



- **Ideal for 916.5 MHz Unlicensed Transmitters in the USA and Canada**
- **Self-Contained RF Functions Shorten Development Time**
- **Compact, Surface-Mount Case with < 90 mm<sup>2</sup> Footprint**

The HX2000 is a miniature transmitter module that generates on-off keyed (OOK) modulation from an external digital encoder (not included). The carrier frequency is quartz, surface-acoustic-wave (SAW) stabilized, and output harmonics are suppressed by a SAW filter. The result is excellent performance in a simple-to-use, surface-mount device with a low external component count. The HX2000 is designed specifically for unlicensed remote-control, wireless security, and data-link transmitters operating in the USA under FCC Part 15.249 and in Canada under TRS RSS-210.

#### Absolute Maximum Ratings

Rating	Value	Units
Power Supply and/or Modulation Input Voltage	10	V
Nonoperating Case Temperature	-40 to +85	°C
Ten-Second Soldering Temperature	230	°C

# HX2000

## 916.5 MHz Hybrid Transmitter



SM-4 Case

#### Electrical Characteristics

Characteristic		Sym	Notes	Minimum	Typical	Maximum	Units
Operating Frequency	Absolute Frequency	f <sub>O</sub>	1, 2, 3, 4,	916.300		916.700	MHz
	Tolerance from 916.500 MHz	Δf <sub>O</sub>	10			±200	kHz
RF Output Power into 50 Ω at 25°C		P <sub>O</sub>	2, 4, 5, 10	-3	0		dBm
	Within Specified Temperature Range		2, 3, 4, 5	-5	0		
Harmonic Spurious Emissions			2, 3, 4, 5		-40		dBc
Modulation Input	Input HIGH Voltage	V <sub>IH</sub>	3, 4, 5	2.5		V <sub>CC</sub>	V
	Input LOW Voltage	V <sub>IL</sub>		0.0		0.3	
	Input HIGH Current	I <sub>IH</sub>				100	μA
	Input LOW Current	I <sub>IL</sub>		0.0			
Data Timing Parameters	Modulation Rise Time	t <sub>R</sub>	3, 4, 5, 6		10	20	μs
	Modulation Fall Time	t <sub>F</sub>			10	20	
Power Supply	Voltage	V <sub>CC</sub>	5, 7	2.7	3	3.3	VDC
	Peak Current	I <sub>CC</sub>	3, 4, 5, 8		9	11	mA
	Standby Current		5, 9			1.0	μA
Operating Case Temperature Range		T <sub>C</sub>	5	-40		+85	°C
Lid Symbolization (in addition to Lot and/or Date Codes)		RFM HX2000					



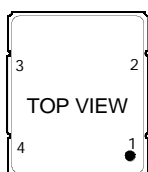
**CAUTION: Electrostatic Sensitive Device. Observe precautions for handling.**

#### NOTES:

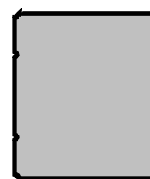
1. One or more of the following United States patents apply: 4,454,488; 4,616,197; 4,670,681; and 4,760,352.
2. Typically, equipment utilizing this device requires emissions testing and government approval, which is the responsibility of the equipment manufacturer.
3. Applies over the specified range of operating temperature.
4. Applies over the specified range of operating power supply voltage.
5. The design, manufacturing process, and specifications of this device are subject to change without notice.
6. The maximum modulation bandwidth (and data rate) is dependent on the characteristics of the external encoding circuitry (not included).
7. Unless noted otherwise, case temperature T<sub>C</sub> = +25°C ± 2°C, test load impedance = 50 Ω, and modulation input is at logic HIGH.
8. The maximum operating current occurs at the maximum specified power supply voltage and maximum specified operating temperature.
9. Standby current is defined as the supply current consumed with the modulation input at logic LOW.
10. Improper antenna loading affects performance of HX device.

## Electrical Connections

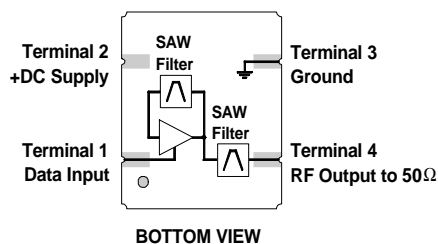
Terminal Number	Connections
1	Data Input
2	+DC Supply
3	Ground
4	RF Output to 50 $\Omega$



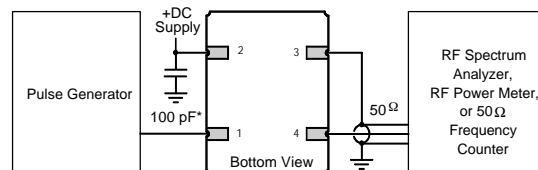
## Footprint



## Block Diagram

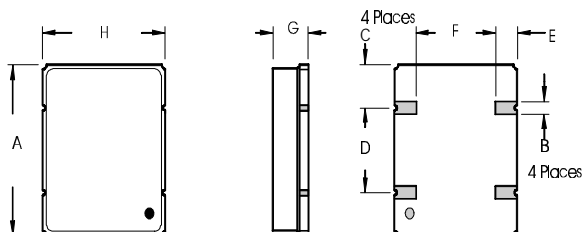


## Typical Test Circuit



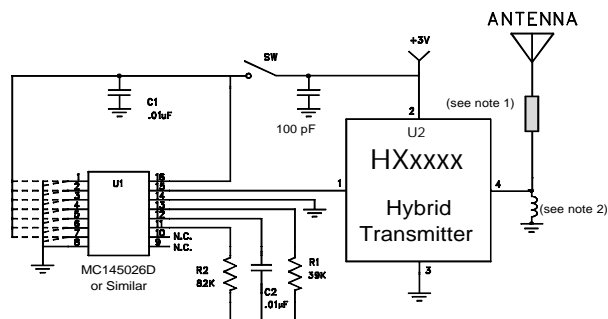
**\*Note:** Bypass required only for "HX2..." series transmitters in the 902 to 928 MHz band.

## Case Design



Dimensions	Millimeters		Inches	
	Min	Max	Min	Max
A		10.67		0.420
B	1.27 Nominal		0.050 Nominal	
C	2.67 Nominal		0.105 Nominal	
D	5.08 Nominal		0.200 Nominal	
E	1.70 Nominal		0.067 Nominal	
F	5.36 Nominal		0.211 Nominal	
G		2.80		0.110
H		9.02		0.355

## Typical Transmitter Application



## Notes:

1. This matching component is required only for antennas that are not 50 ohms. It is typically a chip inductor to match to stub antennas shorter than  $\frac{1}{4}$  wavelength. For very low radiated field-strength applications, a resistor can also be used.
2. For ESD protection.