CC1101 vs SI4432

Competitor comparison

General Characteristics

	CC1101	IA4431/2
Package size	4x4mm QFN	4x4mm QFN
External components	Common match for RX and TX, no RF switch needed.	Requires external RF switch or separate RX and TX antenna.
Vdd range	1.8– 3.6 Volts	1.8- 3.6 Volts

Si443x and CC1101 Reference Designs

Extensive L-C filtering at antenna port. The Si443x datasheet numbers for RF performance is referred to the chip pins, and so the loss from this filter is not included in the datasheet.
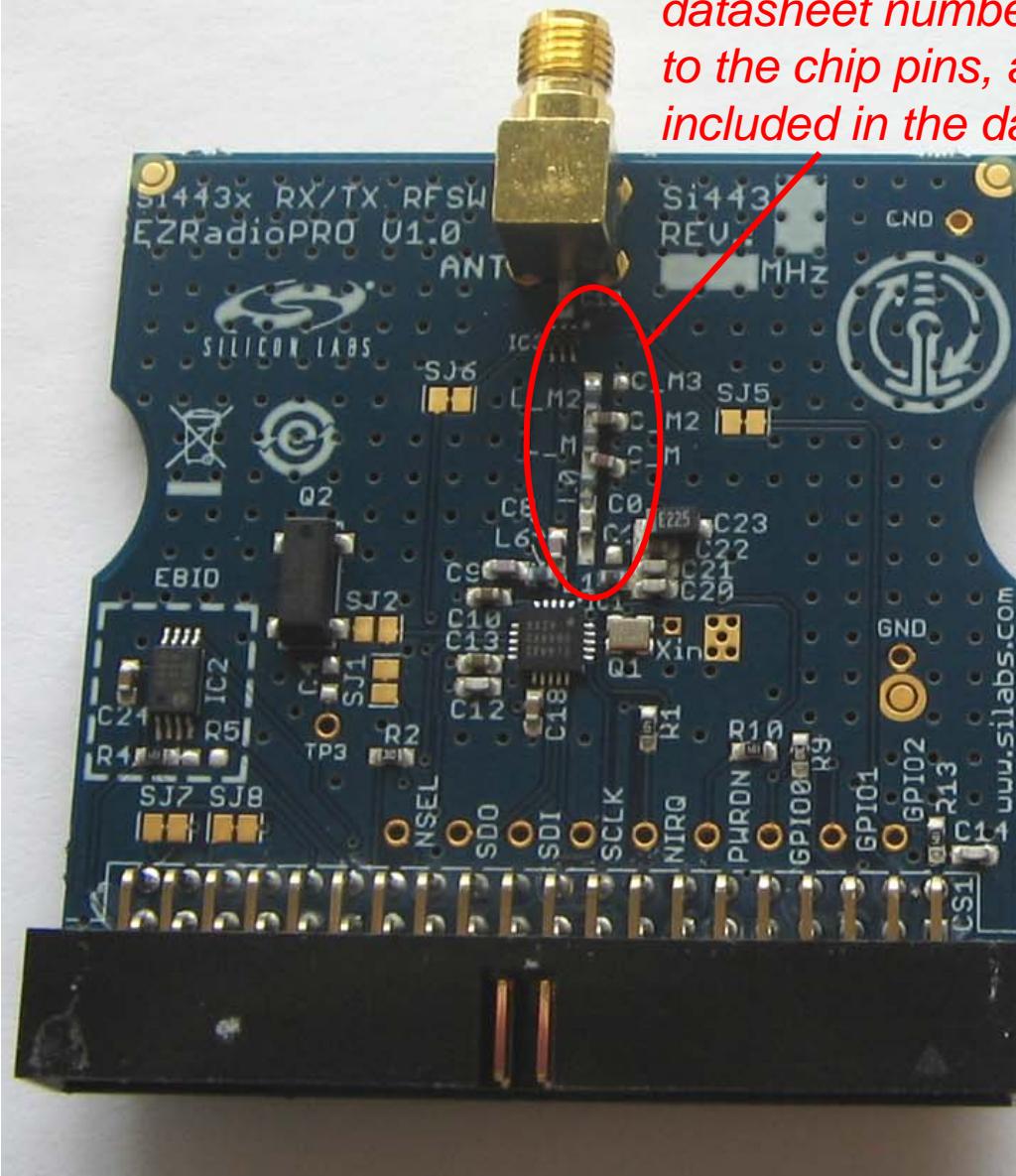
All RF parameters for CC1101 are measured with the complete reference design

RF Performance

	CC1101	SI4431/2
Max datarate FSK / OOK	500kbps / 500kbps	128kbps / 40kbps
Sensitivity (40kbps)	Using OOK: -104dBm Using FSK: -104dBm *With the CC1190+CC1101, the sensitivity is improved to -110dBm*	Using OOK: -102dBm Using FSK: -107dBm
Output power (max)	+12dBm / +26dBm with CC1190	+13/20dBm (datasheet) * Only 10/14dBm allowed in EU except 869.4 – 869.65 where +27dBm is allowed

Note: CC1101 is not optimised for very low datarates (1.2kbps). The minimum channel bandwidth is 58kHz, therefore the best sensitivity is limited to -112dBm.

SI4432 Measured Output Power

• Taken from datasheet "Preliminary V0.3" on the web as of May 2009 @ 2.0V:

- • SI4432 can deliver +15dBm
- • CC1101 can deliver +12dBm

• All RF input and output levels in datasheet refers to the pins of the SI4432 (not the RF module)
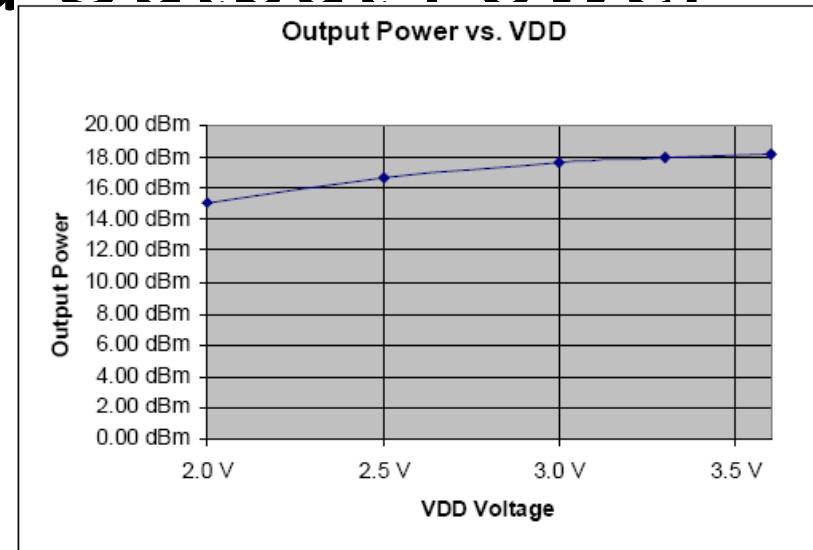
Figure 46. TX Output Power vs. VDD Voltage
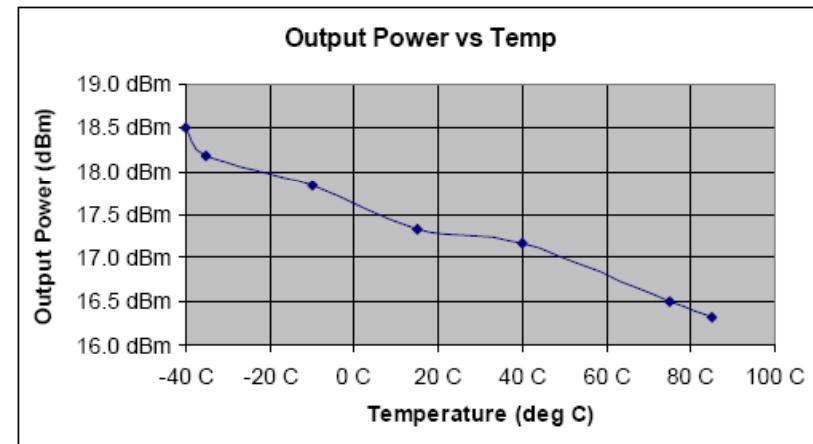
Power Consumption

	CC1101	SI4431/2
Power down with state retention and sleep timer	0.5µA	0.8µA
RX (highest RF performance)	16.5mA	18.5mA
RX (powersave mode)	14.6mA	18.5mA
Startup = XTAL start + PLL setling	XTAL start: 0.15ms PLL setl: 0.09ms	XTAL start: 1ms PLL setl: 0.22ms

Migration Paths to Compatible Platforms

- CC1101 is code, pin and register compatible with CC1100E for operation in 470-510MHz and 950-960MHz frequency bands

- CC1101 is code, pin and register compatible with CC2500 which operates in the 2.4GHz band

- CC1101 radio core is included in CC1110Fx and CC1111Fx which integrates a single-cycle MCU running @ up to 26MHz, up to 4kB RAM/32kB FLASH, AES128 hardware encryption and optional full speed USB 2.0

- CC1101 radio core is included in the upcoming CC430 devices.

Design Resource

- SimpliciTI™ RF network stack: ti.com/si
  - point-to-point and star networks
  - runs on MSP430 and CCxx10/30 RF SoCs
  - sourcecode available as free download

- RF Packet Sniffer: ti.com/packetsniffer
  - graphical visualisation of RF packets

- SmartRF™Studio software: ti.com/sma
  - out-of-the box packet error rate testing
  - generate full register settings for CC110