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16/32-Bit

Architecture

XC2361E, XC2367E

16/32-Bit Single-Chip Microcontroller
with 32-Bit Performance

XC2000 Family Derivatives / Premium Line

Data Sheet

V1.3 2014-06

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XC236xE Data Sheet

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9	Added XC2361E-136FxxLR to Basic Device Types
10	Moved XC2367E-136FxxL from Basic to Special Device Types. Added XC2367E-136FxxLR to Special Device Types
127	Added package type PG-LQFP-100-15

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Table of Contents

1	Summary of Features	7
1.1	Basic Device Types	9
1.2	Special Device Types	10
1.3	Definition of Feature Variants	11
2	General Device Information	12
2.1	Pin Configuration and Definition	13
2.2	Identification Registers	40
3	Functional Description	41
3.1	Memory Subsystem and Organization	41
3.2	External Bus Controller	46
3.3	Central Processing Unit (CPU)	47
3.4	Memory Protection Unit (MPU)	49
3.5	Memory Checker Module (MCHK)	49
3.6	Interrupt System	50
3.7	On-Chip Debug Support (OCDS)	51
3.8	Capture/Compare Unit (CC2)	52
3.9	Capture/Compare Units CCU6x	54
3.10	General Purpose Timer (GPT12E) Unit	56
3.11	Real Time Clock	60
3.12	A/D Converters	62
3.13	Universal Serial Interface Channel Modules (USIC)	63
3.14	MultiCAN Module	65
3.15	System Timer	66
3.16	Watchdog Timer	66
3.17	Clock Generation	67
3.18	Parallel Ports	68
3.19	Instruction Set Summary	69
4	Electrical Parameters	72
4.1	General Parameters	72
4.1.1	Absolut Maximum Rating Conditions	72
4.1.2	Operating Conditions	73
4.1.3	Voltage Range Definition	75
4.1.4	Pad Timing Definition	75
4.1.5	Parameter Interpretation	75
4.2	DC Parameters	76
4.2.1	DC Parameters for Upper Voltage Area	78
4.2.2	DC Parameters for Lower Voltage Area	80
4.2.3	Power Consumption	82
4.3	Analog/Digital Converter Parameters	87

Table of Contents

4.4	System Parameters	92
4.5	Flash Memory Parameters	95
4.6	AC Parameters	97
4.6.1	Testing Waveforms	97
4.6.2	Definition of Internal Timing	98
4.6.2.1	Phase Locked Loop (PLL)	99
4.6.2.2	Wakeup Clock	103
4.6.2.3	Selecting and Changing the Operating Frequency	103
4.6.3	External Clock Input Parameters	104
4.6.4	Pad Properties	106
4.6.5	External Bus Timing	109
4.6.5.1	Bus Cycle Control with the READY Input	115
4.6.6	Synchronous Serial Interface Timing	117
4.6.7	Debug Interface Timing	121
5	Package and Reliability	127
5.1	Packaging	127
5.2	Thermal Considerations	129
5.3	Quality Declarations	130

**16/32-Bit Single-Chip Microcontroller
with 32-Bit Performance
XC236xE (XC2000 Family)**

1 Summary of Features

For a quick overview and easy reference, the features of the XC236xE are summarized here.

- High-performance CPU with five-stage pipeline and MPU
 - 7.8 ns instruction cycle at 128 MHz CPU clock (single-cycle execution)
 - One-cycle 32-bit addition and subtraction with 40-bit result
 - One-cycle multiplication (16 × 16 bit)
 - Background division (32 / 16 bit) in 21 cycles
 - One-cycle multiply-and-accumulate (MAC) instructions
 - Enhanced Boolean bit manipulation facilities
 - Zero-cycle jump execution
 - Additional instructions to support HLL and operating systems
 - Register-based design with multiple variable register banks
 - Fast context switching support with two additional local register banks
 - 16 Kbytes of two-way set-associative Instruction Cache (ICache)
 - 16 Mbytes total linear address space for code and data
 - 1024 Bytes on-chip special function register area (C166 Family compatible)
 - Integrated Memory Protection Unit (MPU)
- Interrupt system with 16 priority levels providing 112 interrupt nodes
 - Selectable external inputs for interrupt generation and wake-up
 - Fastest sample-rate 7.8 ns
- Sixteen-channel interrupt-driven single-cycle data transfer with Peripheral Event Controller (PEC), 24-bit pointers cover total address space
- Clock generation from internal or external clock sources, using on-chip PLL or prescaler
- Hardware CRC-Checker with Programmable Polynomial to Supervise On-Chip Memory Areas
- On-chip memory modules
 - 8 Kbytes on-chip stand-by RAM (SBRAM)
 - 2 Kbytes on-chip dual-port RAM (DPRAM)
 - 24 Kbytes on-chip data SRAM (DSRAM)
 - Up to 64 Kbytes on-chip program/data SRAM (PSRAM)
 - Up to 1 088 Kbytes on-chip program memory (Flash memory)
 - Memory content protection through Error Correction Code (ECC)
- On-Chip Peripheral Modules

Summary of Features

- Multi-functional general purpose timer unit with 5 timers
- 16-channel general purpose capture/compare unit (CAPCOM2)
- Up to four capture/compare units for flexible PWM signal generation (CCU6x)
- Two synchronizable 12-bit A/D Converters with up to 24 channels, conversion time below 1 μ s, optional data preprocessing (data reduction, range check), broken wire detection
- Up to 10 serial interface channels to be used as UART, LIN, high-speed synchronous channel (SPI), IIC bus interface (10-bit addressing, 400 kbit/s), IIS interface
- On-chip MultiCAN interface (Rev. 2.0B active) with up to 64 message objects (Full CAN/Basic CAN) on up to 3 CAN nodes and gateway functionality
- On-chip system timer and on-chip real time clock
- Up to 12 Mbytes external address space for code and data
 - Programmable external bus characteristics for different address ranges
 - Multiplexed or demultiplexed external address/data buses
 - Selectable address bus width
 - 16-bit or 8-bit data bus width
 - Five programmable chip-select signals
- Single power supply from 3.0 V to 5.5 V
- Power reduction and wake-up modes with flexible power management
- Programmable watchdog timer and oscillator watchdog
- Up to 75 general purpose I/O lines
- On-chip bootstrap loaders
- Supported by a full range of development tools including C compilers, macro-assembler packages, emulators, evaluation boards, HLL debuggers, simulators, logic analyzer disassemblers, programming boards
- On-chip debug support via Device Access Port (DAP) or JTAG interface
- 100-pin Green LQFP package, 0.5 mm (19.7 mil) pitch

Ordering Information

The ordering code for an Infineon microcontroller provides an exact reference to a specific product. This ordering code identifies:

- the function set of the corresponding product type
- the temperature range:
 - SAF-...: -40°C to 85°C
 - SAH-...: -40°C to 110°C
 - SAK-...: -40°C to 125°C
- the package and the type of delivery.

For ordering codes for the XC236xE please contact your sales representative or local distributor.

This document describes several derivatives of the XC236xE group:

Basic Device Types are readily available and

Special Device Types are only available on request.

As this document refers to all of these derivatives, some descriptions may not apply to a specific product, in particular to the special device types.

For simplicity the term **XC236xE** is used for all derivatives throughout this document.

1.1 Basic Device Types

Basic device types are available and can be ordered through Infineon's direct and/or distribution channels.

Table 1 Synopsis of XC236xE Basic Device Types

Derivative ¹⁾	Flash Memory ²⁾	PSRAM DSRAM ³⁾	Capt./Comp. Modules	ADC ⁴⁾ Chan.	Interfaces ⁴⁾
XC2361E-136FxxLR	1 088 Kbytes	64 Kbytes 24 Kbytes	CC2 CCU60/1	11 + 5	2 CAN Nodes 6 Serial Chan.

1) xx is a placeholder for the available speed grade (in MHz).

2) Specific information about the on-chip Flash memory in [Table 3](#).

3) All derivatives additionally provide 8 Kbytes SBRAM and 2 Kbytes DPRAM.

4) Specific information about the available channels in [Table 5](#).

Analog input channels are listed for each Analog/Digital Converter module separately (ADC0 + ADC1).

1.2 Special Device Types

Special device types are only available for high-volume applications on request.

Table 2 Synopsis of XC236xE Special Device Types

Derivative ¹⁾	Flash Memory ²⁾	PSRAM DSRAM ³⁾	Capt./Comp. Modules	ADC ⁴⁾ Chan.	Interfaces ⁴⁾
XC2367E-136FxxLR	1 088 Kbytes	64 Kbytes 24 Kbytes	CC2 CCU60/1/2/3	11 + 5	3 CAN Nodes 6 Serial Chan.
XC2361E-72FxxL	576 Kbytes	64 Kbytes 24 Kbytes	CC2 CCU60/1	11 + 5	2 CAN Nodes 6 Serial Chan.
XC2361E-104FxxL	832 Kbytes	64 Kbytes 24 Kbytes	CC2 CCU60/1	11 + 5	2 CAN Nodes 6 Serial Chan.
XC2361E-136FxxL	1 088 Kbytes	64 Kbytes 24 Kbytes	CC2 CCU60/1	11 + 5	2 CAN Nodes 6 Serial Chan.
XC2367E-72FxxL	576 Kbytes	64 Kbytes 24 Kbytes	CC2 CCU60/1/2/3	11 + 5	3 CAN Nodes 6 Serial Chan.
XC2367E-104FxxL	832 Kbytes	64 Kbytes 24 Kbytes	CC2 CCU60/1/2/3	11 + 5	3 CAN Nodes 6 Serial Chan.
XC2367E-136FxxL	1 088 Kbytes	64 Kbytes 24 Kbytes	CC2 CCU60/1/2/3	11 + 5	3 CAN Nodes 6 Serial Chan.

1) xx is a placeholder for the available speed grade (in MHz).

2) Specific information about the on-chip Flash memory in [Table 3](#).

3) All derivatives additionally provide 8 Kbytes SBRAM and 2 Kbytes DPRAM.

4) Specific information about the available channels in [Table 5](#).

Analog input channels are listed for each Analog/Digital Converter module separately (ADC0 + ADC1).

1.3 Definition of Feature Variants

The XC236xE types are offered with several Flash memory sizes. [Table 3](#) describes the location of the available memory areas for each Flash memory size.

Table 3 Flash Memory Allocation

Total Flash Size	Flash Area A ¹⁾	Flash Area B	Flash Area C
1 088 Kbytes	C0'0000 _H ... C0'EFFF _H	C1'0000 _H ... D0'FFFF _H	n.a.
832 Kbytes	C0'0000 _H ... C0'EFFF _H	C1'0000 _H ... CB'FFFF _H	D0'0000 _H ... D0'FFFF _H
576 Kbytes	C0'0000 _H ... C0'EFFF _H	C1'0000 _H ... C7'FFFF _H	D0'0000 _H ... D0'FFFF _H

1) The uppermost 4-Kbyte sector of the first Flash segment is reserved for internal use (C0'F000_H to C0'FFFF_H).

Table 4 Flash Memory Module Allocation (in Kbytes)

Total Flash Size	Flash 0 ¹⁾	Flash 1	Flash 2	Flash 3	Flash 4
1 088 Kbytes	256	256	256	256	64
832 Kbytes	256	256	256	---	64
576 Kbytes	256	256	---	---	64

1) The uppermost 4-Kbyte sector of the first Flash segment is reserved for internal use (C0'F000_H to C0'FFFF_H).

The XC236xE types are offered with different interface options. [Table 5](#) lists the available channels for each option.

Table 5 Interface Channel Association

Total Number	Available Channels
11 ADC0 channels	CH0, CH2 ... CH5, CH8 ... CH11, CH13, CH15
5 ADC1 channels	CH0, CH2, CH4, CH5, CH6 (overlay: CH8 ... CH11)
2 CAN nodes	CAN0, CAN1 64 message objects
3 CAN nodes	CAN0, CAN1, CAN2 64 message objects
6 serial channels	U0C0, U0C1, U1C0, U1C1, U2C0, U2C1

2 General Device Information

The XC236xE series (16/32-Bit Single-Chip Microcontroller with 32-Bit Performance) is a part of the Infineon XC2000 Family of full-feature single-chip CMOS microcontrollers. These devices extend the functionality and performance of the C166 Family in terms of instructions (MAC unit), peripherals, and speed. They combine high CPU performance (up to 128 million instructions per second) with extended peripheral functionality and enhanced IO capabilities. Optimized peripherals can be adapted flexibly to meet the application requirements. These derivatives utilize clock generation via PLL and internal or external clock sources. On-chip memory modules include program Flash, program RAM, and data RAM.

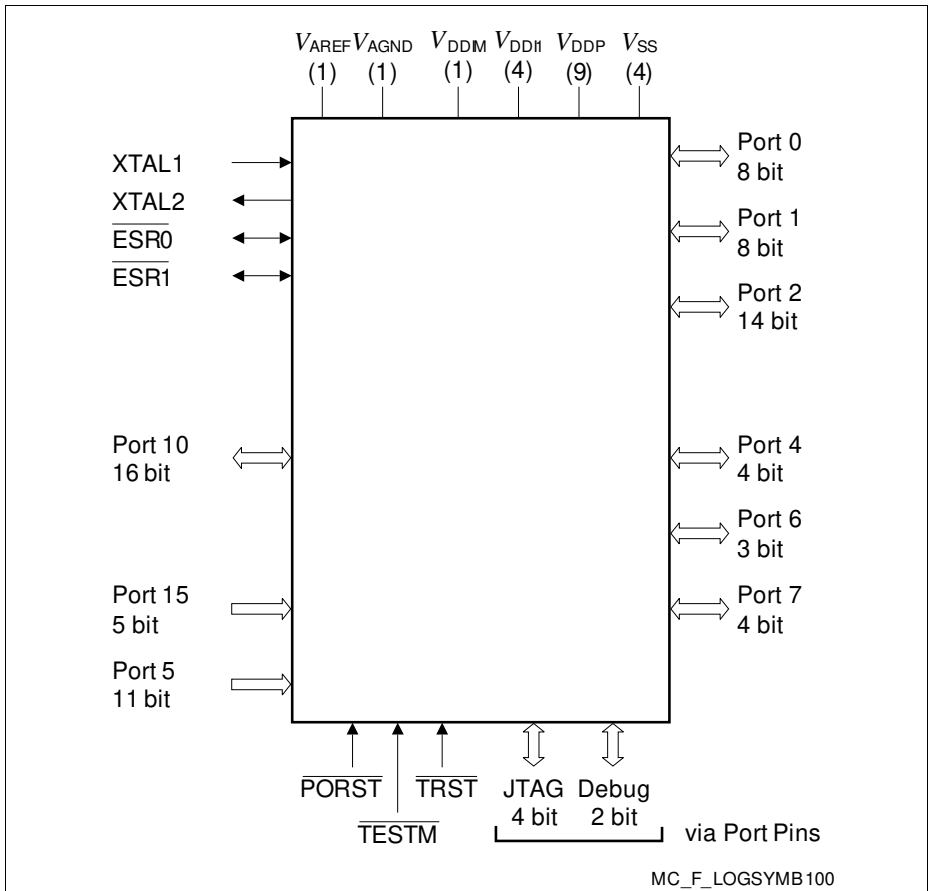


Figure 1 XC236xE Logic Symbol

2.1 Pin Configuration and Definition

The pins of the XC236xE are described in detail in [Table 6](#), which includes all alternate functions. For further explanations please refer to the footnotes at the end of the table. The following figure summarizes all pins, showing their locations on the four sides of the package.

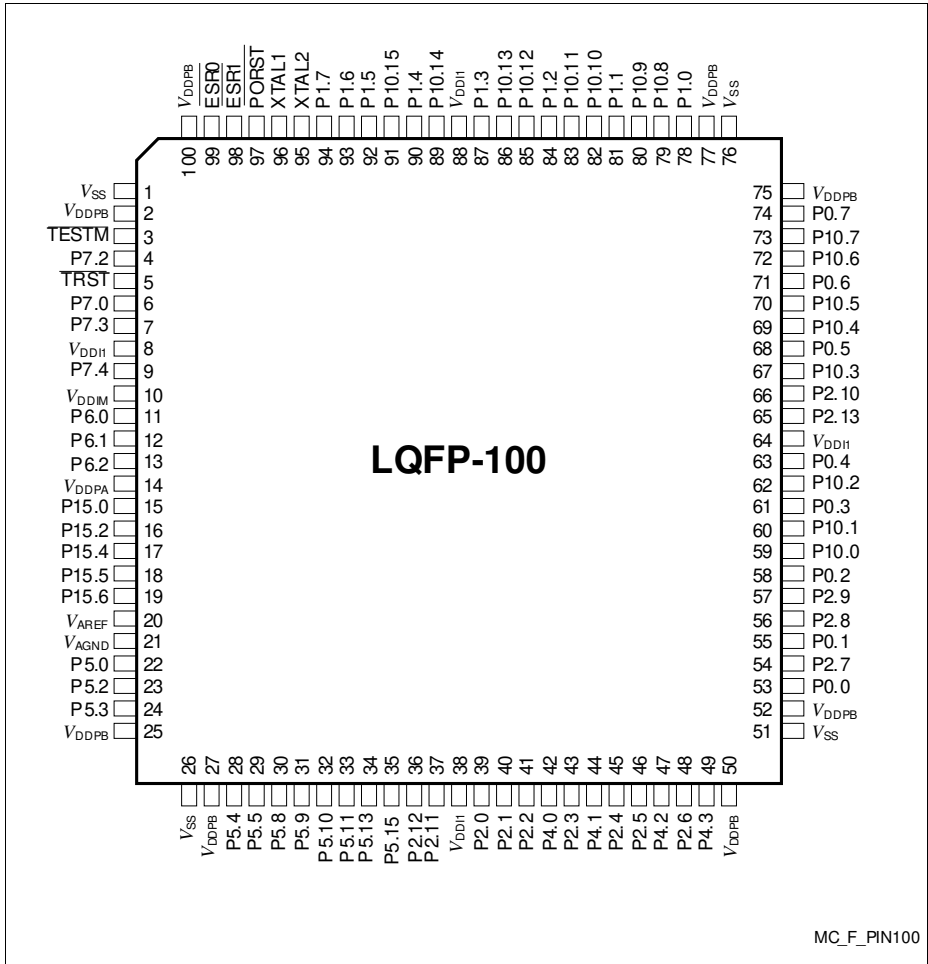


Figure 2 XC236xE Pin Configuration (top view)

Key to Pin Definitions

- **Ctrl.:** The output signal for a port pin is selected by bit field PC in the associated register Px_IOCry. Output O0 is selected by setting the respective bit field PC to 1x00_B, output O1 is selected by 1x01_B, etc. Output signal OH is controlled by hardware.
- **Type:** Indicates the pad type and its power supply domain (A, B, M, 1).
 - St: Standard pad
 - Sp: Special pad e.g. XTALx
 - DP: Double pad - can be used as standard or high speed pad
 - In: Input only pad
 - PS: Power supply pad

Table 6 Pin Definitions and Functions

Pin	Symbol	Ctrl.	Type	Function
3	$\overline{\text{TESTM}}$	I	In/B	Testmode Enable Enables factory test modes, must be held HIGH for normal operation (connect to V_{DDPB}). An internal pull-up device will hold this pin high when nothing is driving it.
4	P7.2	O0 / I	St/B	Bit 2 of Port 7, General Purpose Input/Output
	EMUX0	O1	St/B	External Analog MUX Control Output 0 (ADC1)
	CCU62_CCP OS0A	I	St/B	CCU62 Position Input 0
	TDI_C	IH	St/B	JTAG Test Data Input If JTAG pos. C is selected during start-up, an internal pull-up device will hold this pin high when nothing is driving it.
5	$\overline{\text{TRST}}$	I	In/B	Test-System Reset Input For normal system operation, pin $\overline{\text{TRST}}$ should be held low. A high level at this pin at the rising edge of $\overline{\text{PORST}}$ activates the XC236xE's debug system. In this case, pin $\overline{\text{TRST}}$ must be driven low once to reset the debug system. An internal pull-down device will hold this pin low when nothing is driving it.

Table 6 Pin Definitions and Functions (cont'd)

Pin	Symbol	Ctrl.	Type	Function
6	P7.0	O0 / I	St/B	Bit 0 of Port 7, General Purpose Input/Output
	T3OUT	O1	St/B	GPT12E Timer T3 Toggle Latch Output
	T6OUT	O2	St/B	GPT12E Timer T6 Toggle Latch Output
	TDO_A	OH / IH	St/B	JTAG Test Data Output / DAP1 Input/Output If DAP pos. 0 or 2 is selected during start-up, an internal pull-down device will hold this pin low when nothing is driving it.
	ESR2_1	I	St/B	ESR2 Trigger Input 1
7	P7.3	O0 / I	St/B	Bit 3 of Port 7, General Purpose Input/Output
	EMUX1	O1	St/B	External Analog MUX Control Output 1 (ADC1)
	U0C1_DOUT	O2	St/B	USIC0 Channel 1 Shift Data Output
	U0C0_DOUT	O3	St/B	USIC0 Channel 0 Shift Data Output
	CCU62_CCP OS1A	I	St/B	CCU62 Position Input 1
	TMS_C	IH	St/B	JTAG Test Mode Selection Input If JTAG pos. C is selected during start-up, an internal pull-up device will hold this pin low when nothing is driving it.
	U0C1_DX0F	I	St/B	USIC0 Channel 1 Shift Data Input

Table 6 Pin Definitions and Functions (cont'd)

Pin	Symbol	Ctrl.	Type	Function
9	P7.4	O0 / I	St/B	Bit 4 of Port 7, General Purpose Input/Output
	EMUX2	O1	St/B	External Analog MUX Control Output 2 (ADC1)
	U0C1_DOUT	O2	St/B	USIC0 Channel 1 Shift Data Output
	U0C1_SCLK OUT	O3	St/B	USIC0 Channel 1 Shift Clock Output
	CCU62_CCP OS2A	I	St/B	CCU62 Position Input 2
	TCK_C	IH	St/B	DAP0/JTAG Clock Input If JTAG pos. C is selected during start-up, an internal pull-up device will hold this pin high when nothing is driving it. If DAP pos. 2 is selected during start-up, an internal pull-down device will hold this pin low when nothing is driving it.
	U0C0_DX0D	I	St/B	USIC0 Channel 0 Shift Data Input
U0C1_DX1E	I	St/B	USIC0 Channel 1 Shift Clock Input	
11	P6.0	O0 / I	DA/A	Bit 0 of Port 6, General Purpose Input/Output
	EMUX0	O1	DA/A	External Analog MUX Control Output 0 (ADC0)
	TxDC2	O2	DA/A	CAN Node 2 Transmit Data Output
	BRKOUT	O3	DA/A	OCDS Break Signal Output
	ADC _x _REQG TyG	I	DA/A	External Request Gate Input for ADC0/1
	U1C1_DX0E	I	DA/A	USIC1 Channel 1 Shift Data Input
12	P6.1	O0 / I	DA/A	Bit 1 of Port 6, General Purpose Input/Output
	EMUX1	O1	DA/A	External Analog MUX Control Output 1 (ADC0)
	T3OUT	O2	DA/A	GPT12E Timer T3 Toggle Latch Output
	U1C1_DOUT	O3	DA/A	USIC1 Channel 1 Shift Data Output
	ADC _x _REQT RyE	I	DA/A	External Request Trigger Input for ADC0/1
	RxDC2E	I	DA/A	CAN Node 2 Receive Data Input
	ESR1_6	I	DA/A	ESR1 Trigger Input 6

Table 6 Pin Definitions and Functions (cont'd)

Pin	Symbol	Ctrl.	Type	Function
13	P6.2	O0 / I	DA/A	Bit 2 of Port 6, General Purpose Input/Output
	EMUX2	O1	DA/A	External Analog MUX Control Output 2 (ADC0)
	T6OUT	O2	DA/A	GPT12E Timer T6 Toggle Latch Output
	U1C1_SCLK OUT	O3	DA/A	USIC1 Channel 1 Shift Clock Output
	U1C1_DX1C	I	DA/A	USIC1 Channel 1 Shift Clock Input
15	P15.0	I	In/A	Bit 0 of Port 15, General Purpose Input
	ADC1_CH0	I	In/A	Analog Input Channel 0 for ADC1
16	P15.2	I	In/A	Bit 2 of Port 15, General Purpose Input
	ADC1_CH2	I	In/A	Analog Input Channel 2 for ADC1
	T5INA	I	In/A	GPT12E Timer T5 Count/Gate Input
17	P15.4	I	In/A	Bit 4 of Port 15, General Purpose Input
	ADC1_CH4	I	In/A	Analog Input Channel 4 for ADC1
	T6INA	I	In/A	GPT12E Timer T6 Count/Gate Input
18	P15.5	I	In/A	Bit 5 of Port 15, General Purpose Input
	ADC1_CH5	I	In/A	Analog Input Channel 5 for ADC1
	T6EUDA	I	In/A	GPT12E Timer T6 External Up/Down Control Input
19	P15.6	I	In/A	Bit 6 of Port 15, General Purpose Input
	ADC1_CH6	I	In/A	Analog Input Channel 6 for ADC1
20	V _{AREF}	-	PS/A	Reference Voltage for A/D Converters ADC0/1
21	V _{AGND}	-	PS/A	Reference Ground for A/D Converters ADC0/1
22	P5.0	I	In/A	Bit 0 of Port 5, General Purpose Input
	ADC0_CH0	I	In/A	Analog Input Channel 0 for ADC0
23	P5.2	I	In/A	Bit 2 of Port 5, General Purpose Input
	ADC0_CH2	I	In/A	Analog Input Channel 2 for ADC0
	TDI_A	I	In/A	JTAG Test Data Input

Table 6 Pin Definitions and Functions (cont'd)

Pin	Symbol	Ctrl.	Type	Function
24	P5.3	I	In/A	Bit 3 of Port 5, General Purpose Input
	ADC0_CH3	I	In/A	Analog Input Channel 3 for ADC0
	T3INA	I	In/A	GPT12E Timer T3 Count/Gate Input
28	P5.4	I	In/A	Bit 4 of Port 5, General Purpose Input
	ADC0_CH4	I	In/A	Analog Input Channel 4 for ADC0
	CCU63_T12 HRB	I	In/A	External Run Control Input for T12 of CCU63
	T3EUDA	I	In/A	GPT12E Timer T3 External Up/Down Control Input
	TMS_A	I	In/A	JTAG Test Mode Selection Input
29	P5.5	I	In/A	Bit 5 of Port 5, General Purpose Input
	ADC0_CH5	I	In/A	Analog Input Channel 5 for ADC0
	CCU60_T12 HRB	I	In/A	External Run Control Input for T12 of CCU60
30	P5.8	I	In/A	Bit 8 of Port 5, General Purpose Input
	ADC0_CH8	I	In/A	Analog Input Channel 8 for ADC0
	ADC1_CH8	I	In/A	Analog Input Channel 8 for ADC1
	CCU6x_T12H RC	I	In/A	External Run Control Input for T12 of CCU60/1/2/3
	CCU6x_T13H RC	I	In/A	External Run Control Input for T13 of CCU60/1/2/3
	U2C0_DX0F	I	In/A	USIC2 Channel 0 Shift Data Input
31	P5.9	I	In/A	Bit 9 of Port 5, General Purpose Input
	ADC0_CH9	I	In/A	Analog Input Channel 9 for ADC0
	ADC1_CH9	I	In/A	Analog Input Channel 9 for ADC1
	CC2_T7IN	I	In/A	CAPCOM2 Timer T7 Count Input

Table 6 Pin Definitions and Functions (cont'd)

Pin	Symbol	Ctrl.	Type	Function
32	P5.10	I	In/A	Bit 10 of Port 5, General Purpose Input
	ADC0_CH10	I	In/A	Analog Input Channel 10 for ADC0
	ADC1_CH10	I	In/A	Analog Input Channel 10 for ADC1
	BRKIN_A	I	In/A	OCDS Break Signal Input
	U2C1_DX0F	I	In/A	USIC2 Channel 1 Shift Data Input
	CCU61_T13 HRA	I	In/A	External Run Control Input for T13 of CCU61
33	P5.11	I	In/A	Bit 11 of Port 5, General Purpose Input
	ADC0_CH11	I	In/A	Analog Input Channel 11 for ADC0
	ADC1_CH11	I	In/A	Analog Input Channel 11 for ADC1
34	P5.13	I	In/A	Bit 13 of Port 5, General Purpose Input
	ADC0_CH13	I	In/A	Analog Input Channel 13 for ADC0
	ERU_0B1	I	St/B	External Request Unit Channel 0 Input B1
	CCU63_T13 HRF	I	In/A	External Run Control Input for T13 of CCU63
35	P5.15	I	In/A	Bit 15 of Port 5, General Purpose Input
	ADC0_CH15	I	In/A	Analog Input Channel 15 for ADC0
	RxDC2F	I	In/A	CAN Node 2 Receive Data Input
36	P2.12	O0 / I	St/B	Bit 12 of Port 2, General Purpose Input/Output
	U0C0_SELO 4	O1	St/B	USIC0 Channel 0 Select/Control 4 Output
	U0C1_SELO 3	O2	St/B	USIC0 Channel 1 Select/Control 3 Output
	TXDC2	O3	St/B	CAN Node 2 Transmit Data Output
	READY	IH	St/B	External Bus Interface READY Input

Table 6 Pin Definitions and Functions (cont'd)

Pin	Symbol	Ctrl.	Type	Function
37	P2.11	O0 / I	St/B	Bit 11 of Port 2, General Purpose Input/Output
	U0C0_SELO 2	O1	St/B	USIC0 Channel 0 Select/Control 2 Output
	U0C1_SELO 2	O2	St/B	USIC0 Channel 1 Select/Control 2 Output
	BHE/WRH	OH	St/B	External Bus Interf. High-Byte Control Output Can operate either as Byte High Enable (BHE) or as Write strobe for High Byte (WRH).
39	P2.0	O0 / I	St/B	Bit 0 of Port 2, General Purpose Input/Output
	CCU63_CC6 0	O2	St/B	CCU63 Channel 0 Output
	AD13	OH / IH	St/B	External Bus Interface Address/Data Line 13
	RxDC0C	I	St/B	CAN Node 0 Receive Data Input
	CCU63_CC6 0INB	I	St/B	CCU63 Channel 0 Input
	T5INB	I	St/B	GPT12E Timer T5 Count/Gate Input
40	P2.1	O0 / I	St/B	Bit 1 of Port 2, General Purpose Input/Output
	TxDC0	O1	St/B	CAN Node 0 Transmit Data Output
	CCU63_CC6 1	O2	St/B	CCU63 Channel 1 Output
	AD14	OH / IH	St/B	External Bus Interface Address/Data Line 14
	CCU63_CC6 1INB	I	St/B	CCU63 Channel 1 Input
	T5EUDB	I	St/B	GPT12E Timer T5 External Up/Down Control Input
	ESR1_5	I	St/B	ESR1 Trigger Input 5
ERU_0A0	I	St/B	External Request Unit Channel 0 Input A0	

Table 6 Pin Definitions and Functions (cont'd)

Pin	Symbol	Ctrl.	Type	Function
41	P2.2	O0 / I	St/B	Bit 2 of Port 2, General Purpose Input/Output
	TxDC1	O1	St/B	CAN Node 1 Transmit Data Output
	CCU63_CC6 2	O2	St/B	CCU63 Channel 2 Output
	AD15	OH / IH	St/B	External Bus Interface Address/Data Line 15
	CCU63_CC6 2INB	I	St/B	CCU63 Channel 2 Input
	ESR2_5	I	St/B	ESR2 Trigger Input 5
	ERU_1A0	I	St/B	External Request Unit Channel 1 Input A0
42	P4.0	O0 / I	St/B	Bit 0 of Port 4, General Purpose Input/Output
	CC2_CC24	O3 / I	St/B	CAPCOM2 CC24IO Capture Inp./ Compare Out.
	CS0	OH	St/B	External Bus Interface Chip Select 0 Output
43	P2.3	O0 / I	St/B	Bit 3 of Port 2, General Purpose Input/Output
	U0C0_DOUT	O1	St/B	USIC0 Channel 0 Shift Data Output
	CCU63_COU T63	O2	St/B	CCU63 Channel 3 Output
	CC2_CC16	O3 / I	St/B	CAPCOM2 CC16IO Capture Inp./ Compare Out.
	A16	OH	St/B	External Bus Interface Address Line 16
	ESR2_0	I	St/B	ESR2 Trigger Input 0
	U0C0_DX0E	I	St/B	USIC0 Channel 0 Shift Data Input
	U0C1_DX0D	I	St/B	USIC0 Channel 1 Shift Data Input
	RxDC0A	I	St/B	CAN Node 0 Receive Data Input
44	P4.1	O0 / I	St/B	Bit 1 of Port 4, General Purpose Input/Output
	TxDC2	O2	St/B	CAN Node 2 Transmit Data Output
	CC2_CC25	O3 / I	St/B	CAPCOM2 CC25IO Capture Inp./ Compare Out.
	CS1	OH	St/B	External Bus Interface Chip Select 1 Output
	CCU62_CCP OS0B	I	St/B	CCU62 Position Input 0
	T4EUDB	I	St/B	GPT12E Timer T4 External Up/Down Control Input
	ESR1_8	I	St/B	ESR1 Trigger Input 8

Table 6 Pin Definitions and Functions (cont'd)

Pin	Symbol	Ctrl.	Type	Function
45	P2.4	O0 / I	St/B	Bit 4 of Port 2, General Purpose Input/Output
	U0C1_DOUT	O1	St/B	USIC0 Channel 1 Shift Data Output
	TxDC0	O2	St/B	CAN Node 0 Transmit Data Output
	CC2_CC17	O3 / I	St/B	CAPCOM2 CC17IO Capture Inp./ Compare Out.
	A17	OH	St/B	External Bus Interface Address Line 17
	ESR1_0	I	St/B	ESR1 Trigger Input 0
	U0C0_DX0F	I	St/B	USIC0 Channel 0 Shift Data Input
	RxDC1A	I	St/B	CAN Node 1 Receive Data Input
46	P2.5	O0 / I	St/B	Bit 5 of Port 2, General Purpose Input/Output
	U0C0_SCLK OUT	O1	St/B	USIC0 Channel 0 Shift Clock Output
	TxDC0	O2	St/B	CAN Node 0 Transmit Data Output
	CC2_CC18	O3 / I	St/B	CAPCOM2 CC18IO Capture Inp./ Compare Out.
	A18	OH	St/B	External Bus Interface Address Line 18
	U0C0_DX1D	I	St/B	USIC0 Channel 0 Shift Clock Input
	ESR1_10	I	St/B	ESR1 Trigger Input 10
47	P4.2	O0 / I	St/B	Bit 2 of Port 4, General Purpose Input/Output
	TxDC2	O2	St/B	CAN Node 2 Transmit Data Output
	CC2_CC26	O3 / I	St/B	CAPCOM2 CC26IO Capture Inp./ Compare Out.
	CS2	OH	St/B	External Bus Interface Chip Select 2 Output
	T2INA	I	St/B	GPT12E Timer T2 Count/Gate Input
	CCU62_CCP OS1B	I	St/B	CCU62 Position Input 1

Table 6 Pin Definitions and Functions (cont'd)

Pin	Symbol	Ctrl.	Type	Function
48	P2.6	O0 / I	St/B	Bit 6 of Port 2, General Purpose Input/Output
	U0C0_SELO0	O1	St/B	USIC0 Channel 0 Select/Control 0 Output
	U0C1_SELO1	O2	St/B	USIC0 Channel 1 Select/Control 1 Output
	CC2_CC19	O3 / I	St/B	CAPCOM2 CC19IO Capture Inp./ Compare Out.
	A19	OH	St/B	External Bus Interface Address Line 19
	U0C0_DX2D	I	St/B	USIC0 Channel 0 Shift Control Input
	RxDC0D	I	St/B	CAN Node 0 Receive Data Input
	ESR2_6	I	St/B	ESR2 Trigger Input 6
49	P4.3	O0 / I	St/B	Bit 3 of Port 4, General Purpose Input/Output
	U0C1_DOUT	O1	St/B	USIC0 Channel 1 Shift Data Output
	CC2_CC27	O3 / I	St/B	CAPCOM2 CC27IO Capture Inp./ Compare Out.
	CS3	OH	St/B	External Bus Interface Chip Select 3 Output
	RxDC2A	I	St/B	CAN Node 2 Receive Data Input
	T2EUDA	I	St/B	GPT12E Timer T2 External Up/Down Control Input
	CCU62_CCP0S2B	I	St/B	CCU62 Position Input 2
53	P0.0	O0 / I	St/B	Bit 0 of Port 0, General Purpose Input/Output
	U1C0_DOUT	O1	St/B	USIC1 Channel 0 Shift Data Output
	CCU61_CC60	O3	St/B	CCU61 Channel 0 IOutput
	A0	OH	St/B	External Bus Interface Address Line 0
	U1C0_DX0A	I	St/B	USIC1 Channel 0 Shift Data Input
	CCU61_CC60INA	I	St/B	CCU61 Channel 0 Input
	ESR1_11	I	St/B	ESR1 Trigger Input 11

Table 6 Pin Definitions and Functions (cont'd)

Pin	Symbol	Ctrl.	Type	Function
54	P2.7	O0 / I	St/B	Bit 7 of Port 2, General Purpose Input/Output
	U0C1_SELO0	O1	St/B	USIC0 Channel 1 Select/Control 0 Output
	U0C0_SELO1	O2	St/B	USIC0 Channel 0 Select/Control 1 Output
	CC2_CC20	O3 / I	St/B	CAPCOM2 CC20IO Capture Inp./ Compare Out.
	A20	OH	St/B	External Bus Interface Address Line 20
	U0C1_DX2C	I	St/B	USIC0 Channel 1 Shift Control Input
	RxDC1C	I	St/B	CAN Node 1 Receive Data Input
	ESR2_7	I	St/B	ESR2 Trigger Input 7
55	P0.1	O0 / I	St/B	Bit 1 of Port 0, General Purpose Input/Output
	U1C0_DOUT	O1	St/B	USIC1 Channel 0 Shift Data Output
	TxDC0	O2	St/B	CAN Node 0 Transmit Data Output
	CCU61_CC61	O3	St/B	CCU61 Channel 1 Output
	A1	OH	St/B	External Bus Interface Address Line 1
	U1C0_DX0B	I	St/B	USIC1 Channel 0 Shift Data Input
	CCU61_CC61INA	I	St/B	CCU61 Channel 1 Input
	U1C0_DX1A	I	St/B	USIC1 Channel 0 Shift Clock Input
56	P2.8	O0 / I	DP/B	Bit 8 of Port 2, General Purpose Input/Output
	U0C1_SCLKOUT	O1	DP/B	USIC0 Channel 1 Shift Clock Output
	EXTCLK	O2	DP/B	Programmable Clock Signal Output 1)
	CC2_CC21	O3 / I	DP/B	CAPCOM2 CC21IO Capture Inp./ Compare Out.
	A21	OH	DP/B	External Bus Interface Address Line 21
	U0C1_DX1D	I	DP/B	USIC0 Channel 1 Shift Clock Input

Table 6 Pin Definitions and Functions (cont'd)

Pin	Symbol	Ctrl.	Type	Function
57	P2.9	O0 / I	St/B	Bit 9 of Port 2, General Purpose Input/Output
	U0C1_DOUT	O1	St/B	USIC0 Channel 1 Shift Data Output
	TxDC1	O2	St/B	CAN Node 1 Transmit Data Output
	CC2_CC22	O3 / I	St/B	CAPCOM2 CC22IO Capture Inp./ Compare Out.
	A22	OH	St/B	External Bus Interface Address Line 22
	CLKIN1	I	St/B	Clock Signal Input 1
	TCK_A	IH	St/B	DAP0/JTAG Clock Input If JTAG pos. A is selected during start-up, an internal pull-up device will hold this pin high when nothing is driving it. If DAP pos. 0 is selected during start-up, an internal pull-down device will hold this pin low when nothing is driving it.
58	P0.2	O0 / I	St/B	Bit 2 of Port 0, General Purpose Input/Output
	U1C0_SCLK OUT	O1	St/B	USIC1 Channel 0 Shift Clock Output
	TxDC0	O2	St/B	CAN Node 0 Transmit Data Output
	CCU61_CC6 2	O3	St/B	CCU61 Channel 2 Output
	A2	OH	St/B	External Bus Interface Address Line 2
	U1C0_DX1B	I	St/B	USIC1 Channel 0 Shift Clock Input
	CCU61_CC6 2INA	I	St/B	CCU61 Channel 2 Input