

ENCODER FOR REMOTE CONTROLLER

DESCRIPTION

The UTC **UT912E** of CMOS LSIs for remote control system applications is capable of encoding information which consists of N address bits and 12-N data bits. Each address/data input can be set to one of the two logic states. The programmed addresses/data are transmitted together with the header bits by a RF or an infrared transmission medium upon receipt of a trigger signal.

FEATURES

- * Operating voltage: 2.4V ~ 12V
- * Low power and high noise immunity CMOS technology
- * Low standby current (0.1 μ A (typ.) at V_{DD}=5V)
- * Minimum transmission word (Four words)
- * Built-in oscillator needs only 5% resistor
- * Data code has positive polarity
- * Minimal external components

ORDERING INFORMATION

DIP-14	DIP-18
STATE AND	
SOP-16	SOP-20

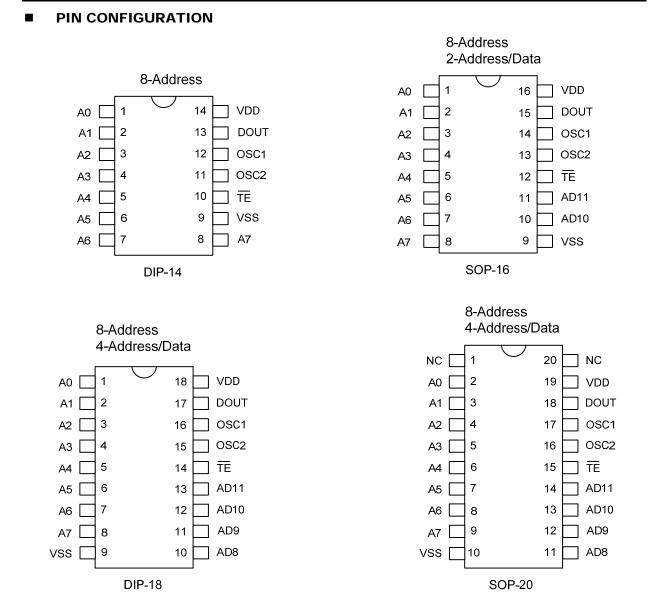
Ordering	g Number	Package	Deaking
Lead Free	Lead Free Halogen Free		Packing
UT912EL-D14-T	UT912EG-D14-T	DIP-14	Tube
-	UT912EG-D18-T	DIP-18	Tube
-	UT912EG-S16-R	SOP-16	Tape Reel
-	UT912EG-S20-R	SOP-20	Tape Reel

UT912EL- <u>D14-T</u> (1)Packing Type (2)Package Type (3)Green Package	 (1) T: Tube, R: Tape Reel (2) D14: DIP-14, D18: DIP-18, S16: SOP-16, S20: SOP-20 (3) L: Lead Free, G: Halogen Free and Lead Free
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MARKING

Packing	MARKING
DIP-14	14 12 11 10 9 8 Date Code UTC □□□□□ L: Lead Free UT912E C: Halogen Free □□ C: Halogen Free 1 2 3 4 5 6 7
DIP-18	18 17 10 11 10 UTC □□□□□□ → Date Code UT912EG □□□ → Lot Code 123456789 ► ► Lot Code
SOP-16	16 15 14 13 12 11 10 9 UTC 0000 0000 L: Lead Free UT912E C: Halogen Free U12 3 4 5 6 7 8
SOP-20	20 10 <t< td=""></t<>





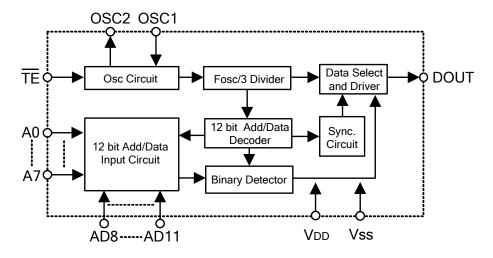
■ PIN DESCRIPTION

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PIN NAME	I/O	INTERNAL CONNECTION	DESCRIPTION
A0 ~ A7	Т	NMOS TRANSMISSION	Input pins for address A0 ~ A7 setting
AU ~ A7	1	GATE PROTECTION DIODE	These pins can be externally set to VSS or left open
AD8 ~ AD11	Т	NMOS TRANSMISSION	Input pins for address/data AD8 ~ AD11 setting
AD0 ~ ADTT	1	GATE PROTECTION DIODE	These pins can be externally set to VSS or left open
DOUT	0	CMOS OUT	Encoder data serial transmission output
TE I CMOS IN Pull-high		CMOS IN Pull-high	Transmission enable, active low
OSC1	Ι	OSCILLATOR 1	Oscillator input pin
OSC2	0	OSCILLATOR 1	Oscillator output pin
V _{SS}	Ι		Negative power supply (GND)
V _{DD}	Ι		Positive power supply



BLOCK DIAGRAM

TE trigger





■ **ABSOLUTE MAXIMUM RATINGS** (T_A=25°C, unless otherwise specified)

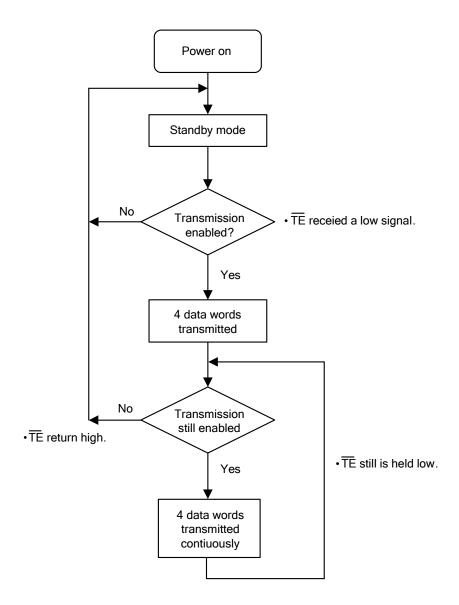
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V _{DD}	-0.3 ~ +13	V
Input Voltage	VIN	Vss-0.3 ~ V _{DD} +0.3	V
Operating Temperature	T _{OPR}	-20 ~ +85	°C
Storage Temperature	T _{STG}	-40 ~ +150	°C

■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST C	ONDITIONS	MIN	TYP	MAX	UNIT		
Operating Voltage	Operating Voltage						12	V	
Standby Current				V _{DD} =3V		0.1	1		
Standby Current		I _{STN-BY}	Oscillator stops	V _{DD} =12V		2	4	μA	
Operating Current			No load,	V _{DD} =3V		40	80	– uA	
		I _{OPR}	Fosc=3kHz	V _{DD} =12V		150	300		
Output Driver Current		I _{DOUT}	V _{DD} =5V	V _{OH} =0.9V _{DD} (Source)	-1	-1.6	mA		
			VDD-3V	V _{OL} =0.1V _{DD} (Sink)	1	1.6		ША	
Input Voltage	High				$0.8V_{\text{DD}}$		V_{DD}	V	
Low		VIL		0		$0.2V_{\text{DD}}$	V		
Oscillator Frequency		f _{osc}	R_{osc} =1.1M Ω , V_{DD}		3		kHz		
TE Pull-high Resistance		RTE	V_{TE} =0V, V_{DD} =5V			1.5	3	MΩ	



OPERATION FLOWCHART

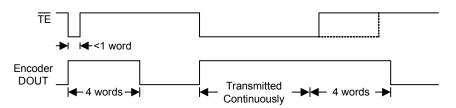




■ FUNCTIONAL DESCRIPTION

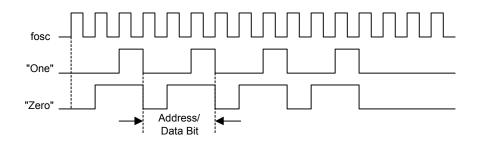
Operation

The UTC **UT912E** start a cycle of 4-words transmission upon receipt of a transmission enable (\overline{TE}). A completed cycle is showed as below. This cycle will repeat itself as long as the transmission enable is held low. While the transmission enable returns high the encoder output completes its final cycle and then stops.



Address/data bit waveform

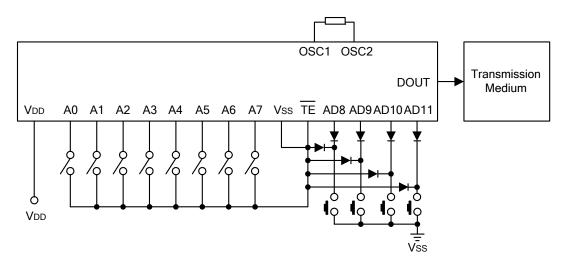
Each programmable address/data pin can be externally set to one of the following two logic states as shown below.



Address/data programming (preset)

The status of each address/data pin can be individually pre-set to logic "high" or "low". If a transmission-enable signal is applied, the encoder scans and transmits the status of the 12 bits of address/data serially in the order A0 to AD11. During information transmission these bits are transmitted with a preceding synchronization bit. If the trigger signal is not applied, the chip enters the standby mode and consumes a reduced current of less than 1 μ A for a supply voltage of 5V.

The following figure shows an application using the UTC UT912E:



Transmitted information:

Pilot &	A0	A1	A2	A3	A4	A5	A6	A7	AD8	AD9	AD10	AD11
Sync.	1	0	1	0	0	0	1	1	1	1	1	0



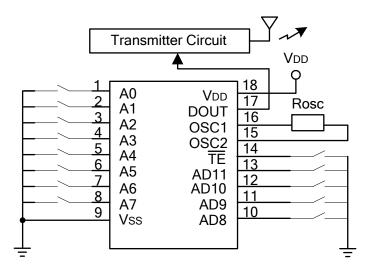
■ FUNCTIONAL DESCRIPTION (Cont.)

Address/Data sequence

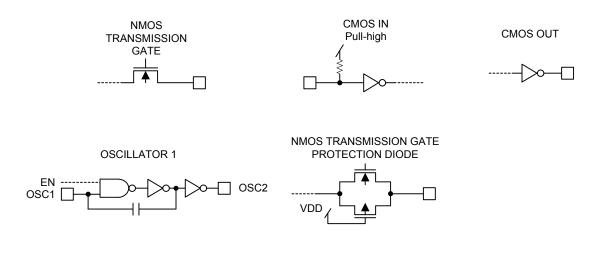
The following provides the address/data sequence table for various models of the UTC **UT912E** encoders. The correct device should be selected according to the individual address and data requirements.

Bits	0	1	2	3	4	5	6	7	8	9	10	11
Address/ Date	A0	A1	A2	A3	A4	A5	A6	A7	AD8	AD9	AD10	AD11

TYPICAL APPLICATION CIRCUIT

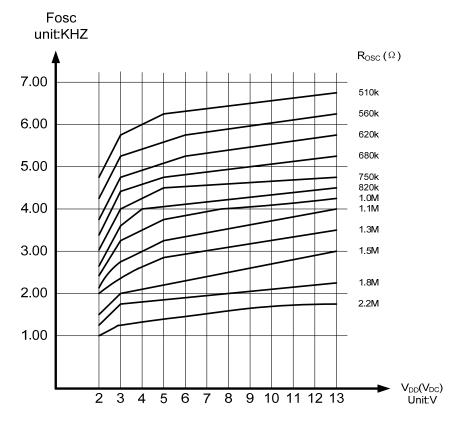


APPROXIMATE INTERNAL CONNECTIONS





• OSCILLATOR FREQUENCY VS SUPPLY VOLTAGE



The recommended oscillator frequency is f_{OSCD} (decoder) \cong 50 f_{OSCE} (UT912E encoder)

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