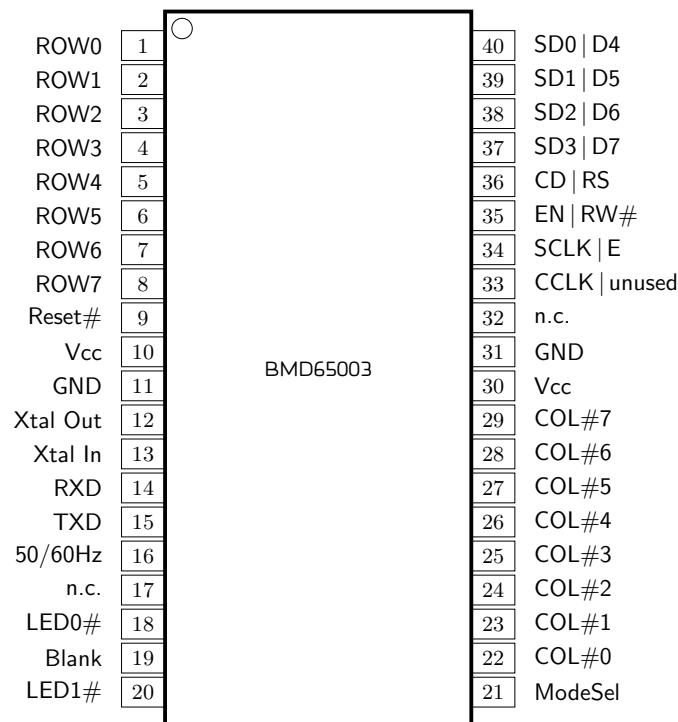


## Features

- ▶ Support for 2x40 char display with display attributes *blink* and *underline*
- ▶ Support for 8x8 button matrix with detection of multiple keypresses
- ▶ Support for 2x8 LED matrix (preparation for 1380-65000-4 compatibility)
- ▶ Two built-in operation modes
  - VFD mode for NEC FIP80B5R VFDs
  - LCD mode for HD44780-compatible displays
- ▶ Replacement for Ensoniq 1380-65000-3 display/panel processor used in ESQ1 and SQ80
- ▶ Full compatibility with
  - Character set and display attributes
  - Control codes
  - Button codes
- ▶ Customized versions (clock speed, UART settings, character set, control codes) available upon request

## Pinout



Please note that this is not a pin-compatible replacement.

You will require either the an adapter PCB or manual wiring to make it fit to the original ESQ1/SQ80 display unit.

## Electrical characteristics (according to chip-technology provider)

### Operating conditions:

Symbol	Parameter	Min	Typ	Max
$T$	Operating Temperature	-55 °C	25 °C	125 °C
$f$	Clock Frequency		4MHz <sup>1</sup>	
$V_{cc}$	Operating Voltage		5V	6V

<sup>1</sup>in this application

## DC Characteristics:

Symbol	Parameter	Min	Typ	Max
$V_{il}$	Input Low Voltage	-0.5V		$0.2V_{cc}$
$V_{ih}$	Input High Voltage	$0.6V_{cc}$		$V_{cc}+0.5$
$V_{ol}$	Output Low Voltage			0.7V
$V_{oh}$	Output High voltage	4.2V		
$I_l$	Input Leakage Current I/O Pin			$1\mu A$
$I_{cc}$	Power Supply Current		3.8mA	5mA

## Pin Description

### Common signals:

Signal	Direction	Description
Vcc	Supply	$V_{cc}$ , 5V Power Supply
GND	Supply	GND Supply
Xtal in	Input	Input to the inverting oscillator amplifier
Xtal Out	Output	Output from the inverting oscillator amplifier
Reset#	Input	System reset
ModeSel	Input	$V_{il}$ selects LCD mode (HD44780) leave open for VFD mode (default)
RXD	Input	UART Data Receive
TXD	Output	UART Data Transmit
ROW 0-7	Input	Keypad row signals
COL# 0-7	Output	Keypad column signals
LED# 0/1	Output	LED anode control (future feature, not available yet)

### Signals specific to VFD mode:

Signal	Direction	Description
Blank	Output	Display blanking
EN	Output	Latching enable
CCLK	Output	Column clock
CD	Output	Column data
SCLK	Output	Segment clock
SD0-3	Output	Segment data

### Signals specific to LCD mode:

Signal	Direction	Description
E	Output	HD44780 enable
RS	Output	HD44780 register select
R/W#	Output	HD44780 read/write#
D4-7	Output	HD44780 data (4-bit operation)