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"[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	96MHz
Connectivity	CANbus, EBI/EMI, I ² C, LINbus, UART/USART
Peripherals	DMA, LVD, PWM, WDT
Number of I/O	108
Program Memory Size	1.0625MB (1.0625M 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/mb91f467bapmc-gse2-w015

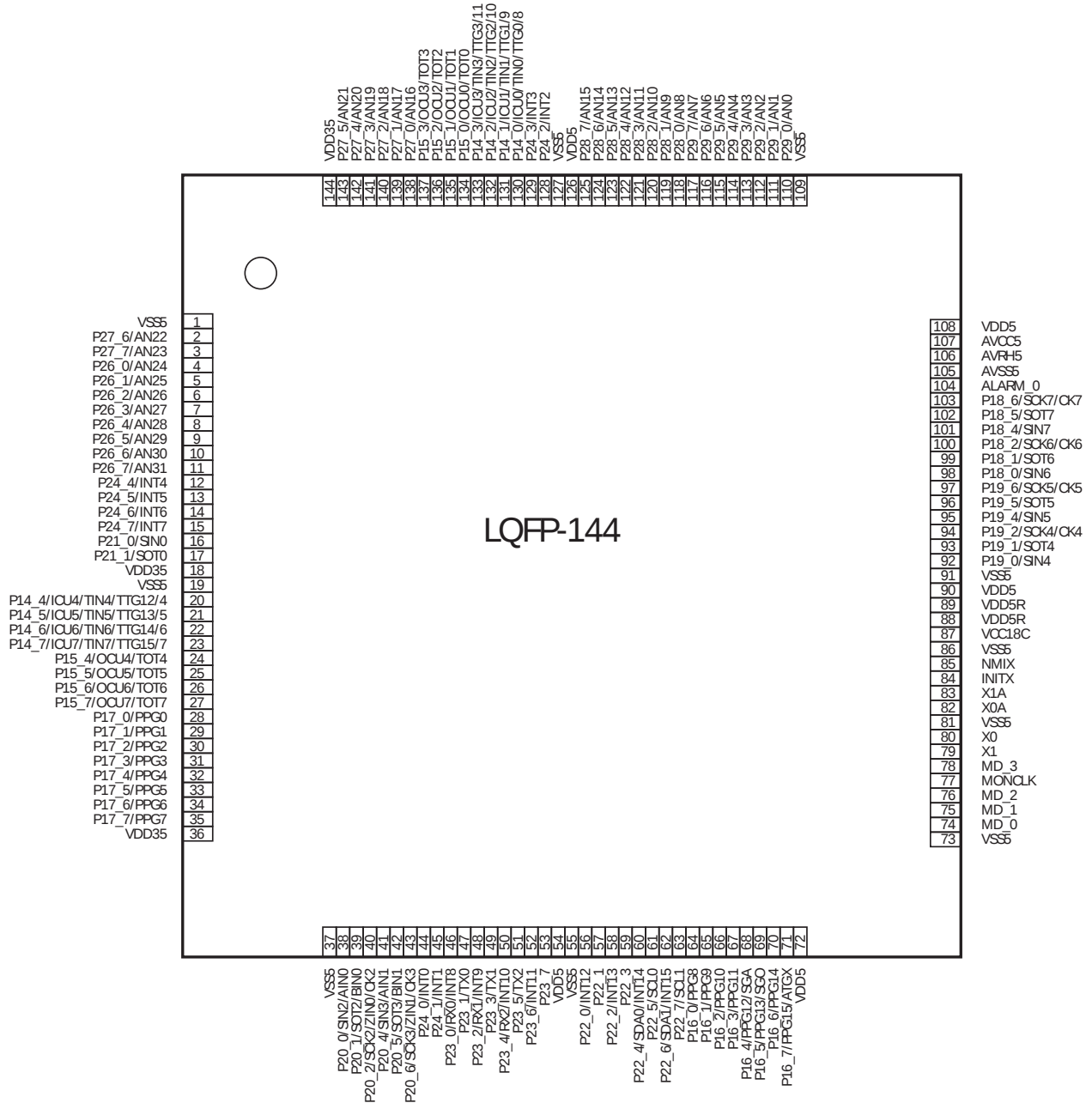
Feature	MB91V460	MB91F465BB/464BB	MB91F467BA/466BA
LIN-USART	4 ch + 4 ch FIFO + 8 ch	MD_3=0: 3 ch + 4 ch FIFO ^[8] MD_3=1: 4 ch FIFO	MD_3=0: 3 ch + 4 ch FIFO ^[8] MD_3=1: 4 ch FIFO
I ² C (400K)	4 ch	2 ch	2 ch
FR external bus	yes (32bit addr, 32bit data)	MD_3=0: no MD_3=1: yes (22bit addr, 16bit data)	MD_3=0: no MD_3=1: yes (22bit addr, 16bit data)
External Interrupts	16 ch	MD_3=0: 16 ch MD_3=1: 12 ch ^[9]	MD_3=0: 16 ch MD_3=1: 12 ch ^[9]
NMI Interrupts	1 ch	1 ch	1 ch
SMC	6 ch	-	-
LCD controller (40x4)	1 ch	-	-
ADC (10-bit)	32 ch	MD_3=0: 32 ch MD_3=1: 16 ch	MD_3=0: 32 ch MD_3=1: 16 ch
Alarm Comparator	2 ch	1 ch	1 ch
Supply Supervisor (low voltage detection)	yes	yes	yes
Clock Supervisor	yes	yes	yes
Main clock oscillator	4 MHz	4 MHz	4 MHz
Sub clock oscillator	32kHz	32kHz	32kHz
RC oscillator	100kHz	100kHz / 2MHz	100kHz / 2MHz
PLL	x 20	x 25	x 25
DSU4	yes	no	no
EDSU	yes (32 BP) ^[1]	yes (16 BP) ^[1]	yes (16 BP) ^[1]
Supply voltage	3V/5V	3V/5V	3V/5V
Regulator	yes	yes	yes
Power consumption	n.a.	< 1.3 W	< 1.3 W
Temperature Range (Ta)	0..70 C	-40..125 C	-40..125 C
Package	BGA-660	QFP-144	QFP-144
Power on to PLL run	< 20 ms	< 20 ms	< 20 ms
Flash Download Time	n.a.	< 5 sec. typical	< 6 sec. typical

1. MPU channels use EDSU breakpoint registers (shared operation between MPU and EDSU).

2. Free Running Timer: MD3=0 : CH 1 and 0 cannot select external clock (bit7 of TCCS1,0)
MD3=1: CH 3, 2, 1, and 0 cannot select external clock (bit7 of TCCS3,2,1,0)

2.4 MB91F465BB/464BB with MD_3=0

(TOP VIEW)



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
	SG0			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

3.2 MB91F467BA/466BA AND MB91F465BB/464BB with MD_3=0

Pin no.	Pin name	I/O	I/O circuit type ^[1]	Function
2 to 3	P27_6 to P27_7	I/O	B	General-purpose input/output ports
	AN22 to AN23			Analog input pins of A/D converter
4 to 11	P26_0 to P26_7	I/O	B	General-purpose input/output ports
	AN24 to AN31			Analog input pins of A/D converter
12 to 15	P24_4 to P24_7	I/O	A	General-purpose input/output ports
	INT4 to INT7			External interrupt input pins
16	P21_0	I/O	A	General-purpose input/output ports
	SIN0			Data input pin of USART0
17	P21_1	I/O	A	General-purpose input/output ports
	SOT0			Data output pin of USART0
20 to 23	P14_4 to P14_7	I/O	A	General-purpose input/output ports
	ICU4 to ICU7			Input capture input pins
	TIN4 to TIN7			External trigger input pins of reload timer
	TTG4/12 to TTG7/15			External trigger input pins of PPG timer
24 to 27	P15_4 to P15_7	I/O	A	General-purpose input/output ports
	OCU4 to OCU7			Output compare output pins
	TOT4 to TOT7			Reload timer output pins
28 to 35	P17_0 to P17_7	I/O	A	General-purpose input/output ports
	PPG0 to PPG7			Output pins of PPG timer
38	P20_0	I/O	A	General-purpose input/output ports
	SIN2			Data input pin of USART2
	AIN0			Up/down counter input pin
39	P20_1	I/O	A	General-purpose input/output ports
	SOT2			Data output pin of USART2
	BIN0			Up/down counter input pin
40	P20_2	I/O	A	General-purpose input/output ports
	SCK2			Clock input/output pin of USART2
	ZIN0			Up/down counter input pin
	CK2			External clock input pin of free-run timer 2
41	P20_4	I/O	A	General-purpose input/output ports
	SIN3			Data input pin of USART3
	AIN1			Up/down counter input pin
42	P20_5	I/O	A	General-purpose input/output ports
	SOT3			Data output pin of USART3
	BIN1			Up/down counter input pin
43	P20_6	I/O	A	General-purpose input/output ports
	SCK3			Clock input/output pin of USART3
	ZIN1			Up/down counter input pin
	CK3			External clock input pin of free-run timer 3

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 ² C 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 ² C bus clock input/output pin (open drain)
62	P22_6	I/O	C	General-purpose input/output ports
	SDA1			I ² C 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 ² C 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
69	P16_5	I/O	A	General-purpose input/output ports
	PPG13			Output pins of PPG timer
	SG0			SG0 output pin of sound generator
70	P16_6	I/O	A	General-purpose input/output ports
	PPG14			Output pins of PPG timer
71	P16_7	I/O	A	General-purpose input/output ports
	PPG15			Output pins of PPG timer
	ATGX			A/D converter external trigger input pin
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85	NMIX	I	H	Non-maskable interrupt input pin
92	P19_0	I/O	A	General-purpose input/output ports
	SIN4			Data input pin of USART4
93	P19_1	I/O	A	General-purpose input/output ports
	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

5.6 Mode Pins (MD_x)

These pins should be connected directly to the power supply or ground pins. To prevent the device from entering test mode accidentally due to noise, minimize the lengths of the patterns between each mode pin and power supply pin or ground pin on the printed circuit board as possible and connect them with low impedance.

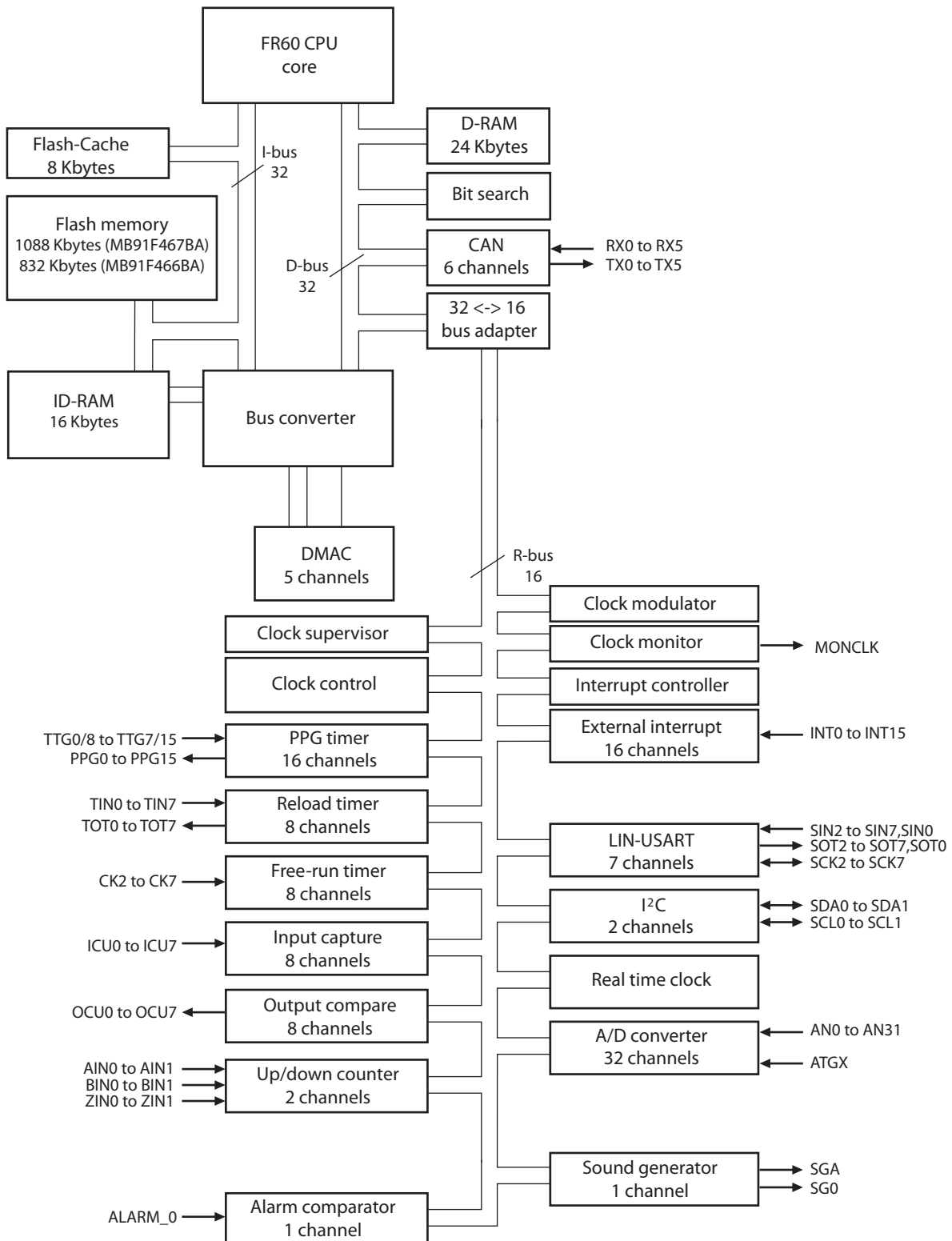
5.7 Notes on Operating in PLL Clock Mode

If the oscillator is disconnected or the clock input stops when the PLL clock is selected, the microcontroller may continue to operate at the free-running frequency of the self-oscillating circuit of the PLL. However, this self-running operation cannot be guaranteed.

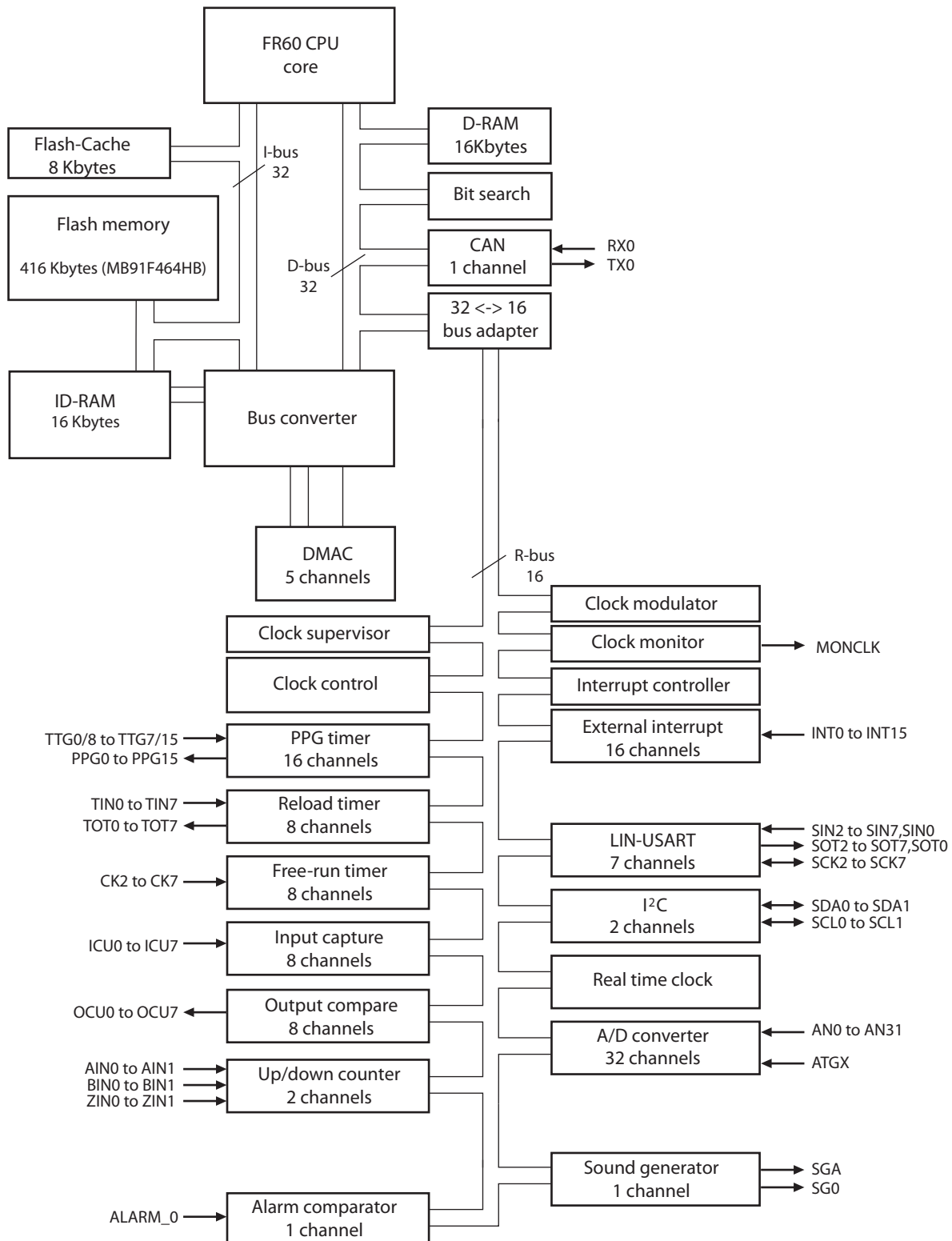
5.8 Pull-up Control

The AC standard is not guaranteed in case a pull-up resistor is connected to the pin serving as an external bus pin.

7.2 MB91F467BA/466BA with MD_3=0



7.4 MB91F465BB/464BB with MD_3=0



9. Embedded Program/Data Memory (Flash)

9.1 Flash features

- MB91F467BA: 1088 Kbytes ($16 \times 64 \text{ Kbytes} + 8 \times 8 \text{ Kbytes} = 8.5 \text{ Mbits}$)
- MB91F466BA: 832 Kbytes ($12 \times 64 \text{ Kbytes} + 8 \times 8 \text{ Kbytes} = 6.5 \text{ Mbits}$)
- MB91F465BB: 544 Kbytes ($8 \times 64 \text{ Kbytes} + 4 \times 8 \text{ Kbytes} = 4.25 \text{ Mbits}$)
- MB91F464BB: 416 Kbytes ($6 \times 64 \text{ Kbytes} + 4 \times 8 \text{ Kbytes} = 3.25 \text{ Mbits}$)
- Programmable wait states for read/write access
- Flash and Boot security with security vector at 0x0014:8000 - 0x0014:800F
- Boot security
- Basic specification: Same as MBM29LV400TC (except size and part of sector configuration)

9.2 Operation Modes

9.2.1 64-bit CPU mode (available on MB91F467BA/466BA only) :

- CPU reads and executes programs in word (32-bit) length units.
- Flash writing is not possible.
- Actual Flash Memory access is performed in d-word (64-bit) length units.

9.2.2 32-bit CPU mode:

- CPU reads and executes programs in word (32-bit) length units.
- Actual Flash Memory access is performed in word (32-bit) length units.

9.2.3 16-bit CPU mode:

- CPU reads and writes in half-word (16-bit) length units.
- Program execution from the Flash is not possible.
- Actual Flash Memory access is performed in word (16-bit) length units.

9.2.4 Flash Memory Mode (External Access to Flash Memory Enabled)

Note: The operation mode of the flash memory can be selected using a Boot-ROM function. The function start address is 0xBF60. The parameter description is given in the Hardware Manual in chapter 54.6 "Flash Access Mode Switching".

9.3.1.3 Flash Memory Map MB91F465BB

Addr									
0014:FFFFh 0014:C000h	SA6 (8KB)				SA7 (8KB)				ROMS7
0014:BFFFh 0014:8000h	SA4 (8KB)				SA5 (8KB)				
0014:7FFFh 0014:4000h	SA2 (8KB)				SA3 (8KB)				
0014:3FFFh 0014:0000h	SA0 (8KB)				SA1 (8KB)				
0013:FFFFh 0012:0000h	SA22 (64KB)				SA23 (64KB)				ROMS6
0011:FFFFh 0010:0000h	SA20 (64KB)				SA21 (64KB)				
000F:FFFFh 000E:0000h	SA18 (64KB)				SA19 (64KB)				ROMS5
000D:FFFFh 000C:0000h	SA16 (64KB)				SA17 (64KB)				ROMS4
000B:FFFFh 000A:0000h	SA14 (64KB)				SA15 (64KB)				ROMS3
0009:FFFFh 0008:0000h	SA12 (64KB)				SA13 (64KB)				ROMS2
0007:FFFFh 0006:0000h	SA10 (64KB)				SA11 (64KB)				ROMS1
0005:FFFFh 0004:0000h	SA8 (64KB)				SA9 (64KB)				ROMS0
	addr+0	addr+1	addr+2	addr+3	addr+4	addr+5	addr+6	addr+7	
16bit read/write	dat[31:16]		dat[15:0]		dat[31:16]		dat[15:0]		
32bit read	dat[31:0]				dat[31:0]				
Legend	Memory not available in this area				Memory available in this area				

9.3.3.3 Address Mapping MB91F465BB

CPU Address (addr)	Condition	Flash sectors	FA (Flash address) Calculation
14:8000h to 14:FFFFh	addr[2]==0	SA4, SA6 (8 Kbyte)	$FA := addr - addr\%00:4000h + (addr\%00:4000h)/2 - (addr/2)\%4 + addr\%4 - 0D:0000h$
14:8000h to 14:FFFFh	addr[2]==1	SA5, SA7 (8 Kbyte)	$FA := addr - addr\%00:4000h + (addr\%00:4000h)/2 + 00:2000h - (addr/2)\%4 + addr\%4 - 0D:0000h$
08:0000h to 0F:FFFFh	addr[2]==0	SA12, SA14, SA16, SA18 (64 Kbyte)	$FA := addr - addr\%02:0000 + (addr\%02:0000h)/2 - (addr/2)\%4 + addr\%4$
08:0000h to 0F:FFFFh	addr[2]==1	SA13, SA15, SA17, SA19 (64 Kbyte)	$FA := addr - addr\%02:0000h + (addr\%02:0000h)/2 + 01:0000h - (addr/2)\%4 + addr\%4$

Note: FA result is without 20:0000h offset for parallel Flash programming . Set offset by keeping FA[21] = 1 as described in section "Parallel Flash programming mode".

9.3.3.4 Address Mapping MB91F464BB

CPU Address (addr)	Condition	Flash sectors	FA (Flash address) Calculation
14:8000h to 14:FFFFh	addr[2]==0	SA4, SA6 (8 Kbyte)	$FA := addr - addr\%00:4000h + (addr\%00:4000h)/2 - (addr/2)\%4 + addr\%4 - 0D:0000h$
14:8000h to 14:FFFFh	addr[2]==1	SA5, SA7 (8 Kbyte)	$FA := addr - addr\%00:4000h + (addr\%00:4000h)/2 + 00:2000h - (addr/2)\%4 + addr\%4 - 0D:0000h$
0A:0000h to 0F:FFFFh	addr[2]==0	SA14, SA16, SA18 (64 Kbyte)	$FA := addr - addr\%02:0000 + (addr\%02:0000h)/2 - (addr/2)\%4 + addr\%4$
0A:0000h to 0F:FFFFh	addr[2]==1	SA15, SA17, SA19 (64 Kbyte)	$FA := addr - addr\%02:0000h + (addr\%02:0000h)/2 + 01:0000h - (addr/2)\%4 + addr\%4$

Note: FA result is without 20:0000h offset for parallel Flash programming . Set offset by keeping FA[21] = 1 as described in section "Parallel Flash programming mode".

10. Memory Space

The FR family has 4 Gbytes of logical address space (2^{32} addresses) available to the CPU by linear access.

■ Direct addressing area

The following address space area is used for I/O.

This area is called direct addressing area, and the address of an operand can be specified directly in an instruction.

The size of directly addressable area depends on the length of the data being accessed as shown below.

Byte data access: 000_H to $0FF_H$

Half word access: 000_H to $1FF_H$

Word data access: 000_H to $3FF_H$

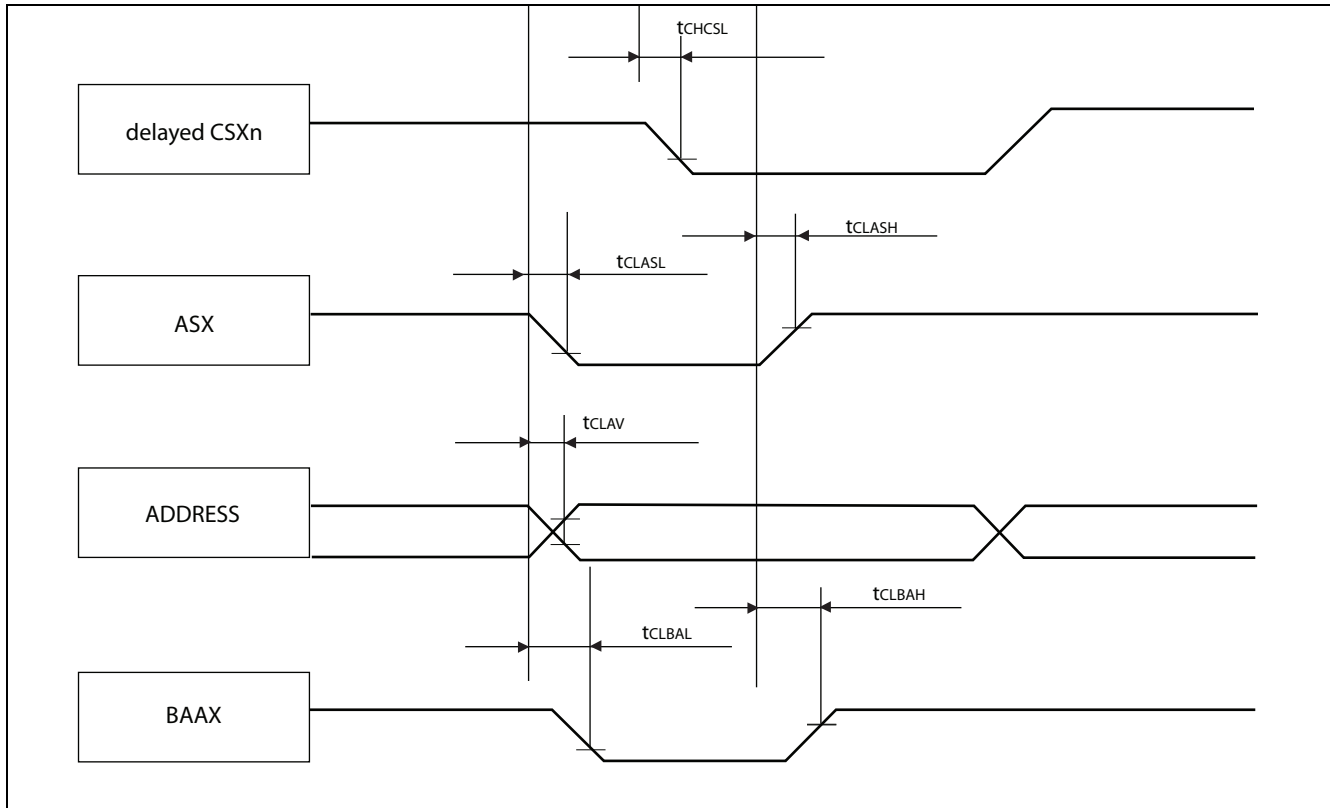
Address	Register				Block
	+0	+1	+2	+3	
000058 _H	SCR03 [R/W,W] 00000000	SMR03 [R/W,W] 00000000	SSR03 [R/W,R] 00001000	RDR03/TDR03 [R/W] 00000000	LIN-USART 3
00005C _H	ESCR03 [R/W] 00000X00	ECCR03 [R/W,R,W] -00000XX	Reserved		
000060 _H	SCR04 [R/W,W] 00000000	SMR04 [R/W,W] 00000000	SSR04 [R/W,R] 00001000	RDR04/TDR04 [R/W] 00000000	LIN-USART 4 with FIFO
000064 _H	ESCR04 [R/W] 00000X00	ECCR04 [R/W,R,W] -00000XX	FSR04 [R] - - - 00000	FCR04 [R/W] 0001 - 000	
000068 _H	SCR05 [R/W,W] 00000000	SMR05 [R/W,W] 00000000	SSR05 [R/W,R] 00001000	RDR05/TDR05 [R/W] 00000000	LIN-USART 5 with FIFO
00006C _H	ESCR05 [R/W] 00000X00	ECCR05 [R/W,R,W] -00000XX	FSR05 [R] - - - 00000	FCR05 [R/W] 0001 - 000	
000070 _H	SCR06 [R/W,W] 00000000	SMR06 [R/W,W] 00000000	SSR06 [R/W,R] 00001000	RDR06/TDR06 [R/W] 00000000	LIN-USART 6 with FIFO
000074 _H	ESCR06 [R/W] 00000X00	ECCR06 [R/W,R,W] -00000XX	FSR06 [R] - - - 00000	FCR06 [R/W] 0001 - 000	
000078 _H	SCR07 [R/W,W] 00000000	SMR07 [R/W,W] 00000000	SSR07 [R/W,R] 00001000	RDR07/TDR07 [R/W] 00000000	LIN-USART 7 with FIFO
00007C _H	ESCR07 [R/W] 00000X00	ECCR07 [R/W,R,W] -00000XX	FSR07 [R] - - - 00000	FCR07 [R/W] 0001 - 000	
000080 _H	BGR100 [R/W] 00000000	BGR000 [R/W] 00000000	Reserved	Reserved	Baud rate Generator LIN-USART 0 to 7
000084 _H	BGR102 [R/W] 00000000	BGR002 [R/W] 00000000	BGR103 [R/W] 00000000	BGR003 [R/W] 00000000	
000088 _H	BGR104 [R/W] 00000000	BGR004 [R/W] 00000000	BGR105 [R/W] 00000000	BGR005 [R/W] 00000000	
00008C _H	BGR106 [R/W] 00000000	BGR006 [R/W] 00000000	BGR107 [R/W] 00000000	BGR007 [R/W] 00000000	
000090 _H to 0000CC _H	Reserved				Reserved
0000D0 _H	IBCR0 [R/W] 00000000	IBSR0 [R] 00000000	ITBAH0 [R/W] - - - - - 00	ITBAL0 [R/W] 00000000	I ² C 0
0000D4 _H	ITMKH0 [R/W] 00 - - - - 11	ITMKL0 [R/W] 11111111	ISMK0 [R/W] 01111111	ISBA0 [R/W] - 0000000	
0000D8 _H	Reserved	IDAR0 [R/W] 00000000	ICCR0 [R/W] - 0011111	Reserved	
0000DC _H	IBCR1 [R/W] 00000000	IBSR1 [R] 00000000	ITBAH1 [R/W] - - - - - 00	ITBAL1 [R/W] 00000000	I ² C 1
0000E0 _H	ITMKH1 [R/W] 00 - - - - 11	ITMKL1 [R/W] 11111111	ISMK1 [R/W] 01111111	ISBA1 [R/W] - 0000000	
0000E4 _H	Reserved	IDAR1 [R/W] 00000000	ICCR1 [R/W] - 0011111	Reserved	

Address	Register				Block
	+0	+1	+2	+3	
000440 _H	ICR00 [R/W] ---11111	ICR01 [R/W] ---11111	ICR02 [R/W] ---11111	ICR03 [R/W] ---11111	Interrupt Controller
000444 _H	ICR04 [R/W] ---11111	ICR05 [R/W] ---11111	ICR06 [R/W] ---11111	ICR07 [R/W] ---11111	
000448 _H	ICR08 [R/W] ---11111	ICR09 [R/W] ---11111	ICR10 [R/W] ---11111	ICR11 [R/W] ---11111	
00044C _H	ICR12 [R/W] ---11111	ICR13 [R/W] ---11111	ICR14 [R/W] ---11111	ICR15 [R/W] ---11111	
000450 _H	ICR16 [R/W] ---11111	ICR17 [R/W] ---11111	ICR18 [R/W] ---11111	ICR19 [R/W] ---11111	
000454 _H	ICR20 [R/W] ---11111	ICR21 [R/W] ---11111	ICR22 [R/W] ---11111	ICR23 [R/W] ---11111	
000458 _H	ICR24 [R/W] ---11111	ICR25 [R/W] ---11111	ICR26 [R/W] ---11111	ICR27 [R/W] ---11111	
00045C _H	ICR28 [R/W] ---11111	ICR29 [R/W] ---11111	ICR30 [R/W] ---11111	ICR31 [R/W] ---11111	
000460 _H	ICR32 [R/W] ---11111	ICR33 [R/W] ---11111	ICR34[R/W] ---11111	ICR35 [R/W] ---11111	
000464 _H	ICR36 [R/W] ---11111	ICR37 [R/W] ---11111	ICR38 [R/W] ---11111	ICR39 [R/W] ---11111	
000468 _H	ICR40 [R/W] ---11111	ICR41 [R/W] ---11111	ICR42 [R/W] ---11111	ICR43 [R/W] ---11111	
00046C _H	ICR44 [R/W] ---11111	ICR45 [R/W] ---11111	ICR46 [R/W] ---11111	ICR47 [R/W] ---11111	
000470 _H	ICR48 [R/W] ---11111	ICR49 [R/W] ---11111	ICR50 [R/W] ---11111	ICR51 [R/W] ---11111	
000474 _H	ICR52 [R/W] ---11111	ICR53 [R/W] ---11111	ICR54 [R/W] ---11111	ICR55 [R/W] ---11111	
000478 _H	ICR56 [R/W] ---11111	ICR57 [R/W] ---11111	ICR58 [R/W] ---11111	ICR59 [R/W] ---11111	
00047C _H	ICR60 [R/W] ---11111	ICR61 [R/W] ---11111	ICR62 [R/W] ---11111	ICR63 [R/W] ---11111	Interrupt Controller
000480 _H	RSRR [R/W] 10000000	STCR [R/W] 00110011	TBCR [R/W] 00XXXX00	CTBR [W] XXXXXXXXXX	Clock Control
000484 _H	CLKR [R/W] ---- 0000	WPR [W] XXXXXXXXXX	DIVR0 [R/W] 00000011	DIVR1 [R/W] 00000000	
000488 _H	Reserved				Reserved
00048C _H	PLLDIVM [R/W] ---- 0000	PLLDIVN [R/W] -- 000000	PLLDIVG [R/W] ---- 0000	PLLMULG [R/W] 00000000	PLL Interface
000490 _H	PLLCTRL [R/W] ---- 0000	Reserved			
000494 _H	OSCC1 [R/W] ----- 010	OSCS1 [R/W] 00001111	OSCC2 [R/W] ----- 010	OSCS2 [R/W] 00001111	Main/Sub Oscillator Control (Reserved)
000498 _H	PORTEN [R/W] ----- 00	Reserved			Port Input Enable Control

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	
00C140 _H	IF2CREQ1 [R/W] 00000000 00000001		IF2CMSK1 [R/W] 00000000 00000000		CAN 1 IF 2 Register
00C144 _H	IF2MSK21 [R/W] 11111111 11111111		IF2MSK11 [R/W] 11111111 11111111		
00C148 _H	IF2ARB21 [R/W] 00000000 00000000		IF2ARB11 [R/W] 00000000 00000000		
00C14C _H	IF2MCTR1 [R/W] 00000000 00000000		Reserved		
00C150 _H	IF2DTA11 [R/W] 00000000 00000000		IF2DTA21 [R/W] 00000000 00000000		
00C154 _H	IF2DTB11 [R/W] 00000000 00000000		IF2DTB21 [R/W] 00000000 00000000		
00C158 _H to 00C15C _H	Reserved				
00C160 _H	IF2DTA21 [R/W] 00000000 00000000		IF2DTA11 [R/W] 00000000 00000000		
00C164 _H	IF2DTB21 [R/W] 00000000 00000000		IF2DTB11 [R/W] 00000000 00000000		
00C168 _H to 00C17C _H	Reserved				
00C180 _H	TREQR21 [R] 00000000 00000000		TREQR11 [R] 00000000 00000000		CAN 1 Status Flags
00C184 _H to 00C18C _H	Reserved		Reserved		
00C190 _H	NEWDT21 [R] 00000000 00000000		NEWDT11 [R] 00000000 00000000		
00C194 _H to 00C19C _H	Reserved		Reserved		
00C1A0 _H	INTPND21 [R] 00000000 00000000		INTPND11 [R] 00000000 00000000		
00C1A4 _H to 00C1AC _H	Reserved		Reserved		
00C1B0 _H	MSGVAL21 [R] 00000000 00000000		MSGVAL11 [R] 00000000 00000000		
00C1B4 _H to 00C1FC _H	Reserved		Reserved		
00C200 _H	CTRLR2 [R/W] 00000000 00000001		STATR2 [R/W] 00000000 00000000		CAN 2 Control Register
00C204 _H	ERRCNT2 [R] 00000000 00000000		BTR2 [R/W] 00100011 00000001		
00C208 _H	INTR2 [R] 00000000 00000000		TESTR2 [R/W] 00000000 X0000000		
00C20C _H	BRPE2 [R/W] 00000000 00000000		CBSYNC2		

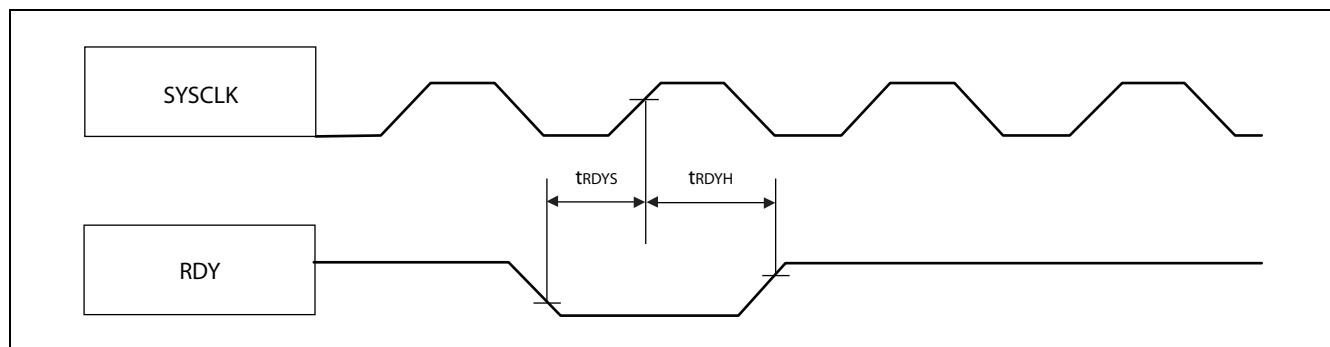
Address	Register				Block
	+0	+1	+2	+3	
00C380 _H	TREQR23 [R] 00000000 00000000		TREQR13 [R] 00000000 00000000		CAN 3 Status Flags Note: Not on MB91F465BB/MB91F464 BB
00C384 _H to 00C38C _H	Reserved				
00C390 _H	NEWDT23 [R] 00000000 00000000		NEWDT13 [R] 00000000 00000000		
00C394 _H to 00C39C _H	Reserved				
00C3A0 _H	INTPND23 [R] 00000000 00000000		INTPND13 [R] 00000000 00000000		
00C3A4 _H to 00C3AC _H	Reserved				
00C3B0 _H	MSGVAL23 [R] 00000000 00000000		MSGVAL13 [R] 00000000 00000000		
00C3B4 _H to 00C3FC _H	Reserved				
00C400 _H	CTRLR4 [R/W] 00000000 00000001		STATR4 [R/W] 00000000 00000000		CAN 4 Control Register Note: Not on MB91F465BB/MB91F464 BB
00C404 _H	ERRCNT4 [R] 00000000 00000000		BTR4 [R/W] 00100011 00000001		
00C408 _H	INTR4 [R] 00000000 00000000		TESTR4 [R/W] 00000000 X0000000		
00C40C _H	BRPE4 [R/W] 00000000 00000000		CBSYNC4		
00C410 _H	IF1CREQ4 [R/W] 00000000 00000001		IF1CMSK4 [R/W] 00000000 00000000		CAN 4 IF 1 Register Note: Not on MB91F465BB/MB91F464 BB
00C414 _H	IF1MSK24 [R/W] 11111111 11111111		IF1MSK14 [R/W] 11111111 11111111		
00C418 _H	IF1ARB24 [R/W] 00000000 00000000		IF1ARB14 [R/W] 00000000 00000000		
00C41C _H	IF1MCTR4 [R/W] 00000000 00000000		Reserved		
00C420 _H	IF1DTA14 [R/W] 00000000 00000000		IF1DTA24 [R/W] 00000000 00000000		
00C424 _H	IF1DTB14 [R/W] 00000000 00000000		IF1DTB24 [R/W] 00000000 00000000		
00C428 _H to 00C42C _H	Reserved				
00C430 _H	IF1DTA24 [R/W] 00000000 00000000		IF1DTA14 [R/W] 00000000 00000000		
00C434 _H	IF1DTB24 [R/W] 00000000 00000000		IF1DTB14 [R/W] 00000000 00000000		
00C438 _H to 00C43C _H	Reserved				



15.7.7.5 RDY Waitcycle Insertion

($V_{DD35} = 3.0\text{ V}$ to 5.5 V , $V_{SS5} = AV_{SS5} = 0\text{ V}$, $T_A = -40\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$)

Parameter	Symbol	Pin name	Value		Unit
			Min	Max	
RDY setup time	TRDYS	SYSCLK RDY	34	–	ns
RDY hold time	TRDYH	SYSCLK RDY	0	–	ns



16. Ordering Information

Part number	Package	Remarks
MB91F465BBPMC-GSE2 MB91F467BAPMC-GSE2	144-pin plastic LQFP (FPT-144P-M08)	Lead-free package