

Technical Description

Report No.: 17050807HKG-001

The Equipment Under Test (EUT) is a portable 2.4GHz Transmitter (Controller Unit) for a RC car operating at the frequency range of 2405-2475MHz with 1MHz channel spacing.

The EUT is powered by 9.0VDC Alkaline battery. After switching on the EUT and being paired with car, the car can be controlled to move forward, backward and turn left/right by the controller.

Antenna Type: Internal integral antenna

Antenna Gain: 0dBi

Nominal rated field strength: 95.8dB μ V/m at 3m

Maximum allowed field strength of production tolerance: +/- 3dB

The brief circuit description is listed as below:

1. U1 (HCA_TLXPS) and the associated circuit act as MCU.
2. Y1 acts as 12 MHz frequency oscillator.
3. F1-F3, B, R, L and M act as control keys.



深圳市尚瑞思电子有限公司
ShenZhen Sunrise Electronics CO.,Ltd
TEL: +86-755-23093179-802 FAX: +86-755-23093179-816
www.sunrisedigit.com/en/ sales@sunrisedigit.com

SR001
2.4 G transceiver
Datasheet
V100



1. Outline

SR001 is a low cost, high integrated 2.4GHZ SOC transceiver;
It use GFSK modulation and demodulation technology, It has a strong anti-interference ability;

Transmit power can be adjusted, and the max transmit power is up to 6DBM;

The receiver with low IF structure, the receive sensitivity can be -96dBm@62.5Kbps. Also, the RSSI can be detected ;

The MCU with a low power consumption, Wakeup enable, 2K flash coding room;

The sleep current can be less than 5UA, and the lowest working voltage is up to 2.2V;

SR001 has a very low cost application, single side board can ensure the function and performance, it support the 33MM wire antenna;

SOP16 footprint, compatible RoHS standard;

1.1 Performance

- 2.4G SOC transceiver
- SOP16 footprint
- Support single side board
- Communication distance up to 100 m
- Support 33 mm wire antenna
- 9 GPIO
- 16 bit instruction
- 2K x 14-bit FLASH Program Memory
- 256x8b data EEPROM
- 128x8b SRAM
- 7 CH 10 bit A/D
- Low voltage reset, low voltage detect

1.2 Typical application

- Remote
- Wireless key and mouse
- Wireless net
- Smart home
- Industrial and commerce short distance communication;
- IP telephone, Cordless phone



2 Pin assignment:

1	ANT	VCO_VDD	16
2	GND	XTALI	15
3	VDD_IO	XTALO	14
4	PA4	VDD	13
5	PC5	PA0	12
6	PC4	PA1	11
7	PC1	PA2	10
8	PC0	PA3	9

SOP16

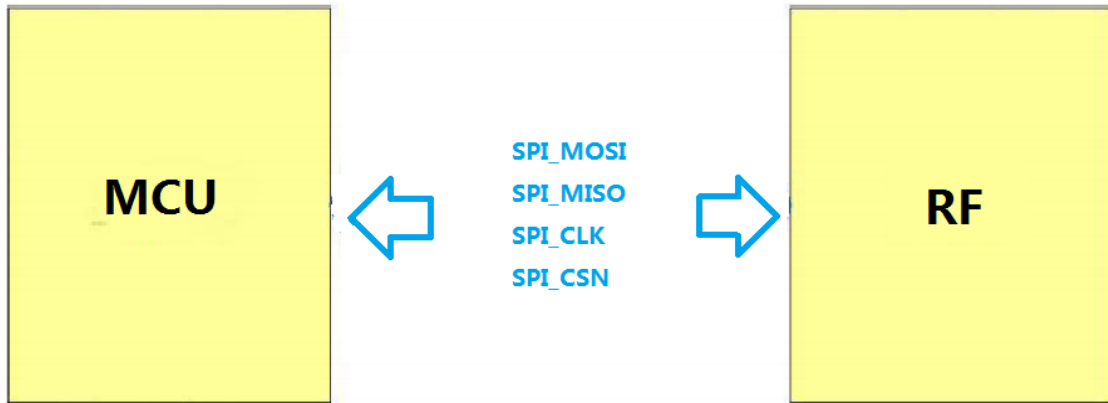
2.1 pin function description

Pin No	Pin Name	Type	Description
1	ANT	Balanced RF	Rf input/output
2	GND	GND	GND
3	VDD_IO	Power	Power for mcu
4	PA4	I/O	GPIO
5	PC5	I/O	GPIO
6	PC4	I/O	GPIO
7	PC1	Power	GPIO
8	PC0	I/O	GPIO
9	PA3	I/O	GPIO
10	PA2	I/O	GPIO
11	PA1	I/O	GPIO
12	PA0	I/O	GPIO
13	VDD	I/O	VDD for RF
14	XTALO	XO	XTAL Output
15	XTALI	XI	XTAL input
16	VCO_VDD	Power	Power for VCO

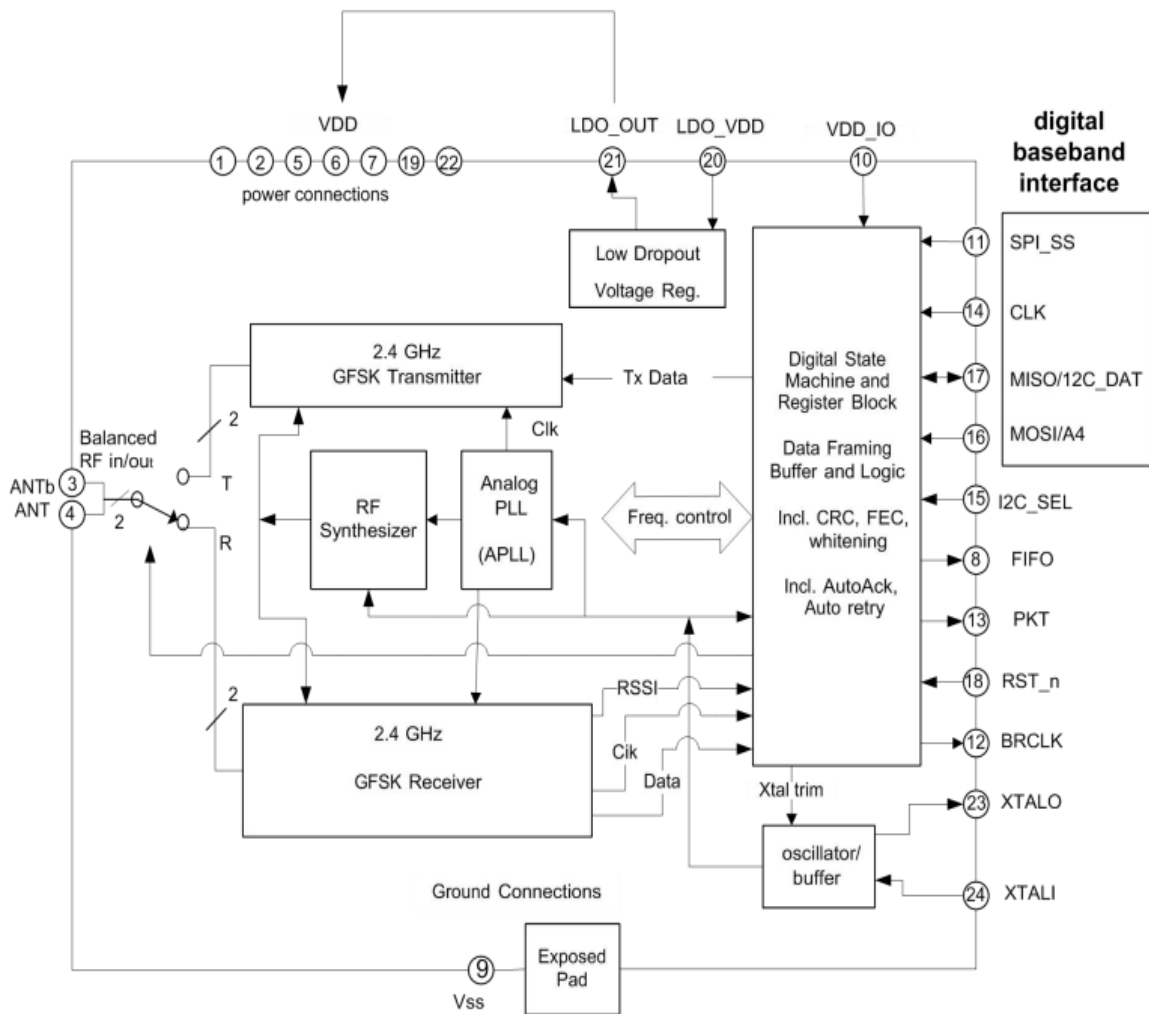


3 IC Block diagram

3.1 IC internal interface

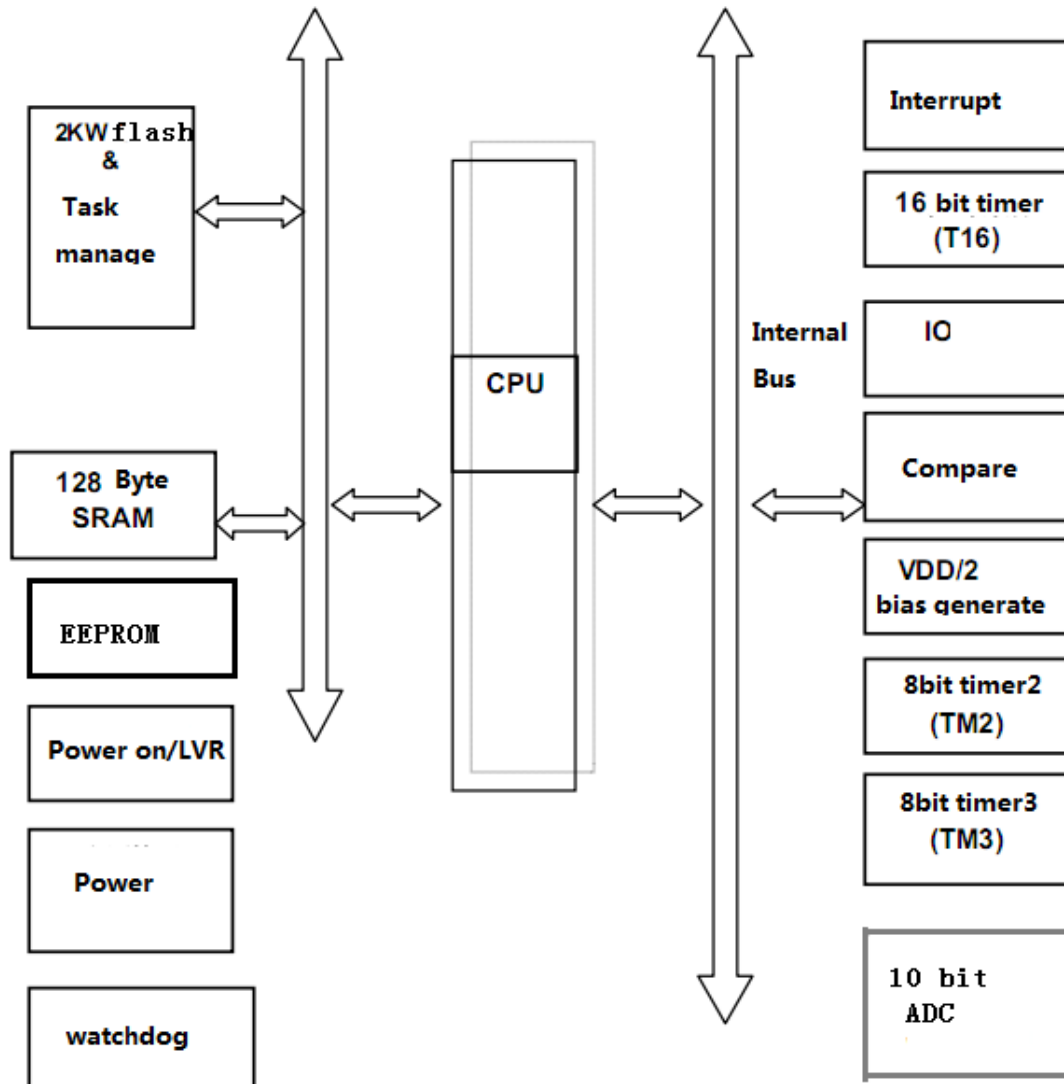


3.2 RF Block diagram

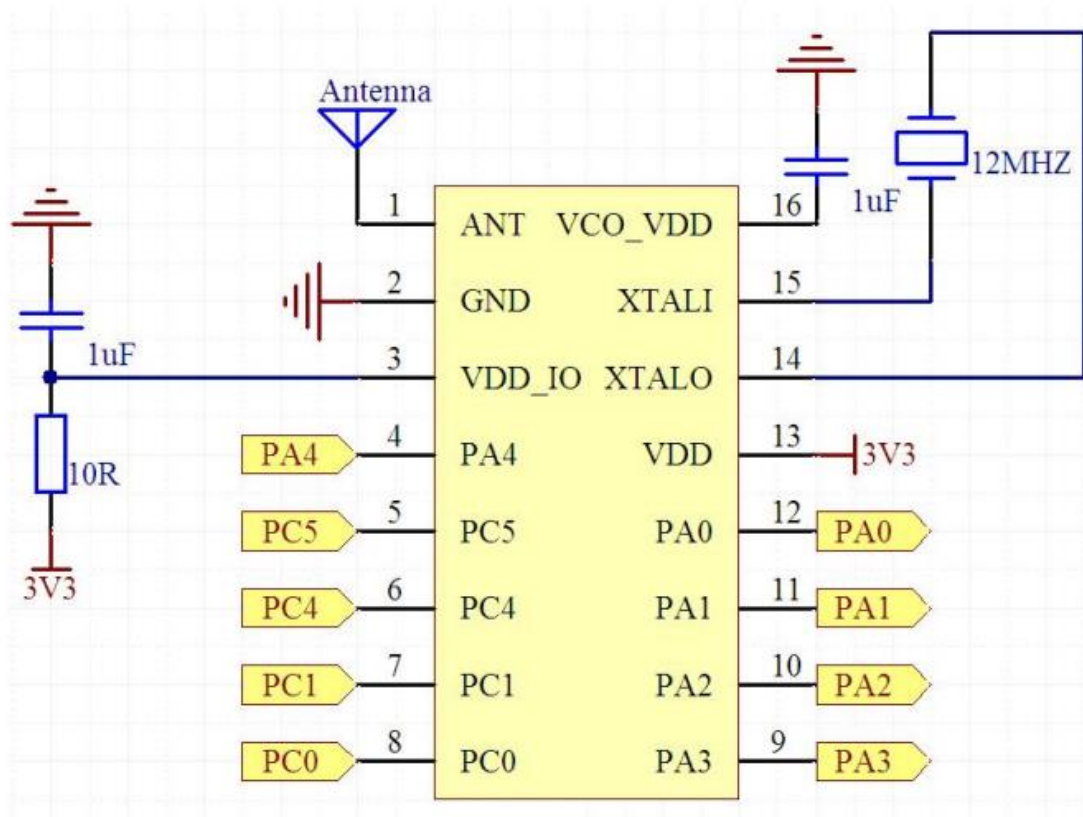




3.3 MCU block diagram



4 Typical application circuit





5. Transmit performance

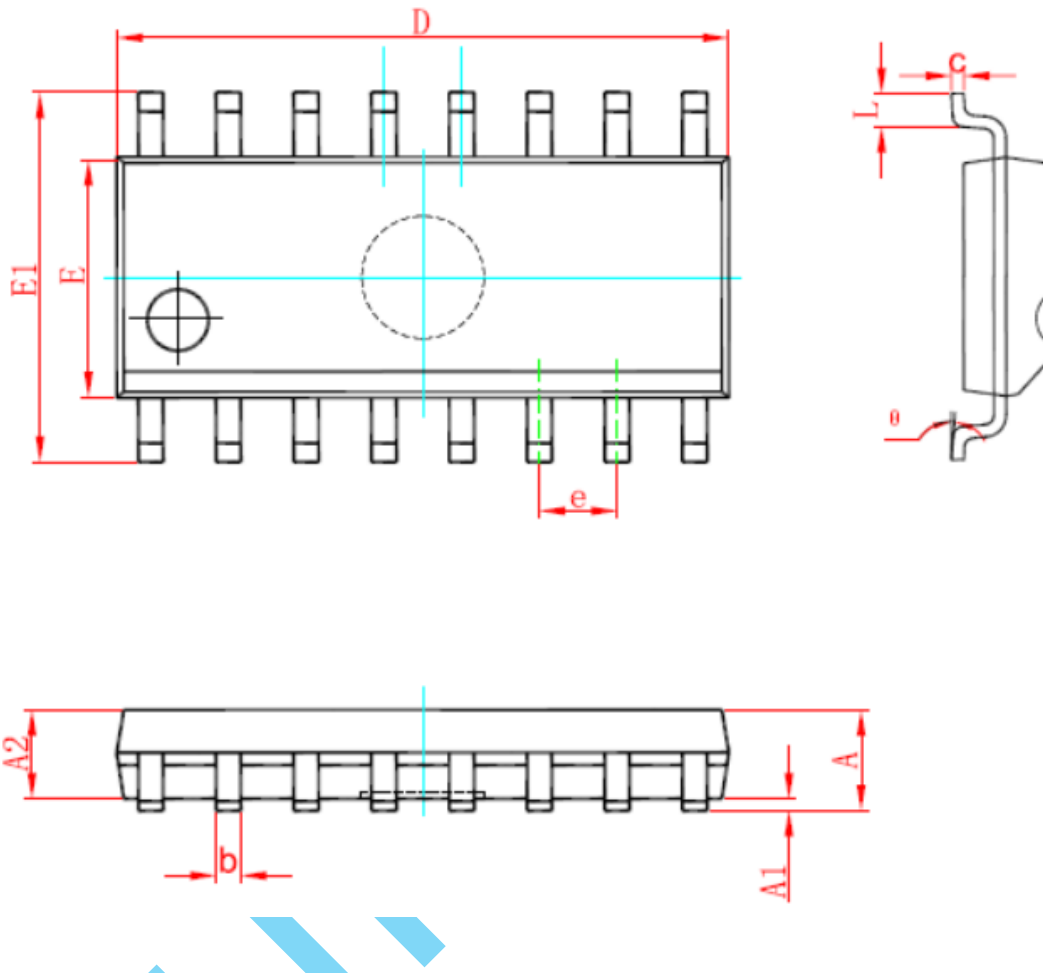
Transmit Section						Measured using 50 Ohm balun3
Transmit power	PAV			6	dBm	
Second harmonic			-50		dBm	Conducted to ANT pin
Third harmonic			-50		dBm	Conducted to ANT pin
modulating characteristic						
Modulation offset	00001111 pattern	Δf_{1avg}		280	kHz	
	01010101 pattern	Δf_{2max}		225	kHz	
In band radiation						
2MHz Modulation offset	IBS_2			-40	dBm	
>3MHz Modulation offset	IBS_3			-60	dBm	
Out of band radiation						
	OBS_O_1		< -60	-36	dBm	30 MHz ~ 1 GHz z
	OBS_O_2		-45	-30	dBm	1 GHz ~ 12.75 GHz, excludes desired signal and harmonics
	OBS_O_3		< -60	-47	dBm	1.8 GHz ~ 1.9 GHz z
	OBS_O_4		< -65	-47	dBm	5.15 GHz ~ 5.3 GHz z

6. Receiver performance

Parameter	Symbol	MIN	TYP	MAX	Unis	Test Condition and Notes
Receive Section						Measured using 50 Ohm balun. For BER \leq 0.1%
receiver sensitivity			-87		dBm	1Mbps
			-90		dBm	250Kbps
			-93		dBm	125Kbps
			-96		dBm	62.5Kbps
max input power		-20	1		dBm	
data symbol	Ts		1		us	
anti interference						For BER \leq 0.1%
Co channel interference	CI_cochanne		+9		dB	-60 dBm desired signal
1MHz adjacent interference	CI_1		+6		dB	-60 dBm desired signal
2MHz adjacent interference	CI_2		-12		dB	-60 dBm desired signal
3MHz adjacent interference	CI_3		-24		dB	-67 dBm desired signal
Out of band interference	OBB_1	-10			dBm	30 MHz to 2000 MHz
	OBB_2	-27			dBm	2000 MHz to 2400 MHz
	OBB_3	-27			dBm	2500 MHz to 3000 MHz
	OBB_4	-10			dBm	3000 MHz to 12.75 GHz



7. PACKAGE



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	9.800	10.200	0.386	0.402
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°