

OZ992

Intelligent Manager Smart ACPI GPIO/SCI

FEATURES

- SMBus, version 1.0, Compliance
- Master mode function to interface with ACPI compliant embedded controller
- Support Pentium and x86-based designs
- Supported by default embedded controller firmware
- Accept up to 16 SCI inputs
- Programmable level or edge (falling and rising edge) triggered SCI inputs
- 20 possible edge-sensitive programmable General Purpose Inputs/Outputs per device
- Programmable addresses for cascading OZ992s
- 32KHz operating frequency
- Supports 3.3v or 5v supply
- LOW-power hardware-driven speaker alarm output
- Software programming kit available
- SMBALERT# and SMIEVENT outputs
- 8 programmable interrupt inputs for SMI event or SMBALERT#
- 8 Auto LED Flash(ALF) programmable outputs with 10% or 50% duty cycles

ORDERING INFORMATION

OZ992S - 28 pin SSOP

GENERAL DESCRIPTION

O₂Micro's OZ992 Smart ACPI/SCI (System Control Interrupt) General Purpose Input/Output unit allows OEMs to transform their legacy systems to ACPI compliant systems by supporting up to 16 extra SCI inputs. Regular core logic chipsets, such as the Intel 430TX/BX and ACPI compliant embedded controllers have limited allowance for the GPIO or SCI input signals for the system. The OZ992 provides a bridge between the chipsets and the rest of the system to allow system designers a cost-effective way to improvise for such a deficiency.

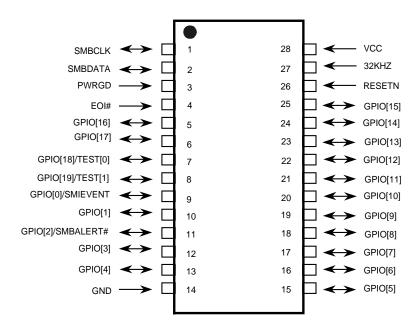
OZ992 provides up to 20 GPIO signals in regular SMB slave mode. In addition, the OZ992 allows up to 16 System Control Interrupt (SCI) input transitions to be written to the system's embedded controller in master mode. The OZ992 provides the perfect solution for leading notebook vendors to stay ahead of the competition.

The OZ992 is an SMBus 1.0 compliant ACPI GPIO with 16 Programmable General Purpose I/Os pins flexible for a variety of functions such as programmable inputs/outputs, SMB/SMI interrupt service, power-saving, modularized hardware ID, and Auto LED Flash (ALF) status display. OZ992's other features include hardware-driven speaker alarm output.

As a Pentium and x86-based system compatible device, the OZ992 Smart ACPI GPIO is a highly cost-effective and practical solution for today's notebook and palmtop computers, pen-based data systems, personal digital assistants, and portable data-collection terminals.



PIN DIAGRAM



PIN DESCRIPTION

| Pin No. | Type | Input | Drive | | Definition | | | |
|--|--|--|---|--|--|--|--|--|
| 1 | I | TTL | = | | SMBus Clock Input | | | |
| SMBus Clock Input for SMBus protocol communication. | | | | | | | | |
| 2 | I/O | TTL | 12mA | | SMBus Data Input/Output | | | |
| SMBus Da | ta Input/Outpu | it for SMBus prof | tocol communic | ation. | n. | | | |
| 3 | I | TTL | - | | Host System Power Good | | | |
| | | | | | | | | |
| system's p | ower is stable | | Il tri-state all the | e output p | | | | |
| 4 | I | TTL | = | | End of Interrupt | | | |
| | | | OZ992 when t | he activa | ted SCI has been serviced. This pin is to be | | | |
| [6:5] | I/O | TTL | 4mA | | General Purpose I/Os | | | |
| Fully progra | ammable GPI | Os that can be ι | used for a varie | ty of dedi | cated or specific functions. Pins GPIO[17:16] | | | |
| | | | | | | | | |
| | 9:16] Config.1 | &2 Registers for | more details a | ind GPIO | Config. Tables (section 5.0) for input/output | | | |
| | 1 | 1 | 1 | | | | | |
| [8:7] | I/O | TTL | 4mA | | General Purpose I/Os | | | |
| E. 0 | | 210- 111 | h | | La de disease de la companya del companya de la companya del companya de la compa | | | |
| | | | | | | | | |
| - | | | , , | _ | | | | |
| | | | roj Corilig. I&Z | Register | s for more details and GPIO Config. Tables | | | |
| ` | , , | • | should be conn | acted to | GPIO(10:18)/TEST(1:0) to ensure the regular | | | |
| | | | | | | | | |
| OZ992 operation. Alternative uses for GPIO[19:18] are as TEST[1:0], which provide 2 proprietary OZ992 test | | | | | | | | |
| | 1 SMBus Clo 2 SMBus Da 3 This pin inc system's pi 4 The embed used with E [6:5] Fully progra default as i to GPIO[19 selections. [8:7] Fully prog GPIO[19:18 GPO[19:18 (section 5.6 During regular | 1 I SMBus Clock Input for S 2 I/O SMBus Data Input/Outpu 3 I This pin indicates that the system's power is stable 4 I The embedded controlle used with EC master mo [6:5] I/O Fully programmable GPI default as inputs. They at to GPIO[19:16] Config. 1 (selections. [8:7] I/O Fully programmable GFI GPIO[19:18]/TEST[1:0] (GPO[19:18]/TEST[1:0] (GPO[19:18]) outputs. Re (section 5.0) for input/out During regular usage, pu OZ992 operation. Alternal | 1 I TTL SMBus Clock Input for SMBus protocol c 2 I/O TTL SMBus Data Input/Output for SMBus protocol c 3 I TTL This pin indicates that the host system's system's power is stable, this input pin wid 4 I TTL The embedded controller will signify the used with EC master mode only. [6:5] I/O TTL Fully programmable GPIOs that can be usefault as inputs. They are programmable to GPIO[19:16] Config.1&2 Registers for selections. [8:7] I/O TTL Fully programmable GPIOs that can GPIO[19:18]/TEST[1:0] default as inputs GPO[19:18]/TEST[1:0] default as inputs GPO[19:18] outputs. Refer to GPIO[19: (section 5.0) for input/output selections. During regular usage, pull-ups of 47KΩ: OZ992 operation. Alternative uses for GI | 1 I TTL - SMBus Clock Input for SMBus protocol communication. 2 I/O TTL 12mA SMBus Data Input/Output for SMBus protocol communication. 3 I TTL - This pin indicates that the host system's power, includi system's power is stable, this input pin will tri-state all the 4 I TTL - The embedded controller will signify the OZ992 when the used with EC master mode only. [6:5] I/O TTL 4mA Fully programmable GPIOs that can be used for a varied default as inputs. They are programmable to function as to GPIO[19:16] Config.1&2 Registers for more details a selections. [8:7] I/O TTL 4mA Fully programmable GPIOs that can be used for GPIO[19:18]/TEST[1:0] default as inputs. They are programmable GPIOs that can be used for GPIO[19:18] outputs. Refer to GPIO[19:16] Config.1&2 (section 5.0) for input/output selections. During regular usage, pull-ups of 47KΩ should be conno OZ992 operation. Alternative uses for GPIO[19:18] are | 1 I TTL - SMBus Clock Input for SMBus protocol communication. 2 I/O TTL 12mA SMBus Data Input/Output for SMBus protocol communication. 3 I TTL - This pin indicates that the host system's power, including the C system's power is stable, this input pin will tri-state all the output 4 I TTL - The embedded controller will signify the OZ992 when the activated with EC master mode only. [6:5] I/O TTL 4mA Fully programmable GPIOs that can be used for a variety of dedicated as inputs. They are programmable to function as either G to GPIO[19:16] Config.1&2 Registers for more details and GPIC selections. [8:7] I/O TTL 4mA Fully programmable GPIOs that can be used for a variety GPIO[19:18]/TEST[1:0] default as inputs. They are programmal GPO[19:18] outputs. Refer to GPIO[19:16] Config.1&2 Register (section 5.0) for input/output selections. During regular usage, pull-ups of 47KΩ should be connected to OZ992 operation. Alternative uses for GPIO[19:18] are as TEST | | | |

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| Name | Pin No. | Туре | Input | Drive | | Definition |
|-----------------------|---|----------------------------------|--------------------------------|------------------------------------|--------------------------|---|
| GPIO[0]/ SMIEVENT | 9 | I/O | TTL | 4mA | | General Purpose I/O / SMIEVENT |
| | SMIEVENT input, GPO[| output as an [0]output, ALF | alternate functi | ion. GPIO[0] d D[0] input. Refe | efaults. It er to GPI | dicated or specific functions. Pin GPIO[0] has is also programmable to function as GPI[0] O Config.1&2 Registers for more details and |
| GPIO[1] | 10 | I/O | TTL | 4mA | | General Purpose I/O |
| | Fully programmable GPIO that can be used for a variety of dedicated or specific functions. GPIO[1] pin defaults as input. It is also programmable to function as GPI[1] input, GPO[1]output, ALF[1] output, or ID[1] input. Refer to GPIO Config.1&2 Registers for more details and GPIO Config. Tables (section 5.0) for input/output selections. | | | | | |
| GPIO[2]/ SMBALERT# | 11 | I/O | TTL | 4mA | | General Purpose I/O / SMBALERT# |
| | Fully programmable GPIO that can be used for a variety of dedicated or specific functions. Pin GPIO[2] defaults as input. This pin, when programmed as an alternate function, can generate the SMBALERT# interrupt. SMBALERT# is an interrupt service request signal to the SMBus Host which can be generated by all devices connected to the OZ992. Pin GPIO[2]/SMBALERT# is also programmable to function as either GPI[2] input, GPO[2] output, ALF[2] output, or ID[2] input. Refer to GPIO Config.1&2 Registers for more details and GPIO Config. Tables (section 5.0) for I/O selections. | | | | | |
| GPIO[7:3] | [17:15], [13:12] | I/O | TTL | 4mA | | General Purpose I/Os |
| | default as ir or ID[7:3] in | nputs. They ar | re programmab GPIO Config.1 | le to function a | is GPI[7:3 | dicated or specific functions. GPIO[7:3] pins inputs, GPO[7:3] outputs, ALF[7:3] outputs, details and GPIO Config. Tables (section 5.0) |
| GPIO[15:8] | [25:18] | I/O | TTL | 4mA | | General Purpose I/Os |
| | Fully programmable GPIOs that can be used for a variety of dedicated or specific functions. Pins GPIO[15:8] default as inputs. Pins GPIO[15:8] as inputs are programmable to generate SMI/SMB interrupts. They are also programmable to function as GPI[15:8] inputs, GPO[15:8] outputs. Refer to GPIO Config.1&2 Registers for more details and GPIO Config. Tables (section 5.0) for input/output selections. | | | | | |
| | 26 | 1 | TTL | - | | Reset |
| RESETN | | l l | – | | | |
| RESETN | OZ992 hard | | – | | l registers | s to their default values. This pin is connected |
| RESETN 32KHz | OZ992 hard | elay from the p | SETN(active L | | l registers | |
| | OZ992 hard to the RC de | elay from the p | SETN(active Lower supplied | | l registers | s to their default values. This pin is connected |
| 32KHz | OZ992 hard to the RC de 27 32KHz Cloc 14 | elay from the p l k Input. | SETN(active Lower supplied | | I registers | s to their default values. This pin is connected 32KHz Clock Input |

GPIO Pins Alternate Usage

| 19 | 16 15 | 8 7 | 0 |
|----|-------|-----------------|---|
| | | | |
| | | GPIO[19:0] | |
| | SMI | EVENT/SMBALERT# | |

SCI to Embedded Controller

DC CHARACTERISTICS

DC TABLE FOR VCC = $5.0V \pm 10\%$

| Symbol | Parameter | Min | Max | Units |
|-----------------|-------------------------------|-----|-----|-------|
| V _{CC} | Power Supply Voltage | 4.5 | 5.5 | V |
| V _{IH} | Input HIGH Voltage | 3.5 | - | V |
| VII | Input LOW Voltage | - | 1.5 | V |
| V _{OH} | Output HIGH Voltage | 2.4 | - | V |
| V _{OL} | Output LOW Voltage | - | 0.4 | V |
| I₁∟ | Maximum Input Leakage Current | -10 | 10 | μΑ |
| I _{OL} | Maximum Output Leakage | -10 | 10 | μΑ |

DC TABLE FOR VCC = $3.3V \pm 10\%$

| Symbol | Parameter | Min | Max | Units |
|-----------------|-------------------------------|-----|-----|-------|
| V _{cc} | Power Supply Voltage | 3.0 | 3.6 | V |
| V _{IH} | Input HIGH Voltage | 2.3 | - | V |
| V _{II} | Input LOW Voltage | - | 1 | V |
| V _{OH} | Output HIGH Voltage | 2.4 | - | V |
| V _{OL} | Output LOW Voltage | - | 0.4 | V |
| I₁∟ | Maximum Input Leakage Current | -10 | 10 | μΑ |
| l _{OL} | Maximum Output Leakage | -10 | 10 | μΑ |

CAPACITANCE

| Symbol | Parameter | 0 °C to 70°C | Units |
|------------------|----------------------------|--------------|-------|
| C _{IN} | Maximum Input Capacitance | 10 | pF |
| C _{OUT} | Maximum Output Capacitance | 10 | pF |
| C _{IO} | Maximum I/O Capacitance | 10 | pF |

ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Units |
|--------------------|---|--------------------------|-------|
| Vcc | DC Power Supply Voltage | 3.0 to 3.6 | V |
| V_{IN}, V_{OUT} | DC Input, Output Voltage | -0.3 to $V_{DD} + 0.3$ | V |
| I _{IN} | DC Current Drain V _{DD} and V _{SS} Pins | ±10 | mA |
| T _{STG} | Storage Temperature | -40 to +125 | °C |
| T _{OPER} | Operation Temperature | 0 to 70 | °C |

Icc SPECIFICATIONS

| Symbol | Parameter | Тур | Max | Units |
|--------|----------------|-----|-----|-------|
| Icc | Supply Current | 50 | 60 | μΑ |

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OZ992 PACKAGE INFORMATION

