Car unit Technical Description

The equipment under test (EUT) is a 2.4GHz transceiver of a Spy Video Car with 17 channels operating at 2410.875-2464.875 MHz MHz. The Spy Video Car has two units, one is the Remote Controller unit, and the other is the Car unit. The Remote Controller unit is powered by 6VDC (4 x 1.5V "AA" batteries) and the Car unit is powered by 9.0VDC (6 x 1.5V "AA" batteries).

Channel List:

Channel	Frequency
0	2410.875
1	2414.250
2	2417.625
3	2421.000
4	2424.375
5	2427.750
6	2431.125
7	2434.500
8	2437.875
9	2441.250
10	2444.625
11	2448.000
12	2451.375
13	2454.750
14	2458.125
15	2461.500
16	2464.875

Modulation Type: GFSK

Antenna Type: Integral antenna

IC Function and circuit description:

Digital Board

1. U4 acts as RF module.

2. U6 acts DC/DC Converter.

3. U2 acts as power regulator.

4. U5 acts as SONiX 8-Bit Micro-Controller.

RF Board U4

1. U1 acts as MCU.

2. U2 acts as CMOS Serial Flash.

3. UR2 acts as 2.4GHz TX/RX Chip.

4. UR1 acts as High Speed LDO regulator.

5. UH1 acts as RF power amplifier.

6. SH1 acts as DC-2.5GHz SPDT Switch.

7. LH1 acts as Band pass filter.

8. Y1 acts as oscillator for U1.

9. XR1 acts as oscillator for UR2.

The datasheet of the 2.4GHz TX/RX Chip is attached.

Typical Applications

- Wireless digital audio
- Wireless Mouse and Keyboard
- 2.4GHz ISM Band Communication System

- Wireless game pad
- Wireless toy

General Description

A7121/A7122 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/ 1Mbps data rate. The chip features a fully programmable frequency synthesizer with integrated VCO circuitry.

Pin Configurations
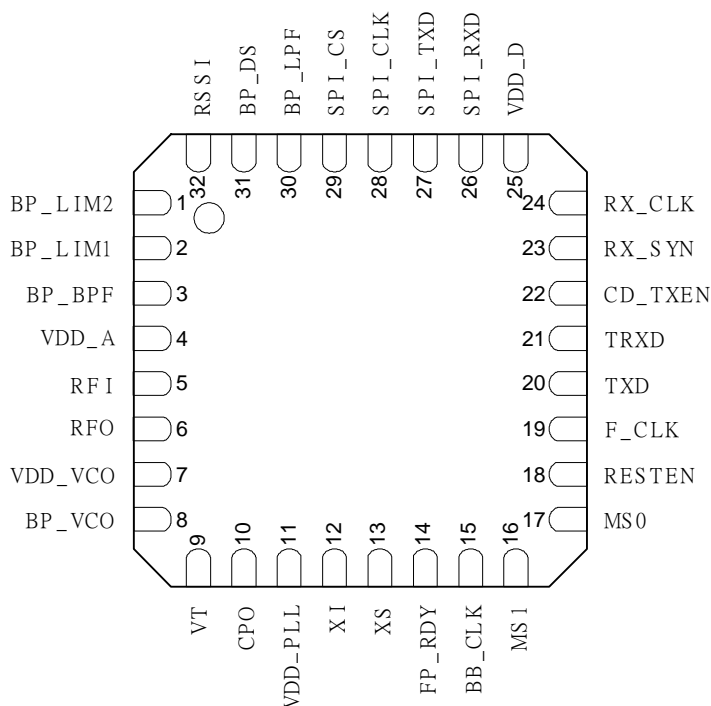
A7121/A7122 QFN Package Top View

Important Notice:

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Pin Descriptions (I: input; O: output; OD: open drain output)

| Pin No.	Symbol	I/O	Function Description
1	BP_LIM2	O	Limiter bypass. Connect to one end of the external limiter bypass capacitor.
2	BP_LIM1	O	Limiter bypass. Connect to the other end of the external limiter bypass capacitor.
3	BP_BPF	O	BPF bypass. Connect to external capacitor.
4	VDD_A	I	Analog supply voltage input.
5	RFI	I	RF input.
6	RFO	O	RF output.
7	VDD_VCO	I	VCO supply voltage input.
8	BP_VCO	O	VCO bypass. Connect to external capacitor.
9	VT	I	VCO tuning voltage input. The VCO frequency increases as VT increases.
10	CPO	O	Charge-pump output. This pin charges external capacitor to adjust VCO frequency.
11	VDD_PLL	I	PLL supply voltage input.
12	XI	I	Colpitts crystal oscillator node 1. Connect to external feedback capacitor.
13	XS	I	Colpitts crystal oscillator node 2. Connect to external feedback capacitor.
14	FP_RDY	O	Multi-function pin of FIFO packet R/W complete or ready signal.
15	BB_CLK	O	Clock output.
16 17	MS1 MS0	I	Transceiver operation mode selection inputs. MS [1:0] = x0: Sleep mode. Transceiver circuit is turned off. MS [1:0] = 01: Standby mode. X'TAL oscillator is turned on. MS [1:0] = 11: TRX mode. Use **Mode control register** bit 3 (TRC) to select TX or RX mode.
18	RESETN	I	Digital circuit reset.
19	F_CLK	I	Clock for FIFO data.
20	TXD	I	TX data input.
21	TRXD	I/O	Input: TX data input. Output: RX data output.
22	CD_TXEN	I/O	Input: TX data modulation enable. Output: Carrier is detected.
23	RX_SYN	O	RX sync pulse output.
24	RX_CLK	O	RX data sampling clock output.
25	VDD_D	I	Digital supply voltage input.
26	SPI_RXD	I	SPI data input.
27	SPI_TXD	O	SPI data output.
28	SPI_CLK	I	SPI clock.
29	SPI_CS	I	SPI chip select.
30	BP_LPF	O	LPF bypass. Connect to external capacitor.
31	BP_DS	O	Data slicer reference bypass. Connect to external capacitor.
32	RSSI	O	Analog RSSI output.

Ordering Information

Part No.	Package	Units Per Reel / Tray
A71C21AQF/Q	QFN32L, Tape & Reel, PB free, -20℃～70℃	3K
A71C21AQF	QFN32L, Tray, PB free, -20℃～70℃	490EA
A71C21AH	Die form, -20℃～70℃	100EA
A71C21AQF/Q	QFN32L, Tape & Reel, PB free, -40℃～85℃	3K
A71C21AQF	QFN32L, Tray, PB free, -40℃～85℃	490EA
A71C21AH	Die form, -40℃～85℃	100EA

Part No.	Package	Units Per Reel / Tray
A71C22AQF/Q	QFN32L, Tape & Reel, PB free, -20℃～70℃	3K
A71C22AQF	QFN32L, Tray, PB free, -20℃～70℃	490EA
A71C22AH	Die form, -20℃～70℃	100EA
A71C22AQF/Q	QFN32L, Tape & Reel, PB free, -40℃～85℃	3K
A71C22AQF	QFN32L, Tray, PB free, -40℃～85℃	490EA
A71C22AH	Die form, -40℃～85℃	100EA

Package Information

QFN 32L Outline Dimensions   unit: inches/mm

Top View   Bottom View
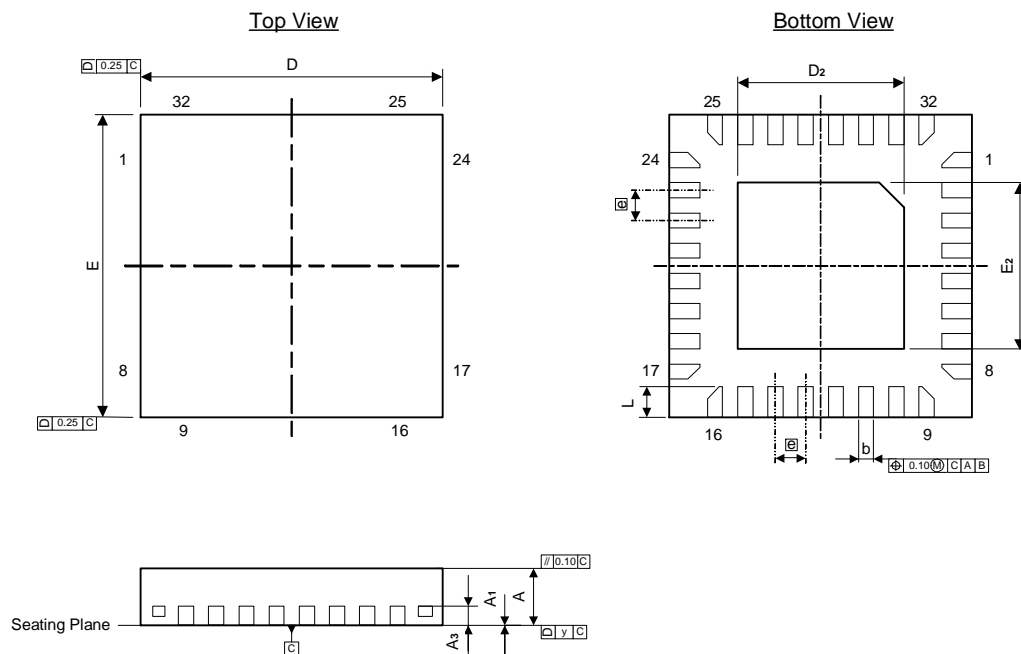
Symbol	Dimensions in inches			Dimensions in mm		
	Min	Nom	Max	Min	Nom	Max
A	0.028	0.030	0.036	0.70	0.75	0.90
A$_1$	0.000	0.001	0.002	0.00	0.02	0.05
A$_3$	0.010 REF			0.20 REF		
b	0.007	0.010	0.012	0.18	0.25	0.30
D	0.193	0.197	0.200	4.90	5.00	5.10
D$_2$	0.049	0.106	0.141	1.25	2.70	3.60
E	0.193	0.197	0.200	4.90	5.00	5.10
E$_2$	0.049	0.106	0.141	1.25	2.70	3.60
e	0.020 BSC			0.50 BSC		
L	0.012	0.016	0.020	0.30	0.40	0.50
y	0 - 0.004			0 - 0.10		