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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

E·XFl

Product Status	Obsolete
Core Processor	FR81S
Core Size	32-Bit Single-Core
Speed	80MHz
Connectivity	CANbus, CSIO, EBI/EMI, I <sup>2</sup> C, LINbus, SPI, UART/USART
Peripherals	DMA, LVD, POR, PWM, WDT
Number of I/O	152
Program Memory Size	1.0625MB (1.0625M × 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 48x12b; D/A 2x8b
Oscillator Type	External
Operating Temperature	-40°C ~ 105°C (TA)
Mounting Type	Surface Mount
Package / Case	176-LQFP
Supplier Device Package	176-LQFP (24x24)
Purchase URL	https://www.e-xfl.com/product-detail/infineon-technologies/mb91f526lsbpmc-gsk5e1

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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.





Adduces			Diask		
Address	+0	+1	+2	+3	BIOCK
0001F8 <sub>H</sub>	TMRLRA XXXXXXXX	6 [R/W] H XXXXXXXX	TMR6 XXXXXXXX	R] H XXXXXXXX	Polood Timor 6
0001FC <sub>Н</sub>	TMRLRB XXXXXXXX	6 [R/W] H XXXXXXXX	TMCSR6 [F 00000000	R/W] B, H,W 0-000000	Reload Timer o
000200 <sub>н</sub> to 000238 <sub>н</sub>	_	_	_	_	Reserved
00023C <sub>H</sub>	DACR0 [R/W] B,H,W 0	DA Converter			
000240 <sub>H</sub>		CPCLR3 11111111 11111111	[R/W] W 11111111 11111111		
000244 <sub>H</sub>		TCDT3 00000000 00000000	[R/W] W 00000000 00000000		Free-run Timer 3 32-bit FRT
000248 <sub>Н</sub>	TCCSH3 [R/W] B,H,W 000	TCCSL3 [R/W] B,H,W -1-00000	_	_	
00024C <sub>Н</sub>		CPCLR4 11111111 11111111	[R/W] W 11111111 11111111		
000250 <sub>Н</sub>		TCDT4 00000000 00000000	[R/W] W 00000000 00000000		Free-run Timer 4 32-bit FRT
000254 <sub>Н</sub>	TCCSH4 [R/W] B,H,W 000	TCCSL4 [R/W] B,H,W -1-00000	_	_	
000258 <sub>н</sub> to 0002C0 <sub>н</sub>	_	_	_	_	Reserved
0002C4 <sub>H</sub> to 0002FC <sub>H</sub>	_	_	_	_	Reserved
000300 <sub>H</sub> to 00030C <sub>H</sub>	_	_	_	_	Reserved
000310 <sub>Н</sub>	_	_	MPUCR 000000-(	[R/W] H )0100	
000314 <sub>H</sub>		—	—	—	
000318 <sub>Н</sub>		-	-		MPU [S]
00031C <sub>Н</sub>	—	—	-	_	can access this area)
000320 <sub>Н</sub>	xx	DPVAF XXXXXX XXXXXXXX	R [R] W XXXXXXXX XXXXXX	xx	
000324 <sub>Н</sub>	_	_	DPVSR 0	[R/W] H 00000	



Adduces	Address offset value / Register name						
Address –	+0 +1 +2 +3						
000328 <sub>Н</sub>	>	DEAR XXXXXXXX XXXXXXXX	R] W XXXXXXXX XXXXX	xx			
00032C <sub>Н</sub>	_	_	DESR (	[R/W] H 000000			
000330 <sub>Н</sub>		PABR0 XXXXXXXX XXXXXXX	[R/W] W X XXXXXXXX XXXX00	000	MPU [S] (Only CPU core		
000334 <sub>H</sub>	_	_	PACR0 000000-0	[R/W] H 000000	can access this area)		
000338 <sub>Н</sub>		PABR1 XXXXXXXX XXXXXXX	[R/W] W ( XXXXXXXX XXXX0(	000			
00033C <sub>H</sub>	_	_	PACR1 000000-0	[R/W] H 000000			
000340 <sub>H</sub>		PABR2 XXXXXXXX XXXXXXX	[R/W] W X XXXXXXXX XXXX00	000			
000344 <sub>Н</sub>	_	_	PACR2 000000-0	[R/W] H 000000			
000348 <sub>Н</sub>		PABR3 XXXXXXXX XXXXXXX	[R/W] W < XXXXXXXX XXXX00	000			
00034C <sub>Н</sub>	_	_	PACR3 000000-0	[R/W] H 000000			
000350 <sub>Н</sub>		PABR4 XXXXXXXX XXXXXXX	[R/W] W ( XXXXXXXX XXXX0(	000			
000354 <sub>Н</sub>	_	_	PACR4 000000-0	[R/W] H 000000	MPU [S] (Only CPU core		
000358 <sub>Н</sub>		PABR5 XXXXXXXX XXXXXXX	[R/W] W ( XXXXXXXX XXXX0(	000	can access this area)		
00035C <sub>Н</sub>	_	_	PACR5 000000-0	[R/W] H 000000			
000360 <sub>Н</sub>		PABR6 XXXXXXXX XXXXXXX	[R/W] W ( XXXXXXXX XXXX00	000			
000364 <sub>Н</sub>	_	_	PACR6 000000-0	[R/W] H 000000			
000368 <sub>Н</sub>		PABR7 XXXXXXXX XXXXXXX	[R/W] W ( XXXXXXXX XXXX00	000			
00036C <sub>Н</sub>	_	_	PACR7 000000-0	[R/W] H 000000			
000370 <sub>H</sub> to		-	_		Reserved [S]		
0003AC <sub>H</sub> 0003B0 <sub>H</sub> to 0003FC <sub>H</sub>	_	_	_	_	Reserved [S]		



A dalama a	Address offset value / Register name						
Address —	+0	+1	+2	+3	BIOCK		
001D20 <sub>H</sub>	PCN43 [R 00000000	/W] B,H,W 000000-0	PCSR4 XXXXXXXX	3 [W] H,W X XXXXXXX			
001D24 <sub>H</sub>	PDUT43 XXXXXXXX	[W] H,W XXXXXXXX	PTMR4 1111111	3 [R] H,W 1 1111111			
001D28 <sub>H</sub>	PCN243 [F 000000	R/W] B,H,W )110	PSDR43 0000000	6 [R/W] H,W 0 0000000	PPG43		
001D2C <sub>н</sub>	PTPC43   00000000	R/W] H,W 00000000	_	_			
001D30 <sub>н</sub>	PCN44 [R 00000000	/W] B,H,W 000000-0	PCSR4 XXXXXXXX	4 [W] H,W X XXXXXXX			
001D34 <sub>H</sub>	PDUT44 XXXXXXXX	[W] H,W XXXXXXXX	PTMR4 1111111	4 [R] H,W 1 1111111			
001D38 <sub>H</sub>	PCN244 [F 000000	νW] Β,Η,W )110	PSDR44 0000000	[R/W] H,W 0 0000000	- PPG44		
001D3C <sub>н</sub>	PTPC44   00000000	R/W] H,W 00000000	_	_			
001D40 <sub>H</sub>	PCN45 [R/W] B,H,W 00000000 000000-0		PCSR4 XXXXXXXX	5 [W] H,W X XXXXXXX			
001D44 <sub>H</sub>	PDUT45 [W] H,W XXXXXXXX XXXXXXX		PTMR4 1111111	5 [R] H,W 1 1111111	PPG45		
001D48 <sub>H</sub>	PCN245 [F 000000	R/W] B,H,W D110	PSDR45 0000000	6 [R/W] H,W 0 00000000	11040		
001D4C <sub>н</sub>	PTPC45   00000000	R/W] H,W 00000000	_	_			
001D50 <sub>Н</sub>	PCN46 [R 00000000	/W] B,H,W 000000-0	PCSR4 XXXXXXXX	6 [W] H,W X XXXXXXX			
001D54 <sub>н</sub>	PDUT46 XXXXXXXX	[W] H,W XXXXXXXX	PTMR4 1111111	6 [R] H,W 1 1111111	PPG46		
001D58 <sub>н</sub>	PCN246 [F 000000	R/W] B,H,W D110	PSDR46 0000000	[R/W] H,W 0 00000000			
001D5Cн	PTPC46   00000000	R/W] H,W 00000000	_	_			
001D60 <sub>н</sub>	PCN47 [R 00000000	/W] B,H,W 000000-0	PCSR4 XXXXXXXX	7 [W] H,W X XXXXXXX			
001D64 <sub>н</sub>	PDUT47 XXXXXXXX	[W] H,W XXXXXXXX	PTMR4 1111111	7 [R] H,W 1 11111111			
001D68 <sub>н</sub>	PCN247 [F 000000	R/W] B,H,W D110	PSDR47 0000000	r [R/W] H,W 0 00000000	FF04/		
001D6Cн	PTPC47 [ 00000000	R/W] H,W 00000000	_	_			



		Address offset val	ue / Register name		
Address	+0	+1	+2	+3	BIOCK
002150 <sub>Н</sub>	IF2DTA11 [I 00000000	R/W] B,H,W 00000000	IF2DTA21 [ 00000000	R/W] B,H,W 00000000	
002154 <sub>Н</sub>	IF2DTB11 [ 00000000	R/W] B,H,W 00000000	IF2DTB21 [ 00000000	R/W] B,H,W 00000000	
002158 <sub>н</sub>	_	_	_	_	-
00215C <sub>Н</sub>	_	_	_	_	
002160 <sub>н</sub> , 002164 <sub>н</sub>		Reserved (IF	2 data mirror)		
002168 <sub>н</sub> to 00217С <sub>н</sub>		-	_		
002180 <sub>H</sub>	TREQR21 00000000	[R] B,H,W 00000000	TREQR11 00000000	[R] B,H,W 00000000	
002184 <sub>H</sub>	TREQR41 00000000	[R] B,H,W 00000000	TREQR31 00000000	[R] B,H,W 00000000	
002188 <sub>H</sub>	_	_	_	_	
00218C <sub>н</sub>	_	—	_	_	
002190 <sub>н</sub>	NEWDT21	[R] B,H,W 00000000	NEWDT11 00000000	[R] B,H,W 00000000	CAN1 (64msb)
002194 <sub>H</sub>	NEWDT41 00000000	[R] B,H,W 00000000	NEWDT31 00000000	[R] B,H,W 00000000	
002198 <sub>Н</sub>	_	—	—	_	
00219C <sub>H</sub>	_	_	_	_	
0021A0 <sub>H</sub>	INTPND21 00000000	[R] B,H,W 00000000	INTPND11 00000000	[R] B,H,W 00000000	
0021A4 <sub>H</sub>	INTPND41 00000000	[R] B,H,W 00000000	INTPND31 00000000	[R] B,H,W 00000000	
0021A8 <sub>H</sub>	_	_	—	—	
0021AC <sub>Н</sub>	_	_	_	_	-
0021B0 <sub>Н</sub>	MSGVAL2 <sup>2</sup> 00000000	I [R] B,H,W 00000000	MSGVAL1 <sup>2</sup> 00000000	1 [R] B,H,W 00000000	
0021B4 <sub>Н</sub>	MSGVAL47 00000000	I [R] B,H,W 00000000	MSGVAL3 00000000	1 [R] B,H,W 00000000	
0021B8 <sub>Н</sub>	_	_	_	_	
0021BC <sub>H</sub>	—	—	-	—	



	Interrupt number		Interrupt		Default	
Interrupt factor	Decimal	Hexa decimal	level	Offset	address for TBR	RN
Multi-function serial interface						
ch_4 (reception completed)	20	10	10040	200	00055590	10* <sup>1</sup>
Multi-function serial interface	20		101112	SOCH	UUUFFFOCH	12
ch_4 (status)						
Multi-function serial interface	20	10	10042	200	00055500	10
ch_4 (transmission completed)	29	ID	ICKIS	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	16	101/14	304H	000FFF04H	14
ch 5 (status)						
Multi-function serial interface	31	1⊑		380	00055580	15
ch 5 (transmission completed)	51		101(15	300H	00011100H	15
Multi-function serial interface						
ch_6 (reception completed)	32	20	ICR16	370	000EEE7C	16* <sup>1</sup>
Multi-function serial interface	02	20		57 CH		10
ch <sub>.</sub> 6 (status)						
Multi-function serial interface	33	21	ICR17	378	000FFF78	17
ch_6 (transmission completed)	00	21		070H	00011170H	
CANO	34	22	ICR18	374 <sub>Н</sub>	000FFF74 <sub>H</sub>	-
CAN1	_					
RAM diagnosis end	_					
RAM initialization completion	_					
Error generation during RAM diagnosis	35	23	ICR19	370 <sub>H</sub>	000FFF70 <sub>н</sub>	-
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>н</sub>	-
Up/down counter 1						
Real time clock	37	25	ICR21	368 <sub>H</sub>	000FFF68 <sub>H</sub>	-
	38	26	ICR22	364 <sub>H</sub>	000FFF64 <sub>н</sub>	-* <sup>6</sup>
16-bit Free-run timer 0 (0 detection) /	30	27	ICP23	360	00055560	23
(compare clear)	- 59	21	101/25	300H	00011100H	25
PPG 1/10/11/20/30/31	_					
16-bit Free-run timer 1 (0 detection) /	40	28	ICR24	35C <sub>H</sub>	000FFF5C <sub>H</sub>	24* <sup>3</sup>
(compare clear)						
PPG 2/3/12/13/23/43	_					
16-bit Free-run timer 2 (0 detection) /	41	29	ICR25	358 <sub>Н</sub>	000FFF58 <sub>н</sub>	25* <sup>3</sup>
(compare clear)						
PPG 4/24/35	42	2A	ICR26	354 <sub>Н</sub>	000FFF54 <sub>Н</sub>	26* <sup>3</sup>
PPG 7/16/17/27/37	43	2B	ICR27	350 <sub>H</sub>	000FFF50 <sub>н</sub>	27* <sup>3</sup>
PPG 19	44	2C	ICR28	34C <sub>H</sub>	000FFF4C <sub>H</sub>	28* <sup>3</sup>
16-bit ICU 0 (fetching) / 16-bit ICU 1 (fetching)	45	2D	ICR29	348 <sub>H</sub>	000FFF48 <sub>H</sub>	29
Main timer						
Sub timer	16	2⊑		3/1	00055544	30
PLL timer	40	20	10130	344H	000FFF44H	50
16-bit ICU 2 (fetching) /16-bit ICU 3 (fetching)						



Interrupt factorDecimalHexadecimalIntervelOffset address for RN TRRNull-function serial interface c.h.4 (transmission completed)271BICR11390,000FFF90,11Multi-function serial interface c.h.4 (transmission completed)281CICR1238C,000FFF8C,12.1Multi-function serial interface c.h.4 (transmission completed)291DICR13388,000FFF8C,13Multi-function serial interface c.h.5 (reception completed)301EICR14380,000FFF8C,14.1Multi-function serial interface c.h.5 (reception completed)311FICR15380,000FFF8C,15Multi-function serial interface c.h.6 (transmission completed)311FICR1637C,000FFF8C,16.1Multi-function serial interface c.h.6 (transmission completed)3321ICR1637C,000FFF7C,16.1Multi-function serial interface c.h.6 (transmission completed)3321ICR1637H,000FFF7A,17CAN1CAN13622ICR1837H,000FFF7A,11CAN1CAN13622ICR1837H,000FFF6C,2.1CAN2CAN2Generation during RAM diagnosis3626ICR2236H,000FFF6C,2.1CAN1CAN13826ICR2236H,000FFF6C,2.12.1CAN2CAN2Generation during RAM diagnosis3826ICR22 <t< th=""><th></th><th colspan="2">Interrupt number</th><th>Interrunt</th><th></th><th>Default</th><th></th></t<>		Interrupt number		Interrunt		Default	
Null-function serial interface ch.4 (transmission completed)         27         1B         ICR11         390, 000FFF90, 11         000FFF90, 12         11           Mull-function serial interface ch.4 (transmission completed)         28         1C         ICR12         38C, 000FFF80, 12         000FFF80, 12         12           Mull-function serial interface ch.4 (transmission completed)         29         1D         ICR13         388, 000FFF80, 14         000FFF80, 14         14           Mull-function serial interface ch.5 (reception completed)         30         1E         ICR14         380, 000FFF80, 15         000FFF80, 15         15           Mull-function serial interface ch.5 (reception completed)         31         1F         ICR16         37C, 16         000FFF80, 37C, 16         15           Mull-function serial interface ch.6 (reception completed)         33         21         ICR16         37C, 16         000FFF70, 17         16           AM diagnosis end Error generation during RAM diagnosis Error generation during RAM diagnosis end Error generation m	Interrupt factor	Decimal	Hexadecimal	level	Offset	address for TBR	RN
ch.3 (transmission completed)         27         1B         ICR11         390+         000FFF80+         11           Multi-function serial interface         ch.4 (teception completed)         28         1C         ICR12         38C+         000FFF80+         12*           Multi-function serial interface         29         1D         ICR13         388+         000FFF80+         13           Multi-function serial interface         29         1D         ICR13         388+         000FFF80+         14*           Multi-function serial interface         30         1E         ICR14         384+         000FFF80+         15           Multi-function serial interface         31         1F         ICR15         380+         000FFF80+         15           Multi-function serial interface         32         20         ICR16         37C+         000FFF70+         16*1           Multi-function serial interface         33         21         ICR16         374+         000FFF70+         -           CAN0         34         22         ICR18         374+         000FFF70+         -           RAM diagnosis end         36         24         ICR20         36C+         000FFF70+         -           Read time clock	Multi-function serial interface	07	45	10044	000	00055500	
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	ch.3 (transmission completed)	27	IB	ICRIT	390 <sub>H</sub>	000FFF90H	11
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Multi-function serial interface						
Multi-function serial interface         28         1C         ICR12         38C <sub>H</sub> 000FFF8C <sub>H</sub> 12*           Multi-function serial interface         29         1D         ICR13         388 <sub>H</sub> 000FFF86 <sub>H</sub> 13           Multi-function serial interface         30         1E         ICR14         384 <sub>H</sub> 000FFF86 <sub>H</sub> 14*           Auti-function serial interface         30         1E         ICR15         380 <sub>H</sub> 000FFF86 <sub>H</sub> 15           Multi-function serial interface         31         1F         ICR16         37C <sub>H</sub> 000FFF86 <sub>H</sub> 15           Multi-function serial interface         31         1F         ICR16         37C <sub>H</sub> 000FFF76 <sub>H</sub> 16*           ch.6 (reception completed)         32         20         ICR16         37C <sub>H</sub> 000FFF76 <sub>H</sub> 16*           whulti-function serial interface         33         21         ICR17         378 <sub>H</sub> 000FFF76 <sub>H</sub> 17           CAN1         RAM initialization completion         33         23         ICR19         370 <sub>H</sub> 000FFF76 <sub>H</sub> -           RAM initialization completion         36         24         ICR20         366 <sub>H</sub> 000FFF66 <sub>H</sub> -	ch.4 (reception completed)		10	10040		00055500	10+1
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Multi-function serial interface	28	1C	ICR12	38C <sup>H</sup>	000FFF8C <sub>H</sub>	12*
Multi-function serial interface ch.4 (transmission completed)         29         1D         ICR13         388 <sub>H</sub> 000FFF88 <sub>H</sub> 13           Multi-function serial interface ch.5 (status)         30         1E         ICR14         384 <sub>H</sub> 000FFF84 <sub>H</sub> 14*           Multi-function serial interface ch.5 (status)         31         1F         ICR15         380 <sub>H</sub> 000FFF84 <sub>H</sub> 15           Multi-function serial interface ch.6 (status)         32         20         ICR16         37C <sub>H</sub> 000FFF76 <sub>H</sub> 16* <sup>1</sup> Multi-function serial interface ch.6 (status)         32         20         ICR18         37C <sub>H</sub> 000FFF76 <sub>H</sub> 16* <sup>1</sup> Multi-function serial interface ch.6 (status)         33         21         ICR18         37A <sub>H</sub> 000FFF76 <sub>H</sub> 17           CAN1         RAM diagnosis end         34         22         ICR18         37A <sub>H</sub> 000FFF70 <sub>H</sub> -           Backup RAM diagnosis end         35         23         ICR19         370 <sub>H</sub> 000FFF70 <sub>H</sub> -           Backup RAM diagnosis end         36         24         ICR20         36C <sub>H</sub> 000FFF64 <sub>H</sub> -           Up/down counter 1         38         26         ICR21	ch.4 (status)						
ch.4 (transmission completed)       29       10       ICR13       388,       000FFR8,,       13         Multi-function serial interface	Multi-function serial interface		45	10040		00055500	40
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	ch.4 (transmission completed)	29	1D	ICR13	388 <sup>H</sup>	000FFF88H	13
ch.5 (reception completed)         30         1E         ICR14         384,n         000FFF84,n         14*1           Multi-function serial interface         31         1F         ICR15         380,n         000FFF84,n         15           Multi-function serial interface         31         1F         ICR16         380,n         000FFF84,n         15           Multi-function serial interface         32         20         ICR16         37C,n         000FFF7C,n         16*1           Auti-function serial interface         33         21         ICR17         378,n         000FFF7C,n         16*1           A.6. (status)         34         22         ICR18         374,n         000FFF7C,n         17           CAN0         34         22         ICR18         374,n         000FFF7C,n         1           RAM diagnosis end         35         23         ICR19         370,n         000FFF7C,n         -           Backup RAM diagnosis end         36         24         ICR20         36C,n         000FFF66,n         -           Up/down counter 1         0         38         26         ICR21         364,n         000FFF66,n         -           Multi-function serial interface         38 <td< td=""><td>Multi-function serial interface</td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	Multi-function serial interface						
Multi-function serial interface         30         TE         ICR14         384 <sub>H</sub> 000FFF84 <sub>H</sub> 14*           Audit-function serial interface         31         TF         ICR15         380 <sub>H</sub> 000FFF80 <sub>H</sub> 15           Multi-function serial interface	ch.5 (reception completed)	20	45	10044	004	00055504	4 4 + 1
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Multi-function serial interface	30	IE	ICR14	384 <sub>H</sub>	000FFF84 <sub>H</sub>	14
Multi-function serial interface         31         1F         ICR15         380+         000FFF80+         15           A.5 (transmission completed)         32         20         ICR16         37C+         000FFF7C+         16*1           Multi-function serial interface         33         21         ICR16         37C+         000FFF7C+         16*1           AMUIt-function serial interface         33         21         ICR17         378+         000FFF7C+         16*1           CAN0         34         22         ICR18         374+         000FFF7C+         1           CAN0         34         22         ICR18         374+         000FFF7C+         1           RAM diagnosis end         35         35         23         ICR19         370+         000FFF7C+         1           Backup RAM diagnosis end         36         24         ICR20         36C+         000FFF6C+         1           Backup RAM diagnosis end         37         25         ICR21         368+         000FFF6C+         1           Up/down counter 0         36         24         ICR20         36C+         000FFF6C+         2           Multi-function serial interface         37         25         ICR21	ch.5 (status)						
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Multi-function serial interface	24	45		200	00055500	45
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	ch.5 (transmission completed)	31	IF	ICRIS	380 <sub>H</sub>	000FFF80H	15
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Multi-function serial interface						
Multi-function serial interface         32         20         ICR18         37CH         000FFF7CH         16           Multi-function serial interface         33         21         ICR17         378H         000FFF76H         17           CAN0         34         22         ICR18         374H         000FFF76H         -           CAN1	ch.6 (reception completed)	20	20		270	00055570	40*1
$\begin{array}{c c c c c c c } \mbox{characle}{ \begin{tabular}{ c c c c c } \mbox{characle}{ \begin{tabular}{ c c c c c c } \mbox{characle}{ \begin{tabular}{ c c c c c c c } \mbox{characle}{ \begin{tabular}{ c c c c c } \mbox{characle}{ \begin{tabular}{ c c c c } \mbox{characle}{ \begin{tabular}{ c c c c c } \mbox{characle}{ \begin{tabular}{ c c c c c } \mbox{characle}{ \begin{tabular}{ c c c c c c c } \mbox{characle}{ \begin{tabular}{ c c c c c c c } \mbox{characle}{ \begin{tabular}{ c c c c c c c c } \mbox{characle}{ \begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	Multi-function serial interface	32	20	ICRID	37 CH	UUUFFF7CH	10
Multi-function serial interface ch.6 (transmission completed)         33         21         ICR17         378 <sub>H</sub> 000FFF78 <sub>H</sub> 17           CAN0         34         22         ICR18         374 <sub>H</sub> 000FFF78 <sub>H</sub> -           CAN0         34         22         ICR18         374 <sub>H</sub> 000FFF78 <sub>H</sub> -           RAM diagnosis end         35         23         ICR19         370 <sub>H</sub> 000FFF70 <sub>H</sub> -           Backup RAM initialization completion         36         24         ICR20         36C <sub>H</sub> 000FFF6C <sub>H</sub> -           Error generation during Backup RAM diagnosis         36         24         ICR20         36C <sub>H</sub> 000FFF6C <sub>H</sub> -           Up/down counter 0         10p/down counter 1         38         26         ICR21         368 <sub>H</sub> 000FFF64 <sub>H</sub> 22 <sup>+1</sup> Multi-function serial interface         38         26         ICR22         364 <sub>H</sub> 000FFF64 <sub>H</sub> 22 <sup>+1</sup> Multi-function serial interface         39         27         ICR23         360 <sub>H</sub> 000FFF64 <sub>H</sub> 23           6.7. (rtasmission completed)         40         28         ICR24         35C <sub>H</sub> 000FFF56 <sub>H</sub> 24 <sup>+3</sup> <td>ch.6 (status)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	ch.6 (status)						
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Multi-function serial interface	22	01		070	00055570	47
CAN0         34         22         ICR18         374 <sub>H</sub> 000FFF74 <sub>H</sub> -           CAN1         RAM diagnosis end         Addiagnosis         Addiagnosis end         Addiagnosis         Addiagnosis         Addiagnosis end         Addiagnosis	ch.6 (transmission completed)	33	21	ICR17	378 <sub>H</sub>	000FFF78H	17
$ \begin{array}{ c c c c c c } \hline CAN1 & & & & & & & & & & & & & & & & & & &$	CAN0	34	22	ICR18	374 <sub>Н</sub>	000FFF74 <sub>H</sub>	-
RAM diagnosis end         AM initialization completion         AM initialization completion         AM initialization completion         ATT A completi	CAN1						
RAM initialization completion         35         23         ICR19         370 <sub>H</sub> 000FFF70 <sub>H</sub> -           Backup RAM diagnosis end         36         23         ICR19         370 <sub>H</sub> 000FFF70 <sub>H</sub> -           Backup RAM initialization completion         36         24         ICR19         370 <sub>H</sub> 000FFF6C <sub>H</sub> -           Error generation during Backup RAM diagnosis         36         24         ICR20         36C <sub>H</sub> 000FFF6C <sub>H</sub> -           Up/down counter 0         36         24         ICR20         36C <sub>H</sub> 000FFF6C <sub>H</sub> -           Up/down counter 1         37         25         ICR21         368 <sub>H</sub> 000FFF6A <sub>H</sub> -           Multi-function serial interface         37         25         ICR22         364 <sub>H</sub> 000FFF6A <sub>H</sub> 22*1           16-bit Free-running timer 0 (0 detection) /         38         26         ICR23         360 <sub>H</sub> 000FFF60 <sub>H</sub> 23           Multi-function serial interface         7         39         27         ICR23         360 <sub>H</sub> 000FFF60 <sub>H</sub> 23           6-bit Free-run timer 1 (0 detection) /         40         28         ICR24         35C <sub>H</sub> 000FFF5C <sub>H</sub> 24*3 <td>RAM diagnosis end</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	RAM diagnosis end						
Error generation during RAM diagnosis         35         23         ICR19         370 <sub>H</sub> 000FFF70 <sub>H</sub> -           Backup RAM diagnosis end         36         24         ICR19         370 <sub>H</sub> 000FFF70 <sub>H</sub> -           Backup RAM initialization completion         36         24         ICR20         36C <sub>H</sub> 000FFF6C <sub>H</sub> -           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         37         25         ICR22         364 <sub>H</sub> 000FFF64 <sub>H</sub> 22* <sup>1</sup> Multi-function serial interface         38         26         ICR22         364 <sub>H</sub> 000FFF64 <sub>H</sub> 22* <sup>1</sup> Multi-function serial interface         39         39         27         ICR23         360 <sub>H</sub> 000FFF50 <sub>H</sub> 23           6.bit Free-run timer 1 (0 detection) /         40         28         ICR24         35C <sub>H</sub> 000FFF5C <sub>H</sub> 24* <sup>3</sup> 16-bit Free-run timer 2 (0 detection) /         41         29         ICR25         358 <sub>H</sub>	RAM initialization completion						
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Error generation during RAM diagnosis	35	23	ICR19	370 <sub>H</sub>	000FFF70 <sub>H</sub>	-
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Backup RAM diagnosis end						
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Backup RAM initialization completion						
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Error generation during Backup RAM diagnosis						
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	CAN2						
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Up/down counter 0	36	24	ICR20	36Cн	000FFF6C <sub>H</sub>	-
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Up/down counter 1						
Multi-function serial interface       38       26       ICR22 $364_{H}$ $000FFF64_{H}$ $22^{*1}$ Multi-function serial interface $364_{H}$ $000FFF64_{H}$ $22^{*1}$ 16-bit Free-running timer 0 (0 detection) / $39$ 27       ICR23 $360_{H}$ $000FFF60_{H}$ $23$ Multi-function serial interface $39$ 27       ICR23 $360_{H}$ $000FFF60_{H}$ $23$ Multi-function serial interface $39$ 27       ICR23 $360_{H}$ $000FFF60_{H}$ $23$ PFG 1/10/11/20/21/30/31 $40$ 28       ICR24 $35C_{H}$ $000FFF5C_{H}$ $24^{*3}$ (compare clear) $40$ 28       ICR25 $358_{H}$ $000FFF58_{H}$ $25^{*3}$ 16-bit Free-run timer 2 (0 detection) / $41$ 29       ICR25 $358_{H}$ $000FFF58_{H}$ $25^{*3}$ PPG 4/5/14/15/24/25/35/44       42       2A       ICR26 $354_{H}$ $000FFF50_{H}$ $27^{*3}$	Real time clock	37	25	ICR21	368 <sub>н</sub>	000FFF68 <sub>H</sub>	-
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Multi-function serial interface						
Multi-function serial interface       38       26       ICR22 $364_{H}$ $000FFF64_{H}$ $22^{**}$ 16-bit Free-running timer 0 (0 detection) / (compare clear)       39       27       ICR23 $360_{H}$ $000FFF60_{H}$ 23         Multi-function serial interface       39       27       ICR23 $360_{H}$ $000FFF60_{H}$ 23         PPG 1/10/11/20/21/30/31       39       28       ICR24 $35C_{H}$ $000FFF5C_{H}$ $24^{*3}$ 16-bit Free-run timer 1 (0 detection) / (compare clear)       40       28       ICR24 $35C_{H}$ $000FFF5C_{H}$ $24^{*3}$ 16-bit Free-run timer 2 (0 detection) / (compare clear)       41       29       ICR25 $358_{H}$ $000FFF58_{H}$ $25^{*3}$ PPG 4/5/14/15/24/25/35/44       42       2A       ICR26 $354_{H}$ $000FFF50_{H}$ $27^{*3}$ PPG 6/7/16/17/26/27/37       43       2B       ICR27 $350_{H}$ $000FFF50_{H}$ $27^{*3}$ PPG 8/9/18/19/28/29       44       2C       ICR28 $34C_{H}$ $000FFF4C_{H}$ $28^{*3}$	ch.7 (reception completed)						aa+1
$ \begin{array}{c} \text{ch.7 (status)} & \text{I} & I$	Multi-function serial interface	38	26	ICR22	364 <sub>Н</sub>	000FFF64 <sub>H</sub>	22*1
$\begin{array}{c cccc} 16-bit \ {\rm Free-running \ timer \ 0 \ (0 \ detection) \ / \ (compare \ clear)} \\ \hline Multi-function \ {\rm serial \ interface \ ch.7 \ (transmission \ completed) \ \\ \hline PPG \ 1/10/11/20/21/30/31 \\ 16-bit \ {\rm Free-run \ timer \ 1 \ (0 \ detection) \ / \ (compare \ clear) \ \\ \hline PPG \ 2/3/12/13/23/32/43 \\ 16-bit \ {\rm Free-run \ timer \ 2 \ (0 \ detection) \ / \ \\ (compare \ clear) \ \\ \hline PPG \ 4/5/14/15/24/25/35/44 \ \\ PPG \ 6/7/16/17/26/27/37 \ \\ \hline PPG \ 8/9/18/19/28/29 \ \\ \hline \end{array} \begin{array}{c} 39 \\ 27 \\ \hline 1CR23 \\ 360_H \\ 20 \\ \hline 1CR23 \\ 360_H \\ 000FFF60_H \\ 23 \\ 000FFF60_H \\ 23 \\ 000FFF5C_H \ 24^{*3} \\ 24^{*3} \\ 24^{*3} \\ 24^{*3} \\ 24^{*3} \\ 24^{*3} \\ 28 \\ \hline 1CR25 \\ 358_H \\ 000FFF58_H \ 25^{*3} \\ 000FFF58_H \ 25^{*3} \\ 25^{*3} \\ 000FFF54_H \ 26^{*3} \\ 27^{*3} \\ 28 \\ \hline 1CR26 \ 354_H \ 000FFF54_H \ 26^{*3} \\ 000FFF54_H \ 27^{*3} \\ 27^{*3} \\ 28 \\ \hline 1CR27 \ 350_H \ 000FFF50_H \ 27^{*3} \\ 000FFF50_H \ 27^{*3} \\ 27^{*3} \\ \hline 27 \\ \hline 28 \\ \hline 1CR28 \ 34C_H \ 000FFF4C_H \ 28^{*3} \\ \hline 28 \\ \hline 1CR28 \ 34C_H \ 000FFF4C_H \ 28^{*3} \\ \hline 28 \\ \hline 28$	ch.7 (status)						
(compare clear)       39       27       ICR23       360 <sub>H</sub> 000FFF60 <sub>H</sub> 23         Multi-function serial interface	16-bit Free-running timer 0 (0 detection) /						
Multi-function serial interface       39       27       ICR23       360 <sub>H</sub> 000FFF60 <sub>H</sub> 23         Multi-function serial interface       29       1CR23       360 <sub>H</sub> 000FFF60 <sub>H</sub> 23         PPG 1/10/11/20/21/30/31       40       28       ICR24       35C <sub>H</sub> 000FFF5C <sub>H</sub> 24* <sup>3</sup> 16-bit Free-run timer 1 (0 detection) /       40       28       ICR24       35C <sub>H</sub> 000FFF5C <sub>H</sub> 24* <sup>3</sup> 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>H</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>	(compare clear)						
ch.7 (transmission completed)       Image: ch.7 (transmission complete)       Image: ch.7 (transmi	Multi-function serial interface	39	27	ICR23	360 <sub>H</sub>	000FFF60 <sub>H</sub>	23
PPG 1/10/11/20/21/30/31       40       28       ICR24       35C <sub>H</sub> 000FFF5C <sub>H</sub> 24*3         16-bit Free-run timer 1 (0 detection) / (compare clear)       40       28       ICR24       35C <sub>H</sub> 000FFF5C <sub>H</sub> 24*3         PPG 2/3/12/13/23/32/43       41       29       ICR25       358 <sub>H</sub> 000FFF58 <sub>H</sub> 25*3         16-bit Free-run timer 2 (0 detection) / (compare clear)       41       29       ICR25       358 <sub>H</sub> 000FFF58 <sub>H</sub> 25*3         PPG 4/5/14/15/24/25/35/44       42       2A       ICR26       354 <sub>H</sub> 000FFF54 <sub>H</sub> 26*3         PPG 6/7/16/17/26/27/37       43       2B       ICR27       350 <sub>H</sub> 000FFF50 <sub>H</sub> 27*3         PPG 8/9/18/19/28/29       44       2C       ICR28       34C <sub>H</sub> 000FFF4C <sub>H</sub> 28*3	ch.7 (transmission completed)						
16-bit Free-run timer 1 (0 detection) / (compare clear)       40       28       ICR24       35C <sub>H</sub> 000FFF5C <sub>H</sub> 24* <sup>3</sup> PPG 2/3/12/13/23/32/43       41       29       ICR25       358 <sub>H</sub> 000FFF58 <sub>H</sub> 25* <sup>3</sup> 16-bit Free-run timer 2 (0 detection) / (compare clear)       41       29       ICR25       358 <sub>H</sub> 000FFF58 <sub>H</sub> 25* <sup>3</sup> PPG 4/5/14/15/24/25/35/44       42       2A       ICR26       354 <sub>H</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>	PPG 1/10/11/20/21/30/31						
(compare clear)       Image: Compare clear (Compare clear)       Image: C	16-bit Free-run timer 1 (0 detection) /	40	28	ICR24	35Cн	000FFF5Cн	24* <sup>3</sup>
PPG 2/3/12/13/23/32/43         41         29         ICR25         358 <sub>H</sub> 000FFF58 <sub>H</sub> 25* <sup>3</sup> 16-bit Free-run timer 2 (0 detection) / (compare clear)         41         29         ICR25         358 <sub>H</sub> 000FFF58 <sub>H</sub> 25* <sup>3</sup> PPG 4/5/14/15/24/25/35/44         42         2A         ICR26         354 <sub>H</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>	(compare clear)						
16-bit Free-run timer 2 (0 detection) / (compare clear)       41       29       ICR25       358 <sub>H</sub> 000FFF58 <sub>H</sub> 25* <sup>3</sup> PPG 4/5/14/15/24/25/35/44       42       2A       ICR26       354 <sub>H</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>	PPG 2/3/12/13/23/32/43						
(compare clear)         Image: Compare clear         Image: Compare	16-bit Free-run timer 2 (0 detection) /	41	29	ICR25	358н	000FFF58 <sub>н</sub>	25* <sup>3</sup>
PPG 4/5/14/15/24/25/35/44         42         2A         ICR26         354 <sub>H</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>	(compare clear)						
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>	PPG 4/5/14/15/24/25/35/44	42	2A	ICR26	354н	000FFF54	26* <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>	PPG 6/7/16/17/26/27/37	43	2B	ICR27	350 <sub>н</sub>	000FFF50 <sub>H</sub>	27* <sup>3</sup>
	PPG 8/9/18/19/28/29	44	2C	ICR28	34Cн	000FFF4C <sub>H</sub>	28* <sup>3</sup>



	Interrupt number		Interrupt		Default	
Interrupt factor	Decimal	Hexadecimal	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	46	<b>2</b> ⊏	10020	244.	00055544	20
Multi-function serial interface	40	20	ICK30	344H	000FFF44H	30
ch.8 (transmission completed)						
16-bit ICU 2 (fetching) /16-bit ICU 3 (fetching)						
Clock calibration unit (sub oscillation)						
Multi-function serial interface						<b>21</b> * <sup>1,</sup>
ch.9 (reception completed)	47	2F	ICR31	340 <sub>H</sub>	000FFF40 <sub>H</sub>	31 *4
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	49	31	ICR33	338⊔	000FFF38	33
ch.9 (transmission completed)		01	101100	0001		00
16-bit OCU 0 (match) / 16-bit OCU 1 (match)						
32-bit Free-run timer 4	50	32	ICR34	334	000FFF34	34* <sup>5</sup>
16-bit OCU 2 (match) / 16-bit OCU 3 (match)						•.
32-bit Free-run timer 3/5	51	33	ICR35	330 <sub>H</sub>	000FFF30H	35* <sup>5</sup>
16-bit OCU 4 (match) / 16-bit OCU 5 (match)	•			00011		
32-bit ICU6 (fetching/measurement)						
Multi-function serial interface						1
ch.10 (reception completed)	52	34	ICR36	32C <sub>H</sub>	000FFF2C <sub>H</sub>	36*'
Multi-function serial interface						
ch.10 (status)						
32-bit ICU7 (fetching/measurement)	50	05	10007	200	00055500	07
Multi-function serial interface	53	35	ICR37	328 <sub>H</sub>	000FFF28H	31
Ch. 10 (transmission completed)						
32-bit ICO8 (fetching/measurement)						
multi-iunction senar interface	ΕA	26	10020	224	00055524	20*1
Multi function parial interface	- 34	30	ICR30	3 <b>24</b> H	000FFF24H	30
ch 11 (status)						
22 hit ICU9 (fotching/moasurement)						
$W_{\rm C}$ dead timer underflow 0/1/2	1					
WG dead timer relead 0/1/2	55	37	ICR39	320 <sub>H</sub>	000FFF20 <sub>H</sub>	39
	-					
32 bit ICU/ (fetching/massurement)						
Multi function serial interface	56	30		310.		40
ch 11 (transmission completed)	50	50	101340	JICH		40



	Interr	upt number	Interrunt		Default	
Interrupt factor	Decimal	Hexadecimal	level	Offset	address for TBR	RN
32-bit ICU5 (fetching/measurement)						
A/D converter 32/33/34/35/36/37/38/39/40/41/42/43/44/45/46/	57	39	ICR41	318 <sub>H</sub>	000FFF18 <sub>н</sub>	41
47						
32-bit OCU 6/7/10/11 (match)	58	3A	ICR42	314 <sub>Н</sub>	000FFF14 <sub>H</sub>	42
32-bit OCU 8/9 (match)	59	3B	ICR43	310 <sub>Н</sub>	000FFF10 <sub>H</sub>	43
Base timer 0 IRQ0	60	30	ICR44	30C⊔		44
Base timer 0 IRQ1	00		101(44	000	COOLLI COH	
Base timer 1 IRQ0						
Base timer 1 IRQ1	61	3D	ICR45	308	000FFF08	45
		02	lortio	0001		10
DMAC 0/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15	62	3E	ICR46	304 <sub>Н</sub>	000FFF04 <sub>H</sub>	-
Delay interrupt	63	3F	ICR47	300н	000FFF00 <sub>H</sub>	-
System reserved	64	40	_	2FCu	000FFFFCu	_
(Used for REALOS)	07	+0		21 04	OCCLUE OF	
System reserved	65	41	_	2F8⊦	000FFFF8 <sub>H</sub>	_
(Used for REALOS)		••		2. 011	0001121011	
	66	42		2F4 <sub>H</sub>	000FFEF4 <sub>H</sub>	
Used with the INT instruction			-			-
	255	FF		000 <sub>H</sub>	000FFC00 <sub>H</sub>	

**Note:** It does not support a DMA transfer request caused by an interrupt generated from a peripheral to which no RN (Resource Number) is assigned.

\*1: It does not support a DMA transfer by the status of the multi-function serial interface and I<sup>2</sup>C reception.

\*2: Reload timer ch.4 to ch.7 do not support a DMA transfer by the interrupt.

\*3: PPG ch.24 to ch.47 do not support a DMA transfer by the interrupt.

\*4: The clock calibration unit does not support a DMA transfer by the interrupt.

\*5: 32-bit Free-run timer ch.3, ch.4 and ch.5 do not support a DMA transfer by the interrupt.

\*6: There is no resource corresponding to the interrupt level.

\*7: It does not support a DMA transfer by the external low-voltage detection interrupt.



# **11. Electrical Characteristics**

## Absolute Maximum Ratings

Devenueden	Cumhal	Ra	ting	11	Demerke	
Parameter	Symbol	Min	Max	Unit	Remarks	
Power supply voltage *1,*2	V <sub>CC</sub>	V <sub>SS</sub> -0.3	V <sub>SS</sub> +6.0	V		
Analog power supply voltage * <sup>1,*2</sup>	AV <sub>CC</sub>	V <sub>SS</sub> -0.3	V <sub>SS</sub> +6.0	V	AVRH ≤ AV <sub>CC</sub> ≤ V <sub>CC</sub>	
Analog reference voltage *1	AVRH	V <sub>SS</sub> -0.3	V <sub>SS</sub> +6.0	V	AVRH ≤ AV <sub>CC</sub>	
Input voltage *1	VI	V <sub>SS</sub> -0.3	V <sub>CC</sub> +0.3	V		
Analog pin input voltage *1	V <sub>IA5</sub>	V <sub>SS</sub> -0.3	V <sub>CC</sub> +0.3	V		
Output voltage * <sup>1</sup>	Vo	V <sub>SS</sub> -0.3	V <sub>CC</sub> +0.3	V		
Maximum clamp current	I <sub>CLAMP</sub>	-	4.0	mA	*6	
Total maximum clamp current	ΣII <sub>CLAMP</sub>	-	20	mA	*6	
"I " lovel meximum output current * <sup>3</sup>	I <sub>OL1</sub>	-	15	mA		
	I <sub>OL2</sub>	-	30	mA		
"I " lovel everge output ourrest * <sup>4</sup>	IOLAV1	-	4	mA	*9	
	I <sub>OLAV2</sub>	-	12	mA	*10	
"I " lovel total output ourrest * <sup>5</sup>	ΣI <sub>OL1</sub>	-	100	mA		
	ΣI <sub>OL2</sub>	-	120	mA		
"I-I" lovel maximum output ourrent* <sup>3</sup>	I <sub>OH1</sub>	-	-15	mA		
H level maximum output current	I <sub>OH2</sub>	-	-30	mA		
	IOHAV1	-	-4	mA	*9	
H level average output current	I <sub>OHAV2</sub>	-	-12	mA	*10	
"I-I" lovel total output ourrent * <sup>5</sup>	ΣI <sub>OH1</sub>	-	-100	mA		
H level total output current	ΣI <sub>OH2</sub>	-	-120	mA		
Power $T_A$ : -40°C to +105°C	<b>D</b>	-	882	mW	*8	
consumption T <sub>A</sub> : -40°C to +125°C	PD	_	675	mW	*8	
	<b>–</b>	-40	+105	°C		
	IA	-40	+125	°C	*7	
Storage temperature	Tstg	-55	+150	°C		

\*1: These parameters are based on the condition that  $V_{SS}$ =AV<sub>SS</sub>=0.0V

\*2: Caution must be taken that AV<sub>CC</sub>, AVRH do not exceed  $V_{CC}$  upon power-on and under other circumstances.

\*3: The maximum output current is defined as the value of the peak current flowing through any one of the corresponding pins.

\*4: The average output current is defined as the value of the average current flowing through any one of the corresponding pins for a 10 ms period. The average value is the operation current × the operation ratio.

\*5: The total output current is defined as the maximum current value flowing through all of corresponding pins.

- \*6: · Corresponding pins: all general-purpose ports except P035, 041, 093, 122.
  - · Use within recommended operating conditions.
    - · Use at DC voltage (current).
    - · The + B signal should always be applied by connecting a limiting resistor between the + B signal and the microcontroller.
    - The value of the limiting resistor should be set so that the current input to the microcontroller pin does not exceed rated values at any time regardless of instantaneously or constantly when the + B signal is input.
    - Note that when the microcontroller drive current is low, such as in the low power consumption modes, the + B input potential can increase the potential at the V<sub>CC</sub> pin via a protective diode, possibly affecting other devices.
    - Note that if the + B signal is input when the microcontroller is off (not fixed at 0 V), since the power is supplied through the pin, the microcontroller may operate incompletely.
    - Note that if the +B signal is input at power-on, since the power is supplied through the pin, the power-on reset may not function in the power supply voltage.
    - · Do not leave + B input pins open.

\*7: When it is used under this condition, contact your sales representative.



(3) Power-on Conditions

(3-1) [MB9152xxxB/MB9152xxxC/MB9152xxxD]

(T<sub>A</sub>: -40°C to +125°C, V<sub>SS</sub>=0.0V)

Deremeter	Symbol	Pin	Pin Conditions		Value			Bomorko	
Parameter	name Conditions Min Typ		Мах	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	toff	Vcc	_	50	-	_	ms	*2	
Power ramp rate	dV/dt	V <sub>cc</sub>	VCC: 0.2V to 2.376V	_	_	4	mV/µs	*3	
C pin voltage at Power-on	_	С	_	_	_	60	mV	*4	

\*1: This spec is at 4mV/µs of power ramp rate. If the power ramp rate is faster than 4mV/µs, there is the possibility to generate or release after the power supply voltage has exceeded the detection voltage range.

\*2: Vcc must be held below 0.2V for a minimum period of  $t_{OFF}$ .

\*3: Power-on can detect by satisfying power ramp rate when power off time is not satisfied.

\*4: C-pin voltage is below 60 mV when VCC is turned on again.

Note:

When using MB91F52xxxB/C, either \*2 or \*3 or \*4 must be satisfied. When neither \*2 nor \*3 nor \*4 can be satisfied, use MB91F52xxxD and assert external reset (RSTX) at power-up and at any brownout event.





Demokratar	O male al	Dia warra	Value		Value	Demarka		
Parameter	Symbol	Pin name	Conditions	Min	Max	Unit	Kemarks	
SCS↓→SCK↑ setup time	t <sub>CSSE</sub>	SCK1 to SCK11 SCS1 to SCS3, SCS40 to SCS43,		3t <sub>CPP</sub> +30	-	ns		
SCK↓→SCS↑ hold time	t <sub>CSHE</sub>	SCS50 to SCS53, SCS60 to SCS63, SCS70 to SCS73, SCS8 to SCS11		+0	-	ns		
SCS deselect time	tcsde	SCS1 to SCS3, SCS40 to SCS43, SCS50 to SCS53, SCS60 to SCS63, SCS70 to SCS73, SCS8 to SCS11	-	3t <sub>CPP</sub> +30	-	ns	External shift clock mode output pin:	
SCS↓→SOT delay time	SCS↓→SOT         tost         SCS1, SCS2,           Belay time         SCS1, SCS0 to SCS53,         SCS60 to SCS63,           SCS↓→SOT         tost         SCS1, SCS0 to SCS53,           SCS↓→SOT         SCS1, SCS0 to SCS63,         SCS70 to SCS73,           SCS1, SCS0 to SCS11         SOT1, SOT2,         SOT5 to SOT11           SCS3, SCS40 to SCS43         SOT3, SOT4         SOT3, SOT4		-	40	ns			
		SCS3, SCS40 to SCS43 SOT3 , SOT4		-	300	ns		
SCS↑→SOT delay time	tdee	SCS1 to SCS3, SCS40 to SCS43, SCS50 to SCS53, SCS60 to SCS63, SCS70 to SCS73, SCS8 to SCS11 SOT1 to SOT11	-	+0	-	ns	External shift clock mode output pin: C∟=50pF	
SCK↑→SCS↓ clock switch time	tscc	SCK1, SCK2, SCK5 to SCK11 SCS1, SCS2, SCS50 to SCS53, SCS60 to SCS63, SCS70 to SCS73, SCS8 to SCS11	-	3t <sub>CPP</sub> -10	3t <sub>CPP</sub> +50	ns	Internal shift clock mode Round operation output pin:	
		SCK3 , SCK4 SCS3 , SCS40 to SCS43		3t <sub>CPP</sub> -300	3t <sub>CPP</sub> +50	ns	C∟=50pF	

\*1: t<sub>CSSU</sub> =SCSTR:CSSU7-0×Serial chip select timing operating clock

\*2: t<sub>CSHD</sub>=SCSTR:CSHD7-0×Serial chip select timing operating clock

\*3: t<sub>CSDS</sub>=SCSTR:CSDS15-0×Serial chip select timing operating clock

Regardless of the deselect time setting, once after the serial chip select pin becomes inactive, it will take at least five peripheral bus clock cycles to be active again

Please see the hardware manual for details of above-mentioned \*1,\*2, and \*3









## (5) Timer input timing

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

Paramotor	Symbol	Pin name	Conditions	Va	lue	Unit	Remarks
Parameter				Min	Мах		
Input pulse width	tтıwн, t <sub>тiwL</sub>	TIN0 to TIN7 ICU0 to ICU9 FRCK0 to FRCK5 TIOA0, TIOA1, TIOB0, TIOB1, AIN0, AIN1, BIN0, BIN1, ZIN0, ZIN1	_	4t <sub>CPP</sub>	_	ns	



# (6) Trigger input timing

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

Baramotor	Symbol	Pin name	Conditions	Va	lue	Unit	Remarks
Faraineter				Min	Мах		
Input pulse width	t <sub>TRGH,</sub>	INT0 to INT15, ADTG,		5t <sub>CPP</sub>	_	ns	
	t <sub>TRGL</sub>	RX0, RX1, RX2	_	1	_	μs	At stop mode





# (12) External bus I/F (ready) Timing

(T<sub>A</sub>: -40°C to +105°C, V<sub>CC</sub>=AV<sub>CC</sub>=5.0V  $\pm$  10%/V<sub>CC</sub>= AV<sub>CC</sub>=3.3V $\pm$ 0.3V, V<sub>SS</sub>=AV<sub>SS</sub>=0.0V) (external load capacitance 50pF)

Paramatar	Cumphiel	Din nome	Va	lue	Unit	Demorke	
Farameter	Symbol	Fill hame	Min	Max	Unit	Remarks	
Cycle time	t <sub>cyc</sub>	SYSCLK	50	-	ns	If using RDY, set SYSCLK to 20 MHz or less.	
RDY setup time → SYSCLK↑	t <sub>RDYS</sub>	SYSCLK, RDY	28	-	ns		
SYSCLK↑→ RDY hold time	t <sub>RDYH</sub>	SYSCLK, RDY	0	-	ns		







# 13. Ordering Information MB91F52xxxB<sup>\*1</sup>

Part number	Sub clock	CSV Initial value LVD Initial value		Package* <sup>2</sup>
MB91F526LWBPMC	B91F526LWBPMC Yes ON		ON	
MB91F526LYBPMC			OFF	
MB91F526LJBPMC		OFF	ON	
MB91F526LLBPMC			OFF	
MB91F525LWBPMC		ON	ON	
MB91F525LYBPMC			OFF	
MB91F525LJBPMC		OFF	ON	
MB91F525LLBPMC			OFF	
MB91F524LWBPMC		ON	ON	
MB91F524LYBPMC			OFF	
MB91F524LJBPMC		OFF	ON	
MB91F524LLBPMC			OFF	
MB91F523LWBPMC		ON	ON	
MB91F523LYBPMC			OFF	
MB91F523LJBPMC		OFF	ON	
MB91F523LLBPMC			OFF	
MB91F522LWBPMC		ON	ON	
MB91F522LYBPMC			OFF	
MB91F522LJBPMC		OFF	ON	
MB91F522LLBPMC			OFF	LQP ⋅ 176 pin,
MB91F526LSBPMC	None	ON	ON	Plastic
MB91F526LUBPMC			OFF	
MB91F526LHBPMC		OFF	ON	
MB91F526LKBPMC			OFF	
MB91F525LSBPMC		ON	ON	
MB91F525LUBPMC			OFF	
MB91F525LHBPMC		OFF	ON	
MB91F525LKBPMC			OFF	
MB91F524LSBPMC		ON	ON	
MB91F524LUBPMC			OFF	
MB91F524LHBPMC		OFF	ON	
MB91F524LKBPMC			OFF	
MB91F523LSBPMC		ON	ON	
MB91F523LUBPMC			OFF	
MB91F523LHBPMC		OFF	ON	
MB91F523LKBPMC			OFF	
MB91F522LSBPMC		ON	ON	
MB91F522LUBPMC			OFF	
MB91F522LHBPMC		OFF	ON	
MB91F522LKBPMC			OFF	





# 15. Ordering Information MB91F52xxxD

Part number	Sub clock	CSV Initial value	LVD Initial value	Package*
MB91F526LWDPMC	Yes	ON	ON	
MB91F526LJDPMC		OFF	ON	
MB91F525LWDPMC		ON	ON	
MB91F525LJDPMC		OFF	ON	
MB91F524LWDPMC		ON	ON	
MB91F524LJDPMC		OFF	ON	
MB91F523LWDPMC		ON	ON	
MB91F523LJDPMC		OFF	ON	
MB91F522LWDPMC		ON	ON	
MB91F522LJDPMC		OFF	ON	LQP・176 pin,
MB91F526LSDPMC	None	ON	ON	Plastic
MB91F526LHDPMC		OFF	ON	
MB91F525LSDPMC		ON	ON	
MB91F525LHDPMC		OFF	ON	
MB91F524LSDPMC		ON	ON	
MB91F524LHDPMC		OFF	ON	
MB91F523LSDPMC		ON	ON	
MB91F523LHDPMC		OFF	ON	
MB91F522LSDPMC		ON	ON	
MB91F522LHDPMC		OFF	ON	
MB91F526KWDPMC	Yes	ON	ON	
MB91F526KJDPMC		OFF	ON	
MB91F525KWDPMC		ON	ON	
MB91F525KJDPMC		OFF	ON	
MB91F524KWDPMC		ON	ON	
MB91F524KJDPMC		OFF	ON	
MB91F523KWDPMC		ON	ON	
MB91F523KJDPMC		OFF	ON	
MB91F522KWDPMC		ON	ON	
MB91F522KJDPMC		OFF	ON	LQS • 144 pin, (Lead pitch 0 5mm)
MB91F526KSDPMC	None	ON	ON	Plastic
MB91F526KHDPMC		OFF	ON	
MB91F525KSDPMC		ON	ON	
MB91F525KHDPMC		OFF	ON	
MB91F524KSDPMC		ON	ON	
MB91F524KHDPMC		OFF	ON	
MB91F523KSDPMC		ON	ON	
MB91F523KHDPMC		OFF	ON	
MB91F522KSDPMC		ON	ON	
MB91F522KHDPMC		OFF	ON	



Page	Section	Change Results							
		A List of "Pin Description" modified.							
		(Error)							
		Pin no.						Pin	
		64	80	100	120	144	176	Name	
								P025	
								WR1X	
		-	-	4	7	10	12	SOT4_1	
								PPG25_0	
								TIN2_0	
		-	_	-	-	-	13	P172	
								PPG38_1	
								P026	
			4	5	Q	11	14		
		-			ð	11	14	PPG26_0	
								TIN3_0	
								P027	
							11 14 12 15 - 16	A01	
		4	5	6	9	12		SCS40_1	
		4					15	PPG27_0	
								TOT0_0	
								RTO3_1	
20	■PIN Description	_	_	-	-	$\begin{array}{c c c c c c c c c c c c c c c c c c c $			
								PPG39_1	
								P030	
			-	7	10	13	17	AU2	
		_						PPG28_0	
								TOT1 0	
								P031	
					11			A03	
		-	6	8		14	18	SCS42_1	
								PPG29_0	
								TOT2_0	
								P032	
								A04	
		5	7	9	12	15	19	<u>50543_1</u>	
								TOT2 0	
								RTO2 1	
								P033	
								A05	
					13			PPG31 0	
		6	8	10		16	20	ICU3 3	
			_					TIN4_0	
								RT01_1	
								SCK3_2	





Page	Section	Change Results					
40	■I/O Circuit Type	Remarks for Type L in "I/O Circuit Types" modified as follow (Error) - Open-drain I/O - Output 25mA (NOD) - TTL input (Correct) - Open-drain I/O - Output 25mA (Nch open-drain) - TTL input					
40	■I/O Circuit Type	Remarks for Type M in "I/O Circuit Types" modified as follows: (Error) - CMOS hysteresis input - Pull-up resistor 50kΩ (5V cont) (Correct) - CMOS hysteresis input - Pull-up resistor 50kΩ					
121	■Interrupt Vector Table	The following sentence deleted from Interrupt vector 64pins. *5: It does not support the DMA transfer by the interrupt because of the RAM ECC bit error.					
124	■Interrupt Vector Table	The interrupt factor in Interrupt vector 80pin modified as follows: (Error) Base timer 1 IRQ0 Base timer 1 IRQ1 - (Correct) Base timer 1 IRQ0 Base timer 1 IRQ1 - - - - - - - - - - - - -					





Revision	ECN	Orig. of Change	Submission Date	Description of Change
				(1) 12-bit A/D Converter Electrical Characteristics:
				Added the value of "Total error".
				Total error value Min – Typ – Max ±12 LSB
				Corrected the value of "Zero transition voltage".
				Min AVRL+0.5LSB-20mV Max AVRL+0.5LSB+20mV
				Corrected the value of "Full-scale transition voltage".
				Min AVRH-13.5LSB Max AVRH+10.5LSB
				Added the following description.
				*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.
				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.
				Electrical Characteristics
				6.Flash memory:
				Parameter: Erase cycle*2/Data retain time
				Deleted the following description.
				Remarks :
				"Temperature at writing/erasing TJ<+105°C"
				Electrical Characteristics
				7.D/A Converter:
				Corrected the following description.
				Parameter : Power supply current
				Symbol IA Pin name AV <sub>cc</sub>
				Symbol IAH Pin name AV <sub>CC</sub>
				Symbol IA Pin name AVCC
				Symbol IAH Pin name AVCC
				Example Characteristics
				Corrected the following description. Watch mode
				Ordering Information
				Corrected the following description.
				ORDERING INFORMATION
				ORDERING INFORMATION MB91F52xxxB <sup>-1</sup>