





# 24AAXX/24LCXX/24FCXX

**TABLE 1-1: DEVICE SELECTION TABLE (CONTINUED)**

| Part Number           | Vcc Range | Max. Clock Frequency   | Page Size | Write-Protect Scheme | Functional Address Pins | Temp. Range | Packages <sup>(5)</sup> |
|-----------------------|-----------|------------------------|-----------|----------------------|-------------------------|-------------|-------------------------|
| <b>128 Kb devices</b> |           |                        |           |                      |                         |             |                         |
| 24AA128               | 1.7-5.5V  | 400 kHz <sup>(2)</sup> | 64 bytes  | Entire Array         |                         |             |                         |













# 24AAXX/24LCXX/24FCXX

## 3.0 PIN DESCRIPTIONS

The descriptions of the pins are listed in Table 3-1.

**TABLE 3-1: PIN FUNCTION TABLE**

| Pin Name | 8-Pin PDIP and SOIC | 8-Pin TSSOP and MSOP | 5-Pin SOT-23 24XX00 | 5-Pin SOT-23 All except 24XX00 | 14-Pin TSSOP        | 8-Pin 5x6 DFN and 2x3 DFN | Function                                     |
|----------|---------------------|----------------------|---------------------|--------------------------------|---------------------|---------------------------|----------------------------------------------|
| A0       | 1                   | 1 <sup>(1)</sup>     | —                   | —                              | 1                   | 1                         | User configurable Chip Select <sup>(3)</sup> |
| A1       | 2                   | 2 <sup>(1)</sup>     | —                   | —                              | 2                   | 2                         | User configurable Chip Select <sup>(3)</sup> |
| A2       | 3                   | 3                    | —                   | —                              | 6                   | 3                         | User configurable Chip Select <sup>(3)</sup> |
| Vss      | 4                   | 4                    | 2                   | 2                              | 7                   | 4                         | Ground                                       |
| SDA      | 5                   | 5                    | 3                   | 3                              | 8                   | 5                         | Serial Data                                  |
| SCL      | 6                   | 6                    | 1                   | 1                              | 9                   | 6                         | Serial Clock                                 |
| (NC)     | —                   | —                    | 4                   | —                              | 3, 4, 5, 10, 11, 12 | —                         | Not Connected                                |
| WP       | 7 <sup>(2)</sup>    | 7 <sup>(2)</sup>     | —                   | 5                              | 13                  | 7                         | Write-Protect Input                          |
| Vcc      | 8                   | 8                    | 5                   | 4                              | 14                  | 8                         | Power Supply                                 |

- Note** 1: Pins 1 and 2 are not connected for the 24XX128 and 24XX256 MSOP packages.  
2: Pin 7 is not used for 24XX00, 24XX025 and 24C01C.  
3: Pins A0, A1 and A2 are not used by some devices (no internal connections). See Table 1-1 for details.

### 3.1 A0, A1, A2 Chip Address Inputs

The A0, A1 and A2 pins are not used by the 24XX01 through 24XX16 devices.

The A0, A1 and A2 inputs are used by the 24C01C, 24C02C, 24XX014, 24XX024, 24XX025 and the 24XX32 through 24XX512 for multiple device operations. The levels on these inputs are compared with the corresponding bits in the slave address. The chip is selected if the compare is true.

For the 24XX128 and 24XX256 in the MSOP package only, pins A0 and A1 are not connected.

Up to eight devices (two for the 24XX128 and 24XX256 MSOP package) may be connected to the same bus by using different Chip Select bit combinations.

In most applications, the chip address inputs A0, A1 and A2 are hard-wired to logic '0' or logic '1'. For applications in which these pins are controlled by a microcontroller or other programmable device, the chip address pins must be driven to logic '0' or logic '1' before normal device operation can proceed.

### 3.2 Serial Data (SDA)

This is a bidirectional pin used to transfer addresses and data into and out of the device. It is an open drain terminal. Therefore, the SDA bus requires a pull-up resistor to Vcc (typical 10 kΩ for 100 kHz, 2 kΩ for 400 kHz and 1 MHz).

For normal data transfer, SDA is allowed to change only during SCL low. Changes during SCL high are reserved for indicating the Start and Stop conditions.

### 3.3 Serial Clock (SCL)

This input is used to synchronize the data transfer to and from the device.

### 3.4 Write-Protect (WP)

This pin must be connected to either Vss or Vcc. If tied to Vss, write operations are enabled. If tied to Vcc, write operations are inhibited but read operations are not affected. See Table 1-1 for the write-protect scheme of each device.

### 3.5 Power Supply (Vcc)

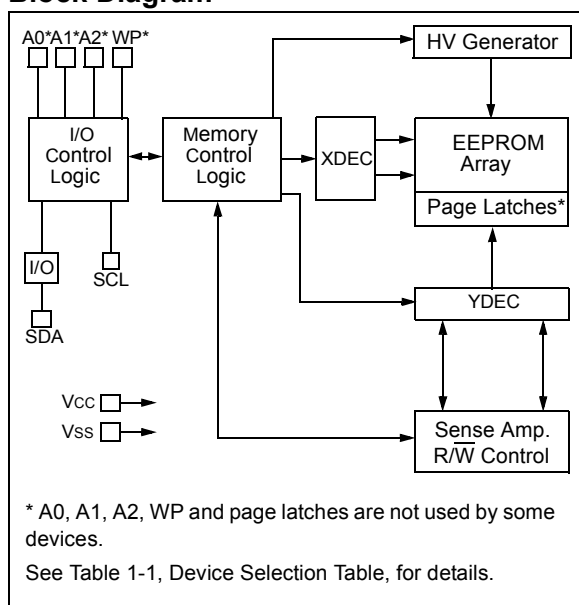
A Vcc threshold detect circuit is employed which disables the internal erase/write logic if Vcc is below 1.5V at nominal conditions. For the 24C00, 24C01C and 24C02C devices, the erase/write logic is disabled below 3.8V at nominal conditions.

# 24AXX/24LCXX/24FCXX

## 4.0 FUNCTIONAL DESCRIPTION

Each 24XX device supports a bidirectional, 2-wire bus and data transmission protocol. A device that sends data onto the bus is defined as a transmitter, while a device receiving data is defined as a receiver. The bus has to be controlled by a master device which generates the Serial Clock (SCL), controls the bus access and generates the Start and Stop conditions, while the 24XX works as slave. Both master and slave can operate as transmitter or receiver, but the master device determines which mode is activated.

### Block Diagram



## 5.0 BUS CHARACTERISTICS

The following **bus protocol** has been defined:

- Data transfer may be initiated only when the bus is not busy.
- During data transfer, the data line must remain stable whenever the clock line is high. Changes in the data line while the clock line is high will be interpreted as a Start or Stop condition.

Accordingly, the following bus conditions have been defined (Figure 5-1).

### 5.1 Bus Not Busy (A)

Both data and clock lines remain high.

### 5.2 Start Data Transfer (B)

A high-to-low transition of the SDA line while the clock (SCL) is high determines a Start condition. All commands must be preceded by a Start condition.

### 5.3 Stop Data Transfer (C)

A low-to-high transition of the SDA line while the clock (SCL) is high determines a Stop condition. All operations must be ended with a Stop condition.

### 5.4 Data Valid (D)

The state of the data line represents valid data when, after a Start condition, the data line is stable for the duration of the high period of the clock signal.

The data on the line must be changed during the low period of the clock signal. There is one clock pulse per bit of data.

Each data transfer is initiated with a Start condition and terminated with a Stop condition. The number of data bytes transferred between Start and Stop conditions is determined by the master device.

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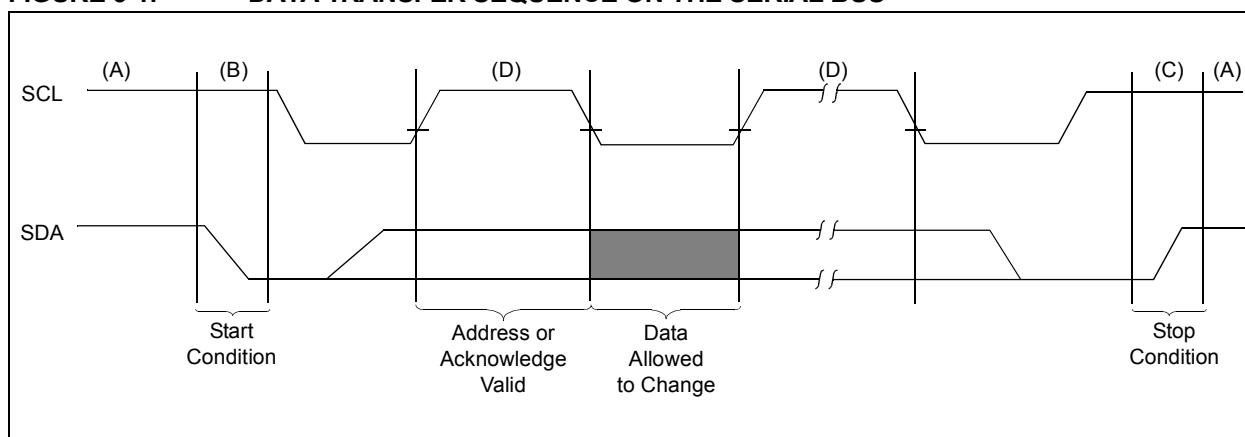
## 5.5 Acknowledge

Each receiving device, when addressed, is obliged to generate an acknowledge after the reception of each byte. The master device must generate an extra clock pulse which is associated with this Acknowledge bit.

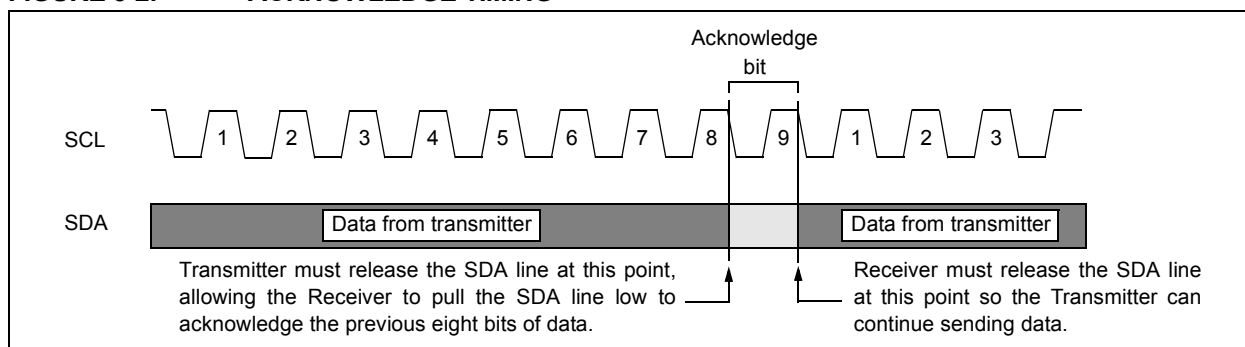
**Note:** During a write cycle, the 24XX will not acknowledge commands.

The device that acknowledges has to pull down the SDA line during the acknowledge clock pulse in such a way that the SDA line is stable low during the high period of the acknowledge related clock pulse. Of course, setup and hold times must be taken into account. During reads, a master must signal an end-of-data to the slave by not generating an Acknowledge bit on the last byte that has been clocked out of the slave. In this case, the slave (24XX) will leave the data line high to enable the master to generate the Stop condition (Figure 5-2).

**FIGURE 5-1: DATA TRANSFER SEQUENCE ON THE SERIAL BUS**



**FIGURE 5-2: ACKNOWLEDGE TIMING**



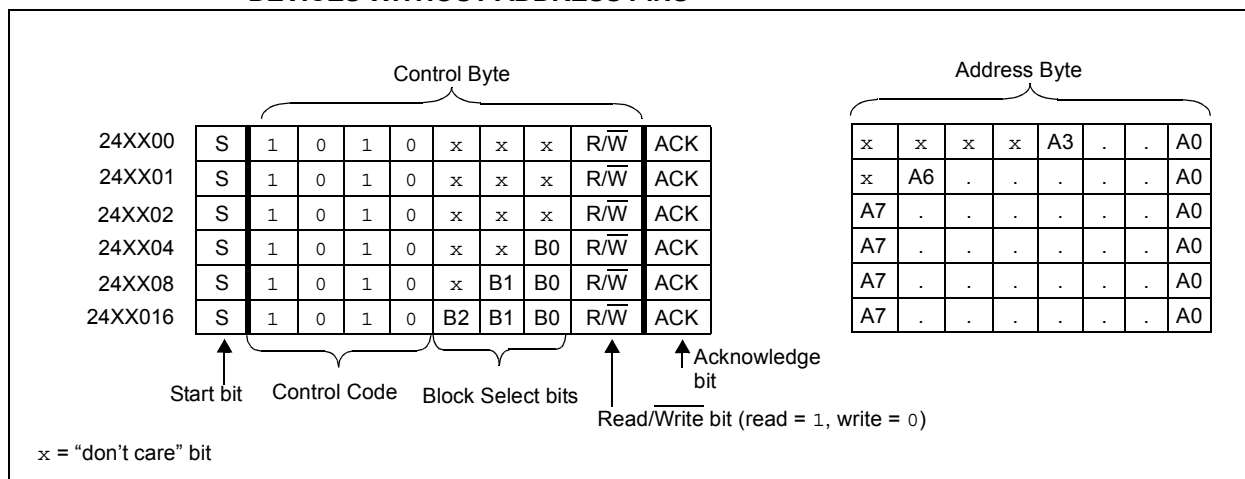
# 24AAXX/24LCXX/24FCXX

## 5.6 Device Addressing For Devices Without Functional Address Pins

A control byte is the first byte received following the Start condition from the master device (Figure 5-3). The control byte begins with a four-bit control code. For the 24XX, this is set as '1010' binary for read and write operations. The next three bits of the control byte are the block-select bits (B2, B1, B0). They are used by the master device to select which of the 256-word blocks of memory are to be accessed. These bits are in effect the three Most Significant bits of the word address. Note that B2, B1 and B0 are "don't care" for the 24XX00, the 24XX01 and 24XX02. B2 and B1 are "don't care" for the 24XX04. B2 is "don't care" for the 24XX08. B2 is "don't care" for the 24XX04. B2 is "don't care" for the 24XX08.

The last bit of the control byte defines the operation to be performed. When set to '1', a read operation is selected. When set to '0' a write operation is selected. Following the Start condition, the 24XX monitors the SDA bus. Upon receiving a '1010' code, the block select bits and the R/W bit, the slave device outputs an Acknowledge signal on the SDA line. The address byte follows the acknowledge.

**FIGURE 5-3: CONTROL AND ADDRESS BYTE ASSIGNMENTS FOR DEVICES WITHOUT ADDRESS PINS**



# 24AAXX/24LCXX/24FCXX

## 5.7 Device Addressing For Devices With Functional Address Pins

A control byte is the first byte received following the Start condition from the master device (Figure 5-4). The control byte begins with a 4-bit control code. For the 24XX, this is set as '1010' binary for read and write operations. The next three bits of the control byte are the Chip Select bits (A2, A1, A0). The Chip Select bits allow the use of up to eight 24XX devices on the same bus and are used to select which device is accessed. The Chip Select bits in the control byte must correspond to the logic levels on the corresponding A2, A1 and A0 pins for the device to respond. These bits are, in effect, the three Most Significant bits of the word address.

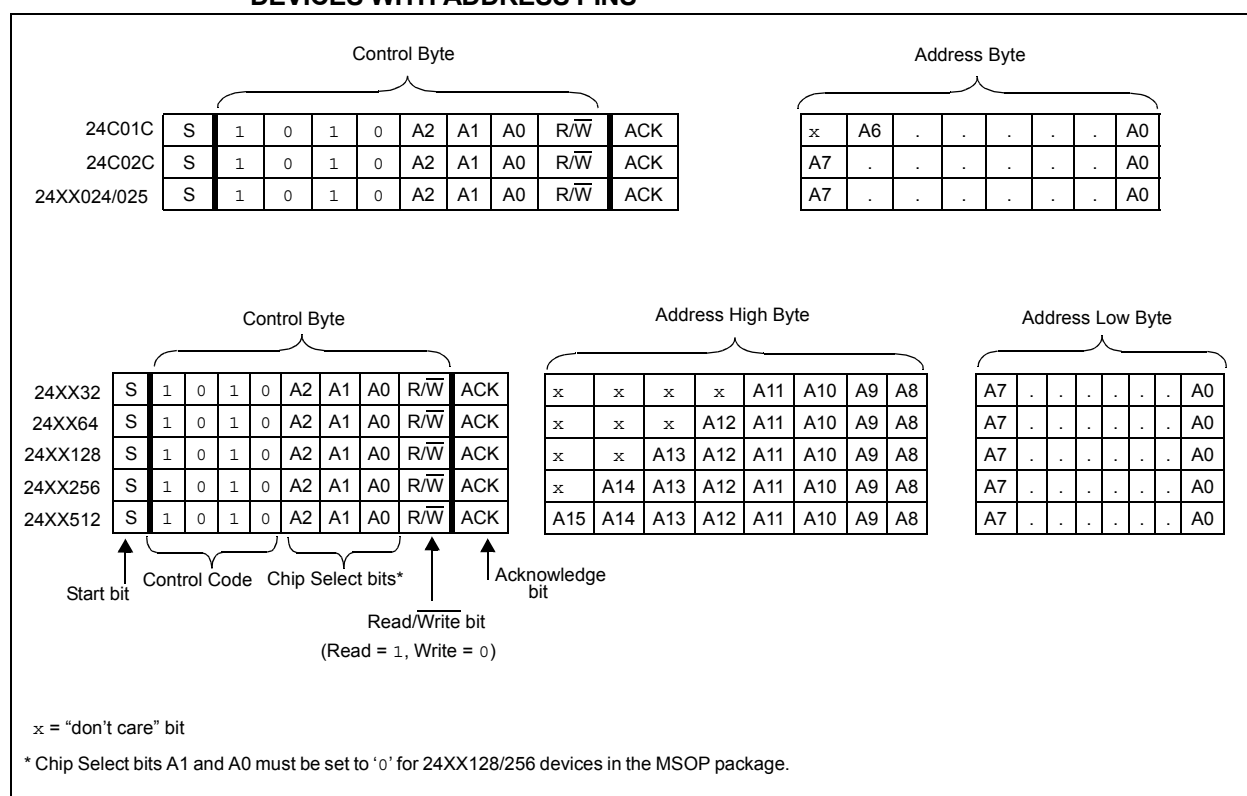
For 24XX128 and 24XX256 in the MSOP package, the A0 and A1 pins are not connected. During device addressing, the A0 and A1 Chip Select bits (Figure 5-4) should be set to '0'. Only two 24XX128 or 24XX256 MSOP packages can be connected to the same bus.

The last bit of the control byte defines the operation to be performed. When set to a '1', a read operation is selected. When set to a '0', a write operation is selected.

For higher density devices (24XX32 through 24XX512), the next two bytes received define the address of the first data byte. Depending on the product density, not all bits in the address high byte are used. A15, A14, A13 and A12 are "don't care" for 24XX32. A15, A14 and A13 are "don't care" for 24XX64. A15 and A14 are "don't care" for 24XX128. A15 is "don't care" for 24XX256. All address bits are used for the 24XX512. The upper address bits are transferred first, followed by the Less Significant bits.

Following the Start condition, the 24XX monitors the SDA bus. Upon receiving a '1010' code, appropriate device select bits and the R/W bit, the slave device outputs an Acknowledge signal on the SDA line. The address byte(s) follow the acknowledge.

**FIGURE 5-4: CONTROL AND ADDRESS BYTE ASSIGNMENTS FOR DEVICES WITH ADDRESS PINS**



## 24AAXX/24LCXX/24FCXX

### 5.7.1 CONTIGUOUS ADDRESSING ACROSS MULTIPLE DEVICES

Chip Select bits A2, A1 and A0 can be used to expand the contiguous address space by adding up to eight 24XXs on the same bus. Software can use the three address bits of the control byte as the three Most Significant bits of the address byte. For example, in the 24XX32 devices, software can use A0 of the **control byte** as address bit A12; A1 as address bit A13; and A2 as address bit A14 (Table 5-1). It is not possible to sequentially read across device boundaries.

**TABLE 5-1: CONTROL BYTE ADDRESS BITS**

|                  | Maximum<br>Devices | Maximum<br>Contiguous<br>Address Space | Chip Select Bit<br>A2 | Chip Select Bit<br>A1 | Chip Select Bit<br>A0 |
|------------------|--------------------|----------------------------------------|-----------------------|-----------------------|-----------------------|
| 1K (24C01C)      | 8                  | 8 Kb                                   | A10                   | A9                    | A8                    |
| 1K (24XX014)     | 8                  | 8 Kb                                   | A10                   | A9                    | A8                    |
| 2K (24C02C)      | 8                  | 16 Kb                                  | A10                   | A9                    | A8                    |
| 2K (24XX024/025) | 8                  | 16 Kb                                  | A10                   | A9                    | A8                    |
| 32K (24XX32)     | 8                  | 256 Kb                                 | A14                   | A13                   | A12                   |
| 64K (24XX64)     | 8                  | 512 Kb                                 | A15                   | A14                   | A13                   |
| 128K (24XX128)   | 8*                 | 1 Mb                                   | A16*                  | A15*                  | A14                   |
| 256K (24XX256)   | 8*                 | 2 Mb                                   | A17*                  | A16*                  | A15                   |
| 512K (24XX512)   | 8                  | 4 Mb                                   | A18                   | A17                   | A16                   |

\* Up to two 24XX128 or 24XX256 devices in the MSOP package can be added for up to 256 kb or 512 kb of address space, respectively. Bits A0 and A1 must be set to '0'.

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## 6.0 WRITE OPERATIONS

### 6.1 Byte Write

A byte write operation begins with a Start condition from the master followed by the four-bit control code (see Figure 6-1 and Figure 6-2). The next 3 bits are either the Block Address bits (for devices without address pins) or the Chip Select bits (for devices with address pins). Then the master transmits the R/W bit (which is a logic low) onto the bus. The slave then generates an Acknowledge bit during the ninth clock cycle.

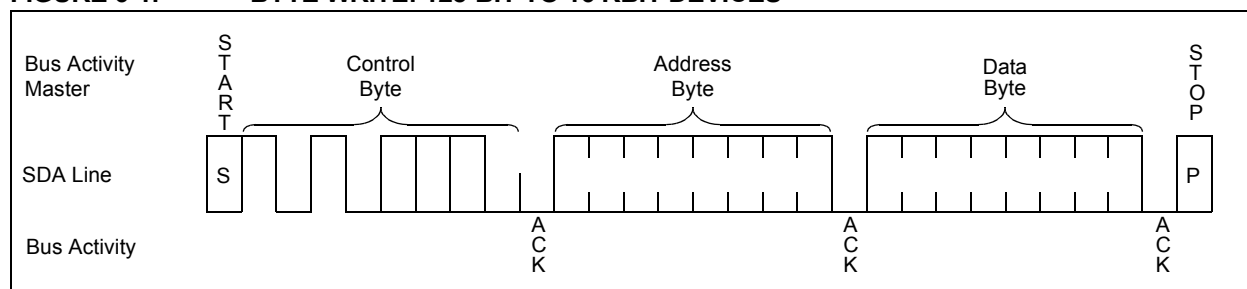
The next byte transmitted by the master is the address byte (for 128-bit to 16 Kbit devices) or the high-order address byte (for 32-512 Kbit devices). For 32 through 512 Kbit devices, the high-order address byte is followed by the low-order address byte. In either case, each address byte is acknowledged by the 24XX and the address bits are latched into the internal address counter of the 24XX.

For the 24XX00 devices, only the lower four address bits are used by the device. The upper four bits are "don't cares."

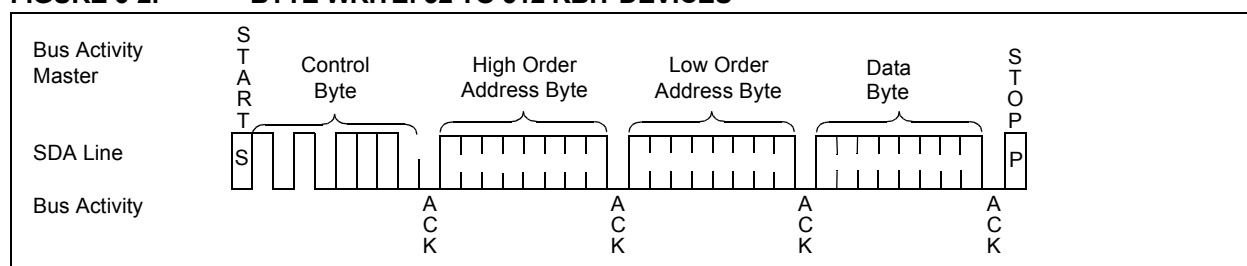
After receiving the ACK from the 24XX acknowledging the final address byte, the master device transmits the data word to be written into the addressed memory location. The 24XX acknowledges again and the master generates a Stop condition, which initiates the internal write cycle.

If an attempt is made to write to an array with the WP pin held high, the device will acknowledge the command, but no write cycle will occur, no data will be written, and the device will immediately accept a new command. After a byte Write command, the internal address counter will increment to the next address location. During a write cycle, the 24XX will not acknowledge commands.

**FIGURE 6-1: BYTE WRITE: 128-BIT TO 16 KBIT DEVICES**



**FIGURE 6-2: BYTE WRITE: 32 TO 512 KBIT DEVICES**





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## 6.2 Page Write

The write control byte, word address byte(s), and the first data byte are transmitted to the 24XX in much the same way as in a byte write (see Figure 6-3 and Figure 6-4). The exception is that instead of generating a Stop condition, the master transmits up to one page of bytes<sup>(1)</sup>, which is temporarily stored in the on-chip page buffer. This data is then written into memory once the master has transmitted a Stop condition. Upon receipt of each word, the internal address counter is incremented by one. If the master should transmit more than one page of data prior to generating the Stop condition, the address counter will roll over and the previously received data will be overwritten. As with the byte write operation, once the Stop condition is received, an internal write cycle begins. During the write cycle, the 24XX will not acknowledge commands.

Page writes can be any number of bytes within a page (up to the page size), starting at any address. Only the data bytes being addressed will be changed within the page.

If an attempt is made to write to the array with the WP pin held high, the device will acknowledge the command, but no write cycle will occur, no data will be written and the device will immediately accept a new command.

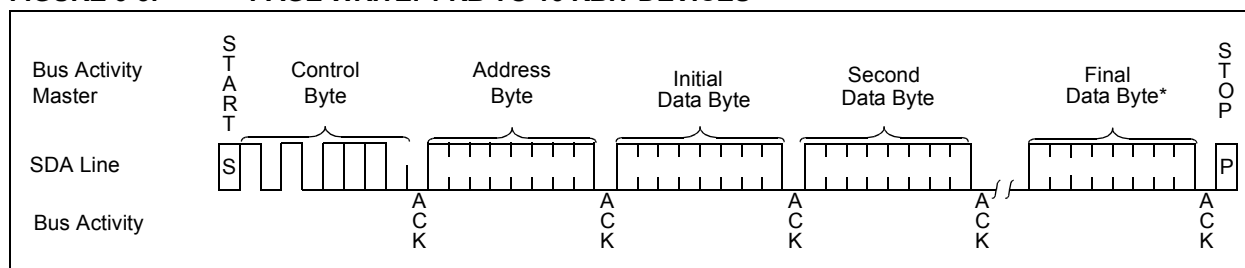
**Note 1:** See Device Selection Table 1-1 for the page size of each device.

## 6.3 Write-Protection

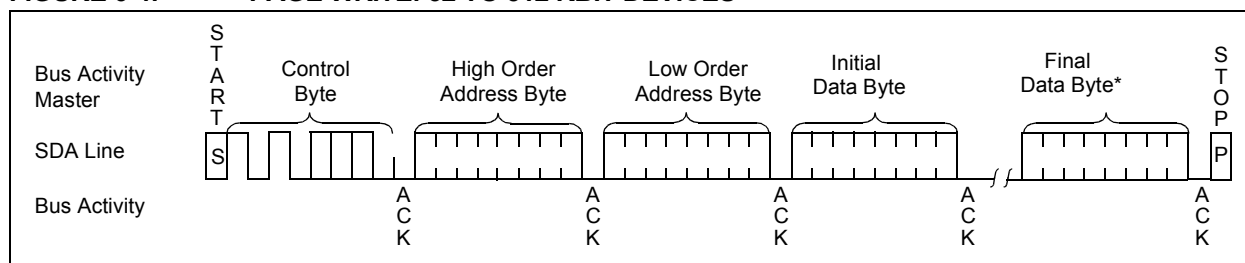
The WP pin allows the user to write-protect the array when the pin is tied to VCC. See Device Selection Table 1-1 for the write-protect scheme of each device. If tied to Vss, the write protection is disabled. The WP pin is sampled prior to the Stop bit for every Write command (Figure 2-1). Toggling the WP pin after the Stop bit will have no effect on the execution of the write cycle.

**Note:** Page write operations are limited to writing bytes within a single physical page, **regardless** of the number of bytes actually being written. Physical page boundaries start at addresses that are integer multiples of the page buffer size (or 'page size') and end at addresses that are integer multiples of [page size - 1]. If a Page Write command attempts to write across a physical page boundary, the result is that the data wraps around to the beginning of the current page (overwriting data previously stored there), instead of being written to the next page, as might be expected. It is therefore necessary for the application software to prevent page write operations that would attempt to cross a page boundary.

**FIGURE 6-3: PAGE WRITE: 1 KB TO 16 KBIT DEVICES**



**FIGURE 6-4: PAGE WRITE: 32 TO 512 KBIT DEVICES**



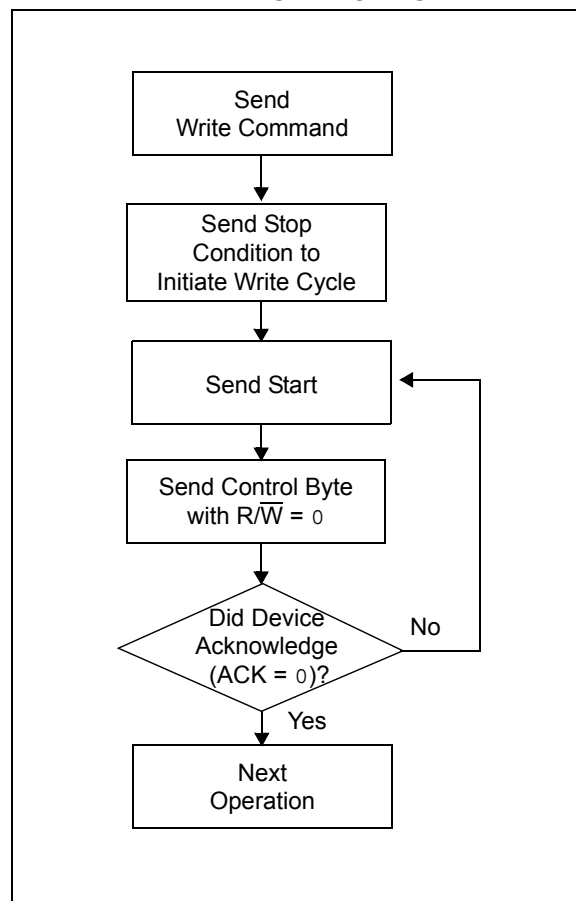
\* See Table 1-1 for maximum number of data bytes in a page.

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## 7.0 ACKNOWLEDGE POLLING

Since the device will not acknowledge commands during a write cycle, this can be used to determine when the cycle is complete (This feature can be used to maximize bus throughput). Once the Stop condition for a Write command has been issued from the master, the device initiates the internally timed write cycle. ACK polling can be initiated immediately. This involves the master sending a Start condition, followed by the control byte for a Write command ( $R/\overline{W} = 0$ ). If the device is still busy with the write cycle, then no ACK will be returned. If no ACK is returned, the Start bit and control byte must be re-sent. If the cycle is complete, then the device will return the ACK and the master can then proceed with the next Read or Write command. See Figure 7-1 for flow diagram.

FIGURE 7-1: ACKNOWLEDGE POLLING FLOW



# 24AAXX/24LCXX/24FCXX

## 8.0 READ OPERATION

Read operations are initiated in much the same way as write operations with the exception that the R/W bit of the control byte is set to '1'. There are three basic types of read operations: current address read, random read and sequential read.

### 8.1 Current Address Read

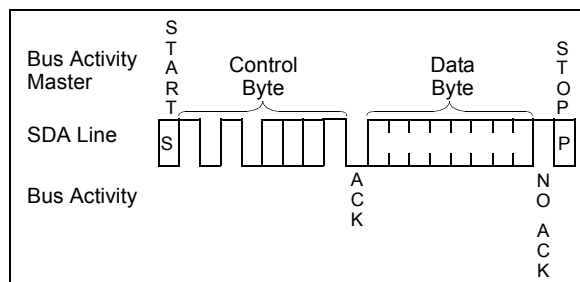
The 24XX contains an address counter that maintains the address of the last byte accessed, internally incremented by '1'. Therefore, if the previous read or write operation was to address 'n' (n is any legal address), the next current address read operation would access data from address  $n + 1$ .

Upon receipt of the control byte with  $\overline{R/W}$  bit set to '1', the 24XX issues an acknowledge and transmits the 8-bit data byte. The master will not acknowledge the transfer, but does generate a Stop condition and the 24XX discontinues transmission (Figure 8-1).

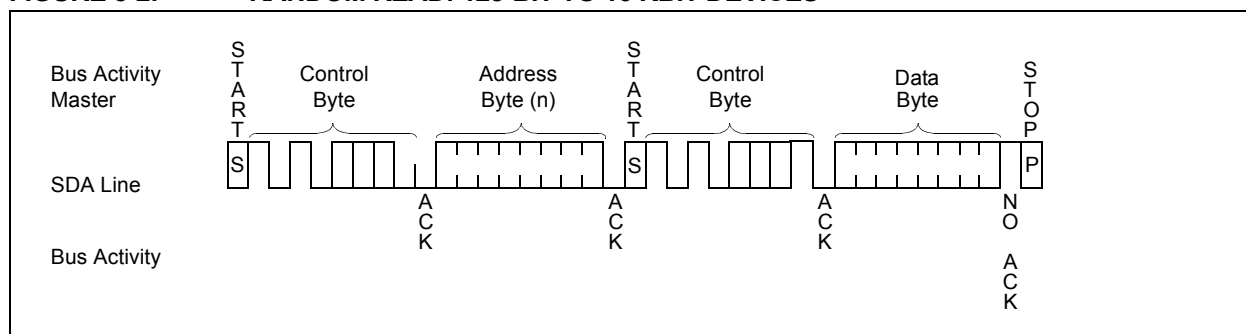
### 8.2 Random Read

Random read operations allow the master to access any memory location in a random manner. To perform this type of read operation, the byte address must first be set. This is done by sending the byte address to the 24XX as part of a write operation ( $\overline{R/W}$  bit set to '0'). Once the byte address is sent, the master generates a Start condition following the acknowledge. This terminates the write operation, but not before the internal address counter is set. The master then issues the control byte again, but with the  $\overline{R/W}$  bit set to a '1'. The 24XX will then issue an acknowledge and transmit the 8-bit data byte. The master will not acknowledge the transfer but does generate a Stop condition, which causes the 24XX to discontinue transmission (Figure 8-2 and Figure 8-3). After a random Read command, the internal address counter will increment to the next address location.

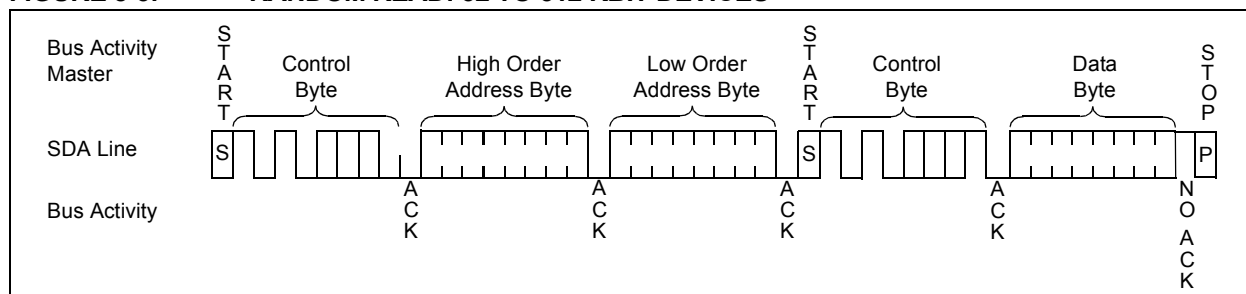
**FIGURE 8-1: CURRENT ADDRESS READ**



**FIGURE 8-2: RANDOM READ: 128-BIT TO 16 KBIT DEVICES**



**FIGURE 8-3: RANDOM READ: 32 TO 512 KBIT DEVICES**

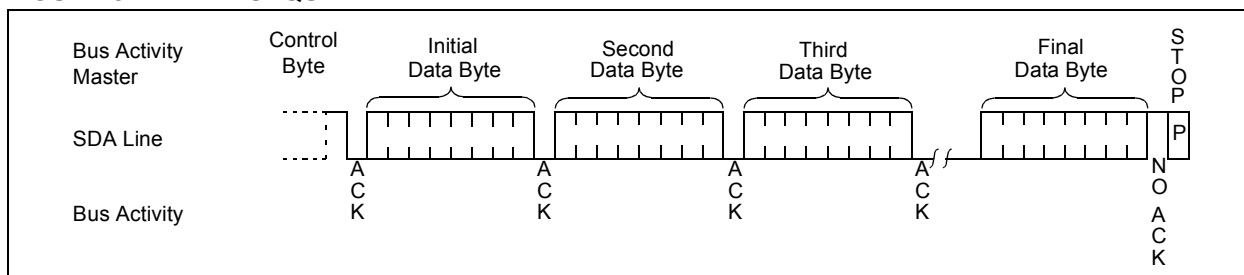


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### 8.3 Sequential Read

Sequential reads are initiated in the same way as a random read except that after the 24XX transmits the first data byte, the master issues an acknowledge as opposed to the Stop condition used in a random read. This acknowledge directs the 24XX to transmit the next sequentially addressed data byte (Figure 8-4). Following the final byte transmitted to the master, the master will NOT generate an acknowledge but will generate a Stop condition. To provide sequential reads, the 24XX contains an internal Address Pointer which is incremented by one at the completion of each operation. This Address Pointer allows the entire memory contents to be serially read during one operation. If the last address byte in the array is acknowledged, the Address Pointer will roll over to address 0x00.

**FIGURE 8-4: SEQUENTIAL READ**



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## APPENDIX A: REVISION HISTORY

### Revision A

Original release of document. Combined Serial EEPROM 24XXX device data sheets.

### Revision B (02/2007)

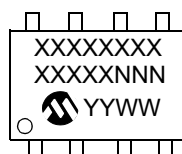
Change 1.8V to 1.7V; Removed 14-Lead TSSOP Package; Replaced Package Drawings; Revised Product ID Section. Updates throughout.

# 24AAXX/24LCXX/24FCXX

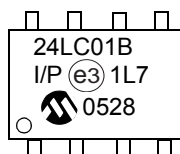
## 9.0 PACKAGING INFORMATION

### 9.1 Package Marking Information

8-Lead PDIP



Example: Pb-free



| 8-Lead PDIP Package Marking (Pb-free) |                |         |                |        |                |         |                |
|---------------------------------------|----------------|---------|----------------|--------|----------------|---------|----------------|
| Device                                | Line 1 Marking | Device  | Line 1 Marking | Device | Line 1 Marking | Device  | Line 1 Marking |
| 24AA00                                | 24AA00         | 24LC00  | 24LC00         | 24C00  | 24C00          |         |                |
| 24AA01                                | 24AA01         | 24LC01B | 24LC01B        |        |                |         |                |
| 24AA014                               | 24AA014        | 24LC014 | 24LC014        |        |                |         |                |
|                                       |                |         |                | 24C01C | 24C01C         |         |                |
| 24AA02                                | 24AA02         | 24LC02B | 24LC02B        |        |                |         |                |
| 24AA024                               | 24AA024        | 24LC024 | 24LC024        |        |                |         |                |
| 24AA025                               | 24AA025        | 24LC025 | 24LC025        |        |                |         |                |
|                                       |                |         |                | 24C02C | 24C02C         |         |                |
| 24AA04                                | 24AA04         | 24LC04B | 24LC04B        |        |                |         |                |
| 24AA08                                | 24AA08         | 24LC08B | 24LC08B        |        |                |         |                |
| 24AA16                                | 24AA16         | 24LC16B | 24LC16B        |        |                |         |                |
| 24AA32A                               | 24AA32A        | 24LC32A | 24LC32A        |        |                |         |                |
| 24AA64                                | 24AA64         | 24LC64  | 24LC64         |        |                | 24FC64  | 24FC64         |
| 24AA128                               | 24AA128        | 24LC128 | 24LC128        |        |                | 24FC128 | 24FC128        |
| 24AA256                               | 24AA256        | 24LC256 | 24LC256        |        |                | 24FC256 | 24FC256        |
| 24AA512                               | 24AA512        | 24LC512 | 24LC512        |        |                | 24FC512 | 24FC512        |

**Legend:** XX...X Part number or part number code  
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) plated devices

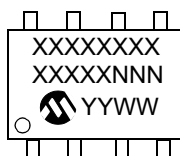
**Note:** For very small packages with no room for the Pb-free JEDEC designator (e3), the marking will only appear on the outer carton or reel label.

**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.

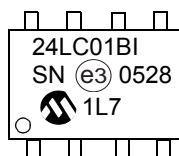
**Note:** Please visit [www.microchip.com/Pbfree](http://www.microchip.com/Pbfree) for the latest information on Pb-free conversion.

# 24AAXX/24LCXX/24FCXX

8-Lead SOIC



Example: Pb-free



| 8-Lead SOIC Package Marking (Pb-free) |                |         |                |        |                |         |                |
|---------------------------------------|----------------|---------|----------------|--------|----------------|---------|----------------|
| Device                                | Line 1 Marking | Device  | Line 1 Marking | Device | Line 1 Marking | Device  | Line 1 Marking |
| 24AA00                                | 24AA00T        | 24LC00  | 24LC00T        | 24C00  | 24C00T         |         |                |
| 24AA01                                | 24AA01T        | 24LC01B | 24LC01BT       |        |                |         |                |
| 24AA014                               | 24AA014T       | 24LC014 | 24LC014T       |        |                |         |                |
|                                       |                |         |                | 24C01C | 24C01CT        |         |                |
| 24AA02                                | 24AA02T        | 24LC02B | 24LC02BT       |        |                |         |                |
| 24AA024                               | 24AA024T       | 24LC024 | 24LC024T       |        |                |         |                |
| 24AA025                               | 24AA025T       | 24LC025 | 24LC025T       |        |                |         |                |
|                                       |                |         |                | 24C02C | 24C02CT        |         |                |
| 24AA04                                | 24AA04T        | 24LC04B | 24LC04BT       |        |                |         |                |
| 24AA08                                | 24AA08T        | 24LC08B | 24LC08BT       |        |                |         |                |
| 24AA16                                | 24AA16T        | 24LC16B | 24LC16BT       |        |                |         |                |
| 24AA32A                               | 24AA32AT       | 24LC32A | 24LC32AT       |        |                |         |                |
| 24AA64                                | 24AA64T        | 24LC64  | 24LC64T        |        |                | 24FC64  | 24FC64T        |
| 24AA128                               | 24AA128T       | 24LC128 | 24LC128T       |        |                | 24FC128 | 24FC128T       |
| 24AA256                               | 24AA256T       | 24LC256 | 24LC256T       |        |                | 24FC256 | 24FC256T       |
| 24AA512                               | 24AA512T       | 24LC512 | 24LC512T       |        |                | 24FC512 | 24FC512T       |

**Note:** T = Temperature range: I = Industrial, E = Extended

**Legend:** XX...X Part number or part number code  
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) plated devices

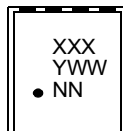
**Note:** For very small packages with no room for the Pb-free JEDEC designator (e3), the marking will only appear on the outer carton or reel label.

**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.

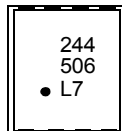
**Note:** Please visit [www.microchip.com/Pbfree](http://www.microchip.com/Pbfree) for the latest information on Pb-free conversion.

# 24AAXX/24LCXX/24FCXX

8-Lead 2x3 DFN



Example:



| 8-Lead 2x3mm DFN Package Marking (Pb-free) |                           |         |                           |                       |        |                           |                       |
|--------------------------------------------|---------------------------|---------|---------------------------|-----------------------|--------|---------------------------|-----------------------|
| Device                                     | Industrial Line 1 Marking | Device  | Industrial Line 1 Marking | E-Temp Line 1 Marking | Device | Industrial Line 1 Marking | E-Temp Line 1 Marking |
| 24AA00                                     | 201                       | 24LC00  | 204                       | 205                   | 24C00  | 207                       | 208                   |
| 24AA01                                     | 211                       | 24LC01B | 214                       | 215                   |        |                           |                       |
| 24AA014                                    | 2N1                       | 24LC014 | 2N4                       | 2N5                   |        |                           |                       |
|                                            |                           |         |                           |                       | 24C01C | 2N7                       | 2N8                   |
| 24AA02                                     | 221                       | 24LC02B | 224                       | 225                   |        |                           |                       |
| 24AA024                                    | 2P1                       | 24LC024 | 2P4                       | 2P5                   |        |                           |                       |
| 24AA025                                    | 2R1                       | 24LC025 | 2R4                       | 2R5                   |        |                           |                       |
|                                            |                           |         |                           |                       | 24C02C | 2P7                       | 2P8                   |
| 24AA04                                     | 231                       | 24LC04B | 234                       | 235                   |        |                           |                       |
| 24AA08                                     | 241                       | 24LC08B | 244                       | 245                   |        |                           |                       |
| 24AA16                                     | 251                       | 24LC16B | 254                       | 255                   |        |                           |                       |
| 24AA32A                                    | 261                       | 24LC32A | 264                       | 265                   |        |                           |                       |
| 24AA64                                     | 271                       | 24LC64  | 274                       | 275                   | 24FC64 | 27A                       | 27B                   |

**Legend:** XX...X Part number or part number code  
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) plated devices

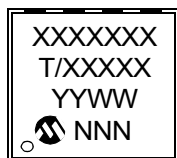
**Note:** For very small packages with no room for the Pb-free JEDEC designator (e3), the marking will only appear on the outer carton or reel label.

**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.

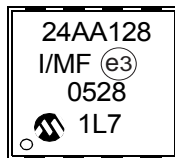


# 24AAXX/24LCXX/24FCXX

8-Lead DFN



Example: Pb-free



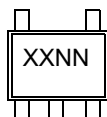
| 8-Lead 5x6mm DFN Package Marking (Pb-free) |                |         |                |         |                |
|--------------------------------------------|----------------|---------|----------------|---------|----------------|
| Device                                     | Line 1 Marking | Device  | Line 1 Marking | Device  | Line 1 Marking |
| 24AA128                                    | 24AA128        | 24LC128 | 24LC128        | 24FC128 | 24FC128        |
| 24AA256                                    | 24AA256        | 24LC256 | 24LC256        | 24FC256 | 24FC256        |
| 24AA512                                    | 24AA512        | 24LC512 | 24LC512        | 24FC512 | 24FC512        |

**Note:** Temperature range (T) listed on second line. I = Industrial, E = Extended

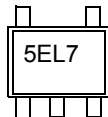
|                |                                                                                                                                                                                                         |                                                                  |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| <b>Legend:</b> | XX...X                                                                                                                                                                                                  | Part number or part number code                                  |
|                | 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) plated devices       |
| <b>Note:</b>   | 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.                                                             |                                                                  |
| <b>Note:</b>   | 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. |                                                                  |

# 24AXX/24LCXX/24FCXX

5-Lead SOT-23



Example:



| 5-Lead SOT-23 Package Marking (Pb-free) |               |                 |         |               |                 |                |        |               |                 |                |  |
|-----------------------------------------|---------------|-----------------|---------|---------------|-----------------|----------------|--------|---------------|-----------------|----------------|--|
| Device                                  | Comm. Marking | Indust. Marking | Device  | Comm. Marking | Indust. Marking | E-Temp Marking | Device | Comm. Marking | Indust. Marking | E-Temp Marking |  |
| 24AA00                                  | A0NN          | B0NN            | 24LC00  | L0NN          | M0NN            | N0NN           | 24C00  | C0NN          | D0NN            | E0NN           |  |
| 24AA01                                  | A1NN          | B1NN            | 24LC01B | L1NN          | M1NN            | N1NN           |        |               |                 |                |  |
| 24AA02                                  | A2NN          | B2NN            | 24LC02B | L2NN          | M2NN            | N2NN           |        |               |                 |                |  |
| 24AA04                                  | A3NN          | B3NN            | 24LC04B | L3NN          | M3NN            | N3NN           |        |               |                 |                |  |
| 24AA08                                  | A4NN          | B4NN            | 24LC08B | L4NN          | M4NN            | N4NN           |        |               |                 |                |  |
| 24AA16                                  | A5NN          | B5NN            | 24LC16B | L5NN          | M5NN            | N5NN           |        |               |                 |                |  |

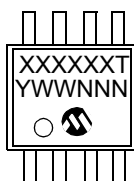
**Legend:** XX...X Part number or part number code  
Y Year code (last digit of calendar year)  
YY Year code (last 2 digits of calendar year)  
WW Week code (week of January 1 is week '01')  
NNN Alphanumeric traceability code (2 characters for small packages)  
(e3) Pb-free JEDEC designator for Matte Tin (Sn) plated devices

**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.

# 24AAXX/24LCXX/24FCXX

8-Lead MSOP (150 mil)



Example:



| 8-Lead MSOP Package Marking (Pb-free) |                |         |                |        |                |         |                |
|---------------------------------------|----------------|---------|----------------|--------|----------------|---------|----------------|
| Device                                | Line 1 Marking | Device  | Line 1 Marking | Device | Line 1 Marking | Device  | Line 1 Marking |
| 24AA01                                | 4A01T          | 24LC01B | 4L1BT          |        |                |         |                |
| 24AA014                               | 4A14T          | 24LC014 | 4L14T          |        |                |         |                |
|                                       |                |         |                | 24C01C | 4C1CT          |         |                |
| 24AA02                                | 4A02T          | 24LC02B | 4L2BT          |        |                |         |                |
| 24AA024                               | 4A24T          | 24LC024 | 4L24T          |        |                |         |                |
| 24AA025                               | 4A25T          | 24LC025 | 4L25T          |        |                |         |                |
|                                       |                |         |                | 24C02C | 4C2CT          |         |                |
| 24AA04                                | 4A04T          | 24LC04B | 4L4BT          |        |                |         |                |
| 24AA08                                | 4A08T          | 24LC08B | 4L8BT          |        |                |         |                |
| 24AA16                                | 4A16T          | 24LC16B | 4L16T          |        |                |         |                |
| 24AA32A                               | 4A32AT         | 24LC32A | 4L32AT         |        |                |         |                |
| 24AA64                                | 4A64T          | 24LC64  | 4L64T          |        |                | 24FC64  | 4F64T          |
| 24AA128                               | 4A128T         | 24LC128 | 4L128T         |        |                | 24FC128 | 4F128T         |
| 24AA256                               | 4A256T         | 24LC256 | 4L256T         |        |                | 24FC256 | 4F256T         |

**Note:** T = Temperature range: I = Industrial, E = Extended

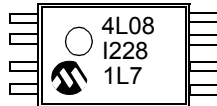
|                |                                                                                                                                                                                                         |                                                                  |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| <b>Legend:</b> | XX...X                                                                                                                                                                                                  | Part number or part number code                                  |
|                | 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) plated devices       |
| <b>Note:</b>   | 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.                                                             |                                                                  |
| <b>Note:</b>   | 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. |                                                                  |

# 24AAXX/24LCXX/24FCXX

8-Lead TSSOP



Example:



| 8-Lead TSSOP Package Marking (Pb-free) |                |         |                |        |                |         |                |
|----------------------------------------|----------------|---------|----------------|--------|----------------|---------|----------------|
| Device                                 | Line 1 Marking | Device  | Line 1 Marking | Device | Line 1 Marking | Device  | Line 1 Marking |
| 24AA00                                 | 4A00           | 24LC00  | 4L00           | 24C00  | 4C00           |         |                |
| 24AA01                                 | 4A01           | 24LC01B | 4L1B           |        |                |         |                |
| 24AA014                                | 4A14           | 24LC014 | 4L14           |        |                |         |                |
|                                        |                |         |                | 24C01C | 4C1C           |         |                |
| 24AA02                                 | 4A02           | 24LC02B | 4L02           |        |                |         |                |
| 24AA024                                | 4A24           | 24LC024 | 4L24           |        |                |         |                |
| 24AA025                                | 4A25           | 24LC025 | 4L25           |        |                |         |                |
|                                        |                |         |                | 24C02C | 4C2C           |         |                |
| 24AA04                                 | 4A04           | 24LC04B | 4L04           |        |                |         |                |
| 24AA08                                 | 4A08           | 24LC08B | 4L08           |        |                |         |                |
| 24AA16                                 | 4A16           | 24LC16B | 4L16           |        |                |         |                |
| 24AA32A                                | 4AA            | 24LC32A | 4LA            |        |                |         |                |
| 24AA64                                 | 4AB            | 24LC64  | 4LB            |        |                | 24FC64  | 4FB            |
| 24AA128                                | 4AC            | 24LC128 | 4LC            |        |                | 24FC128 | 4FC            |
| 24AA256                                | 4AD            | 24LC256 | 4LD            |        |                | 24FC256 | 4FD            |

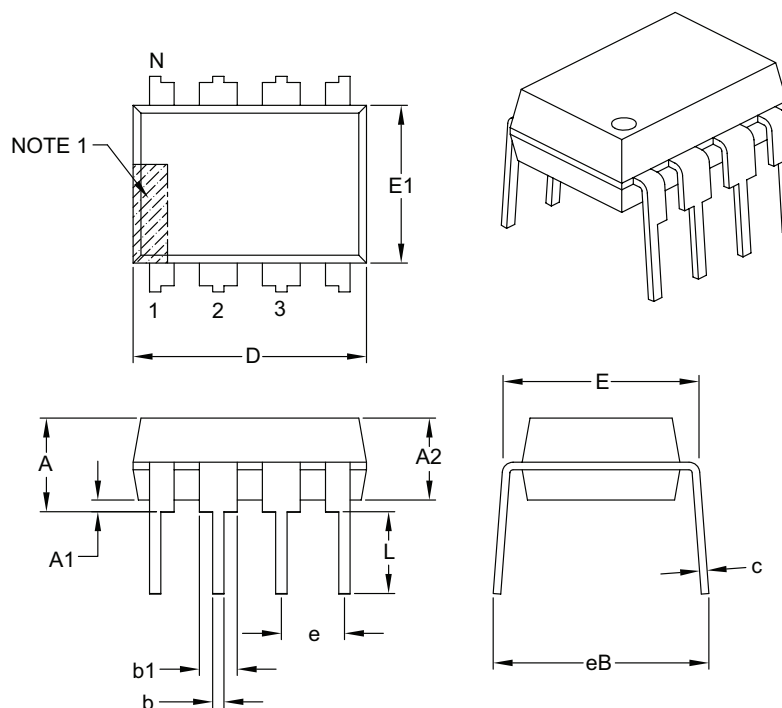
**Note:** T = Temperature range: I = Industrial, E = Extended

|                |                                                                                                                                                                                                         |                                                                  |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| <b>Legend:</b> | XX...X                                                                                                                                                                                                  | Part number or part number code                                  |
|                | 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) plated devices       |
| <b>Note:</b>   | 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.                                                             |                                                                  |
| <b>Note:</b>   | 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. |                                                                  |

# 24AAXX/24LCXX/24FCXX

## 8-Lead Plastic Dual In-Line (P or PA) – 300 mil Body [PDIP]

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



| Units                      |    | INCHES   |      |      |
|----------------------------|----|----------|------|------|
| Dimension Limits           |    | MIN      | NOM  | MAX  |
| Number of Pins             | N  | 8        |      |      |
| Pitch                      | e  | .100 BSC |      |      |
| Top to Seating Plane       | A  | –        | –    | .210 |
| Molded Package Thickness   | A2 | .115     | .130 | .195 |
| Base to Seating Plane      | A1 | .015     | –    | –    |
| Shoulder to Shoulder Width | E  | .290     | .310 | .325 |
| Molded Package Width       | E1 | .240     | .250 | .280 |
| Overall Length             | D  | .348     | .365 | .400 |
| Tip to Seating Plane       | L  | .115     | .130 | .150 |
| Lead Thickness             | c  | .008     | .010 | .015 |
| Upper Lead Width           | b1 | .040     | .060 | .070 |
| Lower Lead Width           | b  | .014     | .018 | .022 |
| Overall Row Spacing §      | eB | –        | –    | .430 |

**Notes:**

- Pin 1 visual index feature may vary, but must be located with the hatched area.
- § Significant Characteristic.
- Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
- Dimensioning and tolerancing per ASME Y14.5M.

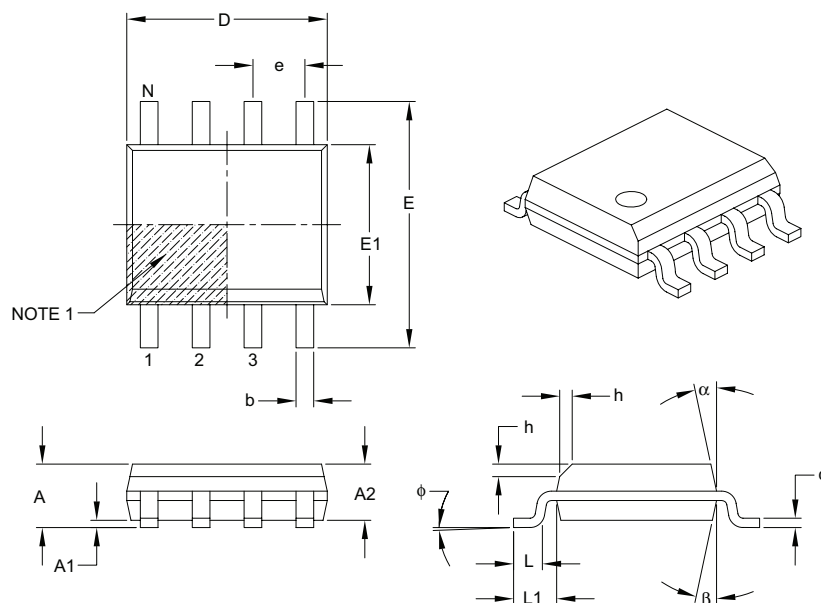
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-018B

# 24AXX/24LCXX/24FCXX

## 8-Lead Plastic Small Outline (SN or OA) – 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>



|                          |    | Units | MILLIMETERS |     |      |
|--------------------------|----|-------|-------------|-----|------|
| Dimension Limits         |    |       | 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.

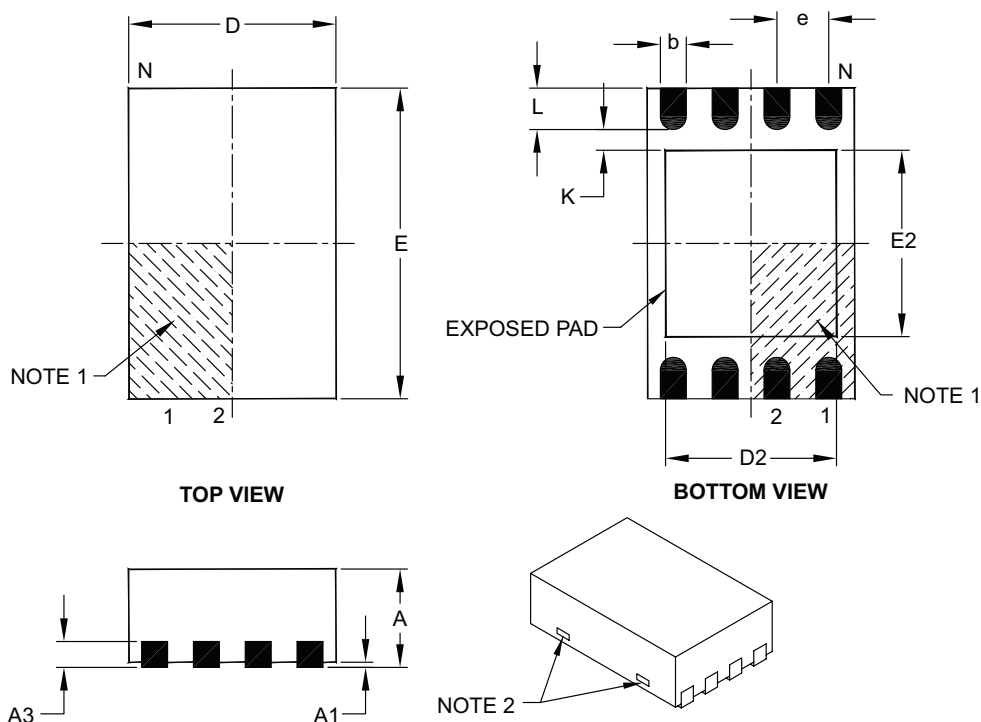
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-057B

# 24AAXX/24LCXX/24FCXX

## 8-Lead Plastic Dual Flat, No Lead Package (MC) – 2x3x0.9 mm Body [DFN]

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



| Units                  |    | MILLIMETERS |      |      |
|------------------------|----|-------------|------|------|
| Dimension Limits       |    | MIN         | NOM  | MAX  |
| Number of Pins         | N  | 8           |      |      |
| Pitch                  | e  | 0.50 BSC    |      |      |
| Overall Height         | A  | 0.80        | 0.90 | 1.00 |
| Standoff               | A1 | 0.00        | 0.02 | 0.05 |
| Contact Thickness      | A3 | 0.20 REF    |      |      |
| Overall Length         | D  | 2.00 BSC    |      |      |
| Overall Width          | E  | 3.00 BSC    |      |      |
| Exposed Pad Length     | D2 | 1.30        | –    | 1.75 |
| Exposed Pad Width      | E2 | 1.50        | –    | 1.90 |
| Contact Width          | b  | 0.18        | 0.25 | 0.30 |
| Contact Length         | L  | 0.30        | 0.40 | 0.50 |
| Contact-to-Exposed Pad | K  | 0.20        | –    | –    |

**Notes:**

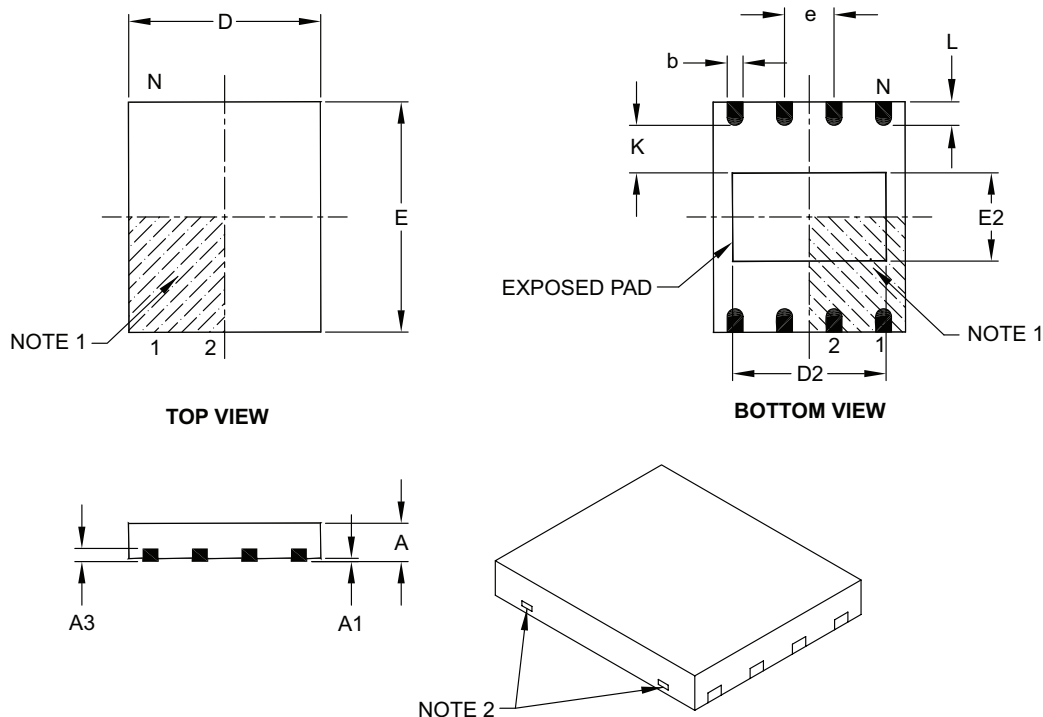
- Pin 1 visual index feature may vary, but must be located within the hatched area.
- Package may have one or more exposed tie bars at ends.
- Package is saw singulated.
- Dimensioning and tolerancing per ASME Y14.5M.  
BSC: Basic Dimension. Theoretically exact value shown without tolerances.  
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-123B

# 24AAXX/24LCXX/24FCXX

## 8-Lead Plastic Dual Flat, No Lead Package (MF) – 6x5 mm Body [DFN-S]

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



| Units                  |    | MILLIMETERS |      |      |
|------------------------|----|-------------|------|------|
| Dimension Limits       |    | MIN         | NOM  | MAX  |
| Number of Pins         | N  | 8           |      |      |
| Pitch                  | e  | 1.27 BSC    |      |      |
| Overall Height         | A  | 0.80        | 0.85 | 1.00 |
| Standoff               | A1 | 0.00        | 0.01 | 0.05 |
| Contact Thickness      | A3 | 0.20 REF    |      |      |
| Overall Length         | D  | 5.00 BSC    |      |      |
| Overall Width          | E  | 6.00 BSC    |      |      |
| Exposed Pad Length     | D2 | 3.90        | 4.00 | 4.10 |
| Exposed Pad Width      | E2 | 2.20        | 2.30 | 2.40 |
| Contact Width          | b  | 0.35        | 0.40 | 0.48 |
| Contact Length         | L  | 0.50        | 0.60 | 0.75 |
| Contact-to-Exposed Pad | K  | 0.20        | –    | –    |

**Notes:**

- Pin 1 visual index feature may vary, but must be located within the hatched area.
- Package may have one or more exposed tie bars at ends.
- Package is saw singulated.
- 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.

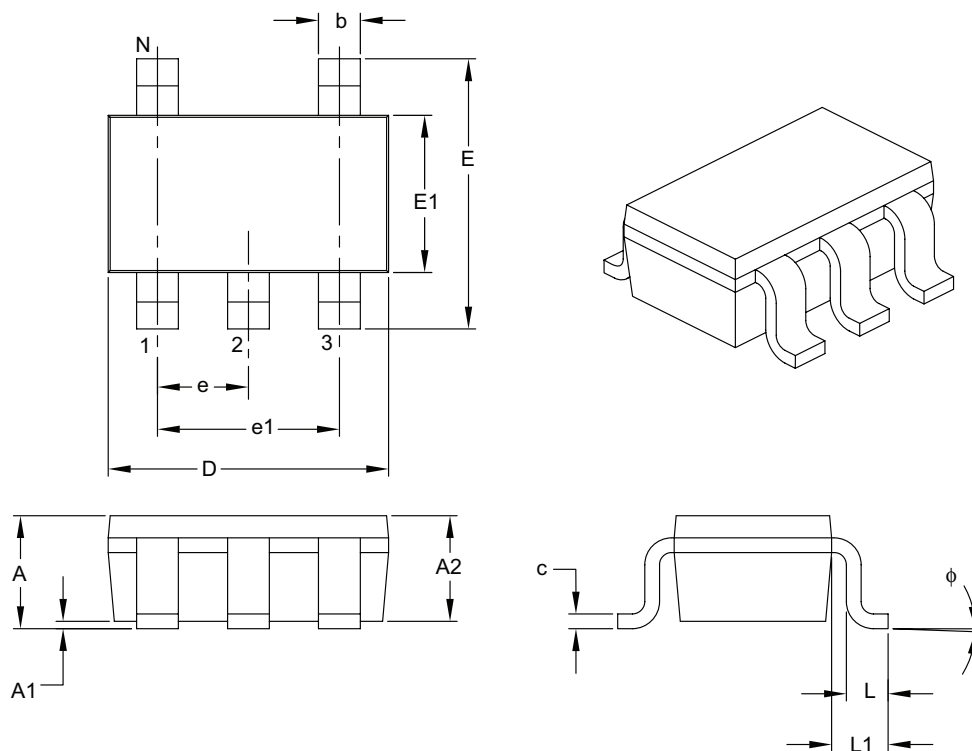
Microchip Technology Drawing C04-122B



# 24AAXX/24LCXX/24FCXX

## 5-Lead Plastic Small Outline Transistor (OT or CT) [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     | 5           |     |      |
| Lead 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:**

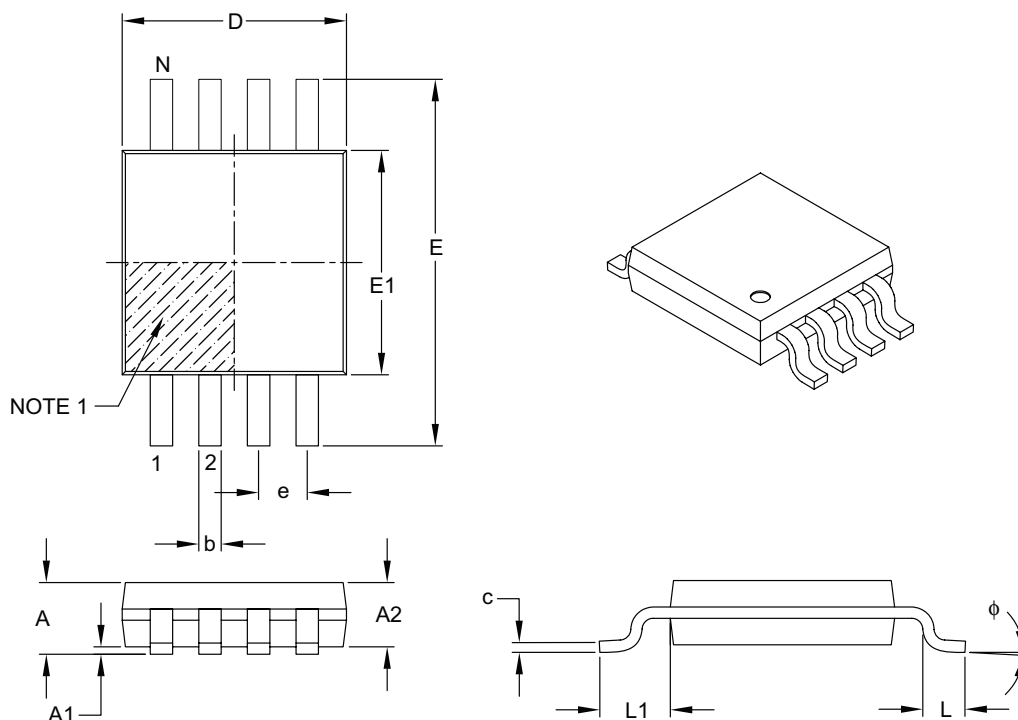
- Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.  
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-091B

# 24AAXX/24LCXX/24FCXX

## 8-Lead Plastic Micro Small Outline Package (MS or UA) [MSOP]

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



|                          |    | Units | MILLIMETERS |      |      |
|--------------------------|----|-------|-------------|------|------|
| Dimension Limits         |    |       | MIN         | NOM  | MAX  |
| Number of Pins           | N  |       | 8           |      |      |
| Pitch                    | e  |       | 0.65 BSC    |      |      |
| Overall Height           | A  |       | –           | –    | 1.10 |
| Molded Package Thickness | A2 |       | 0.75        | 0.85 | 0.95 |
| Standoff                 | A1 |       | 0.00        | –    | 0.15 |
| Overall Width            | E  |       | 4.90 BSC    |      |      |
| Molded Package Width     | E1 |       | 3.00 BSC    |      |      |
| Overall Length           | D  |       | 3.00 BSC    |      |      |
| Foot Length              | L  |       | 0.40        | 0.60 | 0.80 |
| Footprint                | L1 |       | 0.95 REF    |      |      |
| Foot Angle               | φ  |       | 0°          | –    | 8°   |
| Lead Thickness           | c  |       | 0.08        | –    | 0.23 |
| Lead Width               | b  |       | 0.22        | –    | 0.40 |

**Notes:**

- Pin 1 visual index feature may vary, but must be located within the hatched area.
- 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.

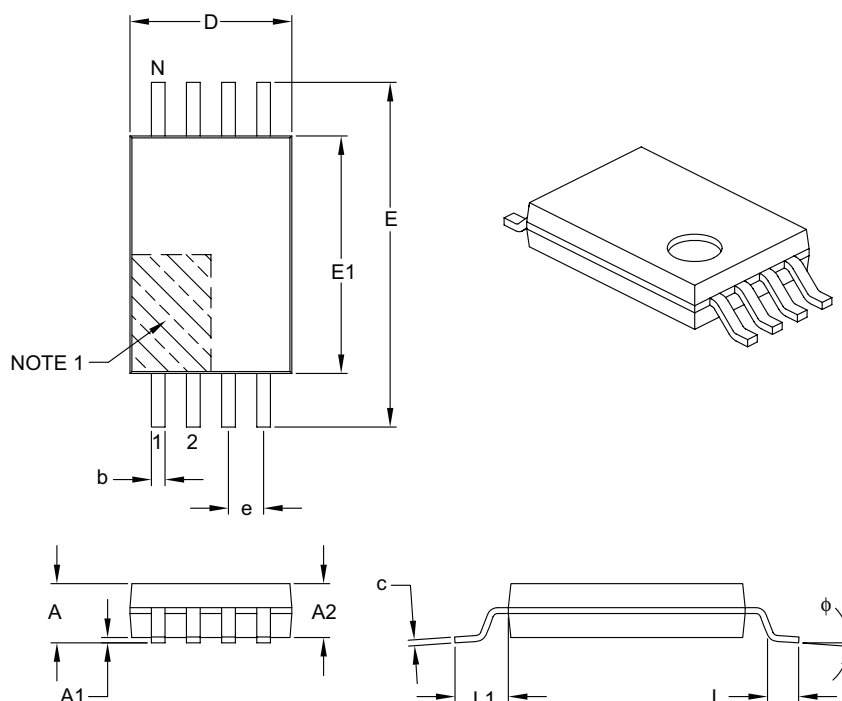
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-111B

# 24AAXX/24LCXX/24FCXX

## 8-Lead Plastic Thin Shrink Small Outline (ST) – 4.4 mm Body [TSSOP]

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



| Units                    |    | MILLIMETERS |      |      |
|--------------------------|----|-------------|------|------|
| Dimension Limits         |    | MIN         | NOM  | MAX  |
| Number of Pins           | N  | 8           |      |      |
| Pitch                    | e  | 0.65 BSC    |      |      |
| Overall Height           | A  | –           | –    | 1.20 |
| Molded Package Thickness | A2 | 0.80        | 1.00 | 1.05 |
| Standoff                 | A1 | 0.05        | –    | 0.15 |
| Overall Width            | E  | 6.40 BSC    |      |      |
| Molded Package Width     | E1 | 4.30        | 4.40 | 4.50 |
| Molded Package Length    | D  | 2.90        | 3.00 | 3.10 |
| Foot Length              | L  | 0.45        | 0.60 | 0.75 |
| Footprint                | L1 | 1.00 REF    |      |      |
| Foot Angle               | φ  | 0°          | –    | 8°   |
| Lead Thickness           | c  | 0.09        | –    | 0.20 |
| Lead Width               | b  | 0.19        | –    | 0.30 |

**Notes:**

- Pin 1 visual index feature may vary, but must be located within the hatched area.
- 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 C04-086B

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# 24AAXX/24LCXX/24FCXX

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# 24AAXX/24LCXX/24FCXX

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# 24AAXX/24LCXX/24FCXX

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| <u>PART NO.</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <u>X</u>            | <u>X</u>             | <u>/XX</u> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------------------|------------|
| Device Part<br>Number<br>(Table 1-1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Packaging<br>Medium | Temperature<br>Range | Package    |
| <div> <p><b>Device:</b> See Table 1-1</p> <p><b>Temperature Range:</b> I = -40°C to +85°C<br/>E = -40°C to +125°C</p> <p><b>Packaging Medium:</b> T = Tape and Reel<br/>Blank = Tube</p> <p><b>Package:</b> P = Plastic DIP (300 mil body), 8-lead<br/>SN = Plastic SOIC (3.90 mm body), 8-lead<br/>SM = Plastic SOIC (208 mil body), 8-lead<br/>ST = Plastic TSSOP (4.4 mm), 8-lead<br/>MS = Plastic Micro Small Outline (MSOP), 8-lead<br/>OT = SOT-23, 5-lead (Tape and Reel only)<br/>MC = 2x3 mm DFN, 8-lead<br/>MF = 5x6 mm DFN, 8-lead</p> </div> |                     |                      |            |
| <p><b>Examples:</b></p> <p>a) 24AA014-I/SN: 1 Kbit, Industrial Temperature, 1.7V, SOIC package</p> <p>b) 24AA02T-I/OT: 2 Kbit, Industrial Temperature, 1.7V, SOT-23 package, Tape and Reel</p> <p>c) 24LC16B-I/P: 16 Kbit, Industrial Temperature, 2.5V, PDIP package</p> <p>d) 24LC32A-E/MS: 32 Kbit, Extended Temperature, 2.5V, MSOP package</p> <p>e) 24LC64T-I/MC: 64 Kbit, Industrial Temperature, 2.5V 2x3 mm DFN package, Tape and Reel</p> <p>f) 24FC512T-I/SM: 512 Kbit, Industrial Temperature, 1 MHz, SOIC package, Tape and Reel</p>        |                     |                      |            |

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