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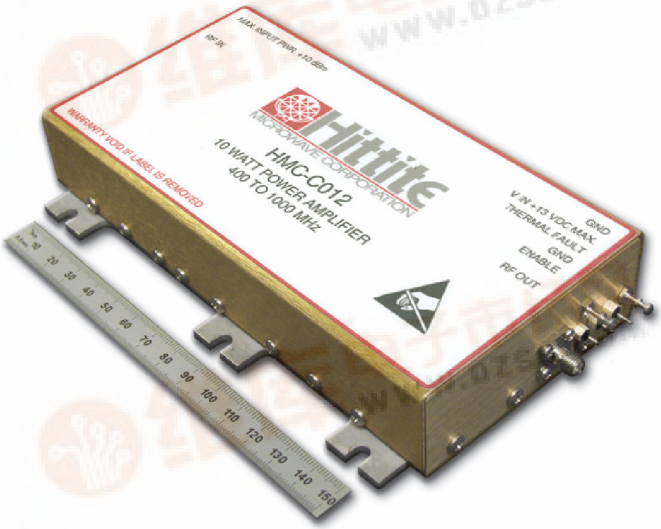
Hittite MICROWAVE CORPORATION v01.1205

HMC-C012

10 WATT POWER AMPLIFIER MODULE, 400 - 1000 MHz

Features

P1dB Output Power: 10 Watts
Gain: 40 dB
Output IP3: +54 dBm
Single Positive Supply: +12V
Thermally Compensated and Protected
TTL DC Power Enable
Unconditionally Stable
Heat Sink/Fan Accessories Available



Typical Applications

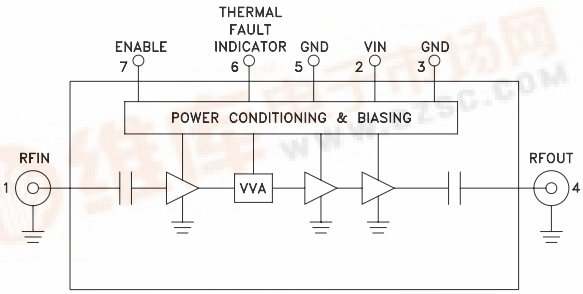
The HMC-C012 is ideal for:

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

General Description

The HMC-C012 is a 10 Watt Power Amplifier Module suitable for Cellular/3G repeaters, wireless data, laboratory use and ATE applications. This extremely robust PA module is DC blocked, internally regulated and over voltage protected. Thermal protection/fault circuitry automatically turns off DC power if base temperature exceeds +75 °C and restores power at < +55 °C.

Functional Diagram



Electrical Specifications, T_A = +25° C, VIN = +12V

Parameter	Min.	Typ.	Max.	Units
Frequency Range		0.4 - 1.0		GHz
Gain	38	40		dB
Input Return Loss	9.5	12		dB
Output Return Loss	7.5	12		dB
Output Power for 1 dB Compression (P1dB)	9	10		W
Saturated Output Power (Psat)		42		dBm
Output Third Order Intercept (IP3) (Two-tone Input Power = -28 dBm each tone)		54		dBm
Channel Output Power for -60 dBc ACPR (CDMA-2000, 1.98 MHz offset)		36		dBm
Channel Output Power for -50 dBc ACPR (CDMA-2000, 885 kHz offset)		34		dBm
Second Harmonic at Output P1dB		-20		dBc
Third Harmonic at Output P1dB		-30		dBc
Spurious at Output P1dB		-65		dBc
Supply Current		6.5	7.0	A

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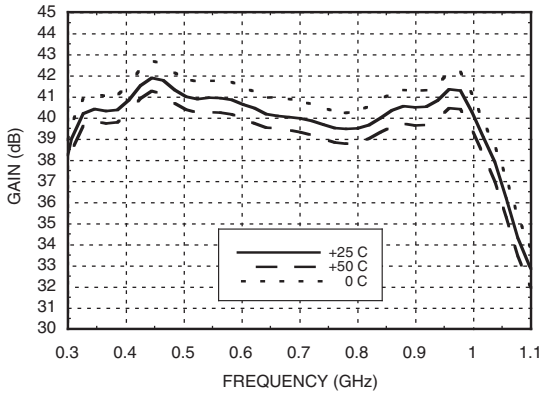
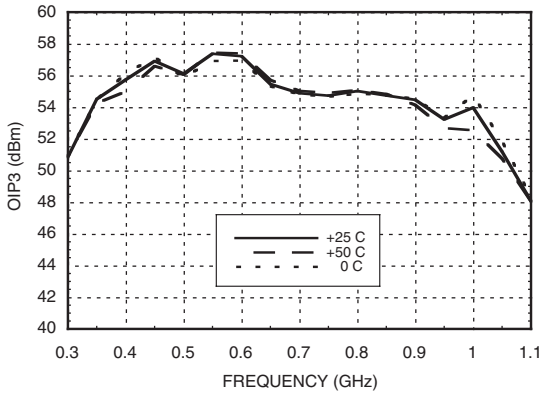
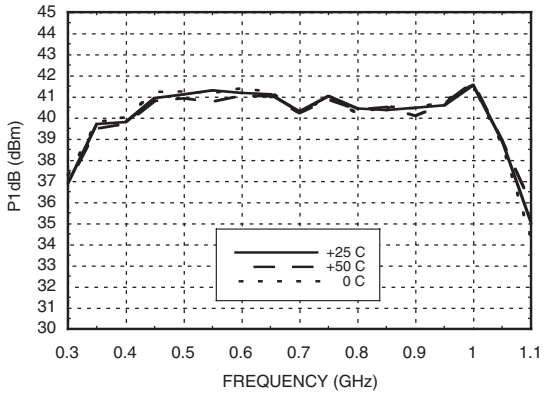
Gain vs. Temperature



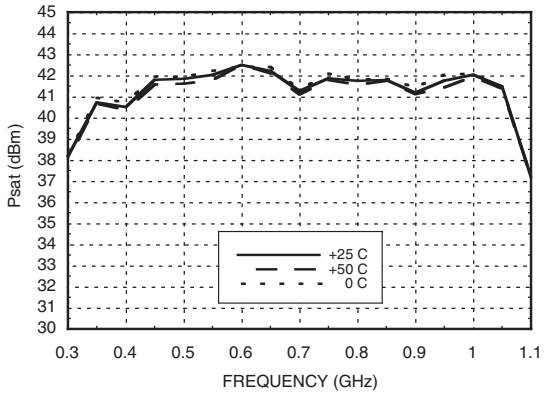
Output IP3 vs. Temperature



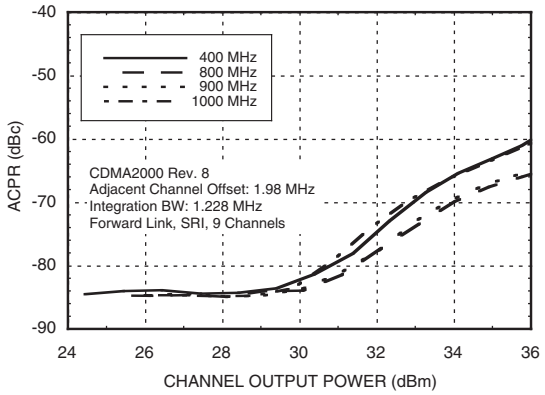
P1dB vs. Temperature



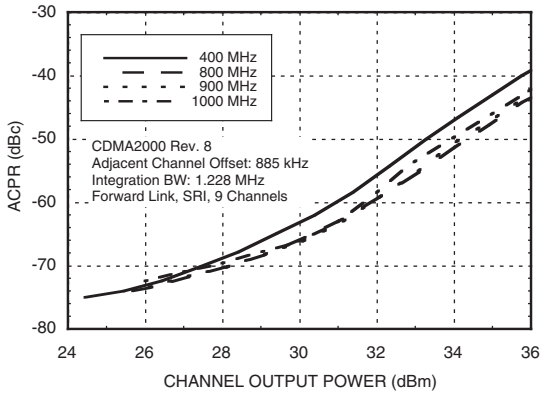
Psat vs. Temperature



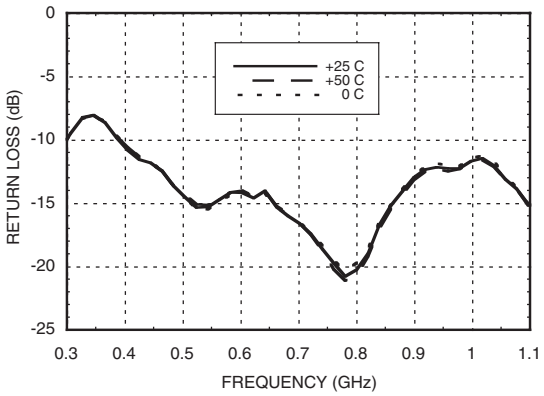
ACPR, CDMA-2000, 1.98 MHz Offset



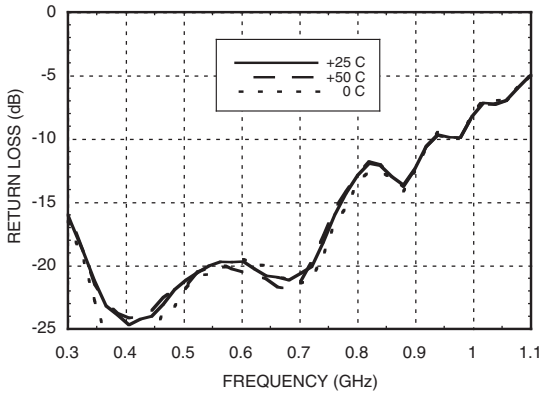
ACPR, CDMA-2000, 885 kHz Offset



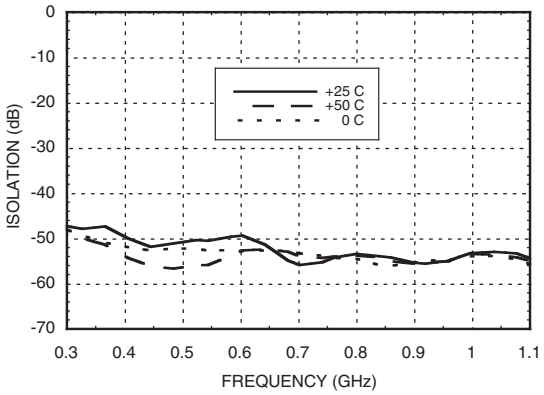
Input Return Loss vs. Temperature



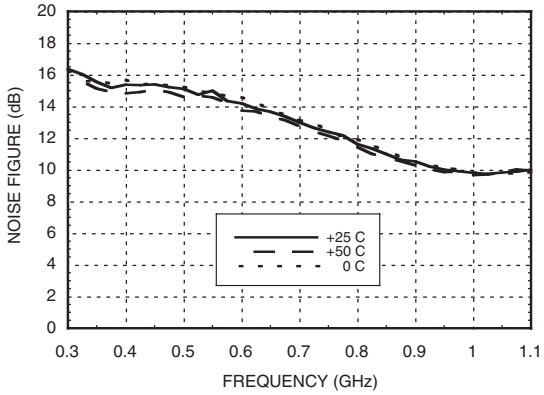
Output Return Loss vs. Temperature



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 +85 °C
Operating Temperature	0 to +50 °C
Thermal Fault Indicator Max Pdiss (derate 1.8 mW/°C above 50 °C)	180 mW
Enable	-0.5 to +6.0 Vdc

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Thermal 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		MOhm

Enable Input Characteristics

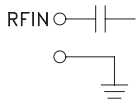
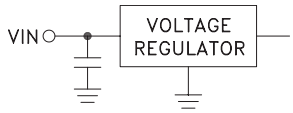
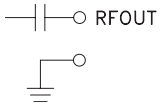
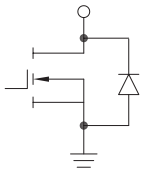
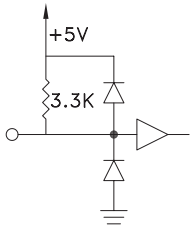
Parameter	Min.	Typ.	Max.	Units
V_{IH}	3.5			V
V_{IL}			1.6	V
I_{IL} @ VIN = 0V		-0.5		mA
I_{IH} @ 5V		< ± 50		µA

Recommended Biasing Procedure

TURN-ON
1. Connect RF input and output
2. Apply Supply Voltage VIN (+12 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 400 - 1000 MHz.	
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 AC coupled and matched to 50 Ohms from 400 - 1000 MHz.	
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. TTL “High” Disable TTL “Low” Enable	

MICROWAVE CORPORATION v01.1205

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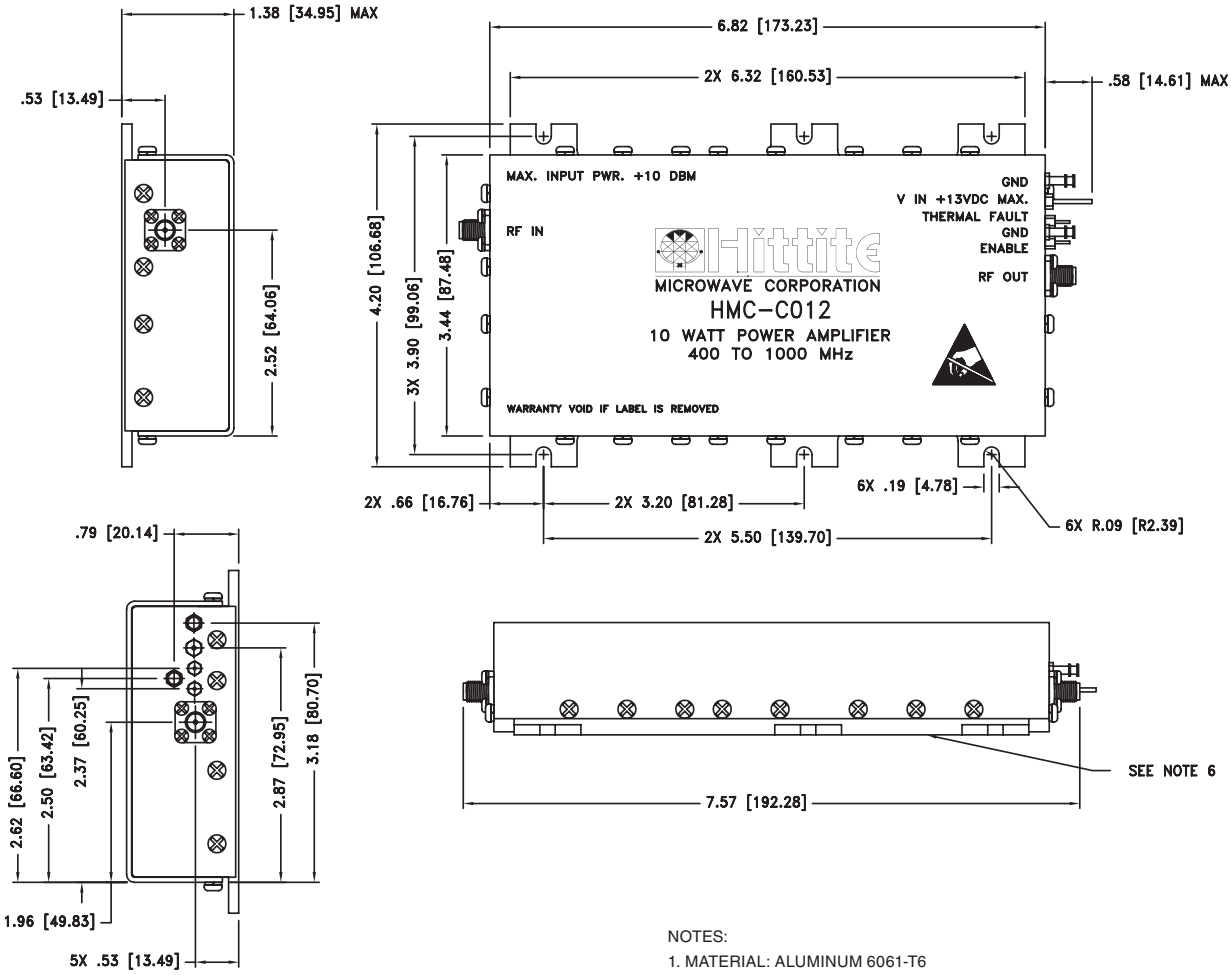
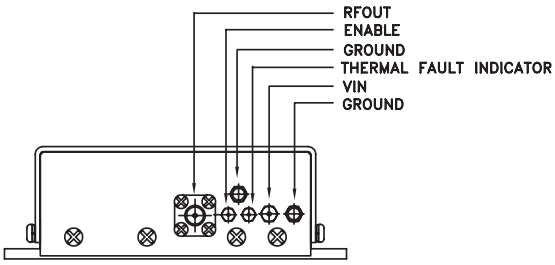
10 WATT POWER AMPLIFIER MODULE, 400 - 1000 MHz

Outline Drawing





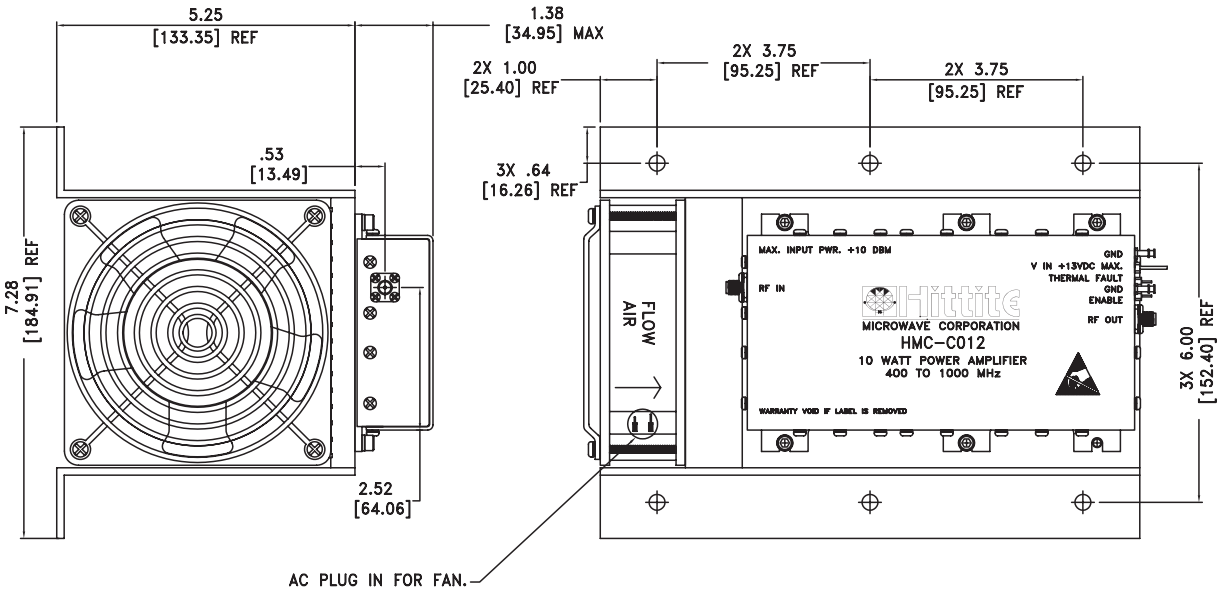
NOTES:
1. MATERIAL: ALUMINUM 6061-T6
2. FINISH
   a. COVER & END PLATES, CHEMICAL FILM PER MIL-C-5541, CLASS 3
   b. BASE, TIN
3. RF CONNECTORS, SMA STYLE
4. DIMENSIONS ARE INCHES (MM)
5. TOLERANCES .X±.1 (2.54mm)
   .XX±.02 (0.50mm)
6. DRAWING TO CHANGE AS REQUIRED.
7. BASE MUST BE GROUNDED AND MOUNTED TO HEAT SINK CAPABLE OF DISSIPATING 100W (65 °C)

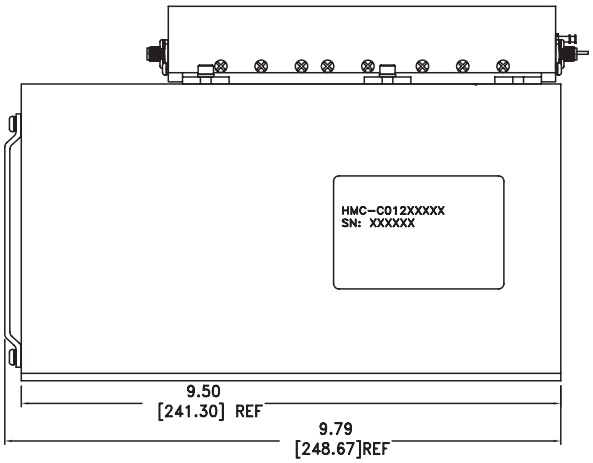
HMC-C012

v01.1205

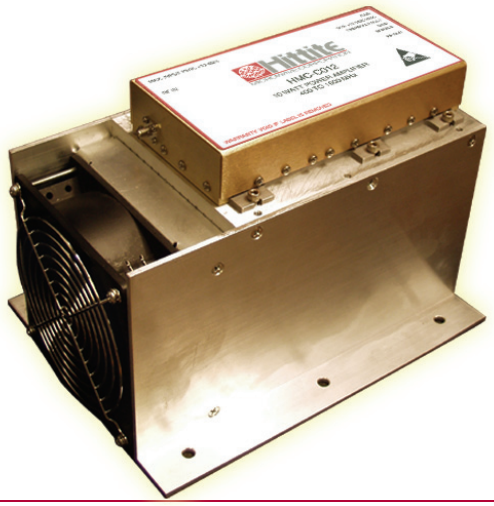
10 WATT POWER AMPLIFIER MODULE, 400 - 1000 MHz

HMC-C012 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-C012	10 Watt Power Amplifier Module, 400 - 1000 MHz
HMC-C012HV115	10 Watt Power Amplifier Module with heat sink, 115 Vac fan and power cord.
HMC-C012HV230	10 Watt Power Amplifier Module with heat sink, 230 Vac fan and power cord.