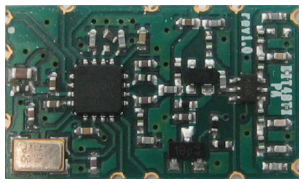
Double Frequency RF Transmitter

Applications

- 433/868 MHz ISM band systems
- Consumer Electronics
- Wireless audio
- Alarm and security systems
- Home and building automation
- Wireless sensor networks
- Industrial monitoring and control



Product Description

BIT48TX/PA is a very low cost RF transmitter module designed for short and medium range wireless applications.
This module is intended for ISM (Industrial, Scientific and Medical) frequency band @ 433, 868/915 MHz.

The Transceiver module supports various modulation formats and has a configurable data rate up to 500 kbps. The communication range can be increased by enabling a Forward Error Correction option, which is integrated in the module.

BIT48TX/PA provides extensive hardware support for packet handling, data buffering, burst transmissions.
The main operating parameters and the 64-byte transmit FIFO of **BIT48TX/PA** can be controlled via an SPI interface. In a typical system, the **BIT48TX/PA** will be used together with a microcontroller.

BIT48TX/PA has a very small package: only 13 x 23 mm ready for SMT assembly.

BIT48TX/PA is based on the well-proven CC1150 Chipcon Products from Texas Instruments.

Key Features

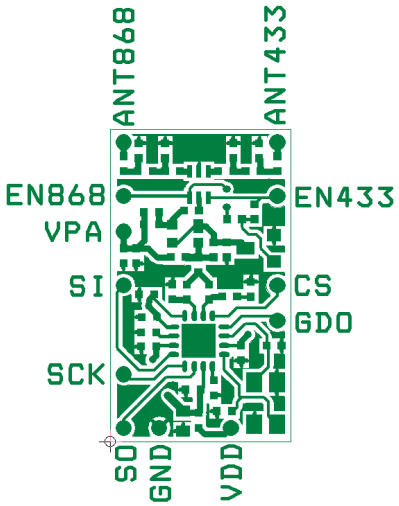
- Small size (13 x 23 mm package, 12 pins).
- Frequency bands:
  1. 400 – 464 MHz
  2. 800 – 928 MHz
- High output power (up to 18 dBm).
- Ideal for multi-channel operation.
- Programmable output power up to + 18 dBm @ VPA = 12V.
- Ideal for multi-channel operation.
- Suitable for frequency hopping systems due to a fast settling frequency synthesizer.

- Optional Forwad Error Correction with interleaving.

Features (continued from front page)

- 64-byte TX data FIFO
- Efficient SPI interface: All registers can be programmed with one “burst” transfer.
- Programmable data rate up to 500 kbps
- OOK/ASK, FSK, GFSK e MSK modulation format supported.
- Pb-free (RoHS compliant) package.

1. Pin-Out



Pin #	Pin Name	Pin Type	Descrizione
P1	EN868	Digital Input	Transmit 868 enable signal
P2	V_{PA}	Power	2.2V – 12V power amplifier supply connection
P3	SI	Digital Input	Serial configuration interface, data input
P4	SCK	Digital Input	Serial configuration interface, clock input
P5	SO	Digital Output	Serial configuration interface, data output
P6	GND	Ground	Ground Connection
P7	V_{DD}	Power	1.8V – 3.6V frequency sintethyzer supply connection
P8	GDO	Digital I/O	Digital Output pin for general use: ▪ Test signal ▪ FIFO status signals ▪ Clock output, down-divided from XOSC ▪ Serial input TX data
P9	CS	Digital Input	Serial configuration interface, chip select
P10	EN433	Digital Input	Transmit 433 enable signal
P11	ANT433	RF Out	433 MHz Antenna Connection
P12	ANT868	RF Out	868 MHz Antenna Connection

2. Electrical Specification

Parameter	Test conditions	Units	Min	Typ	Max
V_{DD}		V	1.8	-	3.6
V_{PA}		V	1.8	-	12
V_{IL}	SI, SCK, SO, CS and GDO pin EN868 and EN433 pin	V V	0 0	- -	0.7 0.2
V_{IH}	SI, SCK, SO, CS and GDO pin EN868 and EN433 pin	V V	V_{DD}–0.7 2.3	- -	V_{DD} 7.5
V_{OL}	SI, SCK, SO, CS and GDO pin Up to 4mA output current	V	0	-	0.5
V_{OH}	SI, SCK, SO, CS and GDO pin Up to 4mA output current	V	V_{DD}–0.3	-	V_{DD}
P_{OUT}	CC1150 configured @ -1dBm output power 433 or 868 TX mode V_{PA} = 1.8V V_{PA} = 3V V_{PA} = 5V V_{PA} = 7.2V V_{PA} = 12V	 dBm dBm dBm dBm dBm	 - - - - -	 10 13.5 15 17 18	 - - - - -
Current consumption ▪ Stand-by mode	EN433 = EN868 = 0V CC1150 in stand-by	nA	-	300	-
▪ I_{VPA} + I_{VDD}	EN433 = 3V ; EN868 = 0V; VPA = 3V CC1150 configured @ -1dBm output power 433 MHz TX mode @ 13.5 dBm ANT433 output power .	mA	-	49	-
▪ I_{VPA} + I_{VDD}	EN433 = 0V ; EN868 = 3V; VPA = 3V CC1150 configured @ -1dBm output power 868 MHz TX mode @ 13.5 dBm ANT868 output power .	mA	-	49	-

3. Development Tools

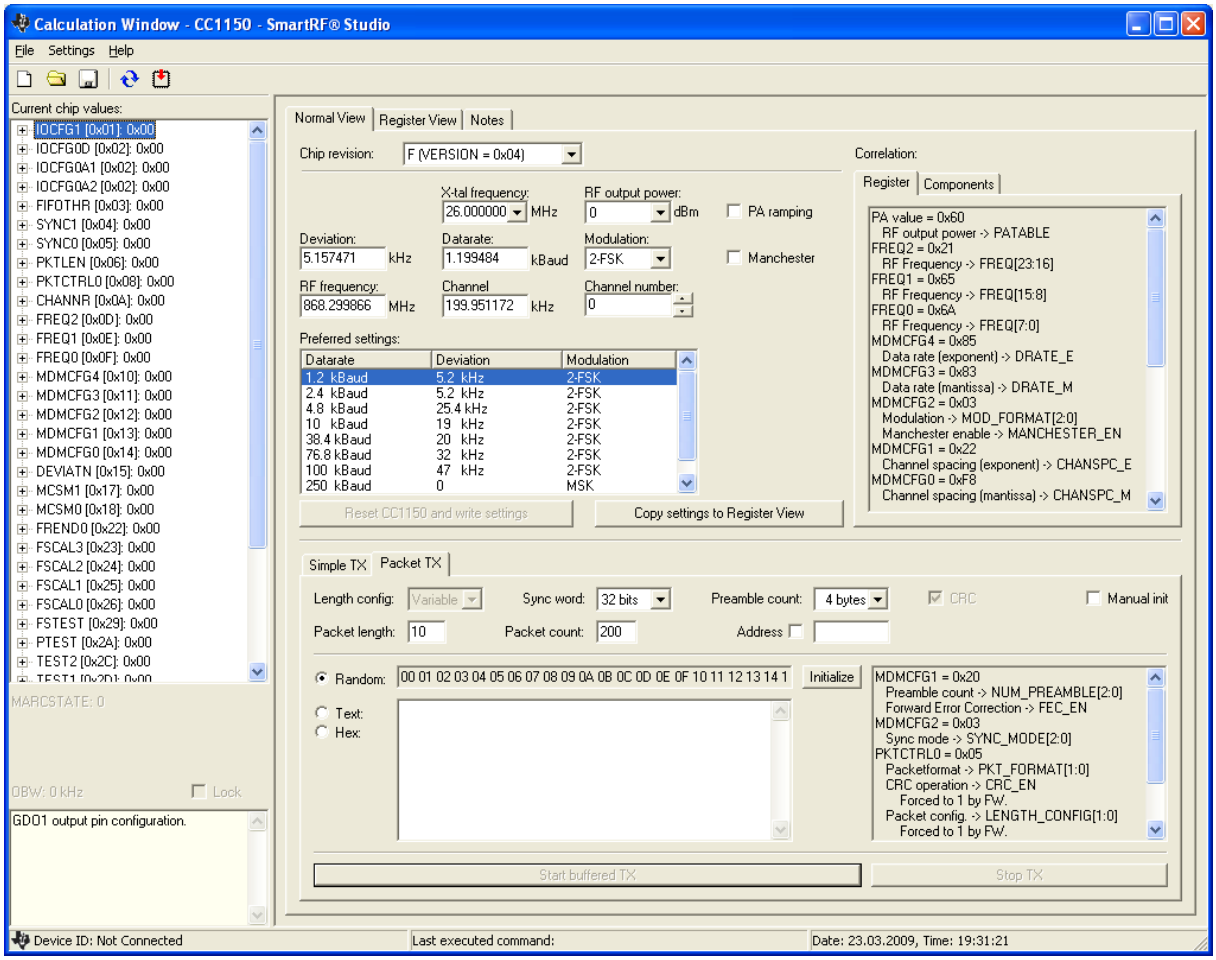
Configuration of main operating parameters are easily achieved using the SmartRF® Studio software described below.
It is strongly recommended not to use CC1150 output power configuration below –1dBm in order to achieve better performance in terms of spurious emission.

3.1. Technical Documents:

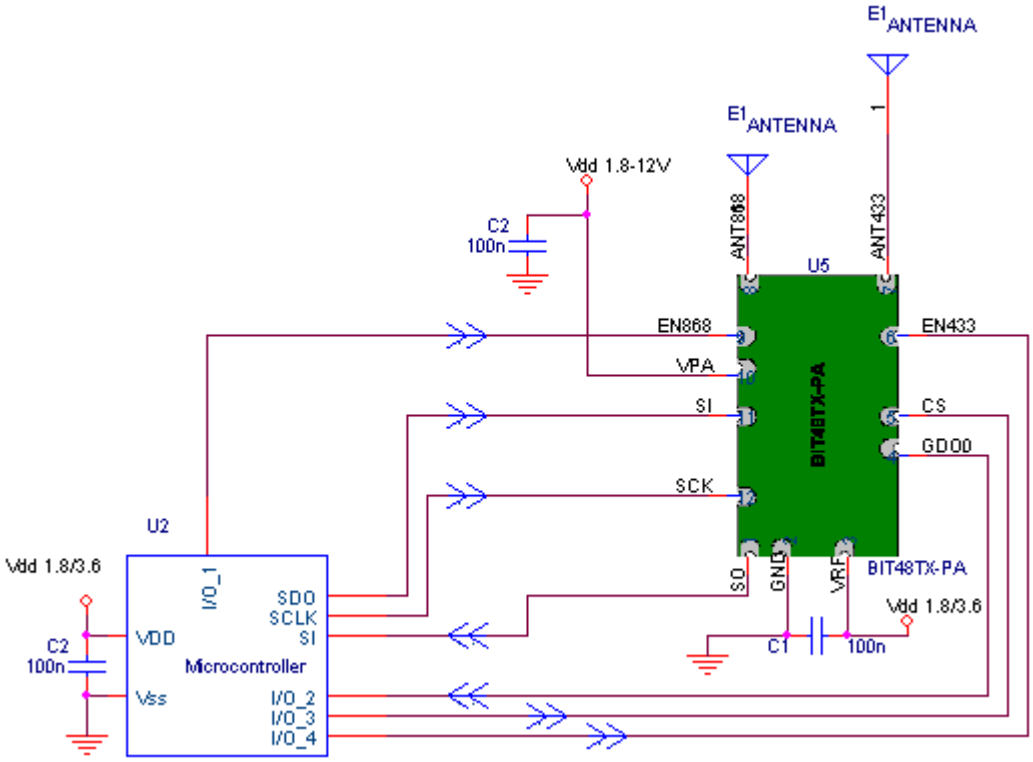
Data sheet CC1150 available for download from:
http://focus.ti.com/docs/prod/folders/print/cc1150.html

3.2. Configuration Software

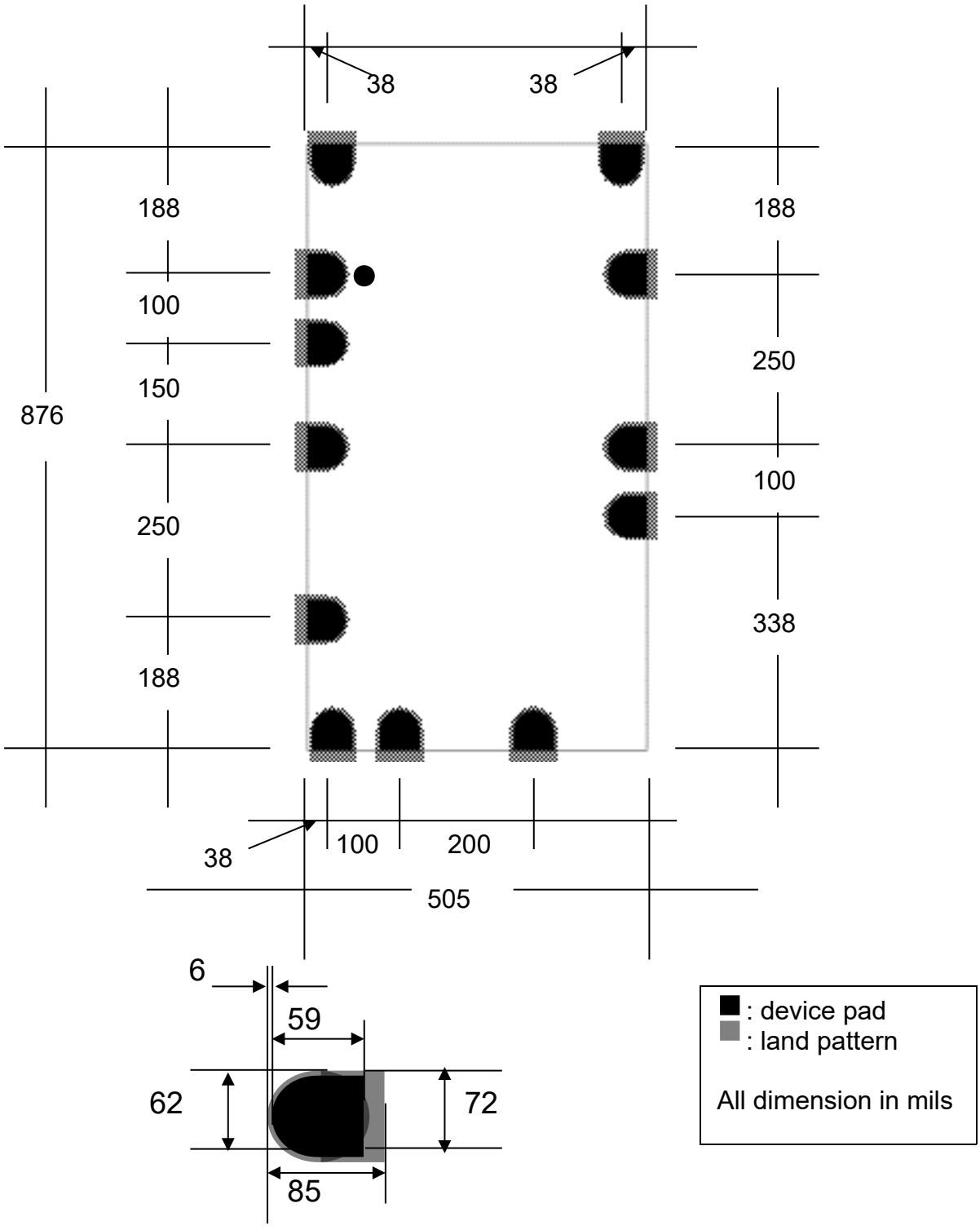
BIT48TX/PA can be configured using the SmartRF® Studio software, available for download from http://www.chipcon.com or http://www.ti.com/lpw The SmartRF® Studio software is highly recommended for obtaining optimum register settings, and for evaluating performance and functionality. A screenshot of the SmartRF® Studio user interface for CC1150 is shown in Figure.



4. Typical application


E1
ANTENNA
E1
ANTENNA
1
Vdd 1.8-12V
C2
100n
ANT868
ANT433
U5
EN868
EN433
VPA
SI
CS
GDO0
SCK
BIT48TX-PA
SO
GND
VRF
BIT48TX-PA
Vdd 1.8/3.6
C1
100n
U2
Vdd 1.8/3.6
I/O_1
SDO
SCLK
SI
C2
100n
VDD
Microcontroller
Vss
I/O_2
I/O_3
I/O_4

5. Package Description and Recommended Footprint



The area underneath the module should be covered with solder resist in order to prevent short circuiting the test pads on the back side of the module. A solid ground plane is preferred.

6. General Information

a. Disclaimer

B.I.T. srl believes the information contained herein is correct and accurate at the time of this printing. However, B.I.T. srl reserves the right to make changes to this product without notice. B.I.T. srl does not assume any responsibility for the use of the described product; neither does it convey any license under its patent rights, or the rights of others. The latest updates are available at the BIT website or by contacting BIT directly.
As far as possible, major changes of product specifications and functionality, will be stated in product specific Errata Notes published at the BIT website. Customers are encouraged to sign up to the Developers Newsletter for the most recent updates on products and support tools.
Compliance with regulations is dependent on complete system performance. It is the customer's responsibility to ensure that the system complies with regulations.

b. Life Support Policy

This BIT product is not designed for use in life support appliances, devices, or other systems where malfunction can reasonably be expected to result in significant personal injury to the user, or as a critical component in any life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness. B.I.T. srl customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify B.I.T. srl for any damages resulting from any improper use or sale.

Bit is **I**talian **T**echnology S.r.l.
Via Settembrini, 29 – 20020 Lainate (MI)
Tel.: (+39) 02 30465311, fax: (+39) 02 30465358
http://www.bit.it/ **info@bit.it**

A SCHURTER company

http://www.kevin.it/

info@kevin.it