Application Note

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

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~7FFFFFh	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.

Revisions List

Revision No	Description	Date
A	Initial Release	2009/07/20
B	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