ISM43439-WBP-L151

802.11 b/g/n + 5.2 BT/BLE + PSoC 6 (Cortex M0 & M4)
Industrial Temperature
WPA3-R3 IoT Platform
System in Package

DATA SHEET

Table of Contents

1 PART NUMBER DETAIL DESCRIPTION

1.1 Ordering Information

Device	Description	Ordering Number
ISM43439-WBP-L151-U	2.4 Wi-Fi + BT/BLE + PSoC 6 (**Cortex M0** & **M4** MCU), **1MB** of MCU internal Flash, **512KB** of SRAM, **2MB** Quad SPI Flash SiP (System in Package). **Certified u.fl Antenna.**	ISM43439-WBP-L151-U
ISM43439-WBP-L151-C	2.4 Wi-Fi + BT/BLE + PSoC 6 (**Cortex M0** & **M4** MCU), **1MB** of MCU internal Flash, **512KB** of SRAM, **2MB** Quad SPI Flash SiP (System in Package). **Certified Chip Antenna.**	ISM43439-WBP-L151-C
ISM43439-WBP-L151-EVB	2.4 Wi-Fi + BT/BLE + PSoC 6 (**Cortex M0** & **M4** MCU), **1MB** of MCU internal Flash, **512KB** of SRAM, **2MB** Quad SPI Flash SiP (System in Package). **Certified u.fl Antenna. Evaluation Board**	ISM43439-WBP-L151-EVB

1.2 Limitations

Inventek Systems products are not authorized for use in safety-critical applications (such as life support) where a failure of the Inventek Systems product would reasonably be expected to cause severe personal injury or death.

2 OVERVIEW

The ISM43439-WBP-L151 SiP (System In Package), is an “ALL” Infineon based IoT platform (Infineon Radio + Infineon MCU + Certified Antenna). The ISM43439-WBP-L151 SiP is also a cost-effective, high performance and secured IoT architecture with one of the industry’s only dedicated Wi-Fi 4 solutions to deliver the latest WPA3 security standard. As a Wi-Fi/Bluetooth/BLE combo chip for IoT applications, the new Inventek ISM43439-WBP-L151 module will make it easier for product designers to comply with new security regulations currently emerging worldwide, including the California Consumer Privacy Act. This, for example, gives more privacy rights to consumers, including the right to know about the personal information a business collects, and the right for that information to be deleted.
The Inventek ISM43439-WBP-L151 module also includes an integrated PSoC 6 MCU. Herald as the sixth generation of the PSoC family, PSoC 6 is purpose-built to speed the development of any IoT application, the ultra-low-power dual-core PSoC 6 family features both an Arm Cortex-M4 and Cortex-M0+ core. Ideally suited for battery-powered applications, the dual-core architecture permits embedded developers to optimize their design for power and performance. As with any IoT application, security is a primary requirement, and the integrated PSoC 6 MCU incorporates Arm's latest platform security architecture (PSA).

The Inventek ISM43439-WBP-L151 2.4G, 802.11 b/g/n serial-to-Wi-Fi + BT/BLE 5.2 + PSoC 6 MCU, module includes an integrated TCP/IP stack, an ARM Cortex-M4 + ARM Cortex-M0 (50MHz / 100MHz), 1MB of MCU Flash, 2MB QSPI Flash and 512KB of SRAM. The platform is fully certified internal chip antenna or U.FL external antenna are also supported.

The ISM43439-WBP-L151 SiP is fully supported by the Inventek ISM43439-WBP-L151 Evaluation Board system for designing, programming, and debugging. The ISM43439-WBP-L151 is also fully supported by the Infineon Modus Toolbox design environment.

The ISM43439-WBP-L151 SiP integrates clock, Wi-Fi/BT, and front end into the smallest form factor LGA Module. The ISM43439-WBP-L151 SiP IEEE 802.11 b/g/n enables wireless connectivity to the simplest existing sensor products with minimal engineering effort. ISM43439WBP-L151-EVB reduces development time, lowers manufacturing costs, saves board space, simplifies certification compliance, and minimizes customer RF expertise required during development of target applications.

The ISM43439-WBP-L151 SiP small form-factor solution also minimizes external components to drive down cost for mass volumes and allows for handheld device flexibility in size, form and function. Comprehensive power management circuitry and software ensure the system can meet the needs of high mobile devices that require minimal power consumption and reliable operations.

The ISM43439-WBP-L151 SiP is compatible with the Bluetooth Low Energy operating mode, which provides a dramatic reduction in the power consumption of the Bluetooth radio and
baseband. The primary application for this mode is to provide support for low data rate devices, such as sensors and remote controls.

The ISM43439-WBP-L151 SiP implements the highly sophisticated Enhanced Collaborative Coexistence algorithms and hardware mechanisms, allowing for an extremely collaborative Bluetooth coexistence scheme along with coexistence support for external radios such as cellular and LTE, GPS, and Ultra-Wideband. An independent, high-speed UART is provided for the Bluetooth host interface.

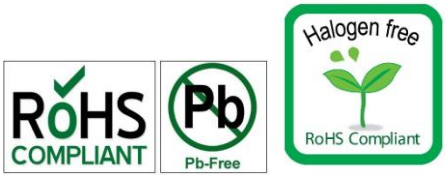
Additionally, the ISM43439-WBP-L151 SiP is supported by a complete platform solution including software drivers, sample applications, API guide, user documentation and a world-class support community from the Infineon ModusToolbox Platform.

3 FEATURES

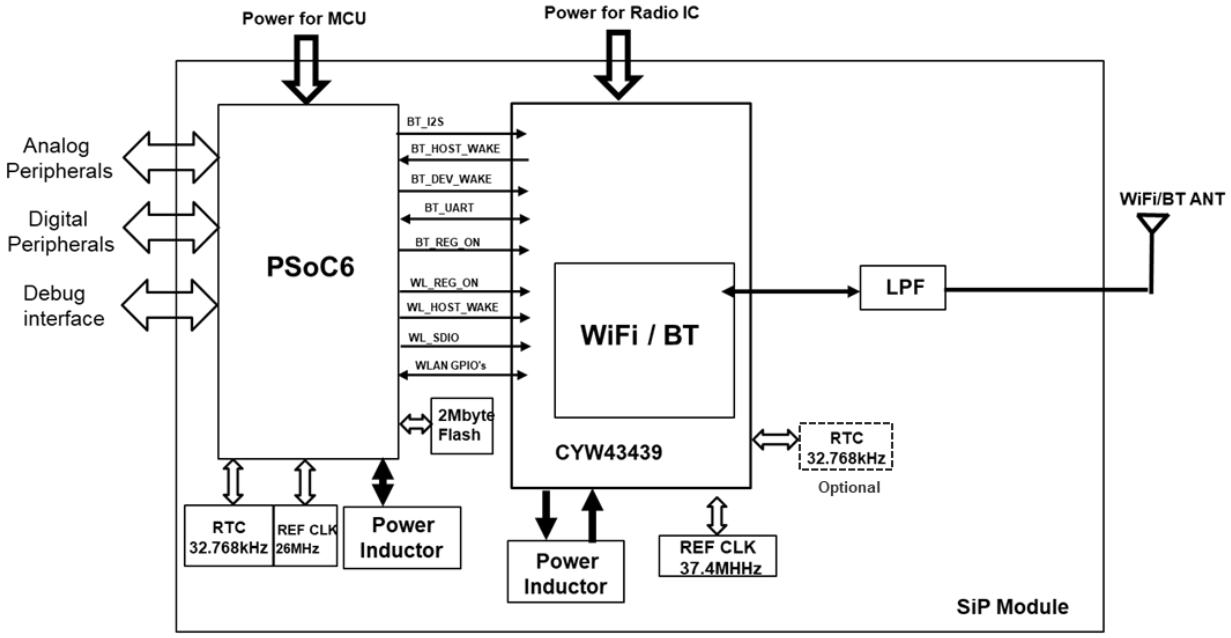
The ISM43439-WBP-L151 supports the following WLAN, Bluetooth & MCU functions:

- PSoC 62 ARM 32-bit CortexTM- M0 + M4 with a frequency up to 100 MHz
  - ARM Cortex-M4 (100MHz)
  - ARM Cortex-M0 (50MHz)
  - 1MB of MCU internal Flash
  - 512KB of SRAM
  - 2MB Quad SPI Flash
  - SPI (supports Dual mode), USART, PCM
  - ADC, I2C, I2S, GPIO, Timers
  - JTAG
- Single-band 2.4 GHz b/g/n, 802.11b, 802.11g, 802.11n (single stream)
  - IEEE 802.11b 1 – 11 Mbps
  - IEEE 802.11g 6 – 54 Mbps
  - IEEE 802.11n (2.4 GHz) 7.2 – 150Mbps
- WPA3-R3
- BT 5.2 COEX
- Infineon Modus Fully compatible
- IEEE 802.11b/g/n single-band radio with internal Power Amplifiers, LNAs and T/R switches
- Hardware Encryption WEP, WPA/WPA2
- Modulation Modes include:
  - Wi-Fi: CCK and OFDM with BPSK, QPSK, 16 QAM, 64QAM, 256QAM
  - BT: Dual-mode classic Bluetooth and Classic Low Energy operation
- Concurrent Bluetooth and WLAN operation
- Single antenna support
- Supports a single 2.4 GHz antenna shared between WLAN and Bluetooth
- BT host digital interface (can be used concurrently with above interface):
  - UART (up to 4 Mbps)
- Bluetooth v5.2 with integrated Class 1 PA
- Bluetooth 2.1+EDR, Bluetooth 3.0, Bluetooth 5.2 (Bluetooth Low Energy)
- Bluetooth v5.2LE Secure Connection via the Cypress BSA stack.
- ECI – enhanced coexistence ability to coordinate BT SCO transmissions for WLAN receives.
- I²S/PCM for BT audio
- HCI high-speed UART (H4, H4 +, H5) transport support
- Bluetooth low power inquiry and page scan
- Bluetooth Low Energy (BLE) support
  - The BBC supports all Bluetooth 5.2 features, with the following benefits:
  - Dual-mode classic Bluetooth and classic Low Energy (BT and BLE) operation.
  - Low Energy Physical Layer & Link Layer
  - Enhancements to HCI for Low Energy
  - Low Energy Direct Test mode
  - AES encryption

- MCU — PSoC62 ARM 32-bit Cortex™-M4F Frequency up to 150 MHz; PSoC62 ARM 32-bit Cortex™-M0+ Frequency up to 100 MHz
- Memory — 1 MB MCU internal Flash, 512KB of SRAM, 2 MB of SPI Flash
- Diverse serial interface — SPI, Quad SPI, USART, PCM
- Sensor applications support — ADC, I2C, I2S, GPIO, Timers
- Debug interface support — SWD
- On-chip functionality — MAC/BB/RF
- Frequency Band — 2.4 GHz
- Network Standard — 802.11b, 802.11g, 802.11n (single stream), Bluetooth 2.1+EDR, Bluetooth 3.0, Bluetooth 5.2 compliance (Bluetooth Low Energy)
- Modulation Modes — Wi-Fi: CCK and OFDM with BPSK, QPSK, 16 QAM, 64QAM
  BT: Dual-mode classic Bluetooth and Classic Low Energy operation
- Hardware Encryption — WEP, WPA/WPA2/WPA3-R3
- Supported Data Rates — IEEE 802.11b 1 – 11 Mbps
  IEEE 802.11g 6 – 54 Mbps
  IEEE 802.11n (2.4 GHz) MCS0 – MCS7
- Adv.1x1 802.11n features — Full/Half Guard Interval Frame Aggregation Space Time Block Coding (STBC) Low Density Parity Check (LDPC) Encoding
- Two antenna configurations — Supported antenna diversity.
- Support BT COEX
- BRCM WICED Fully compatible
- Operating Temperature — -40℃ to 85℃
- MSL level 3
- Certification — FCC, IC and CE compliant (Additional certifications upon request)



4. BLOCK DIAGRAM



Note: the Analog Peripherals and Digital Peripherals are define by customer

ADC	Analog to Digital Converter
I2C	Intelligent Interface Controller
SPI	Serial Peripheral Interface
Quad SPI	Quad Serial Peripheral Interface
USART	Universal synchronous/asynchronous receiver transmitters
TIM	Timers
I2S	Inter-integrated sound

5. INFINEON MODUS TOOLBOX SDK

Please Reference the “Getting Started” collateral for the Modus Development SDK:

https://www.infineon.com/cms/en/design-support/tools/sdk/modustoolbox-software/?term=modus&view=kwr&intc=searchkwr#!documents

The ModusToolbox™ Software is a modern, extensible development ecosystem supporting a wide range of Infineon microcontroller devices, including PSoC™ Arm® Cortex® Microcontrollers,TRAVEO™ T2G Arm® Cortex® Microcontroller, XMC™ Industrial Microcontrollers, AIROC™ Wi-Fi devices, AIROC™ Bluetooth® devices, and USB-C Power Delivery Microcontrollers.

6. ELECTRICAL SPECIFICATION

6.1 Absolute Maximum Rating

Supply Power	Max +4 Volt		
Storage Temperature	- 40° to 85° Celsius		
Voltage ripple	+/- 2%	Max. Values not exceeding Operating voltage	
	Power	min	Max
Power Supply Absolute Maximum Ratings	VDDA	0	4
	VDDUSB	0	4
	VDDIO0	0	4
	VBACKUP	0	4
	VDD_NS	0	4
	VDDD	0	4
	VDD3V3_WIFI	0	6
	VDD3V3_PA	0	6
	VDDIO_WIFI	0	4

6.2 Recommendable Operation Condition

6.2.1 TEMPERATURE, HUMIDITY

The ISM43439-WBP-L151 module has to withstand the operational requirements as listed in the table below.

Operating Temperature	-40° to 85° Celsius	
Humidity range	Max 95%	Non condensing, relative humidity

6.2.2 VOLTAGE

Power supply for the ISM43439-WBP-L151 module will be provided by the host via the power pins

Symbol	Parameter	Min	Typ	Max	Unit
VDDA	MCU Voltage	3.0	3.3	3.6	V
VDDUSB	MCU Voltage	3.0	3.3	3.6	V
VDDIO0	MCU Voltage	3.0	3.3	3.6	V
VBACKUP	MCU Voltage	3.0	3.3	3.6	V
VDD_NS	MCU Voltage	3.0	3.3	3.6	V
VDDD	MCU Voltage	3.0	3.3	3.6	V
VDD3V3_WIFI	Wi-Fi Voltage	3.0	3.3	3.6	V
VDD3V3_PA	Wi-Fi PA Voltage	3.0	3.3	3.6	V
VDDIO_WIFI	MCU With Wi-Fi	3.0	3.3	3.6	V

6.3 Current Consumption

3.1 WLAN

Condition: 25deg.C, includes Both Wi-Fi and Micro-Controller

Item	Condition	Min	Nom	Max	Unit
Tx mode(11b Max current)	11Mbps		290		mA
Tx mode(11g Max current)	54Mbps		195		mA
Tx mode(11n Max current)	MCS7		188		mA
Rx mode	11b (11Mbps)		55		mA
	11g (54Mbps)		55		mA
	11n (MCS7)		55		mA

* The voltage is using 3.3V for all power pin

3.2 BLUETOOTH

6.3.2.1 BLUETOOTH

Condition: 25deg.C, includes Both Wi-Fi/BT and Micro-Controller

Item	Condition	Min	Nom	Max	Unit
Tx Mode	3DH5		50		mA
RX Mode	3DH5		33		mA

* The voltage is using 3.3V for all power pin

6.3.2.2 BLUETOOTH LOW ENERGY

Condition: Condition: 25deg.C, includes Both Wi-Fi/BT and Micro-Controller

Item	Condition	Min	Nom	Max	Unit
Tx Mode	Transmitter and baseband are both operating, 100%		49		mA
RX Mode	Receiver and baseband are both operating, 100%		32		mA

* The voltage is using 3.3V for all power pin

7. RF SPECIFICATION

7.1 WI-FI RF SPECIFICATION

The ISM43439-WBP-L151 module complies with the following features and standards:

Features	Description
WLAN Standards	IEEE 802 Part 11b/g/n (802.11b/g/n single stream n)
Antenna Port	Support Single Antenna for Wi-Fi
Frequency Band	2.400 – 2.484 GHz

The RF performance of ISM43439-WBP-L151 is given as follows. The default voltage is 3.3V.

Features	Description
Frequency Band	2.4000 – 2.497 GHz (2.4 GHz ISM Band)
Number of selectable Sub channels	14 channels
Modulation	OFDM, DSSS (Direct Sequence Spread Spectrum), DBPSK, DQPSK, CCK , 16QAM, 64QAM, 256QAM
Supported rates	1,2, 5.5,11,6,9,12,24,36,48,54 Mbps & HT20 MCS 0~7
Maximum receive input level	- 10dBm (with PER < 8%@11 Mbps) - 20dBm (with PER < 10%@54 Mbps) - 20dBm (with PER < 10%@MCS7)
Output Power	17dBm @ 802.11b 13dBm @ 802.11g 12dBm @ 802.11n 10dBm @ 802.11n
Carrier Frequency Accuracy	+/- 20ppm (crystal: 37.4MHz +/-10ppm in 25^{0}C)

7.1.1 Transmitter Specification

802.11b Transmit					
Item	**Condition**	**Min.**	**Typ.**	**Max.**	**Unit**
Transmit output power level	1M/2M/5.5M/11M	14	17	20	dBm
Transmit center frequency tolerance		-20	0	20	ppm

Transmit spectrum mask	Fc-22MHz<F<Fc-11MHz & Fc+11MHz<F<Fc+22MHz(1/2/5.5/11Mbps; channel 1~13)			-30*	dBr
	F<Fc-22MHz & F>Fc+22MHz(1/2/5.5/11Mbps; channel 1~13)			-50*	dBr
Transmit power -on	10% ~ 90 %		0.3	2*	us
Transmit power -down	90% ~ 10 %		1.5	2*	us
Transmit modulation accuracy	1/2/5.5/11 Mbps		-17	-10	dB

*" indicates IEEE802.11 specification

802.11g Transmit

Item	Condition	Min.	Typ.	Max.	Unit
Transmit output power level	6M/9M/12M/18M/24M/36M/48M/54M	10	13	16	dBm
					dBm
					dBm
Transmit center frequency tolerance		-20	0	20	ppm
Transmit modulation accuracy	6Mbps			-5*	dB
	9Mbps			-8*	dB
	12Mbps			-10*	dB
	18Mbps			-13*	dB
	24Mbps			-16*	dB
	36Mbps			-19*	dB
	48Mbps			-22*	dB
	54Mbps			-25*	dB
Transmit spectrum mask	@ 11MHz			-20*	dBr
	@ 20MHz			-28*	dBr
	@ 30MHz			-40*	dBr

802.11n Transmit					
Item	Condition	Min.	Typ.	Max.	Unit
Transmit output power level	HT20 MCS 0~7	9	12	15	dBm
	HT20 MCS 7 (Turboqam)		10		dBm
Transmit center frequency tolerance		-20	0	20	ppm
Transmit modulation accuracy	HT20, MCS0~7			-27*	dB
	HT20 MCS 7 (Turboqam)			-32*	dB
Transmit Spectrum mask	@ 11MHz			-20*	dBr
	@ 20MHz			-28*	dBr
	@ 30MHz			-40*	dBr

*" indicates IEEE802.11 specification

7.1.2 Receiver Specification

802.11 b Receiver					
Item	**Condition**	**Min.**	**Typ.**	**Max.**	**Unit**
Receiver minimum input level sensitivity (PER< 8 %)	1Mbps	-80*	-93		dBm
	2Mbps	-80*	-91		dBm
	5.5Mbps	-76*	-89		dBm
	11Mbps	-76*	-86		dBm
Receiver maximum input level sensitivity (PER< 8 %)	1/2/5.5/11 Mbps	-10*			dBm

"*" indicates IEEE802.11 specification

802.11g Receiver					
Item	**Condition**	**Min.**	**Typ.**	**Max.**	**Unit**
Receiver minimum input level sensitivity (PER<10 %)	6Mbps	-82*	-88		dBm
	9Mbps	-81*	-87		dBm
	12Mbps	-79*	-85		dBm
	18Mbps	-77*	-83		dBm
	24Mbps	-74*	-80.5		dBm

	36Mbps	-70*	-78.5		dBm
	48Mbps	-66*	-74		dBm
	54Mbps	-65*	-72		dBm
Receiver maximum input level (PER<10%)	6/9/12/18/24/36/48/54	-20*			dBm

"*" indicates IEEE802.11 specification

802.11n Receiver					
Item	**Condition**	**Min.**	**Typ.**	**Max.**	**Unit**
Receiver minimum input level sensitivity (PER<10 %)	HT20, MCS0	-82*	-87.5		dBm
	HT20, MCS1	-79*	-84		dBm
	HT20, MCS2	-77*	-82		dBm
	HT20, MCS3	-74*	-80.5		dBm
	HT20, MCS4	-70*	-77		dBm
	HT20, MCS5	-66*	-72		dBm
	HT20, MCS6	-65*	-71		dBm
	HT20, MCS7	-64*	-70		dBm
Receiver maximum input level (PER<10%)	MSC0~MSC7	-20*			dBm

"*" indicates IEEE802.11 specification

7.2 BT RF SPECIFICATION

7.2.1 BT Transmitter Specification

Parameter	Mode and Condition	Min.	Typ.	Max.	Unit
Transmitter Section					
Frequency Range		2402		2480	MHz
Output power	GFSK	7	10	13	dBm
	QPSK	2.5	5.5	8.5	dBm
	BPSK	2.5	5.5	8.5	dBm
Power control step		2	4	8	dB
Lo performance					
Initial carrier frequency tolerance*			±25	±75	kHz
Lock Time*			72		µs

Frequency Drift					
DH1 packet*			± 8	± 25	kHz
DH3 packet*			± 8	± 40	kHz
DH5 packKet*			± 8	± 40	kHz
Drift rate*			5	20	kHz/50µs
Frequency Deviation					
00001111 sequence in payload[a]*		140	155	175	kHz
10101010 sequence in payload[b]*		115	140		kHz
Channel spacing			1		MHz

a. This pattern represents an average deviation in payload.
b. Pattern represents the maximum deviation in payload for 99.9% of all frequency deviations.
"*" indicates SIG specification

7.2.2 BT Receiver Specification

Parameter	Mode and Condition	Min.	Typ.	Max.	Unit
Receiver Section					
Frequency Range		2402		2480	MHz
Output power	GFSK,0.1% BER, 1Mbps	-70*	-91		dBm
	π/4-DQPSK,0.01% BER, 2Mbps	-70*	-93		dBm
	8-DPSK, 0.01% BER, 3Mbps	-70*	-87		dBm
Input IP3*		-16			dBm
Maximum input*				-20	dBm

"*" indicates SIG specification

7.2.3 4.2.3 BLE RF Specification

Parameter	Mode and Condition	Min.	Typ.	Max.	Unit
Frequency Range		2402		2480	MHz
RX sense[a]	GFSK,0.1% BER, 1Mbps	-70*	-94		dBm
TX Power		5.5	8.5	11.5	dBm
Mod char: delta f1 average*		225	225	275	kHz
Mod char: delta f2 max[b]*		99.9			%
Mod char: ratio*		0.8	0.95		%

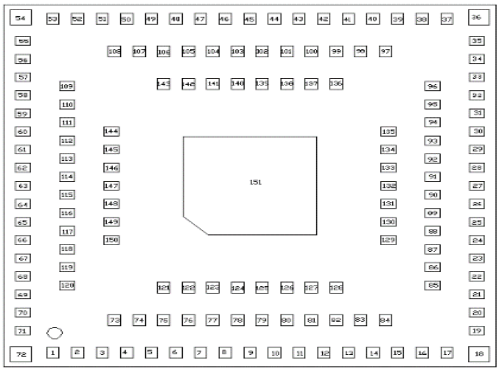
a. The Bluetooth tester is set so that Dirty TX is on.

b. At least 99.9% of all delta F2 max. Frequency values recorded over 10 packets must be greater than 185kHz.

"*" indicates SIG specification

8. PIN DEFINITION

8.1 Pin Number sequence definition



TOP View

8.2 The detail pin definition information

Pin Number	Pin Name	type	Description	Mapping for PSoC62 Packaged Datasheet
1	ANT	I/O	RF transmitter output and RF receiver input	
2	GND	-	Ground	
3	VDD3V3_PA	PI	Wi-Fi PA power supply	
4	VDD3V3_PA	PI	Wi-Fi PA power supply	
5	GND	-	Ground	
6	VDDA	PI	DC supply for MCU and I/O	
7	GND	-	Ground	
8	MICRO_SPI_MOSI_P5_0	I/O	scb[5]_SPI_MOSI	P5_0
9	QSPI_CLK_P11_7	I/O	QUADSPI_CLK	P11_7
10	GND	-	Ground	
11	SPI4_NSS_P10_3	I/O	scb[1]_SPI_NSS	P10_3
12	SPI4_SCK_P10_2	I/O	scb[1]_SPI_SCK form MCU	P10_2
13	SPI4_MISO_P10_1	I/O	scb[1]_SPI_MISO	P10_1
14	SPI4_MOSI_P10_0	I/O	scb[1]_SPI_MOSI	P10_0
15	GND	-	Ground	
16	NC	-	Floating	
17	NC	-	Floating	
18	GND	-	Ground	
19	NC	-	Floating	

Pin Number	Pin Name	type	Description	Mapping for PSoC62 Packaged Datasheet
20	P11_1_N	I/O	MCU_GPIO	P11_1
21	MICRO_SPI2_MISO_P9_1	I/O	scb[2]_SPI2_MISO	P9_1
22	MICRO_SPI2_MOSI_P9_0	I/O	scb[2]_SPI2_MOSI	P9_0
23	GND	-	Ground	
24	VDDD	PI	DC supply for MCU and I/O	
25	GND	-	Ground	
26	NC	-	Floating	
27	GND	-	Ground	
28	VDD3V3_WiFi_IO	PI	DC supply for WI-FI and I/O	
29	GND	-	Ground	
30	USART1_TX_P8_1	I/O	scb[4]_UART_TX	
31	USART1_RX_P8_0	I/O	scb[4]_UART_RX	
32*1	USBDM	I/O	USB_DM	
33*1	USBDP	I/O	USB_DP	
34	GND	-	Ground	
35	TMS_SWDIO_P6_6	I/O	JATG_TMS/SWDIO	P6_6
36	GND	-	Ground	
37	TCLK_SWCLK_P6_7	I/O	JATG_TCK/SWCLK	P6_7
38	TDI_P6_5	I/O	JATG_TDI	P6_5
39	GND	-	Ground	
40	NC	-	Floating	
41	GND	-	Ground	
42	VDD3V3_WiFi	PI	Wi-Fi power supply	
43	VDD3V3_WiFi	PI	Wi-Fi power supply	
44	GND	-	Ground	
45	TDO_SWO_P6_4	I/O	JATG_TDO/SWO	P6_4
46	NC	I/O	Floating	
47	GND	-	Ground	
48	VDD_NS	PI	DC supply for MCU and I/O	
49	GND	-	Ground	
50	QSPI_DATA3_P11_3	I/O	QUADSPI_IO3	P11_3
51	GND	-	Ground	
52	NC	-	Floating	
53	NC	-	Floating	
54	GND	-	Ground	
55	BT_PCM_CLK	I/O	PCM clock; can be master (output) or slave (input)	
56	NC	-	Floating	

Pin Number	Pin Name	type	Description	Mapping for PSoC62 Packaged Datasheet
57	BT_HOST_WAKE	O	BT_HOST_WAKE	
58	GND	-	Ground	
59	VBACKUP	PI	DC supply for MCU and I/O	
60	GND	-	Ground	
61	GND	-	Ground	
62	NC	-	Floating	
63	NC	-	Floating	
64	GND	-	Ground	
65	VDDIO0	PI	DC supply for MCU and I/O	
66	GND	-	Ground	
67	QSPI_DATA1_P11_5	I/O	QUADSPI_IO1	P11_5
68	QSPI_DATA2_P11_4	I/O	QUADSPI_IO2	P11_4
69	I2S_TX_SDO_P13_3	I/O	I2S_TX_SDO	P13_3
70	GND	-	Ground	
71	GND	-	Ground	
72	GND	-	Ground	
73	GND	-	Ground	
74	MICRO_SPI_NSS_P5_3	I/O	scb[5]_SPI_NSS	P5_3
75	MICRO_SPI_SCK_P5_2	I/O	scb[5]_SPI_SCK form MCU	P5_2
76	MICRO_SPI_MISO_P5_1	I/O	scb[5]_SPI_MISO	P5_1
77	GND	-	Ground	
78	I2S_TX_SCK_P13_1	I/O	I2S_TX_SCK	P13_1
79	NC	-	Floating	
80	P5_6	I/O	MCU_GPIO	P5_6
81	I2S_MCLK_P13_0	I/O	I2S_MCLK	P13_0
82	I2C2_SDA	I/O	scb[6] I2C2_SDA /	P12_1
83	I2C2_SCL	I/O	scb[6] I2C2_SCL /	P12_0
84	MCIRO_SPI2_NSS_P9_3	I/O	scb[2]_SPI_NSS	P9_3
85	MCIRO_SPI2_SCK_P9_2	I/O	scb[2]_SPI_SCK	P9_2
86	I2S_RX_SCK_P13_4	I/O	I2S_RX_SCK_P13_4	P13_4
87	I2S_RX_WS_P13_5	I/O	I2S_RX_WS_P13_5	P13_5
88	NC	-	Floating	
89	NC	-	Floating	
90	VDD_USB	PI	VDD for USB	
91	GND	-	Ground	
92	USART6_TX_P5_5	I/O	scb[10] UART_TX	P5_5
93	USART6_RX_P5_4	I/O	scb[10] UART_RX	P5_4

Compatibility: Pins 82 and 83 are reverse from the N12 and N13 for the primary function.
Secondary function of scb[6].UART.TX and scb[6].UART.RX match N12 and N13.
Please Infineon CY8C6248FNI-S2D43 for alternative functionality

Pin Number	Pin Name	type	Description	Mapping for PSoC62 Packaged Datasheet
94	GND	-	Ground	
95	NC	-	Floating	
96	NC	-	Floating	
97	NC	-	Floating	
98	NC	-	Floating	
99	GND	-	Ground	
100	NC	-	Floating	
101	GND	-	Ground	
102	I2C1_SCL_P1_0	I/O	scb[7] I2C1_SCL	P1_0
103	I2C1_SDA_P1_1	I/O	scb[7] I2C1_SDA	P1_1
104	NC	-	Floating	
105	P8_2	I/O	MCU_GPIO	P8_2
106	I2S_RX_SDO_P13_6	I/O	I2S_RX_SDO	P13_6
107	P5_7	I/O	MCU_GPIO	P5_7
108	P7_3	I/O	MCU_GPIO	P7_3
109	P8_3	I/O	MCU_GPIO	P8_3_N
110	P9_4	I/O	MCU_GPIO	P9_4_N
111	P7_7	I/O	MCU_GPIO	P7_7
112	GND	-	Ground	
113	GND	-	Ground	
114	GND	-	Ground	
115	GND	-	Ground	
116	GND	-	Ground	
117	MICRO_RST_N	I/O	MCU_RST_N	
118	QSPI_DATA0_P11_6	I/O	QUADSPI_IO0	P11_6
119	NC	I/O	MCU_WKUP	
120	GND	-	Floating	
121	MICRO_ADC2_P10_5	I/O	MCU_ADC_P10_5	P10_5
122	MICRO_ADC3_P10_6	I/O	MCU_ADC_P10_6	P10_6
123	GND	-	Ground	
124	P0_2	I/O	MCU_GPIO	P0_2
125	P0_3	I/O	MCU_GPIO	P0_3
126	RF_SW_CTRL	I/O	Antenna diversity control signal	
127	P9_7	I/O	MCU_GPIO	P9_7
128	P0_5	I/O	MCU_GPIO	P0_5
129	P10_7	I/O	MCU_GPIO	P10_7
130	P11_0	I/O	MCU_GPIO	P11_0

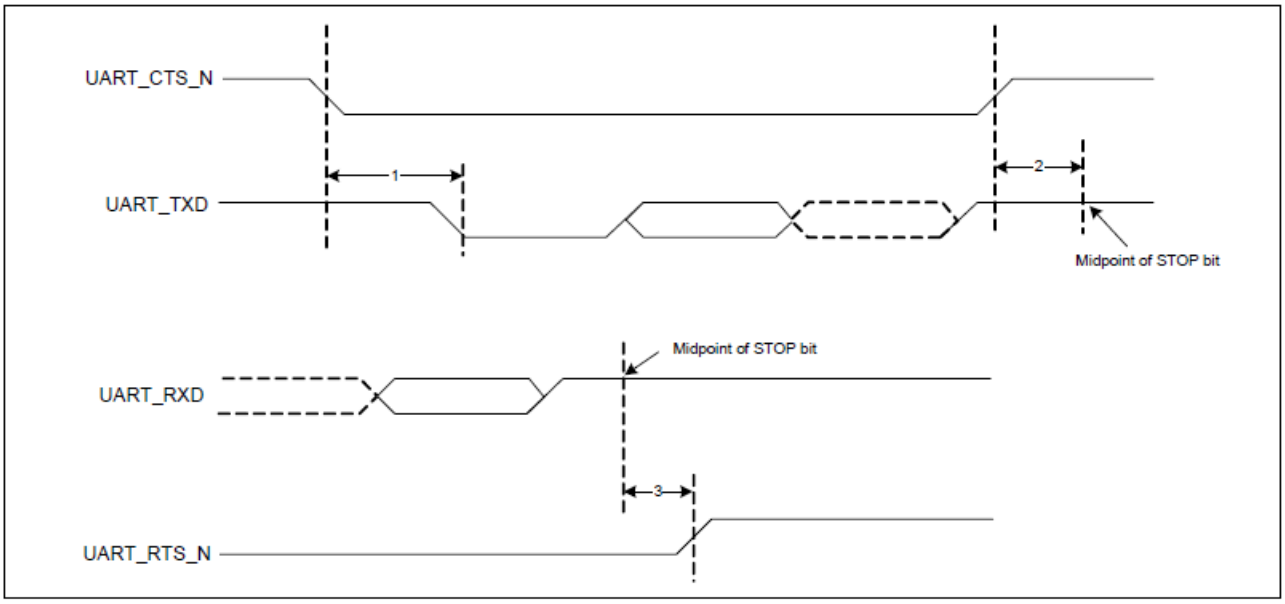
Pin Number	Pin Name	type	Description	Mapping for PSoC62 Packaged Datasheet
131	NC	-	Floating	
132	GND	-	Ground	
133	QSPI_CS_P11_2	I/O	QUADSPI_CS	P11_2
134	GND	-	Ground	
135	GND	-	Ground	
136	NC	-	Floating	
137	P1_4	I/O	MCU_GPIO	P1_4
138	NC	-	Floating	
139	NC	-	Floating	
140	NC	-	Floating	
141	NC	-	Floating	
142	P1_5	I/O	MCU_GPIO	P1_5
143	I2S_TX_WS_P13_2	I/O	I2S_TX_WS	P13_2
144	BT_PCM_SYNC	I/O	PCM Sync; can be master(output) or slave (input)	
145	BT_PCM_OUT	O	PCM data output	
146	BT_PCM_IN	I	PCM data input sensing	
147	P8_4	I/O	MCU_GPIO	P8_4
148	GND	-	Ground	
149	GND	-	Ground	
150	MICRO_ADC1_P10_4	I/O	MCU_ADC_P10_4	P10_4
151	GND	-	Ground	

*[1]: If the USB pins are not used, connect VDDUSB to ground and leave the P14.0/USBDP and P14.1/USBDM pins unconnected.

9. ADDITION INFORMATION

8.1 Communications Interfaces

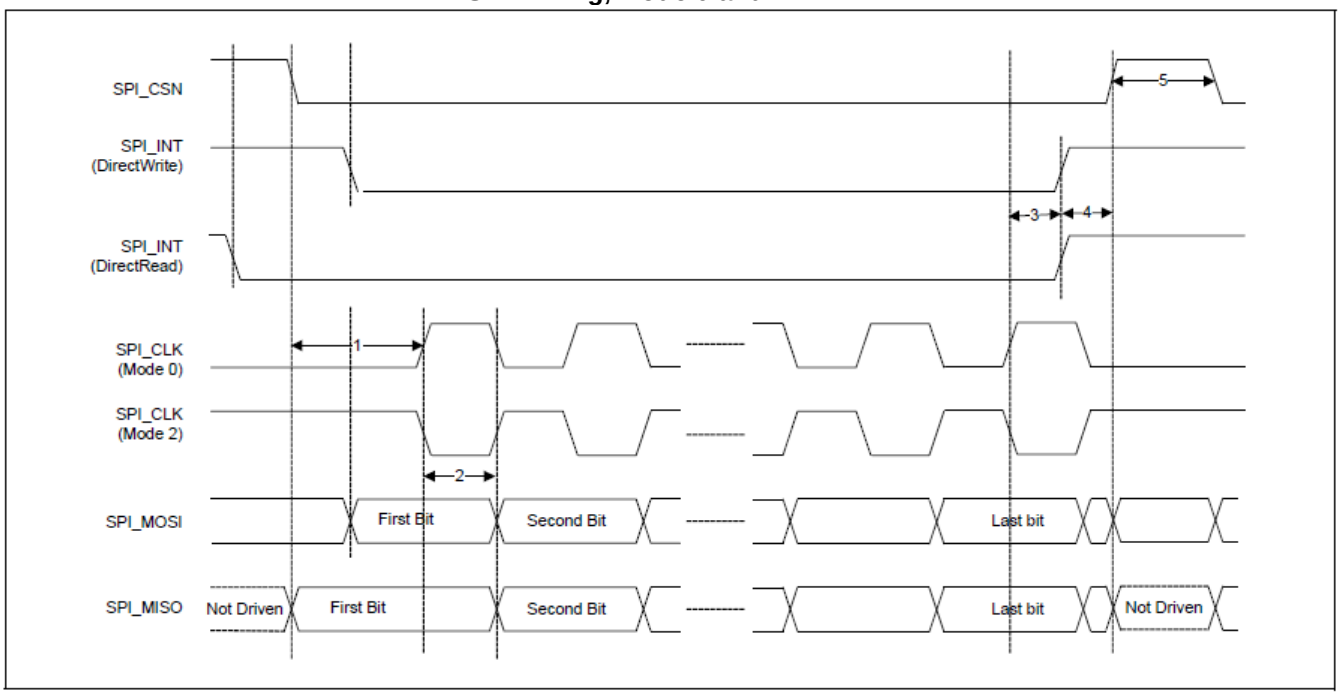
8.1.1 UART TIMING



Reference	Characteristics	Min.	Typ.	Max.	Unit
1	Delay time, UART_CTS_N low to UART_TXD valid.	–	–	1.50	Bit periods
2	Setup time, UART_CTS_N high before midpoint of stop bit.	–	–	0.67	Bit periods
3	Delay time, midpoint of stop bit to UART_RTS_N high.	–	–	1.33	Bit periods

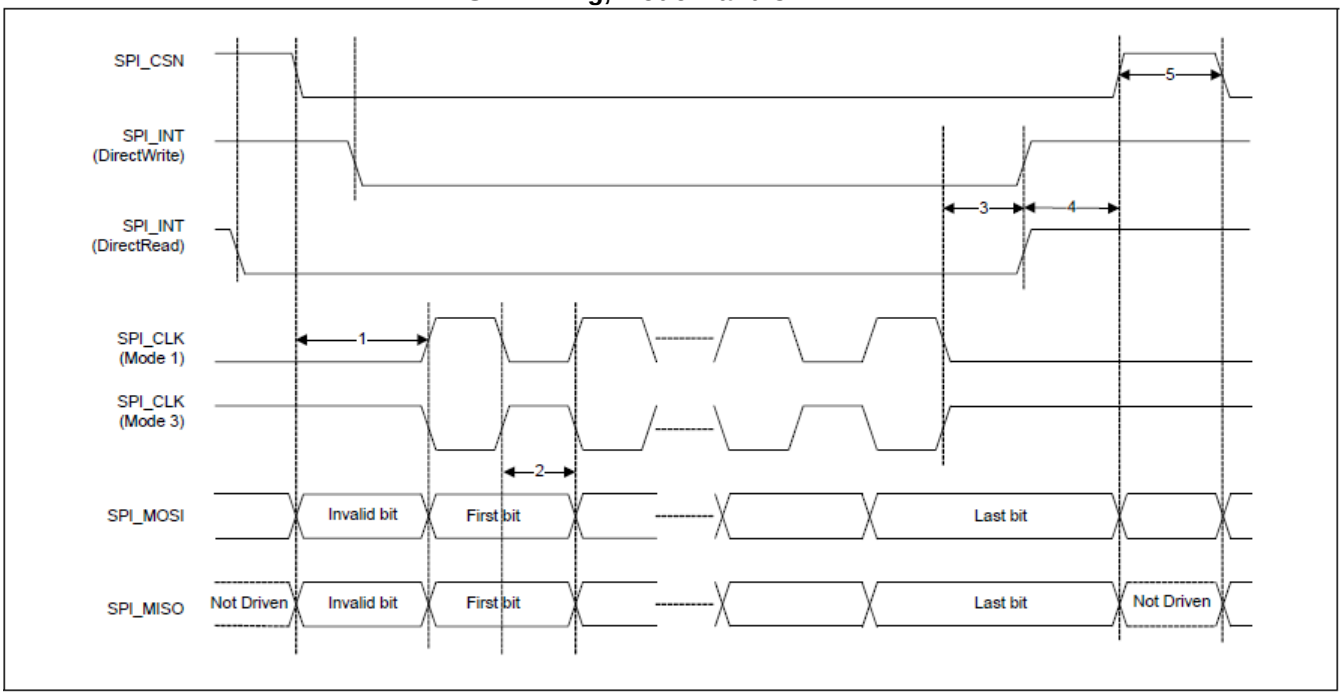
8.2.2 SPI Interface Characteristics

SPI Timing, Mode 0 and 2



Reference	Characteristics	Min.	Max.	Unit
1	Time from master assert SPI_CSN to first clock edge	45	–	ns
2	Hold time for MOSI data lines	12	½ SCK	ns
3	Time from last sample on MOSI/MISO to slave deassert SPI_INT	0	100	ns
4	Time from slave deassert SPI_INT to master deassert SPI_CSN	0	–	ns
5	Idle time between subsequent SPI transactions	1 SCK	–	ns

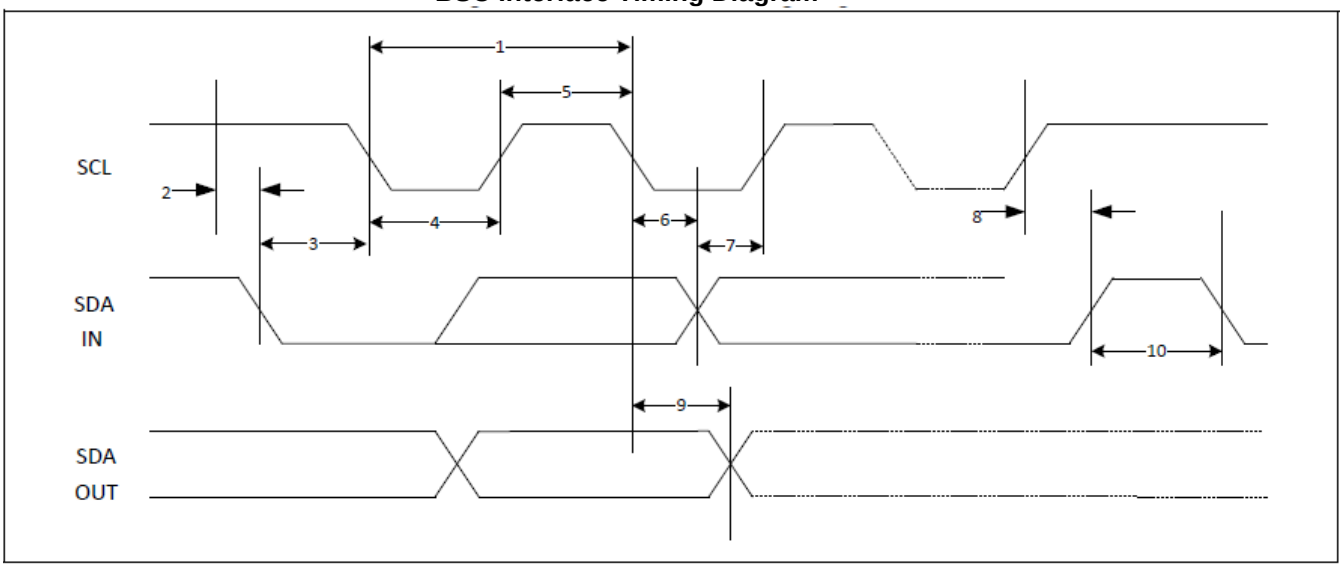
SPI Timing, Mode 1 and 3



Reference	Characteristics	Min.	Max.	Unit
1	Time from master assert SPI_CSN to first clock edge	45	–	ns
2	Hold time for MOSI data lines	12	½ SCK	ns
3	Time from last sample on MOSI/MISO to slave deassert SPI_INT	0	100	ns
4	Time from slave deassert SPI_INT to master deassert SPI_CSN	0	–	ns
5	Idle time between subsequent SPI transactions	1 SCK	–	ns

8.2.3 BSC INTERFACE TIMING

BSC Interface Timing Diagram



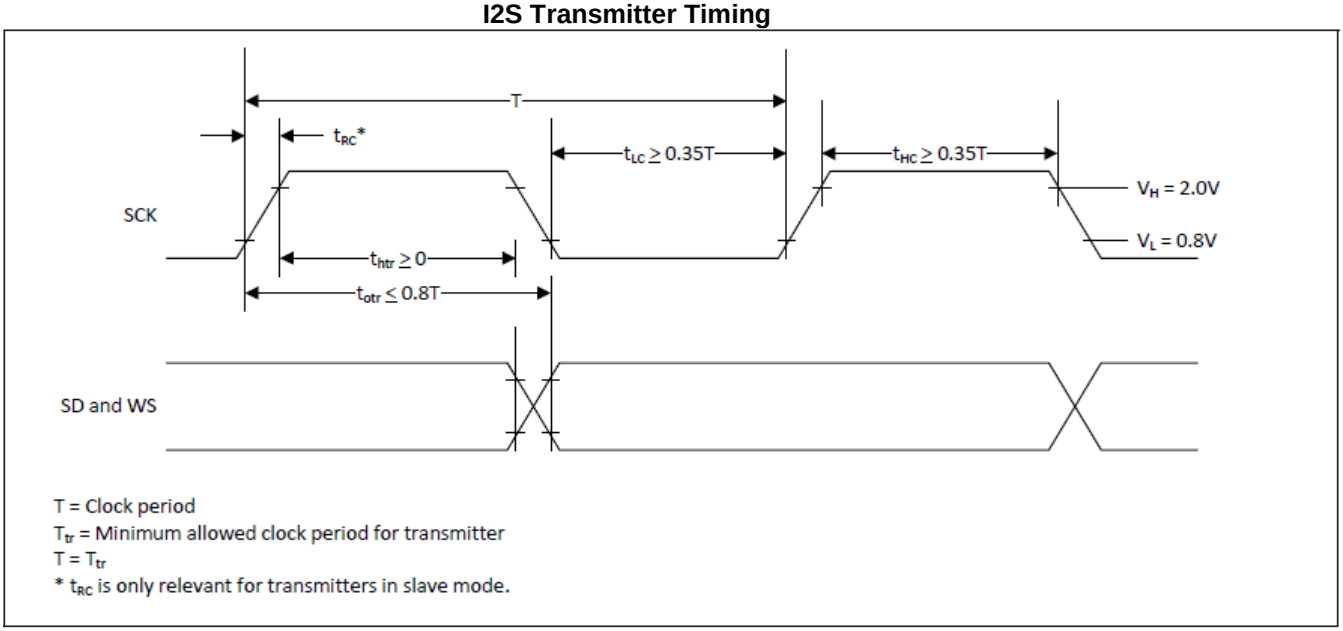
BSC Interface Timing Specifications (up to 1 MHz)

Reference	Characteristics	Minimum	Maximum	Unit
1	Clock frequency	–	100	kHz
			400	
			800	
			1000	
2	START condition setup time	650	–	ns
3	START condition hold time	280	–	ns
4	Clock low time	650	–	ns
5	Clock high time	280	–	ns
6	Data input hold time[a]	0	–	ns
7	Data input setup time	100	–	ns
8	STOP condition setup time	280	–	ns
9	Output valid from clock	–	400	ns
10	Bus free time[b]	650	–	ns

a. As a transmitter, 125 ns of delay is provided to bridge the undefined region of the falling edge of SCL to avoid unintended generation of START or STOP conditions.
b. Time that the CBUS must be free before a new transaction can start.

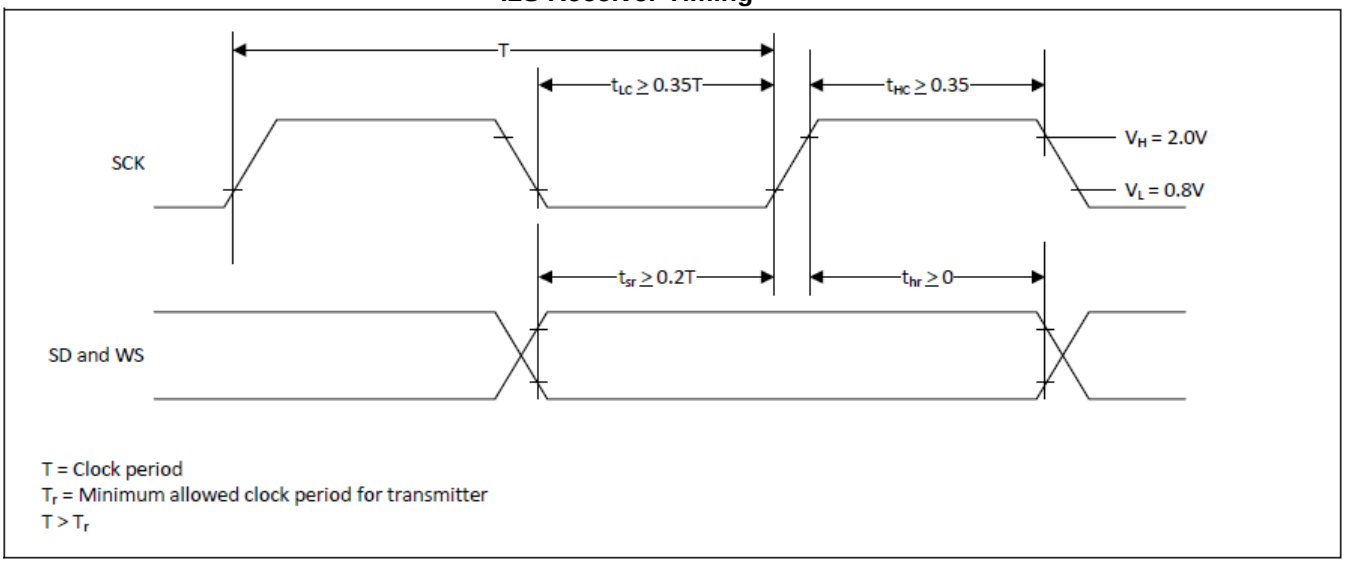
8.2.4 I2S INTERFACE TIMING

I2S Transmitter Timing



T = Clock period
T_{tr} = Minimum allowed clock period for transmitter
$T = T_{tr}$
* t_{RC} is only relevant for transmitters in slave mode.

I2S Receiver Timing



T = Clock period
T_r = Minimum allowed clock period for transmitter
$T > T_r$

Timing for I2S Transmitters and Receivers

	Transmitter				Receiver				Notes
	Lower LImit		Upper Limit		Lower Limit		Upper Limit		
	Min	Max	Min	Max	Min	Max	Min	Max	
Clock Period T	T_{tr}	–	–	–	T_r	–	–	–	a
Master Mode: Clock generated by transmitter or receiver									
HIGH t_{HC}	$0.35T_{tr}$	–	–	–	$0.35T_{tr}$	–	–	–	b
LOWt_{LC}	$0.35T_{tr}$	–	–	–	$0.35T_{tr}$	–	–	–	b
Slave Mode: Clock accepted by transmitter or receiver									
HIGH t_{HC}	–	$0.35T_{tr}$	–	–	–	$0.35T_{tr}$	–	–	c
LOW t_{LC}	–	$0.35T_{tr}$	–	–	–	$0.35T_{tr}$	–	–	c
Rise time t_{RC}	–	–	$0.15T_{tr}$	–	–	–		–	d
Transmitter									
Delay t_{dtr}	–	–	–	0.8T	–	–	–	–	e
Hold time t_{htr}	0	–	–	–	–	–	–	–	d
Receiver									
Setup time t_{sr}	–	–	–	–	$0.2T_{tr}$	–	–	–	f
Hold time t_{hr}	–	–	–	–	$0.2T_{tr}$	–	–	–	f

a. The system clock period T must be greater than T_{tr} and T_r because both the transmitter and receiver have to be able to handle the data transfer rate.
b. At all data rates in master mode, the transmitter or receiver generates a clock signal with a fixed mark/space ratio. For this reason, t_{HC} and t_{LC} are specified with respect to T.
c. In slave mode, the transmitter and receiver need a clock signal with minimum HIGH and LOW periods so that they can detect the signal. So long as the minimum periods are greater than $0.35T_r$, any clock that meets the requirements can be used.
d. Because the delay (t_{dtr}) and the maximum transmitter speed (defined by T_{tr}) are related, a fast transmitter driven by a slow clock edge can result in t_{dtr} not exceeding t_{RC} which means t_{htr} becomes zero or negative. Therefore, the transmitter has to guarantee that t_{htr} is greater than or equal to zero, so long as the clock rise-time t_{RC} is not more than t_{RCmax}, where t_{RCmax} is not less than $0.15T_{tr}$.
e. To allow data to be clocked out on a falling edge, the delay is specified with respect to the rising edge of the clock signal and T, always giving the receiver sufficient setup time.
f. The data setup and hold time must not be less than the specified receiver setup and hold time.

10. MECHANICAL SPECIFICATION

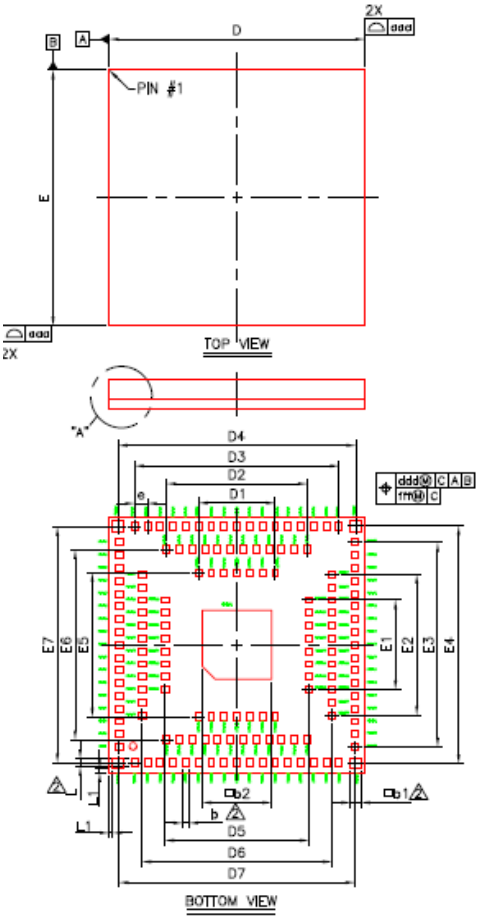
10.1 Size of the Module

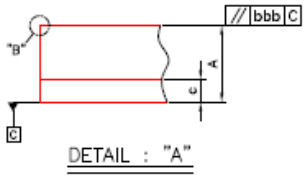
The following paragraphs provide the requirements for the size, weight.
The size and thickness of the ISM43439-WBP-L151 module 10mm (W) x 10mm (L) x 1.2mm (H):

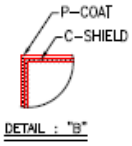
(Tolerance: +/- 0.1mm)

10.2 Mechanical Dimension

Dimension: 10 x 10 x 1.2 mm^3







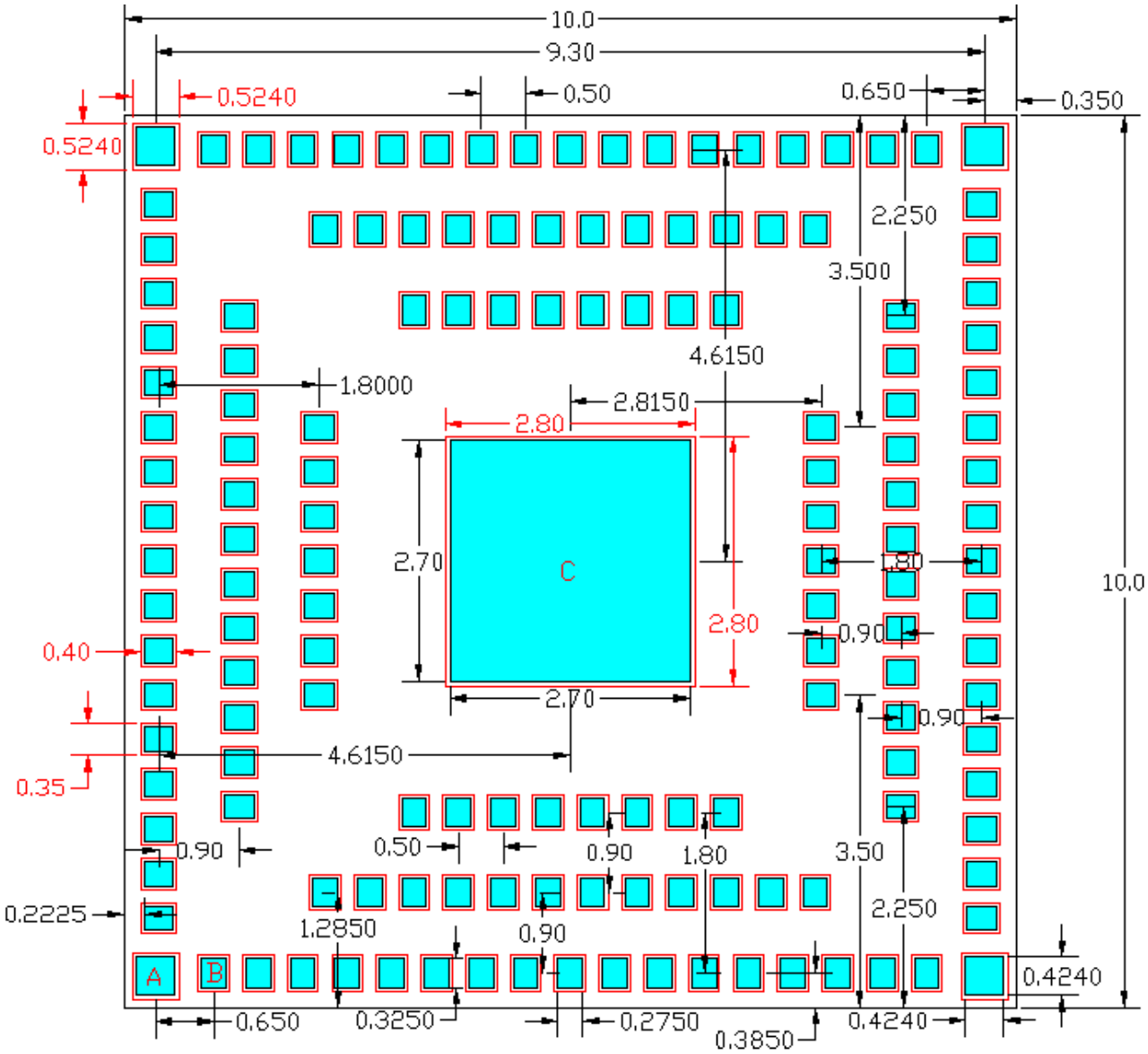
Symbol	Dimension in mm			Dimension in inch		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.14	1.20	1.26	0.045	0.047	0.050
c	0.36	0.40	0.44	0.014	0.016	0.017
D	9.90	10.00	10.10	0.390	0.394	0.398
E	9.90	10.00	10.10	0.390	0.394	0.398
D1	---	3.00	---	---	0.118	---
E1	---	3.50	---	---	0.138	---
D2/E2	---	5.50	---	---	0.217	---
D3/E3	---	8.00	---	---	0.315	---
D4/E4	---	9.30	---	---	0.366	---
D5/E5	---	5.63	---	---	0.222	---
D6/E6	---	7.43	---	---	0.293	---
D7/E7	---	9.23	---	---	0.363	---
e	---	0.50	---	---	0.020	---
b	0.20	0.25	0.30	0.008	0.010	0.012
L	0.25	0.30	0.35	0.010	0.012	0.014
b1	0.37	0.42	0.47	0.015	0.017	0.019
L1	---	0.14	---	---	0.006	---
b2	2.65	2.70	2.75	0.104	0.106	0.108
aaa		0.15			0.006	
bbb		0.10			0.004	
ddd		0.15			0.006	
fff		0.05			0.002	

NOTE:
1. CONTROLLING DIMENSION : MILLIMETER
2. DIMENSION b,b1,b2,L IS MEASURED AT THE MAXIMUM OPENING DIAMETER, PARALLEL TO PRIMARY DATUM C.

11. RECOMMEND FOOTPRINT (BOARD DESIGN)

11.1 Module Dimension Measurement

Unit: mm



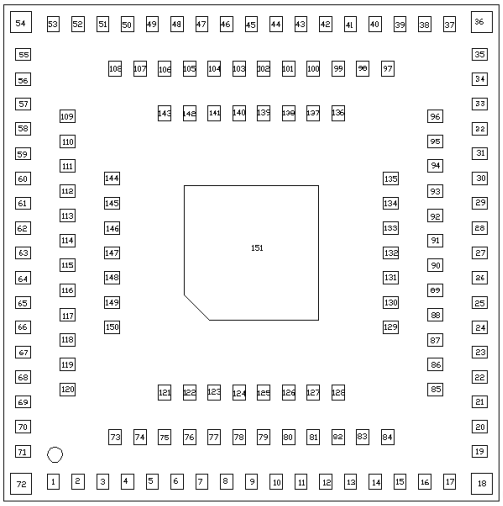
TOP View

Note:

1. Please use Un-Solder Mask to design the Module Footprint.
2. There are three types pad size in the Module.
   - Type A: Pad size: 0.424 x 0.424mm^2 & Solder Mask size: 0.524 x 0.524 mm^2
   - Type B: Pad size: 0.275 x 0.325mm^2 & Solder Mask size: 0.35 x 0.4 mm^2
   - Type C: Pad size: 2.7 x 2.7mm^2 & Solder Mask size: 2.8 x 2.8 mm^2

11.2 The X-Y Central Location Coordinates

Unit: mm (Drawn dimensions with chip 0,0 at bottom right corner)



TOP View

PIN_NUMBER	PAD_Size (mm)	Solder Mask_Size (mm)	PIN_X(mm)	PIN_Y(mm)
1	0.275 x 0.325	0.35 x 0.4	-9	0.385
2	0.275 x 0.325	0.35 x 0.4	-8.5	0.385
3	0.275 x 0.325	0.35 x 0.4	-8	0.385
4	0.275 x 0.325	0.35 x 0.4	-7.5	0.385
5	0.275 x 0.325	0.35 x 0.4	-7	0.385
6	0.275 x 0.325	0.35 x 0.4	-6.5	0.385
7	0.275 x 0.325	0.35 x 0.4	-6	0.385
8	0.275 x 0.325	0.35 x 0.4	-5.5	0.385
9	0.275 x 0.325	0.35 x 0.4	-5	0.385
10	0.275 x 0.325	0.35 x 0.4	-4.5	0.385
11	0.275 x 0.325	0.35 x 0.4	-4	0.385
12	0.275 x 0.325	0.35 x 0.4	-3.5	0.385
13	0.275 x 0.325	0.35 x 0.4	-3	0.385
14	0.275 x 0.325	0.35 x 0.4	-2.5	0.385
15	0.275 x 0.325	0.35 x 0.4	-2	0.385
16	0.275 x 0.325	0.35 x 0.4	-1.5	0.385
17	0.275 x 0.325	0.35 x 0.4	-1	0.385
18	0.424 x 0.424	0.524 x 0.524	-0.35	0.35

PIN_NUMBER	PAD_Size (mm)	Solder Mask_Size (mm)	PIN_X(mm)	PIN_Y(mm)
19	0.325 x 0.275	0.4 x 0.35	-0.385	1
20	0.325 x 0.275	0.4 x 0.35	-0.385	1.5
21	0.325 x 0.275	0.4 x 0.35	-0.385	2
22	0.325 x 0.275	0.4 x 0.35	-0.385	2.5
23	0.325 x 0.275	0.4 x 0.35	-0.385	3
24	0.325 x 0.275	0.4 x 0.35	-0.385	3.5
25	0.325 x 0.275	0.4 x 0.35	-0.385	4
26	0.325 x 0.275	0.4 x 0.35	-0.385	4.5
27	0.325 x 0.275	0.4 x 0.35	-0.385	5
28	0.325 x 0.275	0.4 x 0.35	-0.385	5.5
29	0.325 x 0.275	0.4 x 0.35	-0.385	6
30	0.325 x 0.275	0.4 x 0.35	-0.385	6.5
31	0.325 x 0.275	0.4 x 0.35	-0.385	7
32	0.325 x 0.275	0.4 x 0.35	-0.385	7.5
33	0.325 x 0.275	0.4 x 0.35	-0.385	8
34	0.325 x 0.275	0.4 x 0.35	-0.385	8.5
35	0.325 x 0.275	0.4 x 0.35	-0.385	9
36	0.424 x 0.424	0.524 x 0.524	-0.35	9.65
37	0.275 x 0.325	0.35 x 0.4	-1	9.615
38	0.275 x 0.325	0.35 x 0.4	-1.5	9.615
39	0.275 x 0.325	0.35 x 0.4	-2	9.615
40	0.275 x 0.325	0.35 x 0.4	-2.5	9.615
41	0.275 x 0.325	0.35 x 0.4	-3	9.615
42	0.275 x 0.325	0.35 x 0.4	-3.5	9.615
43	0.275 x 0.325	0.35 x 0.4	-4	9.615
44	0.275 x 0.325	0.35 x 0.4	-4.5	9.615
45	0.275 x 0.325	0.35 x 0.4	-5	9.615
46	0.275 x 0.325	0.35 x 0.4	-5.5	9.615
47	0.275 x 0.325	0.35 x 0.4	-6	9.615
48	0.275 x 0.325	0.35 x 0.4	-6.5	9.615
49	0.275 x 0.325	0.35 x 0.4	-7	9.615
50	0.275 x 0.325	0.35 x 0.4	-7.5	9.615
51	0.275 x 0.325	0.35 x 0.4	-8	9.615

52	0.275 x 0.325	0.35 x 0.4	-8.5	9.615
53	0.275 x 0.325	0.35 x 0.4	-9	9.615
54	0.424 x 0.424	0.524 x 0.524	-9.65	9.65

PIN_NUMBER	PAD_Size (mm)	Solder Mask_Size (mm)	PIN_X(mm)	PIN_Y(mm)
55	0.325 x 0.275	0.4 x 0.35	-9.615	9
56	0.325 x 0.275	0.4 x 0.35	-9.615	8.5
57	0.325 x 0.275	0.4 x 0.35	-9.615	8
58	0.325 x 0.275	0.4 x 0.35	-9.615	7.5
59	0.325 x 0.275	0.4 x 0.35	-9.615	7
60	0.325 x 0.275	0.4 x 0.35	-9.615	6.5
61	0.325 x 0.275	0.4 x 0.35	-9.615	6
62	0.325 x 0.275	0.4 x 0.35	-9.615	5.5
63	0.325 x 0.275	0.4 x 0.35	-9.615	5
64	0.325 x 0.275	0.4 x 0.35	-9.615	4.5
65	0.325 x 0.275	0.4 x 0.35	-9.615	4
66	0.325 x 0.275	0.4 x 0.35	-9.615	3.5
67	0.325 x 0.275	0.4 x 0.35	-9.615	3
68	0.325 x 0.275	0.4 x 0.35	-9.615	2.5
69	0.325 x 0.275	0.4 x 0.35	-9.615	2
70	0.325 x 0.275	0.4 x 0.35	-9.615	1.5
71	0.325 x 0.275	0.4 x 0.35	-9.615	1
72	0.424 x 0.424	0.524 x 0.524	-9.65	0.35
73	0.275 x 0.325	0.35 x 0.4	-7.75	1.285
74	0.275 x 0.325	0.35 x 0.4	-7.25	1.285
75	0.275 x 0.325	0.35 x 0.4	-6.75	1.285
76	0.275 x 0.325	0.35 x 0.4	-6.25	1.285
77	0.275 x 0.325	0.35 x 0.4	-5.75	1.285
78	0.275 x 0.325	0.35 x 0.4	-5.25	1.285
79	0.275 x 0.325	0.35 x 0.4	-4.75	1.285
80	0.275 x 0.325	0.35 x 0.4	-4.25	1.285
81	0.275 x 0.325	0.35 x 0.4	-3.75	1.285
82	0.275 x 0.325	0.35 x 0.4	-3.25	1.285
83	0.275 x 0.325	0.35 x 0.4	-2.75	1.285
84	0.275 x 0.325	0.35 x 0.4	-2.25	1.285
85	0.325 x 0.275	0.4 x 0.35	-1.285	2.25

86	0.325 x 0.275	0.4 x 0.35	-1.285	2.75
87	0.325 x 0.275	0.4 x 0.35	-1.285	3.25
88	0.325 x 0.275	0.4 x 0.35	-1.285	3.75
89	0.325 x 0.275	0.4 x 0.35	-1.285	4.25

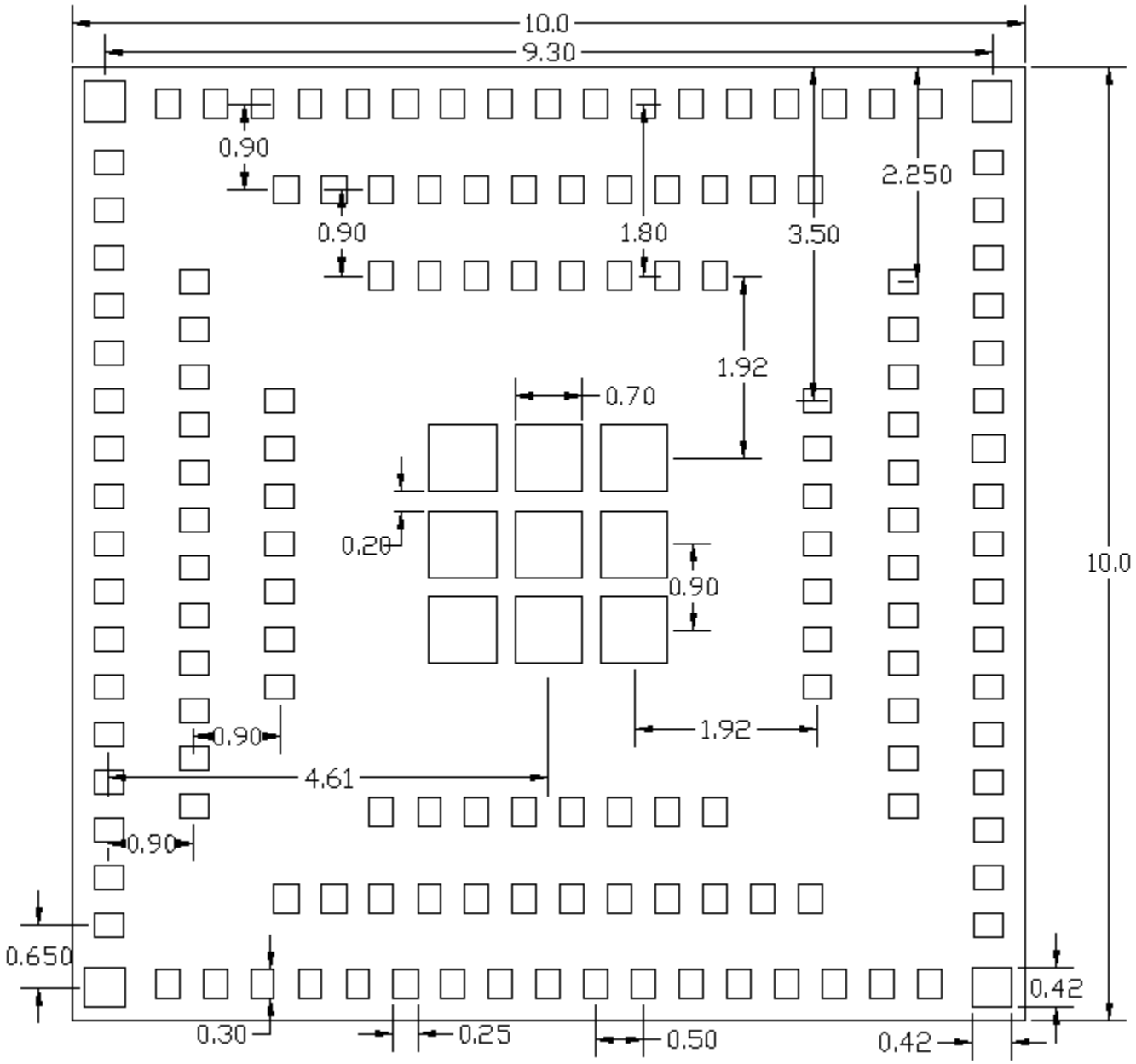
PIN_NUMBER	PAD_Size (mm)	Solder Mask_Size (mm)	PIN_X(mm)	PIN_Y(mm)
90	0.325 x 0.275	0.4 x 0.35	-1.285	4.75
91	0.325 x 0.275	0.4 x 0.35	-1.285	5.25
92	0.325 x 0.275	0.4 x 0.35	-1.285	5.75
93	0.325 x 0.275	0.4 x 0.35	-1.285	6.25
94	0.325 x 0.275	0.4 x 0.35	-1.285	6.75
95	0.325 x 0.275	0.4 x 0.35	-1.285	7.25
96	0.325 x 0.275	0.4 x 0.35	-1.285	7.75
97	0.275 x 0.325	0.35 x 0.4	-2.25	8.715
98	0.275 x 0.325	0.35 x 0.4	-2.75	8.715
99	0.275 x 0.325	0.35 x 0.4	-3.25	8.715
100	0.275 x 0.325	0.35 x 0.4	-3.75	8.715
101	0.275 x 0.325	0.35 x 0.4	-4.25	8.715
102	0.275 x 0.325	0.35 x 0.4	-4.75	8.715
103	0.275 x 0.325	0.35 x 0.4	-5.25	8.715
104	0.275 x 0.325	0.35 x 0.4	-5.75	8.715
105	0.275 x 0.325	0.35 x 0.4	-6.25	8.715
106	0.275 x 0.325	0.35 x 0.4	-6.75	8.715
107	0.275 x 0.325	0.35 x 0.4	-7.25	8.715
108	0.275 x 0.325	0.35 x 0.4	-7.75	8.715
109	0.325 x 0.275	0.4 x 0.35	-8.715	7.75
110	0.325 x 0.275	0.4 x 0.35	-8.715	7.25
111	0.325 x 0.275	0.4 x 0.35	-8.715	6.75
112	0.325 x 0.275	0.4 x 0.35	-8.715	6.25
113	0.325 x 0.275	0.4 x 0.35	-8.715	5.75
114	0.325 x 0.275	0.4 x 0.35	-8.715	5.25
115	0.325 x 0.275	0.4 x 0.35	-8.715	4.75
116	0.325 x 0.275	0.4 x 0.35	-8.715	4.25
117	0.325 x 0.275	0.4 x 0.35	-8.715	3.75
118	0.325 x 0.275	0.4 x 0.35	-8.715	3.25

119	0.325 x 0.275	0.4 x 0.35	-8.715	2.75
120	0.325 x 0.275	0.4 x 0.35	-8.715	2.25
121	0.275 x 0.325	0.35 x 0.4	-6.75	2.185
122	0.275 x 0.325	0.35 x 0.4	-6.25	2.185
123	0.275 x 0.325	0.35 x 0.4	-5.75	2.185
124	0.275 x 0.325	0.35 x 0.4	-5.25	2.185
125	0.275 x 0.325	0.35 x 0.4	-4.75	2.185

PIN_NUMBER	PAD_Size (mm)	Solder Mask_Size (mm)	PIN_X(mm)	PIN_Y(mm)
126	0.275 x 0.325	0.35 x 0.4	-4.25	2.185
127	0.275 x 0.325	0.35 x 0.4	-3.75	2.185
128	0.275 x 0.325	0.35 x 0.4	-3.25	2.185
129	0.325 x 0.275	0.4 x 0.35	-2.185	3.5
130	0.325 x 0.275	0.4 x 0.35	-2.185	4
131	0.325 x 0.275	0.4 x 0.35	-2.185	4.5
132	0.325 x 0.275	0.4 x 0.35	-2.185	5
133	0.325 x 0.275	0.4 x 0.35	-2.185	5.5
134	0.325 x 0.275	0.4 x 0.35	-2.185	6
135	0.325 x 0.275	0.4 x 0.35	-2.185	6.5
136	0.275 x 0.325	0.35 x 0.4	-3.25	7.815
137	0.275 x 0.325	0.35 x 0.4	-3.75	7.815
138	0.275 x 0.325	0.35 x 0.4	-4.25	7.815
139	0.275 x 0.325	0.35 x 0.4	-4.75	7.815
140	0.275 x 0.325	0.35 x 0.4	-5.25	7.815
141	0.275 x 0.325	0.35 x 0.4	-5.75	7.815
142	0.275 x 0.325	0.35 x 0.4	-6.25	7.815
143	0.275 x 0.325	0.35 x 0.4	-6.75	7.815
144	0.325 x 0.275	0.4 x 0.35	-7.815	6.5
145	0.325 x 0.275	0.4 x 0.35	-7.815	6
146	0.325 x 0.275	0.4 x 0.35	-7.815	5.5
147	0.325 x 0.275	0.4 x 0.35	-7.815	5
148	0.325 x 0.275	0.4 x 0.35	-7.815	4.5
149	0.325 x 0.275	0.4 x 0.35	-7.815	4
150	0.325 x 0.275	0.4 x 0.35	-7.815	3.5
151	2.7 x 2.7	2.8 x 2.8	-5	5

12. RECOMMEND STENCIL

Unit: mm

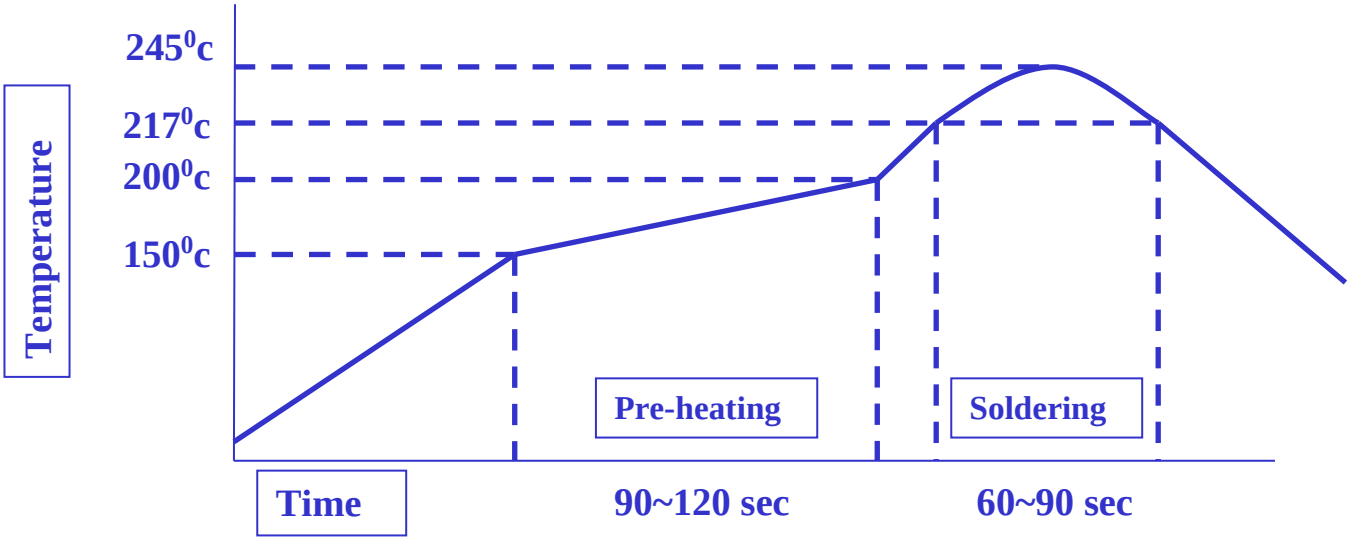


TOP View

Recommend:

(1) ≦ 0.08mm THK stencil will has better solder paste deposit.
(2) Type 4 or 5 solder (fine powder size) will has better solution no matter clean or non clean solder paste.
(3) Nitrogen reflow oven.

13. RECOMMENDED REFLOW PROFILE



- Reference the IPC/JEDEC standard
- Peak Temperature: <250°C
- Number of Times: ≤2 times

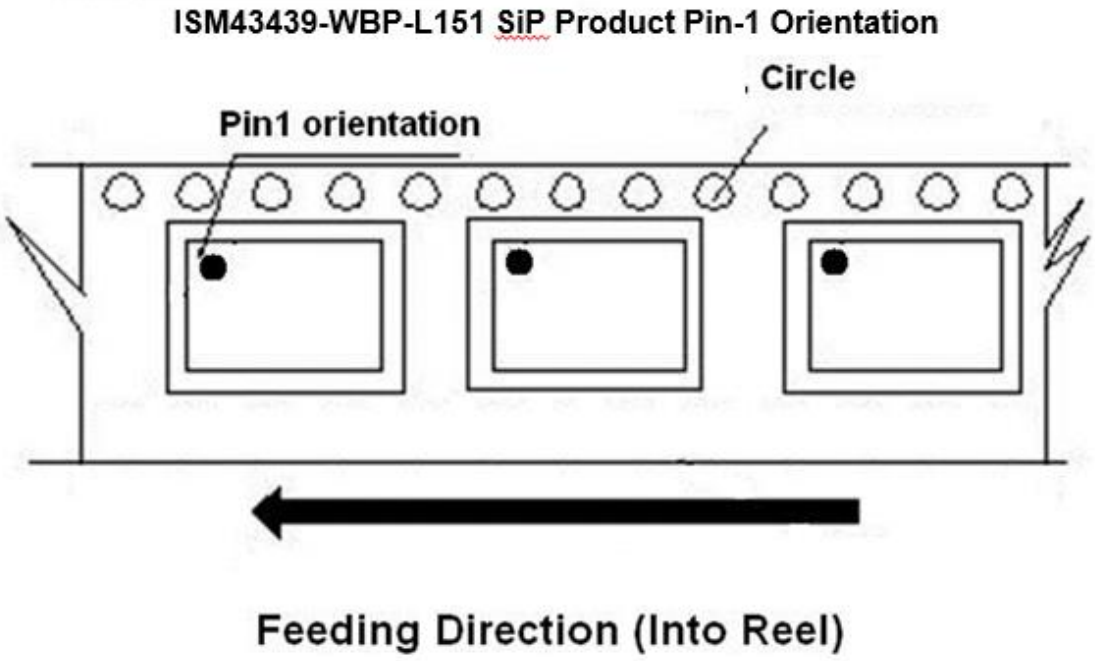
14. PACKAGE AND STORAGE CONDITION

14.1 Package Dimension

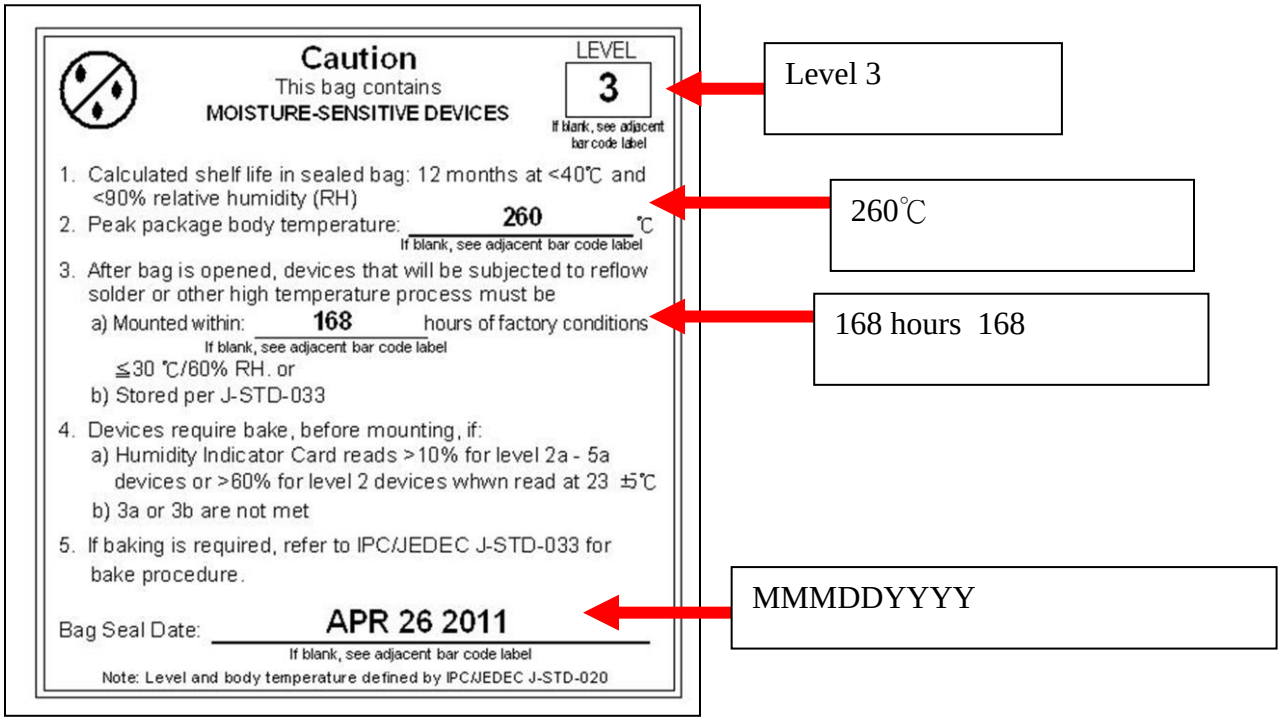
14.2 Laser Mark

Content		Alignment
Line1	PIN1 Dot	Left
Line2	2D Barcode	Left
Line3	SI-WBM-N15	Left
Line4	YYWW	Left
For Inventek		
Line3	ISM4343-WBP	Left

14.3 Pin 1 Location in the Tape/Reel



14.4 MSL & Moisture Sensitive LEVEL



14.5 PCB Cleaning

We do not recommend water-based cleaning.

Options:

Isopropyl Alcohol (IPA)
Spray Flux Remover
Ultrasonic Clear, Use IPA or Flux remover.

Be cautious when using ultrasonic cleaning as it could weaken the soldering joint.

15. REVISION CONTROL

Document: ISM43439-WBP-L151	Wi-Fi + BT/BLE + PSoC 6 Data Sheet
External Release	DOC-DS-43439-1.0

Date	Author	Revision	Comment
3/12/2023	AS	1.0	Preliminary
6-11-24	AS	1.1	512KB SRAM

16. CONTACT INFORMATION

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