



Application Note

**Eon Flash EN29GL128H(L)-70ZIP
VS
TOSHIBA Flash TC58FVM7T(B)5B-TG65**



Eon Silicon Solution Inc.

1. INTRODUCTION

The application note introduces how to implement a system design from TOSHIBA Flash TC58FVM7T(B)5B-TG65 Flash to Eon EN29GL128H(L)-70ZIP Flash.

2. GENERAL FUNCTION COMPARISON TABLE:

The following table highlights the major features of these two devices.

Features	EN29GL128H(L)-70ZIP	TC58FVM7T(B)5B-TG65
voltage range	2.7 ~ 3.6	2.7 ~ 3.6
Pin to Pin	Compatible (for 56 TSOP) Pin 51=DQ15/A-1, Pin 53=BYTE#	Compatible (for 56 TSOP) Pin 51=DQ15, Pin 53=NC
Page Access time	25ns	25ns
Fast random access time	70ns	65ns
Page read buffer length	8 Words	8 Words
Write buffer length	32 Words	No
Page Program	No	8 Words
Fast Program	No	Yes
Sector(Block)Architecture	Uniform 64K Words	8 x 4K Words + 255 x 32K Words
Bank Architecture	Single Bank	8M Bits × 16 Banks
Simultaneous read/write	No	Yes
Byte/Word mode	Yes	Only support Word mode
WP#/ACC	Yes	Yes
Secured silicon sector	128 Words	32K Words
CFI Compliant	Yes	Yes
JEDEC Data# polling & toggle bit command	Yes	Yes
Erase Suspend / Resume	Yes	Yes
Program Suspend / Resume	Yes	Yes
Minimum endurance cycle	100K	100K
Package	56-pin 14mm x 20mm TSOP	56-pin 14mm x 20mm TSOP



3. HARDWARE & PERFORMANCE CONSIDERATIONS

3.1 I_{CC} comparison

Current	EN29GL128H(L)-70ZIP		TC58FVM7T(B)5B-TG65		Unit
	Typ	Max	Typ	Max	
Read I _{CC1} (@10MHz)	25	45	37	55	mA
Write I _{CC2}	20	30	11 for Program 9 for Erase	15	mA
Standby I _{CC3}	1.5	10	3	10	μA

3.2 Max VID comparison

TC58FVM7T(B)5B VID range is 11.4V~12.6V. But EN29GL128H/L doesn't support VID function. Any voltage level higher than chip spec would damage the device, possibly. (Using high voltage into autoselect mode)

3.3 Different V_{HH} (V_{ACC}) level (for accelerating programming functions)

EN29GL128H/L (V_{HH}) voltage level: 8.5V~9.5V.

TC58FVM7T(B)5B (V_{ACC}) voltage level: 8.5~12.6V.

3.4 Different random access speed

EN29GL128H/L: 70ns @ full VCC range: 2.7V~3.6V and C_L=30pF.

TC58FVM7T(B)5B: 65 ns @ full VCC range: 2.7V~3.6V and C_L=30pF /
70 ns. (When C_L=100pF)

3.5 56 TSOP package comparison

For the pin-out of 56 TSOP, the Eon EN29GL128H(L)-70ZIP is the same as TOSHIBA TC58FVM7T(B)5B-TG65 except 51 and 53 pins.

Part No.	EN29GL128H(L)-70ZIP	TC58FVM7T(B)5B-TG65
51 pin	DQ15/A-1	DQ15
53 pin	BYTE#	NC



3.6 Hardware Protection comparison

Both EN29GL128H/L and TC58FVM7T(B)5B have Hardware Sector(Block) protection feature by WP#/ACC = V_{IL}. But the protection area is different.

Eon / Protection Area		TOSHIBA / Protection Area	
EN29GL128L	Lowest address SA0	TC58FVM7B5B	Bottom block BA0 and BA1
EN29GL128H	Highest address SA127	TC58FVM7T5B	Top block BA261 and BA262

4. SOFTWARE CONSIDERATIONS

4.1 Manufacturer ID and Device Identifications comparisons

For EN29GL128H/L: manufacture ID: 007Fh (A8 = "0"), 001Ch (A8 = "1");
device ID: 227Eh / 2221h / 2201h.

TC58FVM7T(B)5B: manufacture ID: 0098h,
device ID: TC58FVM7T5B = 001Bh / TC58FVM7B5B = 001Dh.

CODE TYPE		A22~A12	A6	A1	A0	CODE (HEX)
Manufacturer Code		X	L	L	L	0098h
Device Code	TC58FVM7T5B	X	L	L	H	001Bh
	TC58FVM7B5B	X	L	L	H	001Dh
Verify Block Protect		BA ⁽¹⁾	L	H	L	Data ⁽²⁾

4.2. Password protection commands

EN29GL128H/L: No support.

TC58FVM7T(B)5B: Support.

4.3. Write Buffer commands

EN29GL128H/L: Support 32 Words.

TC58FVM7T(B)5B: No support.



4.4. Page Program command

EN29GL128H/L: No support.

TC58FVM7T(B)5B: Support 8 Words.

4.5. Fast Program commands

EN29GL128H/L: No support.

TC58FVM7T(B)5B: Support.

4.6. Multi-sector (block) erasure commands

EN29GL128H/L: No supported. (Users must issue another sector erase command for the next sector to be erased after the previous one is completed)

TC58FVM7T(B)5B: Support Multi-block erasure.

4.7. Secured silicon sector Address Range

EN29GL128H/L:

Secured Silicon Sector Address Range	
000000h-000007h	Reserve for Factory
000008h-00007Fh	Determined by customer

TC58FVM7T(B)5B:

TYPE	BOOT BLOCK ARCHITECTURE	ADDRESS RANGE	SIZE
TC58FVM7T5B	TOP BOOT BLOCK	7F8000h~7FFFFFFh	32 Kwords
TC58FVM7B5B	BOTTOM BOOT BLOCK	000000h~007FFFh	32 Kwords



4.8. Different PPB protect range

EN29GL128H/L: Sector 0~3 and 124~127 have PPB for each sector. Sector 4~123 are 1 PPB per 4 sectors.

TC58FVM7T(B)5B: A Persistent-Protection-Bit (PPB) is assigned to each block.

4.9. Sector (Block) Architecture and Erase

EN29GL128H/L:

Uniform Sector Architecture:

- 128 sectors of 64K Words
- Any sector can be erased individually

TC58FVM7T(B)5B:

Flexible Sector Architecture:

- 8 blocks of 4K Words and 255 blocks of 32K Words
- Any block can be erased individually



4.10. Sector (Block) Erasure

EN29GL128H/L: Sector or Chip erasable

TC58FVM7T(B)5B: Block or Chip erasable

Note : In the condition of erasing the boot block of TC58FVM7T(B)5B to be replaced with EN29GL128H/L, the customer need to take care the erase area is different between EN29GL128H/L and TC58FVM7T(B)5B. The correlation table is shown below.

Sector Size	Address Range (x16)	for cycle 6th	
		EN29GL128H/L	TC58FVM7B5B
64KWords	000000h-00FFFFh	Issue sector erase (Addr./Data = SA/30h) for SA 0	Issue sector erase (Addr./Data = BA/30h) for BA 0
			Issue sector erase (Addr./Data = BA/30h) for BA 1
			Issue sector erase (Addr./Data = BA/30h) for BA 2
			Issue sector erase (Addr./Data = BA/30h) for BA 3
			Issue sector erase (Addr./Data = BA/30h) for BA 4
			Issue sector erase (Addr./Data = BA/30h) for BA 5
			Issue sector erase (Addr./Data = BA/30h) for BA 6
			Issue sector erase (Addr./Data = BA/30h) for BA 7
			Issue sector erase (Addr./Data = BA/30h) for BA 8
64KWords	010000h-01FFFFh	Issue sector erase (Addr./Data = SA/30h) for SA 1	Issue sector erase (Addr./Data = BA/30h) for BA 9 Issue sector erase (Addr./Data = BA/30h) for BA 10
64KWords	020000h-02FFFFh	Issue sector erase (Addr./Data = SA/30h) for SA 2	Issue sector erase (Addr./Data = BA/30h) for BA 11 Issue sector erase (Addr./Data = BA/30h) for BA 12
64KWords	030000h-03FFFFh	Issue sector erase (Addr./Data = SA/30h) for SA 3	Issue sector erase (Addr./Data = BA/30h) for BA 13 Issue sector erase (Addr./Data = BA/30h) for BA 14
⋮	⋮	⋮	⋮
64KWords	7D0000h-7DFFFFh	Issue sector erase (Addr./Data = SA/30h) for SA 125	Issue sector erase (Addr./Data = BA/30h) for BA 257
			Issue sector erase (Addr./Data = BA/30h) for BA 258
64KWords	7E0000h-7EFFFFh	Issue sector erase (Addr./Data = SA/30h) for SA 126	Issue sector erase (Addr./Data = BA/30h) for BA 259
			Issue sector erase (Addr./Data = BA/30h) for BA 260
64KWords	7F0000h-7FFFFFh	Issue sector erase (Addr./Data = SA/30h) for SA 127	Issue sector erase (Addr./Data = BA/30h) for BA 261
			Issue sector erase (Addr./Data = BA/30h) for BA 262

Note:

TC58FVM7B5B is bottom block, for TC58FVM7T5B (top block) the boot blocks are in high address.



5. PERFORMANCE DIFFERENCES

5.1 Power-on and Reset Timings.

Parameter	Description	EN29GL128H(L)	TC58FVM7T(B)5B
t _{VCS}	Vcc Setup Time (min)	50μs	500μs
t _{RP1}	RESET# Pulse Width (During Embedded Algorithms) (min.)	10μs	*None
t _{RP2}	RESET# Pulse Width (NOT During Embedded Algorithms) (min.)	500ns	500ns
t _{RH}	Reset# High Time Before Read (min.)	50ns	50ns
t _{RB1}	RY/BY# Recovery Time (to CE#, OE# go low)	0ns	0ns
t _{RB2}	RY/BY# Recovery Time (to WE# go low)	50ns	*None
t _{READY1}	Reset# Pin Low (During Embedded Algorithms) to Read or Write (max.)	20μs	25μs
t _{READY2}	Reset# Pin Low (NOT During Embedded Algorithms) to Read or Write (max.)	500ns	500ns

Note*: There is no clear description in datasheet.



Eon Silicon Solution Inc.

Revisions List

Revision No	Description	Date
A	Initial Release	2009/07/20
B	<ol style="list-style-type: none">1. Correct the Write Buffer command comparison on page 2 and 4.2. Add the Page Program and Fast Program commands, Bank Architecture and Simultaneous read/write comparisons on page 2 and 5.	2009/08/11