Hardware Integration Guide

SDC-MSD40NBT

Preliminary version 0.6

Revision History

Version	Revision Date	Change Description
0.01	11/03/2010	Pre-Release Version
0.02	01/04/2011	General Revisions
0.03	02/11/2011	General Revisions including specifications table, revised pin table, block diagram, and mechanical drawings.
0.04	03/01/2011	General Revisions including specifications table, revised pin table, block diagram, and mechanical drawings.
0.05	03/31/2011	Revised Pin table.
0.06	07/06/11	Added data to Specifications table. General Revisions. Changed I/O Signaling Voltage from *1.8 or 3.3 VDC ± 10%* to *3.3 VDC ± 10%*

Contents

Scope

This document describes key hardware aspects of the Summit SDC-MSD40NBT radio module. This document is intended to assist device manufacturers and related parties with the integration of this radio into their host devices. Data in this document is drawn from a number of sources and includes information found in the Broadcom BCM4329 data sheet issued in June of 2009.

The SDC-MSD40NBT is currently in pre-production and this document is preliminary. The information in this document is subject to change. Please contact Summit or visit the Summit website at www.summitdatacom.com to obtain the most recent version of this document.

Operational Description

This device is an SDC-MSD40NBT radio module which supports IEEE 802.11a/b/g/n standards via an SDIO (Secure Digital Input/Output) interface and Bluetooth version 2.1 via a serial UART (Universal Asynchronous Receiver/Transmitter) interface. The radio operates in unlicensed portions of the 2.4 GHz and 5 GHz radio frequency spectrum. The device is compliant with IEEE 802.11a, 802.11b, 802.11g, and 802.11n standards using Direct Sequence Spread Spectrum (DSSS) and Orthogonal Frequency Division Multiplexing (OFDM), and supports Bluetooth 2.1 using Frequency Hopping Spread Spectrum (FHSS). The device supports all 802.11a, 802.11b, 802.11g, 802.11n, and Bluetooth data rates and automatically adjusts data rates and operational modes based on various environmental factors.

When operating on channels in the UNII-2 and UNII-2 Extended bands that are in the 5GHz portion of the frequency spectrum and are subject to Dynamic Frequency Selection requirements, the SDC-MSD40NBT fully conforms to applicable regulatory requirements. In the event that specified types of radar are detected by the network infrastructure, the SDC-MSD40NBT fully conforms to commands from the infrastructure for radar avoidance.

The SDC-MSD40NBT interfaces to host devices via a 60-pin connector. The device is based on the Broadcom BCM4329chip which is an integrated device providing a Media Access Controller (MAC), a Physical Layer Controller (PHY or baseband processor), and fully integrated dual-band radio transceiver. To maximize operational range, the SDC-MSD40NBT incorporates a 5 GHz power amplifier (PA) to increase transmit power. The frequency stability for both 2.4 GHz (802.11b and 802.11g) and 5 GHz (802.11a) operation is +/- 20 ppm.

The SDC-MSD40NBT has its own RF shielding and does not require shielding provided by the host device into which it is installed in order to maintain compliance with applicable regulatory standards. As such, the device may be tested in a standalone configuration via an extender card.

The device buffers all data inputs so that it will comply with all applicable regulations even in the presence of over-modulated input from the host device. Similarly, the SDC-SSD40NBT incorporates power regulation to comply with all applicable regulations even when receiving excess power from the host device.

The SDC-MSD40NBTprovides two unique U.FL type antenna connectors tosupport dual band transmit and receive diversity. Supported host device antenna types include dipole and monopole antennas.

Regulatory operational requirements are included with this document and may be incorporated into the operating manual of any device into which the SDC-MSD40NBT is installed. The SDC-MSD40NBT is designed for installation into mobile devices such as vehicle mount data terminals (which typically operate

at distances greater than 20 cm from the human body) and portable devices such as handheld data terminals (which typically operate at distances less than 20 cm from the human body). See "Documentation Requirements" for more information.

Block Diagram
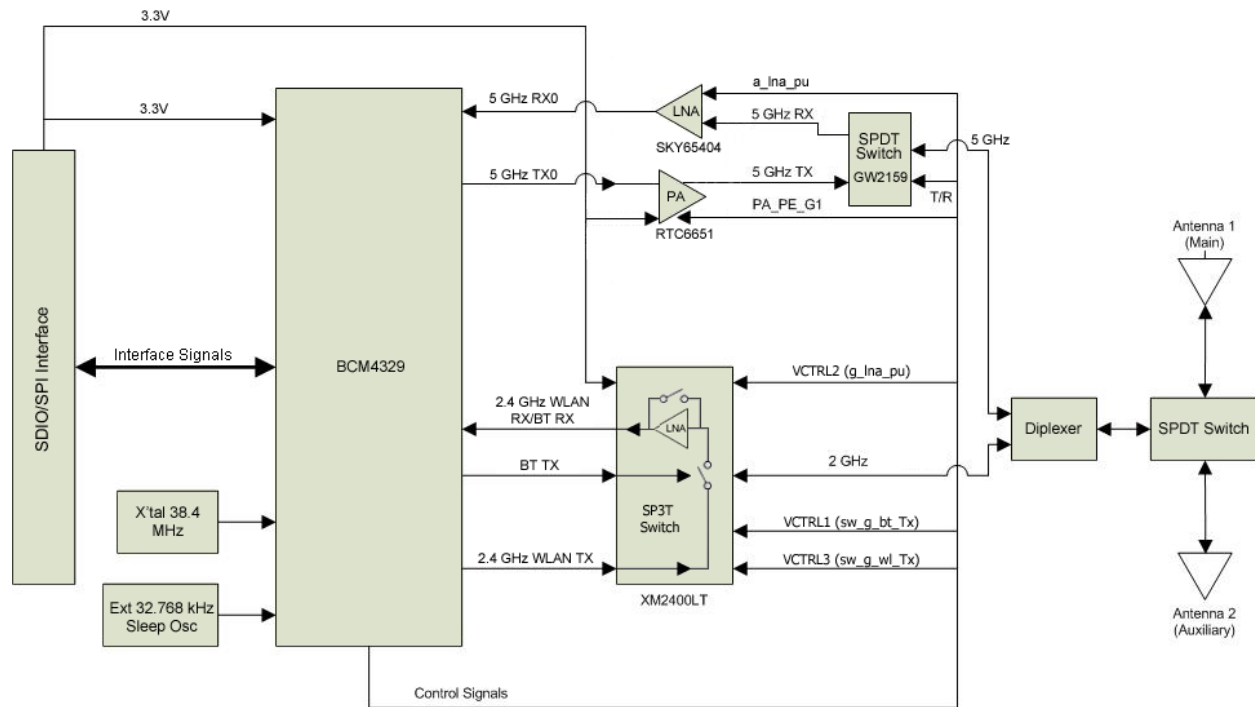
Specifications

Feature	Description
Physical Interface	Molex 54722-0607 60-pin connector (mates to Molex 55560-0607 60-pin connector)
Wi-Fi Interface	1-bit or 4-bit Secure Digital I/O
Bluetooth Interface	Host Controller Interface (HCI) using High Speed UART
Antenna Interface	2 Hirose U.FL connectors for dual-band antenna diversity
Main Chip	Broadcom BCM4329
Input Voltage Requirements	3.3 VDC ± 10% (core)
I/O Signaling Voltage	3.3 VDC ± 10%

Feature	Description
Current Consumption (At maximum transmit power setting) **Note:** *Standby* refers to the radio operating in PM1 powersave mode.	**802.11a** Transmit: 350 mA (1153 mW) Receive: 110 mA (363 mW) Standby: TBD mA (TBD mW) **802.11b** Transmit: 360 mA (1188 mW) Receive: 110 mA (363 mW) Standby: TBD mA (TBD mW) **802.11g** Transmit: 320 mA (1056 mW) Receive: 110 mA (363 mW) Standby: TBD mA (TBD mW) **802.11n (2.4 GHz)** Transmit: 340 mA (1122 mW) Receive: 110 mA (363 mW) Standby: TBD mA (TBD mW) **802.11n (5 GHz)** Transmit: 350 mA (1155 mW) Receive: 110 mA (363 mW) Standby: TBD mA (TBD mW) **Bluetooth** Transmit: 45 mA (149 mW) Receive: TBD mA (TBD mW)
Operating Temperature	-30° to 80°C (-22° to 176°F)
Operating Humidity	10 to 90% (non-condensing)
Storage Temperature	-30° to 85°C (-22° to 185°F)
Storage Humidity	10 to 90% (non-condensing)
Maximum Electrostatic Discharge	8 kV
Length	32 mm (1.26 in.)
Width	22 mm (0.87 in.)
Thickness	5.05mm (0.17 in.)
Weight	3.0 g (0.11 oz.)
Mounting	60-pin connector, mounting holes (M2 screws)
Wi-Fi Media	Direct Sequence-Spread Spectrum (DSSS) Complementary Code Keying (CCK) Orthogonal Frequency Divisional Multiplexing (OFDM)
Bluetooth Media	Frequency Hopping Spread Spectrum (FSSS)
Wi-Fi Media Access Protocol	Carrier sense multiple access with collision avoidance (CSMA/CA)
Network Architecture Types	Infrastructure and ad hoc

SDC-MSD40NBT_HIG_06 (prelim)

Feature	Description
Wi-Fi Standards	IEEE 802.11a, 802.11b, 802.11d, 802.11e, 802.11g, 802.11h, 802.11i, 802.11n
Bluetooth Standards	Bluetooth version 2.1 with Enhanced Data Rate
Wi-Fi Data Rates Supported	802.11a (OFDM) 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11b (DSSS, CCK) 1, 2, 5.5, 11 Mbps 802.11g (OFDM) 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n (OFDM, MCS 0-7) 6.5, 7.2, 13.0, 14.4, 19.5, 21.7, 26.0, 28.9, 39.0, 43.3, 52.0, 57.8, 58.5, 65.0, 72.2 Mbps
Wi-Fi Modulation	BPSK @ 1, 6, 6.5, 7.2 and 9 Mbps QPSK @ 2, 5.5, 11, 12, 13, 14.4,18, 19.5 and 21.7 Mbps 16-QAM @ 24, 26, 28.9, 36, 39 and 43.3 Mbps 64-QAM @ 48, 52, 54, 57.8, 58.5, 65, and 72.2 Mbps
802.11n Spatial Streams	1 (Single Input, Single Output)
Bluetooth Data Rates Supported	1, 2, 3 Mbps
Bluetooth Modulation	GFSK@ 1 Mbps π/4-DQPSK@ 2 Mbps 8-DPSK@ 3 Mbps
Regulatory Domain Support	FCC (Americas, Parts of Asia, and Middle East) ETSI (Europe, Middle East, Africa, and Parts of Asia) MIC (Japan) (formerly TELEC) KC (Korea) (formerly KCC)
Wi-Fi and Bluetooth 2.4 GHz Frequency Bands	**ETSI** 2.4 GHz to 2.483 GHz **FCC** 2.4 GHz to 2.473 GHz **MIC (Japan)** 2.4 GHz to 2.495 GHz **KC** 2.4 GHz to 2.483 GHz
Wi-Fi 5 GHz Frequency Bands	**ETSI** 5.15 GHz to 5.35 GHz 5.47 GHz to 5.725 GHz **FCC** 5.15 GHz to 5.35 GHz 5.725 GHz to 5.82 GHz **MIC (Japan)** 5.15 GHz to 5.35 GHz **KC** 5.15 GHz to 5.35 GHz 5.47 GHz to 5.725 GHz 5.725 GHz to 5.82 GHz
Wi-Fi 2.4 GHz Operating	ETSI: 13 (3 non-overlapping)

Feature	Description
Channels	FCC: 11 (3 non-overlapping) MIC (Japan): 14 (4 non-overlapping) KCC: 13 (3 non-overlapping)
Wi-Fi 5 GHz Operating Channels	ETSI: 19 non-overlapping FCC: 23 non-overlapping MIC (Japan): 4 non-overlapping KCC: 23 non-overlapping

Maximum Transmit Power
 	
Note: Maximum transmit power varies according to individual country regulations. All values nominal, +/-2 dBm.
 	
Note: Summit 40 series radios support a single spatial stream and 20 MHz channels only.
	802.11a
	  6 Mbps 17 dBm (50 mW)
	  54 Mbps 12.5 dBm (18 mW)
	802.11b
	  1 Mbps 18 dBm (63 mW)
	  11 Mbps 18 dBm (63 mW)
	802.11g
	  6 Mbps 18 dBm (63 mW)
	  54 Mbps 14 dBm (25 mW)
	802.11n (2.4 GHz)
	  6.5 Mbps (MCS0) 18 dBm (63 mW)
	  65 Mbps (MCS7) 13 dBm (20 mW)
	802.11n (5 GHz)
	  6.5 Mbps (MCS0) 17 dBm (50 mW)
	  65 Mbps (MCS7) 12 dBm (16 mW)
	Bluetooth
	  4 dBm (2.5 mW) (Class 2)

SUMMIT DATA COMMUNICATIONS

Feature	Description
Typical Receiver Sensitivity **Note:** *All values nominal, +/-3 dBm.*	**802.11a:** 6 Mbps -88 dBm 54 Mbps -72 dBm (PER <= 10%) **802.11b:** 1 Mbps -95 dBm 11 Mbps -89 dBm (PER <= 8%) **802.11g:** 6 Mbps -90 dBm 54 Mbps -74 dBm (PER <= 10%) **802.11n (2.4 GHz)** MCS0 Mbps -90 dBm MCS7 Mbps -73 dBm **802.11n (5 GHz)** MCS0 Mbps -88 dBm MCS7 Mbps -71 dBm **Bluetooth:** 1 Mbps -89 dBm 2 Mbps -91 dBm 3 Mbps -85 dBm
Operating Systems Supported	Windows Mobile 6.5 Windows Mobile 6.1 Windows Mobile 6.0 Windows Mobile 5.0 Windows Embedded CE 6.0 R3 Windows Embedded CE 6.0 R2 Windows Embedded CE 6.0 Windows Embedded CE 5.0 Linux, 2.6.x kernel
Security	**Standards** ▪ Wireless Equivalent Privacy (WEP) ▪ Wi-Fi Protected Access (WPA) ▪ IEEE 802.11i (WPA2) **Encryption** ▪ Wireless Equivalent Privacy (WEP, RC4 Algorithm) ▪ Temporal Key Integrity Protocol (TKIP, RC4 Algorithm) ▪ Advanced Encryption Standard (AES, Rijndael Algorithm) **Encryption Key Provisioning** ▪ Static (40-bit and 128-bit lengths) ▪ Pre-Shared (PSK) ▪ Dynamic **802.1X Extensible Authentication Protocol Types** ▪ EAP-FAST ▪ EAP-TLS ▪ PEAP-GTC ▪ PEAP-MSCHAPv2 ▪ PEAP-TLS ▪ LEAP

SDC-MSD40NBT_HIG_06 (prelim)

Feature	Description
Compliance **Note:** These agency approvals are pending.	**ETSI Regulatory Domain** EN 300 328 EN 300 328 v1.7.1 (BT 2.1) EN 301 489-1 EN 301 489-17 EN 301 893 EN 60950-1 EU 2002/95/EC (RoHS) **FCC Regulatory Domain** FCC 15.247 DTS – 802.11b/g (Wi-Fi) – 2.4 GHz & 5.8 GHz FCC 15.407 UNII – 802.11a (Wi-Fi) – 2.4 GHz & 5.4 GHz FCC 15.247 DSS – BT 2.1 **Industry Canada** RSS-210 – 802.11a/b/g/n (Wi-Fi) – 2.4 GHz, 5.8 GHz, 5.2 GHz, and 5.4 GHz RSS-210 – BT 2.1 **MIC (Japan) Regulatory Domain (formerly TELEC)** Article 2 Item 19, Category WW (2.4GHz Channels 1-13) Article 2 Item 19-2, Category GZ (2.4GHz Channel 14) Article 2 Item 19-3 Category XW (5150-5250 W52 & 5250-5350 W53) Article 2-1 Item 19-2 (BT 2.1)
Certifications **Note:** These certifications are pending.	**Wi-Fi Alliance** 802.11a, 802.11b, 802.11g , 802.11n WPA Enterprise WPA2 Enterprise **Cisco Compatible Extensions** (Version 4) **Bluetooth SIG Qualification**
Warranty	**Limited Lifetime**
All specifications are subject to change without notice	

Recommended Operating Conditions and DC Electrical Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit
VBATT	DC Supply Voltage (VBATT)	2.3	-	5.5	V
VCC	DC Supply Voltage	3.0	3.3	3.6	V
VDD_IO	DC Supply Voltage (I/O)	1.62	1.8V or 3.3V	3.63	V
V_{IL}	Low Level Input Voltage (VDDO = 3.3V)	-	-	0.8	V

Symbol	Parameter	Min.	Typ.	Max.	Unit
V_{IH}	High Level Input Voltage (VDDO = 3.3V)	2.0	-	-	V
V_{IL}	Low Level Input Voltage (VDDO = 1.8V)	-	-	0.6	V
V_{IH}	High Level Input Voltage (VDDO = 1.8V)	1.1	-	-	V
V_{OL}	Low Level Output Voltage (100 µA load)	-	-	0.2	V
V_{OH}	High Level Output Voltage (-100 µA load)	VDDIO– 0.2V	-	-	V
I_{IL}	Low Current Input	-	0.3	-	µA
I_{IH}	High Current Input	-	0.3	-	µA
I_{OL}	Low Current Output (VDDO = 3.3, V_{OL} = 0.4V)	-	-	3.0	mA
I_{OH}	High Current Output (VDDO = 3.3, V_{OH} = 2.9V)	-	-	3.0	mA
C_{IN}	Input Capacitance	-	-	5	pF
	BT UART Baud Rate	9600 bps	115.2 Kbps (default coming out of reset)	4 Mbps	bps/Kbps/Mbps

SDIO Timing Requirements

The following figure (Figure 1) and table display SDIO default mode timing.
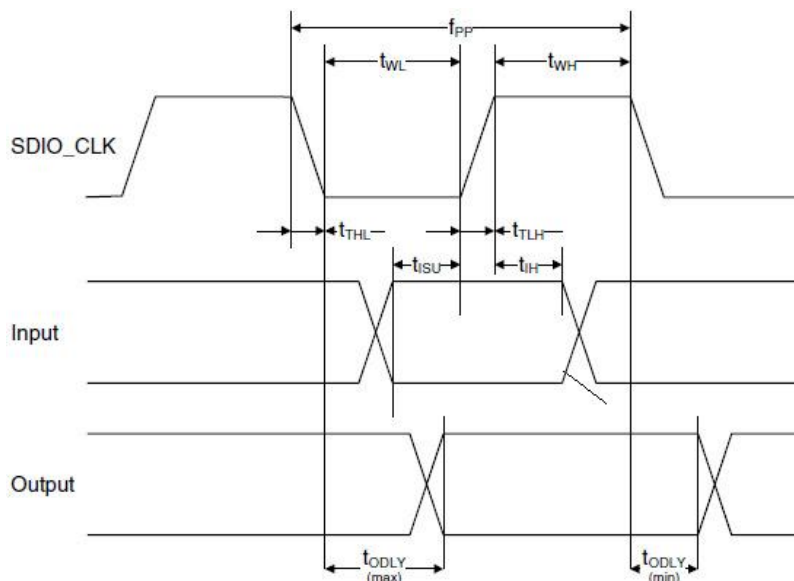
Figure 1: SDIO Default Mode Timing

Note: Timing is based on CL ≤ 40pF load on CMD and Data.

Symbol	Parameter	Min.	Typ.	Max.	Unit
SDIO CLK (All values are referred to minimum VIH and maximum VIL*)					
fPP	Frequency – Data Transfer mode	0	-	25	MHz
fOD	Frequency – Identification mode	0	-	400	kHz
tWL	Clock low time	10	-	-	ns
tWH	Clock high time	10	-	-	ns
tTLH	Clock rise time	-	-	10	ns
tTHL	Clock low time	-	-	10	ns
Inputs: CMD, DAT (referenced to CLK)					
tISU	Input setup time	5	-	-	ns
tIH	Input hold time	5	-	-	ns
Outputs: CMD, DAT (referenced to CLK)					
tODLY	Output delay time – Data Transfer mode	0	-	14	ns
tODLY	Output delay time – Identification mode	0	-	50	ns

*min(Vih) = 0.7 x VDDIO and max(ViL) = 0.2 x VDDIO.

UART Timing Requirements

The following figure (Figure 2) displays UART timing.
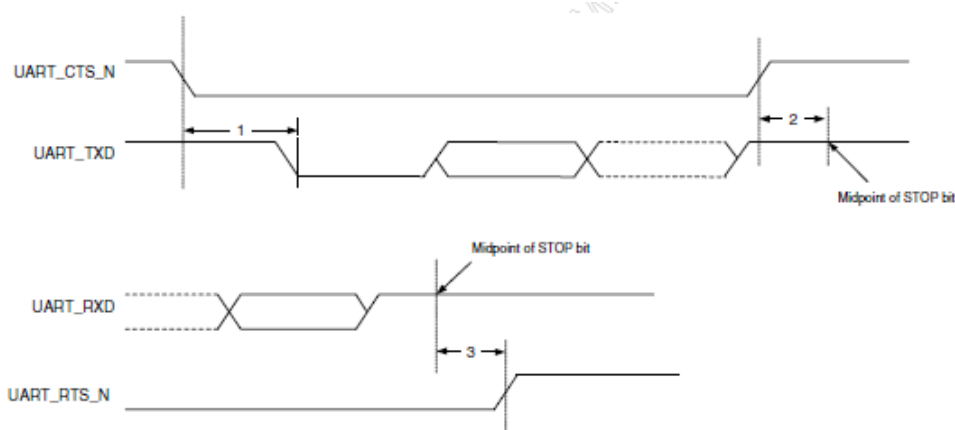
Figure 2: UART Timing Requirements

Notes: The UART 4-wire interface supports Bluetooth 2.1 HCI Specification.

Pin Definitions

Wi-Fi	Bluetooth

Pin Number	Pin Name	I/O	Power Type	Description
1	GND	I		Ground
2	BT_UART_TXD	I/O		Bluetooth UART Serial Output.
3	BT_PRIORITY	I	VDDIO	Reserved for input to BT device. When high, indicates that Bluetooth is transmitting or receiving high priority packets, e.g. SCO and LMP. Not currently supported in the firmware. When not in use, leave open (float).
4	BT_GPIO_6	I/O	VDDIO	3.3/2.6/1.8V I/O Signaling
5	BT_UART_RTS_N	I/O		Request-to-send signal for the Bluetooth UART interface, active low.
6	BT_UART_RXD	I/O		Bluetooth UART Serial Input.
7	BT_HOST_WAKE_B	O		Host Wake-up Signal from the SDC-MSD40NBT to the host indicating that the radio requires

Pin Number	Pin Name	I/O	Power Type	Description
				attention.
				Asserted – Host device must wake-up or remain awake.
				Deasserted – Host device may sleep when sleep criteria are met
				The polarity of this signal is software configurable and can be asserted high or low.
8	WL_GPIO_1	O	VDDIO	Wake on Wireless Wake on Wireless is not currently supported in the radio firmware. Do not connect when not used
9	BT_LED_ACT	O		Bluetooth LED Activity Indicator
10	BT_PCM_OUT	O		PCM data output
11	BT_UART_CTS_N	I/O		Clear-to-send signal for the Bluetooth UART interface, active low.
12	BT_WAKE_B	I		Bluetooth Device Wake-up Signal from the host to the SDC-MSD40NBT indicating that the host requires attention. Asserted – Bluetooth device must wake-up or remain awake Deasserted – Bluetooth device may sleep when sleep criteria are met The polarity of this signal is software configurable and can be asserted high or low.
13	VCC3_3	I		3.3V Module Power
14	No Connect			Not Used. Leave Open (Float)
15	No Connect			Not Used. Leave Open (Float)
16	No Connect			Not Used. Leave Open (Float)
17	No Connect			Not Used. Leave Open (Float)
18	No Connect			Not Used. Leave Open (Float)
19	No Connect			Not Used. Leave Open (Float)

Pin Number	Pin Name	I/O	Power Type	Description
20	BT_PCM_SYNC	I/O		PCM sync signal Can be master (output) or slave (input)
21	VDDIO	I		3.3/2.6/1.8V I/O Power This is the reference pin for all I/O signaling pins. It accepts 1.8VDC to 3.3VDC
22	BT_PCM_IN	I		PCM data input
23	No Connect			Not Used. Leave Open (Float)
24	BT_PCM_CLK	I/O		PCM clock; can be master (output) or slave (input)
25	No Connect			Not Used. Leave Open (Float)
26	SYS_RST_L	I	VDDIO	Resets the radio, active low. Must be asserted when power is first applied to the radio; then released before any transaction can start.
27	SDIO_DATA_2	I/O		SDIO Data 2
28	WLAN_ACTIVE	O	VDDIO	Reserved for output to BT device. When high, indicates that WLAN is transmitting or receiving. Not currently supported in the firmware. When not in use, leave open (float).
29	VCC3_3	I		3.3V Module Power
30	GND	I		Ground
31	GND	I		Ground
32	BT_RST_L	I		Low Asserting Reset for Bluetooth core When pin 48 is pulled from low to high, BT may be reset by toggling pin 32.
33	No Connect			Not Used. Leave Open (Float)
34	No Connect			Not Used. Leave Open (Float)
35	No Connect			Not Used. Leave Open (Float)

Pin Number	Pin Name	I/O	Power Type	Description
36	BT_ACTIVE	I	VDDIO	Reserved for input to BT device. When high, indicates that Bluetooth is transmitting or receiving. The Summit radio does not transmit when BT_ACTIVE is high. Not currently supported in the firmware. When not in use, leave open (float).
37	No Connect			Not Used. Leave Open (Float)
38	No Connect			Not Used. Leave Open (Float)
39	No Connect			Not Used. Leave Open (Float)
40	No Connect			Not Used. Leave Open (Float)
41	No Connect			Not Used. Leave Open (Float)
42	WL_LED_ACT	O	VDDIO	WLAN LED activity indicator I_{OH} = 2mA max (VDDIO = 1.8V) I_{OH} = 4mA max (VDDIO = 3.3V)
43	No Connect			Not Used. Leave Open (Float)
44	No Connect			Not Used. Leave Open (Float)
45	No Connect			Not Used. Leave Open (Float)
46	No Connect			Not Used. Leave Open (Float)
47	No Connect			Not Used. Leave Open (Float)
48	CHIP_PWD_L	I	VDDIO	Powers down the radio, active low
49	No Connect			Not Used. Leave Open (Float)
50	BT_GPIO_3	I/O	VDDIO	3.3/2.6/1.8V I/O Signaling
51	No Connect			Not Used. Leave Open (Float)
52	BT_GPIO_4	I/O	VDDIO	3.3/2.6/1.8V I/O Signaling
53	BT_GPIO_7	I/O	VDDIO	3.3/2.6/1.8V I/O Signaling
54	BT_GPIO_5	I/O	VDDIO	3.3/2.6/1.8V I/O Signaling
55	SDIO_CMD	I/O		SDIO Command
56	SDIO_CLK	I	VDDIO	SDIO Clock (25MHz max)
57	SDIO_DATA_0	I/O		SDIO Data 0
58	SDIO_DATA_3	I/O		SDIO Data 3
59	SDIO_DATA_1	I/O		SDIO Data 1

SDC-MSD40NBT_HIG_06 (prelim)

Pin Number	Pin Name	I/O	Power Type	Description
60	GND	I		Ground

Control Signals

▪ **CHIP_PWD_L** – Used by the PMU to decide whether to power down the internal BCM4329 regulators. If set to low, the regulators are disabled.

▪ **WL_RST_L** – Low Asserting Reset for WLAN Core. This pin must be driven high or low (not left floating). If WL_RST_L is low (regardless of BT_RST_L state), the WLAN core will be shut down.

▪ **BT_RST_L** – Low asserting reset for Bluetooth core. This pin must be driven high or low (not left floating).

Control Signal Timing Diagrams

WLAN = ON, Bluetooth = ON
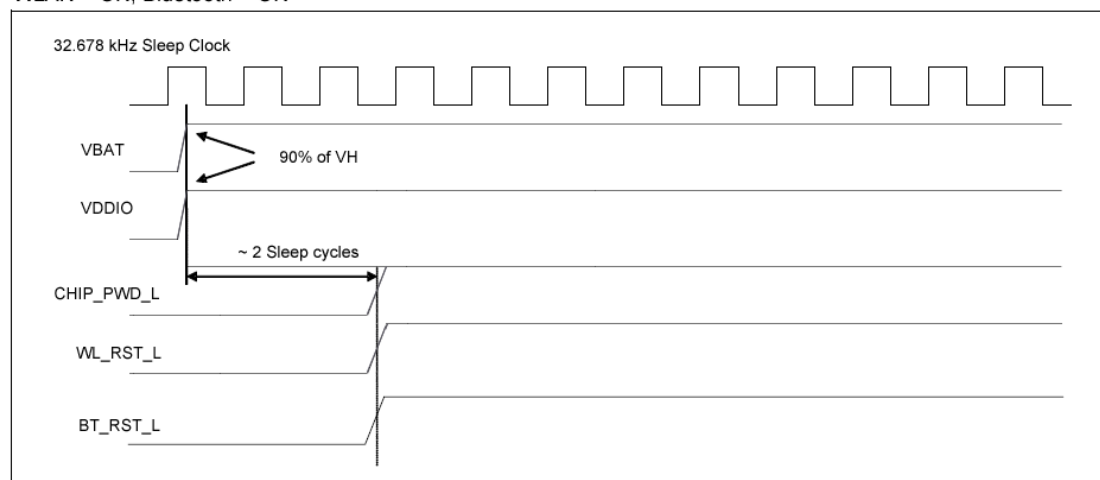
Figure 1: WLAN = ON, Bluetooth = ON

WLAN = OFF, Bluetooth = Off
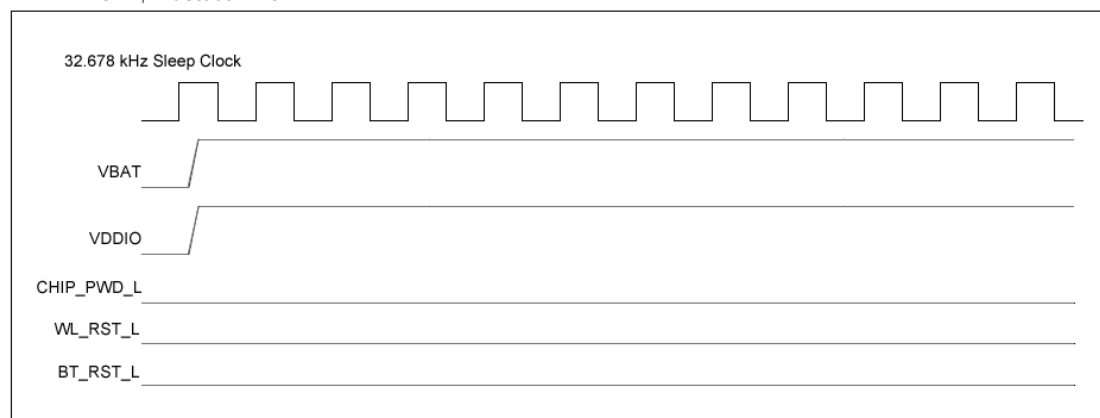
Figure 2: WLAN = OFF, Bluetooth = OFF

SDC-MSD40NBT_HIG_06 (prelim)

Mechanical Specifications

Connector Overview

MSD40NBT connector: Molex 54722-0607 60-pin connector

Mating connector (on board):   Molex 55560-0607 60-pin connector

Top View   Side View   Bottom View
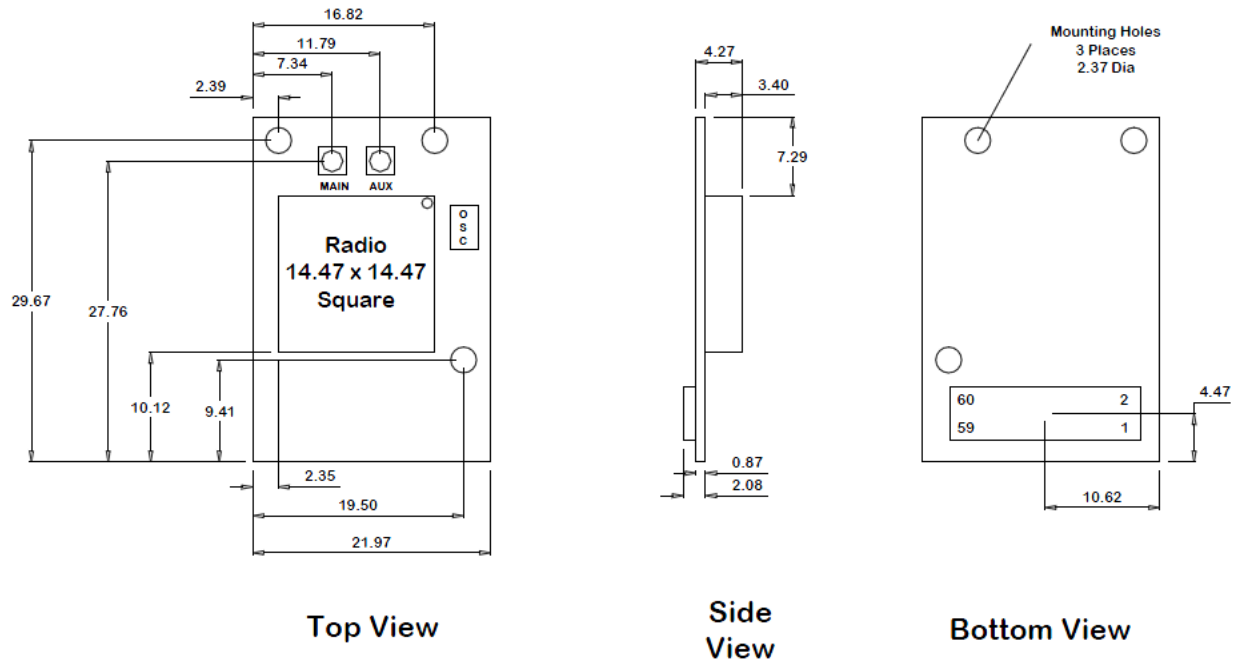
Mounting

Three through-hole mounting with a 60-pin connector. Summit recommends a 0.05 mm bushing.
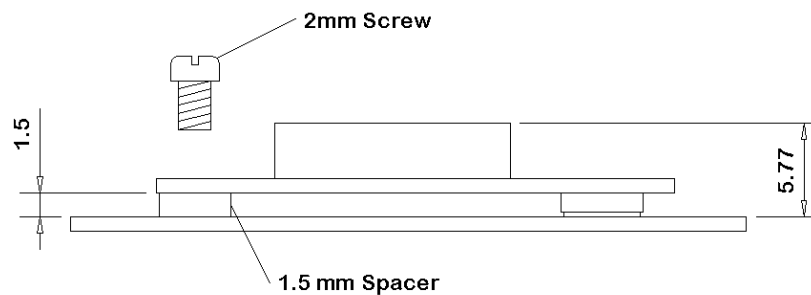
Mounting Recomendations

RF Layout Design Guidelines

The following is a list of RF layout design guidelines and recommendation when installing a Summit radio into your device.

- Do not run antenna cables directly above or directly below the radio.
- Do not place any parts or run any high speed digital lines below the radio.
- If there are other radios or transmitters located on the device (such as a Bluetooth radio), place the devices as far apart from each other as possible.
- Ensure that there is the maximum allowable spacing separating the antenna connectors on the Summit radio from the antenna. In addition, do not place antennas directly above or directly below the radio.
- Summit recommends the use of a double shielded cable for the connection between the radio and the antenna elements.
- Summit has provided three plated mounting holes that can be used for grounding. When additional ground plane is required, you may use some or all of these grounded mounting holes.
- Use proper electro-static-discharge (ESD) procedures when installing the Summit radio module.

Regulatory

Certified Antennas

The SDC-MSD40NBT will be tested to the regulatory standards defined in the "Certifications" section of the Specifications table above. Summit plans to conduct these tests with the following antennas:

Cisco AIR-ANT 4941

- **Form Factor:** Whip
- **Type:** Dipole
- **Maximum 2.4 GHz Gain:** 2.2 dBi
- **Tested and Certified 2.4 GHz Transmit Power:** TBD

Radiall Larson Dipole (R380500314)

- **Form Factor:** Whip
- **Type:** Dipole
- **Maximum 2.4 GHz Gain:** 1.6 dBi (not used during testing)
- **Maximum 5 GHz Gain:** 5 dBi
- **Tested and Certified 5 GHz Transmit Power:** TBD

HUBER+SUHNER (SOA 2459/360/5/0/V_C)

- **Form Factor:** Whip
- **Type:** Monopole
- **Maximum 2.4 GHz Gain:**3dBi

SDC-MSD40NBT_HIG_06 (prelim)

- **Maximum 5 GHz Gain:**6.5dBi
- **Tested and Certified 2.4 GHz Transmit Power:** TBD
- **Tested and Certified 5 GHz Transmit Power:** TBD

Note: If the formal test reports for the SDC-MSD40NBTshow that transmit power was decreased to less than 100% on 2.4 GHz edge channels. Summit will make these transmit power reductions in firmware for the edge channels. Integrators do not need to reduce transmit power on a channel-by-channel basis to comply with band edge regulations.

Antennas of differing types and higher gains may be integrated as well. If necessary, with the Summit Manufacturing Utility software utility, OEMs may reduce the transmit power of the SDC-MSD40NBT to account for higher antenna gain. In some cases, OEMs may be able to reduce certification efforts by using antennas that are of like type and equal or lesser gain to the above listed antennas.

Documentation Requirements

In order to maintain regulatory compliance, when integrating the SDC-MSD40NBT into a host device and leveraging Summit's grants and certifications, it is necessary to meet the documentation requirements set forth by the applicable regulatory agencies. The following sections (FCC, Industry Canada, and European Union) outline the information that may be included in the user's guide and external labels for the host devices into which the SDC-MSD40NBT is integrated.

FCC

User's Guide Requirements

When integrating the SDC-MSD40NBT into a host device, the integrator must include specific information in the user's guide for the device into which the SDC-MSD40NBT is integrated. The integrator must not provide information to the end user regarding how to install or remove this RF module in the user's manual of the device into which the SDC-MSD40NBT is integrated. The following FCC statements must be added in their entirety and without modification into a prominent place in the user's guide for the device into which the SDC-MSD40NBT is integrated:

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.

SDC-MSD40NBT_HIG_06 (prelim)

3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

4. Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

IMPORTANT NOTE: FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Labeling Requirements

The final end product must be labeled in a visible area with the following notice:

Contains FCC ID: TWG-SDCMSD40NBT

Industry Canada

User's Guide Requirements

When integrating the SDC-MSD40NBT into a host device, the integrator must include specific information in the user's guide for the device into which the SDC-MSD40NBT is integrated. The integrator must not provide information to the end user regarding how to install or remove this RF module in the user's manual of the device into which the SDC-MSD40NBT is integrated. In addition to the required FCC statements outlined above, the following IC statements must be added in their entirety and without modification into a prominent place in the user's guide for the device into which the SDC-MSD40NBT is integrated:

To prevent radio interference to the licensed service, this device is intended to be operated indoors and away from windows to provide maximum shielding. Equipment (or its transmit antenna) that is installed outdoors is subject to licensing.

The integrator must list out information for each antenna used with the host device into which the SDC-MSD40NBT is integrated. The following examples are based on antennas with which the SDC-MSD40NBT was tested and represent an acceptable format:

AIR-ANT 4941

▪ **Form Factor:** Whip

- **Type:** Dipole
- **Maximum 2.4 GHz Gain:** 2.2 dBi

Radiall Larson Dipole

- **Form Factor:** Whip
- **Type:** Dipole
- **Maximum 2.4 GHz Gain:** 1.6 dBi (not used during testing)
- **Maximum 5 GHz Gain:** 5 dBi

HUBER+SUHNER

- **Form Factor:** Whip
- **Type:** Monopole
- **Maximum 2.4 GHz Gain:**3dBi
- **Maximum 5 GHz Gain:**6.5dBi

The final end product must be labeled in a visible area with the following notice:

Contains IC ID: 6616A-SDCMSD40NBT

European Union

User's Guide Requirements

The integrator must include specific information in the user's guide for the device into which the SDC-MSD40NBT is integrated. In addition to the required FCC and IC statements outlined above, the following R&TTE statements must be added in their entirety and without modification into a prominent place in the user's guide for the device into which the SDC-MSD40NBT is integrated:

This device complies with the essential requirements of the R&TTE Directive 1999/5/EC. The following test methods have been applied in order to prove presumption of conformity with the essential requirements of the R&TTE Directive 1999/5/EC:

- **EN60950-1:2001 A11:2004**

  Safety of Information Technology Equipment

- **EN 300 328 V1.7.1: (2006-10)**

  Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband Transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using spread spectrum modulation techniques; Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive

- **EN 300 328 v1.7.1 (BT 2.1)**

- **EN 301 489-1 V1.6.1: (2005-09)**

  Electromagnetic compatibility and Radio Spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements

- **EN 301 489-17 V1.2.1 (2002-08)**

Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for 2.4 GHz wideband transmission systems and 5 GHz high performance RLAN equipment

▪ **EN 301 893**

Electromagnetic compatibility and Radio spectrum Matters (ERM); Broadband Radio Access Networks (BRAN); Specific conditions for 5 GHz high performance RLAN equipment

▪ **EU 2002/95/EC (RoHS)**

Declaration of Compliance – EU Directive 2003/95/EC; Reduction of Hazardous Substances (RoHS)

This device is a 2.4 GHz wideband transmission system (transceiver), intended for use in all EU member states and EFTA countries, except in France and Italy where restrictive use applies.

In Italy the end-user should apply for a license at the national spectrum authorities in order to obtain authorization to use the device for setting up outdoor radio links and/or for supplying public access to telecommunications and/or network services.

This device may not be used for setting up outdoor radio links in France and in some areas the RF output power may be limited to 10 mW EIRP in the frequency range of 2454 – 2483.5 MHz. For detailed information the end-user should contact the national spectrum authority in France.

Česky [Czech]	*[Jméno výrobce]* tímto prohlašuje, že tento *[typ zařízení]* je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.
Dansk [Danish]	Undertegnede *[fabrikantens navn]* erklærer herved, at følgende udstyr *[udstyrets typebetegnelse]* overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
Deutsch [German]	Hiermit erklärt *[Name des Herstellers]*, dass sich das Gerät *[Gerätetyp]* in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
Eesti [Estonian]	Käesolevaga kinnitab *[tootja nimi = name of manufacturer]* seadme *[seadme tüüp = type of equipment]* vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
English	Hereby, *[name of manufacturer]*, declares that this *[type of equipment]* is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Español [Spanish]	Por medio de la presente *[nombre del fabricante]* declara que el *[clase de equipo]* cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.

el **Ελληνική [Greek]**	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ *[name of manufacturer]* ΔΗΛΩΝΕΙ ΟΤΙ *[type of equipment]* ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
fr **Français [French]**	Par la présente *[nom du fabricant]* déclare que l'appareil *[type d'appareil]* est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
it **Italiano [Italian]**	Con la presente *[nome del costruttore]* dichiara che questo *[tipo di apparecchio]* è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Latviski [Latvian]	Aršo*[name of manufacturer /izgatavotājanosaukums]* deklarē, ka*[type of equipment / iekārtas tips]*atbilstDirektīvas 1999/5/EK būtiskajāmprasībām un citiemar to saistītajiemnoteikumiem.
Lietuvių [Lithuanian]	Šiuo *[manufacturer name]* deklaruoja, kad šis *[equipment type]* atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
nl **Nederlands [Dutch]**	Hierbij verklaart *[naam van de fabrikant]* dat het toestel *[type van toestel]* in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
mt **Malti [Maltese]**	Hawnhekk, *[isem tal-manifattur]*, jiddikjara li dan *[il-mudel tal-prodott]* jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Dirrettiva 1999/5/EC.
hu **Magyar [Hungarian]**	Alulírott, *[gyártó neve]* nyilatkozom, hogy a *[... típus]*megfelel a vonatkozó alapvetõ követelményeknek és az 1999/5/EC irányelv egyéb elõírásainak.
pl **Polski [Polish]**	Niniejszym *[nazwa producenta]* oświadcza, że *[nazwa wyrobu]* jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.
pt **Português [Portuguese]**	*[Nome do fabricante]* declara que este *[tipo de equipamento]* está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
sl **Slovensko [Slovenian]**	*[Ime proizvajalca]* izjavlja, da je ta *[tip opreme]* v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
Slovensky [Slovak]	*[Menovýrobcu]*týmtovyhlasuje, že*[typzariadenia]*spĺňazákladnépožiadavky a všetkypríslušnéustanoveniaSmernice 1999/5/ES.
fi **Suomi [Finnish]**	*[Valmistaja = manufacturer]* vakuuttaa täten että *[type of equipment = laitteen tyyppimerkintä]* tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.

⁵ᵛ**Svenska [Swedish]**	Härmed intygar *[företag]* att denna *[utrustningstyp]* står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

Labeling Requirements

The final end product must be labeled in a visible area with the following notice:

$C \in \textcircled{!}$

SDC-MSD40NBT_HIG_06 (prelim)