Preliminary

MSM6352

CMOS 4BIT SINGLE CHIP LOW POWER MICROCONTROLLER FOR TELEPHONE

GENERAL DESCRIPTION

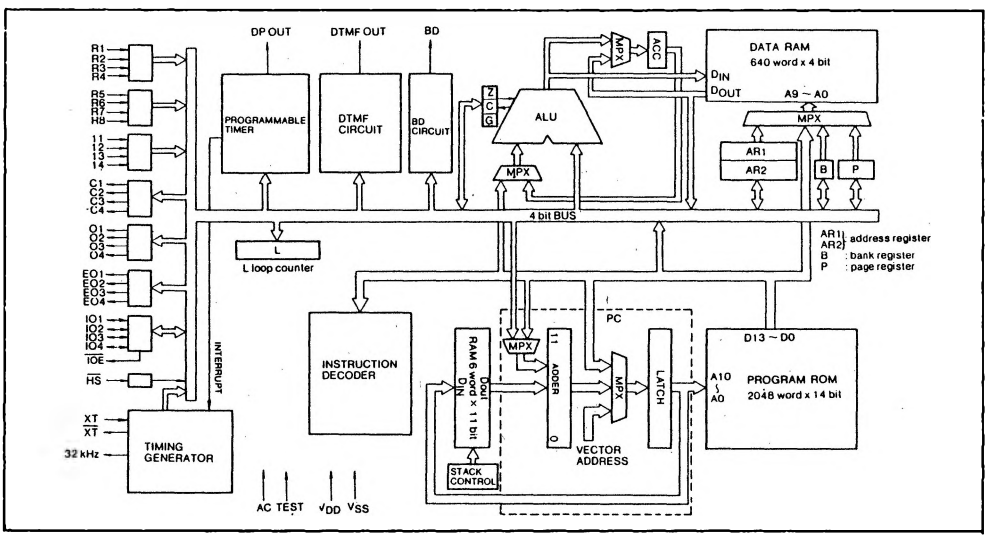
The OKI MSM6352 is a low-power, high-performance single-chip 4-bit microcontroller employing complementary metal oxide semiconductor technology, especially designed for use in sophisticated telephone sets. Integrated onto a single chip are a 4-bit ALU, 28K bits of mask programmable ROM, 2560 bits of data RAM, programmable timer, oscillator, 12-bits of input port, 12-bits of output port and 4-bits of input/output port. In addition to these units, a DTMF generator is provided.

With the MSM6352, sophisticated telephone sets become feasible through a single chip instead of the conventional 3-chip configuration.

FEATURES

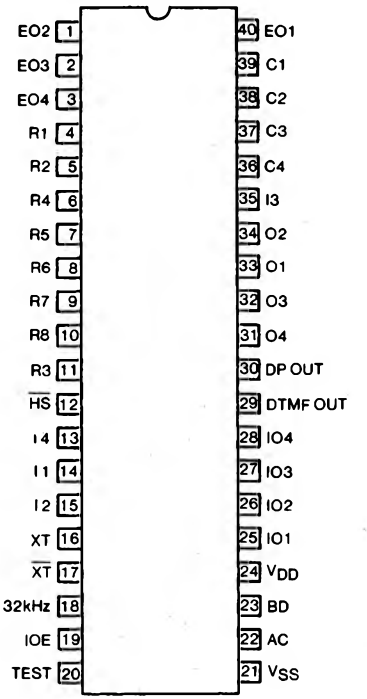
- Low Power Consumption 0.3mA Typical @3V (DTMF output off)
- 2048 × 14 Internal ROM
- 640 × 4 Internal RAM
- 3 × 4 Input Port
- 3 × 4 Output Port
- 1 × 4 Input/Output Port
- DTMF Generator (Single Tone Mode or Dual Tone Mode)
- Buzzer Sound Output
- 4 Bits Programmable Timer Applicable for Output of Dial Pulse
- Watch Dog Timer
- On Hook Dialing and Off Hook Dialing Function
- Interrupt
  Programmable Timer-Interrupt
  Real Time Interrupt
- 5 Level Stack
- Power Down Mode
- 52 Instruction Set
- Instructions Useful for Data Management (Data Search and Block Data Transfer)
- 1.5 to 5.0V Operating Voltage
- Low Voltage Detector
- 3.58 MHz Oscillator
- 17.9 μs Instruction Cycle
- −20 to 75°C Operating Temperature
- 28 Pin DIP or 40 Pin DIP
- Software Compatibility with MSM6052

FUNCTIONAL BLOCK DIAGRAM

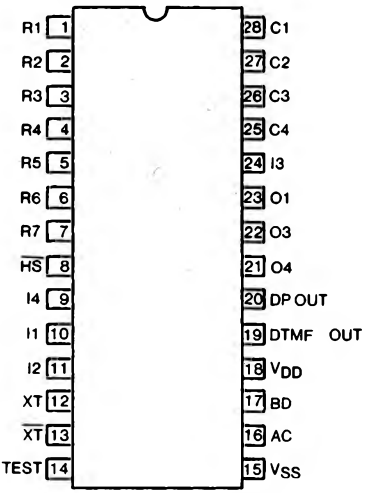


PIN CONFIGURATION

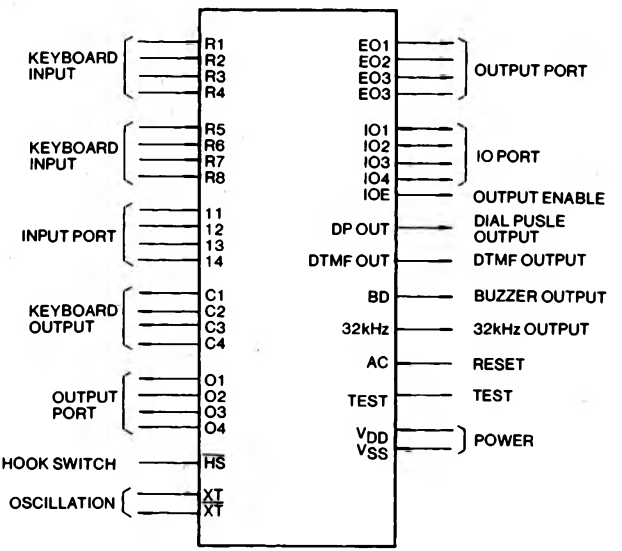
(Top View) 40 Lead Plastic DIP



(Top View) 28 Lead Plastic DIP



LOGIC SYMBOL



PIN DESCRIPTION

Designation	Function
V_{DD}	Pource source
V_{SS}	Circuit ground potential
AC	Terminal to clear internal logic, pulled down to V_{SS}. After power is turned on, the MSM6052 must be reset by this terminal.
TEST	Terminal to test internal logic, pulled down to V_{SS}. This terminal must be open in normal operation.
XT, $\overline{XT}$	Input and output terminals of oscillator inverter. 3.58 MHz ceramic resonator is connected to these terminals.
$\overline{HS}$	Input terminal connected to the hook switch, pulled up tp V_{DD}.
DP OUT	Output terminal of dial pulse. Dial pulse rate (10 pps or 20 pps) and Make Break ratio (40% or 33 %) can be selected by software.
DTMF OUT	Output terminal of DTMF signal
BD	Output terminal of buzzer sound
32 kHz	Output terminal of 32 kHz clock
$R_1 \sim R_4$ $R_5 \sim R_8$	Input port pulled down to V_{SS}.
$I_1 \sim I_4$	Input port having clocked pull-down resistor to V_{SS}. Only when this port is accessed, pull-down resistors are connected to this port.
$C_1 \sim C_4$ $O_1 \sim O_4$	Output port
$IO_1 \sim IO_4$	Tri-state bidirectional port
IOE	Output terminal When $IO_1 \sim IO_4$ is accessed, input completion signal (when read) or load signal (when written) is output from IOE terminal.