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MB9AFB41LB/MB/NB
MB9AFB42LB/MB/NB
MB9AFB44LB/MB/NB

32-bit ARM[®] Cortex[®]-M3, MB9AB40NB Series, FM3 Microcontroller

The MB9AB40NB Series are highly integrated 32-bit microcontrollers dedicated for embedded controllers with low-power consumption mode and competitive cost.

These series are based on the ARM Cortex-M3 Processor with on-chip Flash memory and SRAM, and have peripheral functions such as various timers, ADCs, LCD and Communication Interfaces (USB, UART, CSIO, I²C).

The products which are described in this data sheet are placed into TYPE6 product categories in FM3 Family Peripheral Manual.

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Features

32-bit ARM Cortex-M3 Core

- Processor version: r2p1
- Up to 40 MHz Frequency Operation
- Integrated Nested Vectored Interrupt Controller (NVIC): 1 NMI (non-maskable interrupt) and 48 peripheral interrupts and 16 priority levels
- 24-bit System timer (Sys Tick): System timer for OS task management

On-chip Memories

[Flash memory]

- Dual operation Flash memory
 - Dual Operation Flash memory has the upper bank and the lower bank. So, this series could implement erase, write and read operations for each bank simultaneously.
 - Main area: Up to 256 Kbytes (Up to 240 Kbytes upper bank + 16 Kbytes lower bank)
 - Work area: 32 Kbytes (lower bank)
- Read cycle: 0 wait-cycle
- Security function for code protection

[SRAM]

This Series on-chip SRAM is composed of two independent SRAM (SRAM0, SRAM1). SRAM0 is connected to I-code bus and D-code bus of Cortex-M3 core. SRAM1 is connected to System bus.

- SRAM0: Up to 16 Kbytes
- SRAM1: Up to 16 Kbytes

External Bus Interface*

- Supports SRAM, NOR Flash memory device
- Up to 8 chip selects
- 8/16-bit Data width
- Up to 25-bit Address bit
- Maximum area size : Up to 256 Mbytes
- Supports Address/Data multiplex
- Supports external RDY function

*: MB9AFB41LB, FB42LB and FB44LB do not support External Bus Interface.

USB Interface

The USB interface is composed of Function and Host. PLL for USB is built-in, USB clock can be generated by multiplication of Main clock.

[USB function]

- USB2.0 Full-Speed supported
- Max 6 EndPoint supported
 - EndPoint 0 is control transfer
 - EndPoint 1, 2 can select Bulk-transfer, Interrupt-transfer or Isochronous-transfer
 - EndPoint 3 to 5 can select Bulk-transfer or Interrupt-transfer
 - EndPoint 1 to 5 is comprised of Double Buffers.
 - The size of each endpoint is according to the follows.
 - Endpoint 0, 2 to 5: 64 bytes
 - Endpoint 1: 256 bytes

[USB host]

- USB2.0 Full/Low-speed supported
- Bulk-transfer, interrupt-transfer and Isochronous-transfer support
- USB Device connected/disconnected automatic detection
- Automatic processing of the IN/OUT token handshake packet
- Max 256-byte packet-length supported
- Wake-up function supported

LCD Controller (LCDC)

- Up to 40 SEG × 8 COM
- 8 COM or 4 COM mode can be selected.
- Built-in internal dividing resistor
- LCD drive power supply (bias) pin (VV4 to VV0)
- With blinking function

Multi-function Serial Interface (Max 8channels)

- 4 channels with 16steps×9-bit FIFO (ch.4 to ch.7), 4 channels without FIFO (ch.0 to ch.3)
- Operation mode is selectable from the following 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
- Hardware Flow control* : Automatically control the transmission by CTS/RTS (only ch.4)
- Various error detection functions available (parity errors, framing errors, and overrun errors)

*: MB9AFB41LB, FB42LB and FB44LB do not support Hardware Flow control.

[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

DMA Controller (8 channels)

The DMA Controller has an independent bus from the CPU, so CPU and DMA Controller can process simultaneously.

- 8 independently configured and operated channels
- Transfer can be started by software or request from the built-in peripherals
- Transfer address area: 32-bit (4 Gbytes)
- Transfer mode: Block transfer/Burst transfer/Demand transfer
- Transfer data type: byte/half-word/word
- Transfer block count: 1 to 16
- Number of transfers: 1 to 65536

A/D Converter (Max 24 channels)**[12-bit A/D Converter]**

- Successive Approximation type
- Built-in 2 units
- Conversion time: 2.0 μs @ 2.7 V to 3.6 V
- Priority conversion available (priority at 2 levels)
- Scanning conversion mode
- Built-in FIFO for conversion data storage (for SCAN conversion: 16 steps, for Priority conversion: 4 steps)

Base Timer (Max 8 channels)

Operation mode is selectable from the following 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 external bus or 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 83 fast general-purpose I/O Ports@100 pin Package
- Some ports are 5 V tolerant.

See [Pin Assignment](#) to confirm the corresponding pins.

Dual Timer (32/16-bit Down Counter)

The Dual Timer consists of two programmable 32-/16-bit down counters. Operation mode is selectable from the following for each channel.

- Free-running
- Periodic (=Reload)
- One-shot

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

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)

HDMI-CEC receiver

- Automatic ACK reply function available
- Line error detection function available

Remote control receiver

- 4 bytes reception buffer
- Repeat code detection function available

Real-time clock (RTC)

The Real-time clock can count year/Month/Day/Hour/Minute/Second/A day of the week from 01 to 99.

- The interrupt function with specifying date and time (Year/Month/Day/Hour/Minute/Second/A day of the week.) 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.

Watch Counter

- The Watch counter is used for wake up from sleep and timer mode.
- Interval timer: up to 64 s (Max) @ Sub Clock : 32.768 kHz

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 modes except RTC, Stop, Deep Standby RTC, Deep Standby Stop modes.

CRC (Cyclic Redundancy Check) Accelerator

The CRC accelerator calculates the CRC which has a heavy software processing load, and achieves a reduction of the integrity check processing load for reception data and storage.

CCITT CRC16 and IEEE-802.3 CRC32 are supported.

- CCITT CRC16 Generator Polynomial: 0x1021
- IEEE-802.3 CRC32 Generator Polynomial: 0x04C11DB7

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 48 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 Visor reset

Clock Super Visor (CSV)

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

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

Low-Voltage Consumption Detector (LVD)

- This Series includes 2-stage monitoring of voltage on the VCC pins. 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 (selectable between keeping the value of RAM and not)
 - Deep Standby Stop (selectable between keeping the value of RAM and not)

Debug

- Serial Wire JTAG Debug Port (SWJ-DP)
- Embedded Trace Macrocells (ETM).*

*: MB9AFB41LB/MB, FB42LB/MB, FB44LB/MB support only SWJ-DP.

Unique ID

Unique value of the device (41-bit) is set.

Power Supply

Wide range voltage:

VCC = 1.65 V to 3.6 V

VCC = 3.0 V to 3.6 V (when USB is used)

VCC = 2.2 V to 3.6 V (when LCDC is used)

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1. Product Lineup

Memory size

Product name		MB9AFB41LB/MB/NB	MB9AFB42LB/MB/NB	MB9AFB44LB/MB/NB
On-chip Flash memory	Main area	64 Kbytes	128 Kbytes	256 Kbytes
	Work area	32 Kbytes	32 Kbytes	32 Kbytes
On-chip SRAM	SRAM0	8 Kbytes	8 Kbytes	16 Kbytes
	SRAM1	8 Kbytes	8 Kbytes	16 Kbytes
	Total	16 Kbytes	16 Kbytes	32 Kbytes

Function

Product name		MB9AFB41LB MB9AFB42LB MB9AFB44LB	MB9AFB41MB MB9AFB42MB MB9AFB44MB	MB9AFB41NB MB9AFB42NB MB9AFB44NB
Pin count		64	80/96	100/112
CPU		Cortex-M3		
	Freq.	40 MHz		
Power supply voltage range		1.65 V to 3.6 V		
USB2.0 (Function/Host)		1ch.		
DMAC		8ch.		
External Bus Interface		-	Addr: 21-bit (Max) R/W Data: 8-bit (Max) CS: 4 (Max) Support: SRAM, NOR Flash memory	Addr: 25-bit (Max) R/W Data: 8-/16-bit (Max) CS: 8 (Max) Support: SRAM, NOR Flash memory
LCD Controller		20 SEG × 8COM (Max)	33 SEG × 8COM (Max)	40 SEG × 8COM (Max)
MF Serial Interface (UART/CSIO/I ² C)		8ch. (Max) ch.4 to ch.7: FIFO (16steps × 9-bit) ch.0 to ch.3: No FIFO		
Base Timer (PWC/Reload timer/PWM/PPG)		8ch. (Max)		
Dual Timer		1 unit		
HDMI-CEC/ Remote Control Receiver		2ch. (Max)		
Real-Time Clock		1 unit		
Watch Counter		1 unit		
CRC Accelerator		Yes		
Watchdog timer		1ch. (SW) + 1ch. (HW)		
External Interrupts		8pins (Max) + NMI × 1	11pins (Max) + NMI × 1	16pins (Max) + NMI × 1
I/O ports		51 pins (Max)	66 pins (Max)	83 pins (Max)
12-bit A/D converter		12ch. (2 units)	17ch. (2 units)	24ch. (2 units)
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		SWJ-DP/ETM
Unique ID		Yes		

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](#) 13.5 AC Characteristics 13.5.3 Built-in CR Oscillation Characteristics for accuracy of built-in CR.

2. Packages

Package \ Product name	MB9AFB41LB MB9AFB42LB MB9AFB44LB	MB9AFB41MB MB9AFB42MB MB9AFB44MB	MB9AFB41NB MB9AFB42NB MB9AFB44NB
LQFP: FPT-64P-M38 (0.5mm pitch)	○	-	-
LQFP: FPT-64P-M39 (0.65mm pitch)	○	-	-
QFN: LCC-64P-M24 (0.5mm pitch)	○	-	-
LQFP: FPT-80P-M37 (0.5mm pitch)	-	○	-
LQFP: FPT-80P-M40 (0.65mm pitch)	-	○	-
BGA: BGA-96P-M07 (0.5mm pitch)	-	○	-
LQFP: FPT-100P-M23 (0.5mm pitch)	-	-	○
QFP: FPT-100P-M36 (0.65mm pitch)	-	-	○
BGA: BGA-112P-M04 (0.8mm pitch)	-	-	○

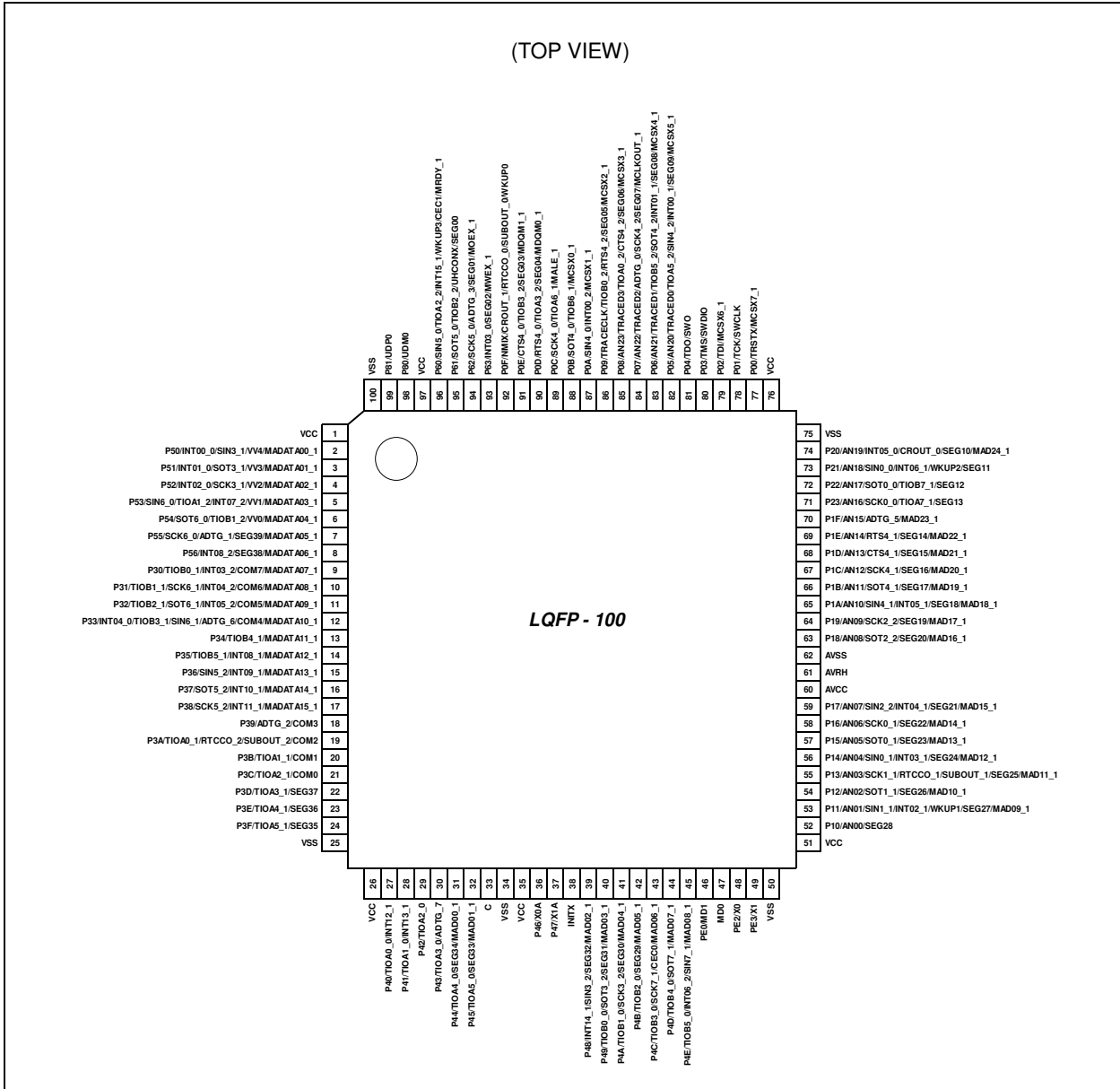
○: Supported

Note:

See [Package Dimensions](#) for detailed information on each package.

3. Pin Assignment

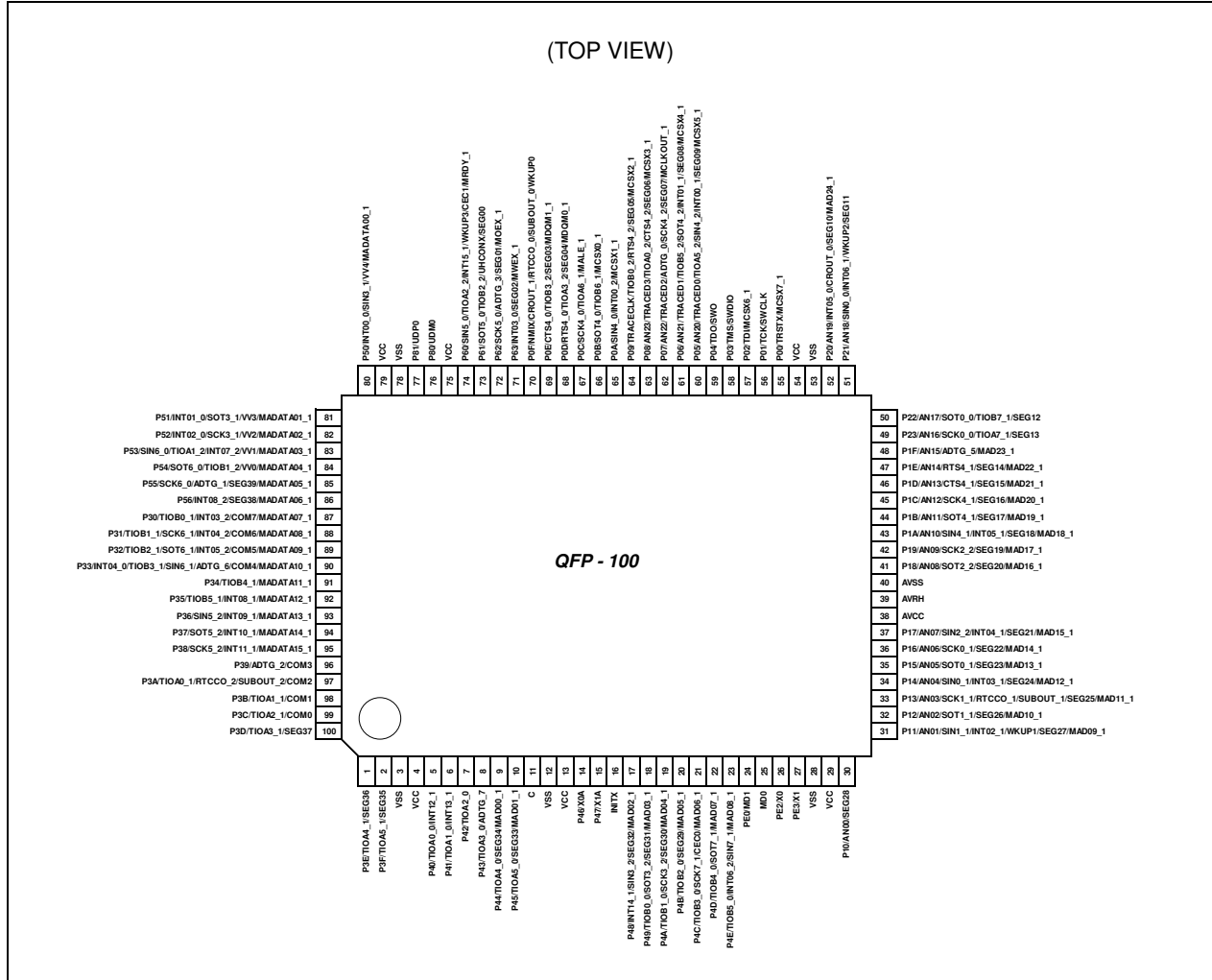
FPT-100P-M23



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.

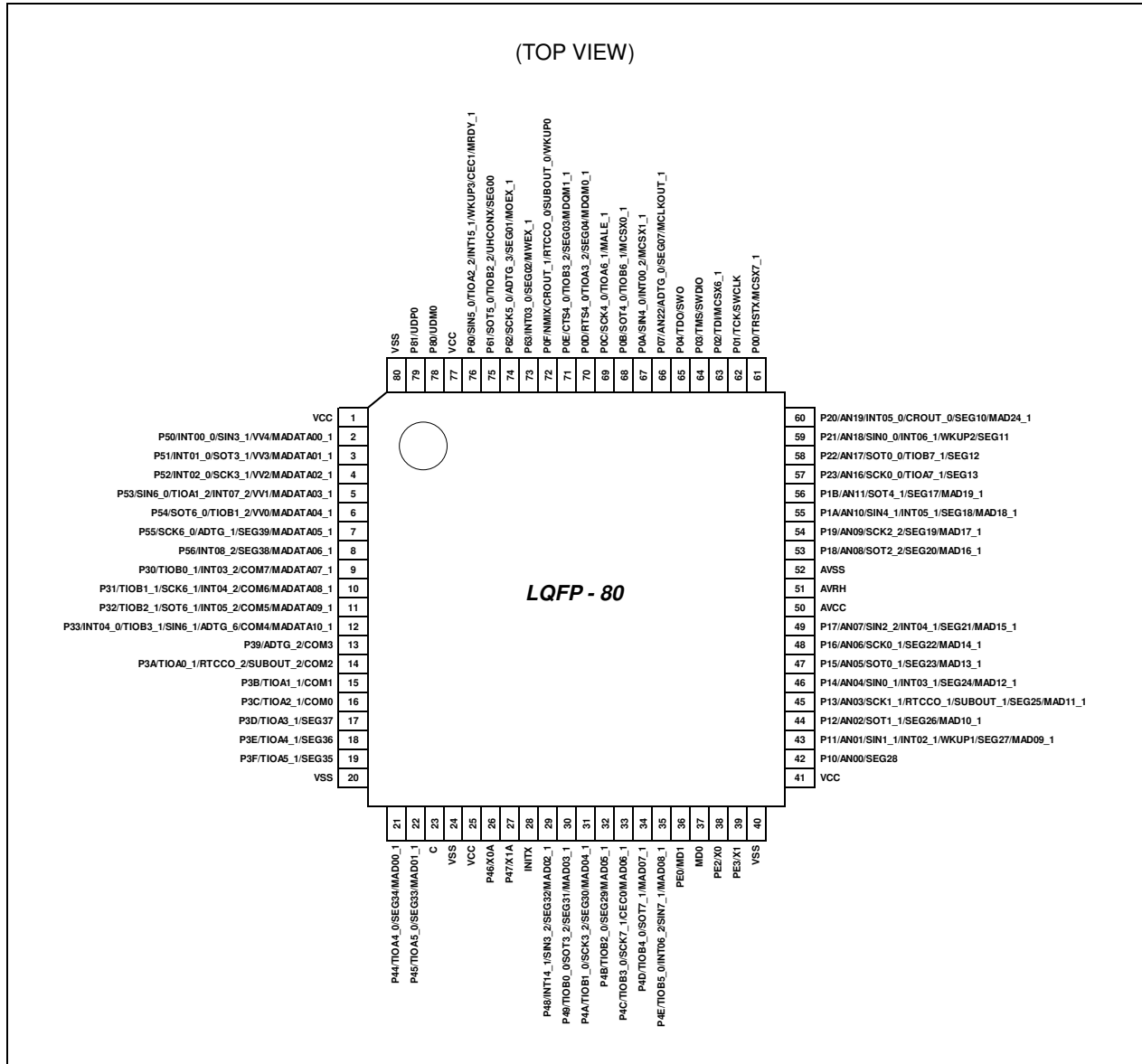
FPT-100P-M36



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.

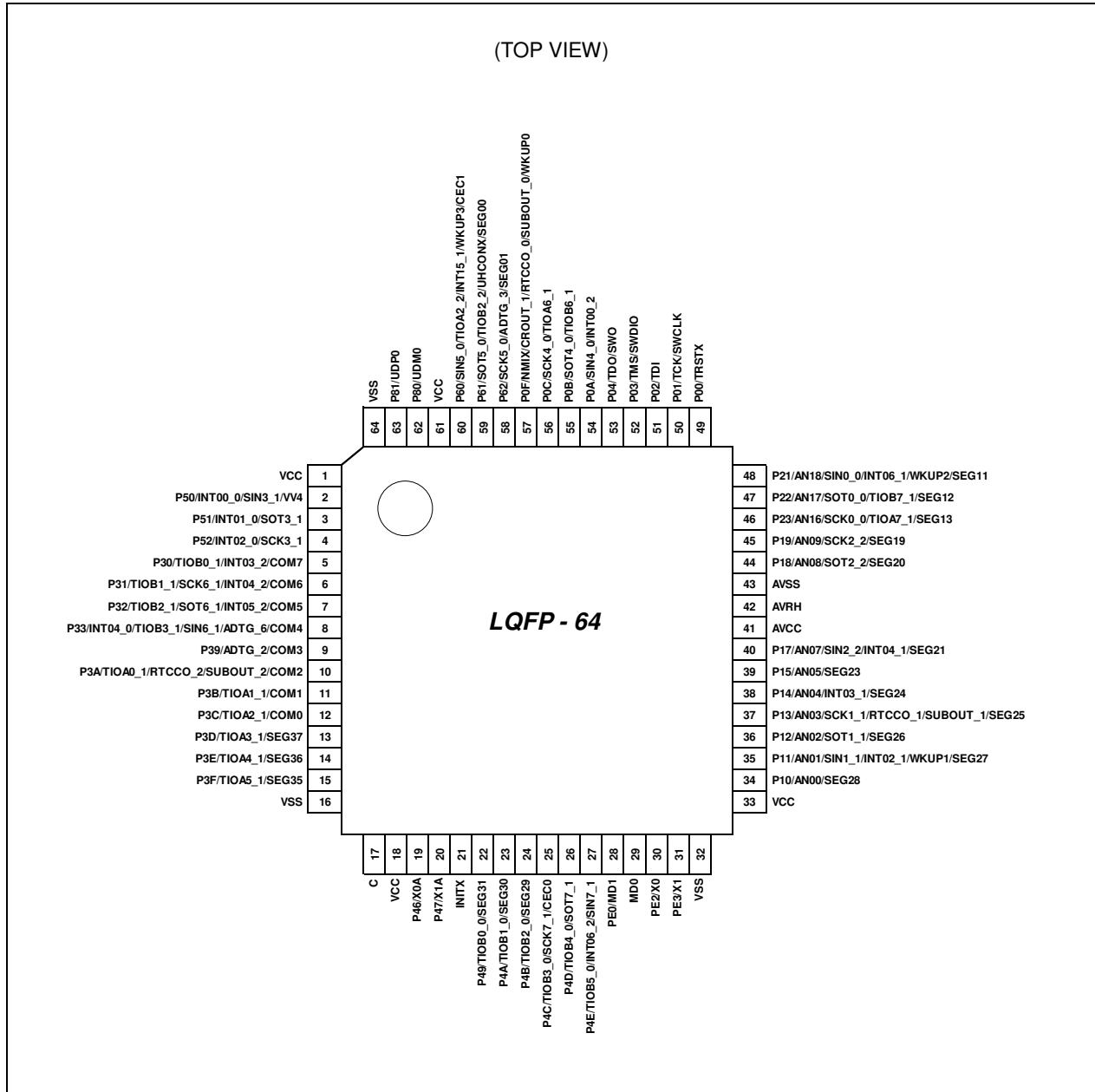
FPT-80P-M37/M40



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.

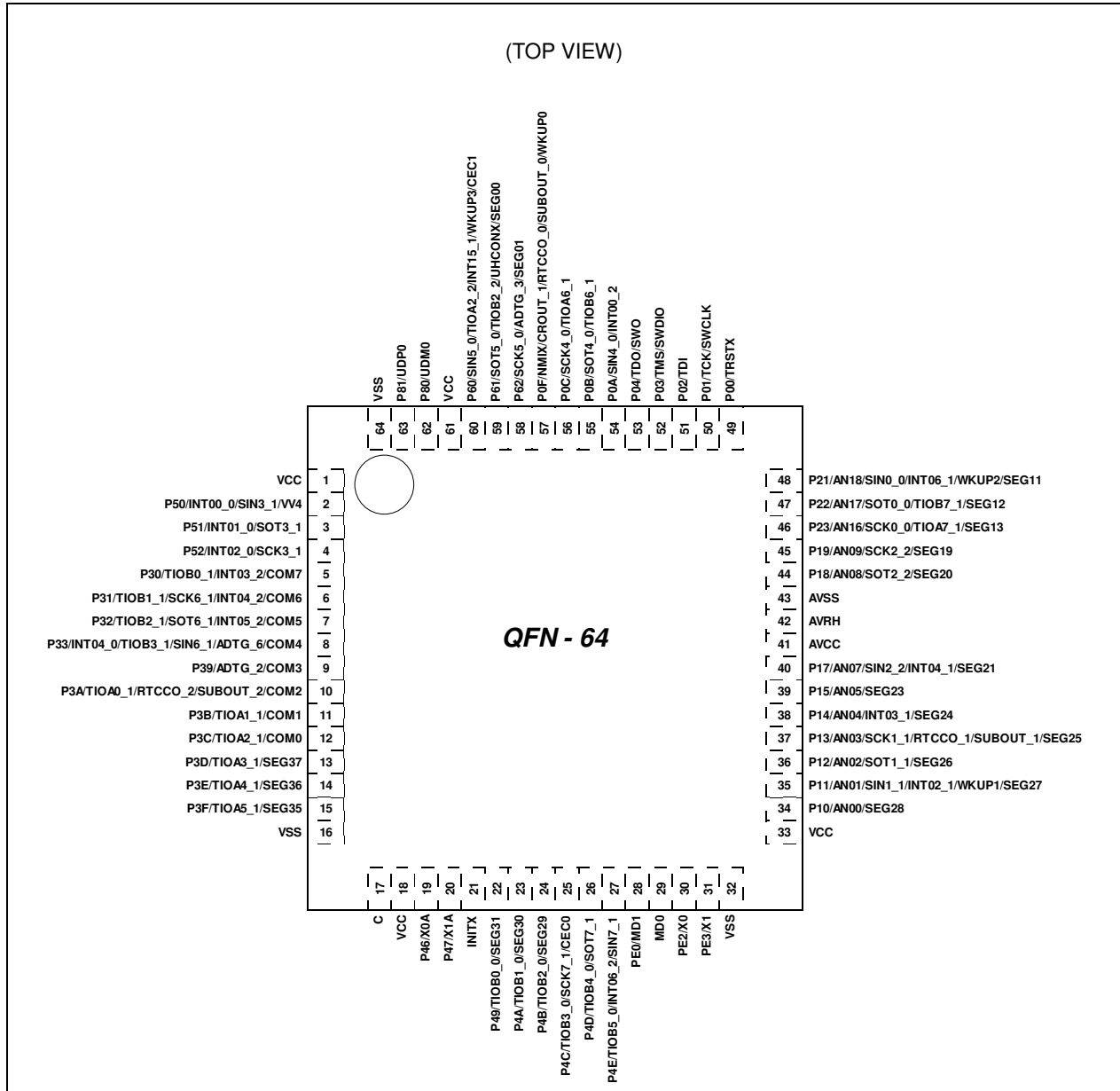
FPT-64P-M38/M39



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.

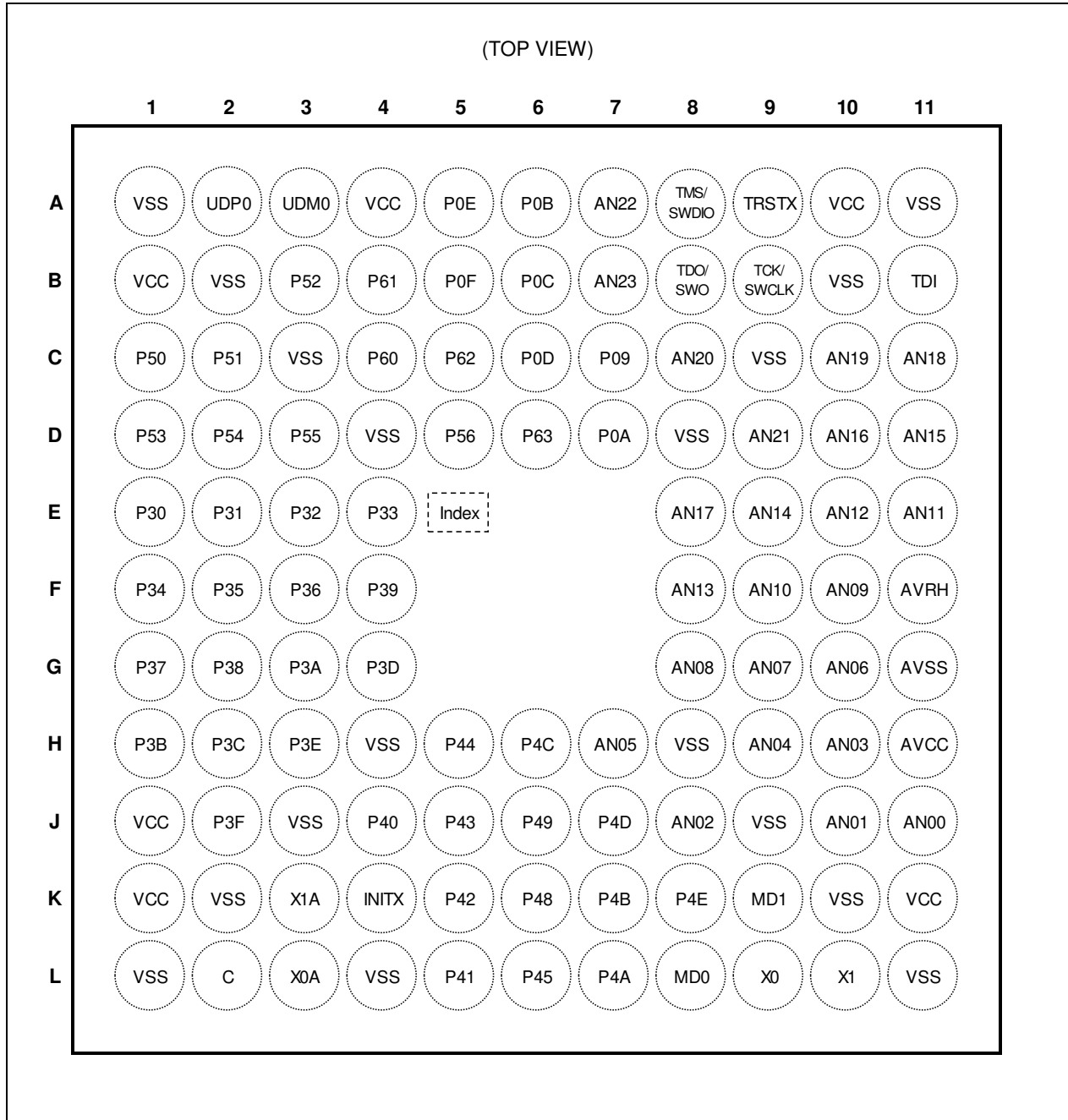
LCC-64P-M24



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.

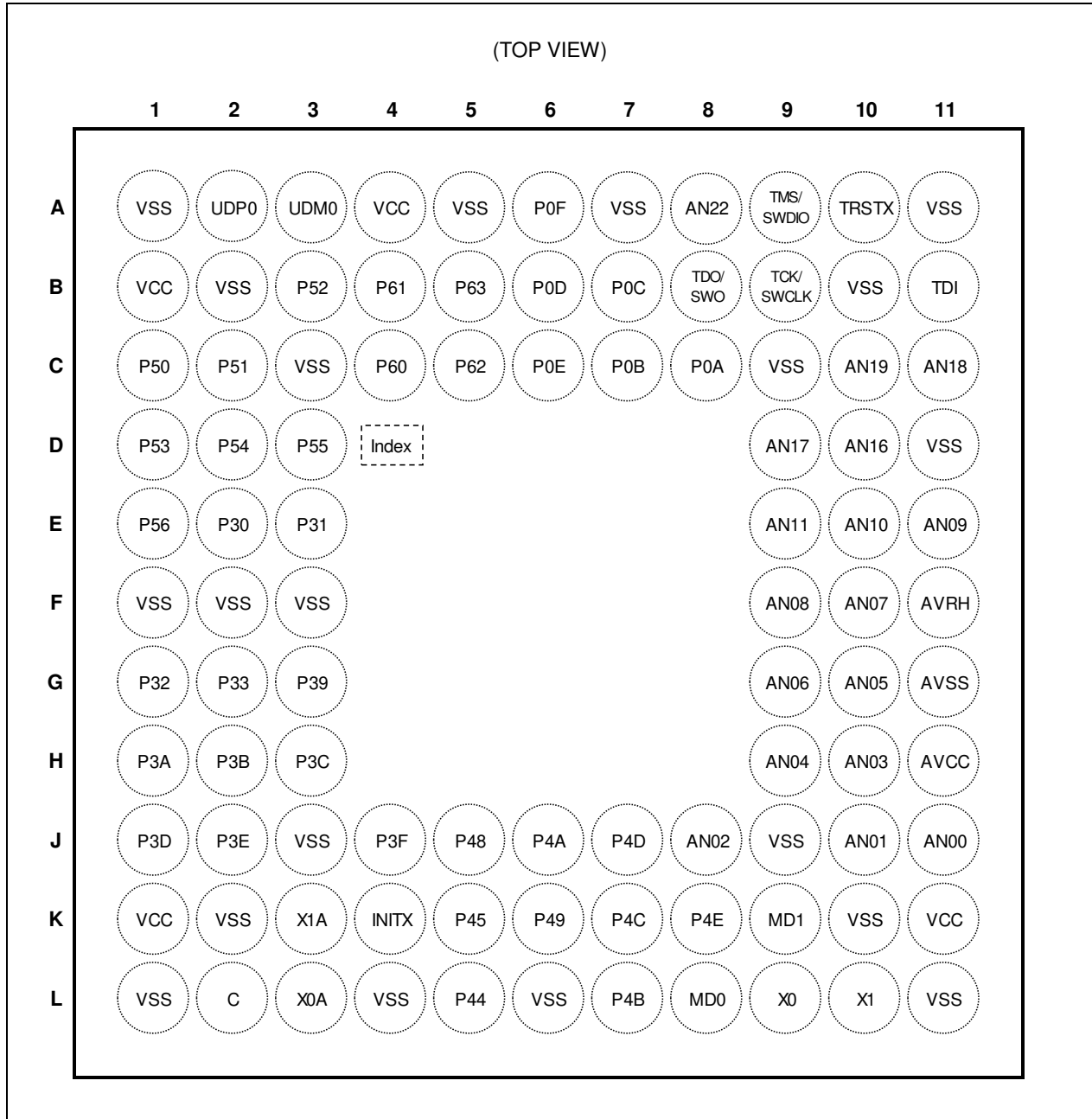
BGA-112P-M04



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.

BGA-96P-M07



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

4.1 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-100	QFP-100	BGA-112	LQFP-80	BGA-96	LQFP-64 QFN-64			
1	79	B1	1	B1	1	VCC	-	
2	80	C1	2	C1	2	P50	J	Y
						INT00_0		
						SIN3_1		
						VV4		
-	-	-	-	-	-	MADATAA00_1		
3	81	C2	3	C2	-	P51	J	Y
						INT01_0		
						SOT3_1 (SDA3_1)		
						VV3		
-	-	-	-	-	-	MADATAA01_1		
-	-	-	-	-	3	P51	E	L
						INT01_0		
						SOT3_1 (SDA3_1)		
4	82	B3	4	B3	-	P52	J	Y
						INT02_0		
						SCK3_1 (SCL3_1)		
						VV2		
-	-	-	-	-	-	MADATAA02_1		
-	-	-	-	-	4	P52	E	L
						INT02_0		
						SCK3_1 (SCL3_1)		
5	83	D1	5	D1	-	P53	J	Y
						SIN6_0		
						TIOA1_2		
						INT07_2		
						VV1		
-	-	-	-	-	-	MADATAA03_1		
6	84	D2	6	D2	-	P54	J	X
						SOT6_0 (SDA6_0)		
						TIOB1_2		
						VV0		
-	-	-	-	-	-	MADATAA04_1		

Pin No						Pin Name	I/O Circuit Type	Pin State Type							
LQFP-100	QFP-100	BGA-112	LQFP-80	BGA-96	LQFP-64 QFN-64										
7	85	D3	7	D3	-	P55	K	U							
						SCK6_0 (SCL6_0)									
						ADTG_1									
						SEG39									
						MADATA05_1									
						P56									
						INT08_2									
						SEG38									
8	86	D5	8	E1	-	MADATA06_1	K	V							
						P30									
						TIOB0_1									
						INT03_2									
9	87	E1	9	E2	5	COM7	K	V							
					-	MADATA07_1									
					10	88			E2	10	E3	6	P31	K	V
													TIOB1_1		
SCK6_1 (SCL6_1)															
INT04_2															
11	89	E3	11	G1	7	COM6	K	V							
						-			MADATA08_1						
						P32									
						TIOB2_1									
12	90	E4	12	G2	8	SOT6_1 (SDA6_1)	K	V							
						INT05_2									
						COM5									
						-			MADATA09_1						
13	91	F1	-	-	-	P33	E	K							
						INT04_0									
						TIOB3_1									
						SIN6_1									
14	92	F2	-	-	-	ADTG_6	E	L							
						COM4									
						-			MADATA10_1						
						P34									
						TIOB4_1									
						MADATA11_1									
						P35									
						TIOB5_1									
						INT08_1									
						MADATA12_1									

Pin No						Pin Name	I/O Circuit Type	Pin State Type
LQFP-100	QFP-100	BGA-112	LQFP-80	BGA-96	LQFP-64 QFN-64			
15	93	F3	-	-	-	P36	E	L
						SIN5_2		
						INT09_1		
						MADATA13_1		
-	-	-	-	F1	-	VSS	-	
-	-	-	-	F2	-	VSS	-	
-	-	-	-	F3	-	VSS	-	
16	94	G1	-	-	-	P37	E	L
						SOT5_2 (SDA5_2)		
						INT10_1		
						MADATA14_1		
17	95	G2	-	-	-	P38	E	L
						SCK5_2 (SCL5_2)		
						INT11_1		
						MADATA15_1		
18	96	F4	13	G3	9	P39	K	U
						ADTG_2		
						COM3		
19	97	G3	14	H1	10	P3A	K	U
						TIOA0_1		
						RTCCO_2		
						SUBOUT_2		
						COM2		
20	98	H1	15	H2	11	P3B	K	U
						TIOA1_1		
						COM1		
21	99	H2	16	H3	12	P3C	K	U
						TIOA2_1		
						COM0		
22	100	G4	17	J1	13	P3D	K	U
						TIOA3_1		
						SEG37		
-	-	B2	-	B2	-	VSS	-	
23	1	H3	18	J2	14	P3E	K	U
						TIOA4_1		
						SEG36		
24	2	J2	19	J4	15	P3F	K	U
						TIOA5_1		
						SEG35		
25	3	L1	20	L1	16	VSS	-	
26	4	J1	-	-	-	VCC	-	

Pin No						Pin Name	I/O Circuit Type	Pin State Type
LQFP-100	QFP-100	BGA-112	LQFP-80	BGA-96	LQFP-64 QFN-64			
27	5	J4	-	-	-	P40	E	L
						TIOA0_0		
						INT12_1		
28	6	L5	-	-	-	P41	E	L
						TIOA1_0		
						INT13_1		
29	7	K5	-	-	-	P42	E	K
						TIOA2_0		
30	8	J5	-	-	-	P43	E	K
						TIOA3_0		
						ADTG_7		
31	9	H5	21	L5	-	P44	K	U
						TIOA4_0		
						SEG34		
						MAD00_1		
32	10	L6	22	K5	-	P45	K	U
						TIOA5_0		
						SEG33		
						MAD01_1		
-	-	K2	-	K2	-	VSS	-	-
-	-	J3	-	J3	-	VSS	-	-
-	-	H4	-	-	-	VSS	-	-
-	-	-	-	L6	-	VSS	-	-
33	11	L2	23	L2	17	C	-	-
34	12	L4	24	L4	-	VSS	-	-
35	13	K1	25	K1	18	VCC	-	-
36	14	L3	26	L3	19	P46	D	F
						X0A		
37	15	K3	27	K3	20	P47	D	G
						X1A		
38	16	K4	28	K4	21	INITX	B	C
39	17	K6	29	J5	-	P48	K	V
						INT14_1		
						SIN3_2		
						SEG32		
40	18	J6	30	K6	22	P49	K	U
						TIOB0_0		
					SEG31			
					-	SOT3_2 (SDA3_2)		
						MAD03_1		

Pin No						Pin Name	I/O Circuit Type	Pin State Type
LQFP-100	QFP-100	BGA-112	LQFP-80	BGA-96	LQFP-64 QFN-64			
41	19	L7	31	J6	23	P4A	K	U
						TIOB1_0		
					SEG30			
					SCK3_2 (SCL3_2)			
					-	MAD04_1		
42	20	K7	32	L7	24	P4B	K	U
						TIOB2_0		
					SEG29			
					MAD05_1			
					-			
43	21	H6	33	K7	25	P4C	I*	S
						TIOB3_0		
					SCK7_1 (SCL7_1)			
					CEC0			
					-	MAD06_1		
44	22	J7	34	J7	26	P4D	I*	K
						TIOB4_0		
					SOT7_1 SDA7_1)			
					MAD07_1			
					-			
45	23	K8	35	K8	27	P4E	I*	L
						TIOB5_0		
					INT06_2			
					SIN7_1			
					-	MAD08_1		
46	24	K9	36	K9	28	MD1	C	E
						PE0		
47	25	L8	37	L8	29	MD0	G	D
48	26	L9	38	L9	30	X0	A	A
						PE2		
49	27	L10	39	L10	31	X1	A	B
						PE3		
50	28	L11	40	L11	32	VSS	-	
51	29	K11	41	K11	33	VCC	-	
52	30	J11	42	J11	34	P10	L	W
						AN00		
						SEG28		
53	31	J10	43	J10	35	P11	L	R
						AN01		
					SIN1_1			
					INT02_1			
					WKUP1			
					SEG27			
					-	MAD09_1		

Pin No						Pin Name	I/O Circuit Type	Pin State Type
LQFP-100	QFP-100	BGA-112	LQFP-80	BGA-96	LQFP-64 QFN-64			
54	32	J8	44	J8	36	P12	L	W
						AN02		
						SOT1_1.(SDA1_1)		
						SEG26		
-	-	K10	-	K10	-	MAD10_1	-	-
-	-	J9	-	J9	-	VSS	-	-
55	33	H10	45	H10	37	P13	L	W
						AN03		
						SCK1_1 (SCL1_1)		
						RTCCO_1		
						SEG25		
						SUBOUT_1		
-	-	-	-	-	-	MAD11_1	-	-
56	34	H9	46	H9	38	P14	L	N
						AN04		
						INT03_1		
						SEG24		
						SIN0_1		
-	-	-	-	-	-	MAD12_1	-	-
57	35	H7	47	G10	39	P15	L	W
						AN05		
						SEG23		
						SOT0_1 (SDA0_1)		
-	-	-	-	-	-	MAD13_1	-	-
58	36	G10	48	G9	-	P16	L	W
						AN06		
						SCK0_1 (SCL0_1)		
						SEG22		
-	-	-	-	-	-	MAD14_1	-	-
59	37	G9	49	F10	40	P17	L	N
						AN07		
						SIN2_2		
						INT04_1		
						SEG21		
-	-	-	-	-	-	MAD15_1	-	-
60	38	H11	50	H11	41	AVCC	-	-
61	39	F11	51	F11	42	AVRH	-	-
62	40	G11	52	G11	43	AVSS	-	-

Pin No						Pin Name	I/O Circuit Type	pin state type
LQFP-100	QFP-100	BGA-112	LQFP-80	BGA-96	LQFP-64 QFN-64			
63	41	G8	53	F9	44	P18	L	W
						AN08		
						SOT2_2 (SDA2_2)		
						SEG20		
-	-	-	-	-	-	MAD16_1	-	-
64	42	F10	54	E11	45	P19	L	W
						AN09		
						SCK2_2 (SCL2_2)		
						SEG19		
-	-	-	-	-	-	MAD17_1	-	-
-	-	H8	-	-	-	VSS	-	-
65	43	F9	55	E10	-	P1A	L	N
						AN10		
						SIN4_1		
						INT05_1		
						SEG18		
MAD18_1								
66	44	E11	56	E9	-	P1B	L	W
						AN11		
						SOT4_1 (SDA4_1)		
						SEG17		
-	-	-	-	-	-	MAD19_1	-	-
67	45	E10	-	-	-	P1C	L	W
						AN12		
						SCK4_1 (SCL4_1)		
						SEG16		
-	-	-	-	-	-	MAD20_1	-	-
68	46	F8	-	-	-	P1D	L	W
						AN13		
						CTS4_1		
						SEG15		
-	-	-	-	-	-	MAD21_1	-	-
69	47	E9	-	-	-	P1E	L	W
						AN14		
						RTS4_1		
						SEG14		
-	-	-	-	-	-	MAD22_1	-	-
70	48	D11	-	-	-	P1F	F	M
						AN15		
						ADTG_5		
						MAD23_1		

Pin No						Pin Name	I/O Circuit Type	Pin State Type
LQFP-100	QFP-100	BGA-112	LQFP-80	BGA-96	LQFP-64 QFN-64			
-	-	B10	-	B10	-	VSS	-	-
-	-	C9	-	C9	-	VSS	-	-
-	-	-	-	D11	-	VSS	-	-
71	49	D10	57	D10	46	P23	L	W
						AN16		
						SCK0_0 (SCL0_0)		
						TIOA7_1		
						SEG13		
72	50	E8	58	D9	47	P22	L	W
						AN17		
						SOT0_0 (SDA0_0)		
						TIOB7_1		
73	51	C11	59	C11	48	P21	L	R
						AN18		
						SIN0_0		
						INT06_1		
						WKUP2		
74	52	C10	60	C10	-	P20	L	N
						AN19		
						INT05_0		
						CROUT_0		
						SEG10		
						MAD24_1		
75	53	A11	-	A11	-	VSS	-	-
76	54	A10	-	-	-	VCC	-	-
77	55	A9	61	A10	49	P00	E	J
					-	TRSTX		
					-	MCSX7_1		
78	56	B9	62	B9	50	P01	E	J
						TCK		
						SWCLK		
79	57	B11	63	B11	51	P02	E	J
					-	TDI		
					-	MCSX6_1		
80	58	A8	64	A9	52	P03	E	J
						TMS		
						SWDIO		
81	59	B8	65	B8	53	P04	E	J
						TDO		
						SWO		

Pin No						Pin Name	I/O Circuit Type	Pin State Type
LQFP-100	QFP-100	BGA-112	LQFP-80	BGA-96	LQFP-64 QFN-64			
82	60	C8	-	-	-	P05	L	Q
						AN20		
						TRACED0		
						TIOA5_2		
						SIN4_2		
						INT00_1		
						SEG09		
MCSX5_1								
-	-	D8	-	-	-	VSS	-	-
83	61	D9	-	-	-	P06	L	Q
						AN21		
						TRACED1		
						TIOB5_2		
						SOT4_2 (SDA4_2)		
						INT01_1		
						SEG08		
MCSX4_1								
84	62	A7	66	A8	-	P07	L	P
						AN22		
						ADTG_0		
			SEG07					
			MCLKOUT_1					
			TRACED2					
			SCK4_2 (SCL4_2)					
-	-	-	-	A7	-	VSS	-	-
85	63	B7	-	-	-	P08	L	P
						AN23		
						TRACED3		
						TIOA0_2		
						CTS4_2		
						SEG06		
						MCSX3_1		
86	64	C7	-	-	-	P09	K	O
						TRACECLK		
						TIOB0_2		
						RTS4_2		
						SEG05		
						MCSX2_1		
87	65	D7	67	C8	54	I*	L	
					P0A			
					SIN4_0			
					INT00_2			
-	-	-	-	-	-	MCSX1_1	-	-

Pin No						Pin Name	I/O Circuit Type	Pin State Type
LQFP-100	QFP-100	BGA-112	LQFP-80	BGA-96	LQFP-64 QFN-64			
88	66	A6	68	C7	55	P0B	I*	K
						SOT4_0 (SDA4_0)		
						TIOB6_1		
						MCSX0_1		
89	67	B6	69	B7	56	P0C	I*	K
						SCK4_0 (SCL4_0)		
						TIOA6_1		
						MALE_1		
-	-	D4	-	-	-	VSS	-	-
-	-	C3	-	C3	-	VSS	-	-
90	68	C6	70	B6	-	P0D	K	U
						RTS4_0		
						TIOA3_2		
						SEG04		
						MDQM0_1		
91	69	A5	71	C6	-	P0E	K	U
						CTS4_0		
						TIOB3_2		
						SEG03		
						MDQM1_1		
-	-	-	-	A5	-	VSS	-	-
92	70	B5	72	A6	57	P0F	E	I
						NMIX		
						CROUT_1		
						RTCCO_0		
						SUBOUT_0		
						WKUP0		
93	71	D6	73	B5	-	P63	K	V
						INT03_0		
						SEG02		
						MWEX_1		
94	72	C5	74	C5	58	P62	K	U
						SCK5_0 (SCL5_0)		
						ADTG_3		
						SEG01		
-	-	-	-	-	-	MOEX_1	-	-
95	73	B4	75	B4	59	P61	K	U
						SOT5_0 (SDA5_0)		
						TIOB2_2		
						UHCONX		
						SEG00		