

TECHNICAL NOTE

This article was originally published in 1999.

INTRODUCTION

Micron's even-sectored 16Mb Flash memory device, MT28F016S5, is organized as 32 separately erasable 64KB blocks. It is similar to Intel's 28F016S5, 28F016SA, and 28F008SA devices and can be used in applications that specify these Intel part numbers. However, there are some differences between the Micron and Intel parts that should be noted before identifying Micron as a replacement for these Intel devices.

MICRON MT28F016S5 AND INTEL 28F016S5

Micron's MT28F016S5 and Intel's 28F016S5 have the same pinout and both come in a 40-pin TSOP.

The difference between the command sets of the two devices is:

- Micron's MT28F016S5 supports the 28F016S5 basic command set but does not support extended operations such as set block lock-bit, set master lock-bit, and clear block lock-bits commands.

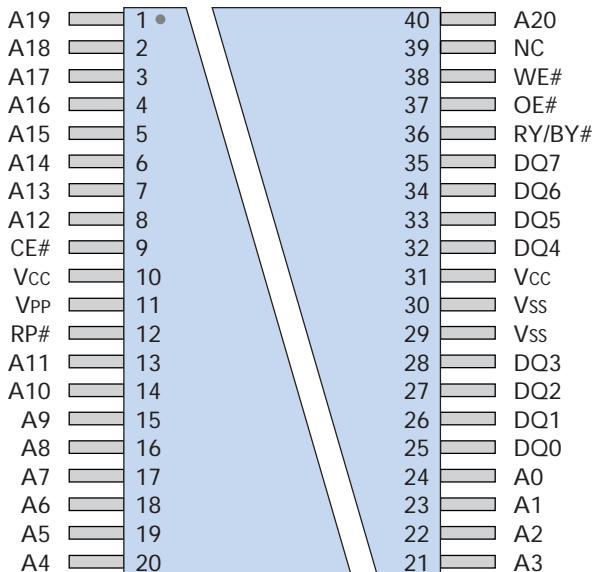


Figure 1
Micron and Intel 28F016S5 Pinout

MICRON®/INTEL® EVEN-SECTORED FLASH COMPATIBILITY

- Micron's MT28F016S5 only supports the ERASE SUSPEND command; it does not support the WRITE command when in the erase suspend mode or the WRITE SUSPEND command.

Micron's MT28F016S5 is designed primarily for 5V V_{PP} operation. For backward compatibility with SmartVoltage technology, 12V V_{PP} is supported for a maximum of 100 cycles and may be connected for up to 100 cumulative hours.

Micron's MT28F016S5 and Intel's 28F016S5 manufacturer ID = 89h. Micron's device ID = A0h; Intel's device ID = AAh.

MICRON MT28F016S5 AND INTEL 28F016SA

Micron's MT28F016S5 comes in a 40-pin TSOP; Intel's 28F016SA comes in a 56-pin TSOP package. The Micron device can be used in 16Mb even-sectored applications that specify the Intel device, but a board redesign is required.

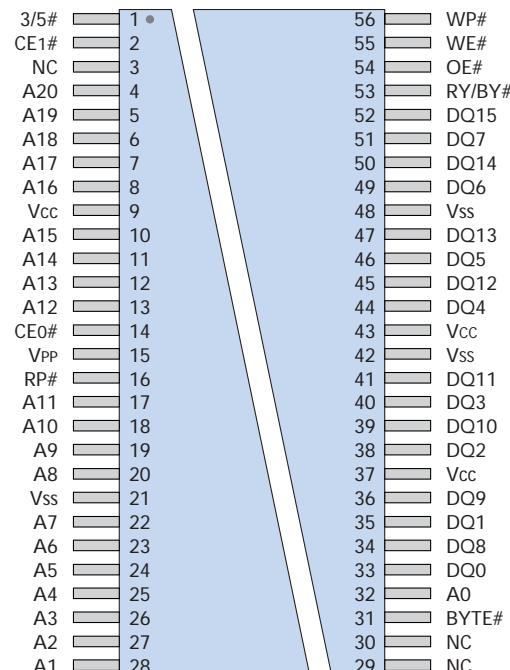


Figure 2
Intel 28F016SA Pinout

The difference between the command sets is:

- Micron's MT28F016S5 supports the 28F008SA basic command subset but does not support the "Performance Enhancement Commands," which include the extended status register commands, page buffer commands, lock commands, extended ready/busy commands, two byte program, upload, erase unlocked, sleep and abort.

The Intel device supports 3V or 5V operation by changing the state of pin 1, the "3/5#" pin. Micron's MT28F016S5 is an 8-bit device; Intel's 28F016SA can be operated as a x8 or x16 device by changing the state of the BYTE# pin.

For both the Micron and Intel devices, the manufacturer ID = 89h and the device ID = A0h.

MICRON MT28F016S5 AND INTEL 28F008SA

Both devices come in a 40-pin TSOP package.

Micron's MT28F016S5 can be considered a pin-for-pin, drop-in replacement for Intel's 28F008SA with the following caveat: the MT28F016S5 is a 16Mb device, and the 28F008SA is an 8Mb device. Pin 40 on the MT28F016S5 is the additional address line required for 16Mb operation; pin 40 on the 28F008SA is a NC.

Both Micron's MT28F016S5 and the 28F008SA operate at 5V Vcc. Both can be programmed and erased with 12V Vpp, although Micron's MT28F016S5 is designed primarily for 5V Vpp. (The Intel device is 12V only.) This allows the Vcc and Vpp pins to use a common supply voltage. For backward compatibility with SmartVoltage technology, 12V Vpp is supported for a maximum of 100 cycles and may be connected for up to 100 cumulative hours.

Micron's MT28F016S5 and Intel's 28F008SA manufacturer ID = 89h. Micron's device ID = A0h, and Intel's device ID = A2h.

SUMMARY

Micron's MT28F016S5 device is Intel-compatible, with the exceptions outlined above. In all cases, Micron recommends tying Vpp to 5V rather than 12V. For a complete description of our 16Mb even-sectored Flash device, please see the latest data sheet, which is available on our Web site at www.micron.com/flash.

A19	1	40	NC
A18	2	39	NC
A17	3	38	WE#
A16	4	37	OE#
A15	5	36	RY/BY#
A14	6	35	DQ7
A13	7	34	DQ6
A12	8	33	DQ5
CE#	9	32	DQ4
VCC	10	31	Vcc
VPP	11	30	Vss
RP#	12	29	Vss
A11	13	28	DQ3
A10	14	27	DQ2
A9	15	26	DQ1
A8	16	25	DQ0
A7	17	24	A0
A6	18	23	A1
A5	19	22	A2
A4	20	21	A3

Figure 3
Intel 28F008SA Pinout



8000 S. Federal Way, P.O. Box 6, Boise, ID 83707-0006, Tel: 208-368-3900

E-mail: prodmktg@micron.com, Internet: <http://www.micron.com>, Customer Comment Line: 800-932-4992

Micron is a registered trademark of Micron Technology, Inc. Intel is a registered trademark of Intel Corporation.