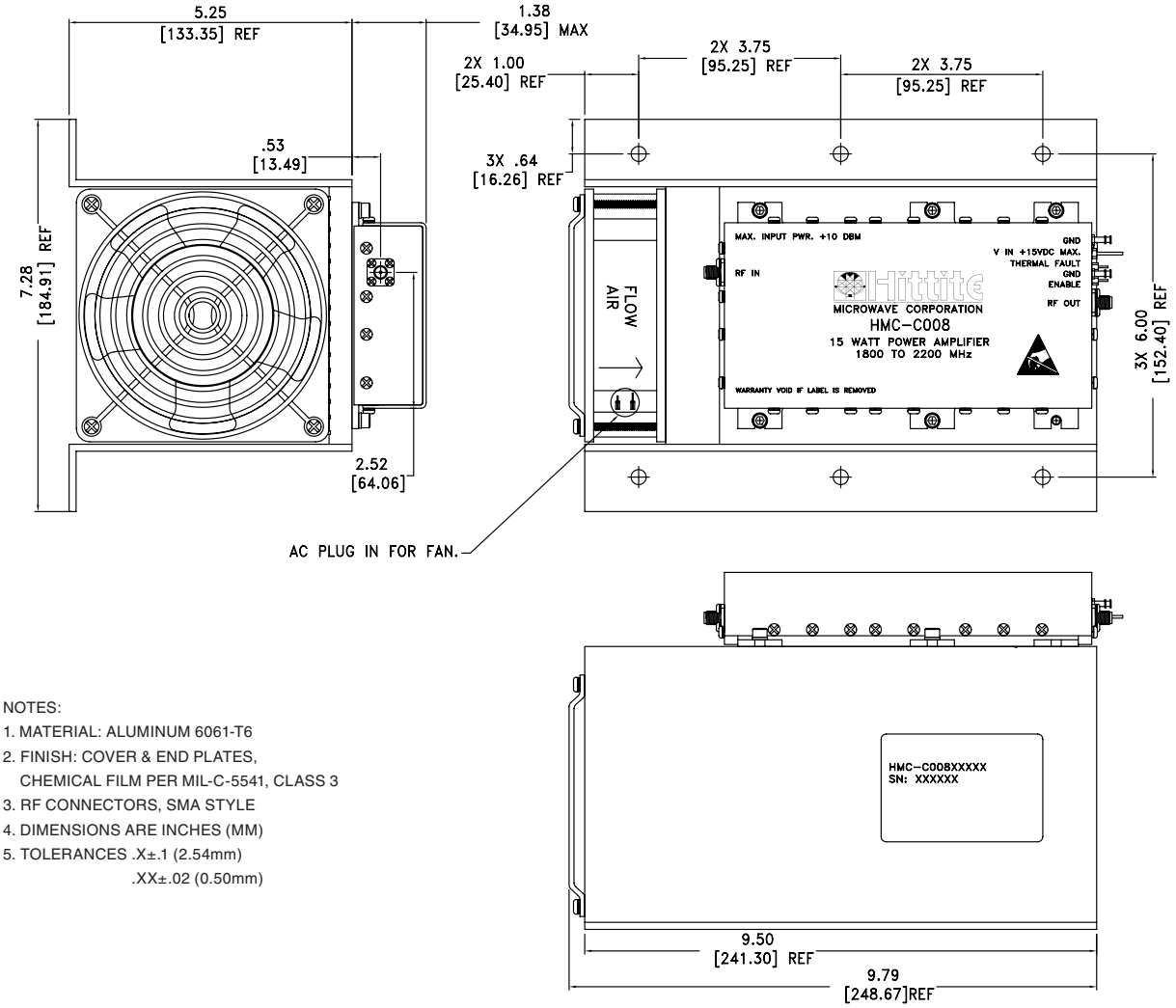



NOTES:

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)

## HMC-C008 Heatsink/Fan Outline Drawing




NOTES:

1. MATERIAL: ALUMINUM 6061-T6
2. FINISH: COVER & END PLATES, CHEMICAL FILM PER MIL-C-5541, CLASS 3
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. |