



# Intel® Quark™ SE Microcontroller C1000

WLCSP Pin Connectivity

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*October 2016*



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## Revision History

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Date	Revision	Description
October 2016	002	Updated Introduction section.
July 2016	001	Initial release



## 1.0 Introduction

The Intel® Quark™ SE Microcontroller C1000 is an ultra-low power Intel® Architecture (IA) device that integrates an Intel® Quark™ processor core, Sensor Subsystem, Memory Subsystem with on-die volatile and non-volatile storage and I/O interfaces into a single system-on-chip (SoC) solution. This document outlines the pin map coordinates for the Intel® Quark™ SE Microcontroller C1000 Wafer Level Chip Scale Package (WLCSP).

**Note:** Metric units are used in some sections in addition to the standard use of U.S. customary system of units (USCS). If there is a discrepancy between the metric and USCS units, assume the USCS unit is most accurate. The conversion factor used is 1 inch (1000 mils) = 25.4 mm.

### 1.1 Terminology

Table 1. Terminology

Term	Description
ADC	Analogue-to-Digital Converter
AGND	Analogue Ground
AIN	Analogue Input
AON	Always ON
AREF	Analogue Reference Voltage
AVD	Analogue Voltage Domain
AVS	Power Supply Decoupling Ground
AVSS	Analogue VSS
BATT	Battery
CLK	Clock
CMP	Comparator
CRB	Customer Reference Board
CS	Chip Select
CTS	Clear To Send
ESR	Equivalent Series Resistance



Term	Description
GPIO	General-Purpose Input/Output
HYB	Hybrid
IO	Input Output
I <sup>2</sup> C	Inter-Integrated Circuit
I2S	Integrated IC Sound
MISO	Master In Slave Out
MOSI	Master Out Slave In
NC	Not Connected
OPM	Over-voltage Protection Module
PLAT	Platform
PLL	Phase Lock Loop
PLT	Platform
PWM	Pulse Width Modulation
PWR	Power
REG	Regulator
RSCK	Receive Serial Clock
RST	Reset
RTC	Real Time Clock
RTS	Request To Send
RWS	Read Write Select
RXD	Receive Data
SCL	Serial Clock
SCK	Serial Clock
SDA	Serial Data
SE	Sensor Enabled
SoC	System on Chip
SPI	Serial Peripheral Interface



Term	Description
SRAM	Static Random Access Memory
SS	Slave Select
TCK	JTAG Chain (Test) Clock
TDI	JTAG (Test) Chain In
TDO	JTAG (Test) Chain Data Out
TMS	JTAG (Test) Chain Mode Select
TRST	JTAG Chain (Test) Reset
TSCK	Transmit Serial Clock
TWS	Transmit interface Word Select
TXD	Transmit Data
UART	Universal Asynchronous Receiver/Transmitter
USB	Universal Serial Bus
VCC	IC Power Supply Pin ( $V_{cc}$ )
VSS	IC Power Supply Pin ( $V_{ss}$ )
WLCSP	Wafer Level Chip Scale Package
XTALI	Crystal Input
XTALO	Crystal Output



## 2.0 Pins and Package Information

The Intel® Quark™ SE Microcontroller C1000 is shipped in a 6.410 X 6.33 X 0.520 mm Wafer Level Chip Scale Package (WLCSP) package.

### 2.1 SoC Attributes

- Package parameters: 6.410 X 6.330 X 0.520 mm (WLCSP)
- Pin Count: 144

All units: mm

Tolerances if not specified:

- .X:  $\pm 0.1$
- .XX:  $\pm 0.05$
- Angles:  $\pm 1.0$  degrees

### 2.2 Pin Multiplexing

Many I/Os are configurable GPIOs. These I/Os are multiplexed with other signals in the ball list. This table matches locations and functions of every ball with all possible multiplexed signals (denoted as GPIO Functions). Configurable GPIOs default to function 0 during power on. Intel® Quark™ SE microcontroller firmware is responsible for enabling the platform specific configuration. By default, all F0 function pins are enabled.

**Table 2. Pin Multiplexing for WLCSP Package**

Location	Ballmap Name	Function_0	Function_1	Function_2	Description
A1	VSS	VSS - Ground			Ground
A2	VCC_AON_1P8	VCC_AON_1P8			1.8v supply voltage for AON counter
A3	EXTERNAL_PAD_27	I2C1_SS_SCL			Clock for I2C1 on SensorSubsystem
A4	EXTERNAL_PAD_34	SPI0_SS_CS_B[3]	GPIO[30]		Chip select 3 for SPI0 on SensorSubsystem/ GPIO[30]





Location	Ballmap Name	Function_0	Function_1	Function_2	Description
A5	VCC_HOST_1P8	VCC_HOST_1P8			1.8v from platform to SOC
A6	EXTERNAL_PAD_40	SPI1_SS_CS_B[2]	UART0_CTS_B		SPI1 Chip Select 2 on SensorSubsystem/ UART0 Clear to Send Active low
A7	EXTERNAL_PAD_48	GPIO[14]	SPI1_M_CS_B[3]		GPIO[14]/SPI1 Master Chip Select 3
A8	EXTERNAL_PAD_50	GPIO[16]	I2S_RSCK		GPIO[16]/I2S Receive Clock
A9	EXTERNAL_PAD_52	GPIO[18]	I2S_TSCK		GPIO[18]/I2S Transmit Clock
A10	EXTERNAL_PAD_59	GPIO[25]	SPIO_M_CS_B[1]		GPIO[25]/SPIO Master Chip Select 1
A11	VCC_IO_AON	VCC_IO_AON			IO supply voltage
A12	NC	NC			No Connect
B1	VSS	VSS			Ground
B2	EXTERNAL_PAD_19	UART0_TXD	GPIO[31]		UART0 transmit/GPIO[31]
B3	EXTERNAL_PAD_26	I2C1_SS_SDA			I2C1 Sensor Subsystem Data
B4	EXTERNAL_PAD_33	SPIO_SS_CS_B[2]	GPIO[29]		SPIO Sensor Subsystem Chip Select 2/GPIO[29]
B5	EXTERNAL_PAD_35	SPI1_SS_MISO			SPI1 Sensor Subsystem Master In Slave Out
B6	EXTERNAL_PAD_41	SPI1_SS_CS_B[3]	UART0_RTS_B		SPI1 Sensor Subsystem Chip Select 3/UART-ready to send
B7	EXTERNAL_PAD_47	GPIO[13]	SPI1_M_CS_B[2]		GPIO[13]/SPI1 Master Chip Select 2
B8	EXTERNAL_PAD_49	GPIO[15]	I2S_RXD		GPIO[15]/I2S Receive
B9	EXTERNAL_PAD_51	GPIO[17]	I2S_RWS		GPIO[17]/I2S Receive Write Select
B10	EXTERNAL_PAD_60	GPIO[26]	SPIO_M_CS_B[2]		GPIO[26]/SPIO Master Chip Select 2
B11	EXTERNAL_PAD_66	GPIO_SS[13]	PWM[3]		GPIO Sensor Subsystem [13]/Pulse Width Modulation[3]
B12	VSS_IO_AON	VSS_IO_AON			Ground for IO
C1	EXTERNAL_PAD_20	I2C0_SCL			I2C0 Clock
C2	EXTERNAL_PAD_21	I2C0_SDA - data			I2C0 Data



Location	Ballmap Name	Function_0	Function_1	Function_2	Description
C3	EXTERNAL_PAD_28	SPIO_SS_MISO			SPIO Sensor Subsystem Master In Slave Out
C4	EXTERNAL_PAD_32	SPIO_SS_CS_B[1]			SPIO Sensor Subsystem Chip Select 1
C5	EXTERNAL_PAD_36	SPI1_SS_MOSI			SPI1 Sensor Subsystem Master Out Slave In
C6	EXTERNAL_PAD_42	GPIO[8]	SPI1_M_SCK -		GPIO[8]/SPI1 Master Clock
C7	EXTERNAL_PAD_46	GPIO[12]	SPI1_M_CS_B[1]		GPIO[12]/SPI1 Master Chip Select 1
C8	VCC_SRAM_1P8	VCC_SRAM_1P8			1.8 SRAM supply voltage
C9	EXTERNAL_PAD_53	GPIO[19]	I2S_TWS		GPIO[19]/I2S Transmit Write Select
C10	EXTERNAL_PAD_61	GPIO[27]	SPIO_M_CS_B[3]		GPIO[27]/SPI0 Master Chip Select 3
C11	EXTERNAL_PAD_65	GPIO_SS[12]	PWM[2]		GPIO for Sensor Subsystem[12]/ PWM[2]
C12	EXTERNAL_PAD_68	GPIO_SS[15]	PLT_CLK[1]		GPIO for Sensor Subsystem[15]/ Platform Clock Output 1
D1	EXTERNAL_PAD_22	I2C1_SCL			I2C1 serial clock
D2	EXTERNAL_PAD_23	I2C1_SDA			I2C1 serial data
D3	EXTERNAL_PAD_30	SPIO_SS_SCK			SPIO SensorSubsystem Clock
D4	EXTERNAL_PAD_31	SPIO_SS_CS_B[0]			SPIO SensorSubsystem Chip Select 0
D5	EXTERNAL_PAD_37	SPI1_SS_SCK			SPI1 Sensor Subsystem Clock
D6	EXTERNAL_PAD_43	GPIO[9]	SPI1_M_MISO		GPIO[9]/SPI1 Master in Slave Out
D7	EXTERNAL_PAD_45	GPIO[11]	SPI1_M_CS_B[0]		GPIO[11]/SPI1 Master Chip Select 0
D8	EXTERNAL_PAD_55	GPIO[21]	SPIO_M_SCK		GPIO[21]/SPI0 Master Clock
D9	EXTERNAL_PAD_54	GPIO[20]	I2S_TXD		GPIO[20]/I2S transmit data
D10	EXTERNAL_PAD_62	GPIO[28]			GPIO[28]
D11	EXTERNAL_PAD	GPIO_SS[11]	PWM[1]		GPIO Sensor Subsystem[11]/



Location	Ballmap Name	Function_0	Function_1	Function_2	Description
	_64				PWM[1]
D12	EXTERNAL_PAD_67	GPIO_SS[14]	PLT_CLK[0]		GPIO for Sensor Subsystem[14]/ Platform Clock 0
E1	EXTERNAL_PAD_24	I2C0_SS_SDA			I2C0 SensorSubsystem Data
E2	EXTERNAL_PAD_25	I2C0_SS_SCL			I2C0 SensorSubsystem Clock
E3	EXTERNAL_PAD_29	SPI0_SS_MOSI			SPI0 SensorSubsystem Master Out Slave In
E4	EXTERNAL_PAD_39	SPI1_SS_CS_B[1]			SPI1 Sensor Subsystem Chip Select 1
E5	EXTERNAL_PAD_38	SPI1_SS_CS_B[0]			SPI1Sensor Subsystem Chip Select 0
E6	EXTERNAL_PAD_44	GPIO[10]	SPI1_M_MOSI		GPIO[10]/SPI1 Master Out Slave In
E7	EXTERNAL_PAD_56	GPIO[22]	SPI0_M_MISO		GPIO[22]/SPI0 Master In Slave Out
E8	EXTERNAL_PAD_58	GPIO[24]	SPI0_M_CS_B[0]		GPIO[24]/ SPI0 Master Chip Select 0
E9	EXTERNAL_PAD_57	GPIO[23]	SPI0_M_MOSI		GPIO[23]/SPI0 Master Out Slave In
E10	EXTERNAL_PAD_63	GPIO_SS[10]	PWM[0]		GPIO for Sensor Subsystem[10]/ PWM[0]
E11	AON_GPIO_PAD_1	AON_GPIO_1			Always on GPIO [1]
E12	AON_GPIO_PAD_2	AON_GPIO_2			Always on GPIO [2]
F1	EXTERNAL_PAD_14	GPIO_SS[6]	AIN[14]		GPIO for Sensor Subsystem[6]/ Analog input [14]
F2	EXTERNAL_PAD_00	GPIO[0]	AIN[0]	SPI_S_CS_B	GPIO[0]/Analog Input [0]/SPI Slave Chip Select
F3	VSS	VSS			Ground
F4	TDI_PAD	TDI			JTAG data in
F5	AREF_PAD	AREF			Analog reference voltage
F6	TMS_PAD	TMS			JTAG master select
F7	VSS_IO_AON	VSS_IO_AON			Ground for IO AON
F8	TDO_PAD	TDO			JTAG data out
F9	AON_GPIO_PAD_3	AON_GPIO_3			Always On GPIO [3]



Location	Ballmap Name	Function_0	Function_1	Function_2	Description
F10	AON_GPIO_PAD_4	AON_GPIO_4			Always On GPIO [4]
F11	RST_N_PAD	RST_N			Main reset for SOC
F12	AON_PWR_GOOD_PAD	AON_PWR_GOOD			Power good input
G1	EXTERNAL_PAD_11	GPIO_SS[3]	AIN[11]		GPIO for Sensor Subsystem[3]/ Analog Input [11]
G2	EXTERNAL_PAD_13	GPIO_SS[5]	AIN[13]		GPIO for Sensor Subsystem[5]/ Analog Input [13]
G3	EXTERNAL_PAD_07	GPIO[7]	AIN[7]		GPIO[7]/ Analog Input [7]
G4	EXTERNAL_PAD_01	GPIO[1]	AIN[1]	SPI_S_MISO	GPIO[1]/ Analog Input [1]/SPI Slave Master in Slave Out
G5	TRST_PAD	TRST			JTAG reset
G6	VCC_IO_AON	VCC_IO_AON			Input voltage for AON IO
G7	TCK_PAD	TCK			JTAG clock
G8	AON_GPIO_PAD_5	AON_GPIO_5			Always on GPIO[5]
G9	AON_GPIO_PAD_0	AON_GPIO_0			Always on GPIO[0]
G10	VCC_RTC_1P8	VCC_RTC_1P8			1.8 supply voltage for RTC
G11	RTC_XTALI_PAD	RTC_XTALI			RTC Clock Input
G12	RTC_XTALO_PAD	RTC_XTALO			RTC Clock output
H1	USB_PADP	USB_P			USB positive
H2	USB_PADN	USB_N			USB negative
H3	VSS_AVSS_CMP	VSS_AVSS_CMP			Comparator ground
H4	EXTERNAL_PAD_06	GPIO[6]	AIN[6]		GPIO[6]/Analog Input [6]
H5	EXTERNAL_PAD_02	GPIO[2]	AIN[2]	SPI_S_SCK	GPIO[2]/Analog Input [2]/SPI Slave Clock
H6	VCC_HOST_1P8	VCC_HOST_1P8			1.8 host supply
H7	VSS_AVSS_ESR2	VSS_AVSS_ESR2			Ground for switching regulator 2
H8	VSS_GNDSENSE_ESR2	VSS_GNDSENSE_ESR2			Ground sense on switching regulator 2



Location	Ballmap Name	Function_0	Function_1	Function_2	Description
H9	VCC_VSENSE_E SR1	VCC_VSENSE_E SR1			VSense on Switching Regulator1
H10	REG_PLAT_PAD	REG_PLAT			Internal or external regulator select
H11	VSS_RTC	VSS_RTC			RTC ground
H12	VSS	VSS			Ground
J1	VSS_USB	VSS_USB			USB ground
J2	VCC_USB_3P3	VCC_USB_3P3			3.3 supply voltage for USB
J3	VCC_CMP_3P3	VCC_CMP_3P3			3.3 comparators supply voltage
J4	EXTERNAL_PAD _12	GPIO_SS[4]	AIN[12]		GPIO for Sensor Subsystem[4]/ Analog Input[12]
J5	EXTERNAL_PAD _15	GPIO_SS[7]	AIN[15]		GPIO for Sensor Subsystem[7]/ Analog Input[15]
J6	EXTERNAL_PAD _03	GPIO[3]	AIN[3]	SPI_S_MOSI	GPIO[3]/Analog Input[3]/SPI slave Master Out slave in
J7	VCC_AON_1P8	VCC_AON_1P8			1.8 supply voltage to AON
J8	VCCOUT_ESR1_ 3P3	VCCOUT_ESR1_ 3P3			Output voltage for switching reg1
J9	VCCOUT_QLR1 _3P3	VCCOUT_QLR1 _3P3			Output voltage for linear reg1
J10	VCC_VSENSE_E SR2	VCC_VSENSE_E SR2			VSense on Switching Regulator2
J11	VCCOUT_QLR2 _1P8	VCCOUT_QLR2 _1P8			Output voltage for linear reg2
J12	VCCOUT_ESR2_ 1P8	VCCOUT_ESR2_ 1P8			Output voltage for switching reg2
K1	HYB_XTALO_P AD	HYB_XTALO			Hybrid clock out
K2	HYB_XTALI_P A D	HYB_XTALI			Hybrid clock in
K3	VCC_PLL_1P8	VCC_PLL_1P8			1.8 PLL supply voltage
K4	EXTERNAL_PAD _18	UART0_RXD	AIN[18]		UART0 receiver data/Analog input[18]
K5	EXTERNAL_PAD _10	GPIO_SS[2]	AIN[10]		GPIO for Sensor Subsystem[2]/ Analog input[10]
K6	EXTERNAL_PAD _04	GPIO[4]	AIN[4]		GPIO[4]/ Analog input[4]



Location	Ballmap Name	Function_0	Function_1	Function_2	Description
K7	VSS_GNDSENS E_OPM	VSS_GNDSENS E_OPM			Ground Sense for over voltage protection module
K8	VCCOUT_AON_ 1P8	VCCOUT_AON_ 1P8			1.8 Supply voltage AON
K9	VCCOUT_ESR3_ 1P8	VCCOUT_ESR3_ 1P8			1.8 Supply voltage ESR3
K10	VCCOUT_HOST_ 1P8	VCCOUT_HOST_ 1P8			1.8 host supply output
K11	VCCOUT_AVD_ OPM_2P6	VCCOUT_AVD_ OPM_2P6			2.6 Output voltage supply for OPM
K12	VCC_AVD_OPM_ 2P6	VCC_AVD_OPM_ 2P6			2.6 voltage supply for OPM
L1	VSS_AVSS_CM P	VSS_AVSS_CM P			Ground for comparators
L2	VSS_PLL	VSS_PLL			Ground for PLL
L3	VSS_ADC_AGN D	VSS_ADC_AGN D			ADC ground
L4	EXTERNAL_PAD _16	GPIO_SS[8]	AIN[16]	UART1_TXD	GPIO for Sensor Subsytem[8]/ Analog In[16]/ UART1 Transmit data
L5	EXTERNAL_PAD _08	GPIO_SS[0]	AIN[8]	UART1_CTS_B	GPIO for Sensor Subsytem[0]/ Analog In[8]/UART1 Clear to send
L6	EXTERNAL_PAD _05	GPIO[5]	AIN[5]		GPIO[5]/Analog input[5]
L7	VSS_AVS_ESR1	VSS_AVS_ESR1			Ground for switching regulator 1
L8	VSS_GNDSENS E_ESR1	VSS_GNDSENS E_ESR1			Ground sense for switching regulator 1
L9	VCC_VSENSE_E SR3	VCC_VSENSE_E SR3			Vsense for Switching regulator 3
L10	VCC_BATT_OP M_3P7	VCC_BATT_OP M_3P7			Main supply voltage for OPM
L11	VCC_BATT_ESR 2_3P7	VCC_BATT_ESR 2_3P7			Main supply voltage for Switching regulator 2
L12	VSS	VSS			Ground
M1	VSS	VSS			Ground
M2	VCC_CMP_3P3	VCC_CMP_3P3			3.3 comparators supply voltage
M3	VCC_ADC_3P3	VCC_ADC_3P3			3.3 ADC supply voltage
M4	EXTERNAL_PAD	GPIO_SS[9]	AIN[17]	UART1_RXD	GPIO for Sensor Subsytem[9]/



Location	Ballmap Name	Function_0	Function_1	Function_2	Description
	_17				Analog[17]/UART1 Receive Data
M5	EXTERNAL_PAD_09	GPIO_SS[1]	AIN[9]	UART1_RTS_B	GPIO for Sensor Subsystem[1]/ Analog In[9]/UART1 Ready to Send
M6	VSS	VSS			Ground
M7	VSS_GNDSENSE_ESR3	VSS_GNDSENSE_ESR3			Ground Sense for ESR3
M8	VSS_AVS_ESR3	VSS_AVS_ESR3			Ground for ESR3
M9	VCC_BATT_ESR3_3P7	VCC_BATT_ESR3_3P7			Mains supply voltage for ESR3
M10	VCC_BATT_ESR1_3P7	VCC_BATT_ESR1_3P7			Mains supply voltage for ESR1
M11	VSS	VSS			Ground
M12	VSS	VSS			Ground

### 2.3 Alphabetical Pin Listing

Table 3. Alphabetical Pin Listing by function for WLCSP Package

Location	Ballmap Name	Function_0	Function_1	Function_2
G9	AON_GPIO_PAD_0	AON_GPIO_0		
E11	AON_GPIO_PAD_1	AON_GPIO_1		
E12	AON_GPIO_PAD_2	AON_GPIO_2		
F9	AON_GPIO_PAD_3	AON_GPIO_3		
F10	AON_GPIO_PAD_4	AON_GPIO_4		
G8	AON_GPIO_PAD_5	AON_GPIO_5		
F12	AON_PWR_GOOD_PAD	AON_PWR_GOOD		
F5	AREF_PAD	AREF		
F2	EXTERNAL_PAD_00	GPIO[0]	AIN[0]	SPI_S_CS_B
G4	EXTERNAL_PAD_01	GPIO[1]	AIN[1]	SPI_S_MISO
H5	EXTERNAL_PAD_02	GPIO[2]	AIN[2]	SPI_S_SCK
J6	EXTERNAL_PAD_03	GPIO[3]	AIN[3]	SPI_S_MOSI
K6	EXTERNAL_PAD_04	GPIO[4]	AIN[4]	
L6	EXTERNAL_PAD_05	GPIO[5]	AIN[5]	



Location	Ballmap Name	Function_0	Function_1	Function_2
H4	EXTERNAL_PAD_06	GPIO[6]	AIN[6]	
G3	EXTERNAL_PAD_07	GPIO[7]	AIN[7]	
C6	EXTERNAL_PAD_42	GPIO[8]	SPI1_M_SCK	
D6	EXTERNAL_PAD_43	GPIO[9]	SPI1_M_MISO	
E6	EXTERNAL_PAD_44	GPIO[10]	SPI1_M_MOSI	
D7	EXTERNAL_PAD_45	GPIO[11]	SPI1_M_CS_B[0]	
C7	EXTERNAL_PAD_46	GPIO[12]	SPI1_M_CS_B[1]	
B7	EXTERNAL_PAD_47	GPIO[13]	SPI1_M_CS_B[2]	
A7	EXTERNAL_PAD_48	GPIO[14]	SPI1_M_CS_B[3]	
B8	EXTERNAL_PAD_49	GPIO[15]	I2S_RXD	
A8	EXTERNAL_PAD_50	GPIO[16]	I2S_RSCK	
B9	EXTERNAL_PAD_51	GPIO[17]	I2S_RWS	
A9	EXTERNAL_PAD_52	GPIO[18]	I2S_TSCK	
C9	EXTERNAL_PAD_53	GPIO[19]	I2S_TWS	
D9	EXTERNAL_PAD_54	GPIO[20]	I2S_TXD	
D8	EXTERNAL_PAD_55	GPIO[21]	SPI0_M_SCK	
E7	EXTERNAL_PAD_56	GPIO[22]	SPI0_M_MISO	
E9	EXTERNAL_PAD_57	GPIO[23]	SPI0_M_MOSI	
E8	EXTERNAL_PAD_58	GPIO[24]	SPI0_M_CS_B[0]	
A10	EXTERNAL_PAD_59	GPIO[25]	SPI0_M_CS_B[1]	
B10	EXTERNAL_PAD_60	GPIO[26]	SPI0_M_CS_B[2]	
C10	EXTERNAL_PAD_61	GPIO[27]	SPI0_M_CS_B[3]	
D10	EXTERNAL_PAD_62	GPIO[28]		
L5	EXTERNAL_PAD_08	GPIO_SS[0]	AIN[8]	UART1_CTS_B
M5	EXTERNAL_PAD_09	GPIO_SS[1]	AIN[9]	UART1_RTS_B
K5	EXTERNAL_PAD_10	GPIO_SS[2]	AIN[10]	
G1	EXTERNAL_PAD_11	GPIO_SS[3]	AIN[11]	
J4	EXTERNAL_PAD_12	GPIO_SS[4]	AIN[12]	
G2	EXTERNAL_PAD_13	GPIO_SS[5]	AIN[13]	
F1	EXTERNAL_PAD_14	GPIO_SS[6]	AIN[14]	
J5	EXTERNAL_PAD_15	GPIO_SS[7]	AIN[15]	
L4	EXTERNAL_PAD_16	GPIO_SS[8]	AIN[16]	UART1_TXD
M4	EXTERNAL_PAD_17	GPIO_SS[9]	AIN[17]	UART1_RXD





Location	Ballmap Name	Function_0	Function_1	Function_2
E10	EXTERNAL_PAD_63	GPIO_SS[10]	PWM[0]	
D11	EXTERNAL_PAD_64	GPIO_SS[11]	PWM[1]	
C11	EXTERNAL_PAD_65	GPIO_SS[12]	PWM[2]	
B11	EXTERNAL_PAD_66	GPIO_SS[13]	PWM[3]	
D12	EXTERNAL_PAD_67	GPIO_SS[14]	PLT_CLK[0]	
C12	EXTERNAL_PAD_68	GPIO_SS[15]	PLT_CLK[1]	
K2	HYB_XTALI_PAD	HYB_XTALI		
K1	HYB_XTALO_PAD	HYB_XTALO		
C1	EXTERNAL_PAD_20	I2C0_SCL		
C2	EXTERNAL_PAD_21	I2C0_SDA		
D1	EXTERNAL_PAD_22	I2C1_SCL		
D2	EXTERNAL_PAD_23	I2C1_SDA		
E1	EXTERNAL_PAD_24	I2C0_SS_SDA		
E2	EXTERNAL_PAD_25	I2C0_SS_SCL		
B3	EXTERNAL_PAD_26	I2C1_SS_SDA		
A3	EXTERNAL_PAD_27	I2C1_SS_SCL		
A12	NC	NC		
H10	REG_PLAT_PAD	REG_PLAT		
F11	RST_N_PAD	RST_N		
G11	RTC_XTALI_PAD	RTC_XTALI		
G12	RTC_XTALO_PAD	RTC_XTALO		
C3	EXTERNAL_PAD_28	SPIO_SS_MISO		
E3	EXTERNAL_PAD_29	SPIO_SS_MOSI		
D3	EXTERNAL_PAD_30	SPIO_SS_SCK		
D4	EXTERNAL_PAD_31	SPIO_SS_CS_B[0]		
C4	EXTERNAL_PAD_32	SPIO_SS_CS_B[1]		
B4	EXTERNAL_PAD_33	SPIO_SS_CS_B[2]	GPIO[29]	
A4	EXTERNAL_PAD_34	SPIO_SS_CS_B[3]	GPIO[30]	
B5	EXTERNAL_PAD_35	SPI1_SS_MISO		
C5	EXTERNAL_PAD_36	SPI1_SS_MOSI		
D5	EXTERNAL_PAD_37	SPI1_SS_SCK		
E5	EXTERNAL_PAD_38	SPI1_SS_CS_B[0]		
E4	EXTERNAL_PAD_39	SPI1_SS_CS_B[1]		



Location	Ballmap Name	Function_0	Function_1	Function_2
A6	EXTERNAL_PAD_40	SPI1_SS_CS_B[2]	UART0_CTS_B	
B6	EXTERNAL_PAD_41	SPI1_SS_CS_B[3]	UART0_RTS_B	
G7	TCK_PAD	TCK		
F4	TDI_PAD	TDI		
F8	TDO_PAD	TDO		
F6	TMS_PAD	TMS		
G5	TRST_PAD	TRST		
K4	EXTERNAL_PAD_18	UART0_RXD	AIN[18]	
B2	EXTERNAL_PAD_19	UART0_TXD	GPIO[31]	
H2	USB_PADN	USB_N		
H1	USB_PADP	USB_P		
M3	VCC_ADC_3P3	VCC_ADC_3P3		
A2	VCC_AON_1P8	VCC_AON_1P8		
J7	VCC_AON_1P8	VCC_AON_1P8		
K12	VCC_AVD_OPM_2P6	VCC_AVD_OPM_2P6		
M10	VCC_BATT_ESR1_3P7	VCC_BATT_ESR1_3P7		
L11	VCC_BATT_ESR2_3P7	VCC_BATT_ESR2_3P7		
M9	VCC_BATT_ESR3_3P7	VCC_BATT_ESR3_3P7		
L10	VCC_BATT_OPM_3P7	VCC_BATT_OPM_3P7		
J3	VCC_CMP_3P3	VCC_CMP_3P3		
M2	VCC_CMP_3P3	VCC_CMP_3P3		
A5	VCC_HOST_1P8	VCC_HOST_1P8		
H6	VCC_HOST_1P8	VCC_HOST_1P8		
A11	VCC_IO_AON	VCC_IO_AON		
G6	VCC_IO_AON	VCC_IO_AON		
K3	VCC_PLL_1P8	VCC_PLL_1P8		
G10	VCC_RTC_1P8	VCC_RTC_1P8		
C8	VCC_SRAM_1P8	VCC_SRAM_1P8		
J2	VCC_USB_3P3	VCC_USB_3P3		
H9	VCC_VSENSE_ESR1	VCC_VSENSE_ESR1		
J10	VCC_VSENSE_ESR2	VCC_VSENSE_ESR2		
L9	VCC_VSENSE_ESR3	VCC_VSENSE_ESR3		
K8	VCCOUT_AON_1P8	VCCOUT_AON_1P8		



Location	Ballmap Name	Function_0	Function_1	Function_2
K11	VCCOUT_AVD_OPM_2P6	VCCOUT_AVD_OPM_2P6		
J8	VCCOUT_ESR1_3P3	VCCOUT_ESR1_3P3		
J12	VCCOUT_ESR2_1P8	VCCOUT_ESR2_1P8		
K9	VCCOUT_ESR3_1P8	VCCOUT_ESR3_1P8		
K10	VCCOUT_HOST_1P8	VCCOUT_HOST_1P8		
J9	VCCOUT_QLR1_3P3	VCCOUT_QLR1_3P3		
J11	VCCOUT_QLR2_1P8	VCCOUT_QLR2_1P8		
A1	VSS	VSS		
B1	VSS	VSS		
F3	VSS	VSS		
H12	VSS	VSS		
L12	VSS	VSS		
M1	VSS	VSS		
M6	VSS	VSS		
M11	VSS	VSS		
M12	VSS	VSS		
L3	VSS_ADC_AGND	VSS_ADC_AGND		
L7	VSS_AVS_ESR1	VSS_AVS_ESR1		
H7	VSS_AVS_ESR2	VSS_AVS_ESR2		
M8	VSS_AVS_ESR3	VSS_AVS_ESR3		
H3	VSS_AVSS_CMP	VSS_AVSS_CMP		
L1	VSS_AVSS_CMP	VSS_AVSS_CMP		
L8	VSS_GNDSense_ESR1	VSS_GNDSense_ESR1		
H8	VSS_GNDSense_ESR2	VSS_GNDSense_ESR2		
M7	VSS_GNDSense_ESR3	VSS_GNDSense_ESR3		
K7	VSS_GNDSense_OPM	VSS_GNDSense_OPM		
B12	VSS_IO_AON	VSS_IO_AON		
F7	VSS_IO_AON	VSS_IO_AON		
L2	VSS_PLL	VSS_PLL		
H11	VSS_RTC	VSS_RTC		
J1	VSS_USB	VSS_USB		



Figure 1. Mechanical Drawing of WLCSP Package

