

### 128K x 32 Radiation Tolerant EEPROM

#### AVAILABLE AS MILITARY SPECIFICATIONS

- MIL-PRF-38534

#### FEATURES

- Access time of 150ns, 200ns, 250ns
- Operation with single 5V  $\pm$  10% supply
- Power Dissipation:
  - Active: 1.43 W (MAX), Max Speed Operation
  - Standby: 7.7 mW (MAX), Battery Back-up Mode
- Automatic Byte Write: 10 ms (MAX)
- Automatic Page Write (128 bytes): 10 ms (MAX)
- Data protection circuit on power on/off
- Low power CMOS
- 10<sup>4</sup> Erase/Write cycles (in Page Mode)
- Software data protection
- TTL Compatible Inputs and Outputs
- Data Retention: 10 years
- Ready/Busy\ and Data Polling Signals
- Write protection by RES\ pin
- Radiation Tolerant: Proven total dose 40K to 100K RADS\*
- Shielded Package for Best Radiation Immunity
- Operating Temperature Ranges:
  - Military: -55°C to +125°C
  - Industrial: -40°C to +85°C

#### OPTIONS

- Timing
  - 150 ns
  - 200 ns
  - 250 ns

#### MARKINGS

-150  
-200  
-250

- Package

|                                        |     |            |
|----------------------------------------|-----|------------|
| Ceramic Quad Flat pack w/ formed leads | Q   | No. 703Q   |
| Ceramic Quad Flat pack w/ tie bar      | QB  | No. 703QB  |
| Shielded Ceramic Quad Flat pack        | SQ  | No. 703SF  |
| Shielded Ceramic Quad Flat pack        | SQB | No. 703SQB |

#### GENERAL DESCRIPTION

The AS8ER128K32 is a 4 Megabit Radiation Tolerant EEPROM Module organized as 128K x 32 bit. User configurable to 256K x16 or 512Kx 8. The module achieves high speed access, low power consumption and high reliability by employing advanced CMOS memory technology.

The military grade product is manufactured in compliance to MIL-STD 883, making the AS8ER128K32 ideally suited for military or space applications.

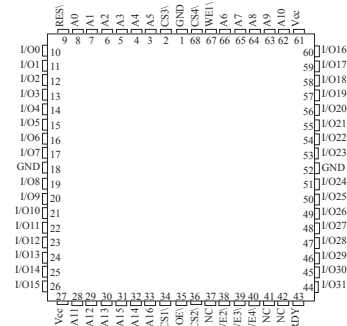
The module is offered as a 68 lead 0.880 inch square ceramic quad flat pack. It has a max. height of 0.200 inch (non-shielded). This package design is targeted for those applications which require low profile SMT Packaging.

\*Contact factory for more information. 2-sided shielding provided via Tungsten lids on both sides. 6.5X typ. TID boost due to shielding. (Geostationary orbit) Proven total dose 40K to 100K RADS. Micross can perform TID lot testing.

#### PIN ASSIGNMENT

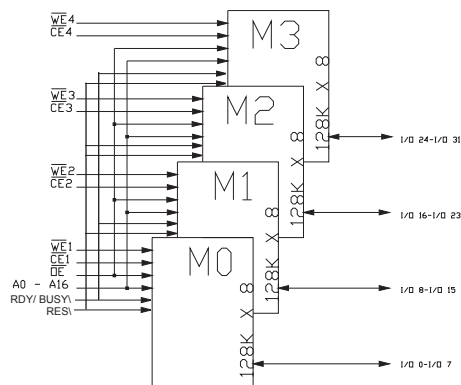
(Top View)

68 Lead CQFP



\*Pin #'s 31 and 32, A15 and A14 respectively, are reversed from the AS8E128K32. Correct use of these address lines is required for operation of the SDP mode to work properly.

| PIN NAME        | FUNCTION          |
|-----------------|-------------------|
| A0 to A16       | Address Input     |
| I/O0 to I/O31   | Data Input/Output |
| OE\             | Output Enable     |
| CE\             | Chip Enable       |
| WE\             | Write Enable      |
| V <sub>CC</sub> | Power Supply      |
| V <sub>SS</sub> | Ground            |
| RDY/BUSY\       | Ready Busy        |
| RES\            | Reset             |



#### FUNCTIONAL BLOCK DIAGRAM

For more products and information  
please visit our web site at

[www.micross.com](http://www.micross.com)

## TRUTH TABLE

| MODE          | CE\             | OE\             | WE\             | RES\                        | RDY/BUSY <sup>1</sup>     | I/O        |
|---------------|-----------------|-----------------|-----------------|-----------------------------|---------------------------|------------|
| Read          | V <sub>IL</sub> | V <sub>IL</sub> | V <sub>IH</sub> | V <sub>H</sub> <sup>2</sup> | High-Z                    | Dout       |
| Standby       | V <sub>IH</sub> | X <sup>3</sup>  | X               | X                           | High-Z                    | High-Z     |
| Write         | V <sub>IL</sub> | V <sub>IH</sub> | V <sub>IL</sub> | V <sub>H</sub>              | High-Z to V <sub>OL</sub> | Din        |
| Deselect      | V <sub>IL</sub> | V <sub>IH</sub> | V <sub>IH</sub> | V <sub>H</sub>              | High-Z                    | High-Z     |
| Write Inhibit | X               | X               | V <sub>IH</sub> | X                           | ---                       | ---        |
|               | X               | V <sub>IL</sub> | X               | X                           | ---                       | ---        |
| Data\ Polling | V <sub>IL</sub> | V <sub>IL</sub> | V <sub>IH</sub> | V <sub>H</sub>              | V <sub>OL</sub>           | Dout (I/O) |
| Program Reset | X               | X               | X               | V <sub>IL</sub>             | High-Z                    | High-Z     |

**NOTES:** 1. RDY/Busy\ output has only active LOW V<sub>OL</sub> and high impedance state. It can not go to HIGH (V<sub>OH</sub>) state.  
 2. V<sub>CC</sub> -0.5 ≤ V<sub>H</sub> ≤ V<sub>CC</sub> +1.0  
 3. X : DON'T CARE

**ABSOLUTE MAXIMUM RATINGS\***

Voltage on Vcc Supply Relative to Vss

Vcc .....-0.6V to +7.0V

Operating Temperature Range<sup>(1)</sup> .....-55°C to +125°C

Storage Temperature Range .....-65°C to +150°C

Voltage on any Pin Relative to Vss.....-0.5V to +7.0V <sup>(2)</sup>

Max Junction Temperature\*\* .....+150°C

Thermal Resistance junction to case ( $\theta_{JC}$ ):

Package Type Q.....11.3° C/W

Package Type P &amp; PN.....2.8° C/W

\*Stresses greater than 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 these or any other conditions above those indicated in the operation section of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

\*\*Junction temperature depends upon package type, cycle time, loading, ambient temperature and airflow, and humidity (plastics).

**NOTES:**

1) Including electrical characteristics and data retention.

2)  $V_{IN}$  MIN = -3.0V for pulse width < 20ns.

**ELECTRICAL CHARACTERISTICS AND RECOMMENDED DC OPERATING CONDITIONS**

(-55°C ≤ T<sub>A</sub> ≤ 125°C or -40°C to +85°C; V<sub>CC</sub> = 5V ± 10%)

| PARAMETER                           | CONDITIONS                                                      | SYMBOL                | MIN                   | MAX                   | UNITS |
|-------------------------------------|-----------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-------|
| Input High Voltage                  |                                                                 | V <sub>IH</sub>       | 2.2                   | V <sub>CC</sub> + 0.3 | V     |
| Input High Voltage (RES\)           |                                                                 | V <sub>H</sub>        | V <sub>CC</sub> - 0.5 | V <sub>CC</sub> + 1.0 | V     |
| Input Low Voltage                   |                                                                 | V <sub>IL</sub>       | -0.3 <sup>1</sup>     | 0.8                   | V     |
| LOW INPUT Leakage(RES\ Signal)      | RES\=0V, V <sub>CC</sub> =5.5V                                  | I <sub>LI</sub> (RES) | -500                  |                       | μA    |
| HIGH INPUT Leakage(RES\ Signal)     | RES\=5.5V, V <sub>CC</sub> =5.5V                                | I <sub>HI</sub> (RES) |                       | 10                    | μA    |
| INPUT LEAKAGE CURRENT <sup>2</sup>  | 0V ≤ V <sub>IN</sub> ≤ V <sub>CC</sub>                          | I <sub>LI</sub>       | -10                   | 10                    | μA    |
| OUTPUT LEAKAGE CURRENT <sup>2</sup> | Outputs(s) Disabled,<br>0V ≤ V <sub>OUT</sub> ≤ V <sub>CC</sub> | I <sub>LO</sub>       | -10                   | 10                    | μA    |
| Output High Voltage                 | I <sub>OH</sub> = -0.4mA                                        | V <sub>OH</sub>       | 2.4                   | --                    | V     |
| Output Low Voltage                  | I <sub>OL</sub> = 2.1mA                                         | V <sub>OL</sub>       | --                    | 0.4                   | V     |
| Supply Voltage                      |                                                                 | V <sub>CC</sub>       | 4.5                   | 5.5                   | V     |

**NOTE:** 1) V<sub>IL</sub> (MIN): -1.0V for pulse width < 20ns.

2) All other Signal pins except RES\

| PARAMETER                          | CONDITIONS                                                                 | SYM              | MAX | UNITS |
|------------------------------------|----------------------------------------------------------------------------|------------------|-----|-------|
|                                    |                                                                            |                  | -15 |       |
| Power Supply Current:<br>Operating | I <sub>out</sub> = 0mA, V <sub>CC</sub> = 5.5V<br>Cycle = 1μS, Duty = 100% | I <sub>CC3</sub> | 80  | mA    |
|                                    | I <sub>out</sub> = 0mA, V <sub>CC</sub> = 5.5V<br>Cycle = MIN, Duty = 100% |                  | 260 |       |
| Power Supply Current:<br>Standby   | CE\ = V <sub>CC</sub> , V <sub>CC</sub> = 5.5V                             | I <sub>CC1</sub> | 1.4 | mA    |
|                                    | CE\ = V <sub>IH</sub> , V <sub>CC</sub> = 5.5V                             | I <sub>CC2</sub> | 12  |       |

**CAPACITANCE TABLE<sup>1</sup>** ( $V_{IN} = 0V$ ,  $f = 1\text{ MHz}$ ,  $T_A = 25^\circ C$ )

| SYMBOL           | PARAMETER                  | MAX | UNITS |
|------------------|----------------------------|-----|-------|
| $C_{ADD}$        | A0 - A16 Capacitance       | 40  | pF    |
| $C_{OE}$         | OE\, RES\, RDY Capacitance | 40  | pF    |
| $C_{WE}, C_{CE}$ | WE\ and CE\ Capacitance    | 12  | pF    |
| $C_{IO}$         | I/O 0- I/O 31 Capacitance  | 20  | pF    |

**NOTE:** 1. This parameter is guaranteed but not tested.

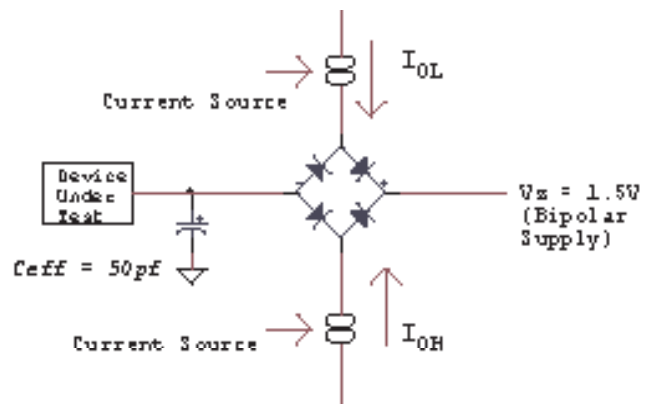
## AC TEST CHARACTERISTICS

### TEST SPECIFICATIONS

Input pulse levels.....  $V_{SS}$  to 3V  
 Input rise and fall times..... 5ns  
 Input timing reference levels..... 1.5V  
 Output reference levels..... 1.5V  
 Output load..... See Figure 1

### NOTES:

$V_Z$  is programmable from -2V to + 7V.  
 $I_{OL}$  and  $I_{OH}$  programmable from 0 to 16 mA.  
 $V_Z$  is typically the midpoint of  $V_{OH}$  and  $V_{OL}$ .  
 $I_{OL}$  and  $I_{OH}$  are adjusted to simulate a typical resistive load circuit.



**Figure 1**

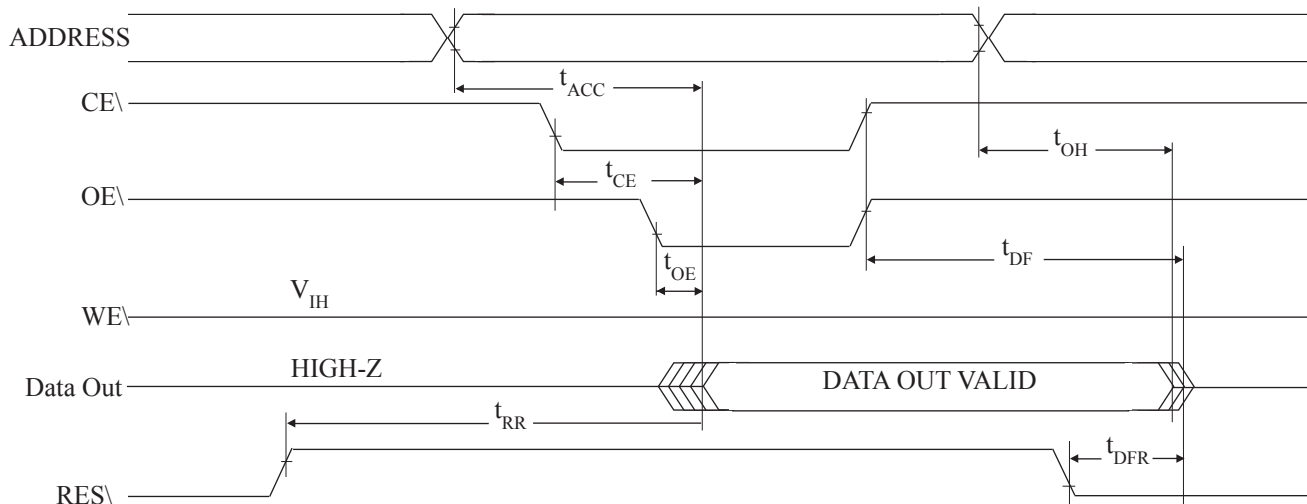
## ELECTRICAL CHARACTERISTICS AND RECOMMENDED AC OPERATING CONDITIONS

( $-55^\circ C \leq T_A \leq +125^\circ C$  or  $-40^\circ C$  to  $+85^\circ C$ ;  $V_{CC} = 5V \pm 10\%$ )

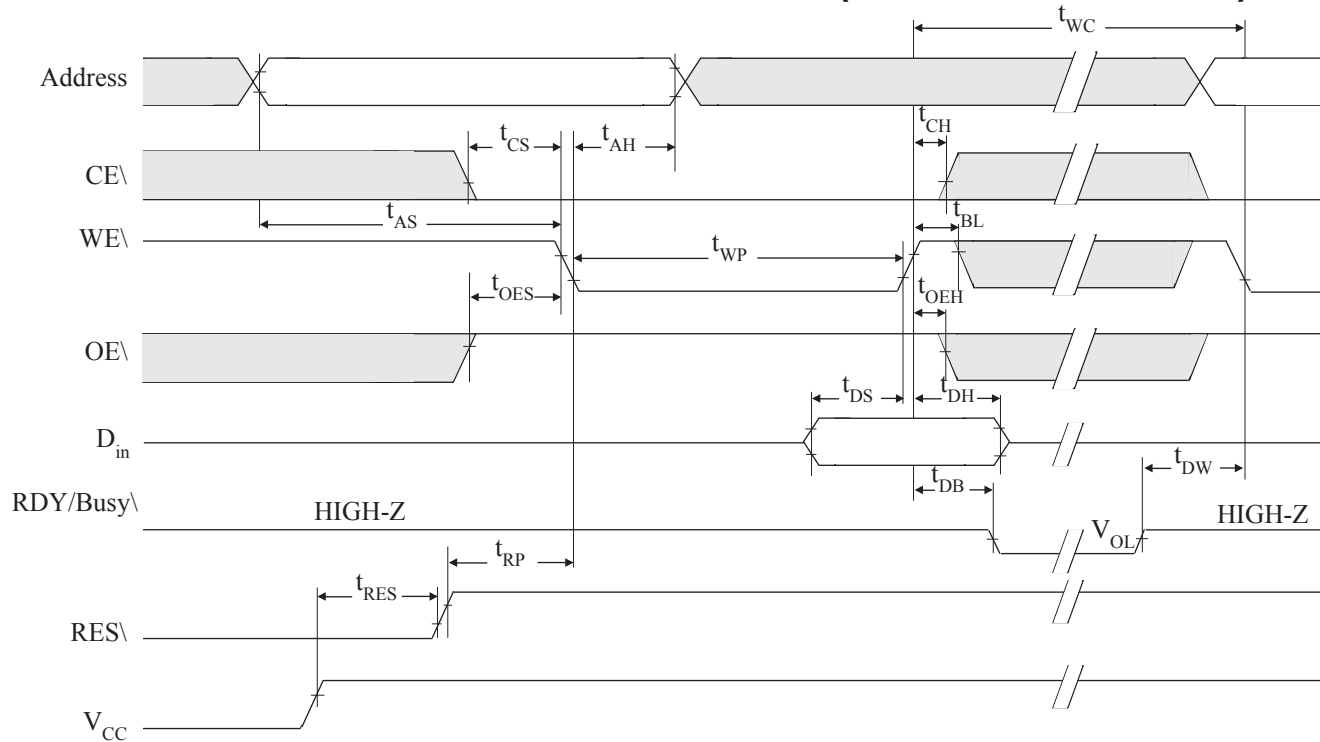
| DESCRIPTION                         | TEST CONDITIONS                       | SYMBOL    | 150 |     | UNITS |
|-------------------------------------|---------------------------------------|-----------|-----|-----|-------|
|                                     |                                       |           | MIN | MAX |       |
| Address to Output Delay             | CE\ = OE\ = $V_{IL}$ , WE\ = $V_{IH}$ | $t_{ACC}$ |     | 150 | ns    |
| CE\ to Output Delay                 | OE\ = $V_{IL}$ , WE\ = $V_{IH}$       | $t_{CE}$  |     | 150 | ns    |
| OE\ to Output Delay                 | OE\ = $V_{IL}$ , WE\ = $V_{IH}$       | $t_{OE}$  | 10  | 75  | ns    |
| Address to Output Hold              | CE\ = OE\ = $V_{IL}$ , WE\ = $V_{IH}$ | $t_{OH}$  | 0   |     | ns    |
| CE\ or OE\ high to Output Float (1) | OE\ = $V_{IL}$ , WE\ = $V_{IH}$       | $t_{DF}$  | 0   | 50  | ns    |
| RES\ low to Output Float (1)        | CE\ = OE\ = $V_{IL}$ , WE\ = $V_{IH}$ | $t_{DFR}$ | 0   | 350 | ns    |
| RES\ to Output Delay                | CE\ = OE\ = $V_{IL}$ , WE\ = $V_{IH}$ | $t_{RR}$  | 0   | 450 | ns    |

**ELECTRICAL CHARACTERISTICS AND RECOMMENDED AC WRITE CHARACTERISTICS**
 $(-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}; V_{CC} = 5\text{V} \pm 10\%)$ 

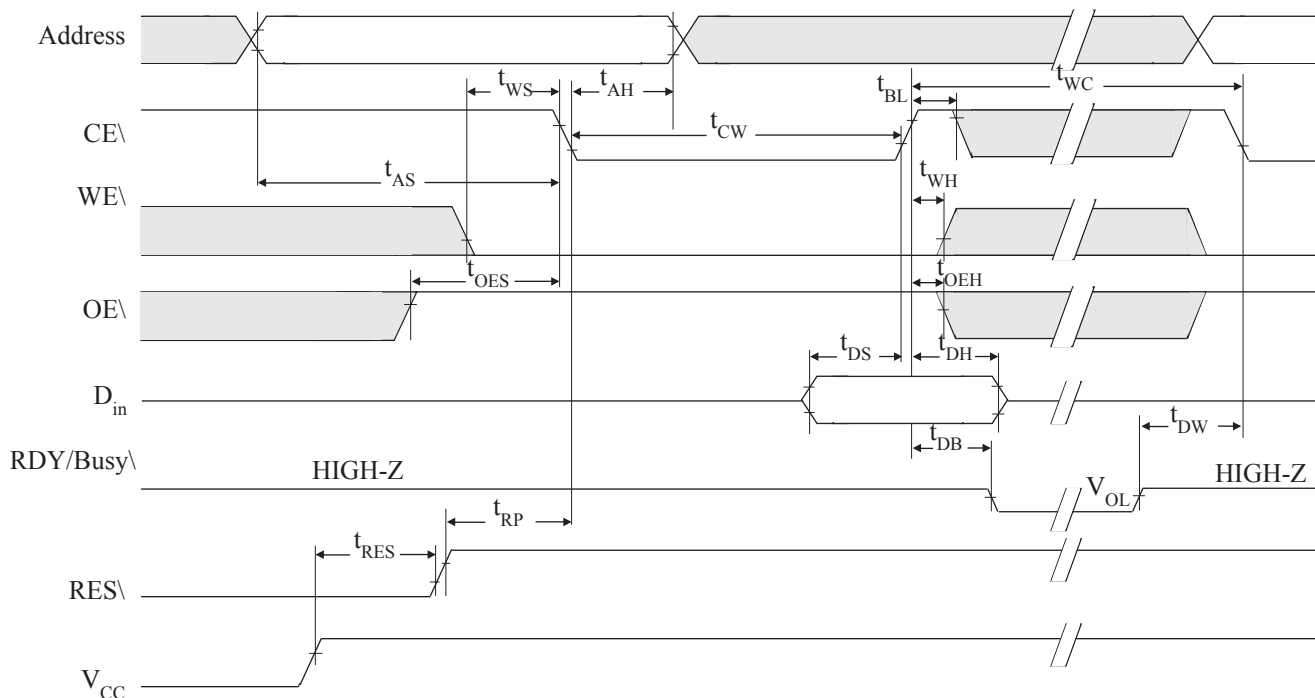
| SYMBOL    | PARAMETER                                | MIN <sup>(2)</sup> | MAX               | UNITS         |
|-----------|------------------------------------------|--------------------|-------------------|---------------|
| $t_{AS}$  | Address Setup Time                       | 0                  |                   | ms            |
| $t_{AH}$  | Address Hold Time                        | 150                |                   | ns            |
| $t_{CS}$  | CE\ to Write Setup Time (WE\ controlled) | 0                  |                   | ns            |
| $t_{CH}$  | CE\ Hold Time (WE\ controlled)           | 0                  |                   | ns            |
| $t_{WS}$  | WE\ to Write Setup Time (CE\ controlled) | 0                  |                   | ns            |
| $t_{WH}$  | WE\ to Hold Time (CE\ controlled)        | 0                  |                   | ns            |
| $t_{OES}$ | OE\ to Write Setup Time                  | 0                  |                   | ns            |
| $t_{OEH}$ | OE\ to Hold Time                         | 0                  |                   | ns            |
| $t_{DS}$  | Data Setup Time                          | 100                |                   | ns            |
| $t_{DH}$  | Data Hold Time                           | 10                 |                   | ns            |
| $t_{WP}$  | WE\ Pulse Width (WE\ controlled)         | 250                |                   | ns            |
| $t_{CW}$  | CE\ Pulse Width (CE\ controlled)         | 250                |                   | ns            |
| $t_{DL}$  | Data Latch Time                          | 300                |                   | ns            |
| $t_{BLC}$ | Byte Load Cycle                          | 0.55               | 30                | $\mu\text{s}$ |
| $t_{BL}$  | Byte Load Window                         | 100                |                   | $\mu\text{s}$ |
| $t_{WC}$  | Write Cycle Time                         |                    | 10 <sup>(3)</sup> | ms            |
| $t_{DB}$  | Time to Device Busy                      | 120                |                   | ns            |
| $t_{DW}$  | Write Start Time                         | 150 <sup>(4)</sup> |                   | ns            |
| $t_{RP}$  | Reset Protect Time                       | 100                |                   | $\mu\text{s}$ |
| $t_{RES}$ | Reset High Time <sup>(5)</sup>           | 1                  |                   | $\mu\text{s}$ |

**READ TIMING WAVEFORM**


## BYTE WRITE TIMING WAVEFORM (WE\ CONTROLLED)

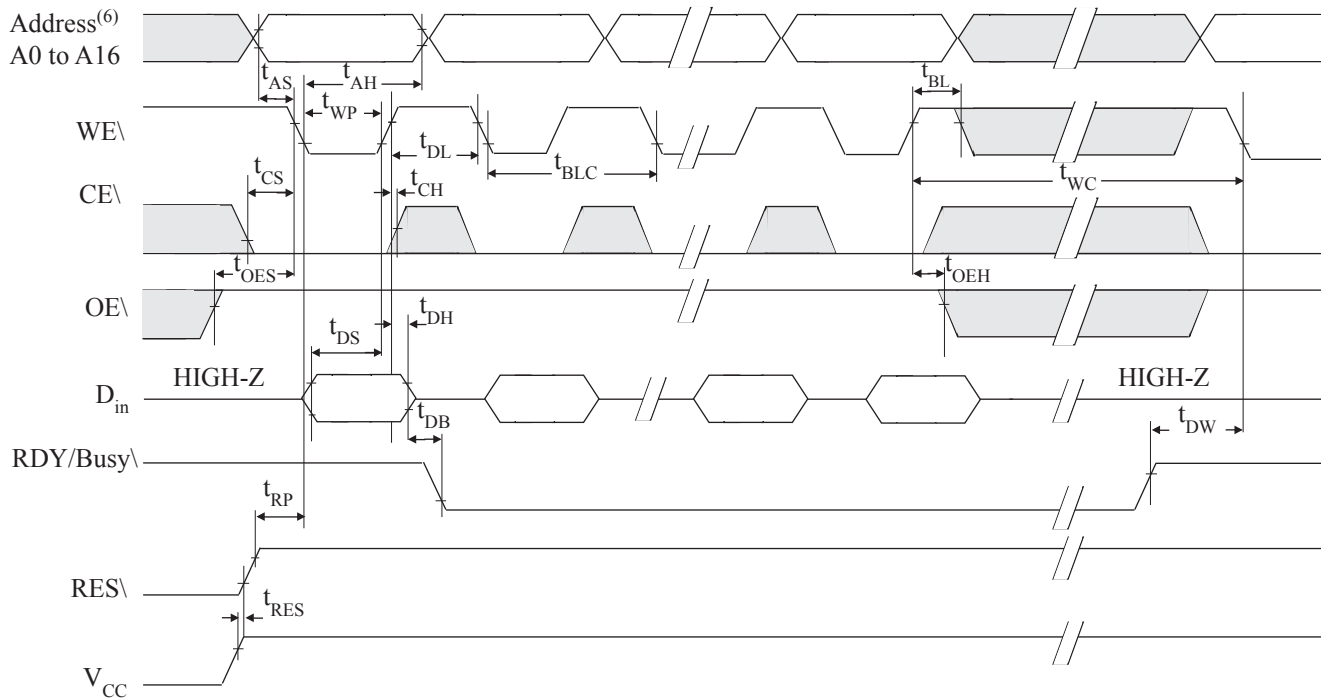


## BYTE WRITE TIMING WAVEFORM (CE\ CONTROLLED)

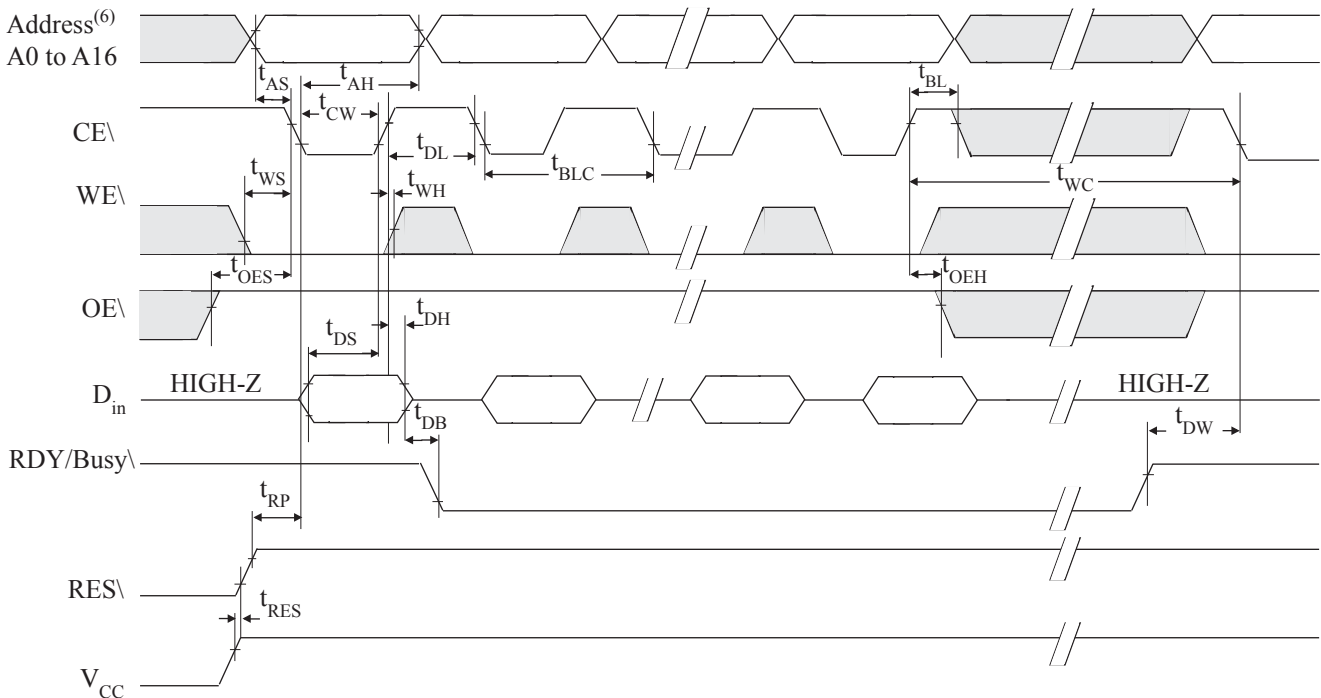




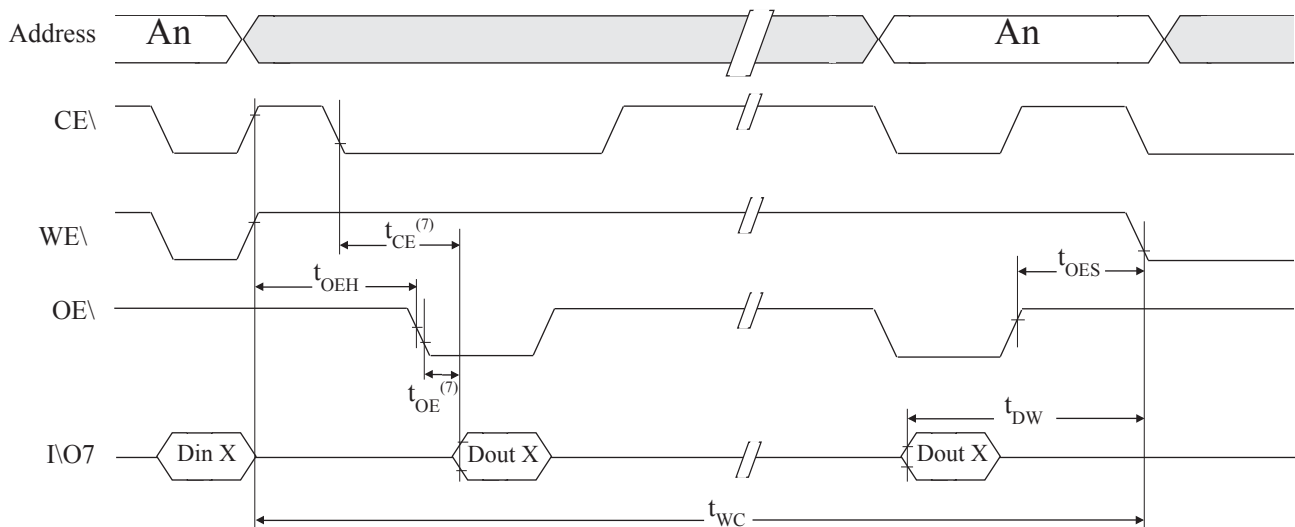
## PAGE WRITE TIMING WAVEFORM (WE\ CONTROLLED)



## PAGE WRITE TIMING WAVEFORM (CE\ CONTROLLED)



## DATA POLLING TIMING WAVEFORM



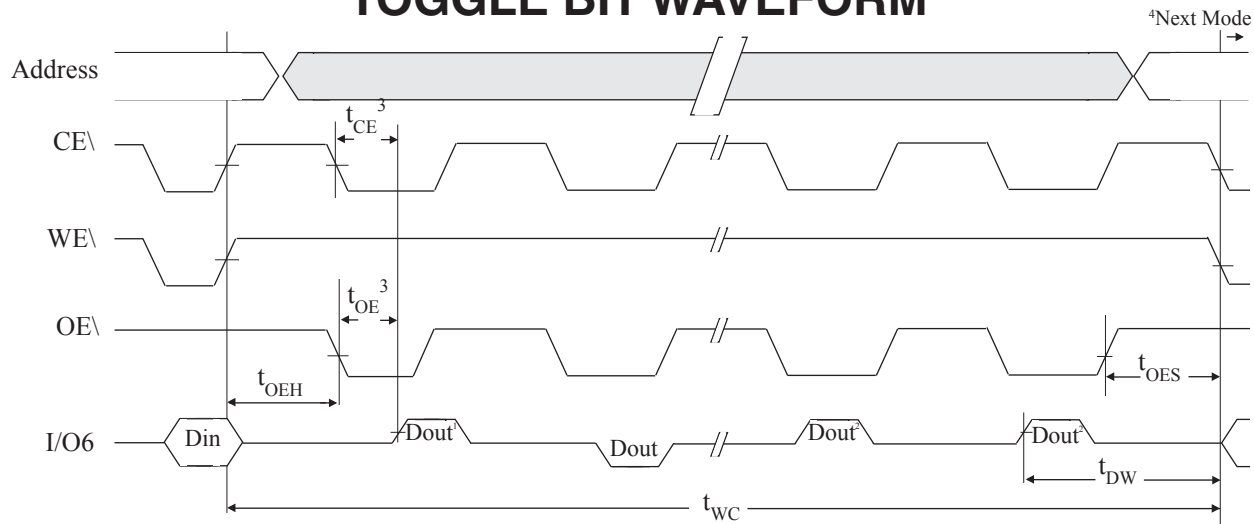
### NOTES:

1.  $t_{DF}$  and  $t_{DFR}$  are defined as the time at which the outputs achieve the open circuit conditions and are no longer driven.
2. Use this device in longer cycle than this value.
3.  $t_{WC}$  must be longer than this value unless polling techniques or RDY/Busy\ are used. This device automatically completes the internal write operation within this value.
4. Next read or write operation can be initiated after  $t_{DW}$  if polling techniques or RDY/Busy\ are used.
5. This parameter is sampled and not 100% tested.
6. A7 to A16 are page addresses and must be same within the page write operation.
7. See AC read characteristics.

## TOGGLE BIT

This device provides another function to determine the internal programming cycle. If the EEPROM is set to read mode during the internal programming cycle, I/O6 will charge from "1" to "0" (toggling) for each read. When the internal programming cycle is finished, toggling of I/O6 will stop and the device can be accessible for next read or program.

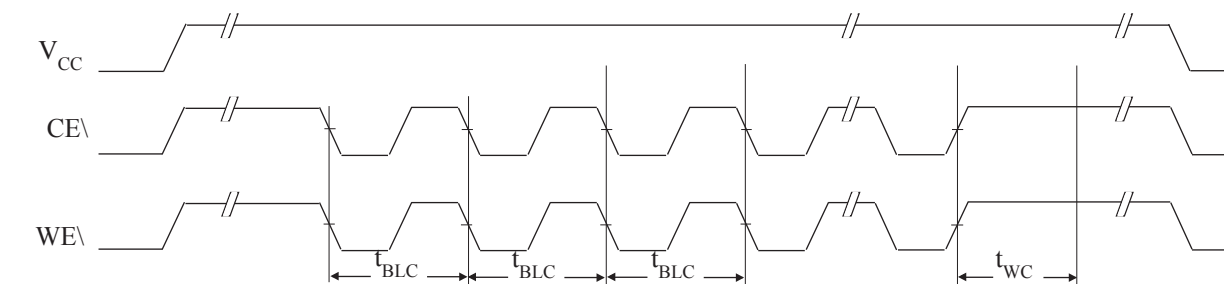
### TOGGLE BIT WAVEFORM



#### NOTES:

- 1) I/O6 beginning state is "1".
- 2) I/O6 ending state will vary.
- 3) See AC read characteristics.
- 4) Any locations can be used, but the address must be fixed.

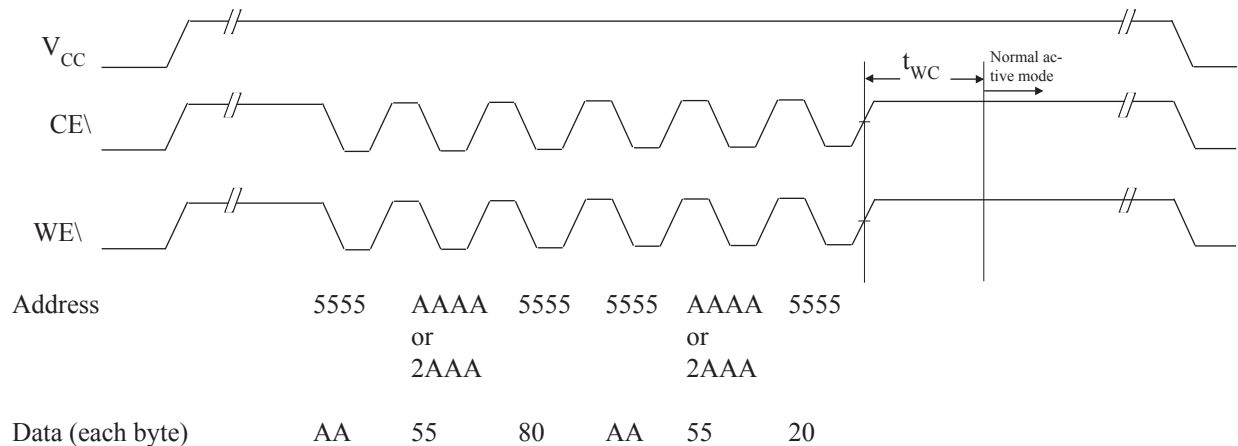
### SOFTWARE DATA PROTECTION TIMING WAVEFORM (In protection mode)



|                  |      |              |      |                |
|------------------|------|--------------|------|----------------|
| Address          | 5555 | AAAA or 2AAA | 5555 | Write Address* |
| Data (each byte) | AA   | 55           | A0   | Write Data     |

\* During this write cycle, data is physically written to the address provided.

## SOFTWARE DATA PROTECTION TIMING WAVEFORM (In non-protection mode)



## FUNCTIONAL DESCRIPTION

### Automatic Page Write

Page-mode write feature allows 1 to 128 bytes of data to be written into the EEPROM in a single write cycle. Following the initial byte cycle, an additional 1 to 128 bytes can be written in the same manner. Each additional byte load cycle must be started within 30 $\mu$ s from the preceding falling edge of WE\ or CE\. When CE\ or WE\ is kept high for 100 $\mu$ s after data input, the EEPROM enters write mode automatically and the input data are written into the EEPROM.

### DATA\ Polling

DATA\ polling allows the status of the EEPROM to be determined. If EEPROM is set to read mode during the write cycle, an inversion of the last byte of data to be loaded outputs from I/O's 7, 15, 23, and 31 to indicate that the EEPROM is performing a write operation.

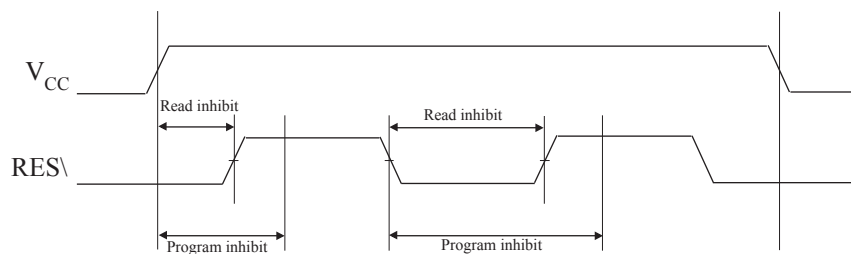
### RDY/Busy\ Signal

RDY/Busy\ signal also allows status of the EEPROM to be determined. The RDY/Busy\ signal has high impedance except in write cycle and is lowered to  $V_{OL}$  after the first write signal. At the end of write cycle, the RDY/Busy\ signal changes state to high impedance.

### RES\ Signal

When RES\ is low, the EEPROM cannot be read or programmed. Therefore, data can be protected by keeping RES\ low when  $V_{CC}$  is switched. RES\ should be high during read and programming because it doesn't provide a latch function. See timing diagram below.

### RES\ Signal Diagram



### WE\, CE\ Pin Operation

During a write cycle, address are latched by the falling edge of WE\ or CE\, and data is latched by the rising edge of WE\ or CE\.

### Write/Erase Endurance and Data Retention Time

The endurance is  $10^4$  cycles in case of the page programming and  $10^3$  cycles in case of the byte programming (1% cumulative failure rate). The data retention time is more than 10 years when a device is page-programmed less than  $10^4$  cycles.

### RDY/Busy\ SIGNAL

RDY/Busy\ signal also allows status of the EEPROM to be determined. The RDY/Busy\ signal has high impedance except in write cycle and is lowered to  $V_{OL}$  after the first write signal. At the end of the write cycle, the RDY/Busy\ signal changes state to high impedance. This allows many 58C1001 devices RDY/Busy\ signal lines to be wired-OR together.

### PROGRAMMING/ERASE

The 58C1001 does **NOT** employ a BULK-erase function. The memory cells can be programmed '0' or '1'. A write cycle performs the function of erase & write on every cycle with the erase being transparent to the user. The internal erase data state is considered to be '1'. To program the memory array with background of ALL 0's or All 1's, the user would program this data using the page mode write operation to program all 1024 128-byte pages.

### Data Protection

#### 1. Data Protection against Noise on Control Pins (CE\, OE\, WE\) During Operation

During readout or standby, noise on the control pins may act as a trigger and turn the EEPROM to programming mode by mistake. To prevent this phenomenon, this device has

a noise cancellation function that cuts noise if its width is 20ns or less in program mode.

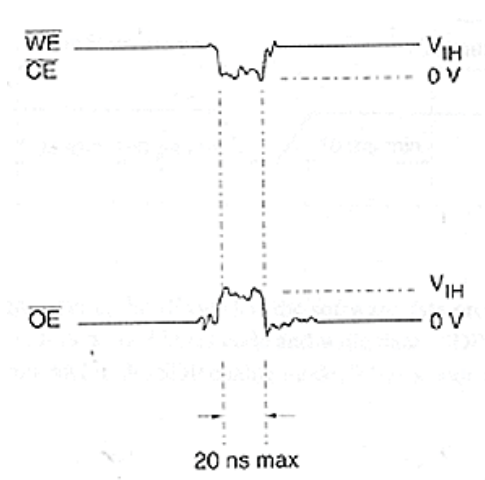
Be careful not to allow noise of a width more than 20ns on the control pins. See Diagram 1 below.

#### 2. Data Protection at $V_{CC}$ On/Off

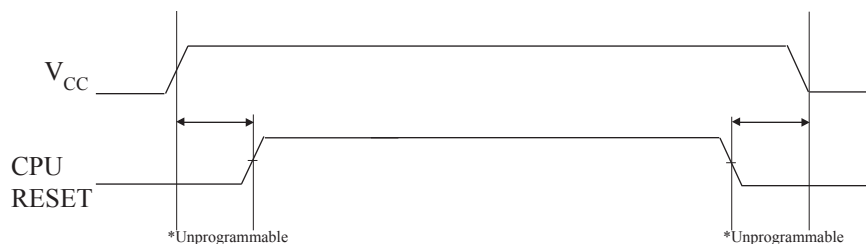
When  $V_{CC}$  is turned on or off, noise on the control pins generated by external circuits (CPU, etc.) may act as a trigger and turn the EEPROM to program mode by mistake. To prevent this unintentional programming, the EEPROM must be kept in an unprogrammable state while the CPR is in an unstable state.

NOTE: The EEPROM should be kept in unprogrammable state during  $V_{CC}$  on/off by using CPU RESET signal. See the timing diagram below.

**DIAGRAM 1**



### DATA PROTECTION AT $V_{CC}$ ON/OFF



### Data Protection Cont.

#### a. Protection by RES\

The unprogrammable state can be realized by the CPU's reset signal inputs directly to the EEPROM's RES pin. RES should be kept  $V_{SS}$  level during  $V_{CC}$  on/off.

The EEPROM brakes off programming operation when RES becomes low, programming operation doesn't finish correctly in case that RES falls low during programming operation. RES should be kept high for 10ms after the last data inputs. See the timing diagram below.

#### 3. Software data protection

To prevent unintentional programming, this device has the software data protection (SDP) mode. The SDP is enabled by inputting the 3 bytes code and write data in Chart 1. SDP is not enabled if only the 3 bytes code is input. To program

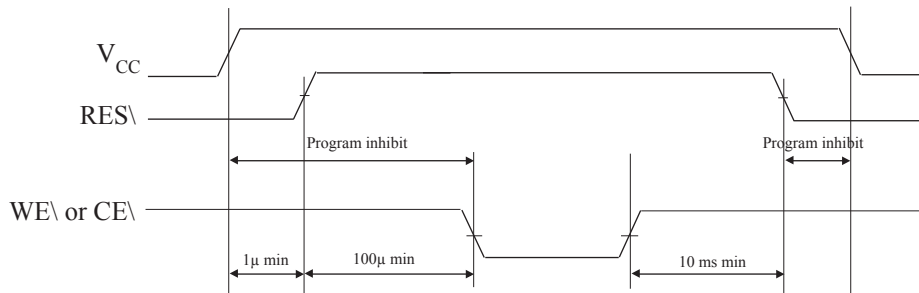
data in the SDP enable mode, 3 bytes code must be input before write data. This 4th cycle during write is required to initiate the SDP and physically writes the address and data. While in SDP the entire array is protected in which writes can only occur if the exact SDP sequence is re-executed or the unprotect sequence is executed.

The SDP is disabled by inputting the 6 bytes code in Chart 2. Note that, if data is input in the SDP disable cycle, data can not be written.

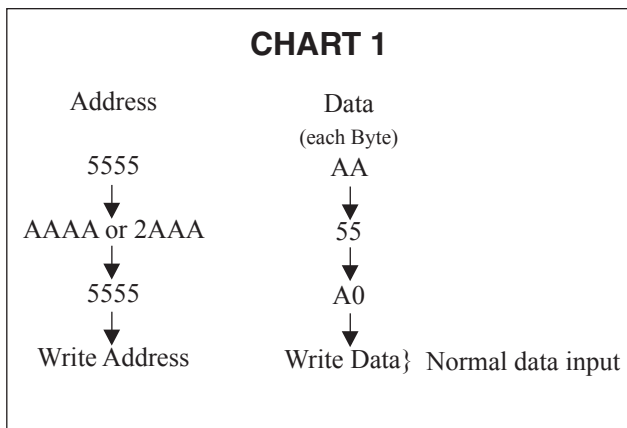
The software data protection is not enabled at the shipment.

NOTE: These are some differences between Micross and other company's for enable/disable sequence of software data protection. If these are any questions, please contact Micross.

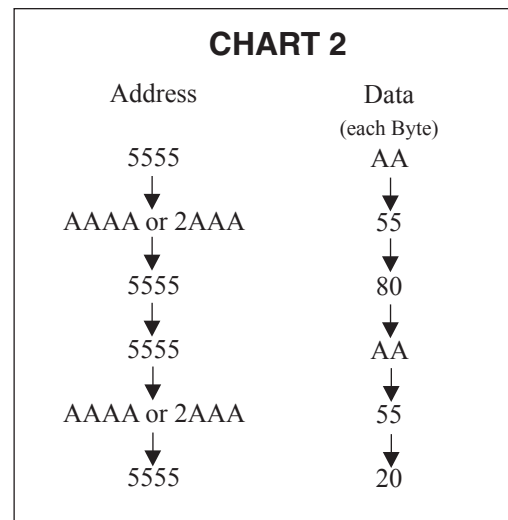
### PROTECTION BY RES\



**CHART 1**

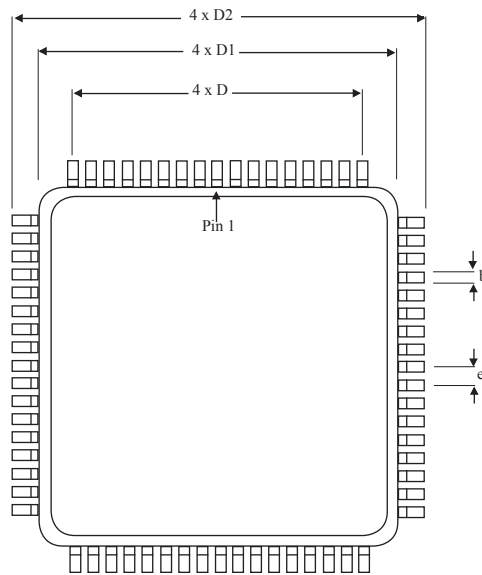


**CHART 2**

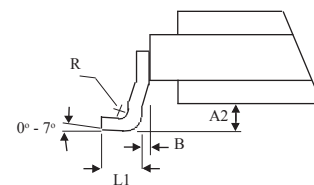


## MECHANICAL DEFINITIONS\*

Micross Case #703 (Package Designator Q)



DETAIL A

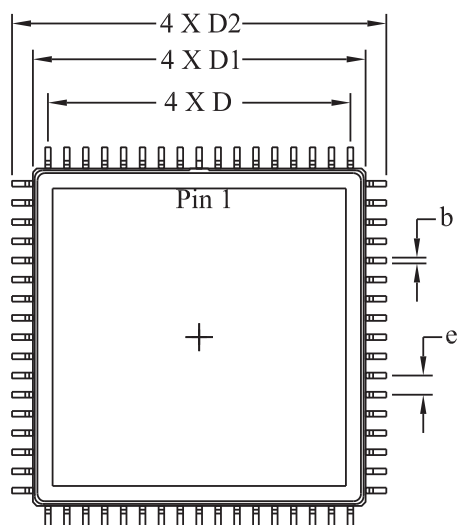


| SYMBOL | MICROSS PACKAGE SPECIFICATIONS |       |
|--------|--------------------------------|-------|
|        | MIN                            | MAX   |
| A      | 0.123                          | 0.200 |
| A1     | 0.118                          | 0.186 |
| A2     | 0.000                          | 0.020 |
| b      | 0.013                          | 0.017 |
| B      | 0.010 REF                      |       |
| D      | 0.800 BSC                      |       |
| D1     | 0.870                          | 0.890 |
| D2     | 0.980                          | 1.000 |
| D3     | 0.936                          | 0.956 |
| e      | 0.050 BSC                      |       |
| R      | 0.005                          | ---   |
| L1     | 0.035                          | 0.045 |

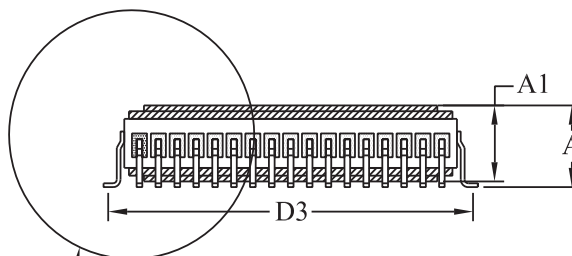
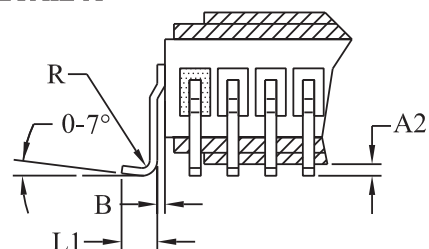
\*All measurements are in inches.

## MECHANICAL DEFINITIONS\*

Micross Case #703SQ

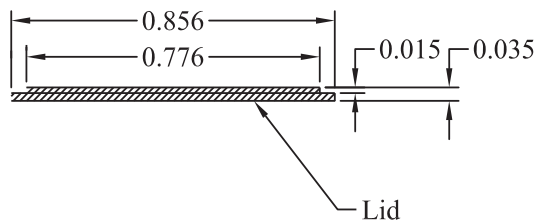


DETAIL A



See Detail A

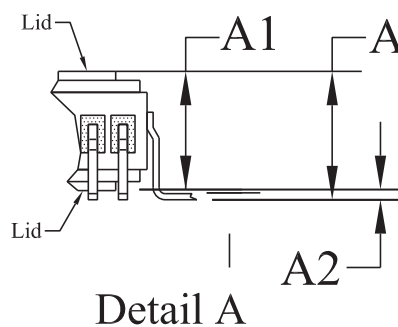
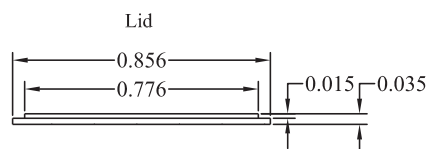
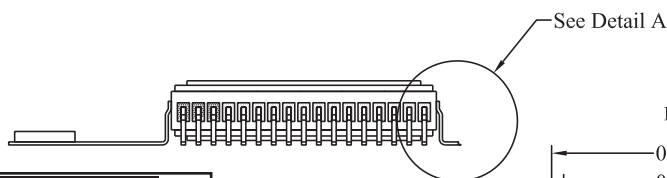
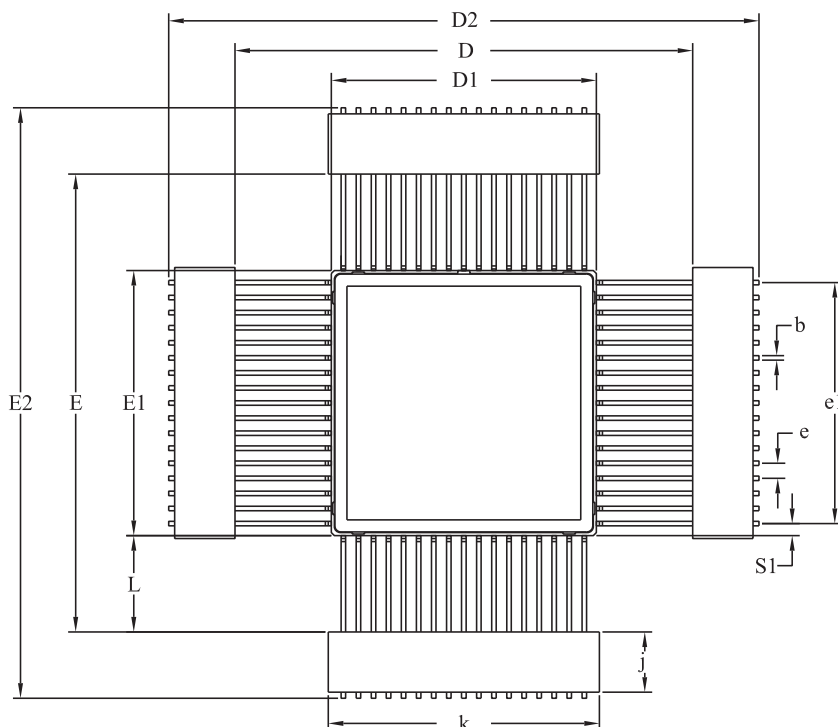
| SYMBOL | MICROSS PACKAGE SPECIFICATIONS |       |
|--------|--------------------------------|-------|
|        | MIN                            | MAX   |
| A      | 0.190                          | 0.235 |
| A1     | 0.180                          | 0.220 |
| A2     | 0.005                          | 0.020 |
| b      | 0.013                          | 0.017 |
| B      | 0.010 REF                      |       |
| D      | 0.800 BSC                      |       |
| D1     | 0.870                          | 0.890 |
| D2     | 0.980                          | 1.000 |
| D3     | 0.930                          | 0.960 |
| e      | 0.050 BSC                      |       |
| R      | 0.005                          | ---   |
| L1     | 0.035                          | 0.045 |



Note: 35 Mil Tungsten alloy lid on each side for improved TID radiation performance.

## MECHANICAL DEFINITIONS\*

Micross Case #703SQB



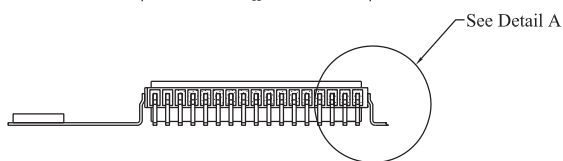
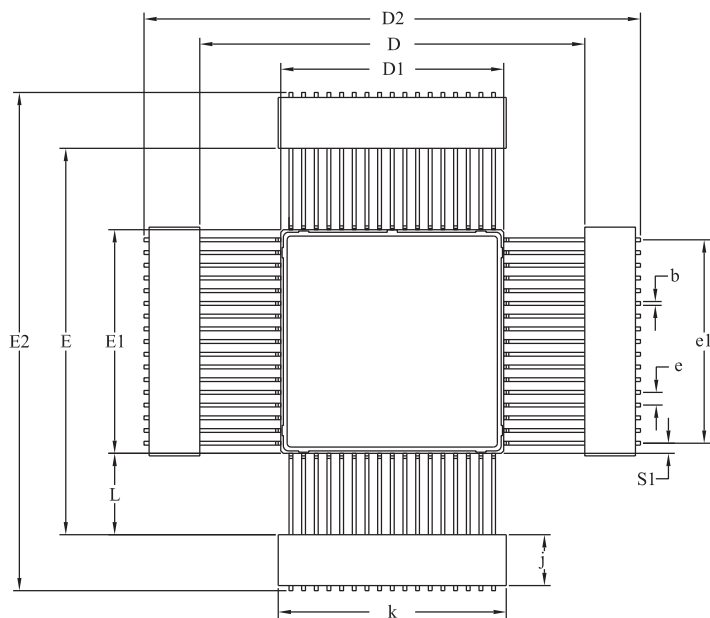
Detail A

| SYMBOL               | MICROSS PACKAGE SPECIFICATIONS |       |
|----------------------|--------------------------------|-------|
|                      | MIN                            | MAX   |
| A                    |                                | 0.235 |
| A1                   | 0.180                          | 0.220 |
| A2                   | 0.005                          | 0.020 |
| b                    | 0.013                          | 0.017 |
| D/E                  | 1.500                          | 1.540 |
| D1 / E1              | 0.870                          | 0.890 |
| D2 / E2              | 1.920                          | 2.000 |
| e                    | 0.050 BSC                      |       |
| e1                   | 0.800 BSC                      |       |
| j                    | 0.190                          | 0.210 |
| k                    | 0.890                          | 0.910 |
| L                    | 0.310                          | 0.330 |
| S1                   | .040 BSC                       |       |
| Dimensions in Inches |                                |       |

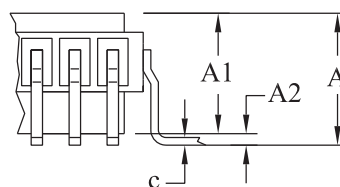
Note: 35 Mil Tungsten alloy lid on each side for improved TID radiation performance.

## MECHANICAL DEFINITIONS\*

Micross Case (Package Designator QB)



| SYMBOL               | MICROSS PACKAGE SPECIFICATIONS |       |
|----------------------|--------------------------------|-------|
|                      | MIN                            | MAX   |
| A                    | 0.157                          | 0.190 |
| A1                   | 0.142                          | 0.175 |
| A2                   | 0.005                          | 0.020 |
| b                    | 0.013                          | 0.017 |
| c                    | 0.009                          | 0.012 |
| D/E                  | 1.500                          | 1.540 |
| D1 / E1              | 0.870                          | 0.890 |
| D2 / E2              | 1.920                          | 2.000 |
| e                    | 0.050 BSC                      |       |
| e1                   | 0.800 BSC                      |       |
| j                    | 0.190                          | 0.210 |
| k                    | 0.890                          | 0.910 |
| L                    | 0.310                          | 0.330 |
| S1                   | .040 BSC                       |       |
| Dimensions in Inches |                                |       |



Detail A

\*All measurements are in inches.

## ORDERING INFORMATION

**EXAMPLE:** AS8ER128K32Q-15/IT

**EXAMPLE:** AS8ER128K32QB-250/XT

| Device Number | Package Type | Speed ns | Process |
|---------------|--------------|----------|---------|
| AS8ER128K32   | Q            | -150     | /*      |
| AS8ER128K32   | Q            | -200     | /*      |
| AS8ER128K32   | Q            | -250     | /*      |
| AS8ER128K32   | QB           | -150     | /*      |
| AS8ER128K32   | QB           | -200     | /*      |
| AS8ER128K32   | QB           | -250     | /*      |
| AS8ER128K32   | SQ           | -150     | /*      |
| AS8ER128K32   | SQ           | -200     | /*      |
| AS8ER128K32   | SQ           | -250     | /*      |
| AS8ER128K32   | SQB          | -150     | /*      |
| AS8ER128K32   | SQB          | -200     | /*      |
| AS8ER128K32   | SQB          | -250     | /*      |

### \*AVAILABLE PROCESSES

IT = Industrial Temperature Range

XT = Extended Temperature Range

883C = Full Military Processing

-40°C to +85°C

-55°C to +125°C

-55°C to +125°C

## MICROSS TO DSCC PART NUMBER CROSS REFERENCE\*

### Package Designator Q

| <u>Micross Part #</u> | <u>SMD Part</u> |
|-----------------------|-----------------|
| AS8ER128K32Q-250/883C | 5962-9458507HMX |
| AS8ER128K32Q-200/883C | 5962-9458508HMX |
| AS8ER128K32Q-150/883C | 5962-9458509HMX |

### Package Designator QB

| <u>Micross Part #</u>  | <u>SMD Part</u> |
|------------------------|-----------------|
| AS8ER128K32QB-250/883C | 5962-9458507HZC |
| AS8ER128K32QB-200/883C | 5962-9458508HZC |
| AS8ER128K32QB-150/883C | 5962-9458509HZC |

\* Micross part number is for reference only. Orders received referencing the SMD part number will be processed per the SMD.



**DOCUMENT TITLE**

128K x 32 Radiation Tolerant EEPROM

**Rev #**

5.5

**History**

Fixed Pin Assignment formatting issues, added RES\ & RDY/BUSY\ signals to the block diagram and updated note on page 1

**Release Date**

November 2010

**Status**

Release