

TOSHIBA Microcontrollers 870 Family
 (TMP87CH34B) (TMP87CK34B) (TMP87CM34B) (TMP87PM34A)

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Datasheet Modifications: I²C Bus Mode Control

The following modifications (shown in red) will be made to the technical datasheets in the next revision.

Section: "I²C bus mode control"

▪ In the explanation of the Serial Bus Interface Control Register 1

1. Delete the setting example where the serial clock frequency exceeds 100 kHz.
2. Add the following note.

SCK	Frequency of Serial clock (f _{SCL}) Selection (only master - mode)	000 : fc/2 ⁶ [Hz] (Reserved (Note))	}	at fc = 8MHz (Output on SCL pin)	Write only
		001 : fc/2 ⁷ [Hz] (62.5kHz)			
		010 : fc/2 ⁸ [Hz] (31.2kHz)			
		011 : fc/2 ⁹ [Hz] (15.6kHz)			
		100 : fc/2 ¹⁰ [Hz] (7.8kHz)			
		101 : fc/2 ¹² [Hz] (1.9kHz)			
		110 : fc/2 ¹⁵ [Hz] (244Hz)			
		111 : reserved			

Note: This I²C bus circuit does not support the Fast mode. It supports the Standard mode only. Although the I²C bus circuit itself allows the setting of a baud rate over 100 kbps, the compliance with the I²C specification is not guaranteed in that case.

▪ In "(3) Serial clock"

1. Add the following sentence about the communication baud rate.
2. Delete setting examples where the SCL clock frequency exceeds 100 kHz.
3. Add the following note.
4. Add the following equations.

The SCK (bits 2 to 0 in the SBICR1) is used to select a maximum transfer frequency directed from the SCL pin in the master mode. **Set a communication baud rate that meets the I²C bus specification, such as the shortest pulse width of t_{LOW}, based on the equations shown below.** If the rising time of output clock is ...

$$\begin{aligned}
 t_{LOW} &= 2^{n-1}/fc \\
 t_{HIGH} &= 2^{n-1}/fc \\
 fscl &= 1/(t_{LOW} + t_{HIGH}) \\
 &= \frac{fc}{2^n}
 \end{aligned}$$

SCK (bits 2 to 0 in SBICR1)	F _{SCL} (at fc = 8MHz)			
	t _{RC} < 250 [ns]		250 [ns] ≤ t _{RC}	
000	Reserved (Note)		Reserved (Note)	
001	62.5	kHZ	41.6	kHZ
010	31.2	kHZ	20.8	kHZ
011	15.6	kHZ	10.4	kHZ
100	7.8	kHZ	5.2	kHZ
101	1.95	kHZ	1.3	kHZ
110	0.24	kHZ	0.16	kHZ
	Case (a)		Case (b)	

Note: This I²C bus circuit does not support the Fast mode. It supports the Standard mode only. Although the I²C bus circuit itself allows the setting of a baud rate over 100 kbps, the compliance with the I²C specification is not guaranteed in that case.