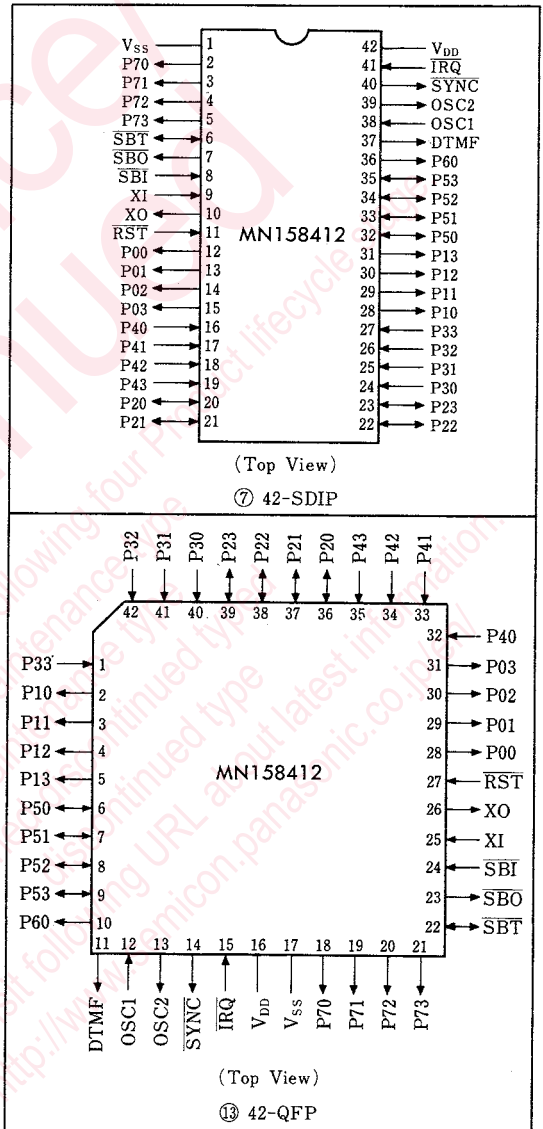


MN158412

■ Features

- ROM capacity: 4,096 × 8 bits
- RAM capacity: 256 × 4 bits + 1,024 × 4 bits
(direct access)(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
- Clock selector circuit incorporated:
Programmable selection of system clocks enabled. Clock sources are OSC1, OSC2 or XI, XO.
- 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
8 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
- Piggyback: EP158412

■ 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 oscillator or crystal oscillator. A feedback resistor is incorporated between OSC/and OSC2.
9 10	25 26	XI XO	Clock input Clock output	I O	Even counter clock. source terminals to connect a crystal oscillator. A feedback resistor is incorporated between XI and XO. They serve as an operating clock source when XI/XO is specified by clock selection.
11	27	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	SYNC	Sync.signal out- put	O	An internal timing signal is outputted every machine cycle.
41	15	IRQ	External inter- rupt	I	External interrupt terminal which receives an interrupt at negative edge. A pull-up resistor can be specified with a mask option.
6	22	SBT	Serial interface clock output	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	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	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 ter- minal	O	It outputs a DTMF signal.
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 out- put	O	4-bit parallel data output ports. 12 V N-channel open drain output. High impedance at reset time.
12~15 28~31	28~31 2~5	P00~P03 P10~P13	Parallel data out- put	O	4-bit parallel data output ports. "H" level at reset time.

Request for your special attention and precautions in using the technical information and semiconductors described in this book

- (1) If any of the products or technical information described in this book is to be exported or provided to non-residents, the laws and regulations of the exporting country, especially, those with regard to security export control, must be observed.
- (2) The technical information described in this book is intended only to show the main characteristics and application circuit examples of the products. No license is granted in and to any intellectual property right or other right owned by Panasonic Corporation or any other company. Therefore, no responsibility is assumed by our company as to the infringement upon any such right owned by any other company which may arise as a result of the use of technical information described in this book.
- (3) The products described in this book are intended to be used for standard applications or general electronic equipment (such as office equipment, communications equipment, measuring instruments and household appliances).
Consult our sales staff in advance for information on the following applications:
 - Special applications (such as for airplanes, aerospace, automobiles, traffic control equipment, combustion equipment, life support systems and safety devices) in which exceptional quality and reliability are required, or if the failure or malfunction of the products may directly jeopardize life or harm the human body.
 - Any applications other than the standard applications intended.
- (4) The products and product specifications described in this book are subject to change without notice for modification and/or improvement. At the final stage of your design, purchasing, or use of the products, therefore, ask for the most up-to-date Product Standards in advance to make sure that the latest specifications satisfy your requirements.
- (5) When designing your equipment, comply with the range of absolute maximum rating and the guaranteed operating conditions (operating power supply voltage and operating environment etc.). Especially, please be careful not to exceed the range of absolute maximum rating on the transient state, such as power-on, power-off and mode-switching. Otherwise, we will not be liable for any defect which may arise later in your equipment.
 - Even when the products are used within the guaranteed values, take into the consideration of incidence of break down and failure mode, possible to occur to semiconductor products. Measures on the systems such as redundant design, arresting the spread of fire or preventing glitch are recommended in order to prevent physical injury, fire, social damages, for example, by using the products.
- (6) Comply with the instructions for use in order to prevent breakdown and characteristics change due to external factors (ESD, EOS, thermal stress and mechanical stress) at the time of handling, mounting or at customer's process. When using products for which damp-proof packing is required, satisfy the conditions, such as shelf life and the elapsed time since first opening the packages.
- (7) This book may be not reprinted or reproduced whether wholly or partially, without the prior written permission of our company.