

Product Datasheet Release Notice for MBI5039

V2.00, March 2009

1. Modify the compulsory error detection time to **700ns** and compulsory error detection current to **0.25mA**.
2. Modify the staggered delay of output from 2ns (typ.) to **5ns (max.)**.
3. Modify the typo on Pin Configuration on P.3.

GND	1	24	VDD
SDI	2	23	R-EXT
CLK	3	22	SDO
LE	4	21	OE
$\overline{\text{OUT0}}$	5	20	$\overline{\text{OUT15}}$
$\overline{\text{OUT1}}$	6	19	$\overline{\text{OUT14}}$
$\overline{\text{OUT2}}$	7	18	$\overline{\text{OUT13}}$
$\overline{\text{OUT3}}$	8	17	$\overline{\text{OUT12}}$
$\overline{\text{OUT4}}$	9	16	$\overline{\text{OUT11}}$
$\overline{\text{OUT5}}$	10	15	$\overline{\text{OUT10}}$
$\overline{\text{OUT6}}$	11	14	$\overline{\text{OUT9}}$
$\overline{\text{OUT7}}$	12	13	$\overline{\text{OUT8}}$

MBI5039GF/GP

4. Modify the Maximum Rating on P.5.

Characteristic	Symbol	Rating	Unit
Supply Voltage	V_{DD}	0~7	V
Sustaining Voltage at OUT Port	V_{DS}	-0.5~17	V

5. Modify the read configuration command on the Control Command section on P.13.

Command Name	Signals Combination* Number of CLK Rising Edge when LE is asserted	Description The Action after a Falling Edge of LE
Read configuration	5	"Configuration register" is shifted out to SDO.

6. Modify the read configuration command on the Data Output from SDO section on P.13.

Command	SDO after a falling edge of LE
Read configuration	Shift out data from configuration register

7. Add the behavior description of check bits on the Writing Configuration Code section on P.19.

8. Modify the default value and description of Definition of Configuration Register section on P.19.

e.g. Default Value

F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
0	1	1	1	0	0	0	1	0	1	6'b101011					

Bit	Definition	Value	Function
F~E	Voltage thresholds for short-circuit detection ($V_{SD,TH}$)	00	$0.33 \times V_{DD} \pm 0.1V$
		01 (Default)	$0.45 \times V_{DD} \pm 0.1V$
		10	$0.58 \times V_{DD} \pm 0.1V$
		11*	$0.73 \times V_{DD} \pm 0.1V$
D~C	Operation of in-message error detection	00	Reserved bits
		01	Enable LE to trigger in-message error detection; SDO shift out error code as "Error Code" section.
		10	Enable \overline{OE} to trigger in-message error detection; SDO shift out error code as "Error Code" section.
		11 (Default)	Enable \overline{OE} or LE to trigger in-message error detection; SDO shift out error code as "Error Code" section.
B~A	Activation of in-message error detection	00 (Default)	Disable in-message error detection
		01	Enable in-message error detection
		10	
		11	
9~6	Check bits	0101	Write in configuration register
5~0	Current gain	000000 ~ 111111	6'b101011 (Default): allow 64-step programmable current gain from 12.5 % to 200%

V1.02, May 2008

1. Modify the ESD rating on the Maximum Rating table on P.5.

ESD Rating	HBM (MIL-STD-883G Method 3015.7, Human Body Mode)	-	Class 3A (4000V~7999V)	-
	MM (JEDEC EIA/JESD22-A115, Machine Mode)	-	Class B (200V~399V)	-

2. Modify the Electrical Characteristics on P.6 and P.7.

 $V_{DD}=5.0V$

Output Current vs. Supply Voltage Regulation*	%/d V_{DD}	V_{DD} within 4.5V and 5.5V	-	± 0.5	± 1.0	% / V
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 $V_{DD}=3.3V$

Output Current vs. Supply Voltage Regulation*	%/d V_{DD}	V_{DD} within 3.0V and 3.6V	-	± 0.5	± 1.0	% / V
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 $V_{DD}=5.0V; 3.3V$

LED Open Detection Threshold Voltage**	$V_{OD,TH}$	-	-	0.35	-	V
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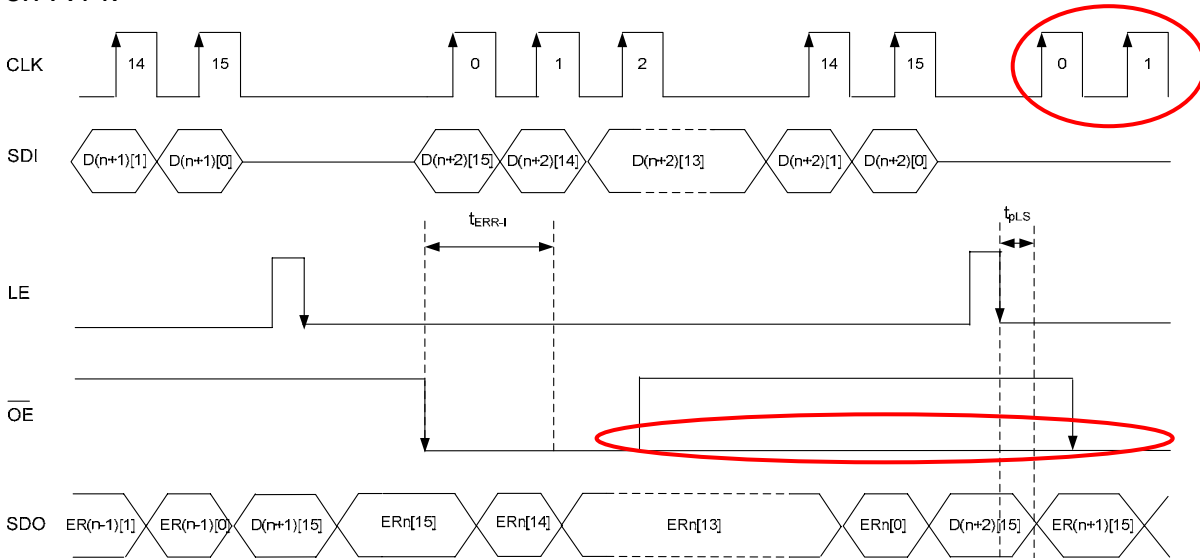
3. Modify the Switching Characteristics on P. 8 and P.9.

 $V_{DD}=5.0V; 3.3V$

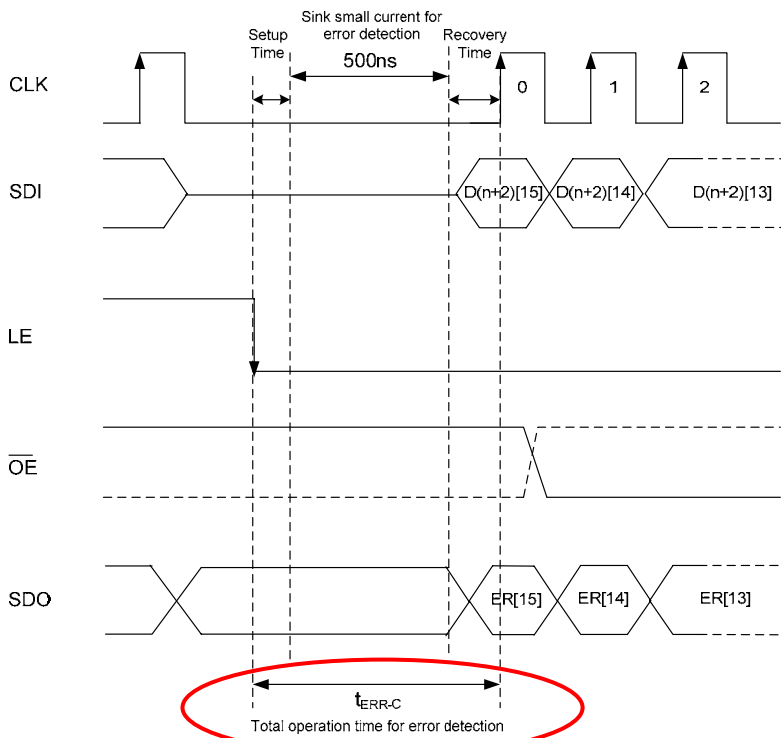
In-message error detection operation time**	t_{ERR-I}	300	350	400	ns
Compulsory error detection operation time**	t_{ERR-C}	600	650	700	ns

** The detection time of in-message and compulsory error detection is 300ns and 500ns separately. However, it takes extra operation time to enter or exit the error detection mode. The specifications here list the total operation time for detection. Please refer to the section of principle of operation for details.

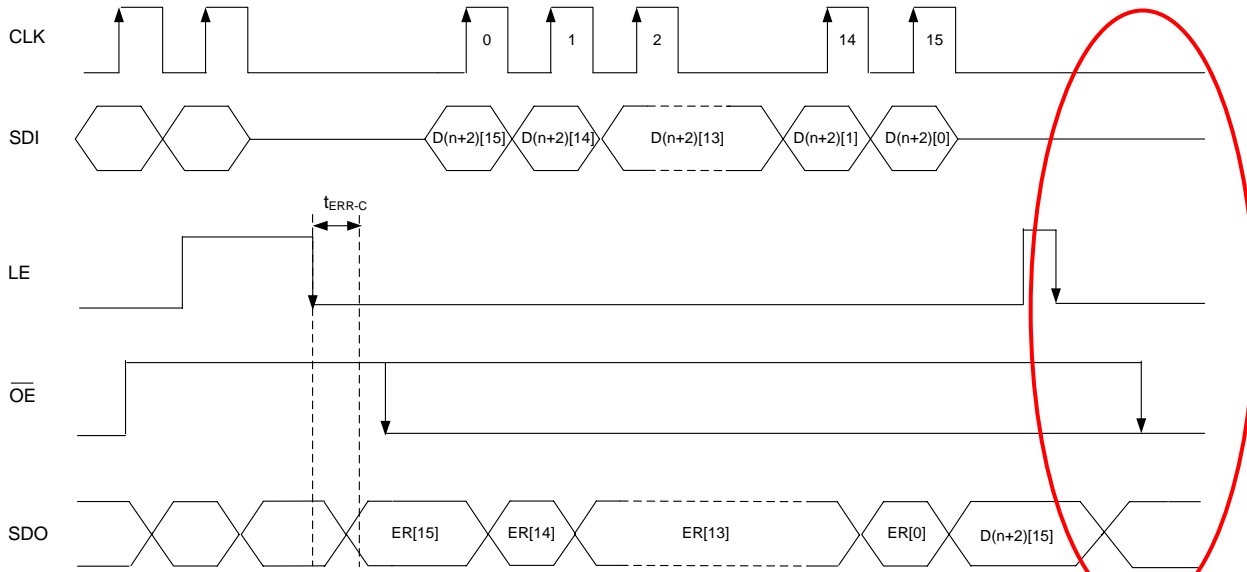
4. Add clocks after t_{pLS} and add $\overline{OE} = \text{low}$ on the waveform of in-message error detection on P.14.



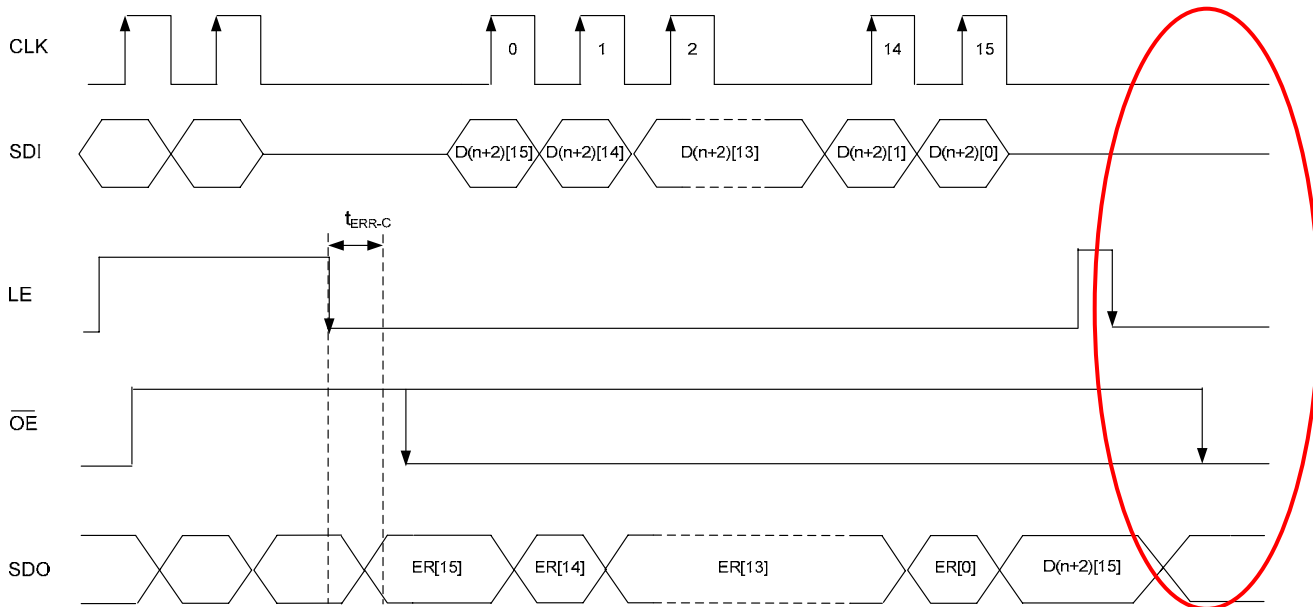
5. Modify the definition of t_{ERR-C} on the timing waveforms of Compulsory Error Detection section on P.15, P.16, and P.17.



6. Delete the marks of " t_{pLS} " and " t_{ERR-I} " on the waveform of compulsory open-circuit detection on P.16.



7. Delete the marks of “ t_{pLS} ” and “ t_{ERR-I} ” on the waveform of compulsory short-circuit detection on P.17.



8. Add the notice of response time of LED when running the short-circuit detection on the compulsory short-circuit detection section on P.17.

V1.01, March 2008

1. Modify the constant output current range at 5.0V supply voltage from 5~90mA to **8**~90mA.

Constant output current range: 3~90

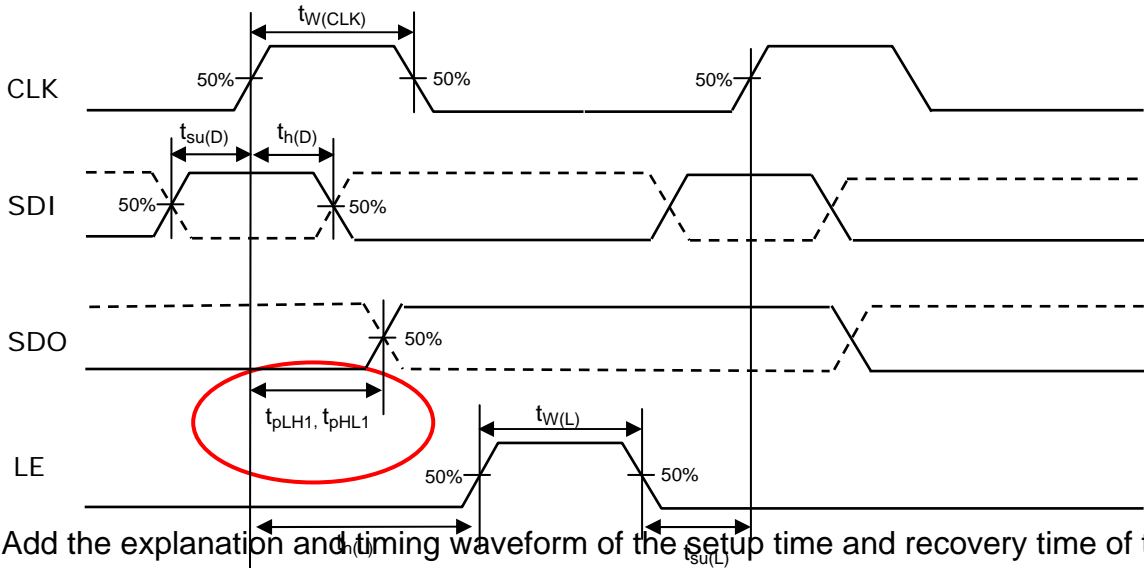
8-90mA @ 5V supply voltage

3-70mA @ 3.3V supply voltage

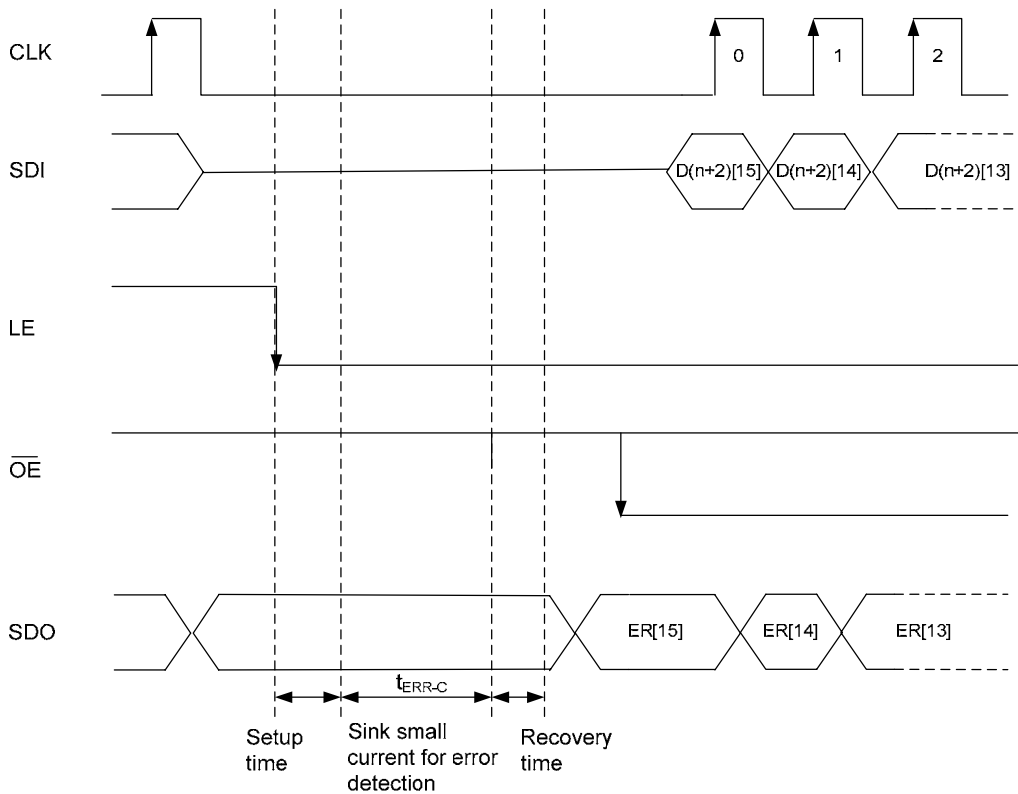
Electrical Characteristics ($V_{DD}=5.0V$) on P.6

Output Current	I_{OUT}	Refer to “Test Circuit for Electrical Characteristics”	8	-	90	mA
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2. Delete the symbol— t_{pHL1} and t_{pLH1} (CLK- \overline{OUTn}) on the Timing Waveform on P.10, and rename the symbols of CLK-SDO as t_{pHL1} and t_{pLH1} .



3. Add the explanation and timing waveform of the setup time and recovery time of the compulsory error detection mode on P.15. (Refer to the chart on the next page)



4. Modify the MBI5039GFN package on P.27.

