RoHS
2002/95/EC

NTE7233
Integrated Circuit
2^{12} CMOS LSI Encoder for
Remote Control Systems

Description:

The NTE7233 is a 2^{12} CMOS LSI encoder in an 18–Lead DIP type package for use in remote control system applications. For proper operation, the NTE7233 should be paired with the NTE7232 decoder or similar device with the same number of addresses and data format.

The NTE7233 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 via an RF or an infrared transmission medium upon receipt of a trigger signal.

Features:

- Operating Voltage: 2.4V to 12V
- Low Power and High Noise Immunity CMOS Technology
- Low Standby Current
- One Word Minimum Transmission
- Built–In Oscillator Needs Only 5% Resistor
- Data Code has Positive Polarity
- Minimal External Components

Features:

- Burglar Alarm Systems
- Smoke and Fire Alarm Systems
- Garage Door Controllers
- Car Door Controllers
- Car Alarm Systems
- Security Systems
- Cordless Telephones
- Other Remote Control Systems

Absolute Maximum Ratings: (Note 1)

Supply Voltage . . . . −0.3V to 13V
Input Voltage . . . . V_{SS}−0.3 to V_{DD}+0.3V
Operating Temperature Range, T_{opr} . . . . −20° to +75°C
Storage Temperature Range, T_{stg} . . . . −50° to +125°C

Note 1. These are stress ratings only. Stresses exceeding the range specified under "Absolute Maximum Ratings" may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in this specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

<u>**Electrical Characteristics:**</u> (V_{DD} = 5V, T_A = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Operating Voltage	V_{DD}			2.4	5.0	12	V
Standby Current	I_{STB}	V_{DD} = 3V	Oscillator Stops	–	0.1	1.0	A
		V_{DD} = 12V		–	2	4	A
Operating Current	I_{DD}	V_{DD} = 3V	No Load, f_{OSC} = 150kHz	–	40	80	A
		V_{DD} = 12V		–	150	300	A
Data Output Source Current	I_D	V_{OH} = 0.9V		–1.0	–1.6	–	mA
Data Output Sink Current	I_D	V_{OL} = 0.1V		1.0	1.6	–	mA
"H" Input Voltage	V_{IH}			0.8V_{DD}	–	V_{DD}	V
"L" Input Voltage	V_{IL}			0	–	0.2V_{DD}	V
Oscillator Frequency	f_{OSC}	R_{OSC} = 1.1M°		–	3	–	kHz
$\overline{TE}$ Pull–High Frequency	$R_{\overline{TE}}$	$V_{\overline{TE}}$ = 0V		–	1.5	3.0	M°

<u>Functional Description:</u>
Operation
The NTE7233 encoder begins a 4–word transmission cycle upon receipt of a transmission enable ($\overline{TE}$). This cycle will repeat itself as long as the transmission enable ($\overline{TE}$) is held low. One the transmission enable returns high the encoder output completes its final cycle and then stops.

Information Word
If L/$\overline{M}$=1 the device is in the latch mode (for use with the latch type of data decoders). When the transmission enable is removed during a transmission, the DOUT pin outputs a complete word and then stops. On the other hand, if L/$\overline{M}$=0 the device is in the momentary mode (for use with the momentary type of data decoders). When the transmission enable is removed during a transmission, the DOUT outputs a complete word and then adds 7 words all with the "1" data code.

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, th 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 reduced current of less than 1 A for a supply voltage of 5V.

Usual applications preset the address pins wit individual security codes using DIP switches or PCB wiring, while the data is selected by push buttons or electronic switches.

Transmission Enable
Transmission is enabled by applying a low signal to the $\overline{TE}$ pin.

Pin Connection Diagram

Pin	Signal		Pin	Signal
1	A0		18	V_{DD}
2	A1		17	DOUT
3	A2		16	OSC1
4	A3		15	OSC2
5	A4		14	$\overline{TE}$
6	A5		13	AD11
7	A6		12	AD10
8	A7		11	AD9
9	V_{SS}		10	AD8

18   10

1   9

.920 (23.4) Max

.155 (3.94)

.100 (2.54)

.115 (2.9) Min

.260 (6.6)

.430 (10.9) Max