

VDIC EEPROM MEMORY

VDEE4M32XS64XX4C250-II USER MANUAL

Version : A0

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VDIC-EEROM

5.0V 128K x 32bit

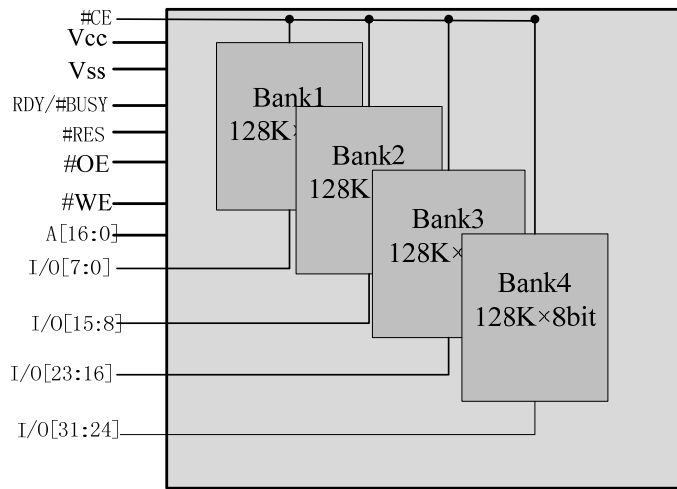
1 Description

The VDEE4M32XS64XX4C250-II is a 131,072 word×32 bit Electrically Erasable and Programmable CMOS ROM. It is organized as 4 dies of 1Mbit. Each die has 8-bit interface. All other signals are common to the four EEPROM 1Mbit. The device is manufactured using well known SiP technology. It is particularly well suited for use in high reliability, high performance and high density system applications. The VDEE4M32XS64XX4C250-II is packaged in a 64 pins SOP.

2 Features

- Single 5.0 V supply: 4.5 V to 5.5 V
- Access time: 250 ns (max)
- Power dissipation
 - Active: 100 mW/MHz, (max)
 - Standby: 550 μ W (max)
- On-chip latches: address, data, #CE, #OE, #WE
- Automatic byte write: 10 ms (max)
- Automatic page write (128 bytes): 10 ms (max)
- Data polling and RDY/#Busy
- Data protection circuit on power on/off
- Conforms to JEDEC byte-wide standard
- Reliable CMOS with MNOS cell technology
- 10^4 erase/write cycles (in page mode)
- 10 years data retention
- Software data protection
- Write protection by #RES pin

3 Block Diagram



(All other signals are common to the four memories)

Figure 1 Block diagram

4 Pin Configurations

| Pin Id | Pin # | Pin # | Pin Id |
|-----------|-------|-------|--------|
| A11 | 1 | 64 | I/O24 |
| A9 | 2 | 63 | I/O16 |
| A8 | 3 | 62 | I/O8 |
| A4 | 4 | 61 | I/O0 |
| A5 | 5 | 60 | I/O25 |
| A6 | 6 | 59 | I/O17 |
| A7 | 7 | 58 | I/O9 |
| A12 | 8 | 57 | I/O1 |
| A14 | 9 | 56 | I/O26 |
| A16 | 10 | 55 | I/O18 |
| RDY/#BUSY | 11 | 54 | I/O10 |
| VCC | 12 | 53 | I/O2 |
| VCC | 13 | 52 | I/O27 |
| VCC | 14 | 51 | I/O19 |
| VCC | 15 | 50 | I/O11 |
| A15 | 16 | 49 | I/O3 |
| #RES | 17 | 48 | I/O28 |
| #WE | 18 | 47 | I/O20 |
| A13 | 19 | 46 | I/O12 |
| A0 | 20 | 45 | I/O4 |
| A1 | 21 | 44 | I/O29 |
| A2 | 22 | 43 | I/O21 |
| A3 | 23 | 42 | I/O13 |
| VSS | 24 | 41 | I/O5 |
| VSS | 25 | 40 | I/O30 |
| VSS | 26 | 39 | I/O22 |
| VSS | 27 | 38 | I/O14 |
| #CE | 28 | 37 | I/O6 |
| NC | 29 | 36 | I/O31 |
| NC | 30 | 35 | I/O23 |
| A10 | 31 | 34 | I/O15 |
| #OE | 32 | 33 | I/O7 |

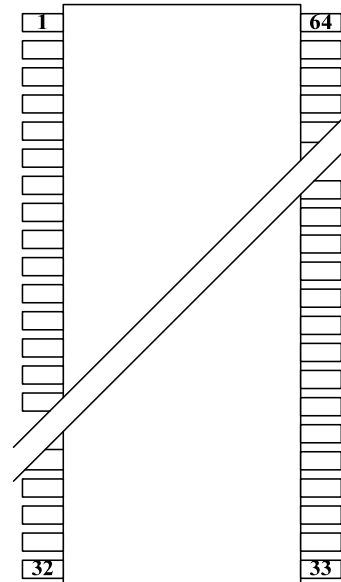


Figure 2 Pin configuration

Table 1 Pin description

| Name | Function |
|-------------|--|
| A0~A16 | Address Input. |
| I/O0- I/O31 | Data Input/Output Ports. 40 bit-directional ports are used to read data from or write data into the EEPROM. |
| #CE | Die Enable Input .When #CE is Low, the command input cycle becomes valid. When #CEn is High, all inputs are ignored. |
| RDY/#BUSY | Ready busy. |
| #RES | Reset input. |
| #OE | Output enable. |
| #WE | Write Enable Input. Enables write operation. |
| VCC | Power supply, connect to 3.3V |
| VSS | Ground |

5 Command Operation

5.1 Absolute Maximum Ratings

Table 2 Absolute maximum ratings

| Parameter | Symbol | Value | Unit |
|--|------------------|--------------|------|
| Supply voltage relative to V _{SS} | V _{CC} | -0.6 to +7.0 | V |
| Input voltage relative to V _{SS} | V _{IN} | -0.5 to +7.0 | V |
| Operating temperature range | T _{OPR} | -55 to +125 | °C |
| Storage temperature range | T _{STG} | -65 to +150 | °C |
| Power Dissipation | P _D | 1 | W |

5.2 Recommended DC Operating Conditions

Table 3 Recommended DC operating condition

| Parameter | Symbol | Min | Typ | Max | Unit |
|----------------|-----------------|----------------------|-----|----------------------|------|
| Supply voltage | V _{CC} | 4.5 | 5.0 | 5.5 | V |
| | V _{SS} | 0 | 0 | 0 | V |
| Input voltage | V _{IL} | -0.3 | - | 0.8 | V |
| | V _{IH} | 2.2 | - | V _{CC} +0.3 | V |
| | V _H | V _{CC} -0.5 | - | V _{CC} +1.0 | V |

5.3 DC Characteristics (VCC =4.5V to 5.5 V)

Table 4 DC characteristics

| Parameter | Symbol | Test conditions | min. | max. | Unit |
|---------------------------|--------|--|------|------|------|
| Output voltage low level | VOL | V _{cc} =4.5V , I _{OL} = 2.1mA | — | 0.4 | V |
| Output voltage high level | VOH | V _{cc} =4.5V , I _{OH} = -400uA | 2.4 | — | V |

6 Typical Application

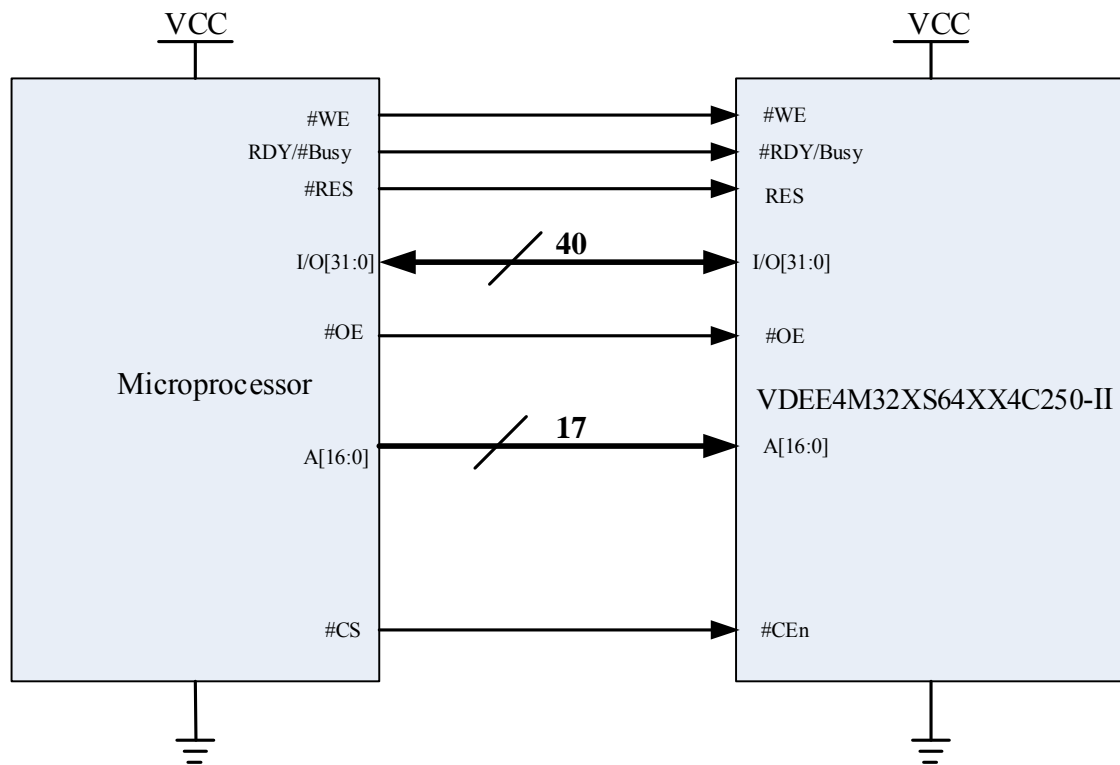


Figure 3 Typical application

7 Ordering Information

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|--|-----------|-----------|-----------|----------|----------|-----------|----------|----------|----------|----------|------------|------------|
| <u>VD</u> | <u>EE</u> | <u>4M</u> | <u>32</u> | <u>X</u> | <u>S</u> | <u>64</u> | <u>X</u> | <u>X</u> | <u>4</u> | <u>C</u> | <u>250</u> | <u>-II</u> |
| VDIC | | | | | | | | | | | | |
| EEPROM | | | | | | | | | | | | |
| Capability: 4M bit | | | | | | | | | | | | |
| Bus Width: 32bit | | | | | | | | | | | | |
| R= Radiation Data Tested; V= Generic Radiation Data Available | | | | | | | | | | | | |
| Package: SOP | | | | | | | | | | | | |
| Pin Quantity: 64 Pin | | | | | | | | | | | | |
| Temperature: E=0~+70℃;I=-40~+85℃;M=-55~+125℃ | | | | | | | | | | | | |
| Quality: E= Sample; B= Industry; M=Military; S= Space | | | | | | | | | | | | |
| Stacking Layer: 4 layer | | | | | | | | | | | | |
| Power Supply : 5.0V | | | | | | | | | | | | |
| Speed: 250ns | | | | | | | | | | | | |
| II=Second Version | | | | | | | | | | | | |

Table 5 Ordering information

| Part Number | Capacity (bit) | Bus Width (bit) | Radiation | | | Packaging | Temperature (°C) |
|------------------------|----------------|-----------------|------------------|------------------|------------------|-----------|--------------------|
| | | | TID ¹ | SEL ² | SEU ³ | | |
| VDEE4M32VS64EE4C250-II | 4M | 32 | - | - | - | SOP64 | 0 ~ +70 |
| VDEE4M32VS64IB4C250-II | 4M | 32 | - | - | - | SOP64 | -40 ~ +85 |
| VDEE4M32VS64MM4C250-II | 4M | 32 | - | - | - | SOP64 | -55 ~ +125 |
| VDEE4M32RS64MS4C250-II | 4M | 32 | TBD | TBD | TBD | SOP64 | -55 ~ +125 |

¹ TID: Total Dose (Krad(Si))

² SEL: LET Threshold (Mev.cm²/mg)

³ SEU:SEU Threshold (Mev.cm²/mg)

8 Package Dimensions

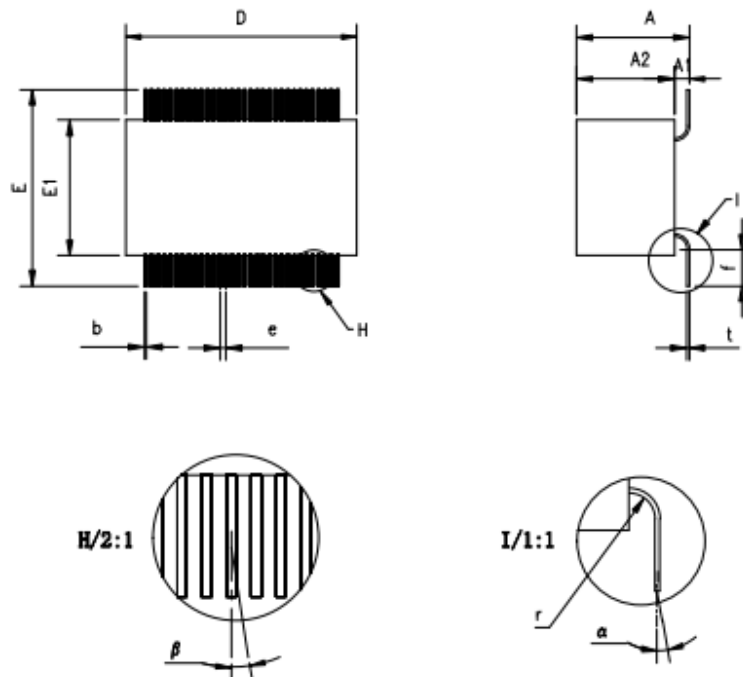


Figure 4 Package dimensions

Table 6 Dimensions information

| | Min | Max |
|----------------------------------|----------------|-------|
| A | 8.80 | 9.50 |
| A2 | 7.60 | 8.20 |
| D | 18.50 | 18.90 |
| E | 15.80 | 16.20 |
| E1 | 10.80 | 11.20 |
| f | 2.90 | |
| b | 0.25 | |
| e | 0.50 | |
| r | 1.00 | |
| t | 0.20 | |
| α | $\leq 3^\circ$ | |
| β | $\leq 3^\circ$ | |
| NOTE: 1.Uint: mm 2. A1=A - A2 | | |

9 REVISION HISTORY

Table 7 Revision history

| Revision | Date | Description of Change |
|----------|---------------|-----------------------|
| A0 | Mar 27th,2020 | First Created |