Notification about the transfer of the semiconductor business

The semiconductor business of Panasonic Corporation was transferred on September 1, 2020 to Nuvoton Technology Corporation (hereinafter referred to as "Nuvoton"). Accordingly, Panasonic Semiconductor Solutions Co., Ltd. became under the umbrella of the Nuvoton Group, with the new name of Nuvoton Technology Corporation Japan (hereinafter referred to as "NTCJ").

In accordance with this transfer, semiconductor products will be handled as NTCJ-made products after September 1, 2020. However, such products will be continuously sold through Panasonic Corporation.

Publisher of this Document is NTCJ.
If you would find description “Panasonic” or “Panasonic semiconductor solutions”, please replace it with NTCJ.

※ Except below description page
“Request for your special attention and precautions in using the technical information and semiconductors described in this book”

Nuvoton Technology Corporation Japan

❑ MN103SG5 Series

Type	MN103SFG5K
Internal ROM type	FLASH
ROM (byte)	256K
RAM (byte)	12K
Package (Lead-free)	LQFP128-P-1818C
Minimum Instruction Execution Time	16.7 ns (4.5 V to 5.5 V)

■ Interrupts

16 external interrupts
65 internal interrupts: Watchdog timer. Timer. Serial I/F. PWM. A/D conversion finish. System error

■ Timer Counter

8-bit timer × 16
Timer 0 to 15 .....Interval timer. Event count. Cascading connectable
16-bit timer × 8
Timer 17, 19, 24 ....Interval timer. Event count. PWM output. Double buffer
Timer 18, 23 .....Interval timer. Event count. PWM output (6 pins simultaneous output are available). Double buffer
Timer 20 to 22 .....Interval timer. Event count. PWM output. Double buffer. Start synchronized with 3-phase PWM are available

■ Serial interface

Multi-master I^2C/Synchronous interface selective × 1
Serial 0.....1-bit to 8-bit transmission (synchronous). 2 and 3 channel type selectable (synchronous)
UART (full duplex) /Synchronous interfaces selective × 3
Serial 1.....1-bit to 8-bit transmission (synchronous). 2 and 3 channel type selectable (synchronous)
Serial 2, 3.....7-bit, 8-bit transmission

■ I/O Pins

I/O 112 : Common use × 110

■ A/D converter

10-bit × 3 unit. 28 channels
Minimum conversion time: 1.0 µs
Simultaneous conversion of 3 series are available
Conversion start synchronized with 3-phase PWM or timer 20, 21, 22 are available

■ Motor Control PWM

16-bit 3-phase PWM × 3
Triangular waveform or jigsaw waveform. Dead time setup. Double buffer. Output polar switching is available. PWM output pin protect function

■ Arithmetic unit for inverter system

This series implement the instructions as follows.
High-speed multiplication. High-speed division. Square-root. Absolute value. Trigonometric functions. 2/3 transform. 3/2 transform. Low-pass filter. PI control

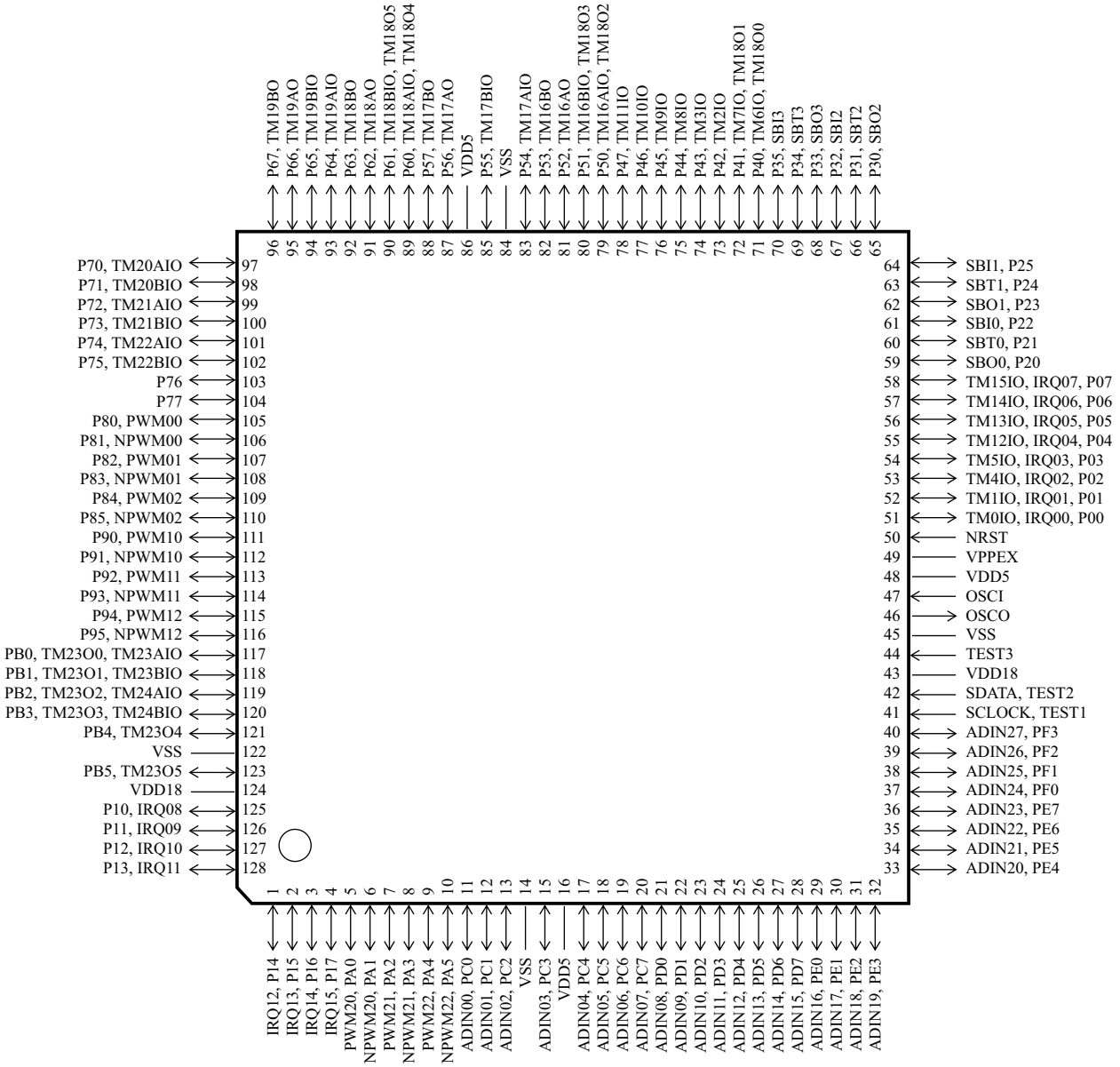
■ Electrical Charactreistics (A/D converter characteristics)

Parameter	Symbol	Condition	Limit			Unit
			min	typ	max	
Non-linear error		10-bit			±3	LSB
A/D conversion time	TAD		1.0			µs
Analog input voltage	VIA		VSS		VDD	V

Ta = 25 °C. VDD = 5.0 V. VSS = 0 V

■ Pin Assignment

LQFP128-P-1818C



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

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(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, Nuvoton Technology Corporation Japan 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 de-scribed in this book.

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Please consult with our sales staff in advance for information on the following applications, moreover please exchange documents separately on terms of use etc.: Special applications (such as for in-vehicle equipment, airplanes, aerospace, automotive equipment, traffic signaling equipment, combustion equipment, medical equipment 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.
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