

# **VDIC EEPROM MEMORY**

## **VDEE2M08XS40XX2V250-II USER MANUAL**

**Version : A0**

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## Contents

|     |  |   |
|-----|--|---|
| 1   | DESCRIPTION .....  | 1 |
| 2   | FEATURES.....  | 1 |
| 3   | BLOCK DIAGRAM .....  | 2 |
| 4   | PIN DESCRIPTIONS .....   | 2 |
| 5   | ELECTRICAL SPECIFICATIONS.....                                       | 3 |
| 5.1 | ABSOLUTE MAXIMUM RATINGS.....  | 3 |
| 5.2 | RECOMMENDED DC OPERATING CONDITIONS.....                             | 3 |
| 5.3 | DC CHARACTERISTICS ( $V_{CC} = 4.5\text{ V TO } 5.5\text{ V}$ )..... | 4 |
| 6   | TYPICAL APPLICATION .....  | 4 |
| 7   | ORDERING INFORMATION .....   | 5 |
| 8   | PACKAGE DIMENSIONS .....   | 6 |
| 9   | REVISION HISTORY .....   | 7 |

# VDIC-EEPROM

## 3.3V 256K × 8bit

### 1 Description

The VDEE2M08XS40XX2V250-II is a 256K × 8bit. Electrically Erasable and Programmable CMOS ROM. It is organized as two dies of 1Mbit. Each die has 8-bit interface and is selected with specific #CEn. 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 VDEE2M08XS40XX2V250-II is packaged in a 40 pins SOP.

### 2 Features

- Single 3.3V supply: 2.7 V to 3.6V
- Access time: 150 ns (max)
- Power dissipation
  - Active: 80 mW/MHz, (typ)
  - Standby: 440 μW (max)
- On-chip latches: address, data, #CEn, #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<sup>4</sup>erase/write cycles (in page mode)
- 10 years data retention
- Software data protection
- Write protection by #RES pin

### 3 Block Diagram

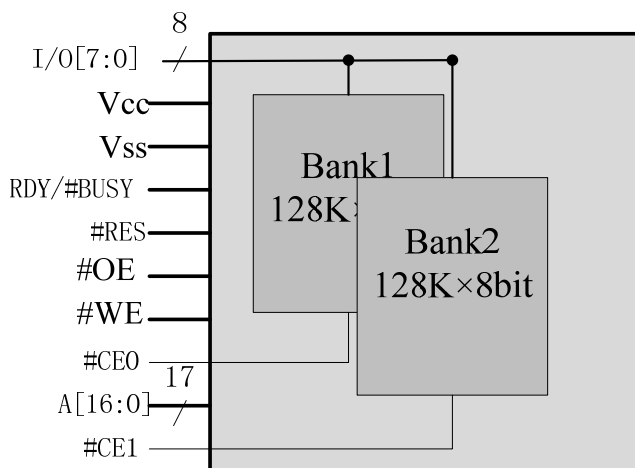


Figure 1 Block diagram

### 4 Pin Descriptions

| Pin Id    | Pin # |    | Pin Id |
|-----------|-------|----|--------|
| VSS       | 1     | 40 | NC     |
| NC        | 2     | 39 | #CE1   |
| A11       | 3     | 38 | #OE    |
| A9        | 4     | 37 | A10    |
| A8        | 5     | 36 | #CE0   |
| A13       | 6     | 35 | I/O7   |
| #WE       | 7     | 34 | I/O6   |
| #RES      | 8     | 33 | I/O5   |
| A15       | 9     | 32 | I/O4   |
| VCC       | 10    | 31 | I/O3   |
| RDY/#BUSY | 11    | 30 | VSS    |
| A16       | 12    | 29 | I/O2   |
| A14       | 13    | 28 | I/O1   |
| A12       | 14    | 27 | I/O0   |
| A7        | 15    | 26 | A0     |
| A6        | 16    | 25 | A1     |
| A5        | 17    | 24 | A2     |
| A4        | 18    | 23 | A3     |
| NC        | 19    | 22 | NC     |
| NC        | 20    | 21 | NC     |

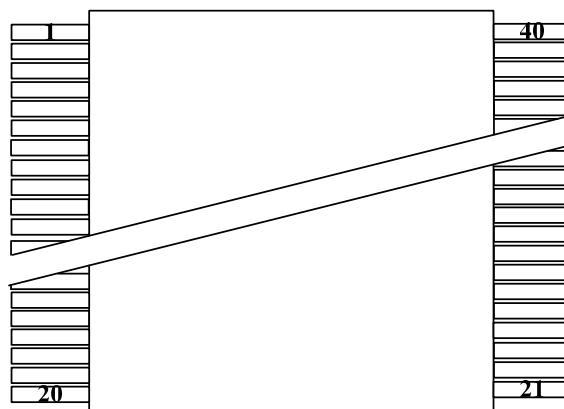


Figure 2 Pin configuration

Table 1 Pin description

| Name        | Function  |
|-------------|---|
| A0~A16      | Address Input.  |
| I/O0- I/O7  | Data Input/Output Ports. 8 bit-directional ports are used to read data from or write data into the EEPROM.            |
| #CE0 (Die1) | Die Enable Input .When #CEn is Low, the command input cycle becomes valid. When #CEn is High, all inputs are ignored. |
| #CE1 (Die2) |   |
| RDY/#BUSY   | Ready busy.   |
| #RES        | Reset input.  |
| #OE         | Output enable.  |
| #WE         | Write Enable Input. Enables write operation.  |
| VCC         | Power supply  |
| VSS         | Ground  |
| NC          | No connection<br>This pin is recommended to be left No Connection on the device.                                      |

## 5 Electrical Specifications

### 5.1 Absolute Maximum Ratings

Table 2 Absolute maximum ratings

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

### 5.2 Recommended DC Operating Conditions

Table 3 Recommended DC operating condition

| Parameter      | Symbol          | Min                  | Typ | Max                  | Unit |
|----------------|-----------------|----------------------|-----|----------------------|------|
| Supply voltage | V <sub>CC</sub> | 2.7                  | 3.3 | 3.6                  | V    |
|                | V <sub>SS</sub> | 0                    | 0   | 0                    | V    |
| Input voltage  | V <sub>IL</sub> | -0.3                 | -   | 0.8                  | V    |
|                | V <sub>IH</sub> | 1.9                  | -   | V <sub>CC</sub> +0.3 | V    |
|                | V <sub>H</sub>  | V <sub>CC</sub> -0.5 | -   | V <sub>CC</sub> +1.0 | V    |

**5.3 DC Characteristics (V<sub>CC</sub> =2.7 V to 3.6 V)**

**Table 4 DC characteristics**

| Parameter                 | Symbol | Test conditions                                  | min. | max. | Unit |
|---------------------------|--------|--|------|------|------|
| Output voltage low level  | VOL    | V <sub>CC</sub> =2.7V , I <sub>OL</sub> = 2.1mA  | —    | 0.4  | V    |
| Output voltage high level | VOH    | V <sub>CC</sub> =2.7V , I <sub>OH</sub> = -400uA | 2.16 | —    | V    |

**6 Typical Application**

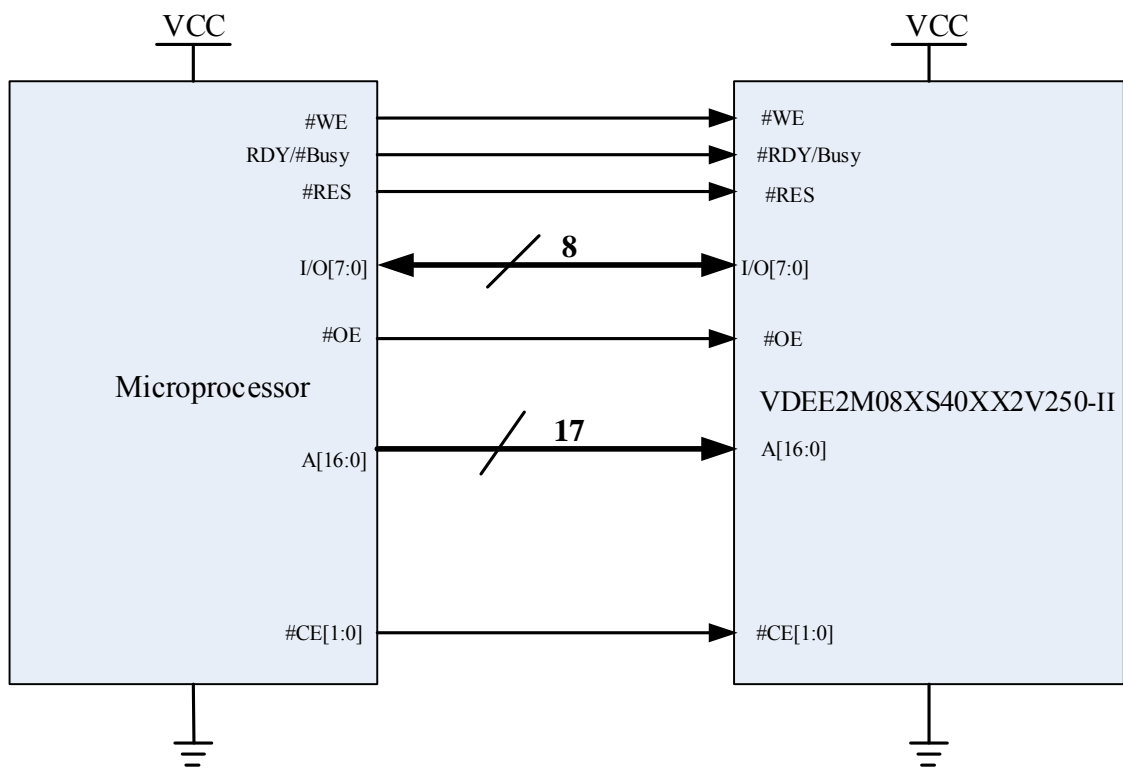


Figure 3 Typical application

## 7 Ordering Information

| 1  | 2         | 3         | 4         | 5        | 6        | 7         | 8        | 9        | 10       | 11       | 12         | 13         |
|--|-----------|-----------|-----------|----------|----------|-----------|----------|----------|----------|----------|------------|------------|
| <u>VD</u>  | <u>EE</u> | <u>2M</u> | <u>08</u> | <u>X</u> | <u>S</u> | <u>40</u> | <u>X</u> | <u>X</u> | <u>2</u> | <u>V</u> | <u>250</u> | <u>-II</u> |
| VDIC   |           |           |           |          |          |           |          |          |          |          |            |            |
| EEPROM   |           |           |           |          |          |           |          |          |          |          |            |            |
| Capability: 2M bit   |           |           |           |          |          |           |          |          |          |          |            |            |
| Bus Width: 8bit  |           |           |           |          |          |           |          |          |          |          |            |            |
| R= Radiation Data Tested;<br>V= Generic Radiation Data Available |           |           |           |          |          |           |          |          |          |          |            |            |
| Package: SOP   |           |           |           |          |          |           |          |          |          |          |            |            |
| Pin Quantity: 40 Pin   |           |           |           |          |          |           |          |          |          |          |            |            |
| Temperature: E=0~+70°C; I=-40~+85°C; M=-55~+125°C                |           |           |           |          |          |           |          |          |          |          |            |            |
| Quality Grade: E= Sample; B= Industry; M=Military; S= Space      |           |           |           |          |          |           |          |          |          |          |            |            |
| Stacking Layer: 2 layer  |           |           |           |          |          |           |          |          |          |          |            |            |
| Power Supply : 3.3V  |           |           |           |          |          |           |          |          |          |          |            |            |
| Speed: 250ns   |           |           |           |          |          |           |          |          |          |          |            |            |
| II=Second Version  |           |           |           |          |          |           |          |          |          |          |            |            |

Table 5 Ordering information

| Part Number            | Capacity (bit) | Bus Width (bit) | Radiation        |                  |                  | Packaging | Temperature ( °C ) |
|------------------------|----------------|-----------------|------------------|------------------|------------------|-----------|--------------------|
|                        |                |                 | TID <sup>1</sup> | SEL <sup>2</sup> | SEU <sup>3</sup> |           |                    |
| VDEE2M08VS40EE2V250-II | 2M             | 8               | -                | -                | -                | SOP40     | 0 ~ +70            |
| VDEE2M08VS40IB2V250-II | 2M             | 8               | -                | -                | -                | SOP40     | -40 ~ +85          |
| VDEE2M08VS40MM2V250-II | 2M             | 8               | -                | -                | -                | SOP40     | -55 ~ +125         |
| VDEE2M08RS40MS2V250-II | 2M             | 8               | 30               | 99.8             | 25               | SOP40     | -55 ~ +125         |

<sup>1</sup> TID: Total Dose (Krad(Si))

<sup>2</sup> SEL: LET Threshold (Mev.cm2/mg)

<sup>3</sup> SEU:SEU Threshold (Mev.cm2/mg)

### 8 Package Dimensions

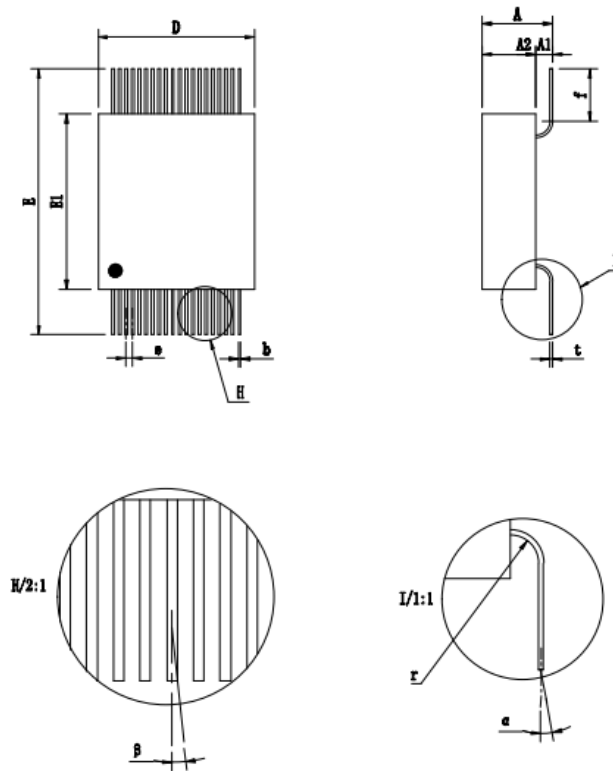


Figure 4 Package dimensions

Table 6 Dimensions information

|                                   | Min   | Max   |
|-----------------------------------|-------|-------|
| A                                 | 5.20  | 5.70  |
| A2                                | 4.00  | 4.40  |
| D                                 | 11.50 | 11.90 |
| E                                 | 19.80 | 20.20 |
| E1                                | 13.00 | 13.40 |
| f                                 | 3.98  |       |
| b                                 | 0.25  |       |
| e                                 | 0.5   |       |
| r                                 | 1.0   |       |
| t                                 | 0.2   |       |
| α                                 | ≤3°   |       |
| β                                 | ≤3°   |       |
| NOTE: 1.Uint: mm<br>2. A1= A - A2 |       |       |



## 9 REVISION HISTORY

Table 7 Revision history

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