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Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

MB9AAA0N Series

32-bit ARM® Cortex®-M3 FM3 Microcontroller

The MB9AAA0N Series are highly integrated 32-bit microcontrollers that dedicated for embedded controllers with low-power consumption mode and competitive cost.
The MB9AAA0N Series are based on the ARM® Cortex®-M3 Processor with on-chip Flash memory and SRAM, and has peripheral functions such as LCD Controller, Motor Control Timers, ADCs, DACs and Communication Interfaces (UART, CSIO, I²C).

The products which are described in this data sheet are placed into TYPE7 product categories in FM3 Family Peripheral Manual.

Features

32-bit ARM® Cortex®-M3 Core

- Processor version: r2p1
- Up to 20MHz Operation Frequency
- Integrated Nested Vectored Interrupt Controller (NVIC): 1 channel NMI (non-maskable interrupt) and 32 channels' peripheral interrupts and 8 priority levels
- 24-bit System timer (Sys Tick): System timer for OS task management

On-chip Memories

[Flash memory]

- Up to 128 Kbytes
- Read cycle: 0 wait-cycle
- Security function for code protection

[SRAM]

This series contains a total of up to 16 Kbyte on-chip SRAM that is connected to System bus of Cortex-M3 core.

- SRAM1: Up to 16 Kbytes

LCD controller (LCDC)

- Selectable from 44 SEG × 4 COM (Max) or 40 SEG × 8 COM (Max)
- Internal divide resistor is contained (selectable from 10 kΩ or 100 kΩ for the resistor value)
- LCD drive power supply (bias) pin (VV4 to VV0)
- Interrupt function synchronized with the LCD module frame frequency
- With blinking function
- Inverted display function

Multi-function Serial Interface (Max 8 channels)

Operation mode is selectable from the followings for each channel.

- UART
- CSIO
- I²C

[UART]

- Full duplex double buffer
- Selection with or without parity supported
- Built-in dedicated baud rate generator
- External clock available as a serial clock
- Various error detection functions available (parity errors, framing errors, and overrun errors)

[CSIO]

- Full duplex double buffer
- Built-in dedicated baud rate generator
- Overrun error detection function available

[I²C]

Standard-mode (Max 100 kbps) / Fast-mode (Max 400 kbps) supported

A/D Converter (Max 16 channels)

[12-bit A/D Converter]

- Successive Approximation type
- Conversion time: Min 1.0 μs
- Priority conversion available (priority at 2 levels)
- Scanning conversion mode
- Built-in FIFO for conversion data storage (for SCAN conversion: 16steps, for Priority conversion: 4 steps)

D/A Converter (Max 2 channels)

- R-2R type
- 10-bit resolution

Base Timer (Max 8 channels)

Operation mode is selectable from the followings for each channel.

- 16-bit PWM timer
- 16-bit PPG timer
- 16-/32-bit reload timer
- 16-/32-bit PWC timer

General-Purpose I/O Port

This series can use its pins as general-purpose I/O ports when they are not used for peripherals. Moreover, the port relocate function is built in. It can set which I/O port the peripheral function can be allocated to.

- Capable of pull-up control per pin
- Capable of reading pin level directly
- Built-in the port relocate function
- Up to 84 high-speed general-purpose I/O Ports@100 pin Package
- Some ports are 5V tolerant I/O
  See List of Pin Functions and I/O Circuit Type to confirm the corresponding pins.

Multi-function Timer

The Multi-function timer is composed of the following blocks.

- 16-bit free-run timer × 3ch.
- Input capture × 4ch.
- Output compare × 6ch.
- A/D activation compare × 1ch.
- Waveform generator × 3ch.
- 16-bit PPG timer × 3ch.
  IGBT mode is contained.

The following function can be used to achieve the motor control.

- PWM signal output function
- DC chopper waveform output function
- Dead time function
- Input capture function
- A/D convertor activate function
- DTIF (Motor emergency stop) interrupt function

HDMI-CEC/Remote Control Receiver (Up to 2 channels)

- HDMI- CEC receiver / Remote control receiver
  - Operating modes supporting the following standards can be selected
    - SIRCS
    - NEC/Association for Electric Home Appliances
    - HDMI-CEC
  - Capable of adjusting detection timings for start bit and data bit
  - Equipped with noise filter
- HDMI-CEC transmitter
  - Header block automatic transmission by judging Signal free
  - Generating status interrupt by detecting Arbitration lost
  - Generating START, EOM, ACK automatically to output CEC transmission by setting 1 byte data
  - Generating transmission status interrupt when transmitting 1 block (1 byte data and EOM/ACK)

Real-time clock (RTC)

The Real-time clock can count Year/Month/Day/Hour/Minute/Second/A day of the week from 00 to 99.

- The interrupt function with specifying date and time (Year/Month/Day/Hour/Minute) is available. This function is also available by specifying only Year, Month, Day, Hour or Minute.
- Timer interrupt function after set time or each set time.
- Capable of rewriting the time with continuing the time count.
- Leap year automatic count is available.

External Interrupt Controller Unit

- Up to 16 external interrupt input pins
- Include one non-maskable interrupt (NMI) input pin

Watchdog Timer (2 channels)

A watchdog timer can generate interrupts or a reset when a time-out value is reached.

This series consists of two different watchdogs, a Hardware watchdog and a Software watchdog.

The Hardware watchdog timer is clocked by the built-in Low-speed CR oscillator. Therefore, the Hardware watchdog is active in any low-power consumption mode except RTC, Stop, Deep Standby RTC and Deep Standby Stop modes.

Clock and Reset

[Clocks]

Selectable from five clock sources (2 external oscillators, 2 built-in CR oscillators, and Main PLL).

- Main Clock: 4 MHz to 20 MHz
- Sub Clock: 32.768 kHz
- Built-in High-speed CR Clock: 4 MHz
- Built-in Low-speed CR Clock: 100 kHz
- Main PLL Clock

[Resets]

- Reset requests from INITX pin
- Power-on reset
- Software reset
- Watchdog timers reset
- Low-voltage detection reset
- Clock Super Viser reset

Clock Super Visor (CSV)

Clocks generated by built-in CR oscillators are used to supervise abnormality of the external clocks.

- If external clock failure (clock stop) is detected, reset is asserted.
- If external frequency anomaly is detected, interrupt or reset is asserted.

Low-Voltage Detector (LVD)

This Series includes 2-stage monitoring of voltage on the VCC. When the voltage falls below the voltage that has been set, Low-Voltage Detector generates an interrupt or reset.

- LVD1: error reporting via interrupt
- LVD2: auto-reset operation

Low-Power Consumption Mode

Six low-power consumption modes supported.

- Sleep
- Timer
- RTC
- Stop
- Deep Standby RTC
- Deep Standby Stop

The back up register is 16 byte

Debug

Serial Wire JTAG Debug Port (SWJ-DP)

Power Supply

Wide range voltage:

VCC = 1.8 V to 5.5 V
VCC = 2.2 V to 5.5 V (when LCDC is used)

Contents

1. Product Lineup

Memory size

Product name		MB9AFAA1L/M/N	MB9AFAA2L/M/N
On-chip Flash memory		64 Kbytes	128 Kbytes
On-chip SRAM	SRAM1	12 Kbytes	16 Kbytes

Function

Product name			MB9AFAA1L MB9AFAA2L	MB9AFAA1M MB9AFAA2M	MB9AFAA1N MB9AFAA2N
Pin count			64	80	100
CPU			Cortex-M3		
	Freq.		20 MHz		
Power supply voltage range			1.8 V to 5.5 V		
LCD Controller (LCDC)			24SEG×4COM (Max) or 20SEG×8COM (Max)	37SEG×4COM (Max) or 33SEG×8COM (Max)	44SEG×4COM (Max) or 40SEG×8COM (Max)
Multi-function Serial Interface (UART/CSIO/I^{2}C)			8ch. (Max)		
Base Timer (PWC/ Reload timer/PWM/PPG)			8ch. (Max)		
MF-Timer	A/D activation compare	1ch.	1 unit (Max)		
	Input capture	4ch.			
	Free-run timer	3ch.			
	Output compare	6ch.			
	Waveform generator	3ch.			
	PPG (IGBT mode)	3ch.			
HDMI-CEC/ Remote Control Receiver			2ch. (Max)		
Real-time clock (RTC)			1 unit		
Watchdog timer			1ch. (SW) + 1ch. (HW)		
External Interrupts			8 pins (Max)+ NMI × 1	11 pins (Max)+ NMI × 1	16 pins (Max)+ NMI × 1
General-purpose I/O ports			52 pins (Max)	67 pins (Max)	84 pins (Max)
12-bit A/D converter			9ch. (1 unit)	12ch. (1 unit)	16ch. (1 unit)
10-bit D/A converter			2ch. (Max)		
CSV (Clock Super Visor)			Yes		
LVD (Low-Voltage Detector)			2ch.		
Built-in CR	High-speed		4 MHz		
	Low-speed		100 kHz		
Debug Function			SWJ-DP		

Note:

– *All signals of the peripheral function in each product cannot be allocated by limiting the pins of package.*
It is necessary to use the port relocate function of the I/O port according to your function use.
See Electrical Characteristics 12.4 AC Characteristics (12.4.3) Built-in CR Oscillation Characteristics for accuracy of built-in CR.

2. Packages

Package / Product name	MB9AFAA1L MB9AFAA2L	MB9AFAA1M MB9AFAA2M	MB9AFAA1N MB9AFAA2N
LQFP: LQD064 (0.5mm pitch)	❍	-	-
LQFP: LQG064 (0.65mm pitch)	❍	-	-
LQFP: LQH080 (0.5mm pitch)	-	❍	-
LQFP: LQJ080 (0.65mm pitch)	-	❍	-
LQFP: LQI100 (0.5mm pitch)	-	-	❍
QFP: PQH100 (0.65mm pitch)	-	-	❍

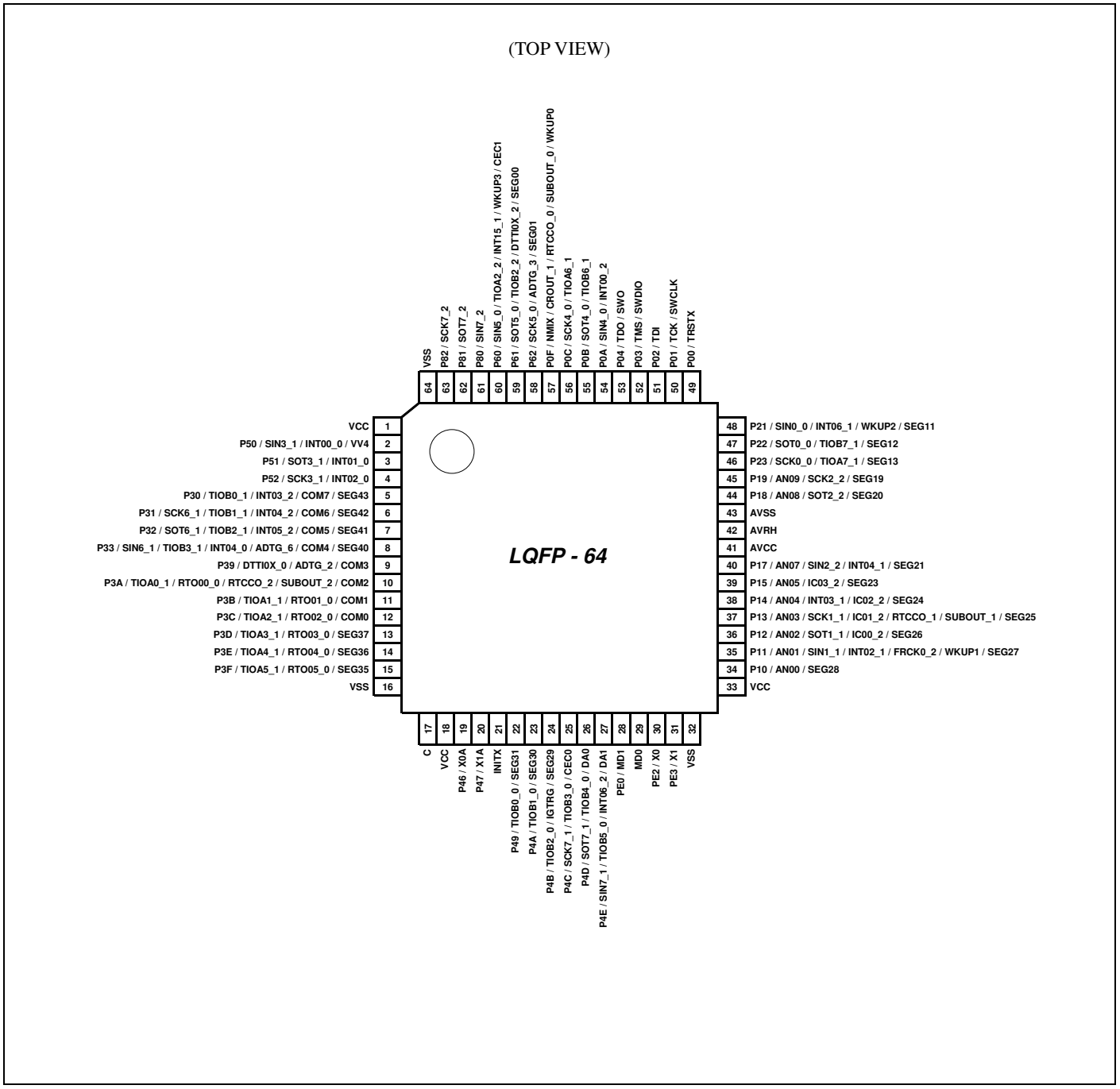
❍: Supported

Note:

- *See Package Dimensions for detailed information on each package.*

3. Pin Assignment

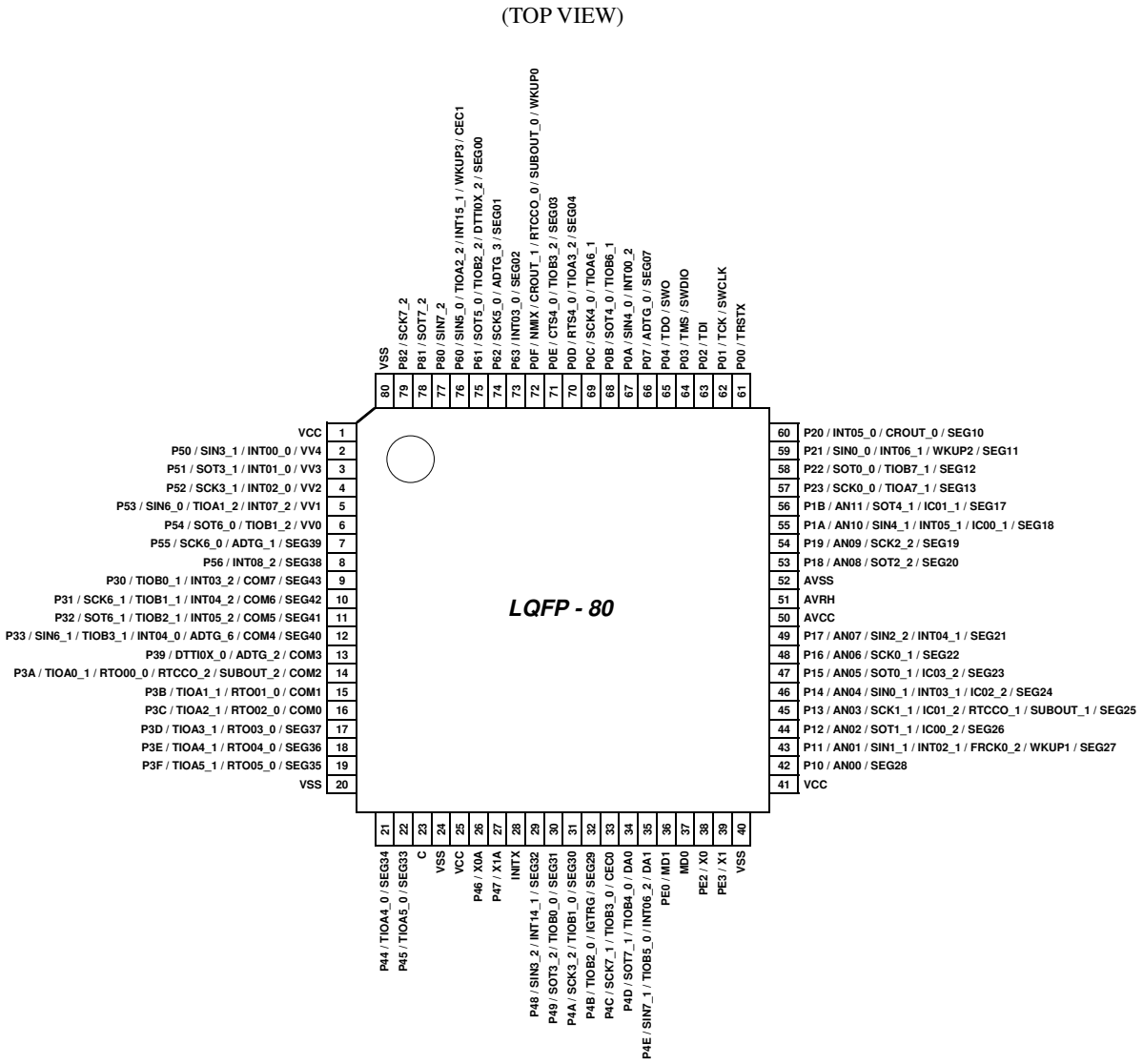
LQD064/LQG064



Note:

- *The number after the underscore ("_") in pin names such as XXX_1 and XXX_2 indicates the relocated port number. For these pins, there are multiple pins that provide the same function for the same channel. Use the extended port function register (EPFR) to select the pin.*

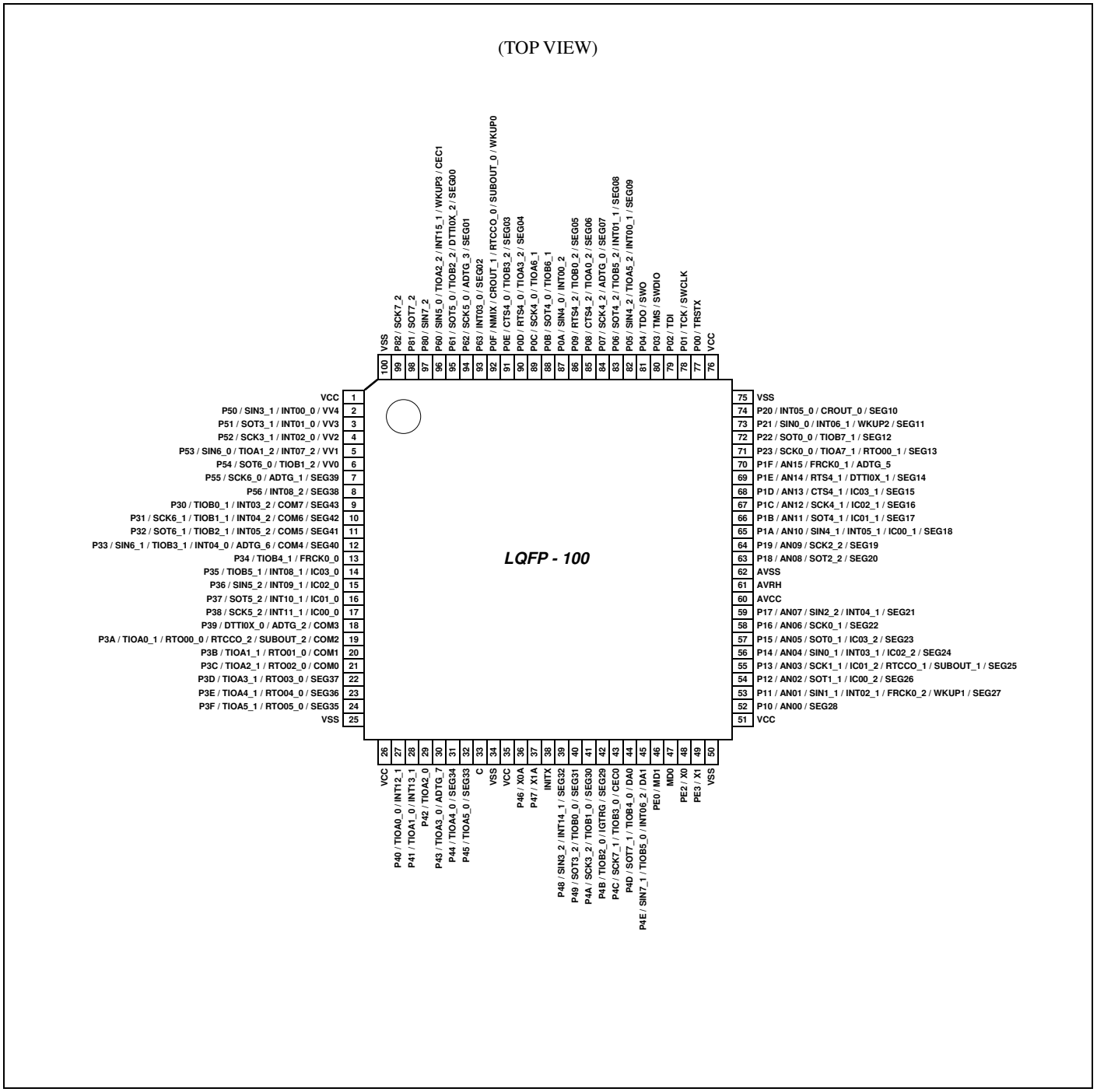
LQH080/LQJ080



Note:

- *The number after the underscore ("_") in pin names such as XXX_1 and XXX_2 indicates the relocated port number. For these pins, there are multiple pins that provide the same function for the same channel. Use the extended port function register (EPFR) to select the pin.*

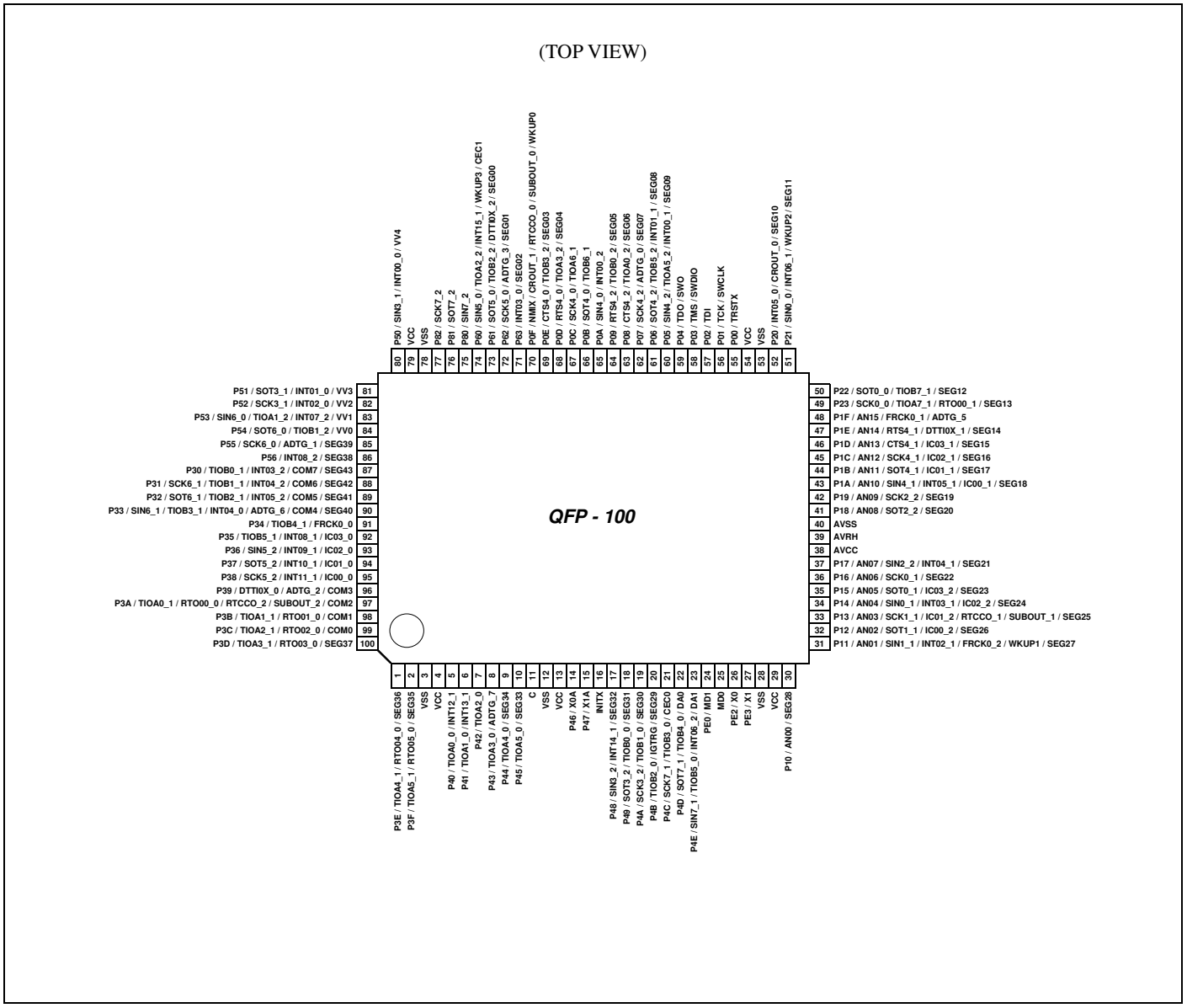
LQI100



Note:

- *The number after the underscore ("_") in pin names such as XXX_1 and XXX_2 indicates the relocated port number. For these pins, there are multiple pins that provide the same function for the same channel. Use the extended port function register (EPFR) to select the pin.*

PQH100



Note:

- *The number after the underscore ("_") in pin names such as XXX_1 and XXX_2 indicates the relocated port number. For these pins, there are multiple pins that provide the same function for the same channel. Use the extended port function register (EPFR) to select the pin.*

4. List of Pin Functions

List of pin numbers

The number after the underscore ("_") in pin names such as XXX_1 and XXX_2 indicates the relocated port number. For these pins, there are multiple pins that provide the same function for the same channel. Use the extended port function register (EPFR) to select the pin.

Pin No				Pin name	I/O circuit type	Pin state type
LQFP-64	LQFP-80	LQFP-100	QFP-100			
1	1	1	79	VCC	-	
2	2	2	80	P50	R	W
				INT00_0		
				SIN3_1		
				VV4		
-	3	3	81	P51	R	W
				INT01_0		
				SOT3_1 (SDA3_1)		
				VV3		
3	-	-	-	P51	E	F
				INT01_0		
				SOT3_1 (SDA3_1)		
-	4	4	82	P52	R	W
				INT02_0		
				SCK3_1 (SCL3_1)		
				VV2		
4	-	-	-	P52	E	F
				INT02_0		
				SCK3_1 (SCL3_1)		
-	5	5	83	P53	R	W
				SIN6_0		
				TIOA1_2		
				INT07_2		
				VV1		
-	6	6	84	P54	R	V
				SOT6_0 (SDA6_0)		
				TIOB1_2		
				VV0		
-	7	7	85	P55	J	U
				SCK6_0 (SCL6_0)		
				ADTG_1		
				SEG39		
-	8	8	86	P56	J	S
				INT08_2		
				SEG38		

Pin No				Pin name	I/O circuit type	Pin state type
LQFP-64	LQFP-80	LQFP-100	QFP-100			
5	9	9	87	P30	K	S
				TIOB0_1		
				INT03_2		
				COM7		
				SEG43		
6	10	10	88	P31	K	S
				TIOB1_1		
				SCK6_1 (SCL6_1)		
				INT04_2		
				COM6		
				SEG42		
7	11	11	89	P32	K	S
				TIOB2_1		
				SOT6_1 (SDA6_1)		
				INT05_2		
				COM5		
				SEG41		
8	12	12	90	P33	K	S
				INT04_0		
				TIOB3_1		
				SIN6_1		
				ADTG_6		
				COM4		
				SEG40		
-	-	13	91	P34	E	H
				FRCK0_0		
				TIOB4_1		
-	-	14	92	P35	E	F
				IC03_0		
				TIOB5_1		
				INT08_1		
-	-	15	93	P36	E	F
				IC02_0		
				SIN5_2		
				INT09_1		
-	-	16	94	P37	E	F
				IC01_0		
				SOT5_2 (SDA5_2)		
				INT10_1		

Pin No				Pin name	I/O circuit type	Pin state type
LQFP-64	LQFP-80	LQFP-100	QFP-100			
-	-	17	95	P38	E	F
				IC00_0		
				SCK5_2 (SCL5_2)		
				INT11_1		
9	13	18	96	P39	L	U
				DTTI0X_0		
				ADTG_2		
				COM3		
10	14	19	97	P3A	L	U
				RTO00_0 (PPG00_0)		
				TIOA0_1		
				RTCCO_2		
				SUBOUT_2		
				COM2		
11	15	20	98	P3B	L	U
				RTO01_0 (PPG00_0)		
				TIOA1_1		
				COM1		
12	16	21	99	P3C	L	U
				RTO02_0 (PPG02_0)		
				TIOA2_1		
				COM0		
13	17	22	100	P3D	J	U
				RTO03_0 (PPG02_0)		
				TIOA3_1		
				SEG37		
14	18	23	1	P3E	J	U
				RTO04_0 (PPG04_0)		
				TIOA4_1		
				SEG36		
15	19	24	2	P3F	J	U
				RTO05_0 (PPG04_0)		
				TIOA5_1		
				SEG35		
16	20	25	3	VSS	-	
-	-	26	4	VCC	-	

Pin No				Pin name	I/O circuit type	Pin state type
LQFP-64	LQFP-80	LQFP-100	QFP-100			
-	-	27	5	P40	E	F
				TIOA0_0		
				INT12_1		
-	-	28	6	P41	E	F
				TIOA1_0		
				INT13_1		
-	-	29	7	P42	E	H
				TIOA2_0		
-	-	30	8	P43	E	H
				TIOA3_0		
				ADTG_7		
-	21	31	9	P44	J	U
				TIOA4_0		
				SEG34		
-	22	32	10	P45	J	U
				TIOA5_0		
				SEG33		
17	23	33	11	C	-	
-	24	34	12	VSS	-	
18	25	35	13	VCC	-	
19	26	36	14	P46	D	M
				X0A		
20	27	37	15	P47	D	N
				X1A		
21	28	38	16	INITX	B	C
-	29	39	17	P48	J	S
				INT14_1		
				SIN3_2		
				SEG32		
22	30	40	18	P49	J	U
				TIOB0_0		
				SEG31		
-				SOT3_2 (SDA3_2)		
23	31	41	19	P4A	J	U
				TIOB1_0		
				SEG30		
-				SCK3_2 (SCL3_2)		

Pin No				Pin name	I/O circuit type	Pin state type
LQFP-64	LQFP-80	LQFP-100	QFP-100			
24	32	42	20	P4B	J	U
				TIOB2_0		
				SEG29		
				IGTRG		
25	33	43	21	P4C	G	Q
				TIOB3_0		
				SCK7_1 (SCL7_1)		
				CEC0		
26	34	44	22	P4D	O	Z
				TIOB4_0		
				SOT7_1 (SDA7_1)		
				DA0		
27	35	45	23	P4E	O	Y
				TIOB5_0		
				INT06_2		
				SIN7_1		
				DA1		
28	36	46	24	PE0	C	P
				MD1		
29	37	47	25	MD0	H	D
30	38	48	26	PE2	A	A
				X0		
31	39	49	27	PE3	A	B
				X1		
32	40	50	28	VSS	-	
33	41	51	29	VCC	-	
34	42	52	30	P10	Q	J
				AN00		
				SEG28		
35	43	53	31	P11	Q	L
				AN01		
				SIN1_1		
				INT02_1		
				FRCK0_2		
				WKUP1		
				SEG27		
36	44	54	32	P12	Q	J
				AN02		
				SOT1_1 (SDA1_1)		
				IC00_2		
				SEG26		

Pin No				Pin name	I/O circuit type	Pin state type
LQFP-64	LQFP-80	LQFP-100	QFP-100			
37	45	55	33	P13	Q	J
				AN03		
				SCK1_1 (SCL1_1)		
				IC01_2		
				RTCCO_1		
				SUBOUT_1		
				SEG25		
38	46	56	34	P14	Q	K
				AN04		
				INT03_1		
				IC02_2		
				SEG24		
-				SIN0_1		
39	47	57	35	P15	Q	J
				AN05		
				IC03_2		
				SEG23		
-				SOT0_1 (SDA0_1)		
-	48	58	36	P16	Q	J
				AN06		
				SCK0_1 (SCL0_1)		
				SEG22		
40	49	59	37	P17	Q	K
				AN07		
				SIN2_2		
				INT04_1		
				SEG21		
41	50	60	38	AVCC	-	
42	51	61	39	AVRH	-	
43	52	62	40	AVSS	-	
44	53	63	41	P18	Q	J
				AN08		
				SOT2_2 (SDA2_2)		
				SEG20		
45	54	64	42	P19	Q	J
				AN09		
				SCK2_2 (SCL2_2)		
				SEG19		

Pin No				Pin name	I/O circuit type	Pin state type
LQFP-64	LQFP-80	LQFP-100	QFP-100			
-	55	65	43	P1A	Q	K
				AN10		
				SIN4_1		
				INT05_1		
				IC00_1		
				SEG18		
-	56	66	44	P1B	Q	J
				AN11		
				SOT4_1 (SDA4_1)		
				IC01_1		
				SEG17		
-	-	67	45	P1C	Q	J
				AN12		
				SCK4_1 (SCL4_1)		
				IC02_1		
				SEG16		
-	-	68	46	P1D	Q	J
				AN13		
				CTS4_1		
				IC03_1		
				SEG15		
-	-	69	47	P1E	Q	J
				AN14		
				RTS4_1		
				DTTI0X_1		
				SEG14		
-	-	70	48	P1F	F	X
				AN15		
				ADTG_5		
				FRCK0_1		
46	57	71	49	P23	J	U
				SCK0_0 (SCL0_0)		
				TIOA7_1		
				SEG13		
-	-			RTO00_1		
47	58	72	50	P22	J	U
				SOT0_0 (SDA0_0)		
				TIOB7_1		
				SEG12		

Pin No				Pin name	I/O circuit type	Pin state type
LQFP-64	LQFP-80	LQFP-100	QFP-100			
48	59	73	51	P21	J	T
				SIN0_0		
				INT06_1		
				WKUP2		
				SEG11		
-	60	74	52	P20	J	S
				INT05_0		
				CROUT_0		
				SEG10		
-	-	75	53	VSS	-	
-	-	76	54	VCC	-	
49	61	77	55	P00	E	E
				TRSTX		
50	62	78	56	P01	E	E
				TCK		
				SWCLK		
51	63	79	57	P02	E	E
				TDI		
52	64	80	58	P03	E	E
				TMS		
				SWDIO		
53	65	81	59	P04	E	E
				TDO		
				SWO		
-	-	82	60	P05	J	S
				TIOA5_2		
				SIN4_2		
				INT00_1		
				SEG09		
-	-	83	61	P06	J	S
				TIOB5_2		
				SOT4_2 (SDA4_2)		
				INT01_1		
				SEG08		
-	66	84	62	P07	J	U
				ADTG_0		
				SEG07		
	-			SCK4_2 (SCL4_2)		
-	-	85	63	P08	J	U
				TIOA0_2		
				CTS4_2		
				SEG06		

Pin No				Pin name	I/O circuit type	Pin state type
LQFP-64	LQFP-80	LQFP-100	QFP-100			
-	-	86	64	P09	J	U
				TIOB0_2		
				RTS4_2		
				SEG05		
54	67	87	65	P0A	G	F
				SIN4_0		
				INT00_2		
55	68	88	66	P0B	G	H
				SOT4_0 (SDA4_0)		
				TIOB6_1		
56	69	89	67	P0C	G	H
				SCK4_0 (SCL4_0)		
				TIOA6_1		
-	70	90	68	P0D	J	U
				RTS4_0		
				TIOA3_2		
				SEG04		
-	71	91	69	P0E	J	U
				CTS4_0		
				TIOB3_2		
				SEG03		
57	72	92	70	P0F	E	I
				NMIX		
				CROUT_1		
				RTCCO_0		
				SUBOUT_0		
				WKUP0		
-	73	93	71	P63	J	S
				INT03_0		
				SEG02		
58	74	94	72	P62	J	U
				SCK5_0 (SCL5_0)		
				ADTG_3		
				SEG01		
59	75	95	73	P61	J	U
				SOT5_0 (SDA5_0)		
				TIOB2_2		
				DTTI0X_2		
				SEG00		

Pin No				Pin name	I/O circuit type	Pin state type
LQFP-64	LQFP-80	LQFP-100	QFP-100			
60	76	96	74	P60	G	R
				SIN5_0		
				TIOA2_2		
				INT15_1		
				WKUP3		
				CEC1		
61	77	97	75	P80	G	H
				SIN7_2		
62	78	98	76	P81	G	H
				SOT7_2 (SDA7_2)		
63	79	99	77	P82	G	H
				SCK7_2 (SCL7_2)		
64	80	100	78	VSS	-	

List of pin functions

The number after the underscore ("_") in pin names such as XXX_1 and XXX_2 indicates the relocated port number. For these pins, there are multiple pins that provide the same function for the same channel. Use the extended port function register (EPFR) to select the pin.

Pin function	Pin name	Function description	Pin No			
			LQFP-64	LQFP-80	LQFP-100	QFP-100
ADC	ADTG_0	A/D converter external trigger input pin	-	66	84	62
	ADTG_1		-	7	7	85
	ADTG_2		9	13	18	96
	ADTG_3		58	74	94	72
	ADTG_4		-	-	-	-
	ADTG_5		-	-	70	48
	ADTG_6		8	12	12	90
	ADTG_7		-	-	30	8
	ADTG_8		-	-	-	-
	AN00	A/D converter analog input pin. ANxx describes ADC ch.xx.	34	42	52	30
	AN01		35	43	53	31
	AN02		36	44	54	32
	AN03		37	45	55	33
	AN04		38	46	56	34
	AN05		39	47	57	35
	AN06		-	48	58	36
	AN07		40	49	59	37
	AN08		44	53	63	41
	AN09		45	54	64	42
	AN10		-	55	65	43
	AN11		-	56	66	44
	AN12		-	-	67	45
	AN13		-	-	68	46
	AN14		-	-	69	47
	AN15		-	-	70	48

Pin function	Pin name	Function description	Pin No			
			LQFP-64	LQFP-80	LQFP-100	QFP-100
Base Timer 0	TIOA0_0	Base timer ch.0 TIOA pin	-	-	27	5
	TIOA0_1		10	14	19	97
	TIOA0_2		-	-	85	63
	TIOB0_0	Base timer ch.0 TIOB pin	22	30	40	18
	TIOB0_1		5	9	9	87
	TIOB0_2		-	-	86	64
Base Timer 1	TIOA1_0	Base timer ch.1 TIOA pin	-	-	28	6
	TIOA1_1		11	15	20	98
	TIOA1_2		-	5	5	83
	TIOB1_0	Base timer ch.1 TIOB pin	23	31	41	19
	TIOB1_1		6	10	10	88
	TIOB1_2		-	6	6	84
Base Timer 2	TIOA2_0	Base timer ch.2 TIOA pin	-	-	29	7
	TIOA2_1		12	16	21	99
	TIOA2_2		60	76	96	74
	TIOB2_0	Base timer ch.2 TIOB pin	24	32	42	20
	TIOB2_1		7	11	11	89
	TIOB2_2		59	75	95	73
Base Timer 3	TIOA3_0	Base timer ch.3 TIOA pin	-	-	30	8
	TIOA3_1		13	17	22	100
	TIOA3_2		-	70	90	68
	TIOB3_0	Base timer ch.3 TIOB pin	25	33	43	21
	TIOB3_1		8	12	12	90
	TIOB3_2		-	71	91	69
Base Timer 4	TIOA4_0	Base timer ch.4 TIOA pin	-	21	31	9
	TIOA4_1		14	18	23	1
	TIOA4_2		-	-	-	-
	TIOB4_0	Base timer ch.4 TIOB pin	26	34	44	22
	TIOB4_1		-	-	13	91
	TIOB4_2		-	-	-	-
Base Timer 5	TIOA5_0	Base timer ch.5 TIOA pin	-	22	32	10
	TIOA5_1		15	19	24	2
	TIOA5_2		-	-	82	60
	TIOB5_0	Base timer ch.5 TIOB pin	27	35	45	23
	TIOB5_1		-	-	14	92
	TIOB5_2		-	-	83	61
Base Timer 6	TIOA6_1	Base timer ch.6 TIOA pin	56	69	89	67
	TIOB6_1	Base timer ch.6 TIOB pin	55	68	88	66
Base Timer 7	TIOA7_0	Base timer ch.7 TIOA pin	-	-	-	-
	TIOA7_1		46	57	71	49
	TIOA7_2		-	-	-	-
	TIOB7_0	Base timer ch.7 TIOB pin	-	-	-	-
	TIOB7_1		47	58	72	50
	TIOB7_2		-	-	-	-

Pin function	Pin name	Function description	Pin No			
			LQFP-64	LQFP-80	LQFP-100	QFP-100
Debugger	SWCLK	Serial wire debug interface clock input pin	50	62	78	56
	SWDIO	Serial wire debug interface data input / output pin	52	64	80	58
	SWO	Serial wire viewer output pin	53	65	81	59
	TRSTX	JTAG reset input pin	49	61	77	55
	TCK	JTAG test clock input pin	50	62	78	56
	TDI	JTAG test data input pin	51	63	79	57
	TMS	JTAG test mode state input/output pin	52	64	80	58
	TDO	JTAG debug data output pin	53	65	81	59
External Interrupt	INT00_0	External interrupt request 00 input pin	2	2	2	80
	INT00_1		-	-	82	60
	INT00_2		54	67	87	65
	INT01_0	External interrupt request 01 input pin	3	3	3	81
	INT01_1		-	-	83	61
	INT02_0	External interrupt request 02 input pin	4	4	4	82
	INT02_1		35	43	53	31
	INT03_0	External interrupt request 03 input pin	-	73	93	71
	INT03_1		38	46	56	34
	INT03_2		5	9	9	87
	INT04_0	External interrupt request 04 input pin	8	12	12	90
	INT04_1		40	49	59	37
	INT04_2		6	10	10	88
	INT05_0	External interrupt request 05 input pin	-	60	74	52
	INT05_1		-	55	65	43
	INT05_2		7	11	11	89
	INT06_1	External interrupt request 06 input pin	48	59	73	51
	INT06_2		27	35	45	23
	INT07_2	External interrupt request 07 input pin	-	5	5	83
	INT08_1	External interrupt request 08 input pin	-	-	14	92
	INT08_2		-	8	8	86
	INT09_1	External interrupt request 09 input pin	-	-	15	93
	INT10_1	External interrupt request 10 input pin	-	-	16	94
	INT11_1	External interrupt request 11 input pin	-	-	17	95
	INT12_1	External interrupt request 12 input pin	-	-	27	5
	INT13_1	External interrupt request 13 input pin	-	-	28	6
	INT14_1	External interrupt request 14 input pin	-	29	39	17
	INT15_1	External interrupt request 15 input pin	60	76	96	74
	NMIX	Non-Maskable Interrupt input pin	57	72	92	70

Pin function	Pin name	Function description	Pin No			
			LQFP-64	LQFP-80	LQFP-100	QFP-100
GPIO	P00	General-purpose I/O port 0	49	61	77	55
	P01		50	62	78	56
	P02		51	63	79	57
	P03		52	64	80	58
	P04		53	65	81	59
	P05		-	-	82	60
	P06		-	-	83	61
	P07		-	66	84	62
	P08		-	-	85	63
	P09		-	-	86	64
	P0A		54	67	87	65
	P0B		55	68	88	66
	P0C		56	69	89	67
	P0D		-	70	90	68
	P0E		-	71	91	69
	P0F		57	72	92	70
	P10	General-purpose I/O port 1	34	42	52	30
	P11		35	43	53	31
	P12		36	44	54	32
	P13		37	45	55	33
	P14		38	46	56	34
	P15		39	47	57	35
	P16		-	48	58	36
	P17		40	49	59	37
	P18		44	53	63	41
	P19		45	54	64	42
	P1A		-	55	65	43
	P1B		-	56	66	44
	P1C		-	-	67	45
	P1D		-	-	68	46
	P1E		-	-	69	47
	P1F		-	-	70	48
	P20	General-purpose I/O port 2	-	60	74	52
	P21		48	59	73	51
	P22		47	58	72	50
	P23		46	57	71	49