



868/915MHz TRANSCEIVER MODULE

Description

MO-CC1101 is a Transceiver module. The MO-CC1101 is a true single-chip UHF transceiver, it is based on 3 wire digital serial interface and an entire Phase-Locked Loop (PLL) for precise local oscillator generation .so the frequency could be setting. It can use in UART / NRZ / Manchester encoding / decoding. MO-CC1101 transceiver module had a high performance and low cost. It could easily to design your product.

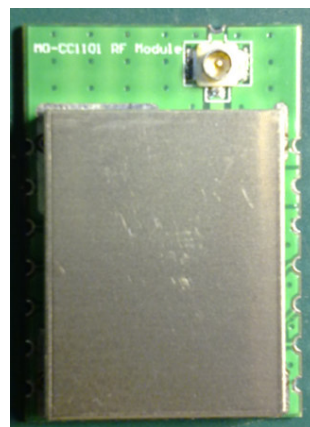
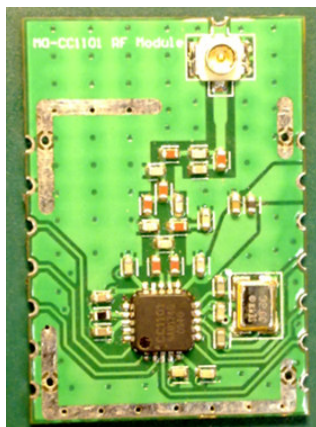
It can be used on wireless security system or specific remote-control function and others wireless system

Applications

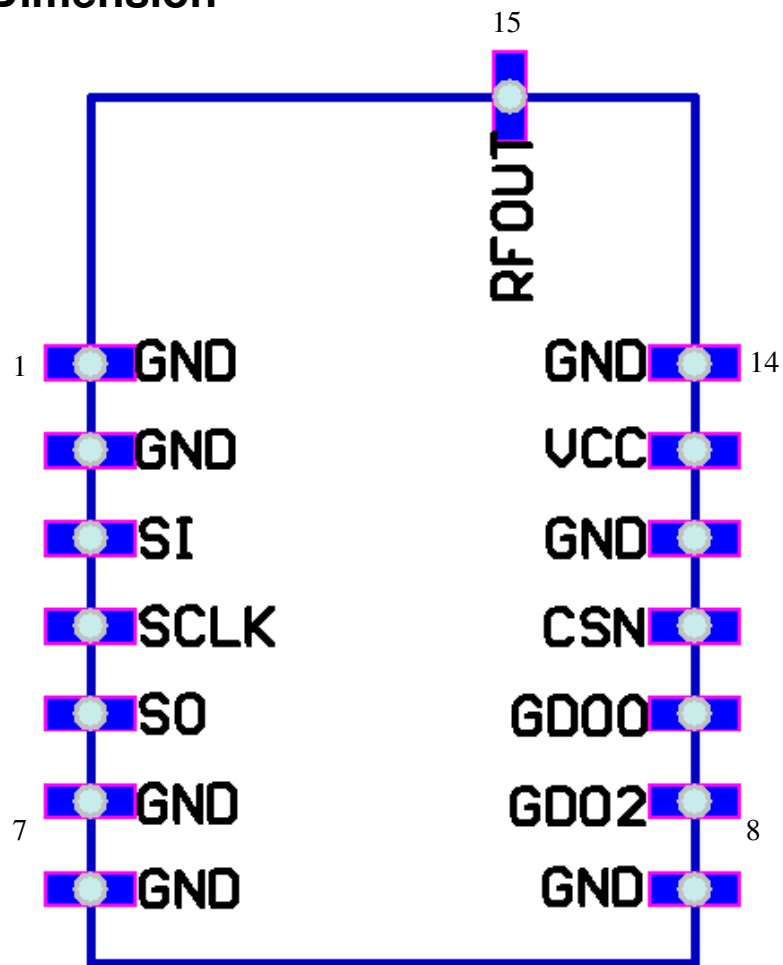
- Ultra low-power wireless applications operating in the 868/915MHz ISM/SRD bands.
- Car security system
- Remote keyless entry
- Industrial Monitoring and control
- Home security
- Wireless mouse
- Automation system

Features

- Integrated bit synchronizer.
- Integrated IF and data filters.
- High sensitivity (type -115dBm at 2.4kbps)
- Programmable output power up to +12dBm
- Operation temperature range : -40°C ~ +85°C
- Available frequency at : 779~928MHz
- Digital RSSI
- Digital function for package format



Pin Dimension



PIN#	Pin name	Pin type	Description
1	GND	Ground	GND
2	GND	Ground	GND
3	SI	Digital input	Serial configuration interface, data input
4	SCLK	Digital input	Serial configuration interface, clock input
5	SO	Digital Output	Serial configuration interface, clock input Optional general output pin when CSN is high
6	GND	Ground	GND
7	GND	Ground	GND
8	GND	Ground	GND
9	GDO2	Digital output	Data output
10	GDO0	Digital output	Data output
11	CSN	Digital input	Serial configuration interface ,chip select
12	GND	Ground	GND
13	+3V3	Power	3.3V
14	GND	Ground	GND
15	RFOUT	RF	RF Tx/Rx Signal

Absolute Maximum Ratings

Parameter	Min	Max	Unit	Condition
Supply Voltage	-0.3	3.9	V	All supply pins must have the same voltage
Input RF Level		+10	dBm	868MHz Transmit mode, +10dBm output power 3.6V VCC
Storage Temperature Range		150	°C	915MHz Transmit mode, +10dBm output power 3.0V VCC
Solder Reflow Temperature		260	°C	According the IPC/JEDEC J-STD-020C

General Characteristics

Parameter	Min	Typ	Max	Unit	Condition/Note
Frequency range	779		928	MHz	
Data rate	1.2		500	kbps	
	1.2		250	kbps	
	26		500	kbps	

Electrical Specifications

T_A = 25° C, VDD = 3.0 V

Parameter	Min	Typ	Max	Unit	Condition
Current consumption, TX		31		mA	868MHz Transmit mode, +10dBm output power 3.0V VCC
		32		mA	868MHz Transmit mode, +10dBm output power 3.6V VCC
		32		mA	915MHz Transmit mode, +10dBm output power 3.0V VCC
		32		mA	915MHz Transmit mode, +10dBm output power 3.6V VCC
Current consumption, RX		17		mA	Receive mode, 250 kBaud

RF Receive Section

T_A = 25° C, VDD = 3.0 V

Parameter	Min	Typ	Max	Unit	Condition/Note
Digital channel filter bandwidth	58		812	KHz Ω	User programmable. The bandwidth limits are proportional to crystal frequency (given values assume a 26MHz crystal)
Spurious emissions		-68	-57	dBm	25MHz-1GHz (Maximum figure is the ETSI EN 300 220)
		-66	-47	dBm	Above 1GHz (Maximum figure is ETSI EN 300 220 limit)
Receiver sensitivity 868MHz		-110		dBm	1.2 kBaud data rate, sensitivity optimized, MDMCFG2.DEM_DCFILT_OFF=0 (GFSK, 1% packet error rate, 20 bytes packet length, 5.2 kHz deviation, 58 kHz digital channel filter bandwidth)
		-102		dBm	38.4 kBaud data rate, sensitivity optimized, MDMCFG2.DEM_DCFILT_OFF=0 (GFSK, 1% packet error rate, 20 bytes packet length, 20 kHz deviation, 100 kHz digital channel filter bandwidth)
		-94		dBm	250 kBaud data rate, sensitivity optimized, MDMCFG2.DEM_DCFILT_OFF=0 (GFSK, 1% packet error rate, 20 bytes packet length, 127 kHz deviation, 540 kHz digital channel filter bandwidth)
		-90		dBm	500 kBaud data rate, sensitivity optimized, MDMCFG2.DEM_DCFILT_OFF=0 (MSK, 1% packet error rate, 20 bytes packet length, 812 kHz digital channel filter bandwidth)
Saturation		-14		dBm	868 MHz, 1.2 kBaud data rate, sensitivity optimized
		-16		dBm	868MHz, 38.4 kBaud data rate, sensitivity optimized
		-17		dBm	868MHz, 250 kBaud data rate, sensitivity optimized
Adjacent channel rejection, 868MHz, ±100KHz offset		37		dB	1.2 kBaud data rate, sensitivity optimized. Desired channel 3 dB above the sensitivity limit. 100 kHz channel spacing See Figure 2 for selectivity performance at other offset frequencies
Adjacent channel rejection, 868MHz, -200KHz offset +200KHz offset		12 25			38.4 kBaud data rate, sensitivity optimized. Desired channel 3 dB above the sensitivity limit. 200 kHz channel spacing See Figure 3 for blocking performance at other offset frequencies

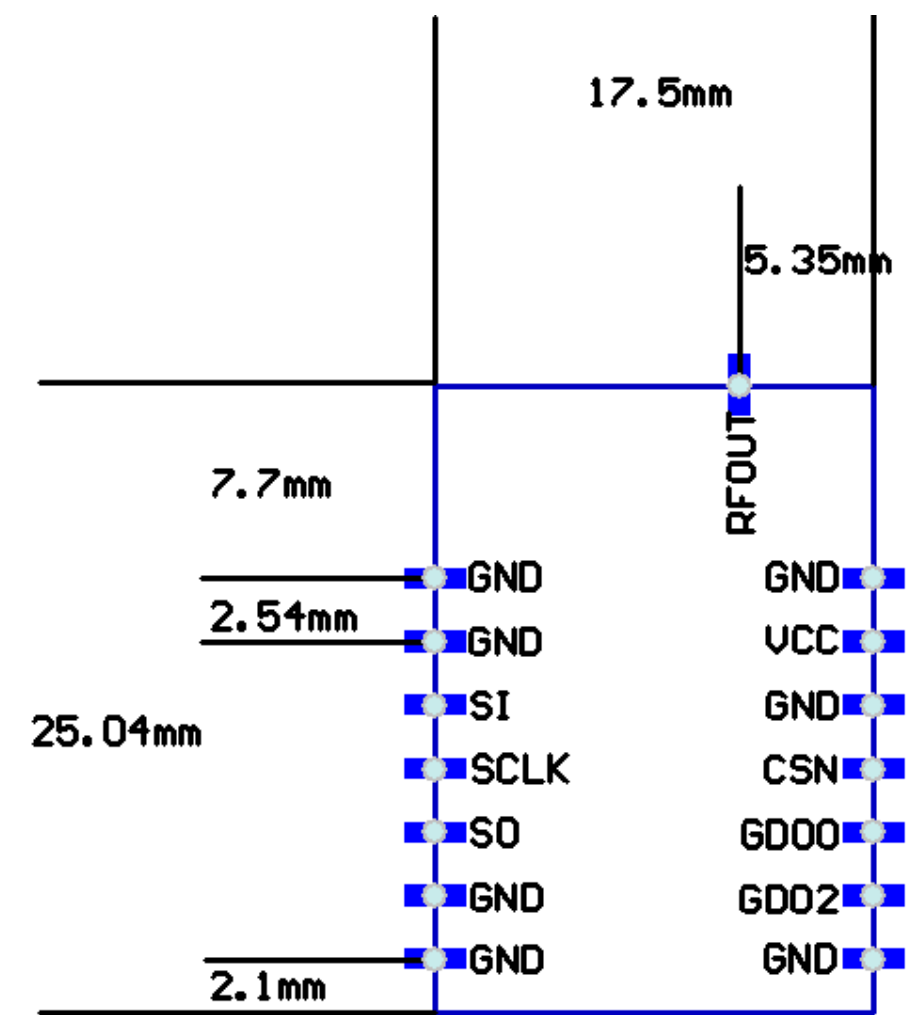
Adjacent channel rejection, 868MHz,		25			250 kBaud data rate, sensitivity optimized. Desired channel 3 dB above the sensitivity limit. 750 kHz channel spacing See Figure 4 for blocking performance at other offset frequencies
Image channel rejection, 868MHz		31		dB	1.2 kBaud data rate, sensitivity optimized. IF frequency 152 kHz Desired channel 3 dB above the sensitivity limit
		23			38.4 kBaud data rate, sensitivity optimized. IF frequency 152 kHz Desired channel 3 dB above the sensitivity limit
		14			250 kBaud data rate, sensitivity optimized. IF frequency 304 kHz Desired channel 3 dB above the sensitivity limit
		1			500 kBaud data rate, sensitivity optimized. IF frequency 355 kHz Desired channel 3 dB above the sensitivity limit
Blocking ±2MHz offset ±10MHz offset		-50 -40		dBm	1.2 k/38.4K/250K/500K Baud data rate, sensitivity optimized. Desired channel 3 dB above the sensitivity limit See Figure 2 for blocking performance at other offset frequencies

RF Transmit Section

T_A = 25° C, VDD = 3.0 V

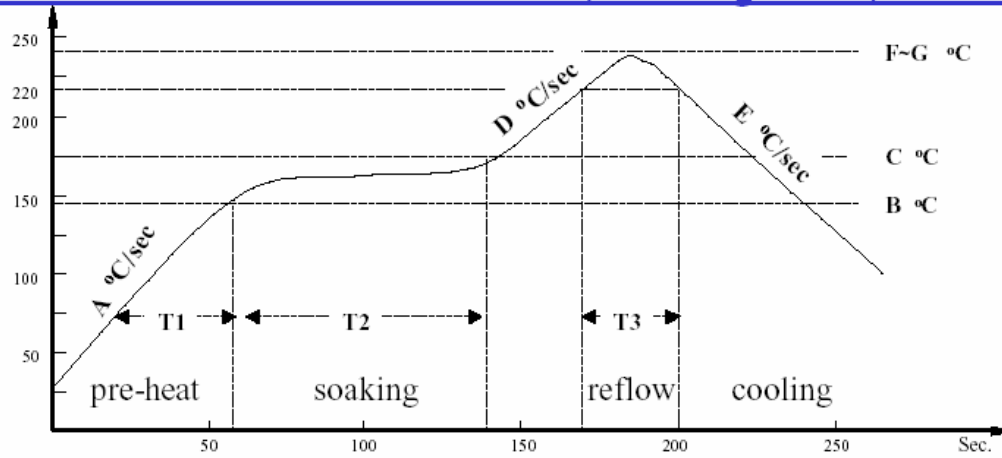
Parameter	Min	Typ	Max	Unit	Condition/Note
Differential load impedance (868/915MHz)		86.5 + j43		Ω	Differential impedance as seen from the RF-port (RF_P and RF_N) towards the antenna.
Output power, highest setting 868MHz 915MHz		+12 +11		dBm dBm	Output power is programmable, and full range is available in all frequency bands. Output power may be restricted by regulatory limits. See also Application Note AN050 [6] and Design Note DN013 [18], which gives the output power and harmonics when using <i>multi-layer</i> inductors. The output power is then typically +10 dBm when operating at 868/915 MHz.
Output power, lowest setting		−30		dBm	Output power is programmable, and full range is available in all frequency bands.
Spurious emissions conducted, harmonics not included 868MHz 915MHz		< -50 < -52 < -53 < -51 < -54			Measured with +12 dBm CW at 868 MHz Frequencies below 1 GHz Frequencies above 1 GHz Frequencies within 47-74, 87.5-118, 174-230, 470-862 MHz Measured with +11 dBm CW at 915 MHz Frequencies below 960 MHz Frequencies above 960 MHz

Layout Guide



Recommended Reflow Profile

Reflow Profile Used at The Evaluation (Sn-3.0Ag-0.5Cu) –PF606-P



A: ramp up rate during preheat:	1.5~3.0 °C/sec
B~C: soaking temperature:	170± 15 °C
D: ramp up rate during reflow:	1.2~2.3 °C/sec
E: ramp down rate during cooling:	1.7~2.2 °C/sec
F~G: peak temperature:	240± 10 °C
T1: preheat time:	65± 15 sec
T2: dwell time during soaking:	75± 15 sec
T3: time above 220 °C :	30± 10 sec

Remarks

1. About detailed Specifications, Please see CC1101 Data sheet.
<http://focus.ti.com/lit/ds/symlink/cc1101.pdf>
www.ti.com