

2K SPI Bus Serial EEPROM with EUI-48™ Node Identity

Device Selection Table

Part Number	Vcc Range	Page Size	Temp. Ranges	Packages
25AA02E48	1.8-5.5V	16 Bytes	I	SN, OT

Features:

- Pre-programmed Globally Unique, 48-bit Node Address
- Compatible with EUI-48™ and EUI-64™
- 10 MHz max. Clock Frequency
- Low-Power CMOS Technology:
 - Max. Write Current: 5 mA at 5.5V
 - Read Current: 5 mA at 5.5V, 10 MHz
 - Standby Current: 1 μ A at 2.5V
- 256 x 8-bit Organization
- Write Page mode (up to 16 bytes)
- Sequential Read
- Self-Timed Erase and Write Cycles (5 ms max.)
- Block Write Protection:
 - Protect none, 1/4, 1/2 or all of array
- Built-in Write Protection:
 - Power-on/off data protection circuitry
 - Write enable latch
 - Write-protect pin
- High Reliability:
 - Endurance: 1,000,000 erase/write cycles
 - Data retention: >200 years
 - ESD protection: >4000V
- Temperature Ranges Supported:
 - Industrial (I): -40°C to +85°C
- Pb-Free and RoHS Compliant

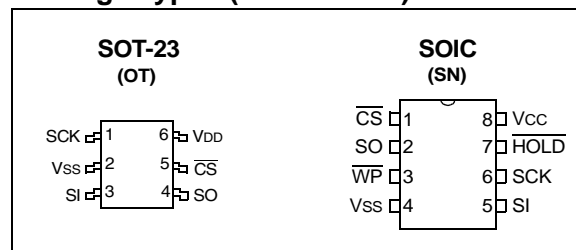
Description:

The Microchip Technology Inc. 25AA02E48 is a 2 Kbit Serial Electrically Erasable Programmable Read-Only Memory (EEPROM). The memory is accessed via a simple Serial Peripheral Interface (SPI) compatible serial bus. The bus signals required are a clock input (SCK) plus separate data in (SI) and data out (SO) lines. Access to the device is controlled through a Chip Select ($\overline{\text{CS}}$) input.

Communication to the device can be paused via the hold pin (HOLD). While the device is paused, transitions on its inputs will be ignored, with the exception of Chip Select, allowing the host to service higher priority interrupts.

The 25AA02E48 is available in the standard 8-lead SOIC and 6-lead SOT-23 packages.

Package Types (not to scale)



Note: This document is supplemented by the "25AA020A Data Sheet" (DS21833). See Section 2.0 "Functional Description".

Pin Function Table

Name	Function
$\overline{\text{CS}}$	Chip Select Input
SO	Serial Data Output
$\overline{\text{WP}}$	Write-Protect
Vss	Ground
SI	Serial Data Input
SCK	Serial Clock Input
$\overline{\text{HOLD}}$	Hold Input
Vcc	Supply Voltage

25AA02E48

1.0 ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings^(†)

V _{CC}	6.5V
All inputs and outputs w.r.t. V _{SS}	-0.6V to V _{CC} +1.0V
Storage temperature	-65°C to 150°C
Ambient temperature under bias	-40°C to 85°C
ESD protection on all pins	4 kV

† NOTICE: Stresses above those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at those or any other conditions above those indicated in the operational listings of this specification is not implied. Exposure to maximum rating conditions for an extended period of time may affect device reliability.

TABLE 1-1: DC CHARACTERISTICS

DC CHARACTERISTICS			Industrial (I): TA = -40°C to +85°C V _{CC} = 1.8V to 5.5V			
Param. No.	Sym.	Characteristic	Min.	Max.	Units	Test Conditions
D001	V _{IH1}	High-level Input voltage	0.7 V _{CC}	V _{CC} +1	V	
D002	V _{IL1}	Low-level Input Voltage	-0.3	0.3 V _{CC}	V	V _{CC} ≥ 2.7V (Note 1)
D003	V _{IL2}		-0.3	0.2 V _{CC}	V	V _{CC} < 2.7V (Note 1)
D004	V _{OL}	Low-level Output Voltage	—	0.4	V	I _{OL} = 2.1 mA
D005	V _{OL}		—	0.2	V	I _{OL} = 1.0 mA, V _{CC} < 2.5V
D006	V _{OH}	High-level Output Voltage	V _{CC} -0.5	—	V	I _{OH} = -400 μA
D007	I _{LI}	Input Leakage Current	—	±1	μA	$\overline{CS} = V_{CC}$, V _{IN} = V _{SS} TO V _{CC}
D008	I _{LO}	Output Leakage Current	—	±1	μA	$\overline{CS} = V_{CC}$, V _{OUT} = V _{SS} TO V _{CC}
D009	C _{INT}	Internal Capacitance (all inputs and outputs)	—	7	pF	TA = 25°C, CLK = 1.0 MHz, V _{CC} = 5.0V (Note 1)
D010	I _{CC} Read	Operating Current	—	5	mA	V _{CC} = 5.5V; F _{CLK} = 10.0 MHz; SO = Open
			—	2.5	mA	V _{CC} = 2.5V; F _{CLK} = 5.0 MHz; SO = Open
D011	I _{CC} Write		—	5	mA	V _{CC} = 5.5V
			—	3	mA	V _{CC} = 2.5V
D012	I _{CCS}	Standby Current	—	1	μA	$\overline{CS} = V_{CC} = 2.5V$, Inputs tied to V _{CC} or V _{SS} , TA = +85°C

Note: This parameter is periodically sampled and not 100% tested.

TABLE 1-2: AC CHARACTERISTICS

AC CHARACTERISTICS			Industrial (I): $T_A = -40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$ $V_{CC} = 1.8\text{V}$ to 5.5V			
Param. No.	Sym.	Characteristic	Min.	Max.	Units	Test Conditions
1	FCLK	Clock Frequency	—	10	MHz	$4.5\text{V} \leq V_{CC} < 5.5\text{V}$
			—	5	MHz	$2.5\text{V} \leq V_{CC} < 4.5\text{V}$
			—	3	MHz	$1.8\text{V} \leq V_{CC} < 2.5\text{V}$
2	T _{CSS}	$\overline{\text{CS}}$ Setup Time	50	—	ns	$4.5\text{V} \leq V_{CC} < 5.5\text{V}$
			100	—	ns	$2.5\text{V} \leq V_{CC} < 4.5\text{V}$
			150	—	ns	$1.8\text{V} \leq V_{CC} < 2.5\text{V}$
3	T _{CSH}	$\overline{\text{CS}}$ Hold Time	100	—	ns	$4.5\text{V} \leq V_{CC} < 5.5\text{V}$
			200	—	ns	$2.5\text{V} \leq V_{CC} < 4.5\text{V}$
			250	—	ns	$1.8\text{V} \leq V_{CC} < 2.5\text{V}$
4	T _{CSD}	$\overline{\text{CS}}$ Disable Time	50	—	ns	—
5	T _{SU}	Data Setup Time	10	—	ns	$4.5\text{V} \leq V_{CC} < 5.5\text{V}$
			20	—	ns	$2.5\text{V} \leq V_{CC} < 4.5\text{V}$
			30	—	ns	$1.8\text{V} \leq V_{CC} < 2.5\text{V}$
6	T _{HD}	Data Hold Time	20	—	ns	$4.5\text{V} \leq V_{CC} < 5.5\text{V}$
			40	—	ns	$2.5\text{V} \leq V_{CC} < 4.5\text{V}$
			50	—	ns	$1.8\text{V} \leq V_{CC} < 2.5\text{V}$
7	T _R	CLK Rise Time	—	100	ns	(Note 1)
8	T _F	CLK Fall Time	—	100	ns	(Note 1)
9	T _{HI}	Clock High Time	50	—	ns	$4.5\text{V} \leq V_{CC} < 5.5\text{V}$
			100	—	ns	$2.5\text{V} \leq V_{CC} < 4.5\text{V}$
			150	—	ns	$1.8\text{V} \leq V_{CC} < 2.5\text{V}$
10	T _{LO}	Clock Low Time	50	—	ns	$4.5\text{V} \leq V_{CC} < 5.5\text{V}$
			100	—	ns	$2.5\text{V} \leq V_{CC} < 4.5\text{V}$
			150	—	ns	$1.8\text{V} \leq V_{CC} < 2.5\text{V}$
11	T _{CLD}	Clock Delay Time	50	—	ns	—
12	T _{CLE}	Clock Enable Time	50	—	ns	—
13	T _V	Output Valid from Clock Low	—	50	ns	$4.5\text{V} \leq V_{CC} < 5.5\text{V}$
			—	100	ns	$2.5\text{V} \leq V_{CC} < 4.5\text{V}$
			—	160	ns	$1.8\text{V} \leq V_{CC} < 2.5\text{V}$
14	T _{HO}	Output Hold Time	0	—	ns	(Note 1)
15	T _{DIS}	Output Disable Time	—	40	ns	$4.5\text{V} \leq V_{CC} < 5.5\text{V}$ (Note 1)
			—	80	ns	$2.5\text{V} \leq V_{CC} < 4.5\text{V}$ (Note 1)
			—	160	ns	$1.8\text{V} \leq V_{CC} < 2.5\text{V}$ (Note 1)
16	T _{HS}	$\overline{\text{HOLD}}$ Setup Time	20	—	ns	$4.5\text{V} \leq V_{CC} < 5.5\text{V}$
			40	—	ns	$2.5\text{V} \leq V_{CC} < 4.5\text{V}$
			80	—	ns	$1.8\text{V} \leq V_{CC} < 2.5\text{V}$

Note 1: This parameter is periodically sampled and not 100% tested.

2: This parameter is not tested but ensured by characterization. For endurance estimates in a specific application, please consult the Total Endurance™ Model which can be obtained from Microchip's web site at www.Microchip.com.

3: T_{WC} begins on the rising edge of $\overline{\text{CS}}$ after a valid write sequence and ends when the internal write cycle is complete.

25AA02E48

TABLE 1-2: AC CHARACTERISTICS (CONTINUED)

AC CHARACTERISTICS			Industrial (I): $T_A = -40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$ $V_{CC} = 1.8\text{V}$ to 5.5V			
Param. No.	Sym.	Characteristic	Min.	Max.	Units	Test Conditions
17	THH	$\overline{\text{HOLD}}$ Hold Time	20	—	ns	$4.5\text{V} \leq V_{CC} < 5.5\text{V}$
			40	—	ns	$2.5\text{V} \leq V_{CC} < 4.5\text{V}$
			80	—	ns	$1.8\text{V} \leq V_{CC} < 2.5\text{V}$
18	THZ	$\overline{\text{HOLD}}$ Low to Output High-Z	30	—	ns	$4.5\text{V} \leq V_{CC} < 5.5\text{V}$ (Note 1)
			60	—	ns	$2.5\text{V} \leq V_{CC} < 4.5\text{V}$ (Note 1)
			160	—	ns	$1.8\text{V} \leq V_{CC} < 2.5\text{V}$ (Note 1)
19	THV	$\overline{\text{HOLD}}$ High to Output Valid	30	—	ns	$4.5\text{V} \leq V_{CC} < 5.5\text{V}$
			60	—	ns	$2.5\text{V} \leq V_{CC} < 4.5\text{V}$
			160	—	ns	$1.8\text{V} \leq V_{CC} < 2.5\text{V}$
20	Twc	Internal Write Cycle Time (byte or page)	—	5	ms	(Note 3)
21	—	Endurance	1M	—	E/W Cycles	(NOTE 2)

Note 1: This parameter is periodically sampled and not 100% tested.

2: This parameter is not tested but ensured by characterization. For endurance estimates in a specific application, please consult the Total Endurance™ Model which can be obtained from Microchip's web site at www.Microchip.com.

3: Twc begins on the rising edge of $\overline{\text{CS}}$ after a valid write sequence and ends when the internal write cycle is complete.

TABLE 1-3: AC TEST CONDITIONS

AC Waveform:	
$V_{LO} = 0.2\text{V}$	—
$V_{HI} = V_{CC} - 0.2\text{V}$	(Note 1)
$V_{HI} = 4.0\text{V}$	(Note 2)
$C_L = 100\text{ pF}$	—
Timing Measurement Reference Level	
Input	0.5 V _{CC}
Output	0.5 V _{CC}

Note 1: For $V_{CC} \leq 4.0\text{V}$

2: For $V_{CC} > 4.0\text{V}$

FIGURE 1-1: HOLD TIMING

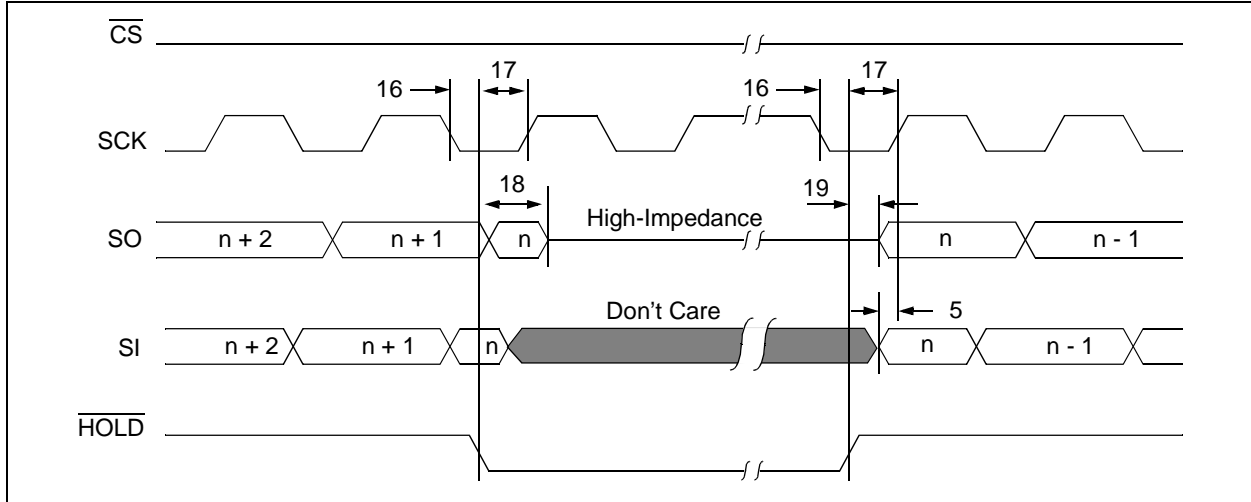


FIGURE 1-2: SERIAL INPUT TIMING

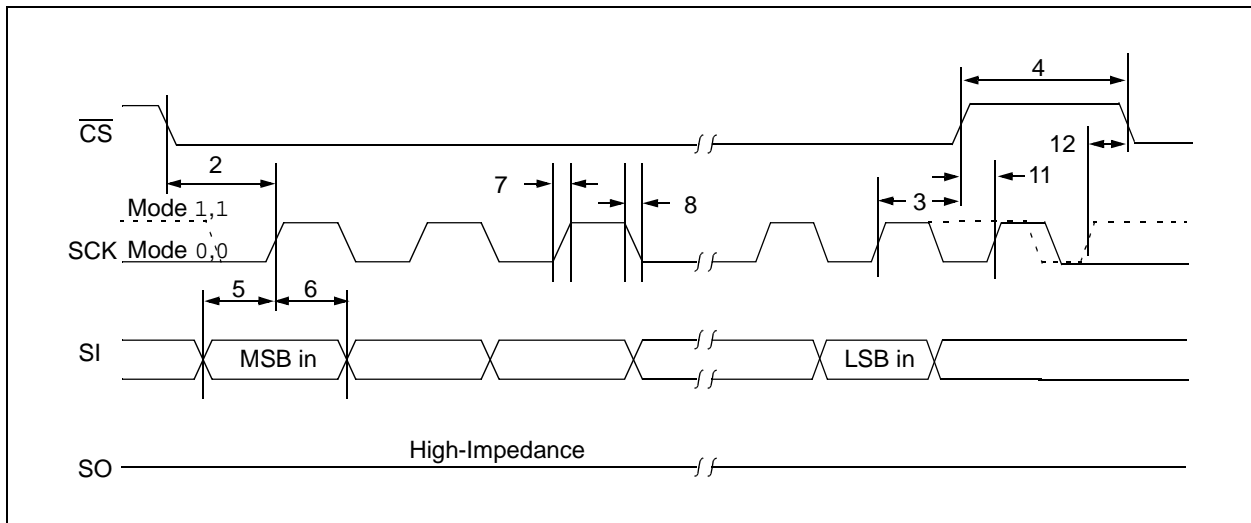
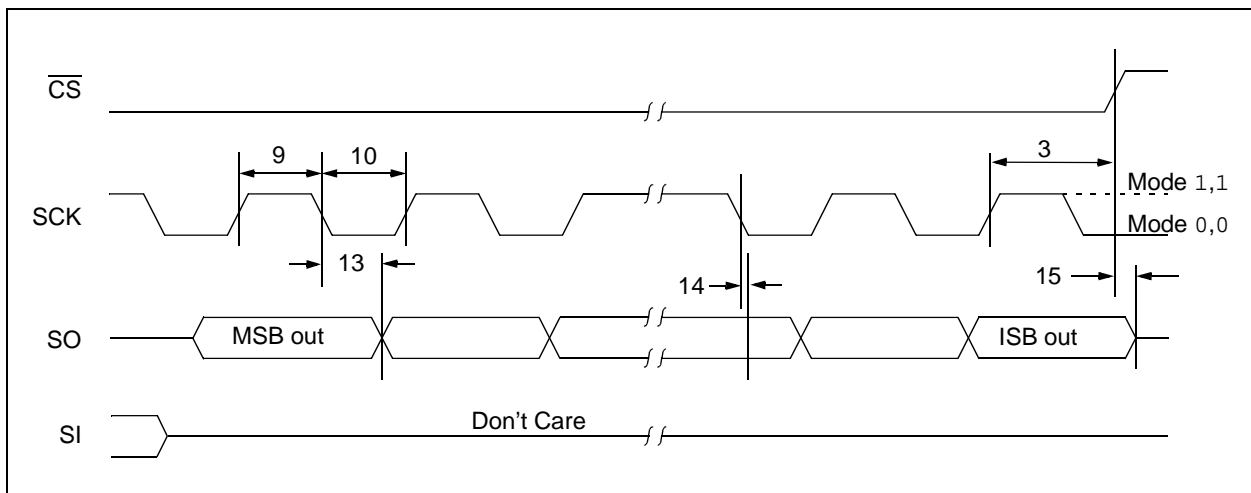


FIGURE 1-3: SERIAL OUTPUT TIMING



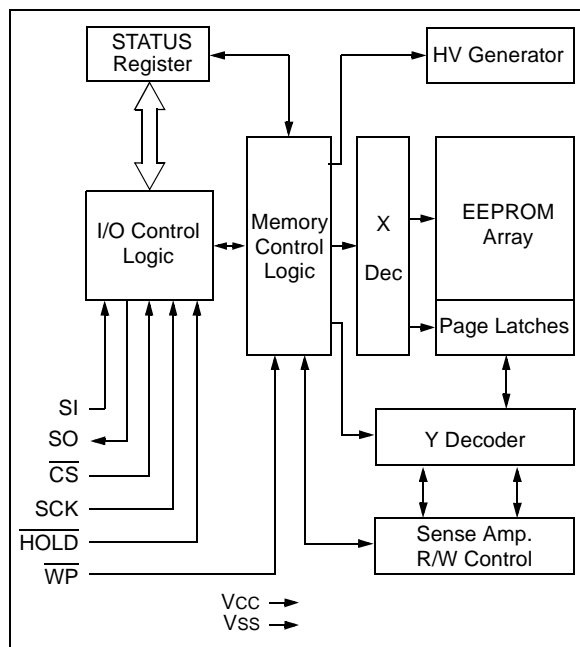
25AA02E48

2.0 FUNCTIONAL DESCRIPTION

2.1 Principles of Operation

The 25AA02E48 is a 256-byte Serial EEPROM designed to interface directly with the Serial Peripheral Interface (SPI) port of many of today's popular microcontroller families, including Microchip's PIC[®] microcontrollers. It may also interface with microcontrollers that do not have a built-in SPI port by using discrete I/O lines programmed properly in software to match the SPI protocol.

BLOCK DIAGRAM



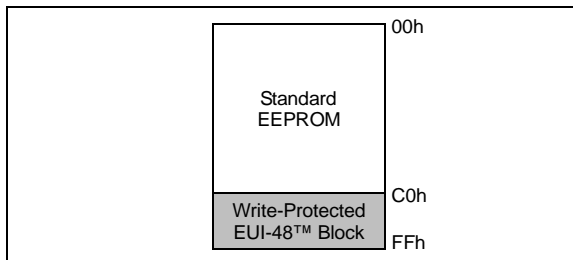
Note: This data sheet documents only the device's features and specifications that are in addition to the features and specifications of the 25AA020A device. For information on the features and specifications shared by the 25AA02E48 and 25AA020A devices, see the "25AA020A Data Sheet" (DS21833).

3.0 PRE-PROGRAMMED EUI-48™ NODE ADDRESS

The 25AA02E48 is programmed at the factory with a globally unique, EUI-48™ and EUI-64™ compatible node address stored in the upper 1/4 of the array and write-protected through the STATUS register. The remaining 1,536 bits are available for application use.

The 6-byte EUI-48™ node address value is stored in array locations 0xFA through 0xFF, as shown in Figure 3-2. The first 3 bytes are the Organizationally Unique Identifier (OUI) assigned to Microchip by the IEEE Registration Authority. The remaining 3 bytes are the Extension Identifier, and are generated by Microchip to ensure a globally-unique, 48-bit value.

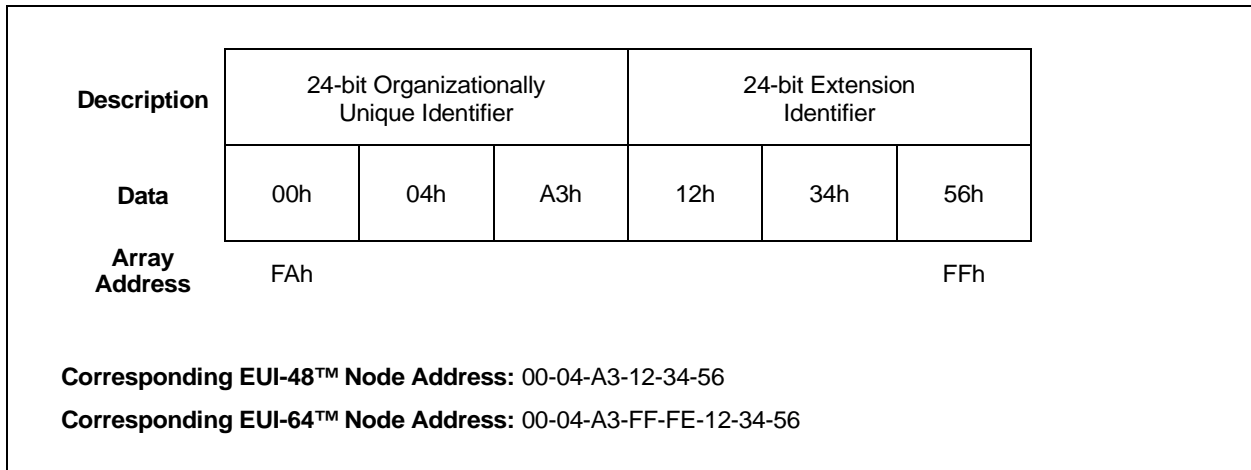
FIGURE 3-1: MEMORY ORGANIZATION



3.1 EUI-64™ Support

The pre-programmed EUI-48 node address can easily be encapsulated at the application level to form a globally unique, 64-bit node address for systems utilizing the EUI-64 standard. This is done by adding 0xFFFE between the OUI and the Extension Identifier, as shown below.

FIGURE 3-2: EUI-48 NODE ADDRESS PHYSICAL MEMORY MAP EXAMPLE



3.2 Factory-Programmed Write Protection

In order to help guard against accidental corruption of the EUI-48 node address, the BP1 and BP0 bits of the STATUS register are programmed at the factory to '0' and '1', respectively, as shown in the following table:

7	6	5	4	3	2	1	0
X	X	X	X	BP1	BP0	WEL	WIP
—	—	—	—	0	1	—	—

This protects the upper 1/4 of the array (0xC0 to 0xFF) from write operations. This array block can be utilized for writing by clearing the BP bits with a Write Status Register (WRSR) instruction. Note that if this is performed, care must be taken to prevent overwriting the EUI-48 value.

4.0 PIN DESCRIPTIONS

The descriptions of the pins are listed in Table 4-1.

TABLE 4-1: PIN FUNCTION TABLE

Name	SOIC	SOT-23	Function
$\overline{\text{CS}}$	1	5	Chip Select Input
SO	2	4	Serial Data Output
$\overline{\text{WP}}$	3	—	Write-Protect Pin
Vss	4	2	Ground
SI	5	3	Serial Data Input
SCK	6	1	Serial Clock Input
$\overline{\text{HOLD}}$	7	—	Hold Input
Vcc	8	6	Supply Voltage

4.1 Chip Select ($\overline{\text{CS}}$)

A low level on this pin selects the device. A high level deselects the device and forces it into Standby mode. However, a programming cycle which is already initiated or in progress will be completed, regardless of the $\overline{\text{CS}}$ input signal. If $\overline{\text{CS}}$ is brought high during a program cycle, the device will go into Standby mode as soon as the programming cycle is complete. When the device is deselected, SO goes to the high-impedance state, allowing multiple parts to share the same SPI bus. A low-to-high transition on $\overline{\text{CS}}$ after a valid write sequence initiates an internal write cycle. After power-up, a low level on $\overline{\text{CS}}$ is required prior to any sequence being initiated.

4.2 Serial Output (SO)

The SO pin is used to transfer data out of the 25AA02E48. During a read cycle, data is shifted out on this pin after the falling edge of the serial clock.

4.3 Write-Protect ($\overline{\text{WP}}$)

The $\overline{\text{WP}}$ pin is a hardware write-protect input pin. When it is low, all writes to the array or STATUS register are disabled, but any other operations function normally. When $\overline{\text{WP}}$ is high, all functions, including nonvolatile writes operate normally. At any time, when $\overline{\text{WP}}$ is low, the write enable Reset latch will be reset and programming will be inhibited. However, if a write cycle is already in progress, $\overline{\text{WP}}$ going low will not change or disable the write cycle. See Table 2-4 for the Write-Protect Functionality Matrix.

4.4 Serial Input (SI)

The SI pin is used to transfer data into the device. It receives instructions, addresses and data. Data is latched on the rising edge of the serial clock.

4.5 Serial Clock (SCK)

The SCK is used to synchronize the communication between a master and the 25AA02E48. Instructions, addresses or data present on the SI pin are latched on the rising edge of the clock input, while data on the SO pin is updated after the falling edge of the clock input.

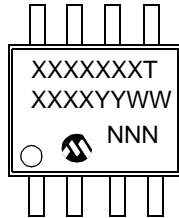
4.6 Hold ($\overline{\text{HOLD}}$)

The $\overline{\text{HOLD}}$ pin is used to suspend transmission to the 25AA02E48 while in the middle of a serial sequence without having to retransmit the entire sequence again. It must be held high any time this function is not being used. Once the device is selected and a serial sequence is underway, the $\overline{\text{HOLD}}$ pin may be pulled low to pause further serial communication without resetting the serial sequence. The $\overline{\text{HOLD}}$ pin must be brought low while SCK is low, otherwise the $\overline{\text{HOLD}}$ function will not be invoked until the next SCK high-to-low transition. The 25AA02E48 must remain selected during this sequence. The SI, SCK and SO pins are in a high-impedance state during the time the device is paused and transitions on these pins will be ignored. To resume serial communication, $\overline{\text{HOLD}}$ must be brought high while the SCK pin is low, otherwise serial communication will not resume. Lowering the $\overline{\text{HOLD}}$ line at any time will tri-state the SO line.

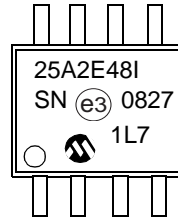
5.0 PACKAGING INFORMATION

5.1 Package Marking Information

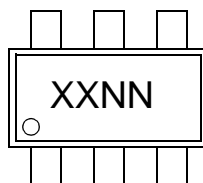
8-Lead SOIC



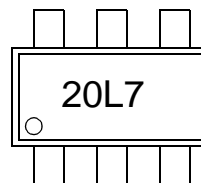
Example:



6-Lead SOT-23



Example:



Part Number	1st Line Marking Code
	SOT-23
	I Temp.
25AA02E48	20NN

Note: NN = Alphanumeric traceability code

Legend:	XX...X	Part number or part number code
	T	Temperature (I, E)
	Y	Year code (last digit of calendar year)
	YY	Year code (last 2 digits of calendar year)
	WW	Week code (week of January 1 is week '01')
	NNN	Alphanumeric traceability code (2 characters for small packages)
	e3	Pb-free JEDEC designator for Matte Tin (Sn)

Note: For very small packages with no room for the Pb-free JEDEC designator e3, the marking will only appear on the outer carton or reel label.

Note: In the event the full Microchip part number cannot be marked on one line, it will be carried over to the next line, thus limiting the number of available characters for customer-specific information.

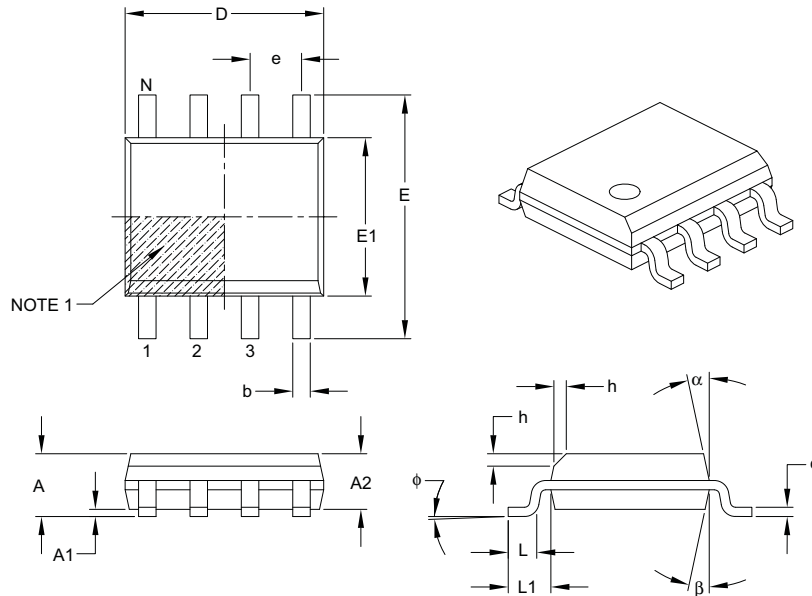
Note: Please visit www.microchip.com/Pbfree for the latest information on Pb-free conversion.

*Standard OTP marking consists of Microchip part number, year code, week code, and traceability code.

25AA02E48

8-Lead Plastic Small Outline (SN) – Narrow, 3.90 mm Body [SOIC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Dimension Limits	Units	MILLIMETERS		
		MIN	NOM	MAX
Number of Pins	N	8		
Pitch	e	1.27 BSC		
Overall Height	A	–	–	1.75
Molded Package Thickness	A2	1.25	–	–
Standoff §	A1	0.10	–	0.25
Overall Width	E	6.00 BSC		
Molded Package Width	E1	3.90 BSC		
Overall Length	D	4.90 BSC		
Chamfer (optional)	h	0.25	–	0.50
Foot Length	L	0.40	–	1.27
Footprint	L1	1.04 REF		
Foot Angle	φ	0°	–	8°
Lead Thickness	c	0.17	–	0.25
Lead Width	b	0.31	–	0.51
Mold Draft Angle Top	α	5°	–	15°
Mold Draft Angle Bottom	β	5°	–	15°

Notes:

- Pin 1 visual index feature may vary, but must be located within the hatched area.
- § Significant Characteristic.
- Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.

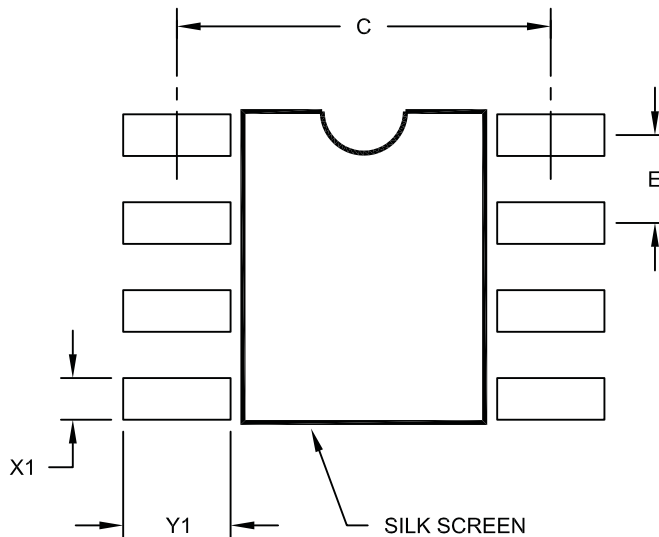
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-057B

8-Lead Plastic Small Outline (SN) – Narrow, 3.90 mm Body [SOIC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



RECOMMENDED LAND PATTERN

Dimension Limits	Units	MILLIMETERS		
		MIN	NOM	MAX
Contact Pitch	E	1.27 BSC		
Contact Pad Spacing	C		5.40	
Contact Pad Width (X8)	X1			0.60
Contact Pad Length (X8)	Y1			1.55

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

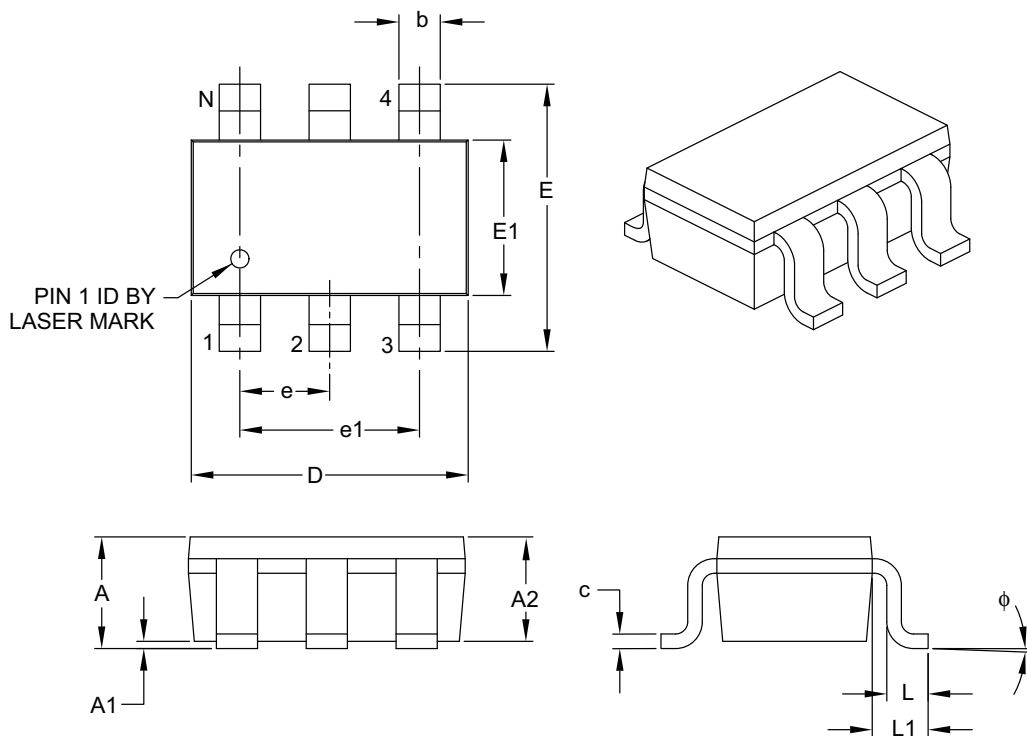
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2057A

25AA02E48

6-Lead Plastic Small Outline Transistor (OT) [SOT-23]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Dimension Limits	Units	MILLIMETERS		
		MIN	NOM	MAX
Number of Pins	N	6		
Pitch	e	0.95 BSC		
Outside Lead Pitch	e1	1.90 BSC		
Overall Height	A	0.90	–	1.45
Molded Package Thickness	A2	0.89	–	1.30
Standoff	A1	0.00	–	0.15
Overall Width	E	2.20	–	3.20
Molded Package Width	E1	1.30	–	1.80
Overall Length	D	2.70	–	3.10
Foot Length	L	0.10	–	0.60
Footprint	L1	0.35	–	0.80
Foot Angle	ϕ	0°	–	30°
Lead Thickness	c	0.08	–	0.26
Lead Width	b	0.20	–	0.51

Notes:

- Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-028B

APPENDIX A: REVISION HISTORY

Revision A (12/08)

Original release of this document.

25AA02E48

NOTES:

THE MICROCHIP WEB SITE

Microchip provides online support via our WWW site at www.microchip.com. This web site is used as a means to make files and information easily available to customers. Accessible by using your favorite Internet browser, the web site contains the following information:

- **Product Support** – Data sheets and errata, application notes and sample programs, design resources, user's guides and hardware support documents, latest software releases and archived software
- **General Technical Support** – Frequently Asked Questions (FAQ), technical support requests, online discussion groups, Microchip consultant program member listing
- **Business of Microchip** – Product selector and ordering guides, latest Microchip press releases, listing of seminars and events, listings of Microchip sales offices, distributors and factory representatives

CUSTOMER CHANGE NOTIFICATION SERVICE

Microchip's customer notification service helps keep customers current on Microchip products. Subscribers will receive e-mail notification whenever there are changes, updates, revisions or errata related to a specified product family or development tool of interest.

To register, access the Microchip web site at www.microchip.com, click on Customer Change Notification and follow the registration instructions.

CUSTOMER SUPPORT

Users of Microchip products can receive assistance through several channels:

- Distributor or Representative
- Local Sales Office
- Field Application Engineer (FAE)
- Technical Support
- Development Systems Information Line

Customers should contact their distributor, representative or field application engineer (FAE) for support. Local sales offices are also available to help customers. A listing of sales offices and locations is included in the back of this document.

Technical support is available through the web site at: <http://support.microchip.com>

25AA02E48

READER RESPONSE

It is our intention to provide you with the best documentation possible to ensure successful use of your Microchip product. If you wish to provide your comments on organization, clarity, subject matter, and ways in which our documentation can better serve you, please FAX your comments to the Technical Publications Manager at (480) 792-4150.

Please list the following information, and use this outline to provide us with your comments about this document.

To: Technical Publications Manager
RE: Reader Response
From: Name _____
Company _____
Address _____
City / State / ZIP / Country _____
Telephone: (_____) _____ - _____ FAX: (_____) _____ - _____

Application (optional):

Would you like a reply? ___Y ___N

Device: 25AA02E48

Literature Number: DS22123A

Questions:

1. What are the best features of this document?

2. How does this document meet your hardware and software development needs?

3. Do you find the organization of this document easy to follow? If not, why?

4. What additions to the document do you think would enhance the structure and subject?

5. What deletions from the document could be made without affecting the overall usefulness?

6. Is there any incorrect or misleading information (what and where)?

7. How would you improve this document?

PRODUCT IDENTIFICATION SYSTEM

To order or obtain information, e.g., on pricing or delivery, refer to the factory or the listed sales office.

<u>PART NO.</u>		<u>X</u>	-	<u>X</u>	<u>/XX</u>
Device	Tape & Reel			Temperature	Package
Device:	25AA02E48				2k-Bit, 1.8V, 16 Byte Page, SPI Serial EEPROM with EUI-48™ Node Identity
Tape & Reel:	Blank =				Standard packaging
	T =				Tape & Reel
Temperature Range:	I =				-40°C to+85°C
Package:	SN =				Plastic SOIC (3.90 mm body), 8-lead
	OT =				SOT-23, 6-lead (Tape and Reel only)

Examples:

- a) 25AA02E48-I/SN = 2k-bit, 16-byte page, 1.8V Serial EEPROM, Industrial temp., SOIC package
- b) 25AA02E48T-I/SN = 2k-bit, 16-byte page, 1.8V Serial EEPROM, Industrial temp., Tape & Reel, SOIC package
- c) 25AA02E48T-I/OT = 2k-bit, 16-byte page, 1.8V Serial EEPROM, Industrial temp., Tape & Reel, SOT-23 package

25AA02E48

NOTES:

Note the following details of the code protection feature on Microchip devices:

- Microchip products meet the specification contained in their particular Microchip Data Sheet.
- Microchip believes that its family of products is one of the most secure families of its kind on the market today, when used in the intended manner and under normal conditions.
- There are dishonest and possibly illegal methods used to breach the code protection feature. All of these methods, to our knowledge, require using the Microchip products in a manner outside the operating specifications contained in Microchip's Data Sheets. Most likely, the person doing so is engaged in theft of intellectual property.
- Microchip is willing to work with the customer who is concerned about the integrity of their code.
- Neither Microchip nor any other semiconductor manufacturer can guarantee the security of their code. Code protection does not mean that we are guaranteeing the product as "unbreakable."

Code protection is constantly evolving. We at Microchip are committed to continuously improving the code protection features of our products. Attempts to break Microchip's code protection feature may be a violation of the Digital Millennium Copyright Act. If such acts allow unauthorized access to your software or other copyrighted work, you may have a right to sue for relief under that Act.

Information contained in this publication regarding device applications and the like is provided only for your convenience and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications. MICROCHIP MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL, STATUTORY OR OTHERWISE, RELATED TO THE INFORMATION, INCLUDING BUT NOT LIMITED TO ITS CONDITION, QUALITY, PERFORMANCE, MERCHANTABILITY OR FITNESS FOR PURPOSE. Microchip disclaims all liability arising from this information and its use. Use of Microchip devices in life support and/or safety applications is entirely at the buyer's risk, and the buyer agrees to defend, indemnify and hold harmless Microchip from any and all damages, claims, suits, or expenses resulting from such use. No licenses are conveyed, implicitly or otherwise, under any Microchip intellectual property rights.

Trademarks

The Microchip name and logo, the Microchip logo, Accuron, dsPIC, KEELOQ, KEELOQ logo, MPLAB, PIC, PICmicro, PICSTART, rfPIC, SmartShunt and UNI/O are registered trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

FilterLab, Linear Active Thermistor, MXDEV, MXLAB, SEEVAL, SmartSensor and The Embedded Control Solutions Company are registered trademarks of Microchip Technology Incorporated in the U.S.A.

Analog-for-the-Digital Age, Application Maestro, CodeGuard, dsPICDEM, dsPICDEM.net, dsPICworks, dsSPEAK, ECAN, ECONOMONITOR, FanSense, In-Circuit Serial Programming, ICSP, ICEPIC, Mindi, MiWi, MPASM, MPLAB Certified logo, MPLIB, MPLINK, mTouch, PICkit, PICDEM, PICDEM.net, PICTail, PIC³² logo, PowerCal, PowerInfo, PowerMate, PowerTool, REAL ICE, rLAB, Select Mode, Total Endurance, WiperLock and ZENA are trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

SQTP is a service mark of Microchip Technology Incorporated in the U.S.A.

All other trademarks mentioned herein are property of their respective companies.

© 2008, Microchip Technology Incorporated, Printed in the U.S.A., All Rights Reserved.

 Printed on recycled paper.

**QUALITY MANAGEMENT SYSTEM
CERTIFIED BY DNV
== ISO/TS 16949:2002 ==**

Microchip received ISO/TS-16949:2002 certification for its worldwide headquarters, design and wafer fabrication facilities in Chandler and Tempe, Arizona; Gresham, Oregon and design centers in California and India. The Company's quality system processes and procedures are for its PIC® MCUs and dsPIC® DSCs, KEELOQ® code hopping devices, Serial EEPROMs, microperipherals, nonvolatile memory and analog products. In addition, Microchip's quality system for the design and manufacture of development systems is ISO 9001:2000 certified.



WORLDWIDE SALES AND SERVICE

AMERICAS

Corporate Office
2355 West Chandler Blvd.
Chandler, AZ 85224-6199
Tel: 480-792-7200
Fax: 480-792-7277
Technical Support:
<http://support.microchip.com>
Web Address:
www.microchip.com

Atlanta
Duluth, GA
Tel: 678-957-9614
Fax: 678-957-1455

Boston
Westborough, MA
Tel: 774-760-0087
Fax: 774-760-0088

Chicago
Itasca, IL
Tel: 630-285-0071
Fax: 630-285-0075

Dallas
Addison, TX
Tel: 972-818-7423
Fax: 972-818-2924

Detroit
Farmington Hills, MI
Tel: 248-538-2250
Fax: 248-538-2260

Kokomo
Kokomo, IN
Tel: 765-864-8360
Fax: 765-864-8387

Los Angeles
Mission Viejo, CA
Tel: 949-462-9523
Fax: 949-462-9608

Santa Clara
Santa Clara, CA
Tel: 408-961-6444
Fax: 408-961-6445

Toronto
Mississauga, Ontario,
Canada
Tel: 905-673-0699
Fax: 905-673-6509

ASIA/PACIFIC

Asia Pacific Office
Suites 3707-14, 37th Floor
Tower 6, The Gateway
Harbour City, Kowloon
Hong Kong
Tel: 852-2401-1200
Fax: 852-2401-3431

Australia - Sydney
Tel: 61-2-9868-6733
Fax: 61-2-9868-6755

China - Beijing
Tel: 86-10-8528-2100
Fax: 86-10-8528-2104

China - Chengdu
Tel: 86-28-8665-5511
Fax: 86-28-8665-7889

China - Fuzhou
Tel: 86-591-8750-3506
Fax: 86-591-8750-3521

China - Hong Kong SAR
Tel: 852-2401-1200
Fax: 852-2401-3431

China - Nanjing
Tel: 86-25-8473-2460
Fax: 86-25-8473-2470

China - Qingdao
Tel: 86-532-8502-7355
Fax: 86-532-8502-7205

China - Shanghai
Tel: 86-21-5407-5533
Fax: 86-21-5407-5066

China - Shenyang
Tel: 86-24-2334-2829
Fax: 86-24-2334-2393

China - Shenzhen
Tel: 86-755-8203-2660
Fax: 86-755-8203-1760

China - Shunde
Tel: 86-757-2839-5507
Fax: 86-757-2839-5571

China - Wuhan
Tel: 86-27-5980-5300
Fax: 86-27-5980-5118

China - Xian
Tel: 86-29-8833-7252
Fax: 86-29-8833-7256

ASIA/PACIFIC

India - Bangalore
Tel: 91-80-4182-8400
Fax: 91-80-4182-8422

India - New Delhi
Tel: 91-11-4160-8631
Fax: 91-11-4160-8632

India - Pune
Tel: 91-20-2566-1512
Fax: 91-20-2566-1513

Japan - Yokohama
Tel: 81-45-471- 6166
Fax: 81-45-471-6122

Korea - Daegu
Tel: 82-53-744-4301
Fax: 82-53-744-4302

Korea - Seoul
Tel: 82-2-554-7200
Fax: 82-2-558-5932 or
82-2-558-5934

Malaysia - Kuala Lumpur
Tel: 60-3-6201-9857
Fax: 60-3-6201-9859

Malaysia - Penang
Tel: 60-4-646-8870
Fax: 60-4-646-5086

Philippines - Manila
Tel: 63-2-634-9065
Fax: 63-2-634-9069

Singapore
Tel: 65-6334-8870
Fax: 65-6334-8850

Taiwan - Hsin Chu
Tel: 886-3-572-9526
Fax: 886-3-572-6459

Taiwan - Kaohsiung
Tel: 886-7-536-4818
Fax: 886-7-536-4803

Taiwan - Taipei
Tel: 886-2-2500-6610
Fax: 886-2-2508-0102

Thailand - Bangkok
Tel: 66-2-694-1351
Fax: 66-2-694-1350

EUROPE

Austria - Wels
Tel: 43-7242-2244-39
Fax: 43-7242-2244-393

Denmark - Copenhagen
Tel: 45-4450-2828
Fax: 45-4485-2829

France - Paris
Tel: 33-1-69-53-63-20
Fax: 33-1-69-30-90-79

Germany - Munich
Tel: 49-89-627-144-0
Fax: 49-89-627-144-44

Italy - Milan
Tel: 39-0331-742611
Fax: 39-0331-466781

Netherlands - Drunen
Tel: 31-416-690399
Fax: 31-416-690340

Spain - Madrid
Tel: 34-91-708-08-90
Fax: 34-91-708-08-91

UK - Wokingham
Tel: 44-118-921-5869
Fax: 44-118-921-5820

09/10/07