DESCRIPION:

RT1248 is an infrared remote control transmitter utilizing CMOS technology. It has 18 functions, and total 75 commands can be transmitted: 63 continuous mode commands and 12 single-shot mode commands Furthermor, multiple keying is possible

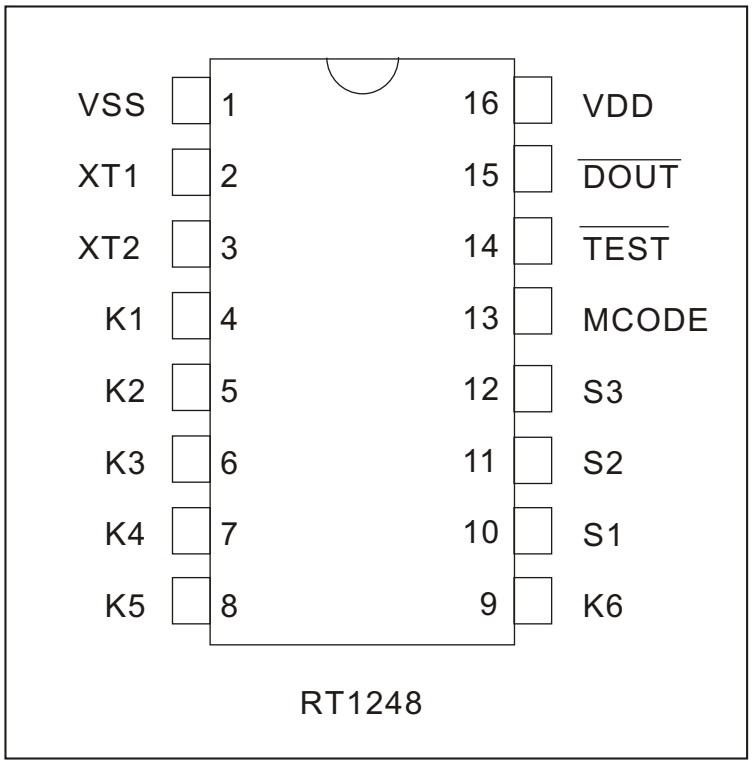
Features:

Operating Voltage:2.0v~5.0v.
Low power Consumption.
Multiple Keying is possible (maxinum: 6 Keys).
455KHz ceramic resonator or crystal .
Each bit is switching by a carrier of duty 1/3 (38KHz).
Total 75 commands can be transmitted.

Applications:

Television (TV) remote control transmitter .
Video cassette recorder (VCR) remote control transmitter.
Other remote control transmitter.

Pin Configuration:



Pin Description:

Pin Name	Description	Pin	I / O
VSS	Negative power supply.	1	I
XT1,XT2	Terminal of OSC ,which are used by connecting a 455KHz ceramic resonator and 100PF copacitance	2,3	I,O
K1～K6	Key input terminal with a built-in pull-low resistor		I
S1～S3	Terminal for matching code between transmitting and receiving.	4～9 10～12	O
MCODE	Transmitting signal output A command word is made by 12bits I cycle and 38KHz (1/3duty)carrier wave.	13	I
$\overline{TEST}$	Terminal for testing mode, when it is connecting to vss. In normal mode, keep this terminal open.	14	I
$\overline{DOUT}$	Transmitting singnal output. A command word is made by 12 bits and 38KHz (1/3duty) carrier wave, and total 75 kings of commands can be transmitted.	15	O
VDD	Positive power supply.		I

Maximum Rating

(Ta=25℃)

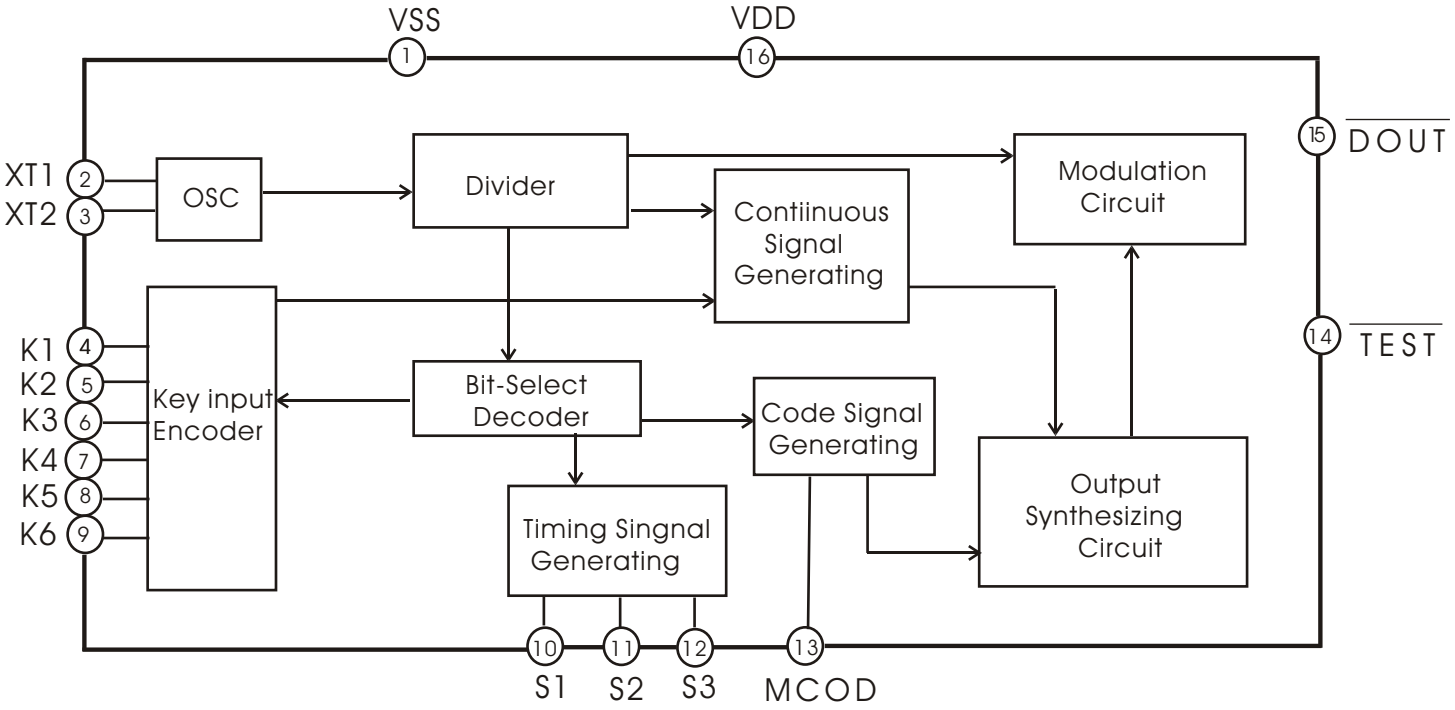
Symbol	Characteristic	Rating	Unit
Vcc	Supply Voltage	5.5	V
VIN	Input/Output Voltage	Vss-0.5 to Vcc+0.5	V
PD	Power Dissipation	200	mW
Top	Operating Temperature	0～+70	℃
TEST	Storage Temperature	-40～+125	℃
IOUT	Dout Output Current	-5	mA

Electrical Characteristics

(Unless otherwise specified,Vcc=3V and Ta=25℃)

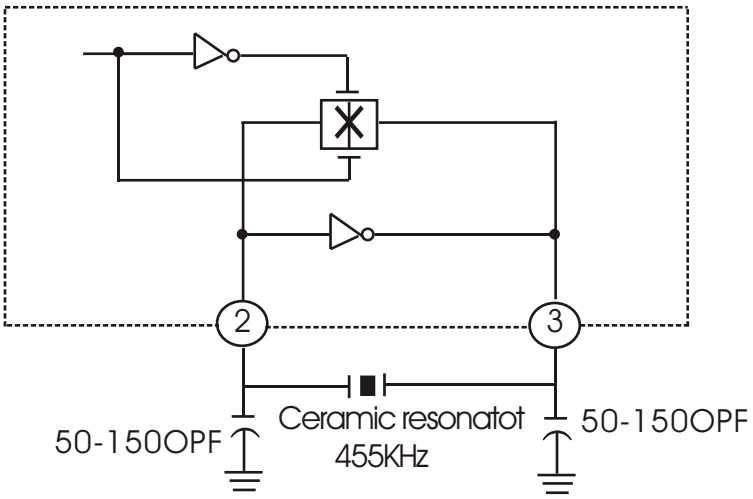
Characteristic				Symbol	Condition	Min.	Typ.	Max.	Unit
Operating Supply Voltage				Vcc	All Function Operation	2.0	3.0	5.0	V
Operating Supply Voltage				IDD	Key On Without Load	-		1.0	mA
Stand-by Current				ISB	All Keys Off, Stops oscillation	-	1	10	mA
INPUT	K1～K6 CODE	Voltage	"H" Level	VIH	-	0.8VDD	-	VDD	V
			"L" Level	VIL	-	0	-	0.5	V
	K1～K6	Current	"H" Level	IIH	VI=3.0V	50	100	150	μA
			"L" Level	IIL	VI=0V	-1.0	-	1.0	μA
	$\overline{T1～T3}$	Current	"H" Level	IOH	VO=2.0V	-500	-	-	μA
			"L" Level	IIL	VO=2.0V	50	-	-	μA
OUTPUT	DOUT	Current	"H" Level	IOH	VO=2.0V	-0.1	-	-	mA
			"L" Level	IOL	VO=2.0V	1.0	-	-	mA
OSC Feedback Resistor				ROSC	-	-	500	-	KΩ
Oscillation Frequency				fosc	-	400	455	600	KHz

Block Diagram:



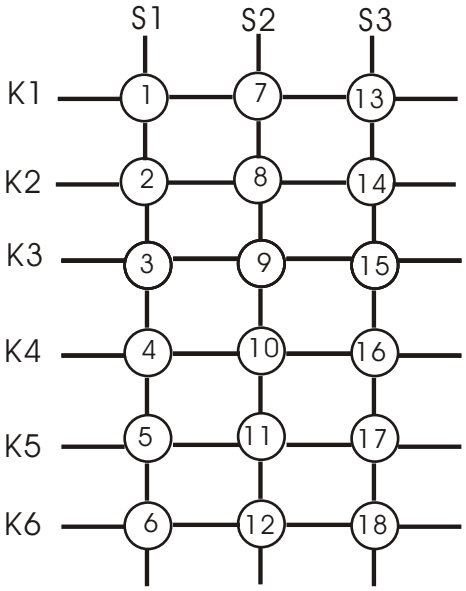
Functional Description:

1.Oscillation Crcuit:



(1)RT1248 use 455KHz ceramic resonaton or crystal for oscillation .
(2)Oscillation will stop to sleeping mode in order to lower the power consumption when none of the key is being active.
(3)when oscillation frequency is set at 455KHz,carrier wave of transmitting signal is set at 38KHz.

2.Key-Input Circuit:

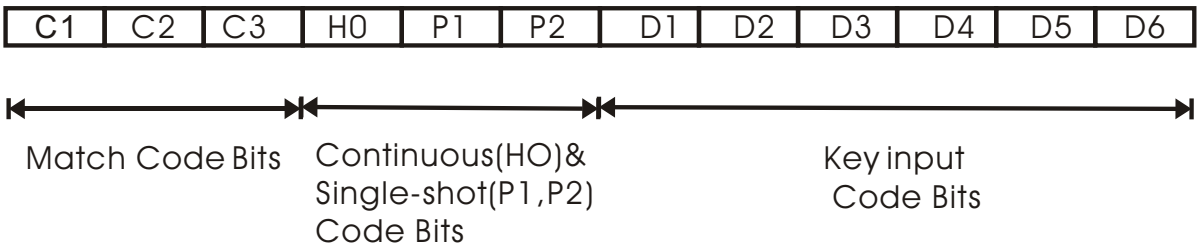


*KEY1-KEY6:Continuous Keys
*KEY7-KEY18:Single shot Keys
*KEY7-KEY18 priority:
KEY7>KEY8>.....>KEY17>KEY18

(1)There are 18Keys are connected by S1～S3 and K1～K6.
(2)Key1～key6: Multiple keying is possible. The 6 keys don't have priority and can be transmitted 63 kinds of command words.
(3)Key～key18: Single keying is possible The 12 keys have priority and can be transmitted 12 kinds of command words.
(4)The order of priority of the timing signal line is S1, S2, and S3,the output will have the preferential order of K1～K6.

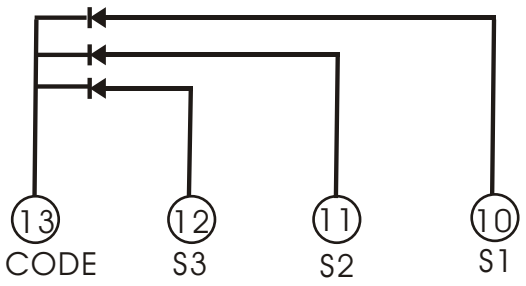
3.Transmission Command:

One transmission command word has 3-bit match code bits (C1～C3),1-bit Continuous code bit (H0),2-bit single-shot bits(P1,P2)and 6-bit key-input code bits (D1～D6),total is 12-bit.



(1)Match Code Bits:

Code bit can be made at one terminal with diodes connected through S1～S3 Terminals.



1)Data of code bit become "1"when diodes are connected to ternimal through Timing signal, other wise ,the code bit is "0".

2)RT1248 has two kinds of receiving IC- RT1249 series and RT1250 series. Therefore, the match code bits of RT1248 must be match with the receiving IC.

(a) The RT1248 Match code Bits connection table for RT1249/RT1250 series Application is given below:

RT1249		RT1248		
CODE2	CODE3	S1	S2	S3
GND	GND	Diode	NC.	NC.
GND	NC.	Diode	NC.	Diode
NC.	GND	Diode	Diode	NC.
NC.	NC.	Diode	Diode	Diode

(b)RT1248 and RT1250 Match code toble:

RT1250		RT1248		
CODE1	CODE2	S1	S2	S3
GND	GND	NC.	NC.	Diode
GND	NC	NC.	Diode	Diode
NC.	GND	Diode	NC.	Diode.
NC.	NC	Diode	Diode	Diode

(Note):(A)NC:RT1248 doesn't connect anything,RT1248/RT1250 is connected by a apactance to negative power supply or nothing.

(B)Diode:It's connected by a diode to code.

(C)CODE1, CODE2, CODE3, are the pin name of RT1249,RT1250.

(D)GND:It's connected to negative power supply.

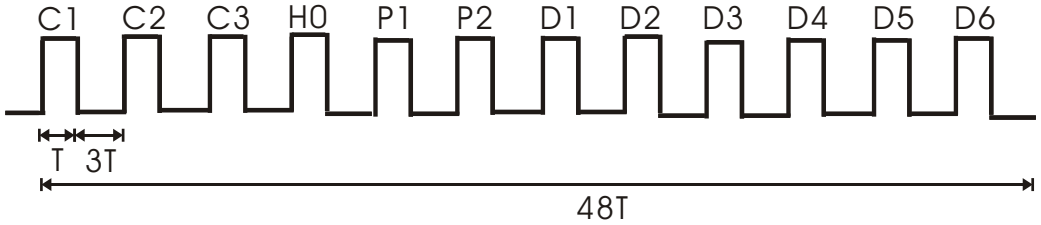
(2)DATA CODE:

KEY NO	DATA									Output From	KEY NO	DATA									Output From
	H0	P1	P2	D1	D2	D3	D4	D5	D6			H0	P1	P2	D1	D2	D3	D4	D5	D6	
1	1	0	0	1	0	0	0	0	0	Continuous	10	0	1	0	0	0	0	1	0	0	Single-shot
2	1	0	0	0	1	0	0	0	0	Continuous	11	0	1	0	0	0	0	0	1	0	Single-shot
3	1	0	0	0	0	1	0	0	0	Continuous	12	0	1	0	0	0	0	0	0	1	Single-shot
4	1	0	0	0	0	0	1	0	0	Continuous	13	0	0	1	1	0	0	0	0	0	Single-shot
5	1	0	0	0	0	0	0	1	0	Continuous	14	0	0	1	0	1	0	0	0	0	Single-shot
6	1	0	0	0	0	0	0	0	1	Continuous	15	0	0	1	0	0	1	0	0	0	Single-shot
7	0	1	0	1	0	0	0	0	0	Single-shot	16	0	0	1	0	0	0	1	0	0	Single-shot
8	0	1	0	0	1	0	0	0	0	Single-shot	17	0	0	1	0	0	0	0	1	0	Single-shot
9	0	1	0	0	0	1	0	0	0	Single-shot	18	0	0	1	0	0	0	0	0	1	Single-shot

1)Key1～Key6 are continuous keys. When any one of them is pressed,H0 is in high leve 1. Because multiple keying is possible in key1～key6, there are 63 kinds of command word.
2)Key7～Key18 are single-shot keys. When any one of them is pressed,P1is in high lere1. When any one of key12～key18 is pressed,P2 is in high leVe 1.Because multiple keying is impossible, there are 12 kinds of command word.
3)There are 75 command word can be transmitted.

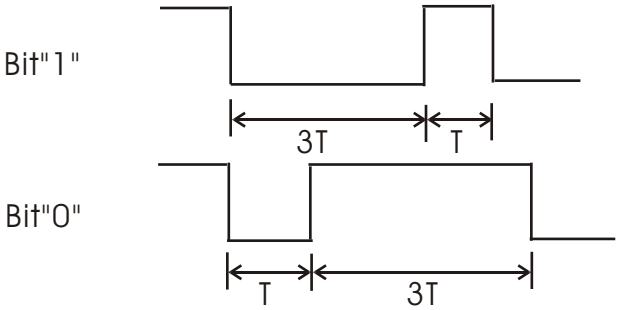
Transmitting waveform:

1.Basic transmitting waveform:
One command code word

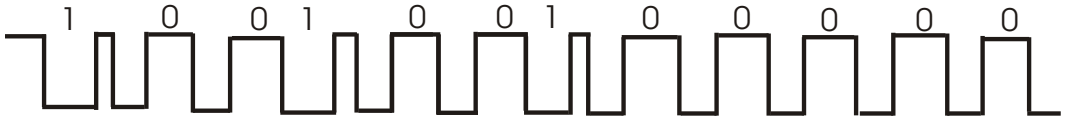


T=192/fosc

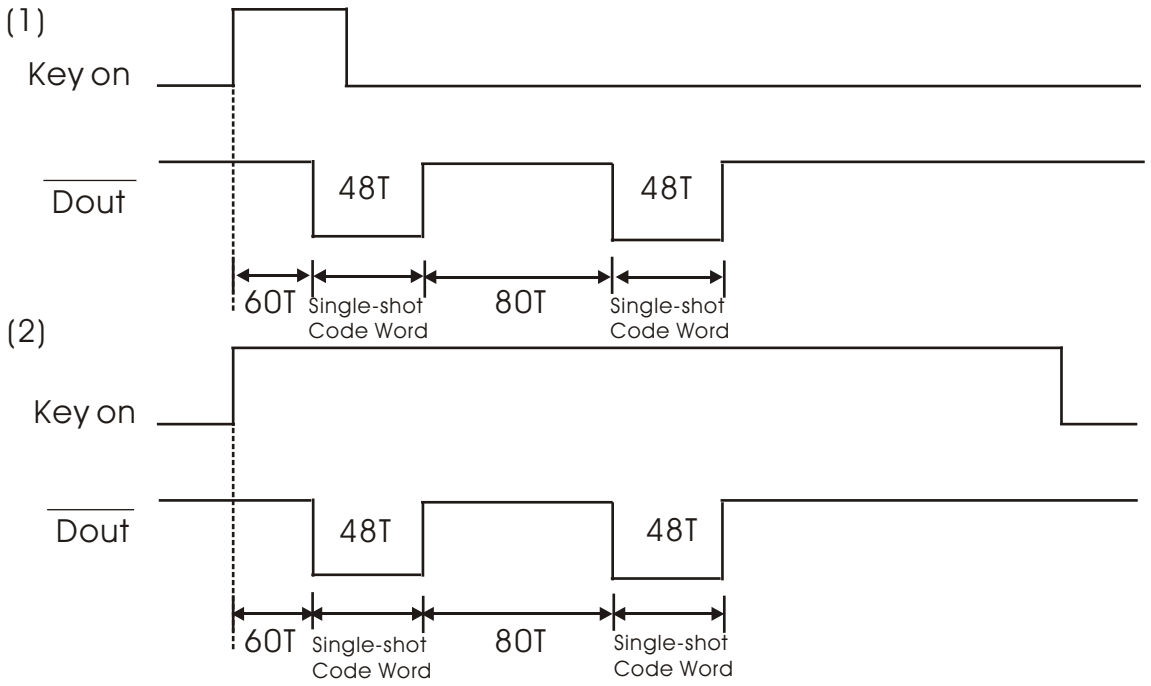
2.Distinction of Bit "1" and "0" :



(EX):KEY1:output format command code word(100100100000)

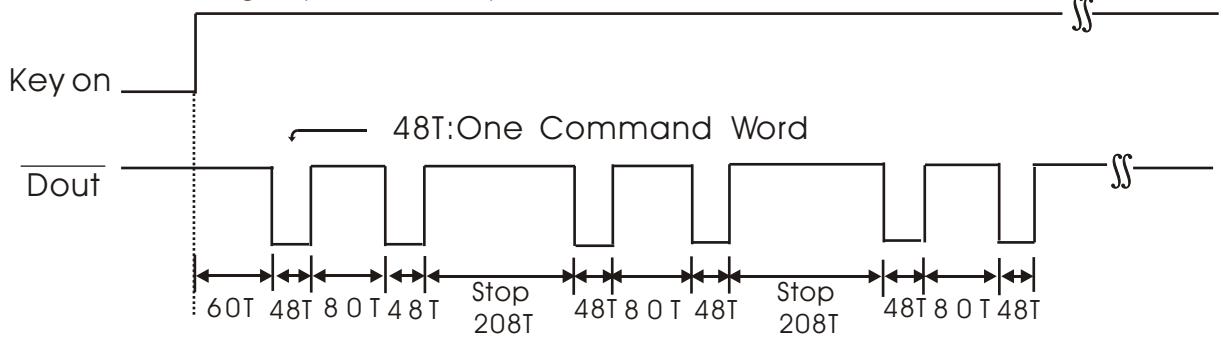


3.Single-shot-singal:(key7～key18)

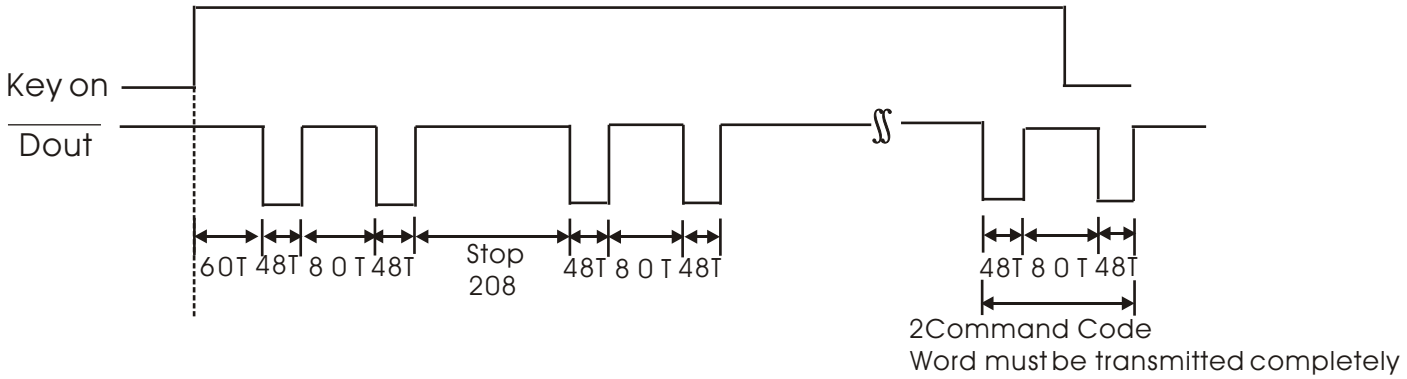


When any one of the single-shot key is pressed, it will transmit the command word in 2 cycles, and end the transmitting.

4.Continuous singal:(Key1～Key6)

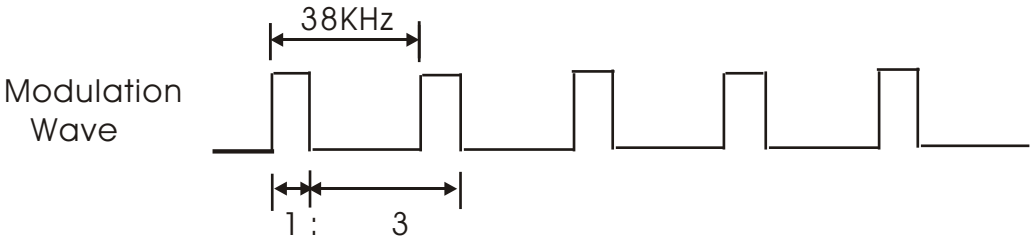


When any one of the continuous key is pressed, it will transmit the command word in 2 cycle, but it will repeat the output until the key is deprssed.
(The latest 2 command code word must be output completely)



5.Modulation wave:

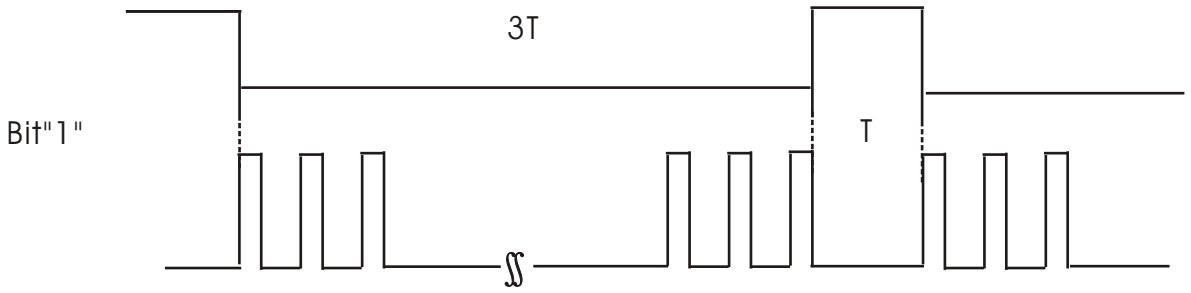
In order to longer the IR LED life circle and to save the power consumption, we have to cut down the power on timing to the 1/3 duty of 38 Khz .



Fcarrier wave = fosc/12
(fosc =455KHz , fcarrier wave

Waveform:

(1)



(2)