

### General Description

A7205 is a high performance and low cost 2.4GHz ISM band wireless receiver. This device integrates high sensitivity receiver (-95dBm @ 500Kbps). In low data rate application, A7205 has special strength for long LOS (line-of-sight) distance because of its ultra high sensitivity (-107 dBm @ 2Kbps, -104 dBm @ 25Kbps) with no requirement of external LNA. Based on Data Rate Register (0x0E), user can configure on-air data rates from 2Kbps to 500Kbps.

A7205 supports fast settling time (130 us) for frequency hopping system. For packet handling, A7205 has a built-in 64-bytes RX FIFO (could be extended to 256 bytes) for data buffering and burst transmission, CRC for error detection, RSSI for clear channel assessment, data whitening for data decryption. Those functions are very easy to use while developing a wireless system. All features are integrated in a small QFN 4X4 20 pins package.

A7205's control registers can be easily accessed via 3-wire or 4-wire SPI. For power saving, A7205 supports sleep mode, idle mode, standby mode. For easy-to-use, A7205 has a unique SPI command set called **Strobe command** that are used to control internal state machine. Based on Strobe commands, MCU can control everything from power saving, RX receiving, channel monitoring, frequency hopping to auto calibrations. In addition, A7205 supports two general purpose I/O pins, GIO1 and GIO2, to inform MCU its status so that MCU could use either polling or interrupt scheme to do radio control. Hence, it is very easy to monitor radio transmission between MCU and A7205 because of its digital interface.

### Typical Applications

- 2.4GHz wireless applications
- Remote control
- Helicopter and airplane radio controller
- 2400 ~ 2483.5 MHz ISM system
- Wireless metering and building automation
- Wireless toys and game controllers

### Feature

- Small size (QFN4 X4, 20 pins).
- Frequency band: 2400 ~ 2483.5MHz.
- FSK or GFSK modulation
- Low current consumption: RX 16mA.
- Low sleep current (1.5 uA).
- On chip regulator, support input voltage 2.0 ~ 3.6 V.
- Programmable data rate from 2Kbps to 500Kbps.
- Ultra High sensitivity:
  - ◆ -95dBm at 500Kbps on-air data rate.
  - ◆ -97dBm at 250Kbps on-air data rate
  - ◆ -104dBm at 25Kbps on-air data rate
  - ◆ -107dBm at 2Kbps on-air data rate
- Fast settling time (130 us) synthesizer for frequency hopping system.
- Built-in Battery Detector.
- Support low cost crystal (12 / 16 / 20 / 24MHz).
- Support crystal sharing, (1 / 2 / 4 / 8MHz) to MCU.
- Easy to use.
  - ◆ Support 3-wire or 4-wire SPI.
  - ◆ Unique Strobe command via SPI.
  - ◆ ONE register setting for new channel frequency.
  - ◆ 8-bits Digital RSSI for clear channel indication.
  - ◆ Auto RSSI measurement.
  - ◆ Auto Calibrations.
  - ◆ Auto IF function.
  - ◆ Auto CRC Check.
  - ◆ Data Whitening for packet decryption.
  - ◆ 64 bytes RX FIFO.
  - ◆ Easy FIFO / Segment FIFO / FIFO Extension (up to 256 bytes).
  - ◆ Support frame sync signal to MCU.
  - ◆ Support direct mode with recovery clock output to MCU.

**Pin Configurations**

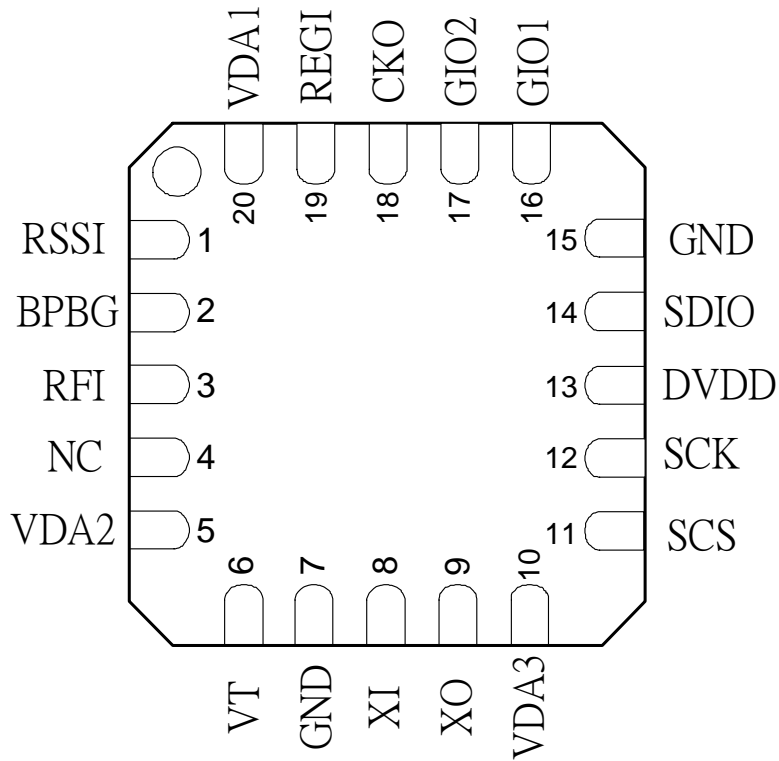


Fig 4-1. A7205 QFN 4x4 Package Top View

**Pin Description (I: input; O: output, I/O: input or output)**

Pin No.	Symbol	I/O	Function Description
1	RSSI	O	Connected to a bypass capacitor for RSSI reading.
2	BPBG	O	Connected to a bypass capacitor for internal Regulator bias point
3	RFI	I	Low noise amplifier input.
4	NC	O	NC.
5	VDA2	I/O	TRX Voltage supply ( <b>from IC internal analog regulator</b> ), connected to a bypass capacitor.
6	VT	I	VCO frequency control input, internal connected to PLL charge pump.
7	GND	G	Ground
8	XI	I	Crystal oscillator input node
9	XO	O	Crystal oscillator output node
10	VDA3	I	Voltage supply ( <b>from VDA1, pin 20</b> ) for PLL part
11	<b>SCS</b>	I	3 wire SPI chip select.
12	<b>SCK</b>	I	3 wire SPI clock input pin.
13	DVDD	I	TRX Voltage supply ( <b>from IC internal digital regulator</b> ), Connected to a bypass capacitor.
14	<b>SDIO</b>	I/O	3 wire SPI read/write data pin.
15	GND	G	Ground
16	<b>GIO1</b>	I/O	Multi-function GIO1 / 4-wire SPI data output.
17	<b>GIO2</b>	I/O	Multi-function GIO2 / 4-wire SPI data output.
18	CKO	O	Multi-function clock output.
19	REGI	I	Internal Regulator input ( <b>External Power Input</b> )
20	VDA1	I/O	Internal Analog Regulator output to supply <b>RFO (pin 4)</b> and <b>VDA3 (pin 10)</b> .
	<b>Back side plate</b>	G	Ground. Back side plate shall be well-solder to ground; otherwise, it will impact RF performance.

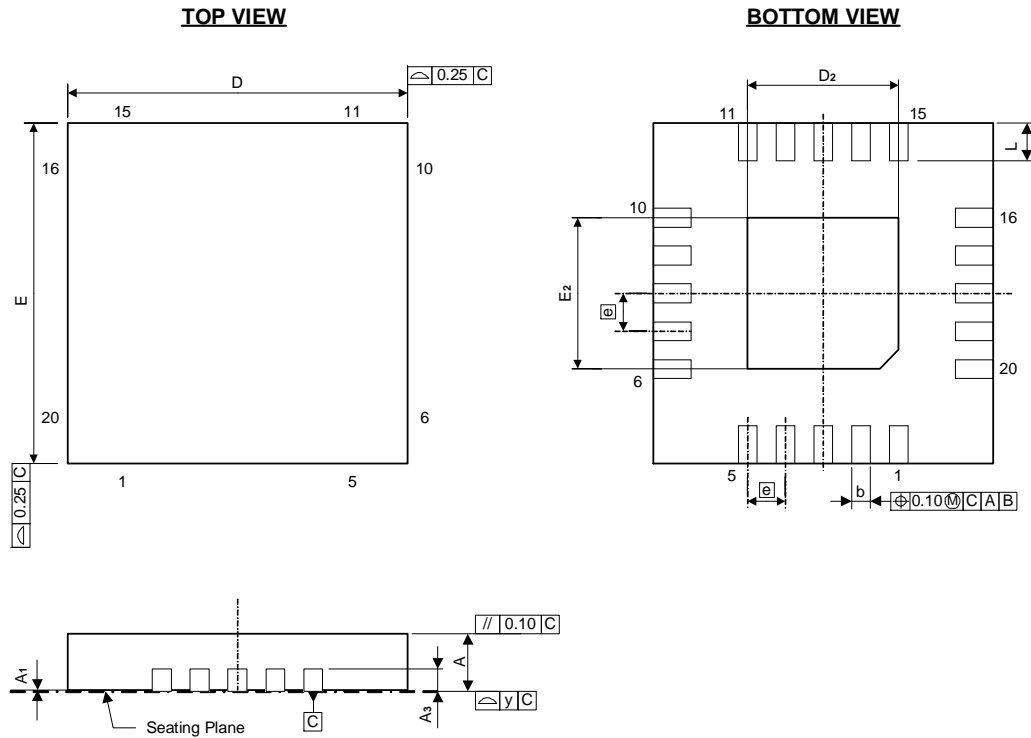
**Ordering Information**

Part No.	Package	Units Per Reel / Tray
A72X05AQFI/Q	QFN20L, Pb Free, Tape & Reel, -40°C ~ 85°C	3K
A72X05AQFI	QFN20L, Pb Free, Tray, -40°C ~ 85°C	490EA
A72X05BH	Die form, -40°C ~ 85°C	100EA

### Package Information

QFN 20L (4 X 4 X 0.8mm) Outline Dimensions

unit: inches/mm



Symbol	Dimensions in inches			Dimensions in mm		
	Min	Nom	Max	Min	Nom	Max
A	0.028	0.030	0.032	0.70	0.75	0.80
A1	0.000	0.001	0.002	0.00	0.02	0.05
A3	0.008 REF			0.203 REF		
b	0.007	0.010	0.012	0.18	0.25	0.30
D	0.154	0.158	0.161	3.90	4.00	4.10
D2	0.075	0.079	0.083	1.90	2.00	2.10
E	0.154	0.158	0.161	3.90	4.00	4.10
E2	0.075	0.079	0.083	1.90	2.00	2.10
e	0.020 BSC			0.50 BSC		
L	0.012	0.016	0.020	0.30	0.40	0.50
y	0.003			0.08		