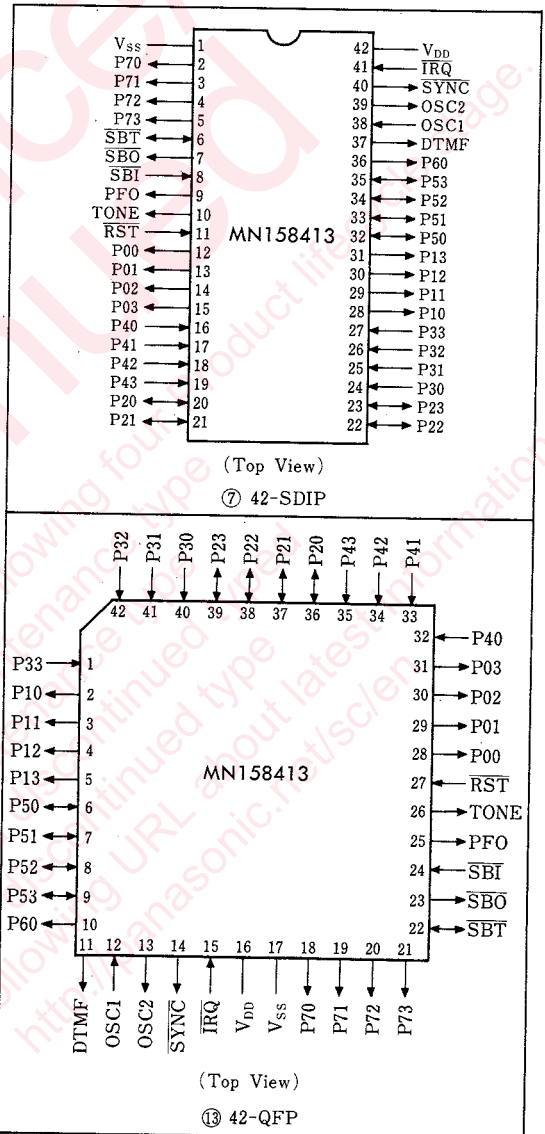


# MN158413

## ■ Features

- ROM capacity:  $4,096 \times 8$  bits
- RAM capacity:  $256 \times 4$ bits +  $512 \times 4$ bits  
(direct access)(access via port)
- Machine cycle:  $2.23 \mu\text{s}$ (4.5 to 5.5 V)  
 $17.9 \mu\text{s}$ (2.5 to 5.5 V)
- Interrupt: External interrupt 1  
Timer interrupt 1  
Serial interrupt 1
- Timer/counter: Timer and event count functions provided by 8-bit programmable timer with 7-bit prescaler
- Serial interface: 8-bit synchronous type
- DTMF circuit incorporated: DTMF output, 1 channel
- Backup mode: STOP/HALT mode
- Operating voltage range: 2.5 to 5.5 V
- I/O pins: 8 for general purpose I/O  
8 for general purpose input  
9 for general purpose output  
5 for high-voltage N-channel open drain output  
1 for serial data input  
1 for serial data output  
1 for serial clock I/O  
1 for DTMF output
- Process: Silicon gate CMOS
- Package: 42-SDIP/QFP
- Piggyback: EP158413

## ■ Pin Configuration



## ■ Pin Functions

Pin No.		Symbol	Pin Name	I/O	Description
42-SDIP	42-QFP				
42 1	16 17	$V_{DD}$ $V_{SS}$	Power supply	I	Connect +2.5-5.5 V to $V_{DD}$ , and 0 V to $V_{SS}$ .
38 39	12 13	OSC1 OSC2	Clock input Clock output	I O	Oscillation terminals to connect ceramic or crystal oscillator. A feedback resistor is incorporated between OSC1 and OSC2.
11	27	$\overline{RST}$	Reset input	I	Reset is applied if the "L" level is inputted over 1 machine cycle. A pull-up resistor can be specified with a mask option.
40	14	$\overline{SYNC}$	Sync. signal output	O	An internal timing signal is outputted every machine cycle.
41	15	$\overline{IRQ}$	External interrupt	I	External interrupt terminal which receives an interrupt at a negative edge. A pull-up resistor can be specified with a mask option.
6	22	$\overline{SBT}$	Serial interface clock I/O	I/O	Serial interface send/receive clock I/O terminal. It serves as an output terminal in the internal clock mode, and as an input terminal in the external clock mode. A pull-up resistor can be specified with a mask option.
7	23	$\overline{SBO}$	Serial interface data output	O	Serial interface send data output terminal. It outputs 8-bit serial data in the send mode. A pull-up resistor can be specified with a mask option.
8	24	$\overline{SBI}$	Serial interface data input	I	Serial interface receive data input terminal. It inputs 8-bit serial data in the receive mode. A pull-up resistor can be specified with a mask option.
37	11	DTMF	DTMF signal output	O	It outputs a DTMF signal.
10	26	TONE	TONE output terminal	O	Capable of output 2 kinds of frequencies(2 kHz, 1 kHz) programmably.
20~23 32~35	36~39 6~9	P20~P23 P50~P53	Parallel data I/O	I/O/ I/O	4-bit parallel data I/O ports. Input, output or I/O can be selected with a mask option.
24~27 16~19	40~42 1 32~35	P30~P33 P40~P43	Parallel data input	I	4-bit parallel data input ports. A pull up resistor can be specified with a mask option
36 2~5	10 18~21	P60 P70~P73	Parallel data output	O	4-bit parallel data outputs 12 V N-channel open drain output. High impedance at reset time
12~15 28~31 9	28~31 2~5 25	P00~P03 P10~P13 PF0	Parallel data output	O	4-bitparallel data output ports. "H" level at reset time.

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