



- **Ideal for 303.825 MHz Unlicensed Transmitters in Japan and Korea**
- **Quartz SAW Frequency Stabilization and Harmonic Filtering**
- **Compact, Surface-Mount Case with < 90 mm<sup>2</sup> Footprint**

The HX1006 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 HX1006 is designed specifically for unlicensed remote-control and wireless security transmitters operating in Japan under MPT and in Korea. Applications also include very short-range devices in the USA and Australia.

#### 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    |

# HX1006

## 303.825 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, | 303.675 |         | 303.975         | MHz   |
|  | Tolerance from 303.825 MHz         | Δf <sub>O</sub> | 10          |         |         | ±150            | kHz   |
| RF Output Power into 50 Ω at 25°C                        |                                    | P <sub>O</sub>  | 2, 4, 5, 10 | -14     | 11      | -9              | dBm   |
|  | Within Specified Temperature Range |                 | 2, 3, 4, 5  | -16     | 11      | -9              |       |
| Harmonic Spurious Emissions                              |                                    |                 | 2, 3, 4, 5  |         | -45     | -35             | 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  |         |         | 100             | μs    |
|  | Modulation Fall Time               | t <sub>F</sub>  |             |         |         | 100             |       |
| 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  |         | 1.5     | 3.0             | 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 HX1006      |             |         |         |                 |       |



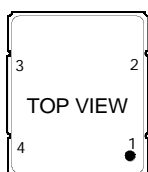
**CAUTION: Electrostatic Sensitive Device. Observe precautions for handling.**

#### 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

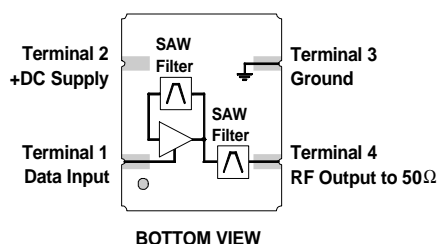
| Terminal Number | Connections              |
|-----------------|--------------------------|
| 1               | Data Input               |
| 2               | +DC Supply               |
| 3               | Ground                   |
| 4               | RF Output to 50 $\Omega$ |



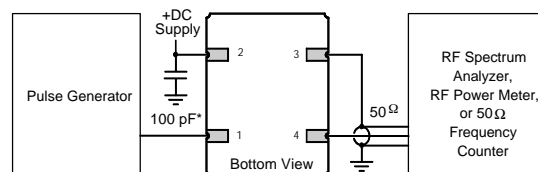
## Footprint



## Block Diagram

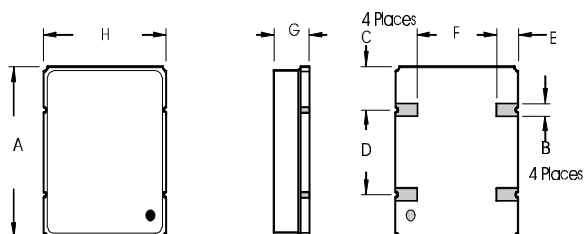


## Typical Test Circuit



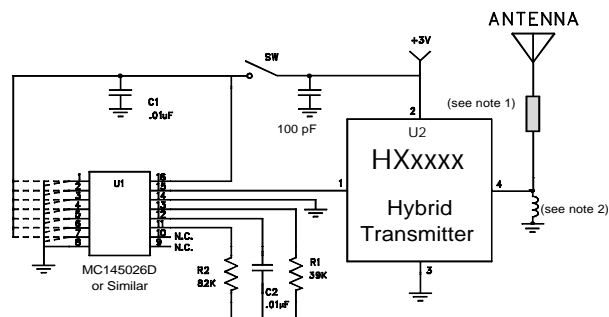
**\*Note:** Bypass required only for "HX2..." series transmitters in the 902 to 928 MHz band.

## 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.