# 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 ..... $V_{CC}$ = 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

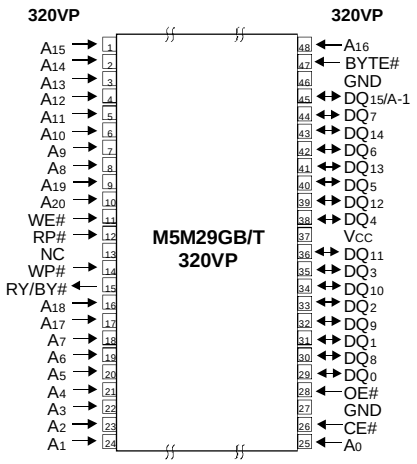
- Program/Erase cycles ..... 100Kcycles

- 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)

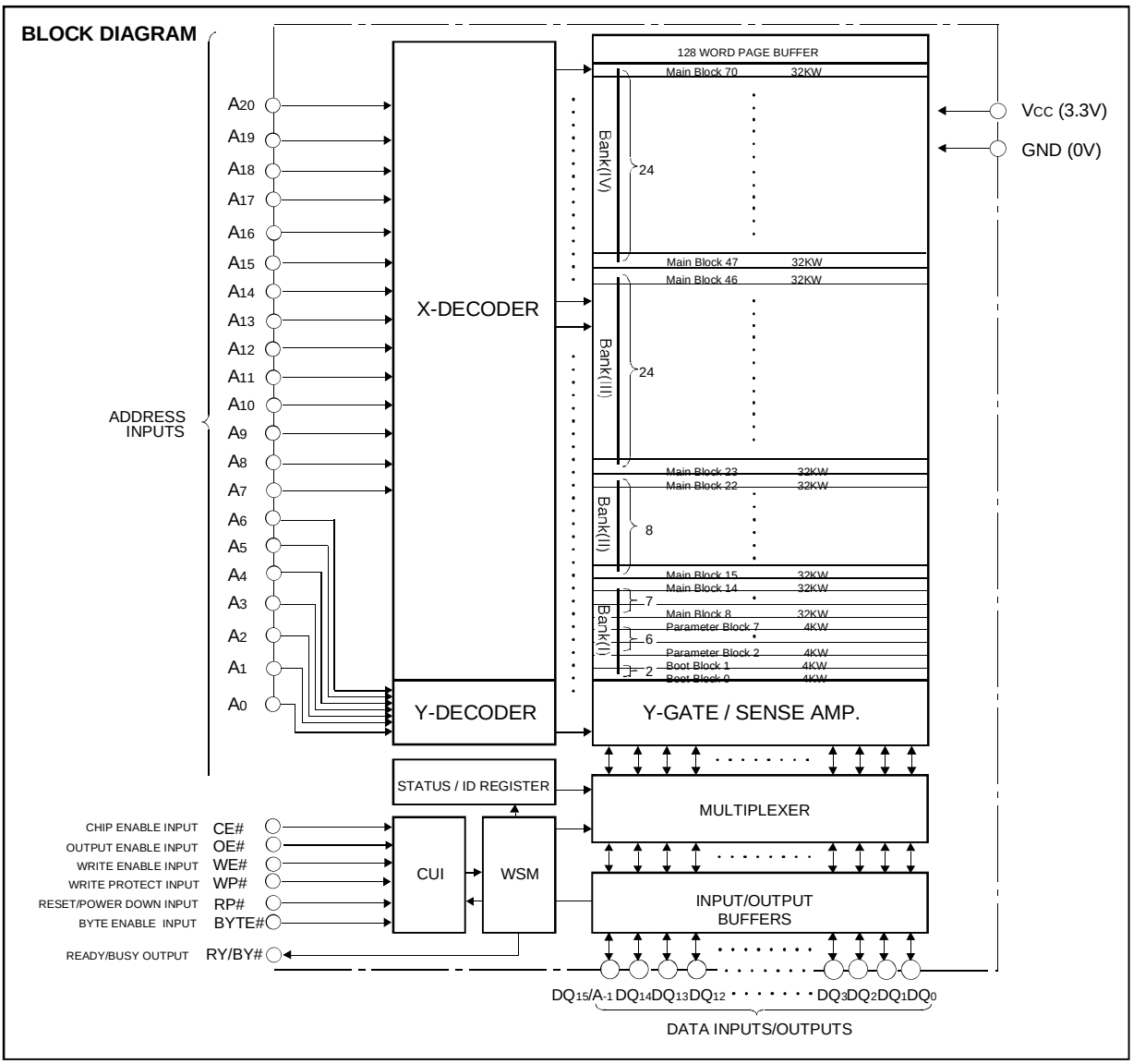



NC : NO CONNECTION

Outline 48pin TSOP type-I (12 X 20mm)
VP(Normal bend)

48P3E-C

**BLOCK DIAGRAM**




M5M29GB/T320VP (8/16 bit version)

**32M Flash Memory Type name**

**M 5 M 29G T 320 VP**

Operating Voltage :
29G : 2.7 - 3.6V
Standard / BGO Type
29V : 2.3 - 2.7V
Standard / BGO Type
29W : 1.65 - 2.2V
Standard / BGO Type

Boot Block :
T : Top Boot
B : Bottom Boot

Density/Write Protect/
Word Organizetion :
320 : 32M WP1#, x8/x16

Package :
VP : 48pin TSOP(I) 12mm x 20mm (Nomal Pinout)

Renesas LSIs

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**CMOS 3.3V-ONLY, BLOCK ERASE FLASH MEMORY**


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