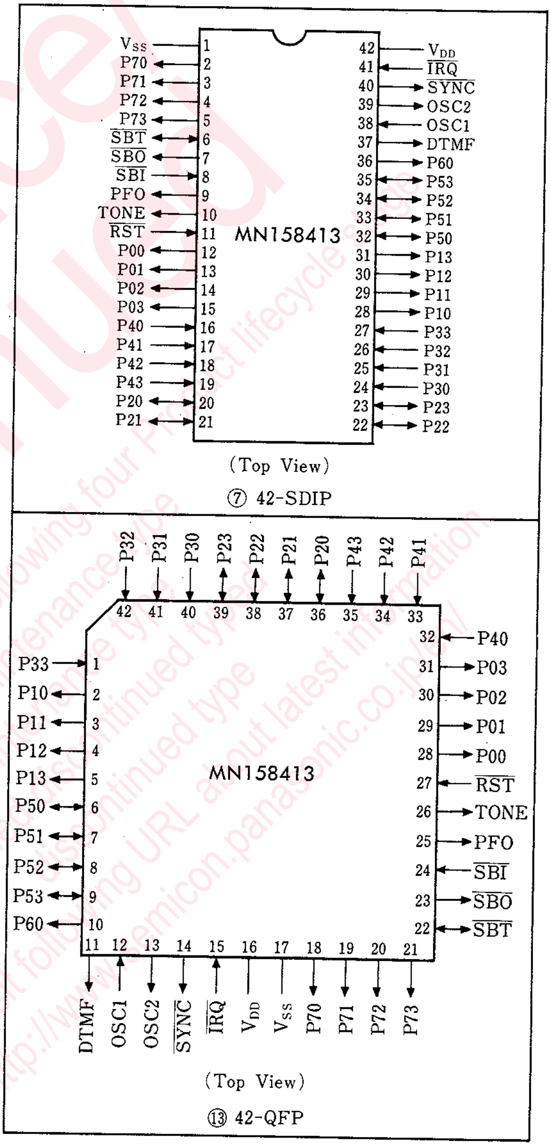
MN158413

■ Features

- ROM capacity: 4,096 × 8 bits
- RAM capacity: 256 × 4bits (direct access) + 512 × 4bits (access via port)
- Machine cycle: 2.23 μs (4.5 to 5.5 V)
  17.9 μs (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


Vss 1
P70 2
P71 3
P72 4
P73 5
SBT 6
SBO 7
SBI 8
PFO 9
TONE 10
RST 11
P00 12
P01 13
P02 14
P03 15
P40 16
P41 17
P42 18
P43 19
P20 20
P21 21
42 VDD
41 IRQ
40 SYNC
39 OSC2
38 OSC1
37 DTMF
36 P60
35 P53
34 P52
33 P51
32 P50
31 P13
30 P12
29 P11
28 P10
27 P33
26 P32
25 P31
24 P30
23 P23
22 P22
MN158413
(Top View)
⑦ 42-SDIP
P32 P31 P30 P23 P22 P21 P20 P43 P42 P41
42 41 40 39 38 37 36 35 34 33
P33 1
P10 2
P11 3
P12 4
P13 5
P50 6
P51 7
P52 8
P53 9
P60 10
32 P40
31 P03
30 P02
29 P01
28 P00
27 RST
26 TONE
25 PFO
24 SBI
23 SBO
22 SBT
MN158413
11 12 13 14 15 16 17 18 19 20 21
DTMF OSC1 OSC2 SYNC IRQ VDD Vss P70 P71 P72 P73
(Top View)
⑬ 42-QFP

■ Pin Functions

Pin No. 42-SDIP	Pin No. 42-QFP	Symbol	Pin Name	I/O	Description
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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