

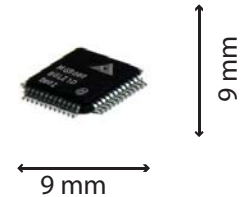
## Highlights

- Drive Activity, Fail/Rebuild and Locate LEDs for each drive
- Directly drives 2 LEDs for up to 8 slots
- Up to 4 MG9083 controllers can be cascaded to support up to 32 drives
- Multiplexed SGPIO with Drive Ready LED signal, to show activity in non-RAID environments
- Built in Regulator for 5V or 3.3V operation. (Supply range 2.7-5.5V)
- Small TQFP-48 Package (9mm X 9mm)
- Internal Temperature Sensor
- Internal Oscillator
- BMC IPMI through SMBus
- SES-2 support through SMBus
- Supports SGPIO Specification SFF-8485
- Supports IBPI Specification SFF-8489
- Support for SES-2 (Revision 15) using companion chip MG9083C
- Global Activity LED & Global Fail LED
- USB 2.0 compliant support for Status, Monitoring, Diagnostic, and FW update
- Firmware Upgradable or Configurable through USB or IPMI
- Diagnostics and FW update tools available for Win32, Win64, Linux, EFI and DOS.



Ver. 1.1

The MegaRAC<sup>®</sup> MG9083 is a low-cost and ultra-small SoC solution for use on SAS and SATA Backplanes with up to eight drives per backplane. This single chip solution doesn't need a plethora of components that drive backplane costs upward, such as: external crystal, flash memory, Power-On Reset (POR) chip, temperature sensor, regulator, EEPROM, LED Driver, FRU, and transceivers.



The MG9083 has a small footprint: measuring only 9x9 millimeters, it saves valuable real estate on the backplane. The chip supports SGPIO and IPMI over SMBUS, with optional support for SES2 over SMBUS.

The MG9083 provides highly integrated functionality that reduces the overall costs of your backplane solution. The chip, compatible with SAS/SATA Host Bus Adapters from all major storage vendors, supports two Serial GPIO ports for connection to the HBA, as well as optional SES-2 via SMBUS using the companion MG9083C.

The MG9083 can directly drive two LEDs for up to 8 slots or three LEDs for up to 6 slots; it determines the number of drives either by sensing the connections on the Mx-bus.

A very important advantage for ODMs is that up to four MG9083 controllers can be cascaded to support up to 32 drives. Thus, the MG9083 part can be deployed in a variety of system models, pocketing good savings on volumes.

The part ships ready to use; no firmware or programming is required.

AMI provides reference schematics for a total of sixteen MegaRAC MG9083 configurations, including:

- Dual combined SGPIO with 8 Activity LEDs and 8 Status LEDs directly connected
- Dual combined SGPIO with 8 Activity LEDs and 8 Status LEDs directly connected, with offset
- Dual combined SGPIO with 8 Activity LEDs and 8 Status LEDs directly connected, with Group ID support
- Dual combined SGPIO with 8 Activity LEDs and 8 Status LEDs directly connected, with Group ID bit assignment and I2C address
- Dual SGPIO with 8 Activity and 8 Status LEDs directly connected; each SGPIO channel manages 4 drives, with channel 1 driving up to 8 LEDs when no activity is detected on channel 2.
- Same as previous, with different I2C address Group ID bit assignment
- Single SGPIO with 6 Activity and 6 Status LEDs directly connected
- Dual SGPIO with 6 Activity, 6 Status and 6 Fail LEDs driven directly manage 4 drives on channel 1 and 2 drives on channel 2
- Dual combined SGPIO with 6 Activity, 6 Status and 6 Fail LEDs driven directly; in this case, all drives converge on one SGPIO channel. Data from two SGPIO initiators is driven to the same LED set.



# MegaRAC® MG9083

## Features

### Key Features

- SAS/SATA Drive Support
- One dedicated SMBus (I2C) connection
- Small TQFP-48 Package (9mm X 9mm)
- Internal Temperature Sensor
- Internal Power-on Reset
- No Level Shifter needed
- Internal Oscillator and RTC
- Configurable from 1 to 8 drives - 4 chips can be cascaded on same SGPIO to support 32 drives, for a total of 64 managed LEDs
- Can drive 18 LEDs directly in 6 drive designs
- Voltage Supply Input range (2.5V -5.25V)
- Drive Activity, Locate and Fail LED
- SES-2 support through SMBUS
- IBPI support
- PIN configurable for 16 LED configurations

### Enclosure Management Protocols

SFF-8485 Specification for Serial GPIO (SGPIO) Bus Revision 0.7

SFF-8489 Specification for Serial GPIO IBPI (International Blinking Pattern Interpretation) Rev 0.1

### SGPIO

Two SGPIO ports communicate enclosure management information, LED management and drive presence

### SES-2

One SES-2 port communicates enclosure management information, LED management and drive presence using the companion chip MG9083C

### IPMI

One SMBUS interface supports the IPMI protocol for interfacing with BMC.

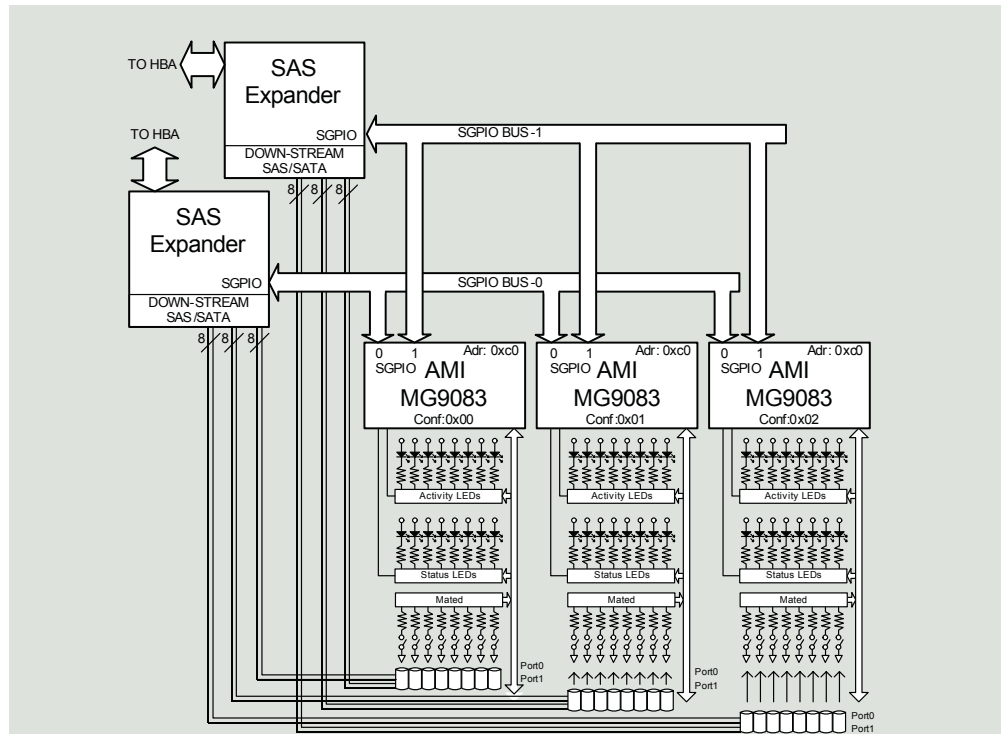
### Development Tools

#### Hardware Tools

- Series 950 USB upgrade tool with 4-pin header to in-circuit upgrade
- Comes with Windows based upgrade utility

#### Software Tools

- Upgrade tools (FlashMG) for DOS, Windows (x32 and x64 version), Linux and EE2
- FlashMG applications boot from a flash drive and upgrade firmware through the system BMC



### SMALL FOOTPRINT FOR EXCEPTIONAL SCALABILITY

The diagram above shows sets of configurations with multiple backplanes cascaded on the same SGPIO-bus. These configurations also support multi-initiator configurations, which allow two initiators to access the same set of drives through both SAS-ports.

WITH MEGA RAC MG9083 THERE'S NO NEED ON THE BACKPLANE FOR ... A LOT OF STUFF



CRYSTAL PoR TEMP SENSOR EEPROM REGULATOR FLASH LEVEL SHIFTER FRU LED DRIVER

### Reference Designs

Contact AMI to receive a reference design in PDF or OrCad schematic format. Please provide your schematic for verification before finalizing your layout

### Evaluation Board

Series 964 eight drive backplane with dual SGPIO channels



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