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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.

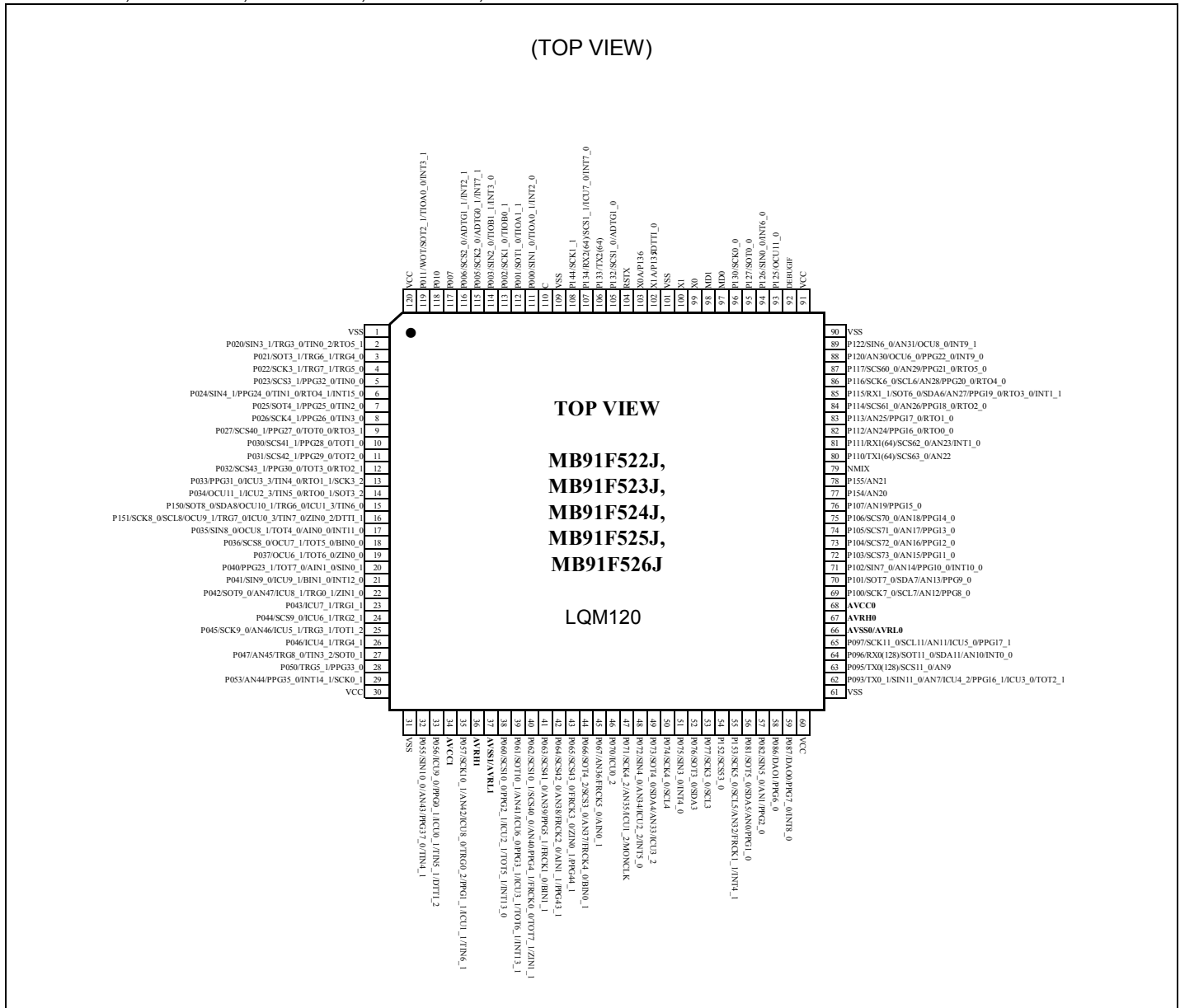
Applications of "[Embedded - Microcontrollers](#)"

Details

Product Status	Obsolete
Core Processor	FR81S
Core Size	32-Bit Single-Core
Speed	80MHz
Connectivity	CANbus, CSIO, EBI/EMI, I ² C, LINbus, SPI, UART/USART
Peripherals	DMA, LVD, POR, PWM, WDT
Number of I/O	120
Program Memory Size	320KB (320K x 8)
Program Memory Type	FLASH
EEPROM Size	64K x 8
RAM Size	56K x 8
Voltage - Supply (Vcc/Vdd)	2.7V ~ 5.5V
Data Converters	A/D 48x12b; D/A 2x8b
Oscillator Type	External
Operating Temperature	-40°C ~ 105°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/mb91f522kscpmc1-gse2

MB91F52xJ

MB91F522J, MB91F523J, MB91F524J, MB91F525J, MB91F526J



* In a single clock product, pin 102 and pin 103 are the general-purpose ports.

8. Memory Map

MB91F522, MB91F523, MB91F524

MB91F522		MB91F523		MB91F524	
0000	0000 _H	0000	0000 _H	0000	0000 _H
	I/O		I/O		I/O
0000	4000 _H	0000	4000 _H	0000	4000 _H
	BackUp RAM (8KB)		BackUp RAM (8KB)		BackUp RAM (8KB)
0000	6000 _H	0000	6000 _H	0000	6000 _H
	I/O		I/O		I/O
0001	0000 _H	0001	0000 _H	0001	0000 _H
	RAM (48KB)		RAM (48KB)		RAM (64KB)
0001	C000 _H	0001	C000 _H	0002	0000 _H
	Reserved		Reserved		Reserved
0007	0000 _H	0007	0000 _H	0007	0000 _H
	Flash memory (256+64)KB		Flash memory (384+64)KB		Flash memory (512+64)KB
000C	0000 _H	000E	0000 _H	000F	FC00 _H
	Reserved		Reserved		Interrupt vector
000F	FC00 _H	000F	FC00 _H		Reset vector
0010	0000 _H	0010	0000 _H	0010	0000 _H
	Reserved		Reserved		Reserved
0033	0000 _H	0033	0000 _H	0033	0000 _H
	WorkFlash (64KB)		WorkFlash (64KB)		WorkFlash (64KB)
0034	0000 _H	0034	0000 _H	0034	0000 _H
	Reserved		Reserved		Reserved
0039	0000 _H	0039	0000 _H	0039	0000 _H
	Reserved		Reserved		Reserved
0039	2000 _H				
8000	0000 _H	8000	0000 _H	8000	0000 _H
	External area		External area		External area
FFFF	FFFF _H	FFFF	FFFF _H	FFFF	FFFF _H

Address	Address offset value / Register name				Block
	+0	+1	+2	+3	
001200 _H	TCGS [R/W] B,H,W -----00	—	—	TCGSE [R/W] B,H,W ----000	16-bit Free-run timer synchronous activation
001204 _H	CPCLRB0/CPCLR0 [W] H,W 11111111 11111111		TCDT0 [R/W] H,W 00000000 00000000		16-bit Free-run Timer 0
001208 _H	TCCS0 [R/W] B,H,W 00000000 01000000 ----0000 -----				
00120C _H	CPCLRB1/CPCLR1 [W] H,W 11111111 11111111		TCDT1 [R/W] H,W 00000000 00000000		16-bit Free-run Timer 1
001210 _H	TCCS1 [R/W] B,H,W 00000000 01000000 ----0000 -----				
001214 _H	CPCLRB2/CPCLR2 [W] H,W 11111111 11111111		TCDT2 [R/W] H,W 00000000 00000000		16-bit Free-run Timer 2
001218 _H	TCCS2 [R/W] B,H,W 00000000 01000000 ----0000 -----				
00121C _H to 001230 _H	—	—	—	—	Reserved
001234 _H	FRS0 [R/W] B,H,W ----- --00--00 --00--00 --00--00				16-bit Free-run timer selection
001238 _H	—		FRS1 [R/W] B,H,W --00--00 --00--00		
00123C _H	FRS2 [R/W] B,H,W --00--00 --00--00 --00--00 --00--00				
001240 _H	FRS3 [R/W] B,H,W --00--00 --00--00 --00--00 --00--00				
001244 _H	FRS4 [R/W] B,H,W --00--00 --00--00 --00--00 --00--00				
001248 _H	—	—	—	—	Reserved
00124C _H	OCCPB0/OCCP0 [R/W] H,W 00000000 00000000		OCCPB1/OCCP1 [R/W] H,W 00000000 00000000		16-bit Output compare 0/1
001250 _H	OCS01 [R/W] B,H,W -110--00 00001100		—	OCMOD01 [R/W] B,H,W -----00	
001254 _H	OCCPB2/OCCP2 [R/W] H,W 00000000 00000000		OCCPB3/OCCP3 [R/W] H,W 00000000 00000000		16-bit Output compare 2/3
001258 _H	OCS23 [R/W] B,H,W -110--00 00001100		—	OCMOD23 [R/W] B,H,W -----00	

Address	Address offset value / Register name				Block
	+0	+1	+2	+3	
0013E8 _H	ADTECS14[R/W] B,H,W -----0 ---00000		ADTECS15[R/W] B,H,W -----0 ---00000		12-bit A/D converter 1/2 unit
0013EC _H	ADTECS16[R/W] B,H,W -----0 ---00000		ADTECS17[R/W] B,H,W -----0 ---00000		
0013F0 _H	ADTECS18[R/W] B,H,W -----0 ---00000		ADTECS19[R/W] B,H,W -----0 ---00000		
0013F4 _H	ADTECS20[R/W] B,H,W -----0 ---00000		ADTECS21[R/W] B,H,W -----0 ---00000		
0013F8 _H	ADTECS22[R/W] B,H,W -----0 ---00000		ADTECS23[R/W] B,H,W -----0 ---00000		
0013FC _H	ADTECS24[R/W] B,H,W -----0 ---00000		ADTECS25[R/W] B,H,W -----0 ---00000		
001400 _H	ADTECS26[R/W] B,H,W -----0 ---00000		ADTECS27[R/W] B,H,W -----0 ---00000		
001404 _H	ADTECS28[R/W] B,H,W -----0 ---00000		ADTECS29[R/W] B,H,W -----0 ---00000		
001408 _H	ADTECS30[R/W] B,H,W -----0 ---00000		ADTECS31[R/W] B,H,W -----0 ---00000		
00140C _H	ADRCUT0[R/W] B,H,W ----0000 00000000		ADRCLT0[R/W] B,H,W ----0000 00000000		
001410 _H	ADRCUT1[R/W] B,H,W ----0000 00000000		ADRCLT1[R/W] B,H,W ----0000 00000000		
001414 _H	ADRCUT2[R/W] B,H,W ----0000 00000000		ADRCLT2[R/W] B,H,W ----0000 00000000		
001418 _H	ADRCUT3[R/W] B,H,W ----0000 00000000		ADRCLT3[R/W] B,H,W ----0000 00000000		
00141C _H	ADRCES0[R/W] B,H,W 00000000	ADRCES1[R/W] B,H,W 00000000	ADRCES2[R/W] B,H,W 00000000	ADRCES3[R/W] B,H,W 00000000	
001420 _H	ADRCES4[R/W] B,H,W 00000000	ADRCES5[R/W] B,H,W 00000000	ADRCES6[R/W] B,H,W 00000000	ADRCES7[R/W] B,H,W 00000000	
001424 _H	ADRCES8[R/W] B,H,W 00000000	ADRCES9[R/W] B,H,W 00000000	ADRCES10[R/W] B,H,W 00000000	ADRCES11[R/W] B,H,W 00000000	
001428 _H	ADRCES12[R/W] B,H,W 00000000	ADRCES13[R/W] B,H,W 00000000	ADRCES14[R/W] B,H,W 00000000	ADRCES15[R/W] B,H,W 00000000	
00142C _H	ADRCES16[R/W] B,H,W 00000000	ADRCES17[R/W] B,H,W 00000000	ADRCES18[R/W] B,H,W 00000000	ADRCES19[R/W] B,H,W 00000000	
001430 _H	ADRCES20[R/W] B,H,W 00000000	ADRCES21[R/W] B,H,W 00000000	ADRCES22[R/W] B,H,W 00000000	ADRCES23[R/W] B,H,W 00000000	

Address	Address offset value / Register name				Block
	+0	+1	+2	+3	
00147C _H	ADCOMP34/ADCOMPB34[R/W] H,W 00000000 00000000		ADCOMP35/ADCOMPB35[R/W] H,W 00000000 00000000		12-bit A/D converter 2/2 unit
001480 _H	ADCOMP36/ADCOMPB36[R/W] H,W 00000000 00000000		ADCOMP37/ADCOMPB37[R/W] H,W 00000000 00000000		
001484 _H	ADCOMP38/ADCOMPB38[R/W] H,W 00000000 00000000		ADCOMP39/ADCOMPB39[R/W] H,W 00000000 00000000		
001488 _H	ADCOMP40/ADCOMPB40[R/W] H,W 00000000 00000000		ADCOMP41/ADCOMPB41[R/W] H,W 00000000 00000000		
00148C _H	ADCOMP42/ADCOMPB42[R/W] H,W 00000000 00000000		ADCOMP43/ADCOMPB43[R/W] H,W 00000000 00000000		
001490 _H	ADCOMP44/ADCOMPB44[R/W] H,W 00000000 00000000		ADCOMP45/ADCOMPB45[R/W] H,W 00000000 00000000		
001494 _H	ADCOMP46/ADCOMPB46[R/W] H,W 00000000 00000000		ADCOMP47/ADCOMPB47[R/W] H,W 00000000 00000000		
001498 _H to 0014B4 _H	—	—	—	—	Reserved
0014B8 _H	ADTCS32[R/W] B,H,W 00000000 0010----		ADTCS33[R/W] B,H,W 00000000 0010----		12-bit A/D converter 2/2 unit
0014BC _H	ADTCS34[R/W] B,H,W 00000000 0010----		ADTCS35[R/W] B,H,W 00000000 0010----		
0014C0 _H	ADTCS36[R/W] B,H,W 00000000 0010----		ADTCS37[R/W] B,H,W 00000000 0010----		
0014C4 _H	ADTCS38[R/W] B,H,W 00000000 0010----		ADTCS39[R/W] B,H,W 00000000 0010----		
0014C8 _H	ADTCS40[R/W] B,H,W 00000000 0010----		ADTCS41[R/W] B,H,W 00000000 0010----		
0014CC _H	ADTCS42[R/W] B,H,W 00000000 0010----		ADTCS43[R/W] B,H,W 00000000 0010----		
0014D0 _H	ADTCS44[R/W] B,H,W 00000000 0010----		ADTCS45[R/W] B,H,W 00000000 0010----		
0014D4 _H	ADTCS46[R/W] B,H,W 00000000 0010----		ADTCS47[R/W] B,H,W 00000000 0010----		
0014D8 _H to 0014F4 _H	—	—	—	—	Reserved
0014F8 _H	ADTCD32[R] B,H,W 10--0000 00000000		ADTCD33[R] B,H,W 10--0000 00000000		12-bit A/D converter 2/2 unit
0014FC _H	ADTCD34[R] B,H,W 10--0000 00000000		ADTCD35[R] B,H,W 10--0000 00000000		

Address	Address offset value / Register name				Block
	+0	+1	+2	+3	
00158 _H	ADRCSS32[R/W] B,H,W 00000000	ADRCSS33[R/W] B,H,W 00000000	ADRCSS34[R/W] B,H,W 00000000	ADRCSS35[R/W] B,H,W 00000000	12-bit A/D converter 2/2 unit
00158 _{C_H}	ADRCSS36[R/W] B,H,W 00000000	ADRCSS37[R/W] B,H,W 00000000	ADRCSS38[R/W] B,H,W 00000000	ADRCSS39[R/W] B,H,W 00000000	
00159 _H	ADRCSS40[R/W] B,H,W 00000000	ADRCSS41[R/W] B,H,W 00000000	ADRCSS42[R/W] B,H,W 00000000	ADRCSS43[R/W] B,H,W 00000000	
00159 _{4_H}	ADRCSS44[R/W] B,H,W 00000000	ADRCSS45[R/W] B,H,W 00000000	ADRCSS46[R/W] B,H,W 00000000	ADRCSS47[R/W] B,H,W 00000000	
00159 _{8_H} to 0015A _{4_H}	—	—	—	—	Reserved
0015A _{8_H}	ADRCOT1 [R] B,H,W ----- 00000000 00000000				12-bit A/D converter 2/2 unit
0015A _{C_H}	ADRCIF1 [R,W] B,H,W ----- 00000000 00000000				
0015B _{0_H}	ADSCANS1 [R/W] B,H,W 000-----	—	—	—	
0015B _{4_H}	ADNCS16 [R/W] B,H,W 0-000-00	ADNCS17 [R/W] B,H,W 0-000-00	ADNCS18 [R/W] B,H,W 0-000-00	ADNCS19 [R/W] B,H,W 0-000-00	
0015B _{8_H}	ADNCS20 [R/W] B,H,W 0-000-00	ADNCS21 [R/W] B,H,W 0-000-00	ADNCS22 [R/W] B,H,W 0-000-00	ADNCS23 [R/W] B,H,W 0-000-00	
0015B _{C_H}	—	—	—	—	
0015C _{0_H}	—	—	—	—	12-bit A/D converter 2/2 unit
0015C _{4_H}	ADPRTF1 [R] B,H,W ----- 00000000 00000000				
0015C _{8_H}	ADEOCF1 [R] B,H,W ----- 11111111 11111111				
0015C _{C_H}	ADCS1 [R] B,H,W 0-----		ADCH1 [R] B,H,W ---00000	ADMD1 [R/W] B,H,W 0---0000	
0015D _{0_H}	ADSTPCS8 [R/W] B,H,W 00000000	ADSTPCS9 [R/W] B,H,W 00000000	ADSTPCS10 [R/W] B,H,W 00000000	ADSTPCS11 [R/W] B,H,W 00000000	
0015D _{4_H} to 00174 _{C_H}	—	—	—	—	Reserved

Address	Address offset value / Register name				Block
	+0	+1	+2	+3	
002150 _H	IF2DTA11 [R/W] B,H,W 00000000 00000000		IF2DTA21 [R/W] B,H,W 00000000 00000000		CAN1 (64msb)
002154 _H	IF2DTB11 [R/W] B,H,W 00000000 00000000		IF2DTB21 [R/W] B,H,W 00000000 00000000		
002158 _H	—	—	—	—	
00215C _H	—	—	—	—	
002160 _H , 002164 _H	Reserved (IF2 data mirror)				
002168 _H to 00217C _H	—				
002180 _H	TREQR21 [R] B,H,W 00000000 00000000		TREQR11 [R] B,H,W 00000000 00000000		
002184 _H	TREQR41 [R] B,H,W 00000000 00000000		TREQR31 [R] B,H,W 00000000 00000000		
002188 _H	—	—	—	—	
00218C _H	—	—	—	—	
002190 _H	NEWDT21 [R] B,H,W 00000000 00000000		NEWDT11 [R] B,H,W 00000000 00000000		
002194 _H	NEWDT41 [R] B,H,W 00000000 00000000		NEWDT31 [R] B,H,W 00000000 00000000		
002198 _H	—	—	—	—	
00219C _H	—	—	—	—	
0021A0 _H	INTPND21 [R] B,H,W 00000000 00000000		INTPND11 [R] B,H,W 00000000 00000000		
0021A4 _H	INTPND41 [R] B,H,W 00000000 00000000		INTPND31 [R] B,H,W 00000000 00000000		
0021A8 _H	—	—	—	—	
0021AC _H	—	—	—	—	
0021B0 _H	MSGVAL21 [R] B,H,W 00000000 00000000		MSGVAL11 [R] B,H,W 00000000 00000000		
0021B4 _H	MSGVAL41 [R] B,H,W 00000000 00000000		MSGVAL31 [R] B,H,W 00000000 00000000		
0021B8 _H	—	—	—	—	
0021BC _H	—	—	—	—	

144 pins

Interrupt factor	Interrupt number		Interrupt level	Offset	Default address for TBR	RN
	Decimal	Hexa decimal				
Reset	0	0	-	3FC _H	000FFFFC _H	-
System reserved	1	1	-	3F8 _H	000FFFF8 _H	-
System reserved	2	2	-	3F4 _H	000FFFF4 _H	-
System reserved	3	3	-	3F0 _H	000FFFF0 _H	-
System reserved	4	4	-	3EC _H	000FFFE4 _H	-
FPU exception	5	5	-	3E8 _H	000FFFE8 _H	-
Exception of instruction access protection violation	6	6	-	3E4 _H	000FFFE4 _H	-
Exception of data access protection violation	7	7	-	3E0 _H	000FFFE0 _H	-
Data access error interrupt	8	8	-	3DC _H	000FFFD4 _H	-
INTE instruction	9	9	-	3D8 _H	000FFFD8 _H	-
Instruction break	10	0A	-	3D4 _H	000FFFD4 _H	-
System reserved	11	0B	-	3D0 _H	000FFFD0 _H	-
System reserved	12	0C	-	3CC _H	000FFFC4 _H	-
System reserved	13	0D	-	3C8 _H	000FFFC8 _H	-
Exception of invalid instruction	14	0E	-	3C4 _H	000FFFC4 _H	-
NMI request	15	0F	15 (F _H) Fixed	3C0 _H	000FFFC0 _H	-
Error generation during internal bus diagnosis						
XBS RAM double-bit error generation						
Backup RAM double-bit error generation						
TPU violation						
External interrupt 0-7	16	10	ICR00	3BC _H	000FFFB4 _H	0
External interrupt 8-15	17	11	ICR01	3B8 _H	000FFFB8 _H	1* ⁷
External low-voltage detection interrupt						
Reload timer 0/1/4/5	18	12	ICR02	3B4 _H	000FFFB4 _H	2* ²
Reload timer 2/3/6/7	19	13	ICR03	3B0 _H	000FFFB0 _H	3* ²
Multi-function serial interface ch.0 (reception completed)	20	14	ICR04	3AC _H	000FFFA4 _H	4* ¹
Multi-function serial interface ch.0 (status)						
Multi-function serial interface ch.0 (transmission completed)	21	15	ICR05	3A8 _H	000FFFA8 _H	5* ¹
Multi-function serial interface ch.1 (reception completed)	22	16	ICR06	3A4 _H	000FFFA4 _H	6* ¹
Multi-function serial interface ch.1 (status)						
Multi-function serial interface ch.1 (transmission completed)	23	17	ICR07	3A0 _H	000FFFA0 _H	7* ¹
Multi-function serial interface ch.2 (reception completed)	24	18	ICR08	39C _H	000FFF9C _H	8* ¹
Multi-function serial interface ch.2 (status)						
Multi-function serial interface ch.2 (transmission completed)	25	19	ICR09	398 _H	000FFF98 _H	9* ¹
Multi-function serial interface ch.3 (reception completed)	26	1A	ICR10	394 _H	000FFF94 _H	10* ¹
Multi-function serial interface ch.3 (status)						

(4) Multi-function Serial

(4-1) CSIO timing

(4-1-1) Bit setting: SMR: MD2=0, SMR: MD1=1, SMR : MD0=0, SMR: SCINV=0, SCR:SPI=0

(TA: -40°C to +125°C, V_{CC}= AV_{CC}=5.0V ± 10%/V_{CC}=AV_{CC}=3.3V±0.3V, V_{SS}=AV_{SS}=0.0V)

Parameter	Symbol	Pin name	Conditions	Value		Unit	Remarks
				Min	Max		
Serial clock cycle time	t _{SCYC}	SCK0 to SCK11	-	4t _{CPP}	-	ns	Internal shift clock mode output pin : C _L =50pF
SCK ↓ → SOT delay time	t _{SLOVI}	SCK0 to SCK2, SCK5 to SCK11 SOT0 to SOT2, SOT5 to SOT11		-30	30	ns	
		SCK3 , SCK4 SOT3 , SOT4		-300	300	ns	
Valid SIN → SCK ↑ setup time	t _{IVSHI}	SCK0 to SCK2, SCK5 to SCK11 SIN0 to SIN2, SIN5 to SIN11		34	-	ns	
		SCK3 , SCK4 SIN3 , SIN4		300	-	ns	
SCK ↑ → Valid SIN hold time	t _{SHIXI}	SCK0 to SCK11 SIN0 to SIN11		0	-	ns	
Serial clock "H" pulse width	t _{SHSL}	SCK0 to SCK11	-	t _{CPP} +10	-	ns	External shift clock mode output pin: C _L =50pF
Serial clock "L" pulse width	t _{SLSH}			2t _{CPP} -10	-	ns	
SCK ↓ → SOT delay time	t _{SLOVE}	SCK0 to SCK2, SCK5 to SCK11 SOT0 to SOT2, SOT5 to SOT11		-	33	ns	
		SCK3 , SCK4 SOT3 , SOT4		-	300	ns	
Valid SIN → SCK ↑ setup time	t _{IVSHE}	SCK0 to SCK11 SIN0 to SIN11		10	-	ns	
SCK ↑ → Valid SIN hold time	t _{SHIXE}			20	-	ns	
SCK fall time	t _F	SCK0 to SCK11		-	5	ns	
SCK rise time	t _R	SCK0 to SCK11		-	5	ns	

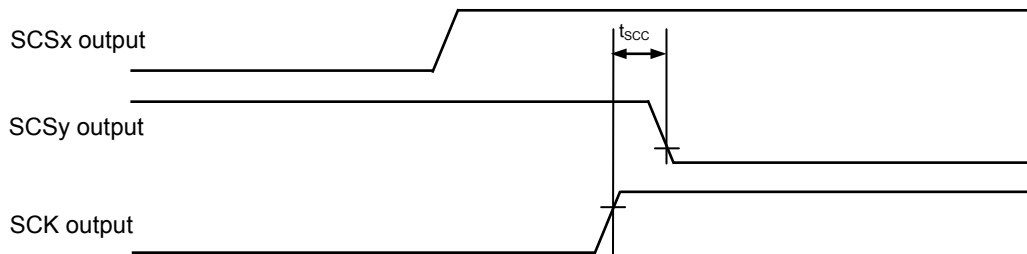
Notes:

AC characteristic in CLK synchronized mode.

C_L is the load capacitance applied to pins during testing.

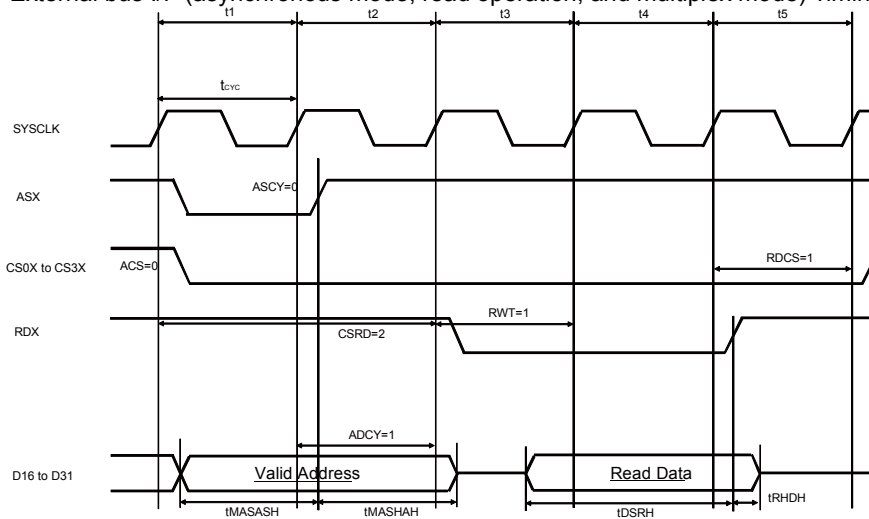
The maximum baud rate is limited by internal operation clock used and other parameters. Please use ch.3 and ch.4 with maximum baud rate 400kbps or less.

See Hardware Manual for details.

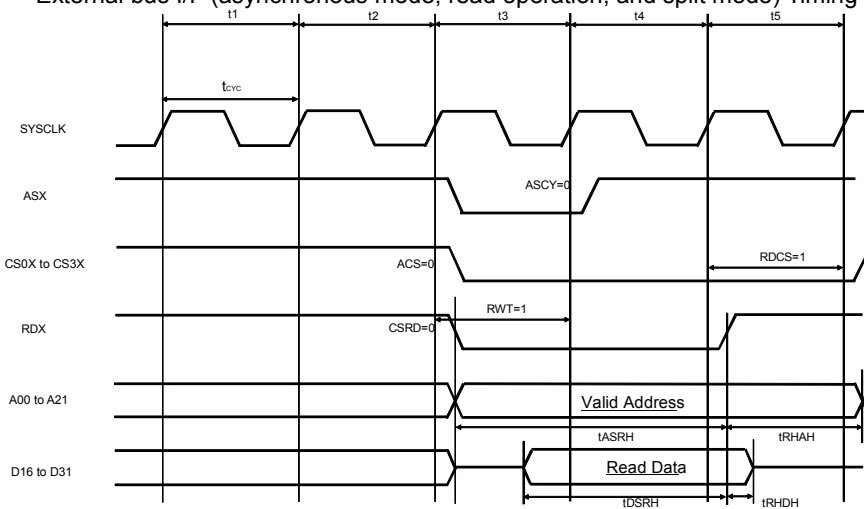


When Serial chip select is used , Serial clock output mark level "L",
Serial chip select Inactive level "H"
Internal shift clock mode , Example of switching clock by round operation (x,y=0,1,2,3)

External bus I/F (asynchronous mode, read operation, and multiplex mode) Timing



External bus I/F (asynchronous mode, read operation, and split mode) Timing



Part number	Sub clock	CSV Initial value	LVD Initial value	Package* ²
MB91F526BWBPMC1	Yes	ON	ON	LQD • 64 pin, Plastic
MB91F526BYBPMC1			OFF	
MB91F526BJBPMC1		OFF	ON	
MB91F526BLBPMC1			OFF	
MB91F525BWBPMC1		ON	ON	
MB91F525BYBPMC1			OFF	
MB91F525BJBPMC1		OFF	ON	
MB91F525BLBPMC1			OFF	
MB91F524BWBPMC1		ON	ON	
MB91F524BYBPMC1			OFF	
MB91F524BJBPMC1		OFF	ON	
MB91F524BLBPMC1			OFF	
MB91F523BWBPMC1		ON	ON	
MB91F523BYBPMC1			OFF	
MB91F523BJBPMC1		OFF	ON	
MB91F523BLBPMC1			OFF	
MB91F522BWBPMC1		ON	ON	
MB91F522BYBPMC1			OFF	
MB91F522BJBPMC1		OFF	ON	
MB91F522BLBPMC1			OFF	
MB91F526BSBPMC1	None	ON	ON	
MB91F526BUBPMC1			OFF	
MB91F526BHBPMC1		OFF	ON	
MB91F526BKBPMC1			OFF	
MB91F525BSBPMC1		ON	ON	
MB91F525BUBPMC1			OFF	
MB91F525BHBPMC1		OFF	ON	
MB91F525BKBPMC1			OFF	
MB91F524BSBPMC1		ON	ON	
MB91F524BUBPMC1			OFF	
MB91F524BHBPMC1		OFF	ON	
MB91F524BKBPMC1			OFF	
MB91F523BSBPMC1		ON	ON	
MB91F523BUBPMC1			OFF	
MB91F523BHBPMC1		OFF	ON	
MB91F523BKBPMC1			OFF	
MB91F522BSBPMC1		ON	ON	
MB91F522BUBPMC1			OFF	
MB91F522BHBPMC1		OFF	ON	
MB91F522BKBPMC1			OFF	

*¹: It is only supported for customers who have already adopted it now. We do not recommend adopting new products.

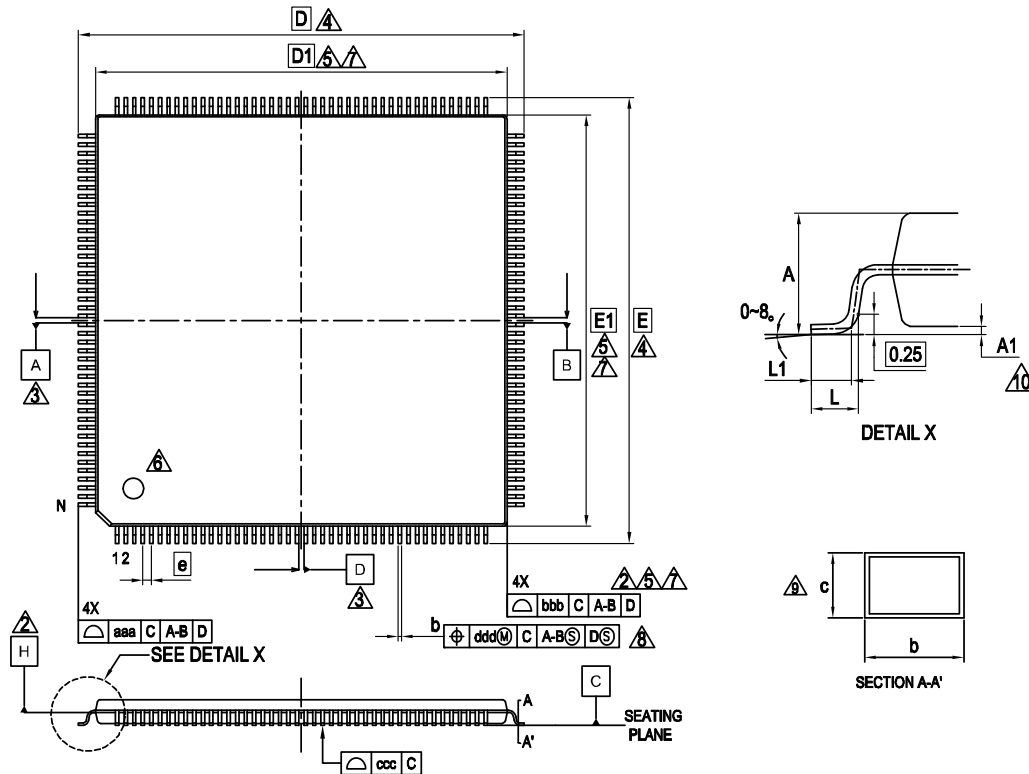
*²: For details of the package, see "■ PACKAGE DIMENSIONS".

Part number	Sub clock	CSV Initial value	LVD Initial value	Package*
MB91F526KWDPMC1	Yes	ON	ON	LQN • 144 pin, (Lead pitch 0.4mm) Plastic
MB91F526KJDPMC1		OFF	ON	
MB91F525KWDPMC1		ON	ON	
MB91F525KJDPMC1		OFF	ON	
MB91F524KWDPMC1		ON	ON	
MB91F524KJDPMC1		OFF	ON	
MB91F523KWDPMC1		ON	ON	
MB91F523KJDPMC1		OFF	ON	
MB91F522KWDPMC1		ON	ON	
MB91F522KJDPMC1		OFF	ON	
MB91F526KSDPMC1	None	ON	ON	
MB91F526KHDPMC1		OFF	ON	
MB91F525KSDPMC1		ON	ON	
MB91F525KHDPMC1		OFF	ON	
MB91F524KSDPMC1		ON	ON	
MB91F524KHDPMC1		OFF	ON	
MB91F523KSDPMC1		ON	ON	
MB91F523KHDPMC1		OFF	ON	
MB91F522KSDPMC1		ON	ON	
MB91F522KHDPMC1		OFF	ON	
MB91F526JWDPMC	Yes	ON	ON	LQM • 120 pin, Plastic
MB91F526JJDPMC		OFF	ON	
MB91F525JWDPMC		ON	ON	
MB91F525JJDPMC		OFF	ON	
MB91F524JWDPMC		ON	ON	
MB91F524JJDPMC		OFF	ON	
MB91F523JWDPMC		ON	ON	
MB91F523JJDPMC		OFF	ON	
MB91F522JWDPMC		ON	ON	
MB91F522JJDPMC		OFF	ON	
MB91F526JSDPMC	None	ON	ON	
MB91F526JHDPMC		OFF	ON	
MB91F525JSDPMC		ON	ON	
MB91F525JHDPMC		OFF	ON	
MB91F524JSDPMC		ON	ON	
MB91F524JHDPMC		OFF	ON	
MB91F523JSDPMC		ON	ON	
MB91F523JHDPMC		OFF	ON	
MB91F522JSDPMC		ON	ON	
MB91F522JHDPMC		OFF	ON	

Part number	Sub clock	CSV Initial value	LVD Initial value	Package*
MB91F526BWEPMC1	Yes	ON	ON	LQE • 64 pin, Plastic
MB91F526BJEPMC1		OFF	ON	
MB91F525BWEPMC1		ON	ON	
MB91F525BJEPMC1		OFF	ON	
MB91F524BWEPMC1		ON	ON	
MB91F524BJEPMC1		OFF	ON	
MB91F523BWEPMC1		ON	ON	
MB91F523BJEPMC1		OFF	ON	
MB91F522BWEPMC1		ON	ON	
MB91F522BJEPMC1		OFF	ON	
MB91F526BSEPMC1	None	ON	ON	
MB91F526BHEPMC1		OFF	ON	
MB91F525BSEPMC1		ON	ON	
MB91F525BHEPMC1		OFF	ON	
MB91F524BSEPMC1		ON	ON	
MB91F524BHEPMC1		OFF	ON	
MB91F523BSEPMC1		ON	ON	
MB91F523BHEPMC1		OFF	ON	
MB91F522BSEPMC1		ON	ON	
MB91F522BHEPMC1		OFF	ON	

*: For details of the package, see "■ PACKAGE DIMENSIONS".

LQP176 , 176 Lead Plastic Low Profile Quad Flat Package



PACKAGE	LQP176		
SYMBOL	MIN.	NOM.	MAX.
A	—	—	1.70
A1	0.00	—	0.20
b	0.17	0.22	0.27
c	0.09	—	0.20
D	26.00 BSC.		
D1	24.00 BSC.		
e	0.50 BSC		
E	26.00 BSC.		
E1	24.00 BSC.		
L	0.45	0.60	0.75
L1	0.30	0.50	0.70
aaa	—	—	0.20
bbb	—	—	0.10
ccc	—	—	0.08
ddd	—	—	0.08
N	176		

NOTES

1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (mm)
2. DATUM PLANE H IS LOCATED AT THE BOTTOM OF THE MOLD PARTING LINE COINCIDENT WITH WHERE THE LEAD EXITS THE BODY.
3. DATUMS A-B AND D TO BE DETERMINED AT DATUM PLANE H.
4. TO BE DETERMINED AT SEATING PLANE C.
5. DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD PROTRUSION. ALLOWABLE PROTRUSION IS 0.25mm PRE SIDE. DIMENSIONS D1 AND E1 INCLUDE MOLD MISMATCH AND ARE DETERMINED AT DATUM PLANE H.
6. DETAILS OF PIN 1 IDENTIFIER ARE OPTIONAL BUT MUST BE LOCATED WITHIN THE ZONE INDICATED.
7. REGARDLESS OF THE RELATIVE SIZE OF THE UPPER AND LOWER BODY SECTIONS. DIMENSIONS D1 AND E1 ARE DETERMINED AT THE LARGEST FEATURE OF THE BODY EXCLUSIVE OF MOLD FLASH AND GATE BURRS. BUT INCLUDING ANY MISMATCH BETWEEN THE UPPER AND LOWER SECTIONS OF THE MOLDER BODY.
8. DIMENSION b DOES NOT INCLUDE DAMBAR PROTRUSION. THE DAMBAR PROTRUSION (S) SHALL NOT CAUSE THE LEAD WIDTH TO EXCEED b MAXIMUM BY MORE THAN 0.08mm. DAMBAR CANNOT BE LOCATED ON THE LOWER RADIUS OR THE LEAD FOOT.
9. THESE DIMENSIONS APPLY TO THE FLAT SECTION OF THE LEAD BETWEEN 0.10mm AND 0.25mm FROM THE LEAD TIP.
10. A1 IS DEFINED AS THE DISTANCE FROM THE SEATING PLANE TO THE LOWEST POINT OF THE PACKAGE BODY.

Page	Section	Change Results
184	■ELECTRICAL CHARACTERISTICS 5.A/D Converter (1) 12-bit A/D Converter Electrical Characteristics	Added the following description. Parameter : Power supply current $I_{A AVCC}^{*3}$ *3 : The power supply current described only current value on A/D converter. The total AVcc current value must be calculated the power supply current for A/D converter and D/A converter.
188	■ELECTRICAL CHARACTERISTICS 7.D/A Converter	Added the following description. Parameter : Power supply current *1 *1 : The power supply current described only current value on D/A converter. The total Avcc current value must be calculated the power supply current for D/A converter and A/D converter.
187	■ELECTRICAL CHARACTERISTICS 6.Flash memory	Parameter: Erase cycle *2 /Data retain time Deleted the following description. Remarks : "Temperature at writing/erasing $T_j < +105^{\circ}\text{C}$ "
188	■ELECTRICAL CHARACTERISTICS 7.D/A Converter	Corrected the following description. Parameter : Power supply current Symbol IA Pin name AV _{CC} Symbol IAH Pin name AV _{CC} ↓ Symbol IA Pin name AVCC Symbol IAH Pin name AVCC
190	■EXAMPLE CHARACTERISTICS	Corrected the following description. Watch mode
192	■ORDERING INFORMATION	Corrected the following description. ■ORDERING INFORMATION ↓ ■ORDERING INFORMATION MB91F52xxxB *1 Package ↓ Package *2
198	■ORDERING INFORMATION	Added the following description. *1 : It is only supported for customers who have already adopted it now. We do not recommend adopting new products.
198	■ORDERING INFORMATION	Corrected the following description. For details of the package, see "■ PACKAGE DIMENSIONS". ↓ *2 : For details of the package, see "■ PACKAGE DIMENSIONS".
199 to 205	■ORDERING INFORMATION	Added the following description. ■ORDERING INFORMATION MB91F52xxxC
-	-	Company name and layout design change

Page	Section	Change Results				
8	■Product Lineup	Corrected the following description for Product lineup comparison(100 pin). <table><tr><td>Multi-Function Serial Interface</td><td>12ch</td></tr></table> ↓ <table><tr><td>Multi-Function Serial Interface</td><td>12ch*1</td></tr></table>	Multi-Function Serial Interface	12ch	Multi-Function Serial Interface	12ch*1
Multi-Function Serial Interface	12ch					
Multi-Function Serial Interface	12ch*1					
8	■Product Lineup	Added the following sentences under Product lineup comparison(100 pin) *1: Only channel 5, channel 6, channel 7, channel 8 and channel 11 support the I ² C (standard mode).				
9	■Product Lineup	Corrected the following description for Product lineup comparison(120 pin). <table><tr><td>Multi-Function Serial Interface</td><td>12ch</td></tr></table> ↓ <table><tr><td>Multi-Function Serial Interface</td><td>12ch*1</td></tr></table>	Multi-Function Serial Interface	12ch	Multi-Function Serial Interface	12ch*1
Multi-Function Serial Interface	12ch					
Multi-Function Serial Interface	12ch*1					
9	■Product Lineup	Added the following sentences under Product lineup comparison(120 pin) *1: Only channel 3 and channel 4 support the I ² C (high-speed mode/standard mode). Only channel 5, channel 6, channel 7, channel 8 and channel 11 support the I ² C (standard mode).				
10	■Product Lineup	Corrected the following description for Product lineup comparison(144 pin). <table><tr><td>Multi-Function Serial Interface</td><td>12ch</td></tr></table> ↓ <table><tr><td>Multi-Function Serial Interface</td><td>12ch*1</td></tr></table>	Multi-Function Serial Interface	12ch	Multi-Function Serial Interface	12ch*1
Multi-Function Serial Interface	12ch					
Multi-Function Serial Interface	12ch*1					
10	■Product Lineup	Added the following sentences under Product lineup comparison(144 pin) *1: Only channel 3 and channel 4 support the I ² C (high-speed mode/standard mode). Only channel 5, channel 6, channel 7, channel 8, channel 10 and channel 11 support the I ² C (standard mode).				
11	■Product Lineup	Corrected the following description for Product lineup comparison(176 pin). <table><tr><td>Multi-Function Serial Interface</td><td>12ch</td></tr></table> ↓ <table><tr><td>Multi-Function Serial Interface</td><td>12ch*1</td></tr></table>	Multi-Function Serial Interface	12ch	Multi-Function Serial Interface	12ch*1
Multi-Function Serial Interface	12ch					
Multi-Function Serial Interface	12ch*1					
11	■Product Lineup	Added the following sentences under Product lineup comparison(176 pin) *1: Only channel 3 and channel 4 support the I ² C (high-speed mode/standard mode). Only channel 5, channel 6, channel 7, channel 8, channel 10 and channel 11 support the I ² C (standard mode).				

Page	Section	Change Results						
20	■PIN Description	(Continued) (Correct)						
		Pin no.						Pin Name
		64	80	100	120	144	176	
		-	-	4 ^{*1}	7 ^{*1}	10	12	P025
								WR1X ^{*4, *5}
								SOT4_1
								PPG25_0
								TIN2_0
		-	-	-	-	-	13	P172
								PPG38_1
		-	4 ^{*1}	5 ^{*1}	8 ^{*1}	11	14	P026
								A00 ^{*3, *4, *5}
								SCK4_1
								PPG26_0
								TIN3_0
		4 ^{*1}	5 ^{*1}	6 ^{*1}	9 ^{*1}	12	15	P027
								A01 ^{*2, *3, *4, *5}
								SCS40_1
								PPG27_0
								TOT0_0
		-	-	-	-	-	16	RTO3_1
								P173
		-	-	7 ^{*1}	10 ^{*1}	13	17	PPG39_1
								P030
								A02 ^{*4, *5}
								SCS41_1
								PPG28_0
		-	6 ^{*1}	8 ^{*1}	11 ^{*1}	14	18	TOT1_0
								P031
								A03 ^{*3, *4, *5}
								SCS42_1
								PPG29_0
		5 ^{*1}	7 ^{*1}	9 ^{*1}	12 ^{*1}	15	19	TOT2_0 ^{*3}
								P032
								A04 ^{*2, *3, *4, *5}
								SCS43_1
								PPG30_0
		6 ^{*1}	8 ^{*1}	10 ^{*1}	13 ^{*1}	16	20	TOT3_0
								RTO2_1
								P033
A05 ^{*2, *3, *4, *5}								
PPG31_0								
ICU3_3								
TIN4_0								
RTO1_1								
						SCK3_2		

Page	Section	Change Results																																																																																																																									
23, 24	■PIN Description	A List of "Pin Description" modified.																																																																																																																									
		(Error)																																																																																																																									
		<table><tr><th colspan="6">Pin no.</th><th rowspan="2">Pin Name</th></tr><tr><th>64</th><th>80</th><th>100</th><th>120</th><th>144</th><th>176</th></tr><tr><td rowspan="6">15</td><td rowspan="6">18</td><td rowspan="6">23</td><td rowspan="6">27</td><td rowspan="6">30</td><td rowspan="6">37</td><td>P047</td></tr><tr><td>A17</td></tr><tr><td>AN45</td></tr><tr><td>TRG8_0</td></tr><tr><td>TIN3_2</td></tr><tr><td>SOT0_1</td></tr><tr><td rowspan="2">-</td><td rowspan="2">-</td><td rowspan="2">-</td><td rowspan="2">-</td><td rowspan="2">-</td><td rowspan="2">38</td><td>P177</td></tr><tr><td>TRG11_0</td></tr><tr><td rowspan="4">-</td><td rowspan="4">-</td><td rowspan="4">-</td><td rowspan="4">28</td><td rowspan="4">31</td><td rowspan="4">39</td><td>P050</td></tr><tr><td>A18</td></tr><tr><td>TRG5_1</td></tr><tr><td>PPG33_0</td></tr><tr><td rowspan="3">-</td><td rowspan="3">-</td><td rowspan="3">-</td><td rowspan="3">-</td><td rowspan="3">32</td><td rowspan="3">40</td><td>P051</td></tr><tr><td>A19</td></tr><tr><td>TRG9_0</td></tr><tr><td rowspan="4">-</td><td rowspan="4">-</td><td rowspan="4">-</td><td rowspan="4">-</td><td rowspan="4">33</td><td rowspan="4">41</td><td>P052</td></tr><tr><td>A20</td></tr><tr><td>PPG34_0</td></tr><tr><td>INT14_0</td></tr><tr><td rowspan="6">16</td><td rowspan="6">19</td><td rowspan="6">24</td><td rowspan="6">29</td><td rowspan="6">34</td><td rowspan="6">42</td><td>P053</td></tr><tr><td>A21</td></tr><tr><td>AN44</td></tr><tr><td>PPG35_0</td></tr><tr><td>INT14_1</td></tr><tr><td>SCK0_1</td></tr><tr><td rowspan="3">-</td><td rowspan="3">-</td><td rowspan="3">-</td><td rowspan="3">-</td><td rowspan="3">35</td><td rowspan="3">43</td><td>P054</td></tr><tr><td>SYCLK</td></tr><tr><td>PPG36_0</td></tr><tr><td rowspan="6">17</td><td rowspan="6">22</td><td rowspan="6">27</td><td rowspan="6">32</td><td rowspan="6">38</td><td rowspan="6">46</td><td>P055</td></tr><tr><td>CS2X</td></tr><tr><td>SIN10_0</td></tr><tr><td>AN43</td></tr><tr><td>PPG37_0</td></tr><tr><td>TIN4_1</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td rowspan="6">-</td><td rowspan="6">-</td><td rowspan="6">-</td><td rowspan="6">33</td><td rowspan="6">39</td><td rowspan="6">49</td><td>P056</td></tr><tr><td>CS3X</td></tr><tr><td>ICU9_0</td></tr><tr><td>PPG0_1</td></tr><tr><td>ICU0_1</td></tr><tr><td>TIN5_1</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td>DTTI_2</td></tr></table>	Pin no.						Pin Name	64	80	100	120	144	176	15	18	23	27	30	37	P047	A17	AN45	TRG8_0	TIN3_2	SOT0_1	-	-	-	-	-	38	P177	TRG11_0	-	-	-	28	31	39	P050	A18	TRG5_1	PPG33_0	-	-	-	-	32	40	P051	A19	TRG9_0	-	-	-	-	33	41	P052	A20	PPG34_0	INT14_0	16	19	24	29	34	42	P053	A21	AN44	PPG35_0	INT14_1	SCK0_1	-	-	-	-	35	43	P054	SYCLK	PPG36_0	17	22	27	32	38	46	P055	CS2X	SIN10_0	AN43	PPG37_0	TIN4_1								-	-	-	33	39	49	P056	CS3X	ICU9_0	PPG0_1	ICU0_1	TIN5_1							DTTI_2
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Page	Section	Change Results
36	■PIN Description	The following sentences modified under the Table of Pin description. (Error) *1: For the I/O circuit types, see "■I/O CIRCUIT TYPE". *2: For switching, see "I/O Port" in HARDWARE MANUAL. (Correct) *1: There is a restriction of pin functions. See "Pin Name" of this table. *2: not supported in 64pin *3: not supported in 80pin *4: not supported in 100pin *5: not supported in 120pin *6: not supported in 144pin *7: not supported in 176pin *8: For the I/O circuit types, see "■I/O CIRCUIT TYPE". *9: For switching, see "I/O Port" in HARDWARE MANUAL.
39	■I/O Circuit Type	Remarks for Type I in "I/O Circuit Types" modified as follows: (Error) - 3V pad power supply (5V tolerant), General-purpose I/O port - Output 4mA - CMOS hysteresis input (Correct) - General-purpose I/O port (5V tolerant) - Output 4mA - CMOS hysteresis input
40	■I/O Circuit Type	Remarks for Type J in "I/O Circuit Types" modified as follows: (Error) - 3V pad power supply (5V tolerant), Analog input, General-purpose I/O port - Output 4mA - CMOS hysteresis input (Correct) - Analog input, General-purpose I/O port (5V tolerant) - Output 4mA - CMOS hysteresis input