A7121 15dBm 2.4GHz 3Mbit GFSK Transceiver

Description :

The MD7121_module is designed for 2.4GHz ISM band with 15dbm output power wireless applications using AMIC-COM A7121 GFSK transceiver and PA RFIC. This module features a fully programmable frequency synthesizer by SPI. The data rate is 1Mbps and 3Mbps.

Feature:

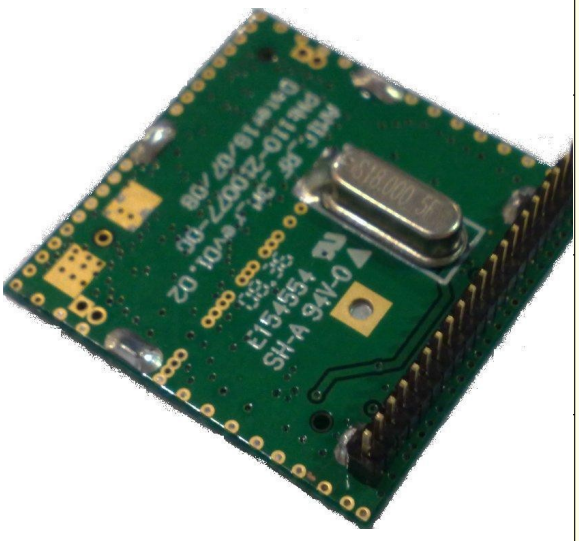
- Supply voltage: 3.3V
- Frequency: 2400 – 2483.5 MHz
- Transmit output power: 15 ± 2 dBm @ Maximum Power Setting
- Rx sensitivity:
  -95 dBm (typical) @ 1M mode, Dev = 250 k
  -90 dBm (typical) @ 3M mode, Dev = 750 k
- Transmission distance: 200 meters (typical)

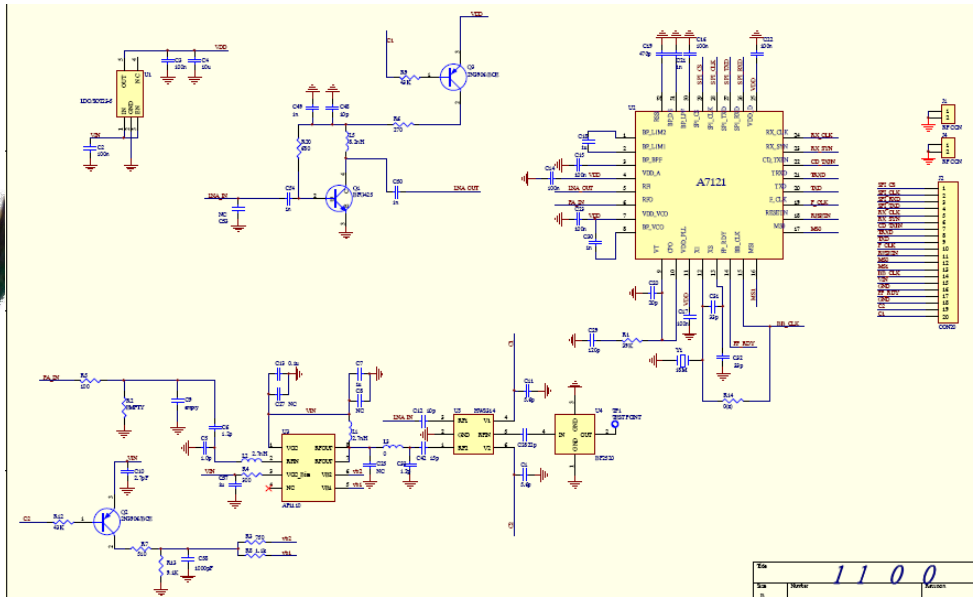
Dimension: 29(L) x 29(W) x 0.8(H) mm3 without antenna

Applications

- Wireless baby monitor
- Wireless home security, Video Door Bell, Video door phone
- Surveillance: Wireless P-CAM
- Automotive: Wireless Vision-Based Robotic System, Automotive car rear view
- Wireless Video Walkie Talkie
- Industrial video monitor
- Toys: Camera Radio Controlled Toy
- Wireless Video for Photo Frame

CIRCUIT





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Avant Com

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Amiccom A7121

Low power R.F 2.4GHz Transceiver

A7121 is a monolithic CMOS integrated circuit for wireless applications in 2.4GHz ISM band. The device is provided in a 32-lead plastic QFN5X5 packaging and is designed as a complete GFSK transceiver up to 3Mbps data rate. The chip features a fully programmable frequency synthesizer with integrated VCO circuitry

- Frequency bands: 2.4GMHz ISM band.
- □ Programmable RF output power: up to 0 dBm.
- □ Low power consumption: RX:28mA, TX:34mA.
- □ Supply voltage 2.25 ~ 2.75V.
- □ High sensitivity (-85dBm at 1Mbps, ≦1E-3 BER).
- □ Data rate up to 3Mbps.
- □ RSSI (Received Signal Strength Indicator).
- □ Separate 64 bytes TX/RX FIFO for data buffer.
- □ QFN32 package (5mm X 5mm).

RFIC PA

2.4~2.5 GHz Power Amplifier

PA is a linear, low current power amplifier in ISM band utilizing InGaP / GaAs HBT process. The PA is well suitable to be used for portable, low current 2.4GHz WLAN applications as well as for BT (Bluetooth) Class1 applications. PA is packaged in *2x2* compact profile. For WLAN application, it features low current of *85mA* at linear power of *18.5dBm*, gain of 26dB under 3.3V. For Bluetooth applications, it features of gain at 26 dB; typical power of *23dBm* and PAE of *40%* under 3.3V. PA is also suitable for the new BT 2.0 (EDR) standard.

- **Ultra Small Profile: 2x2(mm), DFN-8pin**

WLAN Applications: (Under Vc=3.3V, Vref=2.8V)

- LOW Current: 85mA at 18.5dBm
- High efficiency: PAE: 25% at 18dBm
- Gain: 26 Db

BT Applications:
(BT V.1.1&1.2, Under Vc=3.3V, Vref=2.85V)

- LOW Current: 85mA at 18dBm
  60mA at 16dBm
  50mA at 14dBm
- High efficiency: PAE: 40% at 23dBm
- Gain: 26 dB
- Harmonic: -33dBc at 23dBm

(BT EDR version, under Vc&Vref=3.3V)

- LOW Current: 110mA at 18dBm
  95mA at 16dBm
  75mA at 14dBm
- Gain: 23dB

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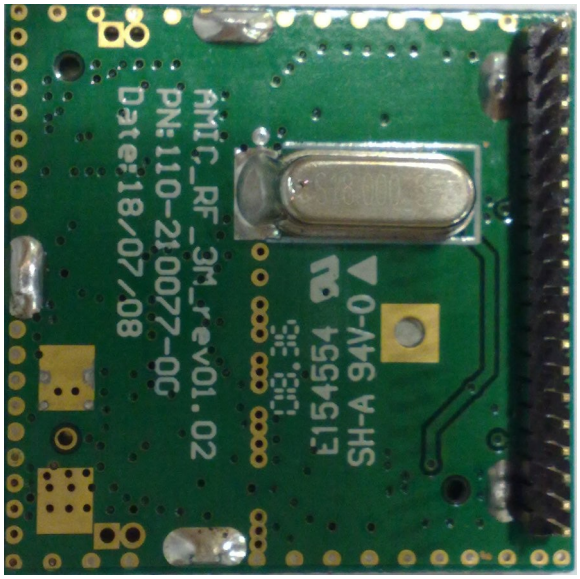
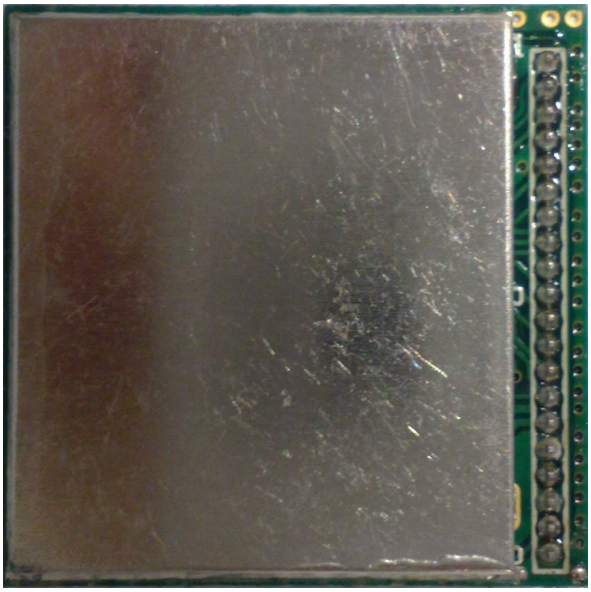
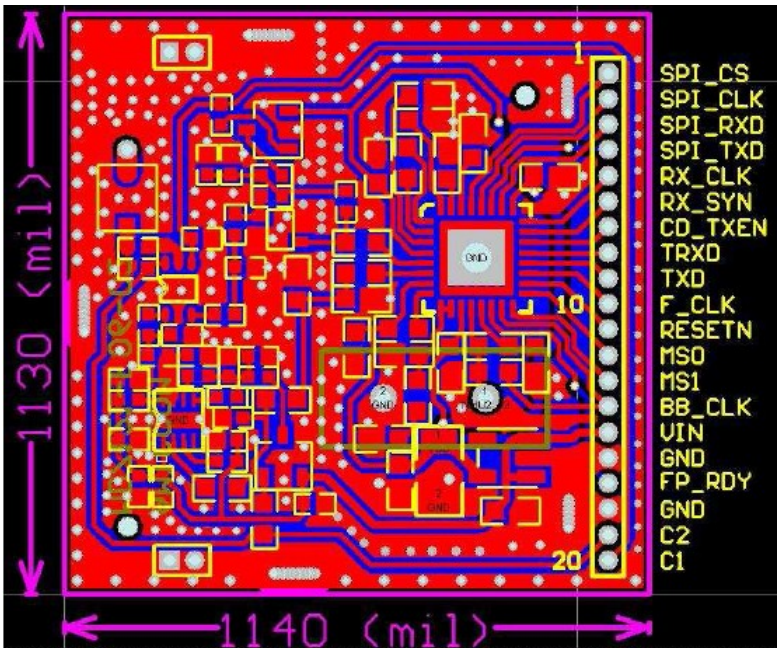




Pin No.	Pin name	Comment
1	SPI_CS	SPI chip select
2	SPI_CLK	SPI clock
3	SPI_RXD	SPI data input
4	SPI_TXD	SPI data output
5	RX_CLK	RX data sampling clock output
6	RX_SYN	RX sync signal output
7	CD_TXEN	TX mode: Modulation enable Rx mode: Carrier detector
8	TRXD	Input: TX data input Output: RX data output
9	TXD	TX data input
10	F_CLK	Clock for FIFO data
11	RESETN	Chip reset
12	MS0	Transceiver operation mode selection input
13	MS1	Transceiver operation mode selection input
14	BB_CLK	Clock output
15	VIN	RF module supply voltage input
16	GND	GND
17	FP_RDY	Multi-function pin of FIFO packet R/W complete or ready signal
18	GND	GND
19	C2	PA on/off control, TRX switch control
20	C1	LNA on/off control, TRX switch control



C1 and C2 control state

Control function	RX ON	TX ON	TR/X OFF	Inhibition
C1	0	1	1	0
C2	1	0	1	0

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Electrical specification

Item	Specification	Remark
Supply voltage	3.3V	
Current consumption	100uA (typical) @Sleep mode 1.7mA (typical) @Stand-by mode 11mA (typical) @Synthesizer Mode 110mA (typical) @Tx power = 15dBm 36mA (typical) @Rx mode	
Frequency	2400 – 2483.5 MHz	ISM band
Transmit output power	15 ± 2 dBm @ Maximum Power Setting	
Rx sensitivity	-95 dBm (typical) @ 1M mode, Dev = 250 k -90 dBm (typical) @ 3M mode, Dev = 750 k	BER≦1E-3
Emission	< -50/-35dbm@ Lo/2Lo < -50dbm@ 2^{nd} 3^{rd} Harmonic	To add the shielding case for the FCC certification.
Modulation	GFSK	
Transmission distance	200 meters (typical) 3M mode.	Outdoor line-of-sight Use dipole antenna
Interface	20 pin 1.27mm header	
PCB Dimension	29(L) x 29(W) x 0.8(H) mm^3 without antenna	
Operating temperature	0 ~ 50 ℃	

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