SEMI-CUSTOM DEVICE:

# Solderable Memory Module



## ELECTRONIC DESIGN AND DEVELOPMENT SERVICES

An elegant solution for industrial and medical applications providing a compact memory module with an electrical SD / MMC interface which is soldered directly onto a printed circuit board.

# For Industrial and Medical Systems

The Solderable Memory Module (SMM) is an alternative for SD cards for industrial and medical embedded systems. The module combines all the advantages of a SD/MMC card without the disadvantages (in particular the need for an additional card holder). Built with SLC NAND Flash and a Hyperstone Flash controller the module is about half the size of a conventional SD/MMC memory card, offers a controlled and transparent BOM and can be delivered with different memory capacities. It can even be supplied with customised software.

## Challenge

Flash based memory is normally preferred when storing large volumes of data in embedded systems. Due to the simple interface and the small dimensions SD/MMC memory cards are often preferred (if there is enough space for the card holder).

When space is limited, or where there is a poor electrical contact due to the environmental conditions (vibration, corrosion etc.) NAND Flash components can be connected directly to the processor. In this case, special component-specific FTL software (Flash Transfer Layer) is required to ensure reliable operation. This is difficult due to the complexity of the FTL software especially on smaller processors.

The SMM has an SD/MMC memory card compatible memory controller providing FTL functionality and is the ideal choice for demanding industrial or medical embedded systems.

## Solution

With a size of 21.4 x 20 mm$^2$ and a pitch of only 2 mm, the SMM is significantly smaller than a standard SD / MMC card, has less demands on board design and can be used wherever space considerations are critical.

A controlled bill of material and close co-operation with the manufacturer ensures that hardware and firmware changes to the NAND Flash controller are always visible to the customer, i.e. problems resulting from hardware and firmware changes to the NAND Flash controller are now a thing of the past.

With it's small form factor the SMM is the ideal choice for embedded systems in extremely demanding applications and environments.

## Benefits

- Small form factor
- Automatic pick and place
- Simple to solder and control (visible solder joints)
- Vibration resistant (soldered)
- Mouldable for harsh environments
- SLC memory ensures high reliability and long life time
- Controlled and transparent BOM
- Standard software (customised functions such as password protection and emergency deletion can be provided on request)

## Techical Data

- Capacity: 1 GByte (other on request)
- Interface: 1 or 4-bit SD/MMC, SPI
- Software Compatibility
    - Standard SD/MMC memory card

- FLASH memory: Micron SLC NAND
- FLASH controller: Hyperstone S6

- Writing speed: up to 21 MByte/s
- Reading speed: up to 24 Mbyte/s
- Temperature: Extended (-25°C - +85°C)
- Operating voltage: 2.7 - 3.6 V
- Power input:
    - Read/Write typ. 35 mA/max. 50 mA
    - Sleep - 0.3 mA (max)

- Dimensions: 21.4 x 20 x 2.1 mm$^3$ (smaller versions possible)
- Package: Open SMD module with 2mm pitch
- Packaging: Tubes (tape & reel on request)