REMOTE CONTROLLER WITH FIVE FUNCTIONS

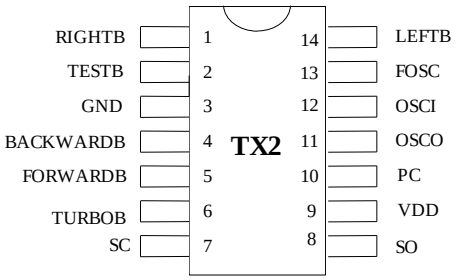
Features

- Wide operating voltage range: 2.4V to 5.0V
- Low Standby current
- Auto Power-OFF function for TX2
- Few external components needed

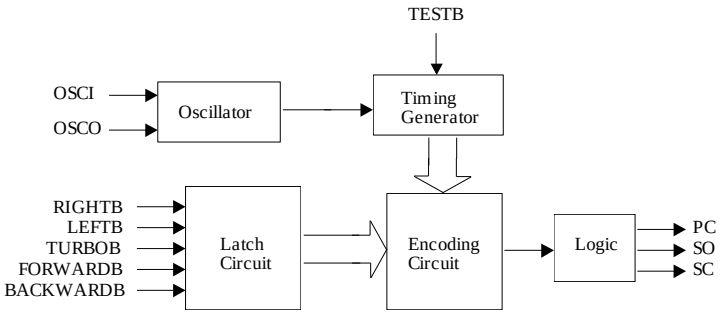
General Description

The TX2/RX2 are a pair of CMOS LSIs designed for remote controlled car applications. TX2 is built with auto Power-OFF function. The TX2/RX2 has five control keys controlling the motions (i.e. Forward, Backward, Rightward, Leftward and Turbo function) of the remote controlled car.

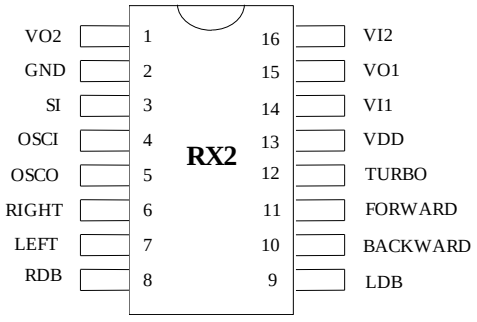
Pin Assignment Transmitter



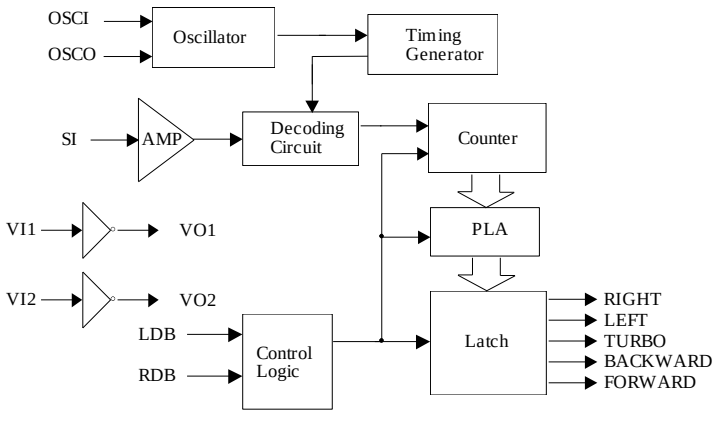
Block Diagram



Pin Assignment Receiver



Block Diagram



Absolute Maximum Ratings

DC Supply Voltage.....0.3V to 5.0V
Input/Output Voltage.....GND -0.2V to VDD + 0.2V
Operating temperature.....-10°C to 60°C
Storage Temperature.....-25°C to 125°C

Comments*

Never allow a stress to exceed the values listed under "Absolute Maximun Ratings", otherwise the device would suffer from a permanent damage. Nor is a stress at the listed value be allowed to persist over a period, since an extended exposure to the absolute maximum rating condition may also affect the reliability of the device, if not causing a damage thereof.

Electrical Characteristics

TX2

(VDD=4.5V, Fosc = 128KHz, T_A=25°C, unless otherwise specified.)

Parameter	Symbol	Min.	Typ.	Max.
Operating Voltage	VDD	2.4V	4.0V	5.0V
Operating Current	I_{dd}	-	-	1mA
Stand-by Current	I_{stb}	-	-	1μA
DC O/P Driving Current	I_{drive}	5mA	-	-
AC O/P Driving Current	I_{drive}	5mA	-	-
AC O/P Frequency	F_{audio}	500Hz	-	1KHz

RX2

(VDD=4.0V, Fosc = 128KHz, T_A=25°C, unless otherwise specified.)

Parameter	Symbol	Min.	Typ.	Max.
Operating Voltage	VDD	2.4V	4.0V	5.0V
Operating Current	I_{dd}	-	-	1mA
O/P Driving Current	I_{drive}	1mA	-	-
O/P Sinking Current	I_{sink}	1mA	-	-
Effect Decoding Frequency Variation	$F_{tolerance}$	-20%	-	20%

Pin Description

TX2

Pin No.	Designation	Description
1	RIGHTB	The rightward function will be selected when this pin is connected to GND.
2	TESTB	This pin is used for testing purpose only.
3	GND	Negative power supply
4	BACKWARDB	The backward function will be selected when this pin is connected to GND.
5	FORWARDB	The forward function will be selected when this pin is connected to GND.
6	TURBOB	The turbo function will be selected when this pin is connected to GND.
7	SC	Output pin of the encoding signal with carrier frequency
8	SO	Output pin of the encoding signal without carrier frequency
9	VDD	Positive power supply
10	PC	Power control output pin
11	OSCO	Oscillator output pin
12	OSCI	Oscillator input pin
13	FOSC	This pin is used for testing mode.
14	LEFTB	The leftward function will be selected when this pin is connected to GND.

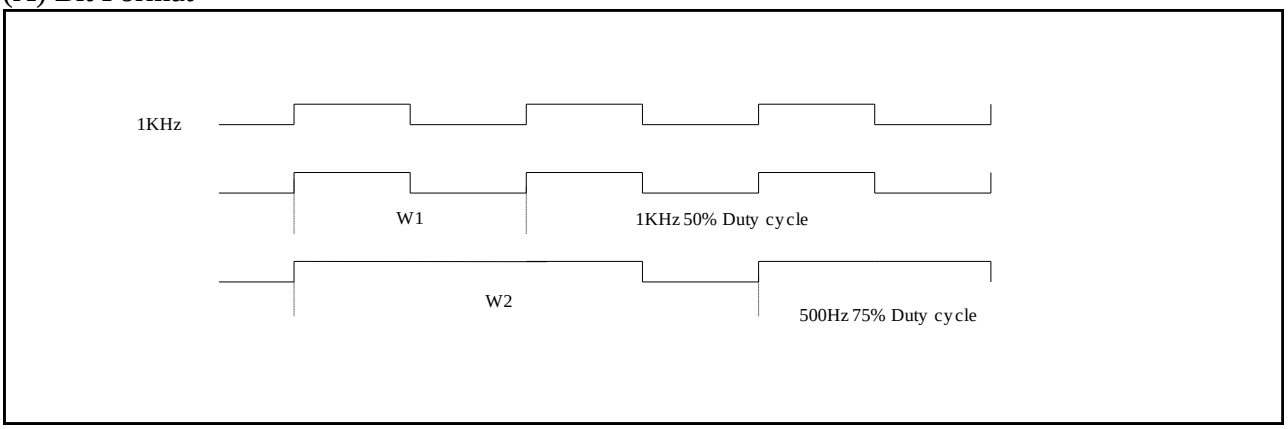
RX2

Pin No.	Designation	Description
1	VO2	Inverter 2 output pin for power amplify
2	GND	Negative power supply
3	SI	Input pin of the encoding signal
4	OSCI	Oscillator input pin
5	OSCO	Oscillator output pin
6	RIGHT	Rightward output pin
7	LEFT	Leftward output pin
8	RDB	Rightward function is disabled when this pin is connected to GND.
9	LDB	Leftward function is disabled when this pin is connected to GND.
10	BACKWARD	Backward output pin
11	FORWARD	Forward output pin
12	TURBO	TURBO output pin
13	VDD	Positive power supply
14	VI1	Inverter 1 input pin for power amplify
15	VO1	Inverter 1 output pin for power amplify
16	VI2	Inverter 2 input pin for power amplify

Code Format

Encode Rule

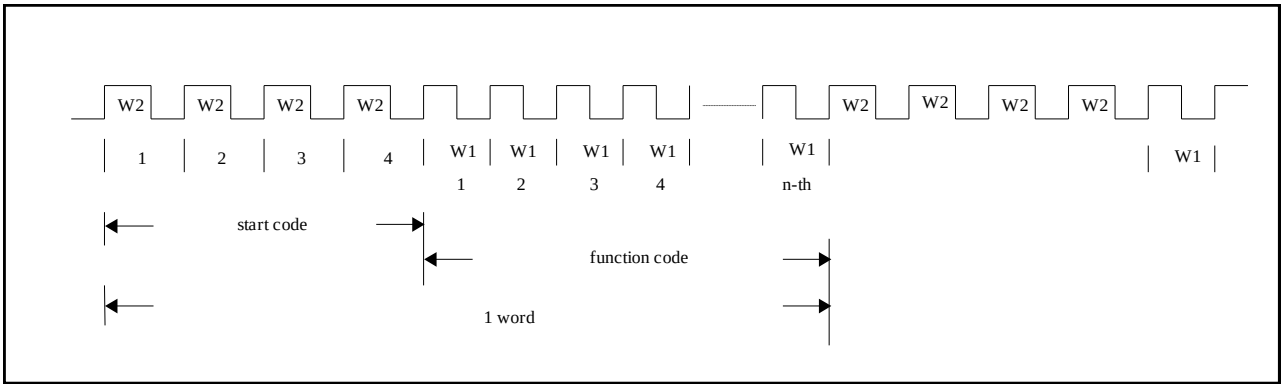
(A) Bit Format



Data Format

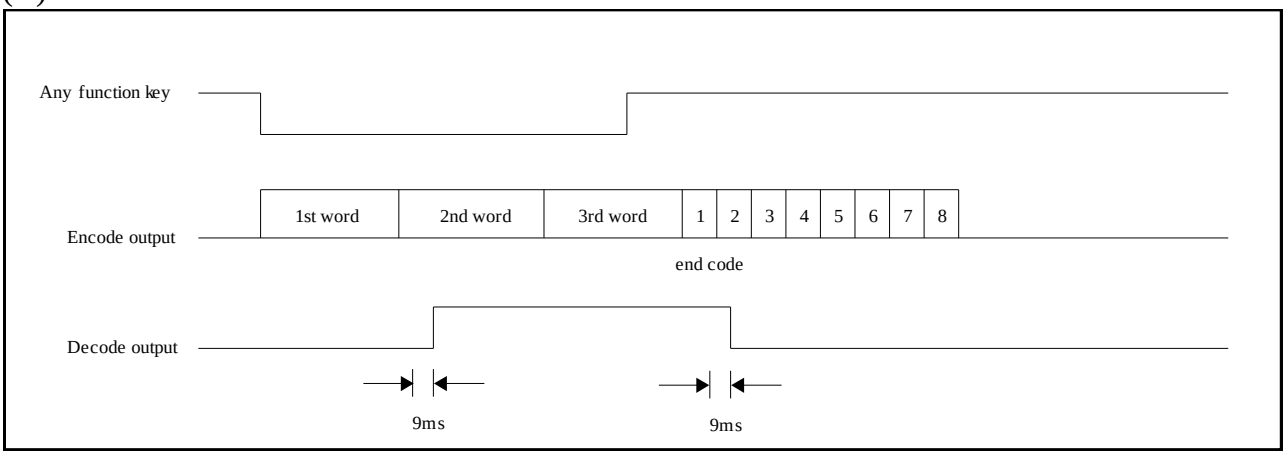
W2 W2 W2 W2 (n) x W1 W2 W2 W2 W2 (n) x W1 W2 W2 W2 W2

Number of Function Codes (n) W1	Function Key	Decode Result
4		End Code
10	Forward	Forward
16	Forward & Turbo	Forward
22	Turbo	Turbo
28	Turbo & Forward & Left	Forward & Left
34	Turbo & Forward & Right	Forward & Right
40	Backward	Backward
46	Backward & Right	Backward & Right
52	Backward & Left	Backward & Left
58	Left	Left
64	Right	Right

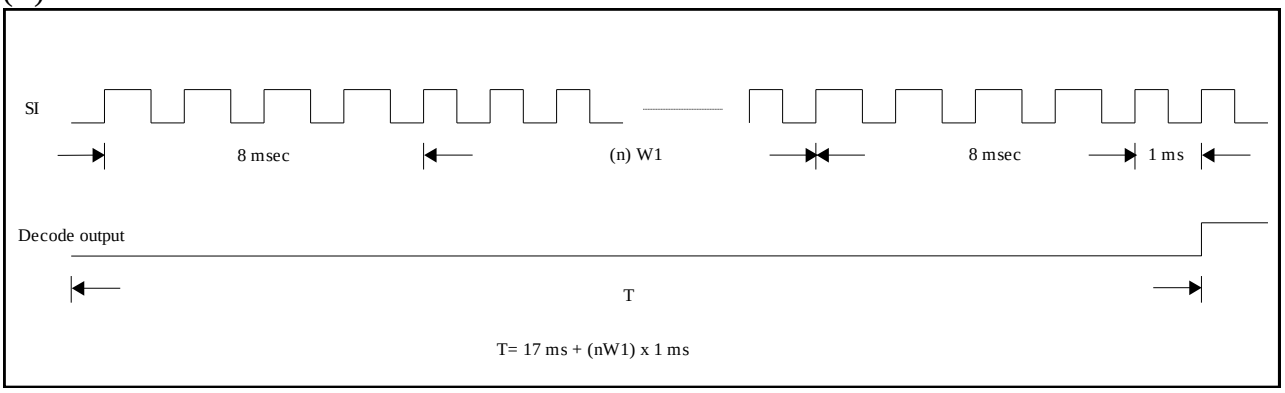


Encode/Decode Timing

(A)

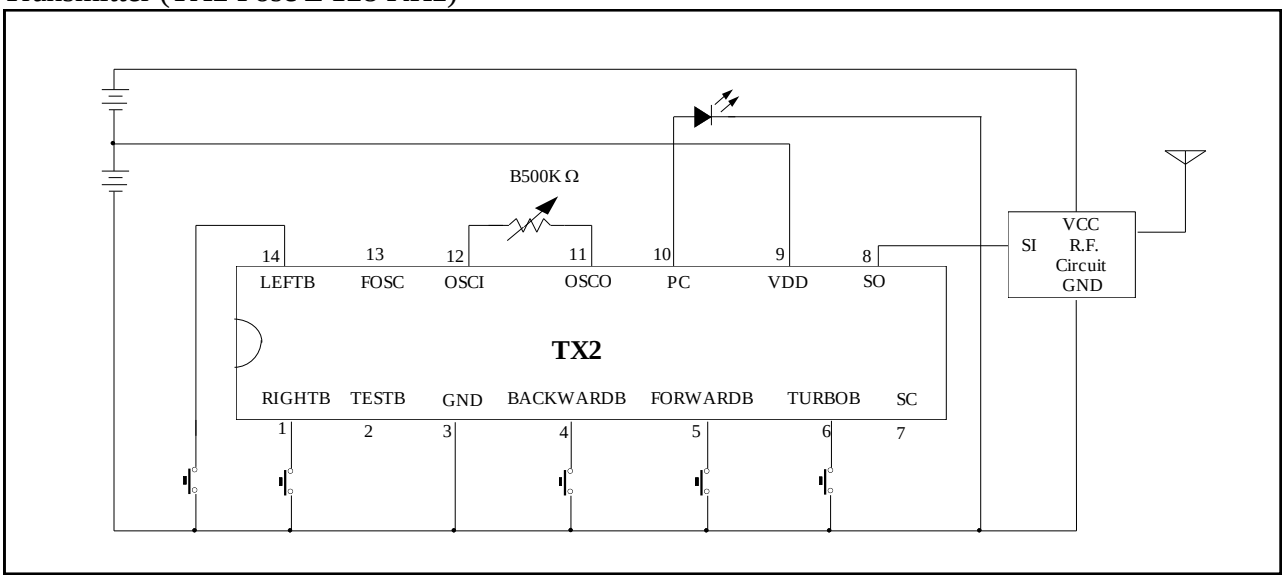


(B)

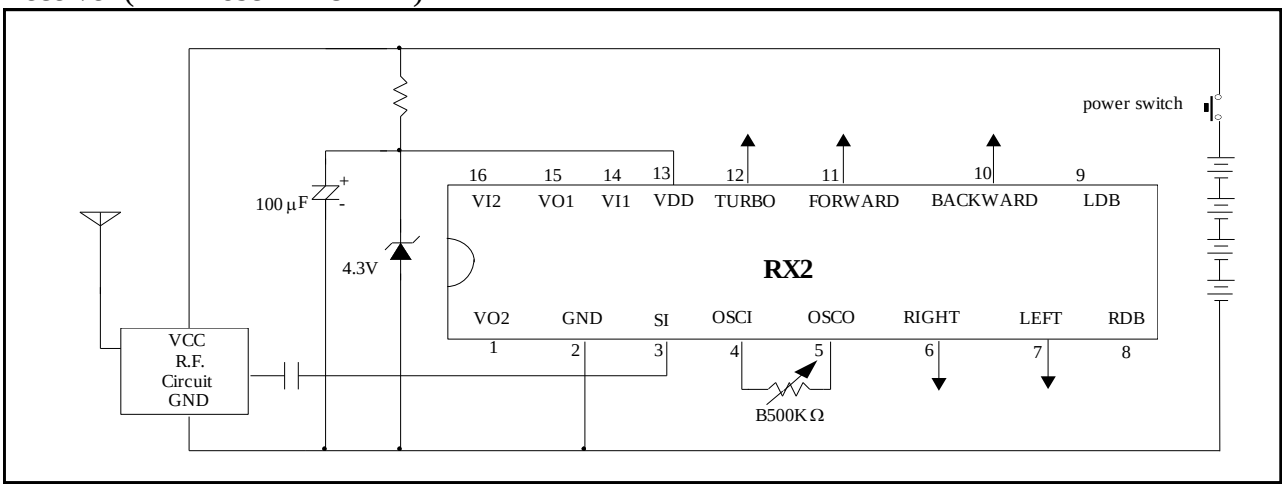


Typical Application Circuit

Transmitter (TX2 Fosc ≅ 128 KHz)

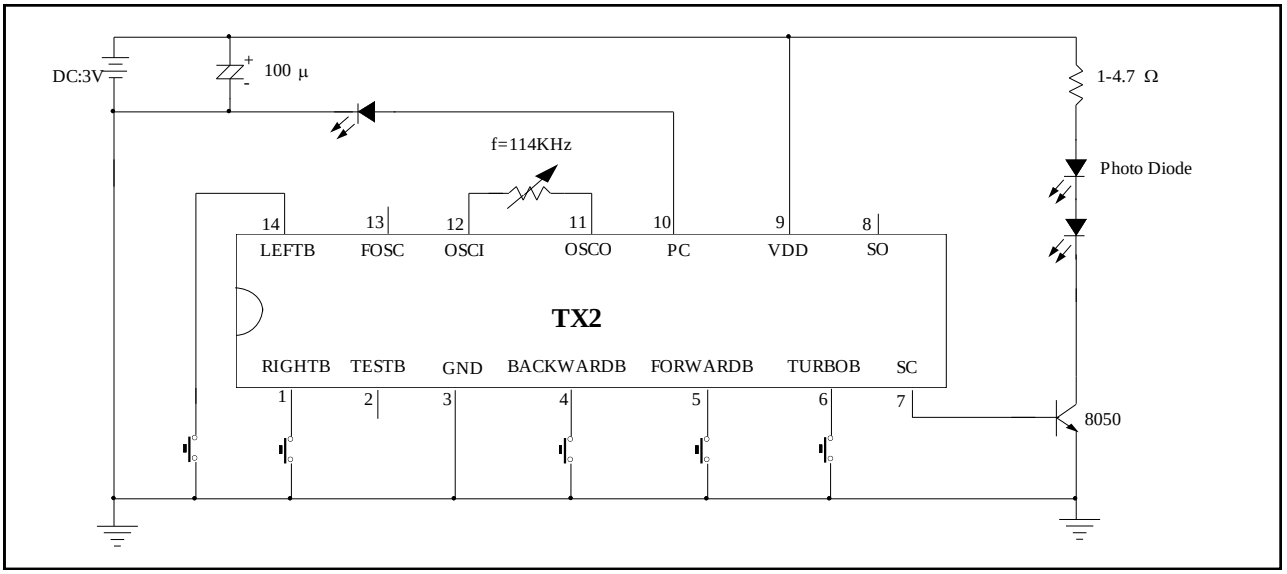


Receiver (RX2 Fosc ≅ 128 KHz)

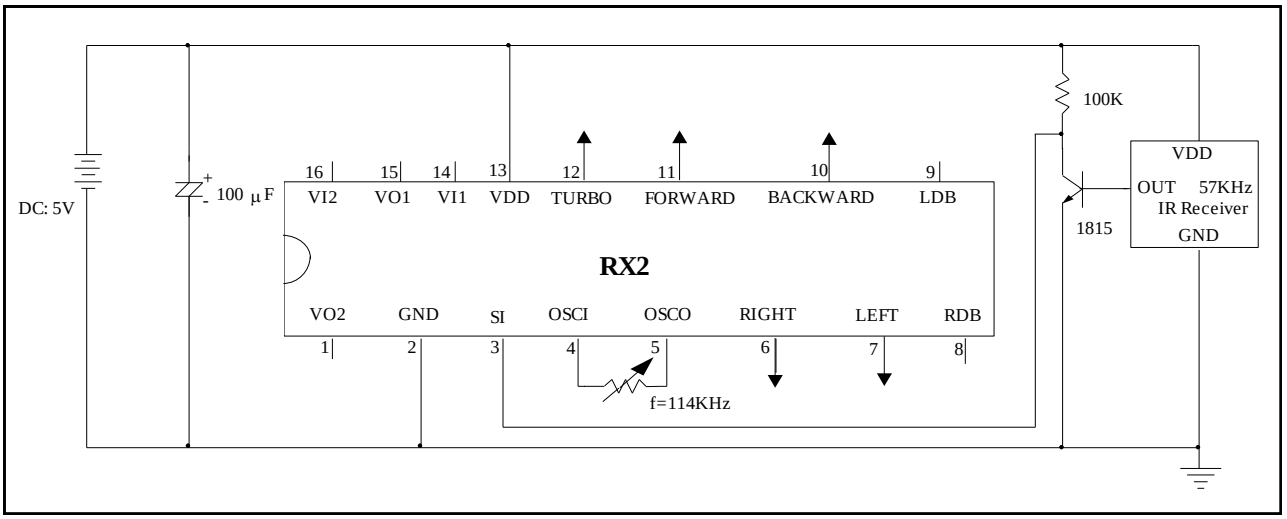


Infrared Application Circuit

Transmitter

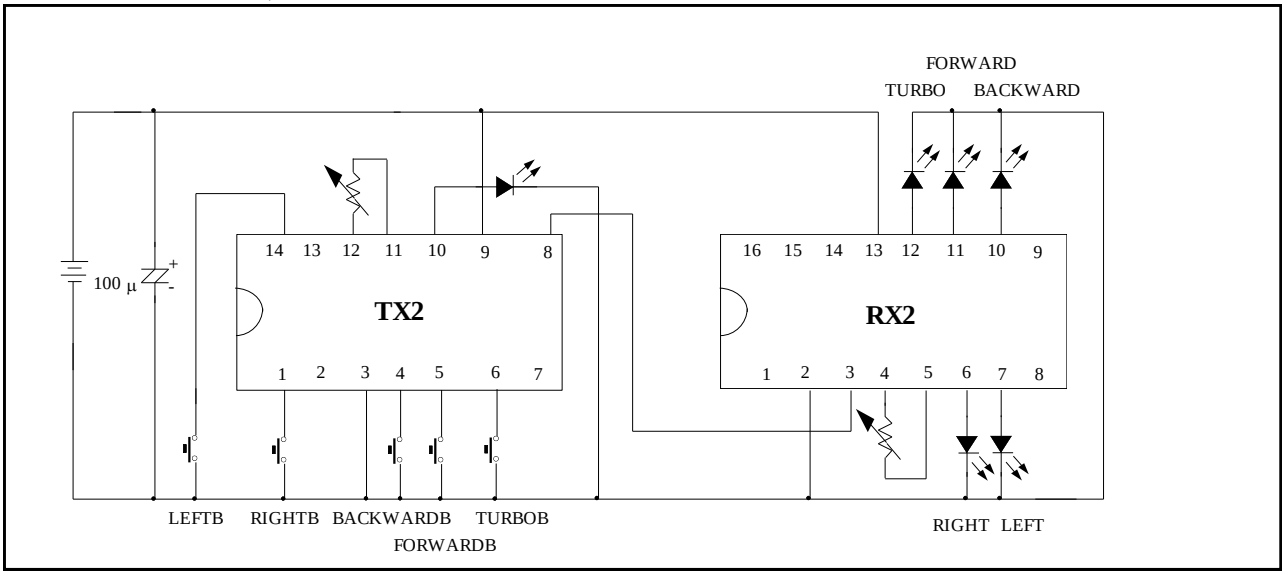


Recevier



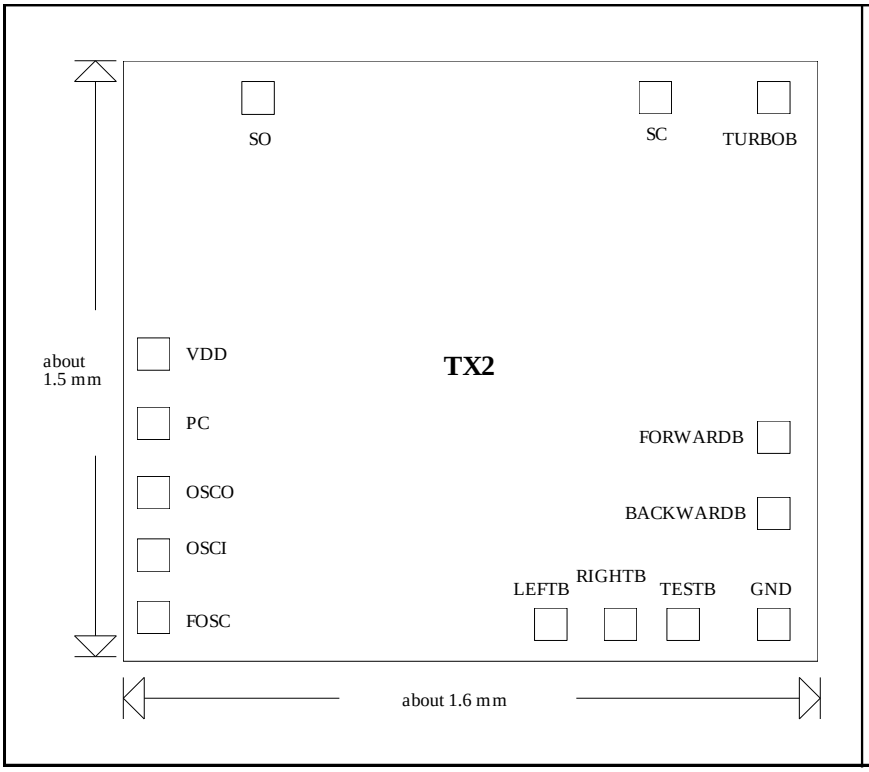
Testing Circuit

Fosc for TX2 ≅ Fosc, RX2 ≅ 128 KHz



Bonding Diagram

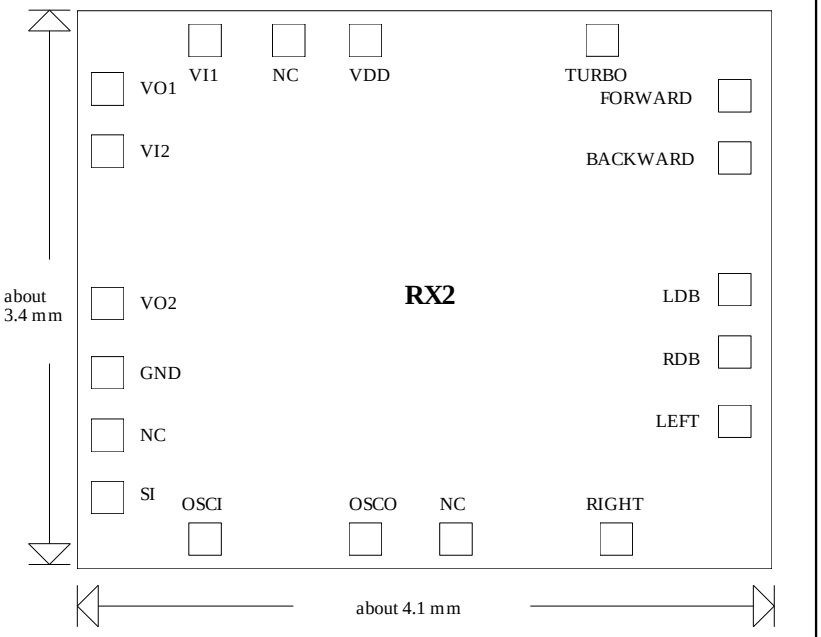
TX2



Designation	X	Y
RIGHTB	6.85	-25.80
TESTB	16.05	-25.80
GND	26.55	-25.80
BACKWARDB	26.55	-14.10
FORWARDB	26.55	-4.90
TURBOB	24.95	25.70
SC	7.8	25.7
SO	-16.7	25.7
VDD	-26.5	12.9
PC	-26.5	3.7
OSCO	-26.5	-5.7
OSCI	-26.5	-15.10
FOSC	-26.5	-24.2
LEFTB	-2.35	-25.80

Note: Substrate is connected to VDD

RX2



Designation	X	Y
VO2	-37.90	3.05
GND	-37.90	-6.15
NC		
SI	-37.90	-24.55
OSCI	-28.6	-30.0
OSCO	-7.45	-30.0
NC		
RIGHT	16.75	-30.0
LEFT	37.9	-23.8
RDB	38.2	-14.6
LDB	38.2	-5.1
BACKWARD	37.9	9.9
FORWARD	37.9	22.5
TURBO	23.2	30.0
NC		
VDD	-6.0	30.0
VI1	-28.6	30.0
VO1	-37.90	24.55
VI2	-37.90	15.35

Unit: in mil
X: 162 Y: 132

Note: Substrate is connected to VDD

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