Infineon Technologies - MB91F465BBPMC-GSK5E2 Datasheet

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What is "Embedded - Microcontrollers"?

"Embedded - Microcontrollers" refer to small, integrated circuits designed to perform specific tasks within larger systems. These microcontrollers are essentially compact computers on a single chip, containing a processor core, memory, and programmable input/output peripherals. They are called "embedded" because they are embedded within electronic devices to control various functions, rather than serving as standalone computers. Microcontrollers are crucial in modern electronics, providing the intelligence and control needed for a wide range of applications.

Applications of "Embedded - Microcontrollers"

Details	
Product Status	Obsolete
Core Processor	FR60 RISC
Core Size	32-Bit Single-Core
Speed	100MHz
Connectivity	CANbus, EBI/EMI, I²C, LINbus, UART/USART
Peripherals	DMA, LVD, PWM, WDT
Number of I/O	108
Program Memory Size	544KB (544K x 8)
Program Memory Type	FLASH
EEPROM Size	-
RAM Size	48K x 8
Voltage - Supply (Vcc/Vdd)	3V ~ 5.5V
Data Converters	A/D 32x10b
Oscillator Type	External
Operating Temperature	-40°C ~ 125°C (TA)
Mounting Type	Surface Mount
Package / Case	144-LQFP
Supplier Device Package	144-LQFP (20x20)
Purchase URL	https://www.e-xfl.com/product-detail/infineon-technologies/mb91f465bbpmc-gsk5e2

Pin no.	Pin name	I/O	I/O circuit type[1]	Function
64	P16_0	I/O	A	General-purpose input/output port
	PPG8			Output pins of PPG timer
65	P16_1	I/O	A	General-purpose input/output port
	PPG9			Output pins of PPG timer
66	P16_2	I/O	A	General-purpose input/output port
	PPG10			Output pins of PPG timer
67	P16_3	I/O	A	General-purpose input/output port
	PPG11			Output pins of PPG timer
68	P16_4	I/O	A	General-purpose input/output port
	PPG12			Output pins of PPG timer
	SGA			SGA output pin of sound generator
69	P16_5	I/O	A	General-purpose input/output port
	PPG13			Output pins of PPG timer
	SGO			SG0 output pin of sound generator
70	P16_6	I/O	A	General-purpose input/output port
	PPG14			Output pins of PPG timer
71	P16_7	I/O	A	General-purpose input/output port
	PPG15			Output pins of PPG timer
	ATGX			A/D converter external trigger input pin
74 to 76	MD_0 to MD_2	I	G	Mode setting pins
77	MONCLK	O	M	Clock monitor pin
78	MD_3	I	H	Mode setting pin
79	X1	—	J1	Clock (oscillation) output
80	X0	—	J1	Clock (oscillation) input
82	X0A	—	J2	Sub clock (oscillation) input
83	X1A	—	J2	Sub clock (oscillation) output
84	INITX	I	H	External reset input pin
85	NMIX	I	H	Non-maskable interrupt input pin
92	P19_0	I/O	A	General-purpose input/output port
	SIN4			Data input pin of USART4
93	P19_1	I/O	A	General-purpose input/output port
	SOT4			Data output pin of USART4
94	P19_2	I/O	A	General-purpose input/output port
	SCK4			Clock input/output pin of USART4
	CK4			External clock input pin of free-run timer 4
95	P19_4	I/O	A	General-purpose input/output port
	SIN5			Data input pin of USART5
96	P19_5	I/O	A	General-purpose input/output port
	SOT5			Data output pin of USART5

Pin no.	Pin name	I/O	I/O circuit type[1]	Function
97	P19_6	I/O	A	General-purpose input/output port
	SCK5			Clock input/output pin of USART5
	CK5			External clock input pin of free-run timer 5
98	P18_0	I/O	A	General-purpose input/output port
	SIN6			Data input pin of USART6
99	P18_1	I/O	A	General-purpose input/output port
	SOT6			Data output pin of USART6
100	P18_2	I/O	A	General-purpose input/output port
	SCK6			Clock input/output pin of USART6
	CK6			External clock input pin of free-run timer 6
101	P18_4	I/O	A	General-purpose input/output port
	SIN7			Data input pin of USART7
102	P18_5	I/O	A	General-purpose input/output port
	SOT7			Data output pin of USART7
103	P18_6	I/O	A	General-purpose input/output port
	SCK7			Clock input/output pin of USART7
	CK7			External clock input pin of free-run timer 7
104	ALARM_0	O	N	Alarm comparator input pin
110 to 117	P29_0 to P29_7	I/O	B	General-purpose input/output port
	AN0 to AN7			Analog input pins of A/D converter
118 to 125	P28_0 to P28_7	I/O	B	General-purpose input/output port
	AN8 to AN15			Analog input pins of A/D converter
128	P24_2	I/O	A	General-purpose input/output port
	INT2			External interrupt input pin
129	P24_3	I/O	A	General-purpose input/output port
	INT3			External interrupt input pin
130 to 133	P14_0 to P14_3	I/O	A	General-purpose input/output port
	ICU0 to ICU3			Input capture input pins
	TIN0 to TIN3			External trigger input pins of reload timer
	TTG0/8 to TTG3/11			External trigger input pins of PPG timer
134 to 137	P15_0 to P15_3	I/O	A	General-purpose input/output port
	OCU0 to OCU3			Output compare output pins
	TOT0 to TOT3			Reload timer output pins
138 to 143	P07_0 to P07_5	I/O	B	General-purpose input/output port
	A0 to A5			Signal pins of external address bus (bit0 to bit5)

Pin no.	Pin name	I/O	I/O circuit type[1]	Function
44	P24_0	I/O	A	General-purpose input/output ports
	INT0			External interrupt input pin
45	P24_1	I/O	A	General-purpose input/output ports
	INT1			External interrupt input pin
46	P23_0	I/O	A	General-purpose input/output ports
	RX0			RX input pin of CAN0
	INT8			External interrupt input pin
47	P23_1	I/O	A	General-purpose input/output ports
	TX0			TX output pin of CAN0
48	P23_2	I/O	A	General-purpose input/output ports
	RX1			RX input pin of CAN1
	INT9			External interrupt input pin
49	P23_3	I/O	A	General-purpose input/output ports
	TX1			TX output pin of CAN1
50	P23_4	I/O	A	General-purpose input/output ports
	RX2			RX input pin of CAN2
	INT10			External interrupt input pin
51	P23_5	I/O	A	General-purpose input/output ports
	TX2			TX output pin of CAN2
52	P23_6	I/O	A	General-purpose input/output ports
	MB91F467BA/ MB91F466BA: RX3			RX input pin of CAN3
	INT11			External interrupt input pin
53	P23_7 MB91F467BA/ MB91F466BA: TX3	I/O	A	General-purpose input/output ports
				TX output pin of CAN3
56	P22_0	I/O	A	General-purpose input/output port
	MB91F467BA/ MB91F466BA: RX4			RX input pin of CAN4
	INT12			External interrupt input pin
57	P22_1	I/O	A	General-purpose input/output port
	MB91F467BA/ MB91F466BA: TX4			TX output pin of CAN4
58	P22_2	I/O	A	General-purpose input/output port
	INT13			External interrupt input pin
	MB91F467BA/ MB91F466BA: RX5			RX input pin of CAN5
59	P22_3	I/O	A	General-purpose input/output port
	MB91F467BA/ MB91F466BA: TX5			TX output pin of CAN5

Pin no.	Pin name	I/O	I/O circuit type[1]	Function
60	P22_4	I/O	C	General-purpose input/output ports
	SDA0			I^2C bus DATA input/output pin (open drain)
	INT14			External interrupt input pin
61	P22_5	I/O	C	General-purpose input/output ports
	SCL0			I^2C bus clock input/output pin (open drain)
62	P22_6	I/O	C	General-purpose input/output ports
	SDA1			I^2C bus DATA input/output pin (open drain)
	INT15			External interrupt input pin
63	P22_7	I/O	C	General-purpose input/output ports
	SCL1			I^2C bus clock input/output pin (open drain)
64 to 67	P16_0 to P16_3	I/O	A	General-purpose input/output ports
	PPG8 to PPG11			Output pins of PPG timer
68	P16_4	I/O	A	General-purpose input/output ports
	PPG12			Output pins of PPG timer
	SGA			SGA output pin of sound generator
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	PPG13			Output pins of PPG timer
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	SIN4			Data input pin of USART4
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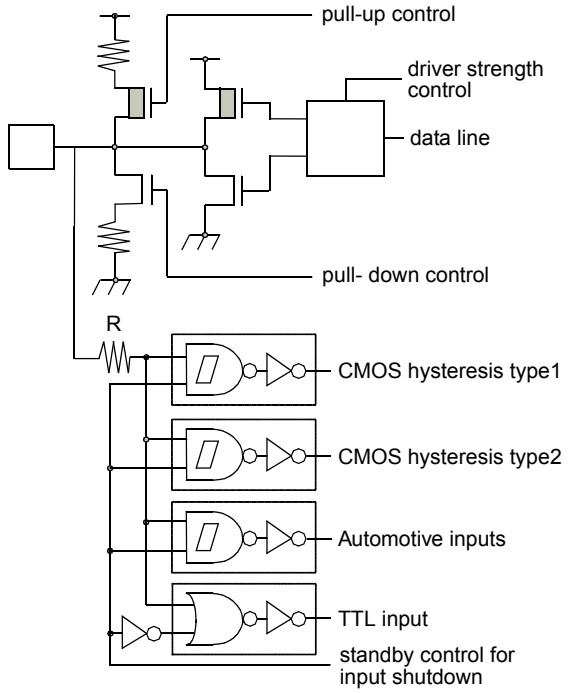
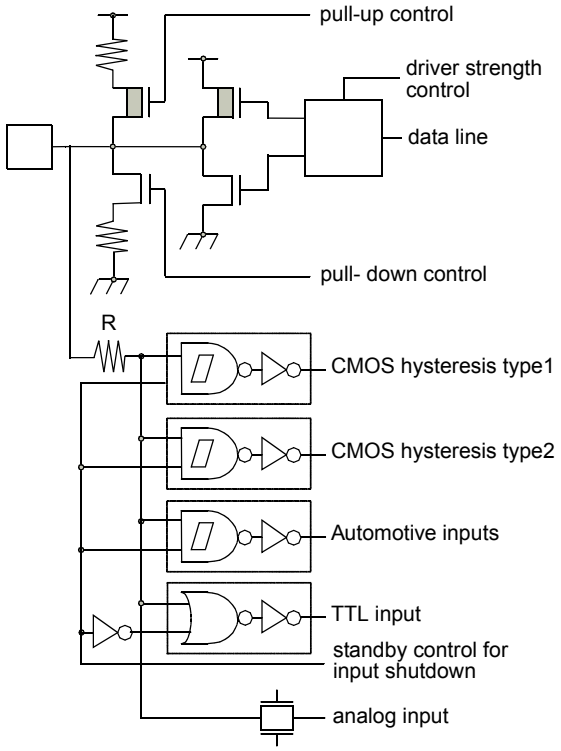
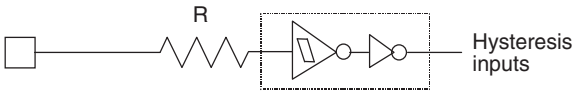
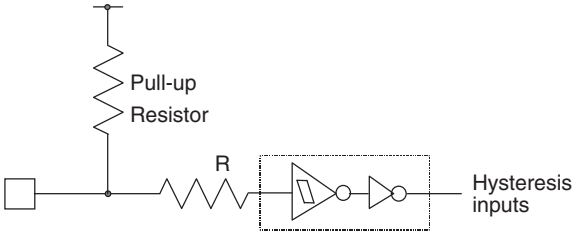
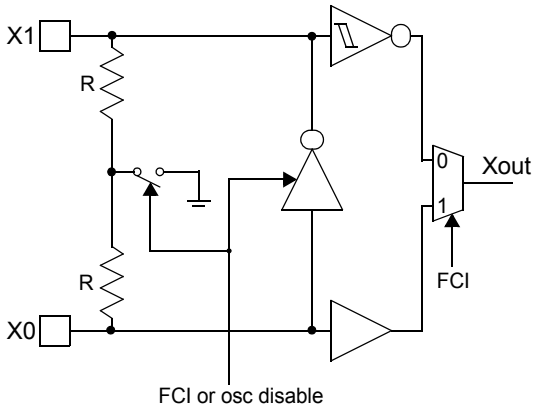
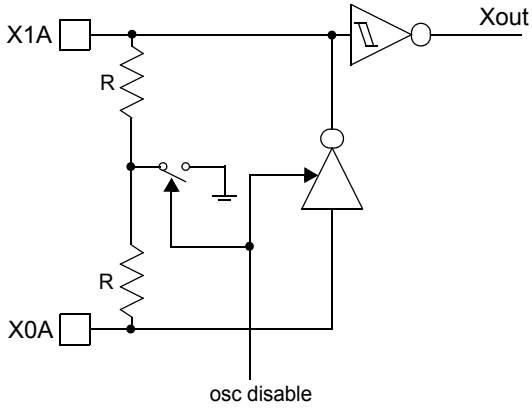
	SOT4			Data output pin of USART4
94	P19_2	I/O	A	General-purpose input/output ports
	SCK4			Clock input/output pin of USART4
	CK4			External clock input pin of free-run timer 4

Type	Circuit	Remarks
E		CMOS level output (programmable I_{OL} = 5mA, I_{OH} = -5mA and I_{OL} = 2mA, I_{OH} = -2mA, and I_{OL} = 30mA, I_{OH} = -30mA) 2 different CMOS hysteresis inputs with input shutdown function Automotive input with input shutdown function TTL input with input shutdown function Programmable pull-up resistor: 50kΩ approx.
F		CMOS level output (programmable I_{OL} = 5mA, I_{OH} = -5mA and I_{OL} = 2mA, I_{OH} = -2mA, and I_{OL} = 30mA, I_{OH} = -30mA) 2 different CMOS hysteresis inputs with input shutdown function Automotive input with input shutdown function TTL input with input shutdown function Programmable pull-up resistor: 50kΩ approx. Analog input

Type	Circuit	Remarks
G		Mask ROM and EVA device: CMOS Hysteresis input pin Flash device: CMOS input pin 12 V withstand (for MD [2:0])
H		CMOS Hysteresis input pin Pull-up resistor value: 50 kΩ approx.
J1		High-speed oscillation circuit: ■ Programmable between oscillation mode (external crystal or resonator connected to X0/X1 pins) and Fast external Clock Input (FCI) mode (external clock connected to X0 pin) ■ Feedback resistor = approx. 2 * 0.5 MΩ. Feedback resistor is grounded in the center when the oscillator is disabled or in FCI mode.
J2		Low-speed oscillation circuit: ■ Feedback resistor = approx. 2 * 5 MΩ. Feedback resistor is grounded in the center when the oscillator is disabled.

Address	Register				Block
	+0	+1	+2	+3	
$0001C0_H$	TMRLR2 [W] XXXXXXXX XXXXXXXX		TMR2 [R] XXXXXXXX XXXXXXXX		Reload Timer 2 (PPG 4, PPG 5)
$0001C4_H$	Reserved		TMCSRH2 [R/W] - - - 00000	TMCSRL2 [R/W] 0 - 000000	
$0001C8_H$	TMRLR3 [W] XXXXXXXX XXXXXXXX		TMR3 [R] XXXXXXXX XXXXXXXX		Reload Timer 3 (PPG 6, PPG 7)
$0001CC_H$	Reserved		TMCSRH3 [R/W] - - - 00000	TMCSRL3 [R/W] 0 - 000000	
$0001D0_H$	TMRLR4 [W] XXXXXXXX XXXXXXXX		TMR4 [R] XXXXXXXX XXXXXXXX		Reload Timer 4 (PPG 8, PPG 9)
$0001D4_H$	Reserved		TMCSRH4 [R/W] - - - 00000	TMCSRL4 [R/W] 0 - 000000	
$0001D8_H$	TMRLR5 [W] XXXXXXXX XXXXXXXX		TMR5 [R] XXXXXXXX XXXXXXXX		Reload Timer 5 (PPG 10, PPG 11)
$0001DC_H$	Reserved		TMCSRH5 [R/W] - - - 00000	TMCSRL5 [R/W] 0 - 000000	
$0001E0_H$	TMRLR6 [W] XXXXXXXX XXXXXXXX		TMR6 [R] XXXXXXXX XXXXXXXX		Reload Timer 6 (PPG 12, PPG 13)
$0001E4_H$	Reserved		TMCSRH6 [R/W] - - - 00000	TMCSRL6 [R/W] 0 - 000000	
$0001E8_H$	TMRLR7 [W] XXXXXXXX XXXXXXXX		TMR7 [R] XXXXXXXX XXXXXXXX		Reload Timer 7 (PPG 14, PPG 15) (A/D Converter)
$0001EC_H$	Reserved		TMCSRH7 [R/W] - - - 00000	TMCSRL7 [R/W] 0 - 000000	
$0001F0_H$	TCDT0 [R/W] XXXXXXXX XXXXXXXX		Reserved	TCCS0 [R/W] 00000000	Free Running Timer 0 (ICU 0, ICU 1)
$0001F4_H$	TCDT1 [R/W] XXXXXXXX XXXXXXXX		Reserved	TCCS1 [R/W] 00000000	Free Running Timer 1 (ICU 2, ICU 3)
$0001F8_H$	TCDT2 [R/W] XXXXXXXX XXXXXXXX		Reserved	TCCS2 [R/W] 00000000	Free Running Timer 2 (OCU 0, OCU 1)
$0001FC_H$	TCDT3 [R/W] XXXXXXXX XXXXXXXX		Reserved	TCCS3 [R/W] 00000000	Free Running Timer 3 (OCU 2, OCU 3)

Address	Register				Block
	+0	+1	+2	+3	
$0004A0_H$	Reserved	WTCER [R/W] - - - - - - 00	WTCR [R/W] 00000000 000 - 00 - 0		Real Time Clock (Watch Timer)
$0004A4_H$	Reserved	WTBR [R/W] - - - XXXXX XXXXXXXX XXXXXXXX			
$0004A8_H$	WTHR [R/W] - - - 00000	WTMR [R/W] - - 000000	WTSR [R/W] - - 000000	Reserved	
$0004AC_H$	CSVTR [R/W] - - - 00010	CSVCR [R/W] - 011100	CSCFG [R/W] 0X000000	CMCFG [R/W] 00000000	Clock- Supervisor / Selector/ Monitor
$0004B0_H$	CUCR [R/W] - - - - - - - - - - - - 0 - - 00		CUTD [R/W] 10000000 00000000		Calibration of Sub Clock
$0004B4_H$	CUTR1 [R] - - - - - - - - 00000000		CUTR2 [R] 00000000 00000000		
$0004B8_H$	CMPR [R/W] - - 000010 11111101		Reserved	CMCR [R/W] - 001 - - 00	Clock Modulator
$0004BC_H$	CMT1 [R/W] 00000000 1 - - - 0000		CMT2 [R/W] - - 000000 - - 000000		
$0004C0_H$	CANPRE [R/W] 0 - - - 0000	CANCKD [R/W] - - 000000	Reserved		CAN Clock Control
$0004C4_H$	LVSEL [R/W] 00000111	LVDET [R/W] 00000 - 00	HWWDE [R/W] - - - - - - 00	HWWD [R/W,W] 00011000	Low Voltage Detection/ Hardware Watchdog
$0004C8_H$	OSCRH [R/W] 000 - - 001	OSCRL [R/W] - - - - - 000	WPCRH [R/W] 000 - - 001	WPCRL [R/W] - - - - - - 00	Main-/Sub-Oscillation Stabilisation Timer
$0004CC_H$	OSCCR [R/W] - - - - - - 00	Reserved	REGSEL [R/W] - - 000110	REGCTR [R/W] - - - 0 - - 00	Main- Oscillation Standby Control / Main/ Sub Regulator Control
$0004D0_H$ to $00063C_H$	Reserved				Reserved

Address	Register				Block
	+0	+1	+2	+3	
000640_H	ASR0 [R/W] 00000000 00000000		ACR0 [R/W] 1111**00 00000000[2]		External Bus Unit
000644_H	ASR1 [R/W] XXXXXXXX XXXXXXXX		ACR1 [R/W] XXXXXXXX XXXXXXXX		
000648_H	ASR2 [R/W] XXXXXXXX XXXXXXXX		ACR2 [R/W] XXXXXXXX XXXXXXXX		
$00064C_H$	ASR3 [R/W] XXXXXXXX XXXXXXXX		ACR3 [R/W] XXXXXXXX XXXXXXXX		
000650_H	ASR4 [R/W] XXXXXXXX XXXXXXXX		ACR4 [R/W] XXXXXXXX XXXXXXXX		
000654_H	ASR5 [R/W] XXXXXXXX XXXXXXXX		ACR5 [R/W] XXXXXXXX XXXXXXXX		
000658_H	ASR6 [R/W] XXXXXXXX XXXXXXXX		ACR6 [R/W] XXXXXXXX XXXXXXXX		
$00065C_H$	ASR7 [R/W] XXXXXXXX XXXXXXXX		ACR7 [R/W] XXXXXXXX XXXXXXXX		
000660_H	AWR0 [R/W] 01111111 11111*11		AWR1 [R/W] XXXXXXXX XXXXXXXX		
000664_H	AWR2 [R/W] XXXXXXXX XXXXXXXX		AWR3 [R/W] XXXXXXXX XXXXXXXX		
000668_H	AWR4 [R/W] XXXXXXXX XXXXXXXX		AWR5 [R/W] XXXXXXXX XXXXXXXX		
$00066C_H$	AWR6 [R/W] XXXXXXXX XXXXXXXX		AWR7 [R/W] XXXXXXXX XXXXXXXX		
000670_H	MCRA [R/W] XXXXXXXX	MCRB [R/W] XXXXXXXX	Reserved		
000674_H	Reserved				
000678_H	IOWR0 [R/W] XXXXXXXX	IOWR1 [R/W] XXXXXXXX	IOWR2 [R/W] XXXXXXXX	IOWR3 [R/W] XXXXXXXX	
$00067C_H$	Reserved				
000680_H	CSER [R/W] 00000001	CHER [R/W] 11111111	Reserved	TCR [R/W] 0000**** [3]	
000684_H	RCRH [R/W] 00XXXXXX	RCRL [R/W] XXXX0XXX	Reserved		
000688_H to $0007F8_H$	Reserved				External Bus Unit
$0007FC_H$	Reserved	MODR [W] XXXXXXXX	Reserved		Mode Register
000800_H to $000CFC_H$	Reserved				Reserved

Address	Register				Block
	+0	+1	+2	+3	
$000D00_H$	PDRD00 [R] XXXXXXXX	PDRD01 [R] XXXXXXXX	Reserved		R-bus Port Data Direct Read Register
$000D04_H$	Reserved	PDRD05 [R] - - XXXXXX	PDRD06 [R] XXXXXXXX	PDRD07 [R] XXXXXXXX	
$000D08_H$	PDRD08 [R] X - - X - - -X	PDRD09 [R] - - - - - - XX	PDRD10 [R] - - - - - - - X	Reserved	
$000D0C_H$	Reserved		PDRD14 [R] XXXXXXXX	PDRD15 [R] XXXXXXXX	
$000D10_H$	PDRD16 [R] XXXXXXXX	PDRD17 [R] XXXXXXXX	PDRD18 [R] - XXX - XXX	PDRD19 [R] - XXX - XXX	
$000D14_H$	PDRD20 [R] - XXX - XXX	PDRD21 [R] - - - - - - - X	PDRD22 [R] XXXXXXXX	PDRD23 [R] XXXXXXXX	
$000D18_H$	PDRD24 [R] XXXXXXXX	Reserved	PDRD26 [R] XXXXXXXX	PDRD27 [R] XXXXXXXX	
$000D1C_H$	PDRD28 [R] XXXXXXXX	PDRD29 [R] XXXXXXXX	Reserved		
$000D20_H$ to $000D3C_H$	Reserved				
$000D40_H$	DDR00 [R/W] 00000000	DDR01 [R/W] 00000000	Reserved		R-bus Port Direction Register
$000D44_H$	Reserved	DDR05 [R/W] - - 000000	DDR06 [R/W] 00000000	DDR07 [R/W] 00000000	
$000D48_H$	DDR08 [R/W] 0 - - 0 - - -0	DDR09 [R/W] - - - - - - 00	DDR10 [R/W] - - - - - - -0	Reserved	
$000D4C_H$	Reserved		DDR14 [R/W] 00000000	DDR15 [R/W] 00000000	
$000D50_H$	DDR16 [R/W] 00000000	DDR17 [R/W] 00000000	DDR18 [R/W] - 000 - 000	DDR19 [R/W] - 000 - 000	
$000D54_H$	DDR20 [R/W] - 000 - 000	DDR21 [R/W] - - - - - - 00	DDR22 [R/W] 00000000	DDR23 [R/W] 00000000	
$000D58_H$	DDR24 [R/W] 00000000	Reserved	DDR26 [R/W] 00000000	DDR27 [R/W] 00000000	
$000D5C_H$	DDR28 [R/W] 00000000	DDR29 [R/W] 00000000	Reserved		
$000D60_H$ to $000D7C_H$	Reserved				Reserved

Address	Register				Block
	+0	+1	+2	+3	
$000D80_H$	PFR00 [R/W] 11111111	PFR01 [R/W] 11111111	Reserved		R-bus Port Function Register
$000D84_H$	Reserved	PFR05 [R/W] - - 111111	PFR06 [R/W] 11111111	PFR07 [R/W] 11111111	
$000D88_H$	PFR08 [R/W] 1 - - 1 - - 11	PFR09 [R/W] - - - - - - 11	PFR10 [R/W] - - - - - - - -1	Reserved	
$000D8C_H$	Reserved		PFR14 [R/W] 00000000	PFR15 [R/W] 00000000	
$000D90_H$	PFR16 [R/W] 00000000	PFR17 [R/W] 00000000	PFR18 [R/W] - 000 - 000	PFR19 [R/W] - 000 - 000	
$000D94_H$	PFR20 [R/W] - 000 - 000	PFR21 [R/W] - - - - - - 00	PFR22 [R/W] 0000-0-0	PFR23 [R/W] -0000000	
$000D98_H$	PFR24 [R/W] 00000000	Reserved	PFR26 [R/W] 00000000	PFR27 [R/W] 00000000	
$000D9C_H$	PFR28 [R/W] 00000000	PFR29 [R/W] 00000000	Reserved		
$000DA0_H$ to $000DC4_H$	Reserved				
$000DC8_H$	Reserved		EPFR10 [R/W] - - - - - - - 0	Reserved	R-bus Port Extra Function Register
$000DCC_H$	Reserved		EPFR14 [R/W] 00000000	EPFR15 [R/W] 00000000	
$000DD0_H$	EPFR16 [R/W] 0 - 00 - - - -	Reserved	EPFR18 [R/W] - 000 - 000	EPFR19 [R/W] - 0- - - 0- -	
$000DD4_H$	EPFR20 [R/W] - 000 - 000	EPFR21 [R/W] - - - - - - - -	Reserved		
$000DD8_H$	Reserved		EPFR26 [R/W] 00000000	EPFR27 [R/W] 00000000	
$000DDC_H$ to $000DFC_H$	Reserved				Reserved
$000E00_H$	PODR00 [R/W] 00000000	PODR01 [R/W] 00000000	Reserved		R-bus Port Output Drive Select Register
$000E04_H$	Reserved	PODR05 [R/W] - - 000000	PODR06 [R/W] 00000000	PODR07 [R/W] 00000000	
$000E08_H$	PODR08 [R/W] 0 - - 0 - - - 0	PODR09 [R/W] - - - - - - 00	PODR10 [R/W] - - - - - - - 0	Reserved	
$000E0C_H$	Reserved		PODR14 [R/W] 00000000	PODR15 [R/W] 00000000	
$000E10_H$	PODR16 [R/W] 00000000	PODR17 [R/W] 00000000	PODR18 [R/W] - 000 - 000	PODR19 [R/W] - 000 - 000	
$000E14_H$	PODR20 [R/W] - 000 - 000	PODR21 [R/W] - - - - - - 00	PODR22 [R/W] 00000000	PODR23 [R/W] 00000000	
$000E18_H$	PODR24 [R/W] 00000000	Reserved	PODR26 [R/W] 00000000	PODR27 [R/W] 00000000	
$000E1C_H$	PODR28 [R/W] 00000000	PODR29 [R/W] 00000000	Reserved		
$000E20_H$ to $000E3C_H$	Reserved				Reserved

Address	Register				Block
	+0	+1	+2	+3	
$00C080_H$	TREQR20 [R] 00000000 00000000		TREQR10 [R] 00000000 00000000		CAN 0 Status Flags
$00C084_H$ to $00C08C_H$	Reserved		Reserved		
$00C090_H$	NEWDT20 [R] 00000000 00000000		NEWDT10 [R] 00000000 00000000		
$00C094_H$ to $00C09C_H$	Reserved		Reserved		
$00C0A0_H$	INTPND20 [R] 00000000 00000000		INTPND10 [R] 00000000 00000000		
$00C0A4_H$ to $00C0AC_H$	Reserved		Reserved		
$00C0B0_H$	MSGVAL20 [R] 00000000 00000000		MSGVAL10 [R] 00000000 00000000		
$00C0B4_H$ to $00C0FC_H$	Reserved		Reserved		
$00C100_H$	CTRLR1 [R/W] 00000000 00000001		STATR1 [R/W] 00000000 00000000		CAN 1 Control Register
$00C104_H$	ERRCNT1 [R] 00000000 00000000		BTR1 [R/W] 00100011 00000001		
$00C108_H$	INTR1 [R] 00000000 00000000		TESTR1 [R/W] 00000000 X0000000		
$00C10C_H$	BRPE1 [R/W] 00000000 00000000		CBSYNC1		
$00C110_H$	IF1CREQ1 [R/W] 00000000 00000001		IF1CMSK1 [R/W] 00000000 00000000		CAN 1 IF 1 Register
$00C114_H$	IF1MSK21 [R/W] 11111111 11111111		IF1MSK11 [R/W] 11111111 11111111		
$00C118_H$	IF1ARB21 [R/W] 00000000 00000000		IF1ARB11 [R/W] 00000000 00000000		
$00C11C_H$	IF1MCTR1 [R/W] 00000000 00000000		Reserved		
$00C120_H$	IF1DTA11 [R/W] 00000000 00000000		IF1DTA21 [R/W] 00000000 00000000		
$00C124_H$	IF1DTB11 [R/W] 00000000 00000000		IF1DTB21 [R/W] 00000000 00000000		
$00C128_H$ to $00C12C_H$	Reserved				
$00C130_H$	IF1DTA21 [R/W] 00000000 00000000		IF1DTA11 [R/W] 00000000 00000000		
$00C134_H$	IF1DTB21 [R/W] 00000000 00000000		IF1DTB11 [R/W] 00000000 00000000		
$00C138_H$ to $00C13C_H$	Reserved				

Address	Register				Block
	+0	+1	+2	+3	
$00C310_H$	IF1CREQ3 [R/W] 00000000 00000001		IF1CMSK3 [R/W] 00000000 00000000		CAN 3 IF 1 Register **Note**: Not on MB91F465BB/MB91F464BB
$00C314_H$	IF1MSK23 [R/W] 11111111 11111111		IF1MSK13 [R/W] 11111111 11111111		
$00C318_H$	IF1ARB23 [R/W] 00000000 00000000		IF1ARB13 [R/W] 00000000 00000000		
$00C31C_H$	IF1MCTR3 [R/W] 00000000 00000000		Reserved		
$00C320_H$	IF1DTA13 [R/W] 00000000 00000000		IF1DTA23 [R/W] 00000000 00000000		
$00C324_H$	IF1DTB13 [R/W] 00000000 00000000		IF1DTB23 [R/W] 00000000 00000000		
$00C328_H$ to $00C32C_H$	Reserved				
$00C330_H$	IF1DTA23 [R/W] 00000000 00000000		IF1DTA13 [R/W] 00000000 00000000		
$00C334_H$	IF1DTB23 [R/W] 00000000 00000000		IF1DTB13 [R/W] 00000000 00000000		
$00C338_H$ to $00C33C_H$	Reserved				
$00C340_H$	IF2CREQ3 [R/W] 00000000 00000001		IF2CMSK3 [R/W] 00000000 00000000		CAN 3 IF 2 Register **Note:** Not on MB91F465BB/MB91F464BB
$00C344_H$	IF2MSK23 [R/W] 11111111 11111111		IF2MSK13 [R/W] 11111111 11111111		
$00C348_H$	IF2ARB23 [R/W] 00000000 00000000		IF2ARB13 [R/W] 00000000 00000000		
$00C34C_H$	IF2MCTR3 [R/W] 00000000 00000000		Reserved		
$00C350_H$	IF2DTA13 [R/W] 00000000 00000000		IF2DTA23 [R/W] 00000000 00000000		
$00C354_H$	IF2DTB13 [R/W] 00000000 00000000		IF2DTB23 [R/W] 00000000 00000000		
$00C358_H$ to $00C35C_H$	Reserved				
$00C360_H$	IF2DTA23 [R/W] 00000000 00000000		IF2DTA13 [R/W] 00000000 00000000		
$00C364_H$	IF2DTB23 [R/W] 00000000 00000000		IF2DTB13 [R/W] 00000000 00000000		
$00C368_H$ to $00C37C_H$	Reserved				

Address	Register				Block
	+0	+1	+2	+3	
$00C440_H$	IF2CREQ4 [R/W] 00000000 00000001		IF2CMSK4 [R/W] 00000000 00000000		CAN 4 IF 2 Register **Note:** Not on MB91F465BB/MB91F464 BB
$00C444_H$	IF2MSK24 [R/W] 11111111 11111111		IF2MSK14 [R/W] 11111111 11111111		
$00C448_H$	IF2ARB24 [R/W] 00000000 00000000		IF2ARB14 [R/W] 00000000 00000000		
$00C44C_H$	IF2MCTR4 [R/W] 00000000 00000000		Reserved		
$00C450_H$	IF2DTA14 [R/W] 00000000 00000000		IF2DTA24 [R/W] 00000000 00000000		
$00C454_H$	IF2DTB14 [R/W] 00000000 00000000		IF2DTB24 [R/W] 00000000 00000000		
$00C458_H$ to $00C45C_H$	Reserved				
$00C460_H$	IF2DTA24 [R/W] 00000000 00000000		IF2DTA14 [R/W] 00000000 00000000		
$00C464_H$	IF2DTB24 [R/W] 00000000 00000000		IF2DTB14 [R/W] 00000000 00000000		
$00C468_H$ to $00C47C_H$	Reserved				
$00C480_H$	TREQR24 [R] 00000000 00000000		TREQR14 [R] 00000000 00000000		CAN 4 Status Flags **Note:** Not on MB91F465BB/MB91F464 BB
$00C484_H$ to $00C48C_H$	Reserved				
$00C490_H$	NEWDT24 [R] 00000000 00000000		NEWDT14 [R] 00000000 00000000		
$00C494_H$ to $00C49C_H$	Reserved				
$00C4A0_H$	INTPND24 [R] 00000000 00000000		INTPND14 [R] 00000000 00000000		
$00C4A4_H$ to $00C4AC_H$	Reserved				
$00C4B0_H$	MSGVAL24 [R] 00000000 00000000		MSGVAL14 [R] 00000000 00000000		
$00C4B4_H$ to $00C4FC_H$	Reserved				
$00C500_H$	CTRLR5 [R/W] 00000000 00000001		STATR5 [R/W] 00000000 00000000		CAN 5 Control Register **Note:** Not on MB91F465BB/MB91F464 BB
$00C504_H$	ERRCNT5 [R] 00000000 00000000		BTR5 [R/W] 00100011 00000001		
$00C508_H$	INTR5 [R] 00000000 00000000		TESTR5 [R/W] 00000000 X0000000		
$00C50C_H$	BRPE5 [R/W] 00000000 00000000		CBSYNC5		

14.2 Clock Modulator settings

The following table shows all possible settings for the Clock Modulator in a base clock frequency range from 32MHz up to 88MHz.

The Flash access time settings need to be adjusted according to Fmax while the PLL and clockgear settings should be set according to base clock frequency.

Table 8. Clock Modulator settings, frequency range and supported supply voltage

Modulation Degree (k)	Random No (N)	CMPR [hex]	Baseclk [MHz]	Fmin [MHz]	Fmax [MHz]
1	3	026F	88	79.5	98.5 Not on MB91F467BA/466BA
1	3	026F	84	76.1	93.8
1	3	026F	80	72.6	89.1
1	5	02AE	80	68.7	95.8
2	3	046E	80	68.7	95.8
1	3	026F	76	69.1	84.5
1	5	02AE	76	65.3	90.8
1	7	02ED	76	62	98.1 Not on MB91F467BA/466BA
2	3	046E	76	65.3	90.8
3	3	066D	76	62	98.1 Not on MB91F467BA/466BA
1	3	026F	72	65.5	79.9
1	5	02AE	72	62	85.8
1	7	02ED	72	58.8	92.7
2	3	046E	72	62	85.8
3	3	066D	72	58.8	92.7
1	3	026F	68	62	75.3
1	5	02AE	68	58.7	80.9
1	7	02ED	68	55.7	87.3
1	9	032C	68	53	95
2	3	046E	68	58.7	80.9
2	5	04AC	68	53	95
3	3	066D	68	55.7	87.3
4	3	086C	68	53	95
1	3	026F	64	58.5	70.7
1	5	02AE	64	55.3	75.9
1	7	02ED	64	52.5	82
1	9	032C	64	49.9	89.1
1	11	036B	64	47.6	97.6 Not on MB91F467BA/466BA
2	3	046E	64	55.3	75.9
2	5	04AC	64	49.9	89.1
3	3	066D	64	52.5	82
4	3	086C	64	49.9	89.1

15.7.3 LIN-USART Timings at $V_{DD}5$ = 3.0 to 5.5 V

■ Conditions during AC measurements

■ All AC tests were measured under the following conditions:

- ❒ - IO_{drive} = 5 mA
- ❒ - $V_{DD}5$ = 3.0 V to 5.5 V, I_{load} = 3 mA
- ❒ - $V_{SS}5$ = 0 V
- ❒ - T_a = -40 °C to +125× °C
- ❒ - C_l = 50 pF (load capacity value of pins when testing)
- ❒ - VOL = 0.2 x $V_{DD}5$
- ❒ - VOH = 0.8 x $V_{DD}5$
- ❒ - EPILR = 0, PILR = 1 (Automotive Level = worst case)

($V_{DD}5$ = 3.0 V to 5.5 V, $V_{SS}5$ = $AV_{SS}5$ = 0 V, T_A = –40 °C to + 125 °C)

Parameter	Symbol	Pin name	Condition	$V_{DD}5$ = 3.0 V to 4.5 V		$V_{DD}5$ = 4.5 V to 5.5 V		Unit
				Min	Max	Min	Max	
Serial clock cycle time	t_{SCYCI}	SCKn	Internal clock operation (master mode)	4 t_{CLKP}	-	4 t_{CLKP}	-	ns
SCK ↓ → SOT delay time	t_{SLOVI}	SCKn SOTn		- 30	30	- 20	20	ns
SOT → SCK ↓ delay time	t_{OVSHI}	SCKn SOTn		m × t_{CLKP} - 30[1]	-	m × t_{CLKP} - 20[1]	-	ns
Valid SIN → SCK ↑ setup time	t_{IVSHI}	SCKn SINn		t_{CLKP} + 55	-	t_{CLKP} + 45	-	ns
SCK ↑ → valid SIN hold time	t_{SHIXI}	SCKn SINn		0	-	0	-	ns
Serial clock “H” pulse width	t_{SHSLE}	SCKn	External clock operation (slave mode)	t_{CLKP} + 10	-	t_{CLKP} + 10	-	ns
Serial clock“L” pulse width	t_{SLSHE}	SCKn		t_{CLKP} + 10	-	t_{CLKP} + 10	-	ns
SCK ↓ → SOT delay time	t_{SLOVE}	SCKn SOTn		-	2 t_{CLKP} + 55	-	2 t_{CLKP} + 45	ns
Valid SIN → SCK ↑ setup time	t_{IVSHE}	SCKn SINn		10	-	10	-	ns
SCK ↑ → valid SIN hold time	t_{SHIXE}	SCKn SINn		t_{CLKP} + 10	-	t_{CLKP} + 10	-	ns
SCK rising time	t_{FE}	SCKn		-	20	-	20	ns
SCK falling time	t_{RE}	SCKn		-	20	-	20	ns

1. Parameter m depends on t_{SCYCI} and can be calculated as :

■ if t_{SCYCI} = 2*k*t_{CLKP}, then m = k, where k is an integer > 2

■ if t_{SCYCI} = (2*k + 1)*t_{CLKP}, then m = k + 1, where k is an integer > 1

Notes :

■ The above values are AC characteristics for CLK synchronous mode.

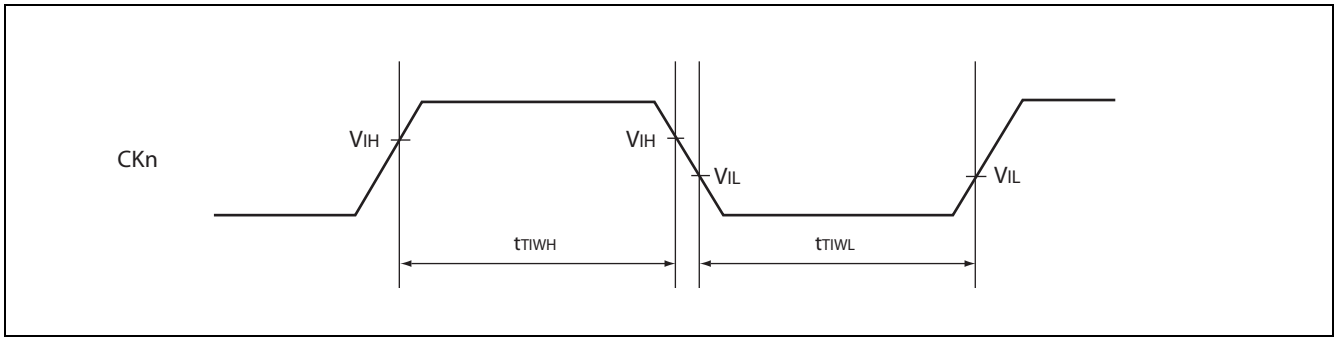
■ t_{CLKP} is the cycle time of the peripheral clock.

15.7.5 Free-Run Timer Clock

($V_{DD}5$ = 3.0 V to 5.5 V, $V_{SS}5$ = $AV_{SS}5$ = 0 V, T_A = –40 °C to + 125 °C)

Parameter	Symbol	Pin name	Condition	Value		Unit
				Min	Max	
Input pulse width	t_{TIWH} t_{TIWL}	CKn	–	$4t_{CLKP}$	–	ns

Note: t_{CLKP} is the cycle time of the peripheral clock.

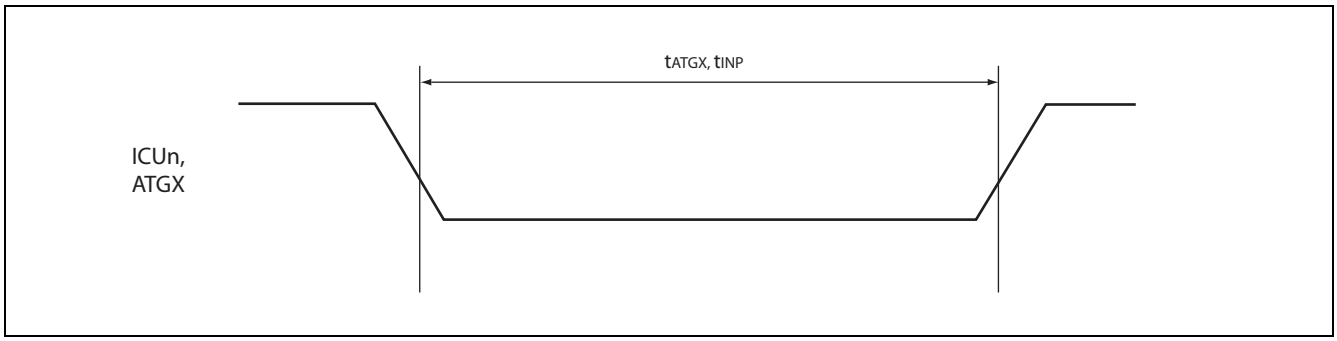


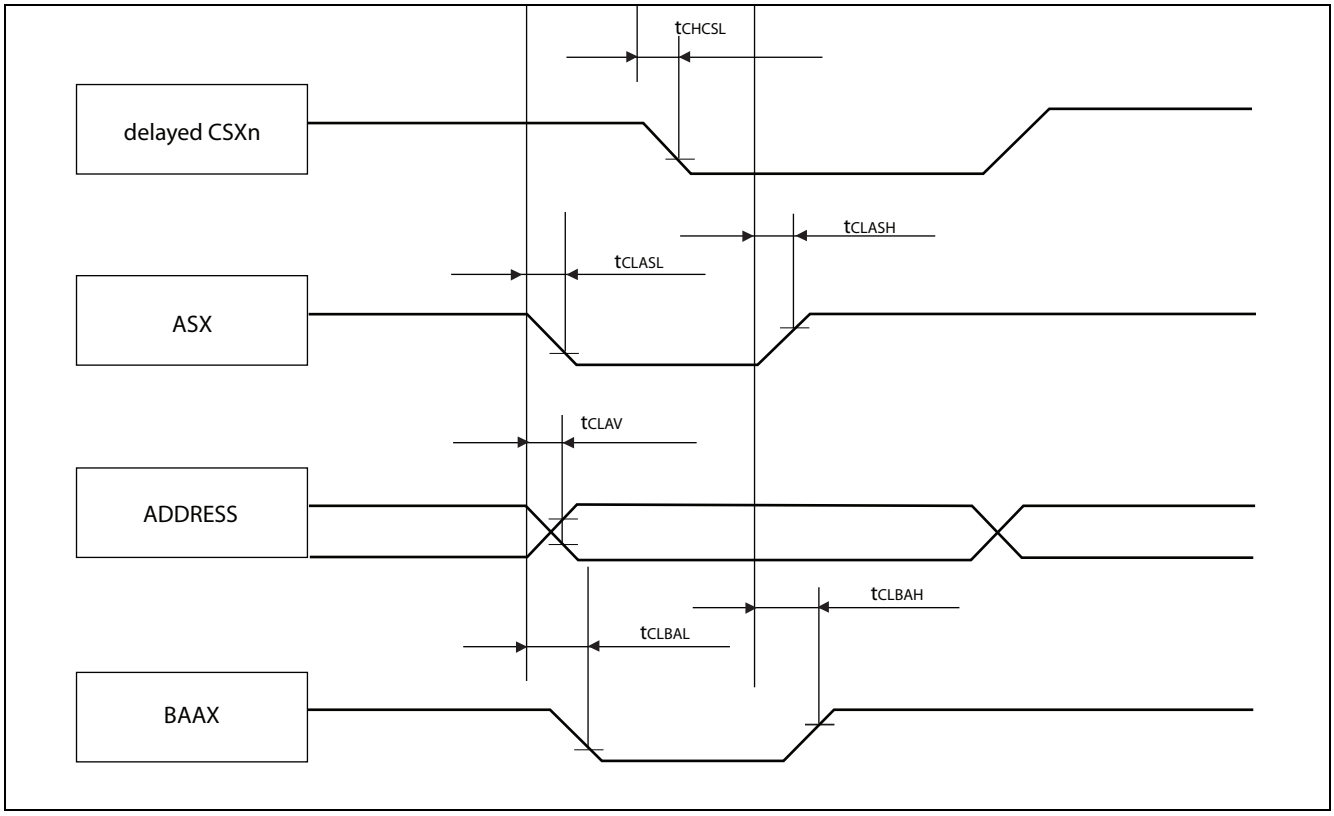
15.7.6 Trigger Input Timing

($V_{DD}5$ = 3.0 V to 5.5 V, $V_{SS}5$ = $AV_{SS}5$ = 0 V, T_A = –40 °C to + 125 °C)

Parameter	Symbol	Pin name	Condition	Value		Unit
				Min	Max	
Input capture input trigger	t_{INP}	ICUn	–	$5t_{CLKP}$	–	ns
A/D converter trigger	t_{ATGX}	ATGX	–	$5t_{CLKP}$	–	ns

Note: t_{CLKP} is the cycle time of the peripheral clock.

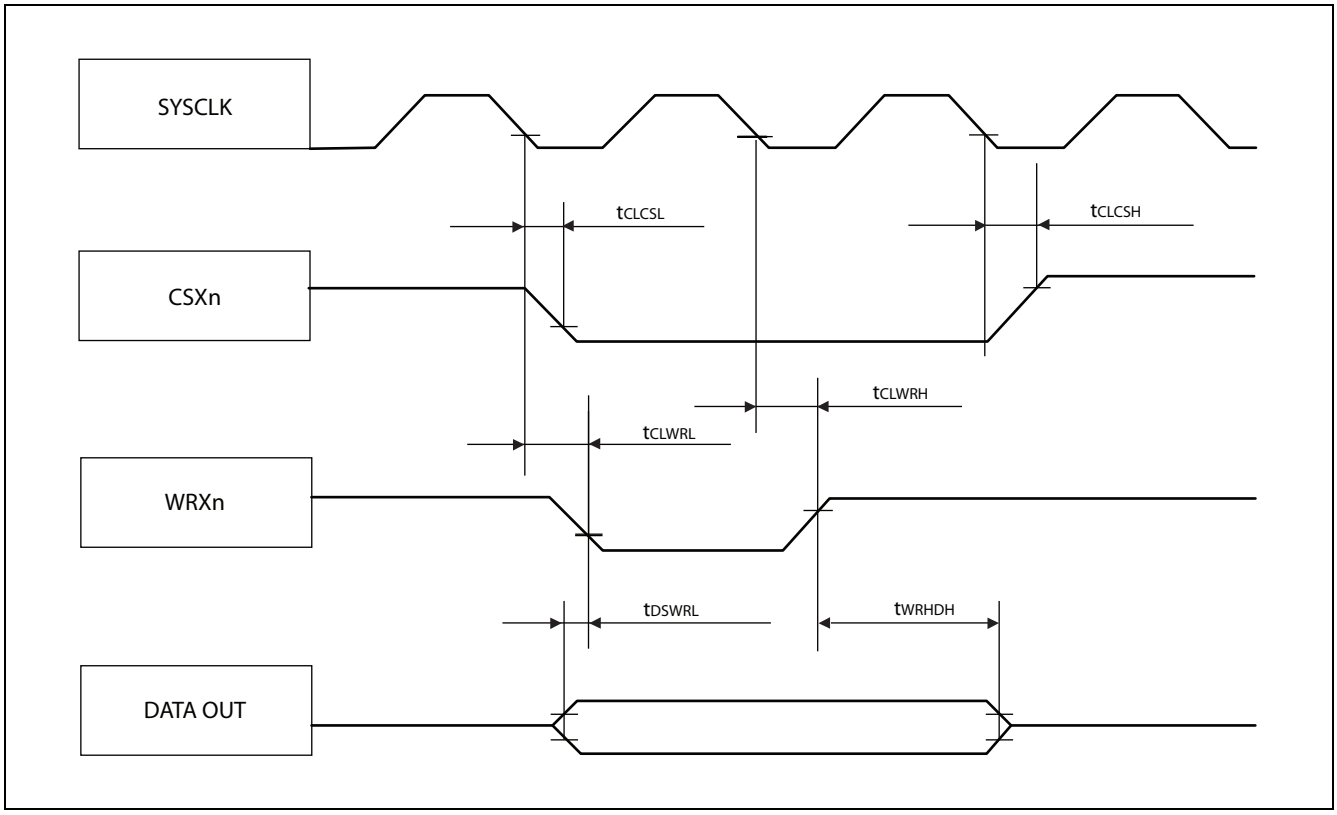



tCHCSL
delayed CSXn
tCLASH
tCLASL
ASX
tCLAV
ADDRESS
tCLBAH
tCLBAL
BAAX

15.7.7.3 Synchronous write access

($V_{DD}35$ = 3.0 V to 5.5 V, Vss5 = AVss5 = 0 V, T_A = –40 °C to + 125 °C)

Parameter	Symbol	Pin name	Value		Unit
			Min	Max	
SYSCLK ↓ to WRXn delay time	TCLWRL	SYSCLK WRXn	-	8	ns
	TCLWRH		0	-	ns
Data valid to WRXn ↓ setup time	TDSWRL	WRXn D31 to D16	- 7	-	ns
WRXn ↑ to Data valid hold time	TWRHDH	WRXn D31 to D16	t_{CLKT} - 20	-	ns
SYSCLK ↓ to CSXn delay time	TCLCSL	SYSCLK CSXn	-	8	ns
	TCLCSH		-	12	ns



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