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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 "<u>Embedded -</u> <u>Microcontrollers</u>"

#### Details

Product Status	Obsolete
Core Processor	FR81S
Core Size	32-Bit Single-Core
Speed	80MHz
Connectivity	CANbus, CSIO, I <sup>2</sup> C, LINbus, SPI, UART/USART
Peripherals	DMA, LVD, POR, PWM, WDT
Number of I/O	76
Program Memory Size	1.0625MB (1.0625M x 8)
Program Memory Type	FLASH
EEPROM Size	64K x 8
RAM Size	136К х 8
Voltage - Supply (Vcc/Vdd)	2.7V ~ 5.5V
Data Converters	A/D 37x12b; D/A 2x8b
Oscillator Type	External
Operating Temperature	-40°C ~ 105°C (TA)
Mounting Type	Surface Mount
Package / Case	100-LQFP
Supplier Device Package	100-LQFP (14x14)
Purchase URL	https://www.e-xfl.com/product-detail/infineon-technologies/mb91f526fwbpmc-gse1

Email: info@E-XFL.COM

Address: Room A, 16/F, Full Win Commercial Centre, 573 Nathan Road, Mongkok, Hong Kong



#### Product lineup comparison 80 pins

	MB91F522D	MB91F523D	MB91F524D	MB91F525D	MB91F526D			
System Clock		On chip P	LL Clock multip	le method				
Minimum instruction execution time		12.5ns (80MHz)						
Flash Capacity (Program)	(256+64)KB	(384+64)KB	(512+64)KB	(768+64)KB	(1024+64)KB			
Flash Capacity (Data)			64KB					
RAM Capacity	(48+8	8)KB	(64+8)KB	(96+8)KB	(128+8)KB			
External BUS I/F	None							
(22address/16data/4cs)			None					
DMA Transfer			16ch					
16-bit Base Timer			1ch					
Free-run Timer		16	oit×3ch, 32bit×2	2ch				
Input capture		16	oit×4ch, 32bit×5	Sch				
Output Compare		16	oit×6ch, 32bit×4	lch				
16-bit Reload Timer			7ch					
PPG			16bit×27ch					
Up/down Counter			2ch					
Clock Supervisor			Yes					
External Interrupt			8ch×2units					
A/D converter		12bit×16ch	(1unit), 12bit×1	l6ch (1unit)				
D/A converter (8bit)			1ch					
Multi-Function Serial Interface			$9ch^{*1}$					
CAN		64ms	g×2ch/128msg	×1ch				
Hardware Watchdog Timer			Yes					
CRC Formation			Yes					
Low-voltage detection reset			Yes					
Flash Security			Yes					
ECC Flash/WorkFlash			Yes					
ECC RAM			Yes					
Memory Protection Function (MPU)			Yes					
Floating point arithmetic (FPU)			Yes					
Real Time Clock (RTC)			Yes					
General-purpose port (#GPIOs)			56 ports					
SSCG			Yes					
Sub clock			Yes					
CR oscillator			Yes					
NMI request function			Yes					
OCD (On Chip Debug)			Yes					
TPU (Timing Protection Unit)			Yes					
Key code register			Yes					
Waveform generator			6ch					
Operation guaranteed temperature		_	40°C to +125°C					
(T <sub>A</sub> )		-		,				
Power supply			2.7V to 5.5V *2					
Package			LQH080					

\*1: Only channel 5, channel 6 and channel 11 support the I<sup>2</sup>C (standard mode).

\*2: The initial detection voltage of the external low voltage detection is 2.8V±8% (2.576V to 3.024V). This LVD setting and internal LVD cannot be used to reliably generate a reset before voltage dips below minimum guaranteed operation voltage, as these detection levels are below the minimum guaranteed MCU operation voltage. Below the minimum guaranteed MCU operation voltage, MCU operations are not guaranteed with the exception of LVD.



Туре	Circuit	Remarks
G	Pull-up control Digital output Digital output TTT CMOS-hys input Standby control Analog input	<ul> <li>Analog input, General-purpose I/O port</li> <li>Output 4mA</li> <li>Pull-up resistor control 50kΩ</li> <li>CMOS hysteresis input</li> </ul>
Н	Pull-up control	<ul> <li>Analog input, General-purpose I/O port</li> <li>Output 12mA</li> <li>Pull-up resistor control 50kΩ</li> <li>Automotive input</li> </ul>
I	Digital output	• General-purpose I/O port (5V tolerant) • Output 4mA • CMOS hysteresis input







Code: DS00-00004-2Ea

#### Observance of Safety Regulations and Standards

Most countries in the world have established standards and regulations regarding safety, protection from electromagnetic interference, etc. Customers are requested to observe applicable regulations and standards in the design of products.

#### Fail-Safe Design

Any semiconductor devices have inherently a certain rate of failure. You must protect against injury, damage or loss from such failures by incorporating safety design measures into your facility and equipment such as redundancy, fire protection, and prevention of over-current levels and other abnormal operating conditions.

#### Precautions Related to Usage of Devices

Cypress semiconductor devices are intended for use in standard applications (computers, office automation and other office equipment, industrial, communications, and measurement equipment, personal or household devices, etc.).

**CAUTION:** Customers considering the use of our products in special applications where failure or abnormal operation may directly affect human lives or cause physical injury or property damage, or where extremely high levels of reliability are demanded (such as aerospace systems, atomic energy controls, sea floor repeaters, vehicle operating controls, medical devices for life support, etc.) are requested to consult with sales representatives before such use. The company will not be responsible for damages arising from such use without prior approval.

#### 2. Precautions for Package Mounting

Package mounting may be either lead insertion type or surface mount type. In either case, for heat resistance during soldering, you should only mount under Cypress's recommended conditions. For detailed information about mount conditions, contact your sales representative.

#### Lead Insertion Type

Mounting of lead insertion type packages onto printed circuit boards may be done by two methods: direct soldering on the board, or mounting by using a socket.

Direct mounting onto boards normally involves processes for inserting leads into through-holes on the board and using the flow soldering (wave soldering) method of applying liquid solder. In this case, the soldering process usually causes leads to be subjected to thermal stress in excess of the absolute ratings for storage temperature. Mounting processes should conform to Cypress recommended mounting conditions.

If socket mounting is used, differences in surface treatment of the socket contacts and IC lead surfaces can lead to contact deterioration after long periods. For this reason it is recommended that the surface treatment of socket contacts and IC leads be verified before mounting.

#### ■ Surface Mount Type

Surface mount packaging has longer and thinner leads than lead-insertion packaging, and therefore leads are more easily deformed or bent. The use of packages with higher pin counts and narrower pin pitch results in increased susceptibility to open connections caused by deformed pins, or shorting due to solder bridges.

You must use appropriate mounting techniques. Cypress recommends the solder reflow method, and has established a ranking of mounting conditions for each product. Users are advised to mount packages in accordance with Cypress ranking of recommended conditions.

#### ■ Lead-Free Packaging

**CAUTION:** When ball grid array (BGA) packages with Sn-Ag-Cu balls are mounted using Sn-Pb eutectic soldering, junction strength may be reduced under some conditions of use.



Address	Address offset value / Register name							
Address	+0	+1	+2	+3	DIOCK			
000F70 <sub>H</sub>	RCRH0 [W] H,W XXXXXXXX	RCRL0 [W] B,H,W XXXXXXXX	UDCRH0 [R] H,W 00000000	UDCRL0 [R] B,H,W 00000000	Up/Down			
000F74 <sub>H</sub>	CCR0 [F 00000000	R/W] B,H -0001000	Ι	CSR0 [R/W] B 00000000	Counter 0			
000F78 <sub>H</sub> to 000F7C <sub>H</sub>	—	_	—	—	Reserved			
000F80 <sub>н</sub>	RCRH1 [W] H,W XXXXXXXX	RCRL1 [W] B,H,W XXXXXXXX	UDCRH1 [R] H,W 00000000	UDCRL1 [R] B,H,W 00000000	Up/Down			
000F84 <sub>H</sub>	CCR1 [F 00000000	R/W] B,H -0001000	Ι	CSR1 [R/W] B 00000000	Counter 1			
000F88 <sub>H</sub>	_	_	MSCH45 [R] B,H,W 00000000	MSCL45 [R/W] B,H,W 00	Input Capture 4,5 32-bit ICU Cycle and pulse width measurement control 45			
000F8C <sub>H</sub>			MSCH67 [R] B,H,W 00000000	MSCL67 [R/W] B,H,W 00	Input Capture 6,7 32-bit ICU Cycle and pulse width measurement control 67			
000F90 <sub>H</sub>		OCCP10 00000000 00000000	[R/W] W 00000000 00000000		Output Compare			
000F94 <sub>H</sub>		OCCP11 00000000 00000000	[R/W] W 00000000 00000000		32-bit OCU			
000F98 <sub>н</sub>	_	_	OCSH1011 [R/W] B,H,W 000	OCSL1011 [R/W] B,H,W 000000	Output Compare 10,11 32-bit OCU			
000F9Cн	_	_	—	OCLS1011 [R/W] B,H,W 0000	OCU1011 Output level control register			
000FA0 <sub>H</sub>		CPCLR5 11111111 11111111	[R/W] W 11111111 11111111					
000FA4 <sub>H</sub>		TCDT5 00000000 00000000	[R/W] W 00000000 00000000		Free-run Timer 5 32-bit FRT			
000FA8 <sub>н</sub>	TCCSH5 [R/W]B,H,W 000	TCCSL5 [R/W]B,H,W -1-00000	_	_				
000FAC <sub>н</sub> to 000FCC <sub>н</sub>	_	_	_	_	Reserved			





A d duo o o	Address offset value / Register name							
Address	+0	+1	+2	+3	ВІОСК			
001840 <sub>Н</sub>	SCR6/(IBCR6) [R/W] B,H,W 000000	SMR6[R/W] B,H,W 000-00-0	SSR6[R/W] B,H,W 0-000011	ESCR6/(IBSR6)[R/W ] B,H,W 00000000	Multi-UART6			
001844 <sub>н</sub>	— /(RDR16/(TDR 	816))[R/W] B,H,W <sup>*3</sup>	RDR06/(TDR0 0 00	96)[R/W] B,H,W 9000000 <sup>*1</sup>				
001848 <sub>н</sub>	SACSR6[R 0000 (	2/W] B,H,W 00000000	STMR6[ 00000000	R] B,H,W 00000000	Multi-UART6			
00184C <sub>Н</sub>	STMCR6[F 00000000	8/W] B,H,W 00000000	— /(SCSCR6/SF	UR6)[R/W] B,H,W <sup>*3 *4</sup>	*1: Byte access is possible only for			
001850 <sub>Н</sub>	— /(SCSTR36)/ (LAMSR6) [R/W] B,H,W <sup>*3</sup>	— /(SCSTR26)/ (LAMCR6) [R/W] B,H,W <sup>*3</sup>	— /(SCSTR16)/ (SFLR16) [R/W] B,H,W *3	— /(SCSTR06)/ (SFLR06) [R/W] B,H,W *3	*2: Reserved			
001854 <sub>Н</sub>	_	— /(SCSFR26) [R/W] B,H,W *3	— /(SCSFR16) [R/W] B,H,W *3	— /(SCSFR06) [R/W] B,H,W *3	mode is not set immediately after reset.			
001858 <sub>Н</sub>	—/(TBYTE36)/ (LAMESR6) [R/W] B,H,W <sup>*3</sup>	—/(TBYTE26)/ (LAMERT6) [R/W] B,H,W <sup>*3</sup>	—/(TBYTE16)/ (LAMIER6) [R/W] B,H,W <sup>*3</sup>	TBYTE06/(LAMRID6) / (LAMTID6) [R/W] B,H,W 00000000	*3: Reserved because CSIO mode is not set immediately after reset.			
00185Cн	BGR6[R/ 00000000	W] H, W 00000000	— /(ISMK6)[R/W] B,H,W <sup>*2</sup>	— /(ISBA6)[R/W] B,H,W <sup>*2</sup>	*4: Reserved because LIN2.1			
001860 <sub>н</sub>	FCR16[R/W] B,H,W 00100	FCR06[R/W] B,H,W -0000000	FBYTE6[F 00000000	8/W] B,H,W 00000000	mode is not set immediately after reset.			
001864 <sub>H</sub>	FTICR6[R 00000000	W] B,H,W 00000000	_	_				
001868 <sub>н</sub>	SCR7/(IBCR7) [R/W] B,H,W 000000	SMR7[R/W] B,H,W 000-00-0	SSR7[R/W] B,H,W 0-000011	ESCR7/(IBSR7)[R/W ] B,H,W 00000000	Multi-UART7 *1: Byte access is possible only for			
00186C <sub>Н</sub>	— /(RDR17/(TDR 	817))[R/W] B,H,W <sup>*3</sup>	RDR07/(TDR0 0 00	access to lower 8 bits.				
001870 <sub>н</sub>	SACSR7[R 0000 (	2/W] B,H,W 00000000	STMR7[ 00000000	R] B,H,W 00000000	*2: Reserved because I <sup>2</sup> C			
001874 <sub>Н</sub>	STMCR7[F 00000000	8/W] B,H,W 00000000	— /(SCSCR7/SF	UR7)[R/W] B,H,W *3 *4	mode is not set immediately after reset.			



	Interr	upt number	Interrunt		Default	
Interrupt factor	Decimal	Hexadecimal	level	Offset	address for TBR	RN
Multi-function serial interface	27	10		200	00055500	11
ch.3 (transmission completed)	21	ID	ICKII	390H	000FFF90H	11
Multi-function serial interface						
ch.4 (reception completed)	00	10	10040	200	00055500	4.0+1
Multi-function serial interface	28	10	ICR12	38CH		12"
ch.4 (status)						
Multi-function serial interface	20	10	10012	200	00055500	10
ch.4 (transmission completed)	29	ID	ICRIS	300H	000FFF00H	15
Multi-function serial interface						
ch.5 (reception completed)	30	1⊏		394	00055584	1.1* <sup>1</sup>
Multi-function serial interface	50	1	10114	304H	000FFF04H	14
ch.5 (status)						
Multi-function serial interface	21	10		380.	00055580.	15
ch.5 (transmission completed)	51		ICKIS	300H	000FFF80H	15
Multi-function serial interface						
ch.6 (reception completed)	32	20		370	00055570	16* <sup>1</sup>
Multi-function serial interface	52	20		57 CH	0001117CH	10
ch.6 (status)						
Multi-function serial interface	33	21	ICR17	378.	000FFF78	17
ch.6 (transmission completed)	55	21		570H	00011170H	17
CAN0	34	22	ICR18	374 <sub>H</sub>	$000FFF74_{H}$	-
CAN1						
RAM diagnosis end						
RAM initialization completion						
Error generation during RAM diagnosis	35	23	ICR19	370 <sub>H</sub>	$000FFF70_{H}$	-
Backup RAM diagnosis end						
Backup RAM initialization completion						
Error generation during Backup RAM diagnosis						
CAN2						
Up/down counter 0	36	24	ICR20	36C <sub>H</sub>	000FFF6C <sub>H</sub>	-
Up/down counter 1						
Real time clock	37	25	ICR21	368 <sub>H</sub>	000FFF68 <sub>H</sub>	-
Multi-function serial interface						
ch.7 (reception completed)	20	26	10022	264	00055564	<b>22</b> * <sup>1</sup>
Multi-function serial interface	50	20	101722	304H	000FFF04H	22
ch.7 (status)						
16-bit Free-run timer 0 (0 detection) /						
(compare clear)	30	27	10023	360.	00055560	23
Multi-function serial interface	55	21	101/20	300H	00011100H	25
ch.7 (transmission completed)						
PPG 0/1/10/11/20/21/30/31						_
16-bit Free-run timer 1 (0 detection) /	40	28	ICR24	35Cн	000FFF5C <sub>H</sub>	24* <sup>3</sup>
(compare clear)						
PPG 2/3/12/13/22/23/32/33/43						^
16-bit Free-run timer 2 (0 detection) /	41	29	ICR25	358 <sub>H</sub>	000FFF58 <sub>H</sub>	25* <sup>3</sup>
(compare clear)						-
PPG 4/5/14/15/24/25/35/44	42	2A	ICR26	354 <sub>Н</sub>	000FFF54 <sub>H</sub>	26* <sup>3</sup>
PPG 6/7/16/17/26/27/37	43	2B	ICR27	350 <sub>H</sub>	000FFF50 <sub>H</sub>	27* <sup>3</sup>
PPG 8/9/18/19/28/29	44	2C	ICR28	34C <sub>H</sub>	000FFF4C <sub>H</sub>	28* <sup>3</sup>



	Interrupt number				Default	
Interrupt factor	Decimal	Hexa decim al	Interrupt level	Offset	address for TBR	RN
Multi-function serial interface						
ch.8 (reception completed)						
Multi-function serial interface	45	2D	ICR29	348 <sub>H</sub>	000FFF48 <sub>H</sub>	29* <sup>1</sup>
ch.8 (status)						
16-bit ICU 0 (fetching) / 16-bit ICU 1 (fetching)						
Main timer						
Sub timer						
PLL timer		05	10000		00055544	
Multi-function serial interface	46	2E	ICR30	344 <sub>H</sub>	000FFF44 <sub>H</sub>	30
ch.8 (transmission completed)						
16-bit ICU 2 (fetching) /16-bit ICU 3 (fetching)						
Clock calibration unit (sub oscillation)						
Multi-function serial interface						
ch.9 (reception completed)	47	2F	ICR31	340 <sub>Н</sub>	000FFF40 <sub>H</sub>	31* <sup>1, *4</sup>
Multi-function serial interface						
ch.9 (status)						
A/D converter						
0/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/16	48	30	ICR32	33Cн	000FFF3C <sub>H</sub>	32
17/18/19/20/21/22/23/24/25/26/27/28/29/30/31						
Clock calibration unit ( CR oscillation)						
Multi-function serial interface	40	24		000	00055500	22
ch.9 (transmission completed)	49	51	ICR33	SSOH	000FFF38H	33
16-bit OCU 0 (match) / 16-bit OCU 1 (match)						
32-bit Free-run timer 4	50		10004	004	00055504	0.4+5
16-bit OCU 2 (match) / 16-bit OCU 3 (match)	50	32	ICR34	334 <sub>H</sub>	000FFF34 <sub>H</sub>	34**
32-bit Free-run timer 3/5	= 4		10005	000	00055500	05+5
16-bit OCU 4 (match) / 16-bit OCU 5 (match)	51	33	ICR35	330 <sub>H</sub>	000FFF30 <sub>H</sub>	35**
32-bit ICU 6 (fetching/measurement)						
Multi-function serial interface						
ch.10 (reception completed)	52	34	ICR36	32Cн	000FFF2C <sub>H</sub>	36* <sup>1</sup>
Multi-function serial interface						
ch.10 (status)						
32-bit ICU7 (fetching/measurement)						
Multi-function serial interface	53	35	ICR37	328 <sub>H</sub>	000FFF28 <sub>H</sub>	37
ch.10 (transmission completed)						
32-bit ICU8 (fetching/measurement)						
Multi-function serial interface						
ch.11 (reception completed)	54	36	ICR38	324 <sub>H</sub>	000FFF24 <sub>H</sub>	38* <sup>1</sup>
Multi-function serial interface						
ch.11 (status)						
32-bit ICU9 (fetching/measurement)						
WG dead timer underflow 0 / 1/ 2	FF	27		220	00055500	20
WG dead timer reload 0 / 1/ 2	55	31	ICK39	J∠U <sub>H</sub>	000FFF20 <sub>H</sub>	39
WG DTTI 0	]					
32-bit ICU4 (fetching/measurement)						
Multi-function serial interface	56	38	ICR40	31C <sub>H</sub>	000FFF1C <sub>н</sub>	40
ch.11 (transmission completed)						





### **AC Characteristics**

(1) Main Clock Timing

 $(T_A: -40^{\circ}C \text{ to } +125^{\circ}C, V_{CC}=AV_{CC}=5.0V \pm 10\%/V_{CC}=AV_{CC}=3.3V \pm 0.3V, V_{SS}=AV_{SS}=0.0V)$ 

Deveneter	Cumphel	Pin	Conditions		Value		11	Demerika									
Parameter	Зутвої	name	Conditions	Min	Тур	Max	Unit	Remarks									
Source oscillation clock frequency	Fc	X0, X1		-	4	16	MHz										
Source oscillation clock cycle time	t <sub>CYL</sub>	X0, X1		62.5	250	-	ns										
	F <sub>CP</sub>			2		80		CPU clock									
	$F_{CPP}$			1		40		Peripheral bus clock									
Internal operating clock frequency*1	-	-		1	-	40	MHz	External bus clock (When $V_{CC}$ =5.0V is used) <sup>*2</sup>									
	FCPT	ГСРТ			1		32		External bus clock (When V <sub>CC</sub> =3.3V is used)								
	t <sub>CP</sub>		_	12.5		500		CPU clock									
	t <sub>CPP</sub>													25	1000		Peripheral bus clock
Internal operating clock cycle time <sup>*1</sup>	t <sub>СРТ</sub>	tсрт		-	-		25	-	1000	ns	External bus clock (When V <sub>CC</sub> =5.0V is used)						
					31.25		1000		External bus clock (When V <sub>CC</sub> =3.3V is used)								
CAN PLL jitter (during lock)	t <sub>PJ</sub>	-		-10	-	10	ns	F <sub>CP</sub> =80MHz (4MHz <u></u> Multiplied by 20)									
Built-in CR oscillation frequency	F <sub>CCR</sub>	-		50	100	150	kHz										

\*1: The maximum / minimum value is defined when using the main clock and PLL clock.

\*2: Please use it with external load capacity 12pF or less for VCC=3.3V±0.3V (40MHz operation).









0.010

## (3-2) [MB9152xxxE]

(TA: -40 C to + 125 C, Vss=0.0V)										
Parameter	Symbol	Pin	Conditions	Value			Unit	Pomorko		
Falameter	Symbol	name	Conditions	Min	Тур	Max	Unit	Remarks		
Level detection voltage	_	Vcc	_	2.024	2.2	2.376	V			
Level detection hysteresis width	_	V <sub>cc</sub>	_	-	100	_	mV			
Level detection time	-	-	_	_	-	30	μs	*1		
Power off time	t <sub>OFF1</sub>	Vcc	Vcc ≤ 0.2V	50	-	-	ms	*2		
	t <sub>OFF2</sub>	V <sub>CC</sub>	Vcc ≤ 1.3V	100	_	-	μs	*4		
	dV/dt	V <sub>cc</sub>	VCC: 0.2V to 2.376V (t <sub>OFF1</sub> <50ms)	-	_	50	mV/µs	*3		
Power ramp rate	dV/dt	V <sub>cc</sub>	VCC: 1.3V to 2.376V (t <sub>OFF2</sub> ≥ 100µs)	_	_	1000	mV/µs	*4		
C pin voltage at Power-on	-	С	_	_	Ι	60	mV	*5		
Maximum ramp rate guaranteed to not generate power-on reset	dV/dt	Vcc	VCC: Between 2.4V and 4.5V	_	-	50	mV/µs	*6		

\*1: The specified level detection time applies only for power ramp rate of 1000mV/µs or less.

\*2: Vcc must be held below 0.2V for a minimum period of t<sub>OFF1</sub>.

\*3: Power-on can detect by satisfying power ramp rate when t<sub>OFF1</sub> is not satisfied.

\*4: Vcc must be held below 1.3V for a minimum period of t<sub>OFF2</sub>.
 Power ramp rate must be 1000mV/μs or less from 1.3V to 2.376V.
 Power-on can detect by satisfying power ramp rate and power off time.

\*5: C-pin voltage is below 60 mV when VCC is turned on again.

\*6: This specification is specified the power supply fluctuation after power on detection. When VCC voltage is between 2.4V and 4.5V, the power supply fluctuation is below 50mV/us, the detection of power-on is suppressed. The power-on does not detect in any power fluctuation between 4.5V and 5.5V.

Note: When using MB91F52xxxE, either \*2 or \*3 or \*4 or \*5 must be satisfied. When neither \*2 nor \*3 nor \*4 nor \*5 can be satisfied, assert external reset (RSTX) at power-up and at any brownout event.





(4-1-5) Bit setting: SMR:MD2=0, SMR:MD1=1, SMR:MD0=0, When Serial chip select is used : SCSCR:CSEN=1, Serial clock output mark level "H" : SMR,SCSFR:SCINV=0, Serial chip select Inactive level "H" : SCSCR,SCSFR:CSLVL=1 (<u>T\_A:-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</u>)

Deremeter	Symbol	Din nome	Conditions	Conditions		Unit	Domorko
Parameter	Symbol	Fin name Cond	Conditions	Min	Max	Unit	Remarks
SCS↓→SCK↓ setup time	tcssi	SCK1, SCK2, SCK5 to SCK11 SCS1, SCS2, SCS50 to SCS53, SCS60 to SCS63, SCS70 to SCS73, SCS8 to SCS11		t <sub>cssu</sub> -50 ⁺1	t <sub>cssu</sub> +0 *1	ns	
		SCK3 , SCK4 SCS3 , SCS40 to SCS43		t <sub>CSSU</sub> -50 *1	t <sub>CSSU</sub> +300 *1	ns	
SCK↑→SCS↑ hold time	tcsнı	SCK1, SCK2, SCK5 to SCK11 SCS1, SCS2, SCS50 to SCS53, SCS60 to SCS63, SCS70 to SCS73, SCS8 to SCS11	-	t <sub>CSHD</sub> -10 ⁺2	t <sub>сзнр</sub> +50 *2	ns	Internal shift clock mode output pin : C <sub>L</sub> =50pF
		SCK3 , SCK4 SCS3 , SCS40 to SCS43		t <sub>CSHD</sub> -300 *2	t <sub>CSHD</sub> +50 *2	ns	
SCS deselect time	tcspi	SCS1 to SCS3, SCS40 to SCS43, SCS50 to SCS53, SCS60 to SCS63, SCS70 to SCS73, SCS8 to SCS11		t <sub>CSDS</sub> -50	t <sub>CSDS</sub> +50	ns	



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



# (4-3) LIN Interface (v2.1)( Asynchronous Serial Interface for LIN (v2.1)) timing Bit setting: SMR : MD2=0, SMR:MD1=1, SMR : MD0=1

(T<sub>A</sub>:-40°C to +125°C, V<sub>CC</sub>=AV<sub>CC</sub>=5.0V±10%/V<sub>CC</sub>=AV<sub>CC</sub>=3.3V±0.3V, V<sub>SS</sub>=AV<sub>SS</sub>=0.0V)

Devenueten	Cumhal	Pin name	Value		Value		Pomorko		
Parameter	Symbol		Conditions	Min	Max	Unit	Remarks		
Serial clock "L" pulse width	t <sub>sLSH</sub>	SCK0 to SCK11		t <sub>CPP</sub> +10 - ns	ns				
Serial clock "H"pulse width	t <sub>SHSL</sub>		SCK0 to SCK11			t <sub>CPP</sub> +10	-	ns	output pin:
SCK fall time	t⊨			-	-	5	ns	C∟=50pF	
SCK rise time	t <sub>R</sub>			-	5	ns			





Part number	Sub clock	CSV Initial value	LVD Initial value	Package* <sup>2</sup>
MB91F526DWBPMC	Yes	ON	ON	
MB91F526DYBPMC			OFF	
MB91F526DJBPMC		OFF	ON	
MB91F526DLBPMC			OFF	
MB91F525DWBPMC		ON	ON	
MB91F525DYBPMC			OFF	
MB91F525DJBPMC		OFF	ON	
MB91F525DLBPMC			OFF	
MB91F524DWBPMC		ON	ON	
MB91F524DYBPMC			OFF	
MB91F524DJBPMC		OFF	ON	
MB91F524DLBPMC			OFF	
MB91F523DWBPMC		ON	ON	
MB91F523DYBPMC			OFF	
MB91F523DJBPMC		OFF	ON	
MB91F523DLBPMC			OFF	
MB91F522DWBPMC		ON	ON	
MB91F522DYBPMC			OFF	
MB91F522DJBPMC		OFF	ON	
MB91F522DLBPMC			OFF	LQH • 80 pin,
MB91F526DSBPMC	None	ON	ON	Plastic
MB91F526DUBPMC			OFF	
MB91F526DHBPMC		OFF	ON	
MB91F526DKBPMC			OFF	
MB91F525DSBPMC		ON	ON	
MB91F525DUBPMC			OFF	
MB91F525DHBPMC		OFF	ON	
MB91F525DKBPMC			OFF	
MB91F524DSBPMC		ON	ON	
MB91F524DUBPMC			OFF	
MB91F524DHBPMC		OFF	ON	
MB91F524DKBPMC			OFF	
MB91F523DSBPMC		ON	ON	
MB91F523DUBPMC			OFF	
MB91F523DHBPMC		OFF	ON	
MB91F523DKBPMC			OFF	
MB91F522DSBPMC		ON	ON	
MB91F522DUBPMC			OFF	
MB91F522DHBPMC		OFF	ON	
MB91F522DKBPMC			OFF	



Part number	Sub clock	CSV Initial value	LVD Initial value	Package <sup>*2</sup>
MB91F526BWCPMC1	Yes	ON	ON	
MB91F526BYCPMC1			OFF	
MB91F526BJCPMC1		OFF	ON	
MB91F526BLCPMC1			OFF	
MB91F525BWCPMC1		ON	ON	
MB91F525BYCPMC1			OFF	
MB91F525BJCPMC1		OFF	ON	
MB91F525BLCPMC1			OFF	
MB91F524BWCPMC1		ON	ON	
MB91F524BYCPMC1			OFF	
MB91F524BJCPMC1		OFF	ON	
MB91F524BLCPMC1			OFF	
MB91F523BWCPMC1		ON	ON	
MB91F523BYCPMC1			OFF	
MB91F523BJCPMC1		OFF	ON	
MB91F523BLCPMC1			OFF	
MB91F522BWCPMC1		ON	ON	
MB91F522BYCPMC1			OFF	
MB91F522BJCPMC1		OFF	ON	
MB91F522BLCPMC1			OFF	LQD • 64 pin,
MB91F526BSCPMC1	None	ON	ON	Plastic
MB91F526BUCPMC1			OFF	
MB91F526BHCPMC1		OFF	ON	
MB91F526BKCPMC1			OFF	
MB91F525BSCPMC1		ON	ON	
MB91F525BUCPMC1			OFF	
MB91F525BHCPMC1		OFF	ON	
MB91F525BKCPMC1			OFF	
MB91F524BSCPMC1		ON	ON	
MB91F524BUCPMC1			OFF	
MB91F524BHCPMC1		OFF	ON	
MB91F524BKCPMC1			OFF	
MB91F523BSCPMC1		ON	ON	
MB91F523BUCPMC1			OFF	
MB91F523BHCPMC1		OFF	ON	
MB91F523BKCPMC1			OFF	
MB91F522BSCPMC1		ON	ON	
MB91F522BUCPMC1			OFF	
MB91F522BHCPMC1		OFF	ON	
MB91F522BKCPMC1			OFF	

\*<sup>1</sup>: It is only supported for customers who have already adopted it now. We do not recommend adopting new products. \*<sup>2</sup>: For details of the package, see "■ PACKAGE DIMENSIONS ".



Page	Section	Change Results								
		(Continued)								
		(Correct)								
			Pin no.				-	Pin		
		64	80	100	120	144	176	Name		
								P025		
				4 *1	7 <sup>*1</sup>			WR1X <sup>4, 5</sup>		
		-	-			10	12	SOT4_1		
								TIN2 0		
								P172		
		-	-	-	-	-	13	PPG38_1		
								P026		
				4 <sup>*1</sup> 5 <sup>*1</sup>				A00 <sup>*3, *4, *5</sup>		
		-	4 *1		8 <sup>*1</sup>	11	14	SCK4_1		
								PPG26_0		
								TIN3_0		
								P027		
					AU1					
			9 <sup>*1</sup>	12	15	PPG27_0				
	■PIN Description							TOTO 0		
								RTO3 1		
					-	-	16	P173		
20		-	-	-				PPG39_1		
				- *1	10 <sup>*1</sup>	13	17	P030		
			-					A02 4, 3		
	-	-		7				SCS41_1		
						14		P031		
								A03 <sup>*3, *4, *5</sup>		
		-	6 <sup>*1</sup>	8 *1	11 <sup>*1</sup>		18	SCS42_1		
								PPG29_0		
								TOT2_0 <sup>*3</sup>		
								P032		
								A04 <sup>2, 3, 4, 3</sup>		
		5 <sup>*1</sup>	7 <sup>*1</sup>	9 *1	12 <sup>*1</sup>	15	19	SCS43_1		
								TOT3 0		
								RTO2 1		
								P033		
								A05 <sup>*2, *3, *4, *5</sup>		
						3 <sup>*1</sup> 16		PPG31_0		
		6 *1	8 <sup>*1</sup>	10 <sup>*1</sup>	13 <sup>*1</sup>		20	ICU3_3		
								TIN4_0		
								RT01_1		
								SCK3_2		



Page	Section	Change Results								
		(Continued)								
		(Correct)								
					Pin					
		64	80	100	120	144	176	Name		
								P034		
								A06		
		7 *1	9 <sup>*1</sup>	11 <sup>*1</sup>	14 <sup>*1</sup>	17	21	ICU2 3		
								TIN5 0		
								RTO0_1		
								SOT3_2		
								P151		
				13	16		23	SCK8_0/		
						19		OCU9 1		
		8 *1	10 <sup>*1</sup>					TRG7 0		
								ICU0_3		
								TIN7_0		
								ZIN0_2		
21, 22	■PIN Description							DTTI_1		
						20	24	P035		
								AU7 -, -, -, -, -, -, -		
		9 <sup>*1</sup>	11 <sup>*1</sup>	14 <sup>*1</sup>	17 <sup>*1</sup>					
		U						TOT4 0		
								AIN0_0		
								INT11_0		
								P036		
						21		A08 <sup>*2,*3,*4,*5</sup>		
		10 <sup>*1</sup>	12 <sup>*1</sup>	15 <sup>*1</sup>	18 <sup>*1</sup>		25	SCS8_0 <sup>2, 3</sup>		
							20	OCU7_1		
								BIND 0		
								P037		
								A09 <sup>*4, *5</sup>		
		-	-	16 <sup>*1</sup>	19 <sup>*1</sup>	22	26	OCU6 1		
								TOT6_0		
								ZIN0_0		
		_	-	-	_	_	27	P174		
		_	_	_	-	-	21	TRG8_1		



Page	Section	Change Results									
		A List of "Pin Description" modified.									
		(Error)									
		64	00	Pin							
		64	80	100	120	144	176	P057			
								RDY			
								SCK10_1			
		_	_	_	_			AN42			
		19	24	29	35	41	51	ICU8_0			
								IRG0_2			
05								TIN6 1			
25	■PIN Description										
		(Correc	ct)								
			1	Pin	no.		1	Pin			
		64	80	100	120	144	176	Name			
								P057			
								SCK10_1			
							51	AN42			
		19 <sup>*1</sup>	24 *1	29 *1	35 <sup>*1</sup>	41		ICU8_0			
								TRG0_2			
								PPG1_1			
		A List o	of "Pin [	Descrip	tion" mo	odified.					
		(Error)									
				Pin	no.			Pin			
		64	80	100	120	144	176	Name			
								P073			
					43 49	57	71	SOT4_0/			
		-	35	43				SDA4			
								AN33			
27	■PIN Description							ICU3_2			
		(Correc	(Correct)								
		Pin no. Pin									
		64	80	100	120	144	176	Name			
								P073			
			οr <sup>*3</sup>	42 *4	40	57	74	SOT4_0/			
		-	33	43	49	57	71	AN33			
								ICU3 2			
							1	·			





Page	Section	Change Results								
		The following sentence modified as following:								
			(Error) High-speed mode <sup>*3</sup> Unit Remarks Min Max							
184	11. Electrical Characteristics AC Characteristics (4-4) I2C timing	Notes: Only ch.3 and ch.4 are standard mode/high-speed mode correspondence.								
		*3: A high-speed mode I <sup>2</sup> C bus device can be used								
		(Correct) Fast mode <sup>*3</sup> Min Max Unit Remarks								
		N	otes: On corre	ly ch.3 sponde	and ch.4 a ence.	are stand	ard mode/fast mode			
		*3	B: A fast i	node l <sup>2</sup>	C bus dev	ice can b	e used			
		The following sentence modified in the Detection voltage as following:								
187		(Error)								
		Min Typ M		e Max	Unit	Remarks				
			27 - 55	V						
	11. Electrical Characteristics (8) Low voltage detection (External	-	-8%	2.8	+8%	V	When power-supply voltage falls and detection level is set initially			
	iow-voltage detection)		Correct)							
		Value			e		When power-supply voltage falls and detection level is set initially Remarks			
			Min	Тур	Мах	Unit	Remarks			
			2.7	-	5.5	V				
				-8%	LVD56 _SEL [3:0]	+8%	v	LVD5F_SEL[3:0] are programmable. Refer to the hardware manual.		
		Tł	ne follow	ing ser	ntence mo	dified as t	following:			
188	11. Electrical Characteristics (9) Low voltage detection (RAM retention low-voltage detection)	(Error) (9) Low voltage detection (Internal low-voltage detection)								
		(Correct)								
		(9) Low voltage detection (RAM retention low-voltage detection)								