Revision History

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<tr><th>Rev.</th><th>History</th><th>Issue Date</th><th>Remark</th></tr>
<tr><td>0.1</td><td>Initial issue: written by Randall Lan</td><td>2014/1/18</td><td>Preliminary</td></tr>
<tr><td>0.2</td><td>1. The Pin Configuration on Page 4 has been changed from “bottom view” in version 0.1, to “top View”.
2. The Function Block Diagram on Page 1 has been changed.
3. The Application Circuit on Page 5 has been changed.
4. The Functional Pin Description on Page 5 has been changed.</td><td>2017/9/14</td><td>Preliminary</td></tr>
<tr><td>0.3</td><td>1. Tx/ Rx Control Logic.
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2. Functional Pin Description at Pin 8 and Pin 9.</td><td>2018/01/23</td><td>Preliminary</td></tr>
<tr><td>0.4</td><td>1. add Harmonics spectrum at page 4
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General Description

TM2114 is a high power out GFSK transceiver operating in the world wide ISM frequency band at 2400~2483.5 MHz. Burst mode transmission and up to 4Mbps air data rate make them suitable for applications requiring ultra low power consumption.The embedded packet processing engines enable their full operation with a very simple MCU as a radio system. Auto re-transmission and auto acknowledge give reliable link without any MCU interference.

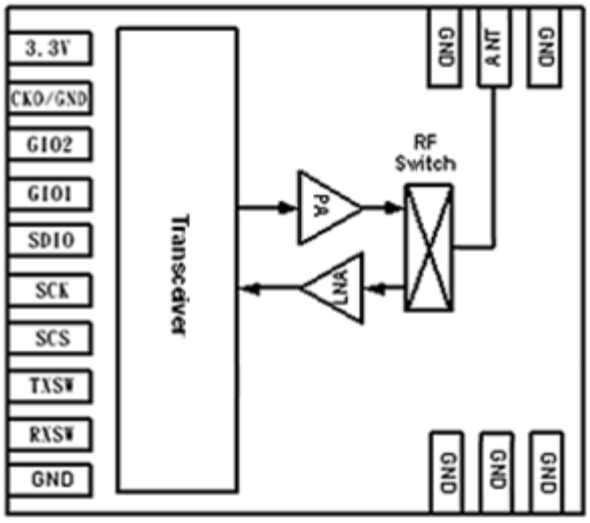
TM2114 operates in TDD mode, either as a transmitter or as a receiver. The RF channel frequency determines the center of the channel used by TM2114. The frequency is set by the RF_CH register in register bank 0 according to the following formula: F0=2400+RF_CH (MHz). The resolution of the RF channel frequency is 1MHz. A transmitter and a receiver must be programmed with the same RF channel frequency to be able to communicate with each other.The output power of TM2114 is set by the RF_PWR bits in the RF_SETUP register.

Demodulation is done with embedded data slicer and bit recovery logic. The air data rate can be programmed to 4Mbps by RF_DR register. A transmitter and a receiver must be programmed with the same setting. In the following chapters, all registers are in register bank 0 except with explicit claim.

Features

- 2400-2483.5 MHz ISM band operation
- Support 4 Mbps air data rate
- Programmable output power (-27dBm to 18dBm)
- Low power consumption
- Tolerate +/- 60ppm 16 MHz crystal
- Variable payload length from 1 to 32bytes
- Automatic packet processing
- 6 data pipes for 1:6 star networks
- 3V to 3.6V power supply
- 4-pin SPI interface with maximum 8 MHz clock rate

Function Block Diagram



Applications

- Wireless PC peripherals
- Wireless mice and keyboards
- Wireless gamepads
- Wireless audio
- VOIP and wireless headsets
- Remote controls
- Consumer electronics
- Home automation
- Toys
- Personal health and entertainment

Absolute Maximum Ratings

Parameter	Maximum Rating	Unit
VDD Supply Voltage	+3.6	V
Operating Temperature	-20 to +85	℃
Storage temperature	-50 to 100	℃

Notes:

1. Operation of this device in excess of any maximum rating as specified above may cause permanent damage to the device.
2. Caution! ESD Sensitive Device.

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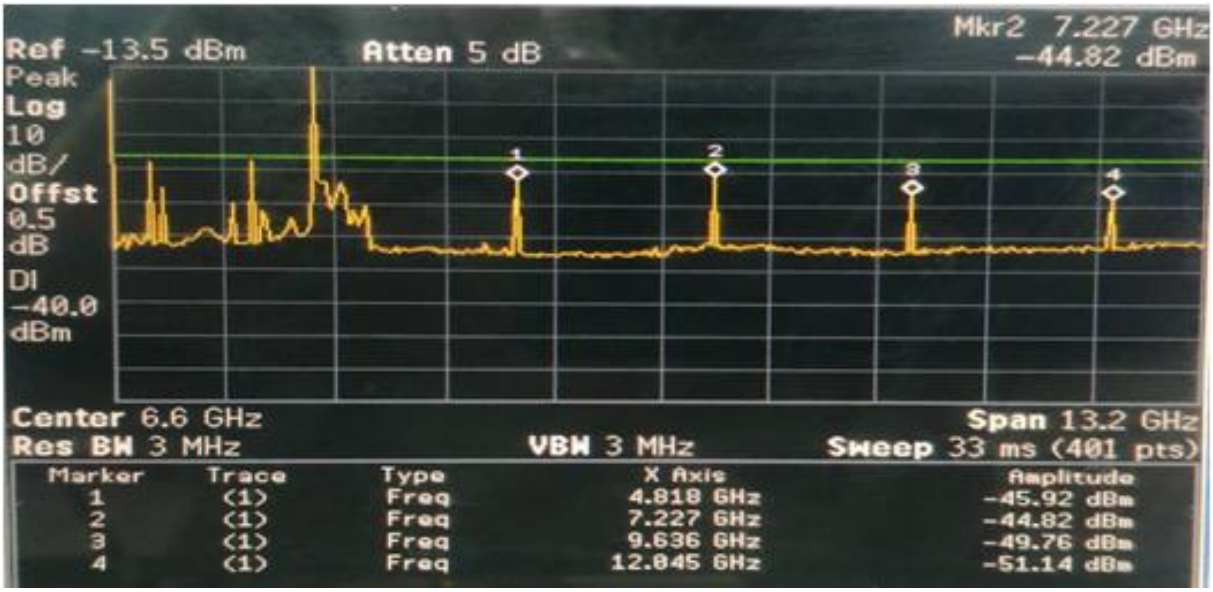
Specification Summary

Parameter	Min.	Typical	Max.	Unit
General Parameters				
Operating Frequency Range	2.4		2.4835	GHz
Supply Voltage	3	3.3	3.6	V
Operation		TDD		
Current Consumption				
Rx Mode		40		mA
Tx Mode 18 dBm		145		mA
Operating Temperature	-20		+85	℃
Transmitter				
Tx Output Power	16	18		dBm
Tx Pout Flatness		+/-1		dB
Receiver				
1 E-3 BER sensitivity (4Mbps)		-93		dBm
Frequency Deviation	450	600		KHz

Harmonics spectrum



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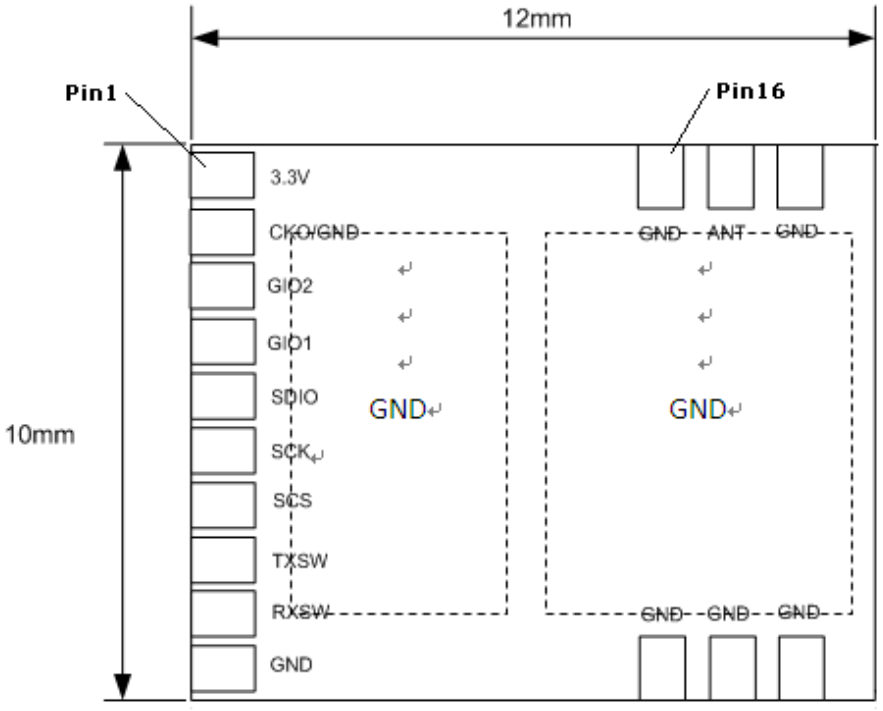
Harmonies and Power Level

Freq MHz	lv dBm	TX		2次谐波	3次谐波	4次谐波	5次谐波
		PWR	mA	4820/4900/4964	7230/7350/7446	9640/9800/9928	12050/12250/12410
2410	5	21.7	220	-42	-37	-47	-39
	0	20.5	183	-50	-39	-48	-48
	-5	18.4	145	-44	-43	-48	-50
2450	5	21.4	193	-37	-39	-61	-36
	0	20.7	166	-41	-38	-49	-39
	-5	19.4	140	-46	-40	-47	-47
2482	5	21.4	181	-37	-42	-57	-47
	0	20.7	155	-40	-39	-60	-50
	-5	19.4	130	-48	-40	-60	-59

Pin Configuration

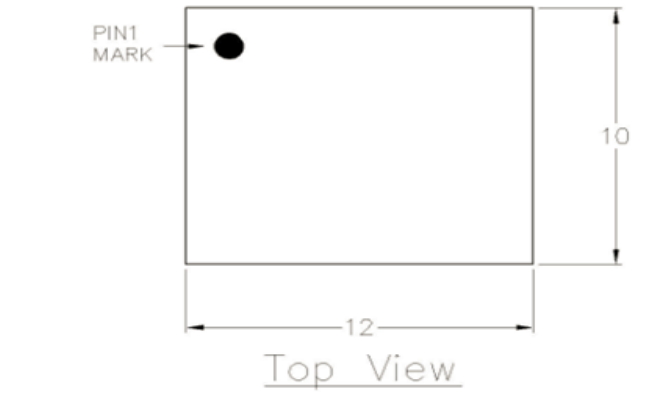


Top View

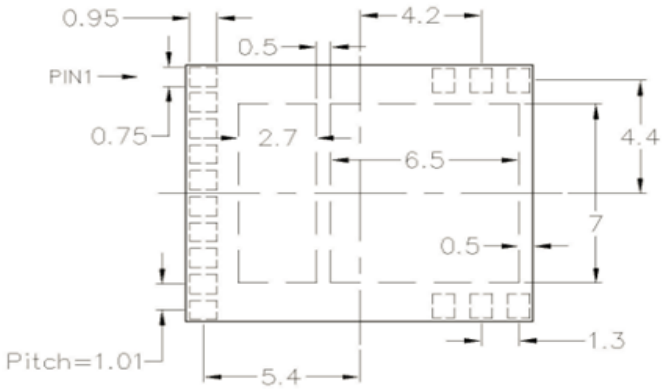
Functional Pin Description

Name	Pin#	Description
3.3V	1	Power Supply (3.3V DC)
CKO/GND	2	Multi-function clock output / Ground
GIO2	3	Multi-function GIO2 / 4-wire SPI data output
GIO1	4	Multi-function GIO1 / 4-wire SPI data output
SDIO	5	SPI read/write data
SCK	6	SPI clock input pin
SCS	7	SPI chip select
TXSW	8	TXSW switch control, "0" enable, RXSW switch control, "1" enable. Tx Mode
RXSW	9	RXSW switch control, "0" enable, TXSW switch control, "1" enable, Rx Mode
GND	10,11,12, 13,14,16	Ground
ANT	15	Antenna

Pin 1 and Dimension

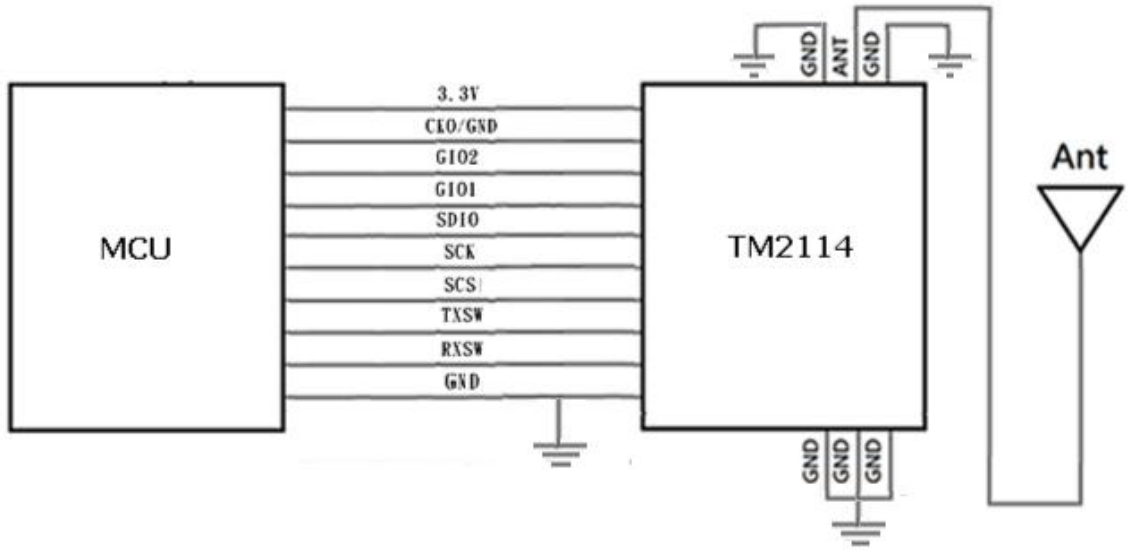


Top View



Top to Bottom View

Application Circuit



Tx/ Rx Control Logic

Pin Name	Rx Mode	Tx Mode
TXSW	1	0
RXSW	0	1

SMT Reflow Profile