

Renesas LSIs

# M5M29GB/T320VP-80

33,554,432-BIT (4,194,304-WORD BY 8-BIT / 2,097,152-WORD BY16-BIT)  
CMOS 3.3V-ONLY, BLOCK ERASE FLASH MEMORY

## DESCRIPTION

The Mobile FLASH M5M29GB/T320VP are 3.3V-only high speed 33,554,432-bit CMOS boot block Flash Memories with alternating BGO (Back Ground Operation) feature. The BGO feature of the device allows Program or Erase operations to be performed in one bank while the device simultaneously allows Read operations to be performed on the other bank. This BGO feature is suitable for mobile and personal computing, and communication products. The M5M29GB/T320VP are fabricated by CMOS technology for the peripheral circuits and DINOR(Divided bit line NOR) architecture for the memory cells, and are available in 48pin TSOP(I) .

## FEATURES

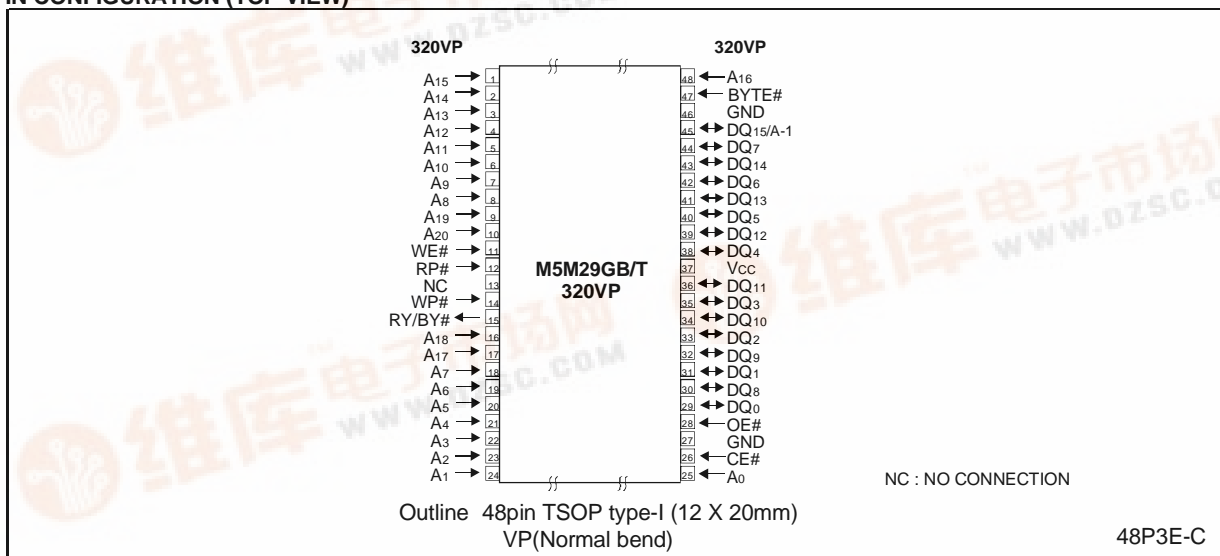
- Organization
  - ..... 2,097,152 word x 16bit
  - ..... 4,194,304 word x 8 bit
- Supply voltage
  - ..... Vcc = 2.7 ~ 3.6V
- Access time
  - ..... 80ns (Vcc=3.0~3.6V)
  - ..... 90ns (Vcc=2.7~3.6V)
- Power Dissipation
  - Read ..... 72 mW (Max. at 5MHz)
  - (After Automatic Power saving) ..... 0.33μW (typ.)
  - Program/Erase ..... 126mW (Max.)
  - Standby ..... 0.33μW (typ.)
- Deep power down mode ..... 0.33μW (typ.)
- Auto program for Bank(I) and Bank(II)
  - Program Time ..... 4ms (typ.)
  - Program Unit
    - (Byte Program) ..... 1word/1byte
    - (Page Program) ..... 128word/256byte
- Auto program for Bank(III) and Bank(IV)
  - Program Time ..... 4ms (typ.)
  - Program Unit ..... 128word/256byte
- Auto Erase
  - Erase time ..... 40 ms (typ.)
  - Erase Unit
    - Bank(I) Boot Block ..... 4Kword/8Kbyte x 2
    - Parameter Block ..... 4Kword/8Kbyte x 6
    - Main Block ..... 32Kword/64Kbyte x 7
    - Bank(II) Main Block ..... 32Kword/64Kbyte x 8
    - Bank(III) Main Block ..... 32Kword/64Kbyte x 24
    - Bank(IV) Main Block ..... 32Kword/64Kbyte x 24
- Program/Erase cycles ..... 100Kcycles

- Boot Block
  - M5M29GB320VP .....Bottom Boot
  - M5M29GT320VP .....Top Boot
- Other Functions
  - Soft Ware Command Control
  - Selective Block Lock
  - Status Register Read
  - Alternating Back Ground Program/Erase Operation Between Bank(I) ,Bank(II),Bank(III) and Bank(IV)
- Package
  - 48-Lead, 12mm x 20mm TSOP (type-I)

## APPLICATION

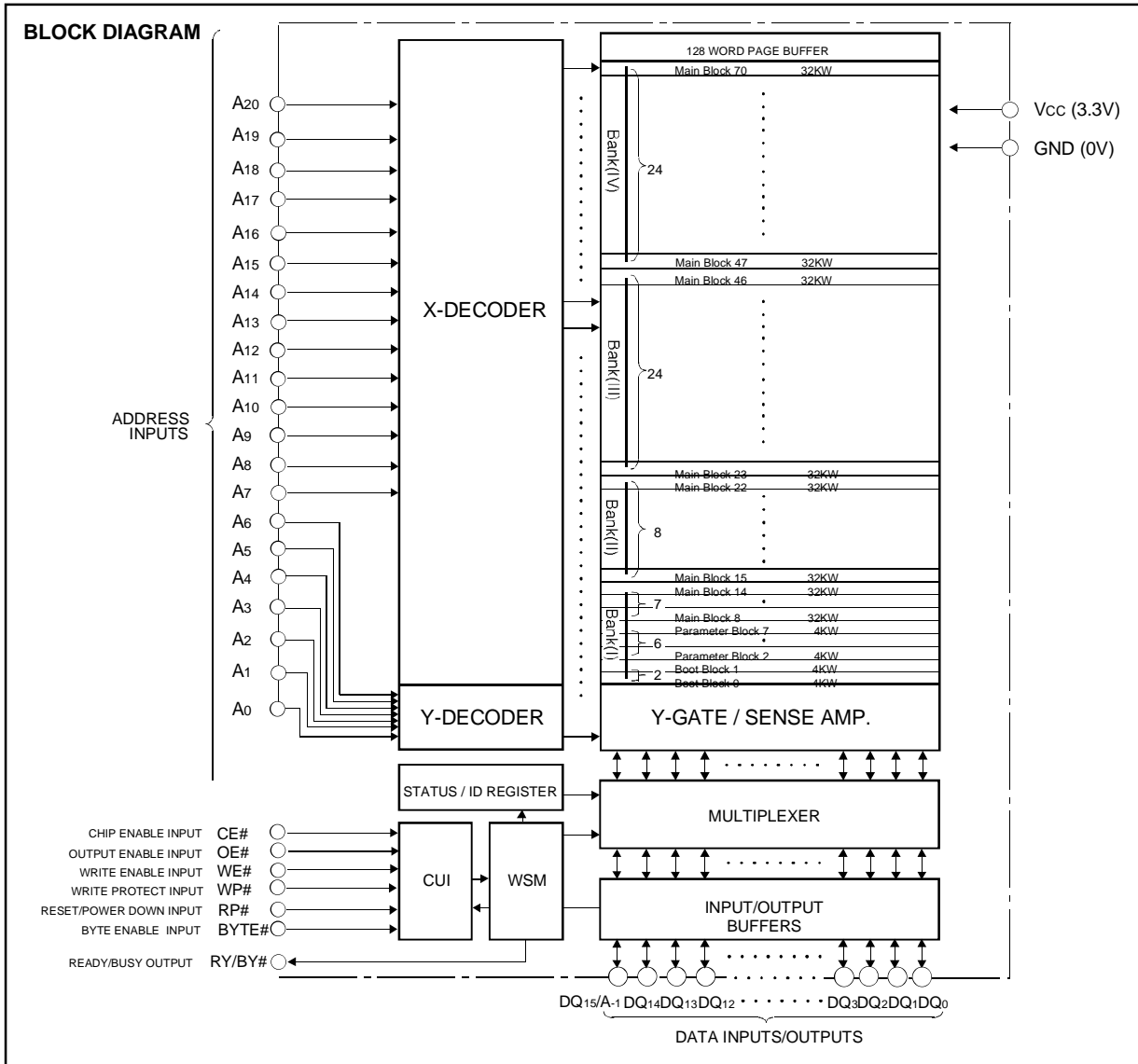
- Code Strage
- Digital Cellular Phone
- Telecommunication
- Mobile Computing Machine
- PDA (Personal Digital Assistance)
- Car Navigation System
- Video Game Machine

## PIN CONFIGURATION (TOP VIEW)

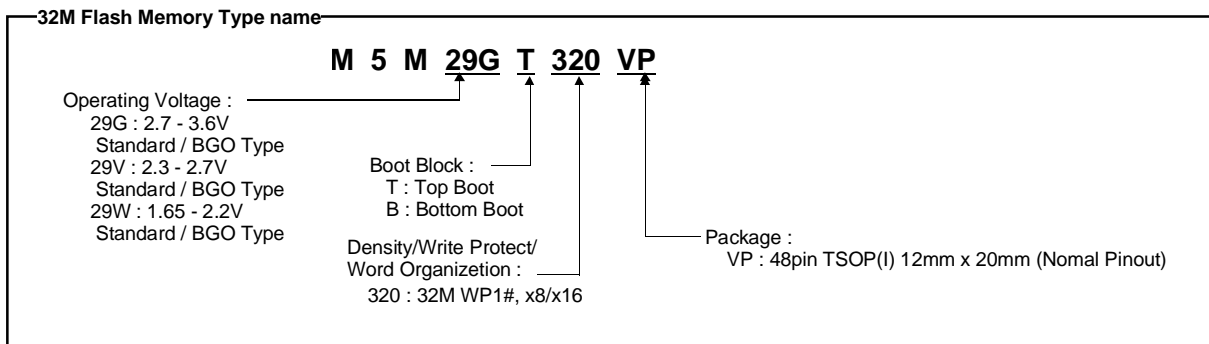


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M5M29GB/T320VP (8/16 bit version)



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## Renesas Technology Corp.

Nippon Bldg., 6-2, Otemachi 2-chome, Chiyoda-ku, Tokyo, 100-0004 Japan

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