



## RBA5104

Preliminary

LINEAR INTEGRATED CIRCUIT

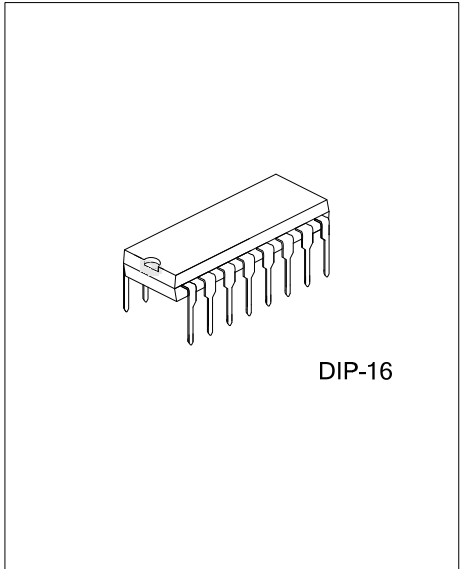
### FAN REMOTE CONTROL ENCODER

#### DESCRIPTION

**UTC RBA5104** is a remote control encoder mainly used for Fan remote control, air cleaner, humidifier, heater and other electrical home appliance remote control application. 2 bits custom code options and maximum 8 input channels offers great freedom in application. **UTC RBA5104** uses a special coding technique to increase noise immunity to a very great extent.

#### FEATURES

- \* Wide operation voltage:  $V_{CC}=2.0\sim 4.0V$
- \* Noise immunity technique
- \* 2 bits custom code
- \* 8 input channels maximum
- \* Uses 455kHz crystal oscillator
- \* Key-in oscillation, reduce static current dissipation.
- \* 38kHz carrier transmits output.
- \* LED indicates work state

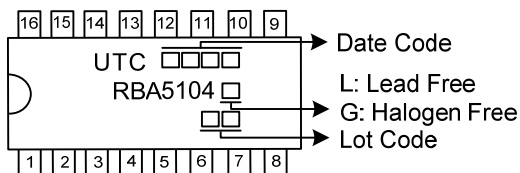


#### ORDERING INFORMATION

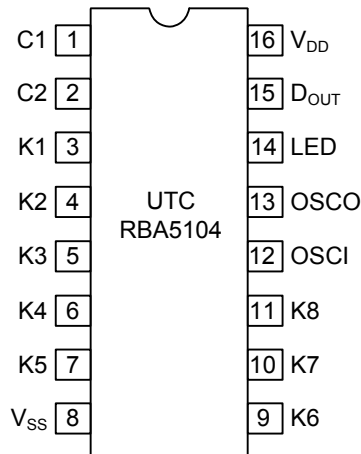
Ordering Number		Package	Packing
Lead Free	Halogen Free		
RBA5104L-D16-T	RBA5104G-D16-T	DIP-16	Tube

<p>RBA5104G-D16-T</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p>	<p>(1) T: Tube (2) D16: DIP-16 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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#### MARKING



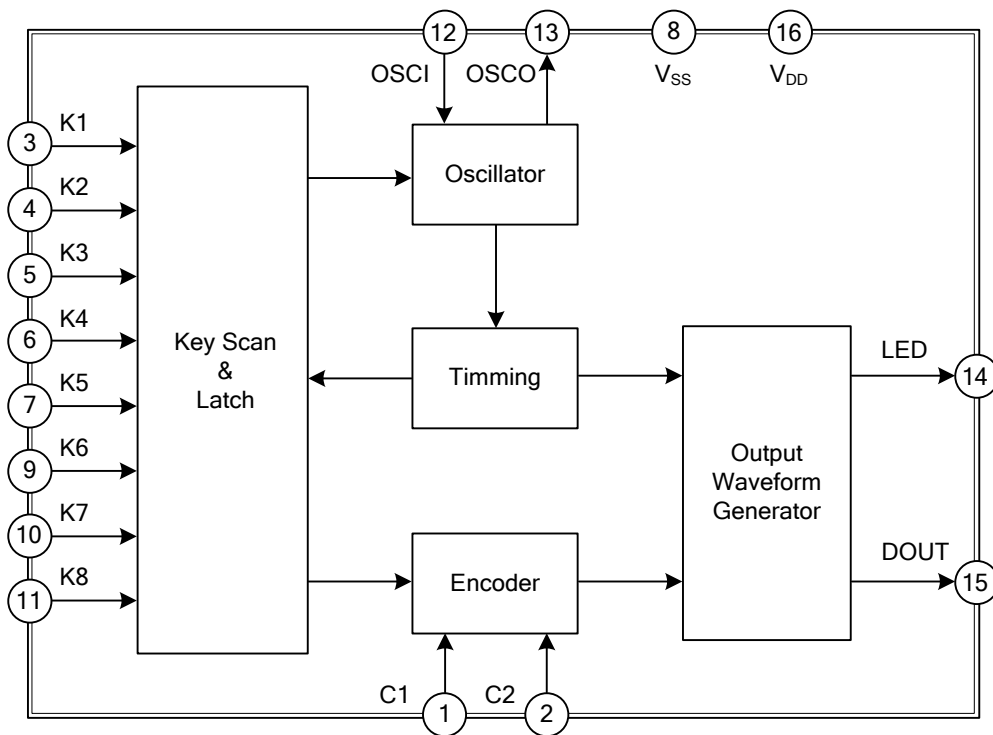
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1~2	C1, C2	Custom Code Option: Built In Pull-Up Resistor, Grounding Denote "0", Floating Denote "1".
3~7	K1~K5	Key Input Pins, Built In Pull-Up Resistor.
8	V <sub>SS</sub>	Negative Power Supply.
9~11	K6~K8	Key Input Pins, Built In Pull-Up Resistor.
12	OSCI	455kHz Oscillator Input Pin.
13	OSCO	455kHz Oscillator Output Pin.
14	LED	LED Driver Output Indication
15	DOUT	Code Data Output (Contain 38kHz Carrier Signal)
16	V <sub>DD</sub>	Positive Power Supply.

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING ( $T_A=25^{\circ}\text{C}$ , unless other specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V_{DD}$	-0.3 ~ 6.0	V
Input/Output Voltage	$V_{IN}$	$V_{SS}-0.3\text{V} \sim V_{DD}+0.3\text{V}$	V
Power Dissipation	$P_D$	500	mW
Operating Temperature	$T_{OPR}$	-10 ~ +70	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-40 ~ +125	$^{\circ}\text{C}$

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ DC ELECTRICAL CHARACTERISTICS ( $V_{DD}=3\text{V}$ ,  $T_A=25^{\circ}\text{C}$ , unless other specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	$V_{DD}$		2.0	3.0	4.0	V
Static Power Dissipation	$I_{SB}$	no load, oscillation is stopped, $C1=C2=1$		0.1		$\mu\text{A}$
		no load, oscillation is stopped, $C1=C2=0$		1.8		$\mu\text{A}$
DOUT Output High Current	$I_{OH}$	$V_{OH}=2.7\text{V}$		2.5		mA
DOUT Output Low Current	$I_{OL}$	$V_{OL}=0.3\text{V}$		-0.74		mA
High Input Voltage	$V_{IH}$		$0.7V_{DD}$		$V_{DD}$	V
Low Input Voltage	$V_{IL}$		0		$0.3V_{DD}$	V
LED High Output Current	$I_{OH}$	$V_{OH}=2.7\text{V}$		2.5	10	mA
LED Low Output Current	$I_{OL}$	$V_{OL}=0.3\text{V}$		-1.0		mA
Oscillation Frequency	$f_{OSC}$			455		kHz
Pull-up resistor at C1, C2	$R_C$	$V_{IN}=0\text{V}$		4		M $\Omega$
Pull-up resistor at K1~K8	$R_i$	$V_{IN}=0\text{V}$		250		K $\Omega$

■ FUNCTION DESCRIPTIONS

1. Key inputs K1~K8

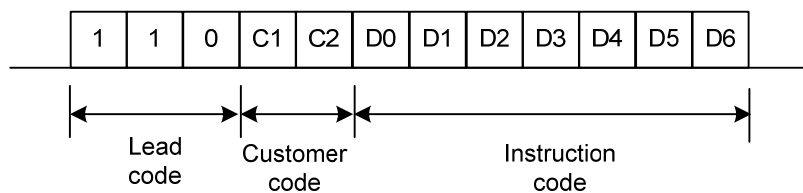
In static mode, key inputs K1~K8 are set as high level through pull-up resistor and there is no current flows in circuit. When one key is pressed, corresponding code is transmitted.

2. Customer code C1, C2

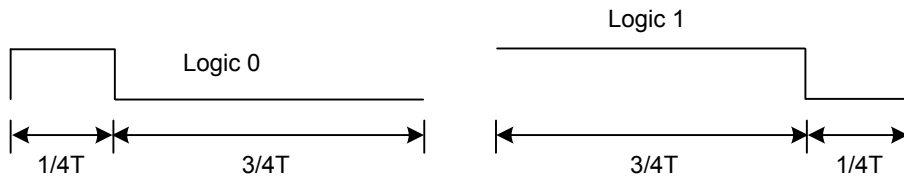
In static mode, C1 and C2 are internal pulled as high level. Four different customer code combination are available by the two bits. For these two bits, "1" indicates corresponding pin is grounded while "0" indicates floating or connected to V<sub>DD</sub>.

3. Code format A frame consists of:

- a. Lead code——110
- b. Customer code——C1C2
- c. Instruction code——7 bits key code

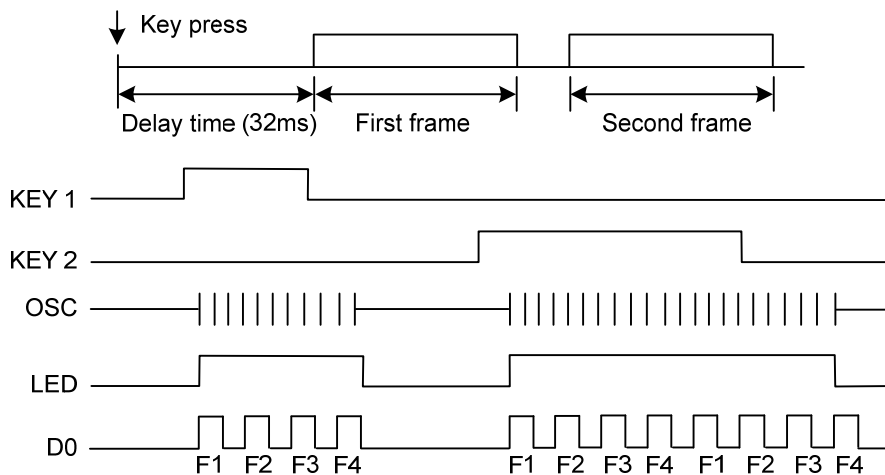


- d. Logic 0: 1/4T high level, 3/4T low level; Logic 1: 3/4T high level, 1/4T Low level.
- e. Code cyclic time T=1.6879ms
- f. Interval between two frame: 4T



4. Data out

Data code is output at Dout. When one key is pressed, high level is output at pin LED and data (four frames at least) is output at Dout after 32ms delay. Data is continuously output if the key is kept pressed and there is 4 code interval between frames.



\* Basic code of D0 is composed of F1~F4

## ■ FUNCTION DESCRIPTIONS (Cont.)

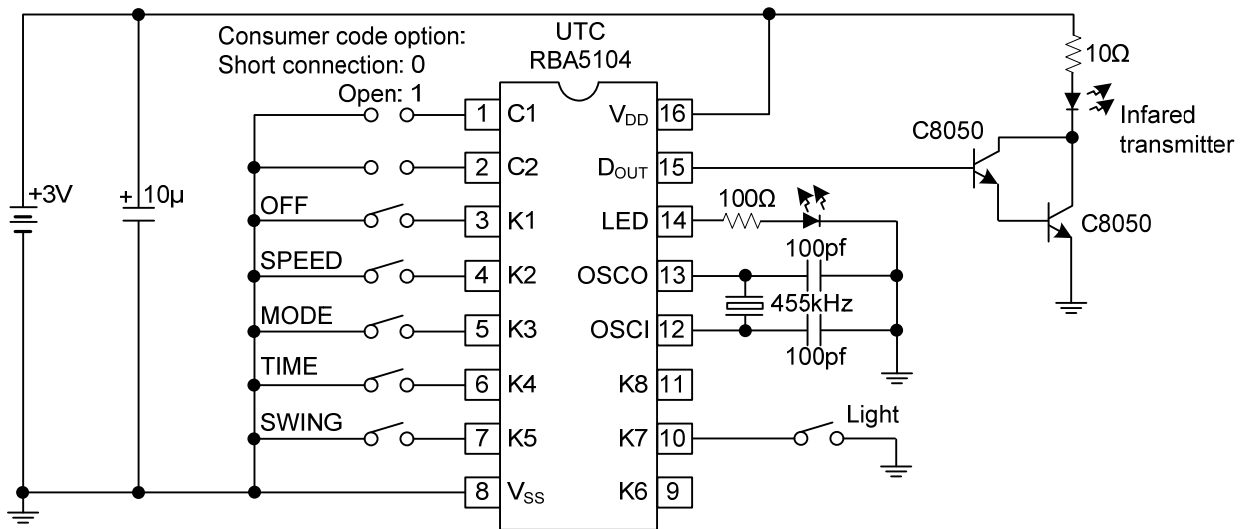
**5. Oscillator**

Internal oscillator integrates advanced key-press start power saving function. The oscillator is in sleep mode when there is no key pressed and there is no current; it only works when key is pressed. This is for power saving. 455 KHz oscillator is connected to pins OSC1 and OSC0 for using.

**6. Key code table**

Key No.	Instruction code						
	D0	D1	D2	D3	D4	D5	D6
K1	0	0	0	0	0	0	1
K2	0	0	0	0	0	1	0
K3	0	0	0	0	1	0	0
K4	0	0	0	1	0	0	0
K5	0	0	1	0	0	0	0
K6	0	1	0	0	0	0	0
K7	1	0	0	0	0	1	1
K8	1	0	0	0	1	1	0

■ TYPICAL APPLICATION CIRCUIT



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.