

# MM53200 Encoder/Decoder

The MM53200 Encoder/Decoder is an MOS/LSI Digital Code Transmitter — Receiver system.

## Features

- A single chip contains both the Encoder and Decoder.
- Oscillator stability is non-critical, 5% components may be used.
- Cross interference of receivers in close proximity is virtually eliminated by circuitry which requires 4 valid words to be received, each within 64 ms of the other.

## Operation

In the transmit mode the twelve inputs are scanned sequentially producing the output pattern shown in Figure

1. This code is generated at the rate of 0.96 ms/bit, or 11.52 ms/word with 11.52 ms reset pulse between words.

In the receiver mode, the incoming signal is compared to the local code in a sequential manner; if there is an error, the system is reset and begins its comparison on the next pulse. If all twelve bits are received correctly, a "valid" signal will be generated. This signal clears a 64 ms counter and clocks a 3 stage counter. The 3 stage counter counts the "valid" pulses and when 4 pulses have been received, the transmit/receive output goes low. After the transmit/receive output is enabled, the next "valid" must be received within 128 ms, giving a one valid in 6 requirement to keep the transmit/receive output low.

Connection diagrams for the device in the Receive and Transmit modes are shown in Figures 2 and 3.

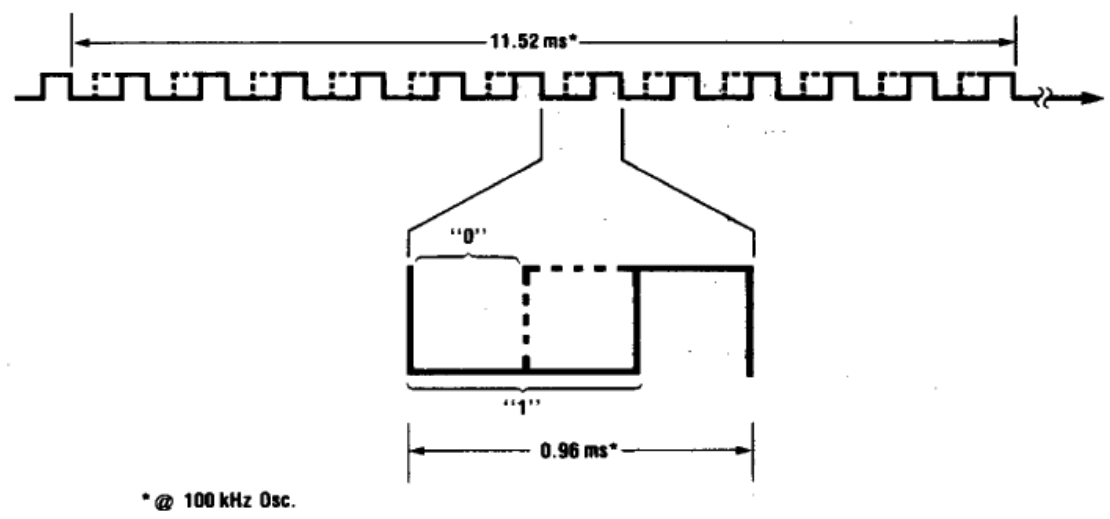


Figure 1. Output Waveform

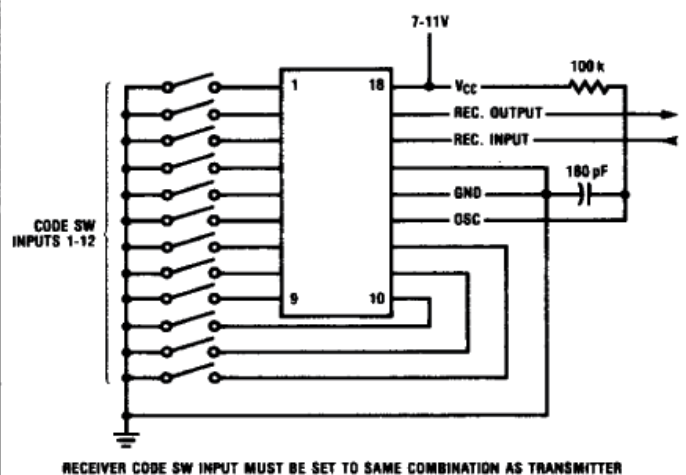


Figure 2. Pin Connections for Receiver Mode

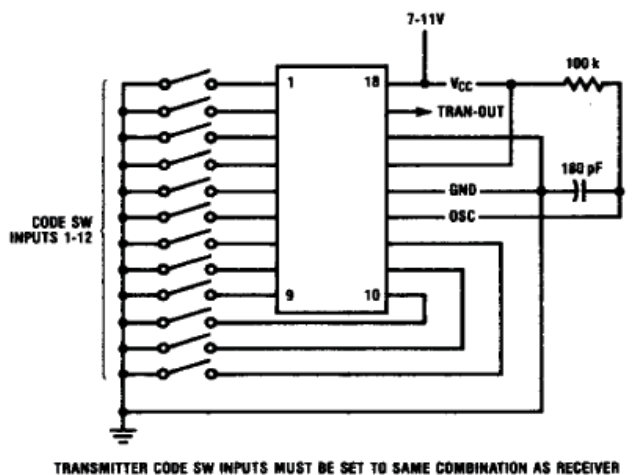


Figure 3. Pin Connections for Transmitter Mode

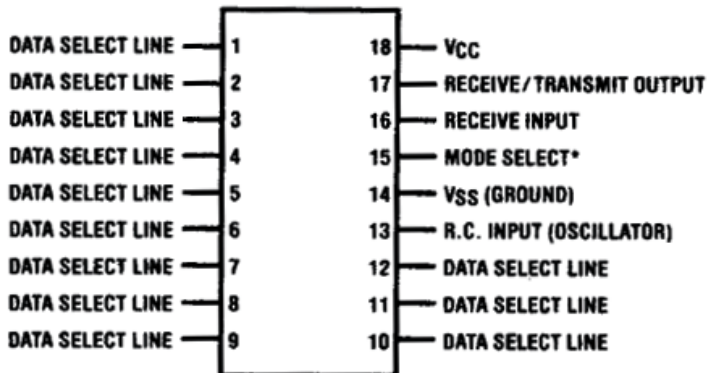
# Design Specifications

Storage Temperature	-65 °C to +125 °C
Operating Temperature	-25 °C to +70 °C
Lead Temperature, Max. (Soldering, 10 seconds)	+300 °C
Power Supply	
$V_{DD}$	$V_{SS} + 7V$ to $V_{SS} + 11V$
$I_{DD}$	12 mA Max.

# Electrical Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Levels Schmitt Trigger Input	Level 1	$V_{SS} + 4$			V
	Level 0			$V_{SS} + 2$	V
All Other Inputs	Level 1	$V_{DD} - 0.5$		$V_{DD}$	V
	Level 0	$V_{SS}$		$V_{SS} + 0.5$	V
Input Resistor to $V_{DD}$		200k		1.2M	$\Omega$
Output Voltage (trans/rec) Logic High "1"	$I_{SOURCE} 5\mu A$ $I_{SINK} 2 mA$	$V_{DD} - 0.5$		$V_{DD}$	
		$V_{SS}$		$V_{SS} + 1.0$	
Oscillator Frequency	$\pm 15\%$ exclusive of external components		100		kHz

## 18-Pin DIP — Top View



- \*a. GROUND CONNECTION IS RECEIVER MODE
- b.  $V_{DD}$  CONNECTION IS TRANSMITTER MODE

Order Number MM53200N  
See Package 20

## Pin Functions

### Pin #

- 1-12 These Data Select lines are used to set the address of the encoder/decoder pair. They have on-chip pull-ups and input switches should pull them to ground.
- 13 The R.C. Input is the connection point for the single pin Oscillator. A resistor is hooked from this pin to  $V_{CC}$  and a capacitor from this pin to GND. The frequency =  $2/RC$ . The frequency may be decreased by increasing the resistor value.
- 14  $V_{SS}$  is the Ground Pin.
- 15 The Mode Select pin changes operation of the IC from Receiver to Transmitter. By grounding pin 15 the IC is put in the Receiver mode. By connection to  $V_{CC}$  the IC is put in the Transmitter mode.
- 16 The Receiver input receives the digital PCM waveform from the Detector circuit.
- 17 The Output pin produces the PCM waveform when in the Transmit mode and is active low in the Receive mode.
- 18  $V_{CC}$  is the positive supply pin.