Ultra-Small Chip Size Package-Mounted Flash Memory for Wireless Communications Modules
MBM29LV400TC/BC in SuperCSP™

This product is a highly effective flash memory
for systems requiring considerably limited packaging sizes,
such as Bluetooth™ modules.

Product Description

FUJITSU has successfully commercialized a 4M-bit flash memory mounted in SuperCSP(Super Chip Size Package) proprietary package technology. This new memory is designed for use in wireless communications modules and ultra-small handheld equipment, including typical Bluetooth devices.

Mobile information terminals have been making remarkable advances, and a growing number of users own two or more cellular phones. These mobile terminals feature very diversified capabilities, providing not only telephone functions but also Internet website browsing and downloading of Java applications.

Data transmission between mobile terminals and PCs or other home electronics appliances requires cables, but this cumbersome requirement can be eliminated by the alternative wireless communications technology typified by Bluetooth. The new wireless communications modules incorporate not only wireless communications ASIC and RF devices, but also ROM for storage of program codes. Many of these devices must be packaged in compact-sized modules, requiring mounted devices of increasingly smaller size.

To meet these needs, FUJITSU has applied the proprietary compact package technology SuperCSP to the 4M-bit flash memories to offer a new memory for wireless communications modules. Because the mounting area is as small as a bare chip, the new product saves space, allows high-speed packaging using the surface mounting technology (SMT), and results in more reliable mounting than bare chip. In addition, the packaged flash memory is of boot block-type operated on a single power supply of 3V, and is thus perfectly suited for the holding of program codes.

Photo 1 External View
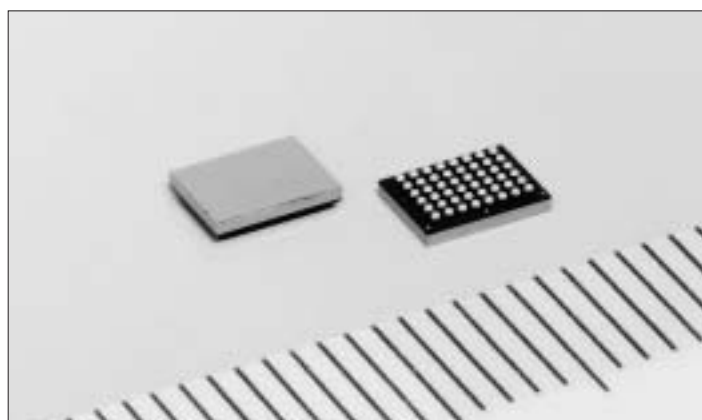
Product Features

■ Package
Fabrication process

Fig.1 shows the product cross section, and **Fig.2** provides a flowchart of the assembly process. During its manufacture, the flash memory moves through all the fabrication processes in the form of a wafer.

① When the wafer has passed all applicable tests, its Cu leads are redistributed from the AL pads on the LSI chip to the desired position.

② At the relocated positions, metal contact posts (indicated by ① in Fig. 2) are formed.

③ Then encapsulating resin is poured and solder balls are mounted (② and ③ in Fig. 2).

④ Finally, the wafer is cut into dice or chips (called dicing) and the assembly is complete.

Package profile

Fig.3 shows the outline dimensions of the package. As can be seen from the figure, this product features a compact, low-profile design.

■ 4M-bit flash memory MBM29LV400TC/BC
Single 3V power supply

This memory allows reading/writing/erasing with a single 3V power supply. This obviates the need for a 12V power supply, thereby allowing system configuration without any voltage conversion devices or other additional components.

Boot block-type sector

The boot block-type sector is composed of 16K-byte×1, 8K-byte×2, 32K-byte×1 and 64K-byte×7, allowing it to hold parameters, start-up programs, BIOS, other smaller program codes, and programs rewritten in even smaller

units. This product is available in two types—a top boot block allocated in higher addresses and a bottom boot block allocated in lower addresses.
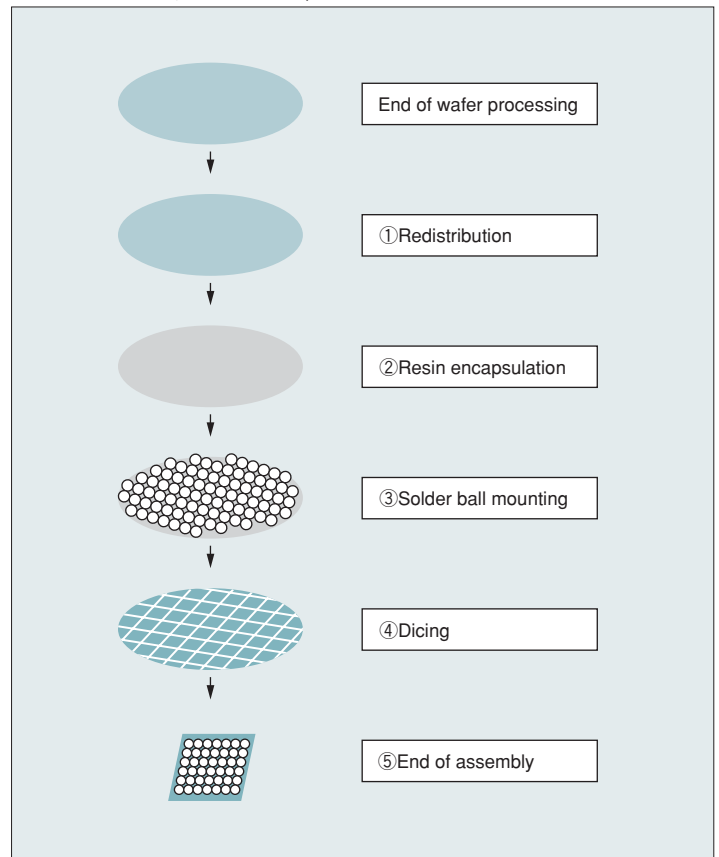
Automatic sleep mode

This function helps minimize the standby current when the flash memory is not accessed. It is activated when no address change occurs for 150ns or more during the read-out cycle. In this case, current consumption is $1\mu A$ (typical) at the CMOS level. This function is especially well suited for mobile terminals and other energy-saving applications.
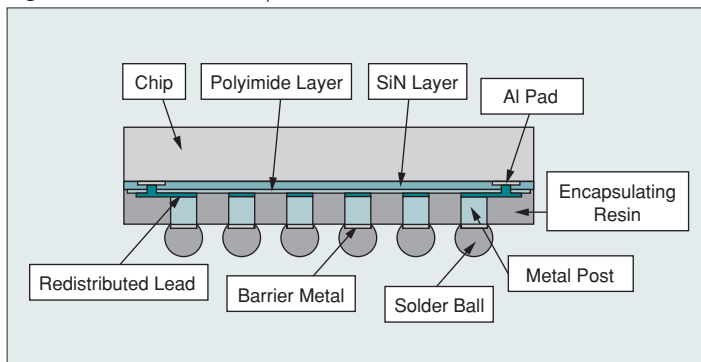
×8bit / ×16bit configuration

The /BYTE pin selects either byte mode (8bit) or word mode (16bit). When the /BYTE pin is set to H, devices operate in the word mode, using the DQ15 through DQ0 for reading/writing of data. When the /BYTE pin is set to L, devices operate in the byte mode. In this mode, DQ15/A-1 becomes the lowest address bit, while DQ8 through DQ14 are set at high impedances.

Fig.4 shows the pin assignments.

Figure 2 Assembly Process of SuperCSP

End of wafer processing

①Redistribution

②Resin encapsulation

③Solder ball mounting

④Dicing

⑤End of assembly

Figure 1 Cross Section of SuperCSP

Chip
Polyimide Layer
SiN Layer
Al Pad
Encapsulating Resin
Redistributed Lead
Barrier Metal
Solder Ball
Metal Post

Applications

Based on the above features, this product will be highly effective for the applications listed below.

- Equipment restricted strictly to its packaging area, such as Bluetooth wireless communications modules, digital cameras, PDAs and other mobile information terminals
- Systems required to consistently update program contents

NOTES

∗ SuperCSP is a trademark of FUJITSU LIMITED.

∗ Bluetooth is a registered trademark of Bluetooth SIG, Inc., USA and licensed to FUJITSU LIMITED.
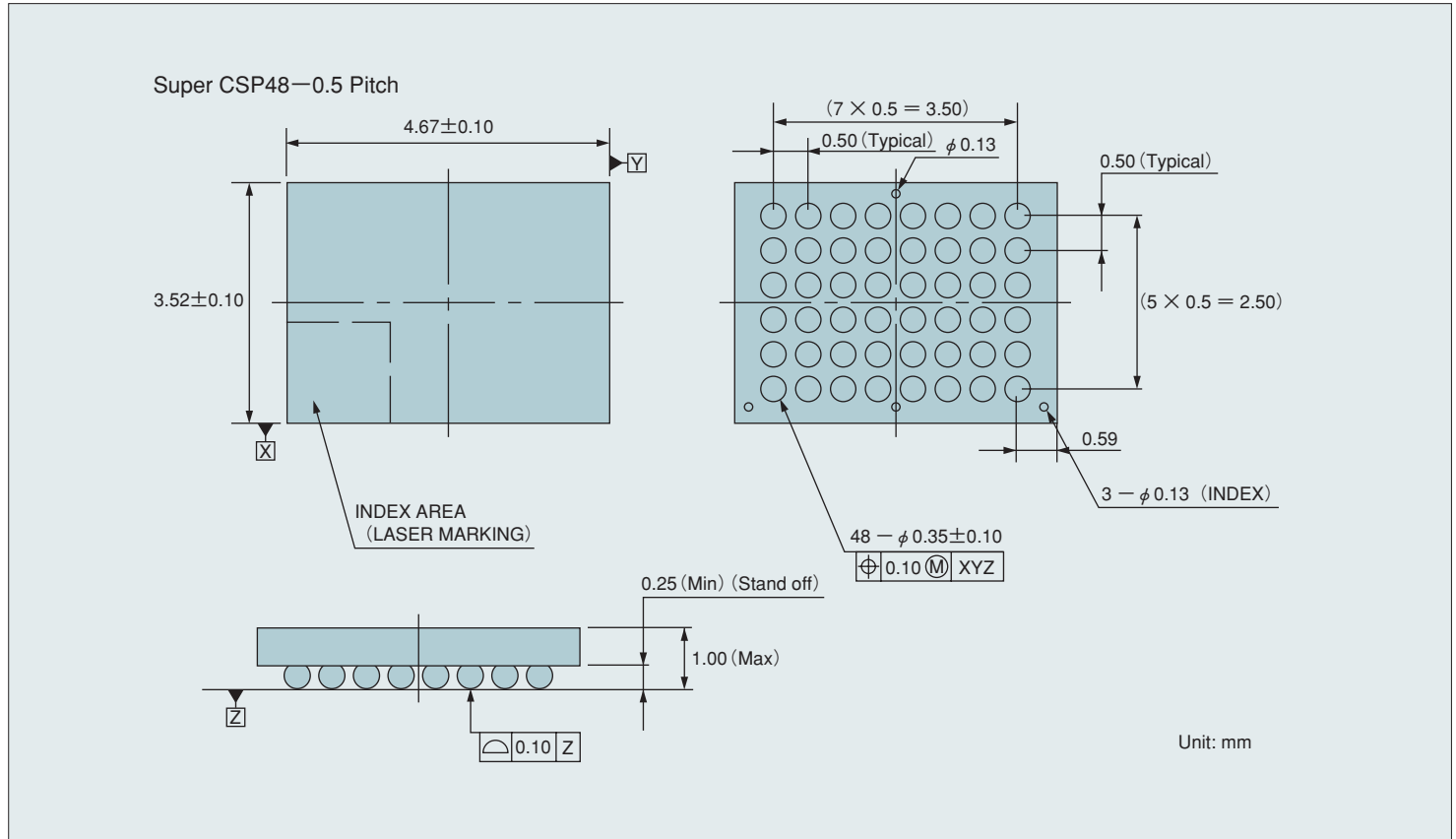
Figure 3 Package Dimensions

Figure 4 Pin Assignments

Top View

	A	B	C	D	E	F	G	H
6	A3	A4	A2	A1	A0	$\overline{CE}$	$\overline{OE}$	Vss
5	A7	A17	A6	A5	DQ0	DQ8	DQ9	DQ1
4	R/B	N.C.	N.C.	N.C.	DQ2	DQ10	DQ11	DQ3
3	$\overline{WE}$	$\overline{RST}$	N.C.	N.C.	DQ5	DQ12	Vcc	DQ4
2	A9	A8	A10	A11	DQ7	DQ14	DQ13	DQ6
1	A13	A12	A14	A15	A16	$\overline{BYT}$	DQ15/A-1	Vss

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