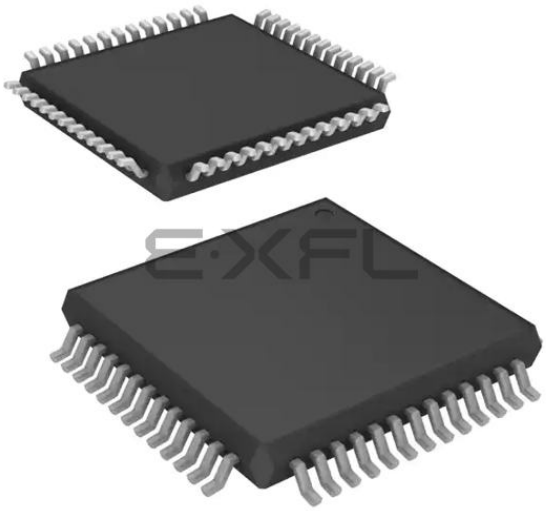

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Details	
Product Status	Obsolete
Core Processor	HCS12
Core Size	16-Bit
Speed	25MHz
Connectivity	EBI/EMI, SCI, SPI
Peripherals	POR, PWM, WDT
Number of I/O	35
Program Memory Size	128KB (128K x 8)
Program Memory Type	FLASH
EEPROM Size	-
RAM Size	4K x 8
Voltage - Supply (Vcc/Vdd)	2.35V ~ 5.5V
Data Converters	A/D 8x10b
Oscillator Type	Internal
Operating Temperature	-40°C ~ 105°C (TA)
Mounting Type	Surface Mount
Package / Case	52-LQFP
Supplier Device Package	52-TQFP (10x10)
Purchase URL	https://www.e-xfl.com/product-detail/nxp-semiconductors/mc9s12gc128vpber

1.2.2 Detailed Register Map

The detailed register map of the MC9S12C128 is listed in address order below.

0x0000–0x000F MEBI Map 1 of 3 (HCS12 Multiplexed External Bus Interface)

Address	Name		Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0x0000	PORTA	Read:	Bit 7	6	5	4	3	2	1	Bit 0
		Write:								
0x0001	PORTB	Read:	Bit 7	6	5	4	3	2	1	Bit 0
		Write:								
0x0002	DDRA	Read:	Bit 7	6	5	4	3	2	1	Bit 0
		Write:								
0x0003	DDRB	Read:	Bit 7	6	5	4	3	2	1	Bit 0
		Write:								
0x0004	Reserved	Read:	0	0	0	0	0	0	0	0
		Write:								
0x0005	Reserved	Read:	0	0	0	0	0	0	0	0
		Write:								
0x0006	Reserved	Read:	0	0	0	0	0	0	0	0
		Write:								
0x0007	Reserved	Read:	0	0	0	0	0	0	0	0
		Write:								
0x0008	PORTE	Read:	Bit 7	6	5	4	3	2	Bit 1	Bit 0
		Write:								
0x0009	DDRE	Read:	Bit 7	6	5	4	3	Bit 2	0	0
		Write:								
0x000A	PEAR	Read:	NOACCE	0	PIPOE	NECLK	LSTRE	RDWE	0	0
		Write:								
0x000B	MODE	Read:	MODC	MODB	MODA	0	IVIS	0	EMK	EME
		Write:								
0x000C	PUCR	Read:	PUPKE	0	0	PUPEE	0	0	PUPBE	PUPAE
		Write:								
0x000D	RDRIV	Read:	RDPK	0	0	RDPE	0	0	RDPB	RDPA
		Write:								
0x000E	EBICTL	Read:	0	0	0	0	0	0	0	ESTR
		Write:								
0x000F	Reserved	Read:	0	0	0	0	0	0	0	0
		Write:								

Address	Name		Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0x005F	TC7 (lo)	Read:	Bit 7	6	5	4	3	2	1	Bit 0
		Write:								
0x0060	PACTL	Read:	0	PAEN	PAMOD	PEDGE	CLK1	CLK0	PAOVI	PAI
		Write:								
0x0061	PAFLG	Read:	0	0	0	0	0	0	PAOVF	PAIF
		Write:								
0x0062	PACNT (hi)	Read:	Bit 15	14	13	12	11	10	9	Bit 8
		Write:								
0x0063	PACNT (lo)	Read:	Bit 7	6	5	4	3	2	1	Bit 0
		Write:								
0x0064	Reserved	Read:	0	0	0	0	0	0	0	0
		Write:								
0x0065	Reserved	Read:	0	0	0	0	0	0	0	0
		Write:								
0x0066	Reserved	Read:	0	0	0	0	0	0	0	0
		Write:								
0x0067	Reserved	Read:	0	0	0	0	0	0	0	0
		Write:								
0x0068	Reserved	Read:	0	0	0	0	0	0	0	0
		Write:								
0x0069	Reserved	Read:	0	0	0	0	0	0	0	0
		Write:								
0x006A	Reserved	Read:	0	0	0	0	0	0	0	0
		Write:								
0x006B	Reserved	Read:	0	0	0	0	0	0	0	0
		Write:								
0x006C	Reserved	Read:	0	0	0	0	0	0	0	0
		Write:								
0x006D	Reserved	Read:	0	0	0	0	0	0	0	0
		Write:								
0x006E	Reserved	Read:	0	0	0	0	0	0	0	0
		Write:								
0x006F	Reserved	Read:	0	0	0	0	0	0	0	0
		Write:								

0x0070–0x007F Reserved

Address	Name		Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0x0070–0x007F	Reserved	Read:	0	0	0	0	0	0	0	0
		Write:								

3.3.2.2 Initialization of Internal Registers Position Register (INITRG)

Module Base + 0x0011
Starting address location affected by INITRG register setting.

	7	6	5	4	3	2	1	0
R	0	REG14	REG13	REG12	REG11	0	0	0
W								
Reset	0	0	0	0	0	0	0	0

= Unimplemented or Reserved

Figure 3-4. Initialization of Internal Registers Position Register (INITRG)

Read: Anytime

Write: Once in normal and emulation modes and anytime in special modes

This register initializes the position of the internal registers within the on-chip system memory map. The registers occupy either a 1K byte or 2K byte space and can be mapped to any 2K byte space within the first 32K bytes of the system's address space.

Table 3-3. INITRG Field Descriptions

Field	Description
6:3 REG[14:11]	**Internal Register Map Position** — These four bits in combination with the leading zero supplied by bit 7 of INITRG determine the upper five bits of the base address for the system's internal registers (i.e., the minimum base address is 0x0000 and the maximum is 0x7FFF).

3.3.2.4 Miscellaneous System Control Register (MISC)

Module Base + 0x0013
Starting address location affected by INITRG register setting.

	7	6	5	4	3	2	1	0
R	0	0	0	0	EXSTR1	EXSTR0	ROMHM	ROMON
W								
Reset: Expanded or Emulation	0	0	0	0	1	1	0	—[1]
Reset: Peripheral or Single Chip	0	0	0	0	1	1	0	1
Reset: Special Test	0	0	0	0	1	1	0	0

1. The reset state of this bit is determined at the chip integration level.

= Unimplemented or Reserved

Figure 3-6. Miscellaneous System Control Register (MISC)

Read: Anytime

Write: As stated in each bit description

NOTE

Writes to this register take one cycle to go into effect.

This register initializes miscellaneous control functions.

Table 3-5. INITEE Field Descriptions

Field	Description
3:2 EXSTR[1:0]	**External Access Stretch Bits 1 and 0** Write: once in normal and emulation modes and anytime in special modes This two-bit field determines the amount of clock stretch on accesses to the external address space as shown in Table 3-6. In single chip and peripheral modes these bits have no meaning or effect.
1 ROMHM	**FLASH EEPROM or ROM Only in Second Half of Memory Map** Write: once in normal and emulation modes and anytime in special modes 0 The fixed page(s) of FLASH EEPROM or ROM in the lower half of the memory map can be accessed. 1 Disables direct access to the FLASH EEPROM or ROM in the lower half of the memory map. These physical locations of the FLASH EEPROM or ROM remain accessible through the program page window.
0 ROMON	**ROMON — Enable FLASH EEPROM or ROM** Write: once in normal and emulation modes and anytime in special modes This bit is used to enable the FLASH EEPROM or ROM memory in the memory map. 0 Disables the FLASH EEPROM or ROM from the memory map. 1 Enables the FLASH EEPROM or ROM in the memory map.

5.2 External Signal Description

Most interfacing with the interrupt sub-block is done within the core. However, the interrupt does receive direct input from the multiplexed external bus interface (MEBI) sub-block of the core for the $\overline{IRQ}$ and $\overline{XIRQ}$ pin data.

5.3 Memory Map and Register Definition

Detailed descriptions of the registers and associated bits are given in the subsections that follow.

5.3.1 Module Memory Map

Table 5-1. INT Memory Map

Address Offset	Use	Access
0x0015	Interrupt Test Control Register (ITCR)	R/W
0x0016	Interrupt Test Registers (ITEST)	R/W
0x001F	Highest Priority Interrupt (Optional) (HPRIO)	R/W

5.3.2 Register Descriptions

5.3.2.1 Interrupt Test Control Register

Module Base + 0x0015
Starting address location affected by INITRG register setting.

	7	6	5	4	3	2	1	0
R	0	0	0	WRTINT	ADR3	ADR2	ADR1	ADR0
W								
Reset	0	0	0	0	1	1	1	1

= Unimplemented or Reserved

Figure 5-2. Interrupt Test Control Register (ITCR)

Read: See individual bit descriptions

Write: See individual bit descriptions

Table 6-2. BDMSTS Field Descriptions

Field	Description
7 ENBDM	**Enable BDM** — This bit controls whether the BDM is enabled or disabled. When enabled, BDM can be made active to allow firmware commands to be executed. When disabled, BDM cannot be made active but BDM hardware commands are allowed. 0 BDM disabled 1 BDM enabled **Note:** ENBDM is set by the firmware immediately out of reset in special single-chip mode. In secure mode, this bit will not be set by the firmware until after the EEPROM and FLASH erase verify tests are complete.
6 BDMACT	**BDM Active Status** — This bit becomes set upon entering BDM. The standard BDM firmware lookup table is then enabled and put into the memory map. BDMACT is cleared by a carefully timed store instruction in the standard BDM firmware as part of the exit sequence to return to user code and remove the BDM memory from the map. 0 BDM not active 1 BDM active
5 ENTAG	**Tagging Enable** — This bit indicates whether instruction tagging in enabled or disabled. It is set when the TAGGO command is executed and cleared when BDM is entered. The serial system is disabled and the tag function enabled 16 cycles after this bit is written. BDM cannot process serial commands while tagging is active. 0 Tagging not enabled or BDM active 1 Tagging enabled
4 SDV	**Shift Data Valid** — This bit is set and cleared by the BDM hardware. It is set after data has been transmitted as part of a firmware read command or after data has been received as part of a firmware write command. It is cleared when the next BDM command has been received or BDM is exited. SDV is used by the standard BDM firmware to control program flow execution. 0 Data phase of command not complete 1 Data phase of command is complete
3 TRACE	**TRACE1 BDM Firmware Command is Being Executed** — This bit gets set when a BDM TRACE1 firmware command is first recognized. It will stay set as long as continuous back-to-back TRACE1 commands are executed. This bit will get cleared when the next command that is not a TRACE1 command is recognized. 0 TRACE1 command is not being executed 1 TRACE1 command is being executed

8.3.2 Register Descriptions

This section describes in address order all the ATD10B8C registers and their individual bits.

8.3.2.1 Reserved Register (ATDCTL0)

Module Base + 0x0000

	7	6	5	4	3	2	1	0
R	0	0	0	0	0	0	0	0
W								
Reset	0	0	0	0	0	0	0	0

= Unimplemented or Reserved

Figure 8-3. Reserved Register (ATDCTL0)

Read: Always read $00 in normal modes

Write: Unimplemented in normal modes

8.3.2.2 Reserved Register (ATDCTL1)

Module Base + 0x0001

	7	6	5	4	3	2	1	0
R	0	0	0	0	0	0	0	0
W								
Reset	0	0	0	0	0	0	0	0

= Unimplemented or Reserved

Figure 8-4. Reserved Register (ATDCTL1)

Read: Always read $00 in normal modes

Write: Unimplemented in normal modes

NOTE

Writing to this registers when in special modes can alter functionality.

Table 9-2. CRGFLG Field Descriptions (continued)

Field	Description
1 SCMIF	**Self-Clock Mode Interrupt Flag** — SCMIF is set to 1 when SCM status bit changes. This flag can only be cleared by writing a 1. Writing a 0 has no effect. If enabled (SCMIE=1), SCMIF causes an interrupt request. 0 No change in SCM bit. 1 SCM bit has changed.
0 SCM	**Self-Clock Mode Status Bit** — SCM reflects the current clocking mode. Writes have no effect. 0 MCU is operating normally with OSCCLK available. 1 MCU is operating in self-clock mode with OSCCLK in an unknown state. All clocks are derived from PLLCLK running at its minimum frequency f_{SCM}.

9.3.2.5 CRG Interrupt Enable Register (CRGINT)

This register enables CRG interrupt requests.

Module Base + 0x0004

	7	6	5	4	3	2	1	0
R	RTIE	0	0	LOCKIE	0	0	SCMIE	0
W								
Reset	0	0	0	0	0	0	0	0

= Unimplemented or Reserved

Figure 9-8. CRG Interrupt Enable Register (CRGINT)

Read: anytime

Write: anytime

Table 9-3. CRGINT Field Descriptions

Field	Description
7 RTIE	**Real-Time Interrupt Enable Bit** 0 Interrupt requests from RTI are disabled. 1 Interrupt will be requested whenever RTIF is set.
4 LOCKIE	**Lock Interrupt Enable Bit** 0 LOCK interrupt requests are disabled. 1 Interrupt will be requested whenever LOCKIF is set.
1 SCMIE	**Self-Clock Mode Interrupt Enable Bit** 0 SCM interrupt requests are disabled. 1 Interrupt will be requested whenever SCMIF is set.

10.3.2.4 MSCAN Bus Timing Register 1 (CANBTR1)

The CANBTR1 register configures various CAN bus timing parameters of the MSCAN module.

Module Base + 0x0003

	7	6	5	4	3	2	1	0
R W	SAMP	TSEG22	TSEG21	TSEG20	TSEG13	TSEG12	TSEG11	TSEG10
Reset:	0	0	0	0	0	0	0	0

Figure 10-7. MSCAN Bus Timing Register 1 (CANBTR1)

Read: Anytime
Write: Anytime in initialization mode (INITRQ = 1 and INITAK = 1)

Table 10-6. CANBTR1 Register Field Descriptions

Field	Description
7 SAMP	**Sampling** — This bit determines the number of CAN bus samples taken per bit time. 0 One sample per bit. 1 Three samples per bit(1). If SAMP = 0, the resulting bit value is equal to the value of the single bit positioned at the sample point. If SAMP = 1, the resulting bit value is determined by using majority rule on the three total samples. For higher bit rates, it is recommended that only one sample is taken per bit time (SAMP = 0).
6:4 TSEG2[2:0]	**Time Segment 2** — Time segments within the bit time fix the number of clock cycles per bit time and the location of the sample point (see Figure 10-43). Time segment 2 (TSEG2) values are programmable as shown in Table 10-7.
3:0 TSEG1[3:0]	**Time Segment 1** — Time segments within the bit time fix the number of clock cycles per bit time and the location of the sample point (see Figure 10-43). Time segment 1 (TSEG1) values are programmable as shown in Table 10-8.

1. In this case, PHASE_SEG1 must be at least 2 time quanta (Tq).

Table 10-7. Time Segment 2 Values

TSEG22	TSEG21	TSEG20	Time Segment 2
0	0	0	1 Tq clock cycle(1)
0	0	1	2 Tq clock cycles
:	:	:	:
1	1	0	7 Tq clock cycles
1	1	1	8 Tq clock cycles

1. This setting is not valid. Please refer to Table 10-34 for valid settings.

12.3.2 Register Descriptions

The following paragraphs describe in detail all the registers and register bits in the PWM8B6CV1 module.

Register Name		Bit 7	6	5	4	3	2	1	Bit 0
0x0000 PWME	R	0	0	PWME5	PWME4	PWME3	PWME2	PWME1	PWME0
	W								
0x0001 PWMPOL	R	0	0	PPOL5	PPOL4	PPOL3	PPOL2	PPOL1	PPOL0
	W								
0x0002 PWMCLK	R	0	0	PCLK5	PCLK4	PCLK3	PCLK2	PCLK1	PCLK0
	W								
0x0003 PWMPRCLK	R	0	PCKB2	PCKB1	PCKB0	0	PCKA2	PCKA1	PCKA0
	W								
0x0004 PWMCAE	R	0	0	CAE5	CAE4	CAE2	CAE2	CAE1	CAE0
	W								
0x0005 PWMCTL	R	0	CON45	CON23	CON01	PSWAI	PFRZ	0	0
	W								
0x0006 PWMTST	R	0	0	0	0	0	0	0	0
	W								
0x0007 PWMPRSC	R	0	0	0	0	0	0	0	0
	W								
0x0008 PWMSCLA	R	Bit 7	6	5	4	3	2	1	Bit 0
	W								
0x0009 PWMSCLB	R	Bit 7	6	5	4	3	2	1	Bit 0
	W								
0x000A PWMSCNTA	R	0	0	0	0	0	0	0	0
	W								
0x000B PWMSCNTB	R	0	0	0	0	0	0	0	0
	W								
0x000C PWMCNT0	R	Bit 7	6	5	4	3	2	1	Bit 0
	W	0	0	0	0	0	0	0	0
0x000D PWMCNT1	R	Bit 7	6	5	4	3	2	1	Bit 0
	W	0	0	0	0	0	0	0	0
0x000E PWMCNT2	R	Bit 7	6	5	4	3	2	1	Bit 0
	W	0	0	0	0	0	0	0	0

= Unimplemented or Reserved

Figure 12-2. PWM Register Summary

- The channel is disabled

In this way, the output of the PWM will always be either the old waveform or the new waveform, not some variation in between. If the channel is not enabled, then writes to the period register will go directly to the latches as well as the buffer.

NOTE

Reads of this register return the most recent value written. Reads do not necessarily return the value of the currently active period due to the double buffering scheme.

Reference Section 12.4.2.3, “PWM Period and Duty,” for more information.

To calculate the output period, take the selected clock source period for the channel of interest (A, B, SA, or SB) and multiply it by the value in the period register for that channel:

- Left aligned output (CAEx = 0)
- PWMx period = channel clock period * PWMPERx center aligned output (CAEx = 1)
- PWMx period = channel clock period * (2 * PWMPERx)

For boundary case programming values, please refer to Section 12.4.2.8, “PWM Boundary Cases.”

Module Base + 0x0012

	7	6	5	4	3	2	1	0
R W	Bit 7	6	5	4	3	2	1	Bit 0
Reset	0	0	0	0	0	0	0	0

Figure 12-21. PWM Channel Period Registers (PWMPER0)

Module Base + 0x0013

	7	6	5	4	3	2	1	0
R W	Bit 7	6	5	4	3	2	1	Bit 0
Reset	0	0	0	0	0	0	0	0

Figure 12-22. PWM Channel Period Registers (PWMPER1)

Module Base + 0x0014

	7	6	5	4	3	2	1	0
R W	Bit 7	6	5	4	3	2	1	Bit 0
Reset	0	0	0	0	0	0	0	0

Figure 12-23. PWM Channel Period Registers (PWMPER2)

13.4.4.2 Character Reception

During an SCI reception, the receive shift register shifts a frame in from the **Rx input** signal. The SCI data register is the read-only buffer between the internal data bus and the receive shift register.

After a complete frame shifts into the receive shift register, the data portion of the frame transfers to the SCI data register. The receive data register full flag, RDRF, in SCI status register 1 (SCISR1) becomes set, indicating that the received byte can be read. If the receive interrupt enable bit, RIE, in SCI control register 2 (SCICR2) is also set, the RDRF flag generates an RDRF interrupt request.

13.4.4.3 Data Sampling

The receiver samples the **Rx input** signal at the RT clock rate. The RT clock is an internal signal with a frequency 16 times the baud rate. To adjust for baud rate mismatch, the RT clock (see Figure 13-13) is re-synchronized:

- After every start bit
- After the receiver detects a data bit change from logic 1 to logic 0 (after the majority of data bit samples at RT8, RT9, and RT10 returns a valid logic 1 and the majority of the next RT8, RT9, and RT10 samples returns a valid logic 0)

To locate the start bit, data recovery logic does an asynchronous search for a logic 0 preceded by three logic 1s.When the falling edge of a possible start bit occurs, the RT clock begins to count to 16.

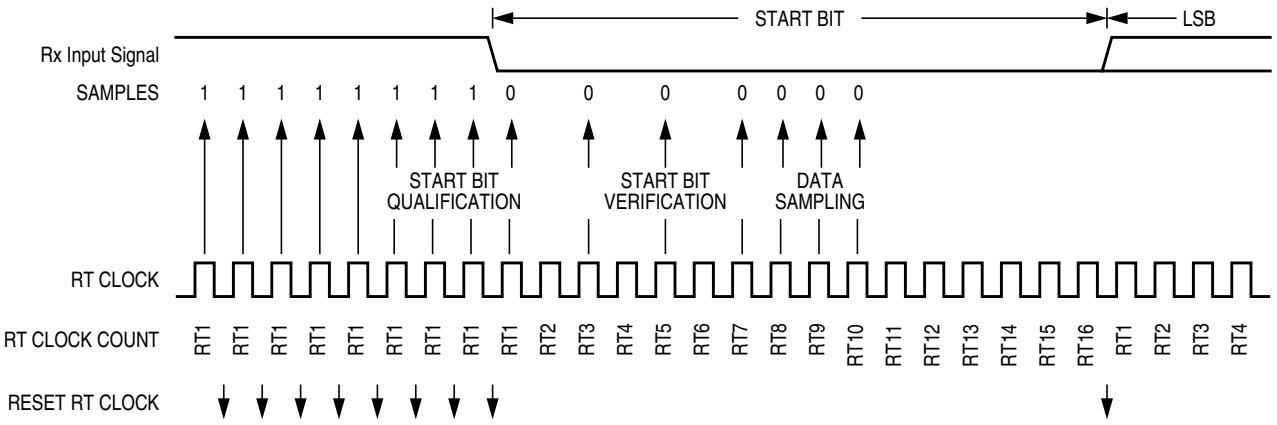


Figure 13-13. Receiver Data Sampling

To verify the start bit and to detect noise, data recovery logic takes samples at RT3, RT5, and RT7. Table 13-11 summarizes the results of the start bit verification samples.

Table 13-11. Start Bit Verification

RT3, RT5, and RT7 Samples	Start Bit Verification	Noise Flag
000	Yes	0
001	Yes	1
010	Yes	1
011	No	0

13.5.2 Interrupt Operation

13.5.2.1 System Level Interrupt Sources

There are five interrupt sources that can generate an SCI interrupt in to the CPU. They are listed in Table 13-14.

Table 13-14. SCI Interrupt Source

Interrupt Source	Flag	Local Enable
Transmitter	TDRE	TIE
Transmitter	TC	TCIE
Receiver	RDRF	RIE
	OR	
Receiver	IDLE	ILIE

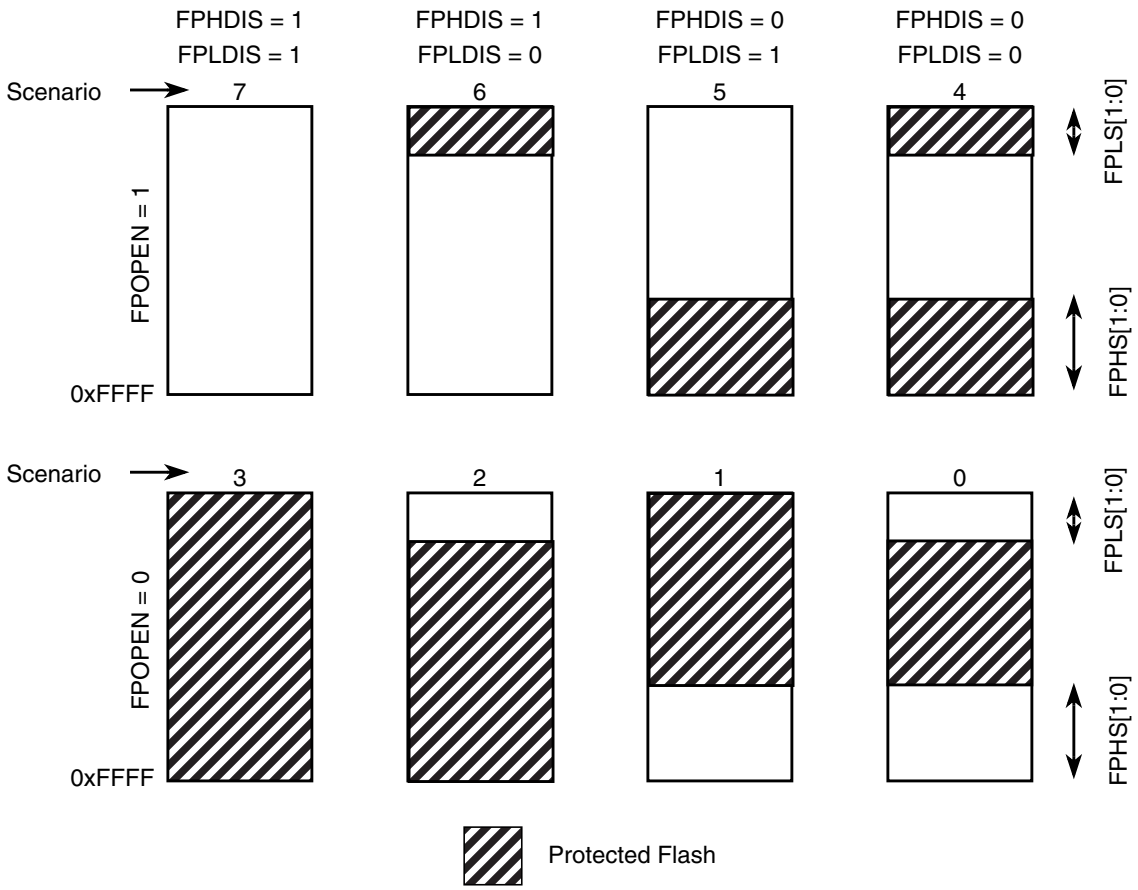


Figure 18-9. Flash Protection Scenarios

18.3.2.5.1 Flash Protection Restrictions

The general guideline is that protection can only be added, not removed. All valid transitions between Flash protection scenarios are specified in Table 18-12. Any attempt to write an invalid scenario to the FPROT register will be ignored and the FPROT register will remain unchanged. The contents of the FPROT register reflect the active protection scenario.

Table 18-12. Flash Protection Scenario Transitions

From Protection Scenario	To Protection Scenario[1]							
	0	1	2	3	4	5	6	7
0	X	X	X	X				
1		X		X				
2			X	X				
3				X				
4				X	X			
5			X	X	X	X		

Table 19-5. FSEC Field Descriptions

Field	Description
7–6 KEYEN[1:0]	**Backdoor Key Security Enable Bits** — The KEYEN[1:0] bits define the enabling of the backdoor key access to the Flash module as shown in Table 19-6.
5–2 NV[5:2]	**Nonvolatile Flag Bits** — The NV[5:2] bits are available to the user as nonvolatile flags.
1–0 SEC[1:0]	**Flash Security Bits** — The SEC[1:0] bits define the security state of the MCU as shown in Table 19-7. If the Flash module is unsecured using backdoor key access, the SEC[1:0] bits are forced to 1:0.

Table 19-6. Flash KEYEN States

KEYEN[1:0]	Status of Backdoor Key Access
00	DISABLED
01(1)	DISABLED
10	ENABLED
11	DISABLED

1. Preferred KEYEN state to disable Backdoor Key Access.

Table 19-7. Flash Security States

SEC[1:0]	Status of Security
00	Secured
01(1)	Secured
10	Unsecured
11	Secured

1. Preferred SEC state to set MCU to secured state.

The security function in the Flash module is described in Section 19.4.3, “Flash Module Security”.

19.3.2.3 RESERVED1

This register is reserved for factory testing and is not accessible to the user.

Module Base + 0x0002

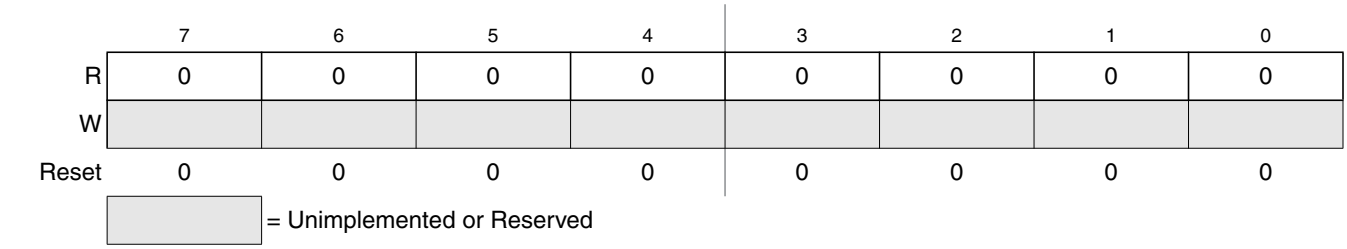


Figure 19-8. RESERVED1

All bits read 0 and are not writable.

19.4.1.2 Command Write Sequence

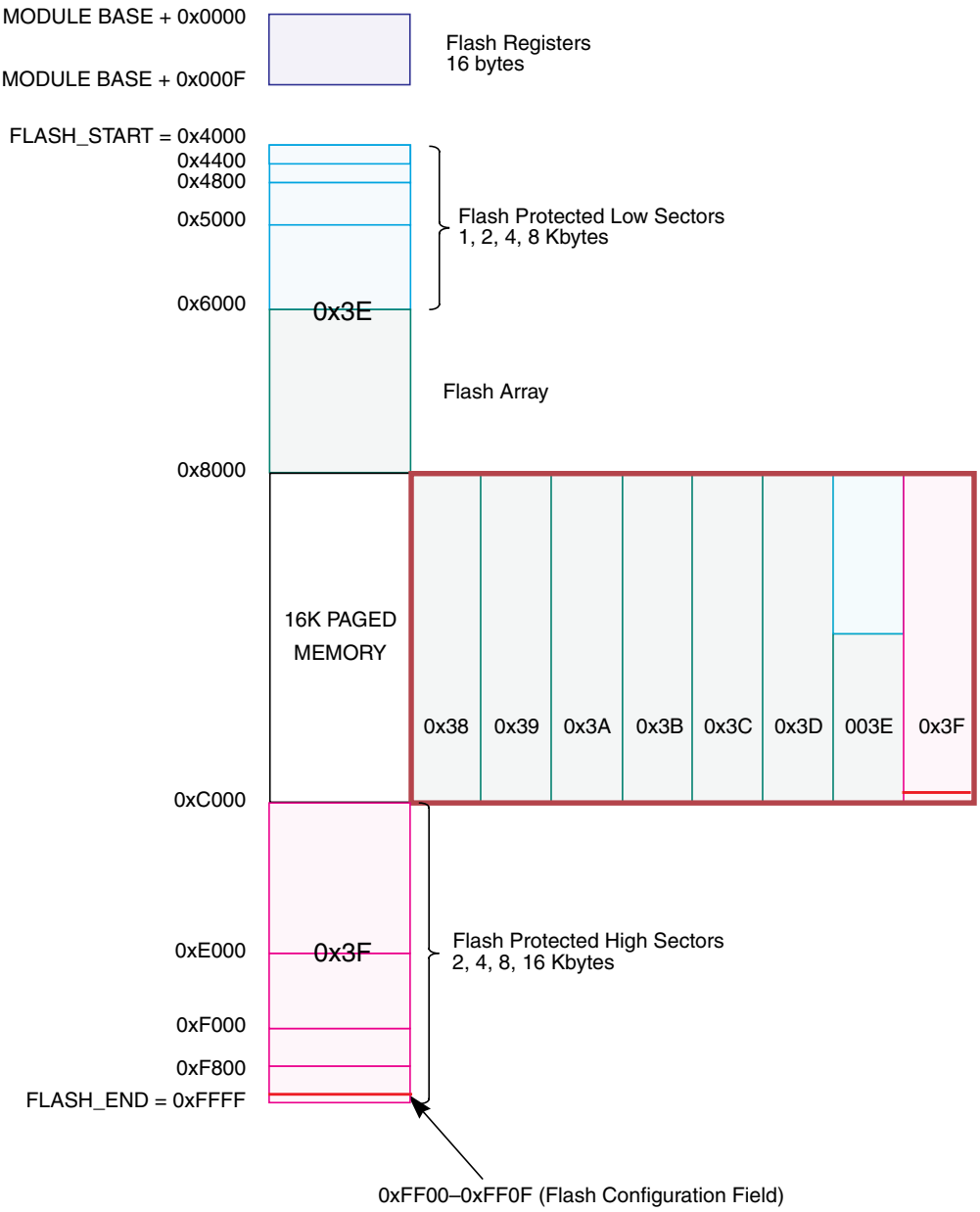
The Flash command controller is used to supervise the command write sequence to execute program, erase, and erase verify algorithms.

Before starting a command write sequence, the ACCERR and PVIOL flags in the FSTAT register must be clear and the CBEIF flag should be tested to determine the state of the address, data, and command buffers. If the CBEIF flag is set, indicating the buffers are empty, a new command write sequence can be started. If the CBEIF flag is clear, indicating the buffers are not available, a new command write sequence will overwrite the contents of the address, data, and command buffers.

A command write sequence consists of three steps which must be strictly adhered to with writes to the Flash module not permitted between the steps. However, Flash register and array reads are allowed during a command write sequence. The basic command write sequence is as follows:

1. Write to a valid address in the Flash array memory.
2. Write a valid command to the FCMD register.
3. Clear the CBEIF flag in the FSTAT register by writing a 1 to CBEIF to launch the command.

The address written in step 1 will be stored in the FADDR registers and the data will be stored in the FDATA registers. When the CBEIF flag is cleared in step 3, the CCIF flag is cleared by the Flash command controller indicating that the command was successfully launched. For all command write sequences, the CBEIF flag will set after the CCIF flag is cleared indicating that the address, data, and command buffers are ready for a new command write sequence to begin. A buffered command will wait for the active operation to be completed before being launched. Once a command is launched, the completion of the command operation is indicated by the setting of the CCIF flag in the FSTAT register. The CCIF flag will set upon completion of all active and buffered commands.



Note: 0x38–0x3F correspond to the PPAGE register content

Figure 20-3. Flash Memory Map

20.3.2 Register Descriptions

The Flash module contains a set of 16 control and status registers located between module base + 0x0000 and 0x000F. A summary of the Flash module registers is given in Figure 20-5. Detailed descriptions of each register bit are provided.

Register Name		Bit 7	6	5	4	3	2	1	Bit 0
0x0000 FCLKDIV	R	FDIVLD	PRDIV8	FDIV5	FDIV4	FDIV3	FDIV2	FDIV1	FDIV0
	W								
0x0001 FSEC	R	KEYEN1	KEYEN0	NV5	NV4	NV3	NV2	SEC1	SEC0
	W								
0x0002 RESERVED1 (1)	R	0	0	0	0	0	0	0	0
	W								
0x0003 FCNFG	R	CBEIE	CCIE	KEYACC	0	0	0	0	0
	W								
0x0004 FPROT	R	FPOPEN	NV6	FPHDIS	FPHS1	FPHS0	FPLDIS	FPLS1	FPLS0
	W								
0x0005 FSTAT	R	CBEIF	CCIF	PVIOL	ACCERR	0	BLANK	FAIL	DONE
	W								
0x0006 FCMD	R	0	CMDB6	CMDB5	0	0	CMDB2	0	CMDB0
	W								
0x0007 RESERVED2[1]	R	0	0	0	0	0	0	0	0
	W								
0x0008 FADDRHI[1]	R	FABHI							
	W								
0x0009 FADDRLO[1]	R	FABLO							
	W								
0x000A FDATAHI[1]	R	FDHI							
	W								
0x000B FDATALO[1]	R	FDLO							
	W								
0x000C RESERVED3[1]	R	0	0	0	0	0	0	0	0
	W								
0x000D RESERVED4[1]	R	0	0	0	0	0	0	0	0
	W								
0x000E RESERVED5[1]	R	0	0	0	0	0	0	0	0
	W								
0x000F RESERVED6[1]	R	0	0	0	0	0	0	0	0
	W								

= Unimplemented or Reserved

Figure 20-5. Flash Register Summary

1. Intended for factory test purposes only.

Appendix E
Ordering Information

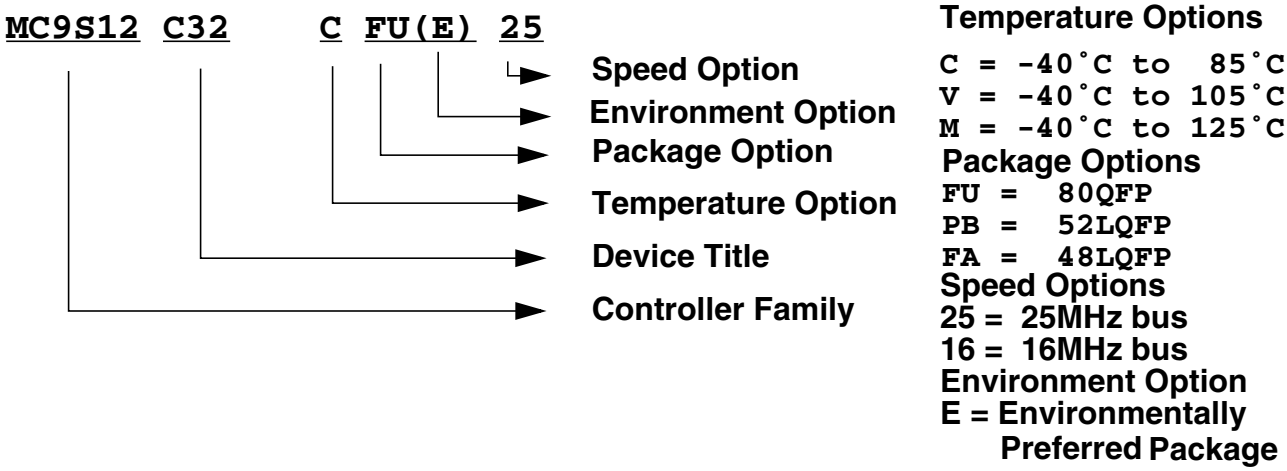


Figure E-1. Order Part number Coding

Table E-1. lists C-family part number coding based on package, speed and temperature and die options.

Table E-2. lists CG-family part number coding based on package, speed and temperature and die options.

Table E-1. MC9S12C-Family / MC9S12GC-Family Part Number Coding

Part Number	Mask[1] set	Temp.	Package	Speed	Die Type	Flash	RAM	I/O[2], [3]
MC9S12C128CFA	XL09S/0M66G	-40˚C, 85˚C	48LQFP	25MHz	C128 die	128K	4K	31
MC9S12C128CPB	XL09S/0M66G	-40˚C, 85˚C	52LQFP	25MHz	C128 die	128K	4K	35
MC9S12C128CFU	XL09S/0M66G	-40˚C, 85˚C	80QFP	25MHz	C128 die	128K	4K	60
MC9S12C128VFA	XL09S/0M66G	-40˚C,105˚C	48LQFP	25MHz	C128 die	128K	4K	31
MC9S12C128VPB	XL09S/0M66G	-40˚C,105˚C	52LQFP	25MHz	C128 die	128K	4K	35
MC9S12C128VFU	XL09S/0M66G	-40˚C, 105˚C	80QFP	25MHz	C128 die	128K	4K	60
MC9S12C128MFA	XL09S/0M66G	-40˚C,125˚C	48LQFP	25MHz	C128 die	128K	4K	31
MC9S12C128MPB	XL09S/0M66G	-40˚C,125˚C	52LQFP	25MHz	C128 die	128K	4K	35
MC9S12C128MFU	XL09S/0M66G	-40˚C, 125˚C	80QFP	25MHz	C128 die	128K	4K	60
MC9S12C96CFA	XL09S/0M66G	-40˚C, 85˚C	48LQFP	25MHz	C128 die	96K	4K	31
MC9S12C96CPB	XL09S/0M66G	-40˚C, 85˚C	52LQFP	25MHz	C128 die	96K	4K	35
MC9S12C96CFU	XL09S/0M66G	-40˚C, 85˚C	80QFP	25MHz	C128 die	96K	4K	60
MC9S12C96VFA	XL09S/0M66G	-40˚C,105˚C	48LQFP	25MHz	C128 die	96K	4K	31
MC9S12C96VPB	XL09S/0M66G	-40˚C,105˚C	52LQFP	25MHz	C128 die	96K	4K	35
MC9S12C96VFU	XL09S/0M66G	-40˚C, 105˚C	80QFP	25MHz	C128 die	96K	4K	60
MC9S12C96MFA	XL09S/0M66G	-40˚C,125˚C	48LQFP	25MHz	C128 die	96K	4K	31
MC9S12C96MPB	XL09S/0M66G	-40˚C,125˚C	52LQFP	25MHz	C128 die	96K	4K	35
MC9S12C96MFU	XL09S/0M66G	-40˚C, 125˚C	80QFP	25MHz	C128 die	96K	4K	60
MC9S12C64CFA	XL09S/0M66G	-40˚C, 85˚C	48LQFP	25MHz	C128 die	64K	4K	31
MC9S12C64CPB	XL09S/0M66G	-40˚C, 85˚C	52LQFP	25MHz	C128 die	64K	4K	35