



# Summit User's Guide

## SDC-SSD40L

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# Contents

Contents..... 2

Scope..... 3

Specifications ..... 3

    Recommended Operating Conditions and DC Electrical Characteristics..... 7

Pin Definitions..... 9

    Integration Considerations ..... 11

Mechanical Specifications..... 13

    Mounting..... 14

RF Layout Design Guidelines..... 15

Regulatory..... 16

    Design Implementation Requirements..... 16

    Documentation Requirements ..... 19

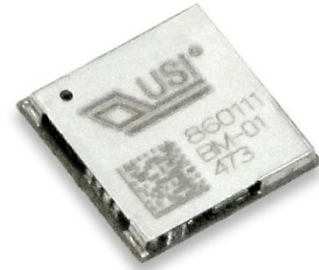
        FCC ..... 19

        Industry Canada ..... 21

        European Union ..... 22

## Scope

This document describes key hardware aspects of the Summit SSD40L SDIO (Secure Digital Input/Output) radio module (Model # SDC-SSD40L). 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 are drawn from a number of sources and include information found in the USI (WM-N-BM-01) data sheet issued in April, 2009 and the USI (WM-N-BM-01) application note issued in January, 2010.



Please contact Summit or visit the Summit website at [www.summitdata.com](http://www.summitdata.com) to obtain the most recent version of this document.

## Specifications

Feature	Description
<b>Physical Interface</b>	0.62 mm pitch LGA (land grid array) (0.62 GSP)
<b>Wi-Fi Interface</b>	1-bit or 4-bit Secure Digital I/O
<b>Antenna Interface</b>	Single antenna port (when mounted on an MSD40L board)
<b>Chip Set</b>	Broadcom BCM4319
<b>Input Voltage Requirements</b>	3.3 VDC $\pm$ 10% (core)
<b>I/O Signaling Voltage</b>	1.8/3.3 VDC $\pm$ 10%
<b>Current Consumption</b> (At maximum transmit power setting)	<p><b>802.11b</b> (17 dBm output power)            Transmit: 340 mA (1040 mW)            Receive: 85 mA (254 mW)            Standby: 28 mA (TBD mW)</p> <p><b>802.11g</b> (15 dBm output power)            Transmit: 290 mA (726 mW)            Receive: 85 mA (254 mW)            Standby: 28 mA (TBD mW)</p> <p><b>802.11n</b> (14 dBm output power) (20-MHz channel)            Transmit: 280 mA (726 mW)            Receive: 77 mA (254 mW)            Standby: TBD mA (TBD mW)</p>
<b>Operating Temperature</b>	-20° to 70°C (-4° to 158°F) (SDIO)
<b>Operating Humidity</b>	10 to 90% (non-condensing)
<b>Storage Temperature</b>	-30° to 85°C (-22° to 185°F)
<b>Storage Humidity</b>	10 to 90% (non-condensing)
<b>Maximum Electrostatic Discharge</b>	$\pm$ 2 kV

Feature	Description
<b>Length</b> <i>Note: Length, width, and thickness measurements include the metal shielding.</i>	10 mm (0.39")
<b>Width</b>	10 mm (0.39")
<b>Thickness</b>	1.3 mm (0.05")
<b>Mounting</b>	See "Mounting" section for more information
<b>Wireless Media</b>	Direct Sequence-Spread Spectrum (DSSS) Orthogonal Frequency Divisional Multiplexing (OFDM)
<b>Media Access Protocol</b>	Carrier sense multiple access with collision avoidance (CSMA/CA)
<b>Network Architecture Types</b>	Infrastructure and ad hoc
<b>Network Standards</b>	IEEE 802.11b, 802.11d, 802.11e, 802.11g, 802.11i, 802.11n
<b>Data Rates Supported</b>	802.11b (DSSS) 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
<b>Modulation</b>	BPSK @ 1, 6, 6.5, 7.2 and 9 Mbps QPSK @ 2, 12, 13, 14.4, 18, 19.5 and 21.7 Mbps CCK @ 5.5 and 11 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
<b>802.11n Spatial Streams</b>	1 (Single Input, Single Output)
<b>2.4 GHz Frequency Bands</b>	<b>ETSI</b> 2.4 GHz to 2.483 GHz <b>FCC</b> 2.4 to 2.483 GHz <b>MIC (Japan)</b> (formerly TELEC) 2.4 GHz to 2.495 GHz <b>KCC</b> 2.4 GHz to 2.483 GHz
<b>2.4 GHz Operating Channels</b>	ETSI: 13 (3 non-overlapping) FCC: 11 (3 non-overlapping) MIC (Japan): 14 (4 non-overlapping) KCC: 13 (3 non-overlapping)
<b>Transmit Power Settings</b>  <i>Note: Maximum transmit power varies according to individual country regulations. All values nominal, +/-2 dBm</i>	<b>802.11b/g</b> 17 dBm (50 mW) 15 dBm (30 mW) <b>802.11n</b> 15 dBm (30 mW)

Feature	Description
<p><b>Typical Receiver Sensitivity</b></p>	<p><b>802.11b</b>                      1 Mbps -94 dBm                      2 Mbps TBD dBm                      5.5 Mbps TBD dBm                      11 Mbps -87 dBm (PER &lt;= 10%)</p> <p><b>802.11g</b>                      6 Mbps -86 dBm                      9 Mbps TBD dBm                      12 Mbps TBD dBm                      18 Mbps TBD dBm                      24 Mbps TBD dBm                      36 Mbps TBD dBm                      48 Mbps TBD dBm                      54 Mbps -73 dBm (PER &lt;= 10%)</p> <p><b>802.11n</b>                      6.5 Mbps TBD dBm                      7.2 Mbps TBD dBm                      13 Mbps TBD dBm                      14.4 Mbps TBD dBm                      19.5 Mbps TBD dBm                      21.7 Mbps TBD dBm                      26 Mbps TBD dBm                      28.9 Mbps TBD dBm                      39 Mbps TBD dBm                      43.3 Mbps TBD dBm                      52 Mbps TBD dBm                      57.8 Mbps TBD dBm                      58.5 Mbps TBD dBm                      65 Mbps -86 dBm                      72.2 Mbps TBD dBm</p>
<p><b>Operating Systems Supported</b></p>	<p>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</p>

Feature	Description
<b>Security</b>	<p><b>Standards</b></p> <ul style="list-style-type: none"> <li>▪ Wireless Equivalent Privacy (WEP)</li> <li>▪ Wi-Fi Protected Access (WPA)</li> <li>▪ IEEE 802.11i (WPA2)</li> </ul> <p><b>Encryption</b></p> <ul style="list-style-type: none"> <li>▪ Wireless Equivalent Privacy (WEP, RC4 Algorithm)</li> <li>▪ Temporal Key Integrity Protocol (TKIP, RC4 Algorithm)</li> <li>▪ Advanced Encryption Standard (AES, Rijndael Algorithm)</li> </ul> <p><b>Encryption Key Provisioning</b></p> <ul style="list-style-type: none"> <li>▪ Static (40-bit and 128-bit lengths)</li> <li>▪ Pre-Shared (PSK)</li> <li>▪ Dynamic</li> </ul> <p><b>802.1X Extensible Authentication Protocol Types</b></p> <ul style="list-style-type: none"> <li>▪ EAP-FAST</li> <li>▪ EAP-TLS</li> <li>▪ EAP-TTLS</li> <li>▪ PEAP-GTC</li> <li>▪ PEAP-MSCHAPv2</li> <li>▪ PEAP-TLS</li> <li>▪ LEAP</li> </ul>
<p><b>Compliance</b></p> <p><b>Note:</b> These agency approvals are pending.</p>	<p><b>ETSI Regulatory Domain</b></p> <p>EN 300 328  EN 301 489-1  EN 301 489-17  EN 301 893  EN 60950-1  EU 2002/95/EC (RoHS)</p> <p><b>FCC Regulatory Domain</b></p> <p>FCC 15.247 DTS – 802.11b/g (Wi-Fi) – 2.4 GHz &amp; 5.8 GHz  FCC 15.407 UNII – 802.11a (Wi-Fi) – 2.4 GHz &amp; 5.4 GHz</p> <p><b>Industry Canada</b></p> <p>RSS-210 – 802.11a/b/g/n (Wi-Fi) – 2.4 GHz, 5.8 GHz, 5.2 GHz, and 5.4 GHz</p> <p><b>MIC (Japan) Regulatory Domain (formerly TELEC)</b></p> <p>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 &amp; 5250-5350 W53)</p>
<p><b>Certifications</b></p>	<p>Summit is not pursuing agency, Wi-Fi Alliance, or CCX certifications for this radio at this time.</p>
<p><b>Warranty</b></p>	<p><b>One-Year Warranty</b></p>
<p><b><i>All specifications are subject to change without notice</i></b></p>	

**Recommended Operating Conditions and DC Electrical Characteristics**

Symbol	Parameter	Min	Typ	Max	Unit
VBATT	DC Supply Voltage (VBATT)	2.8	3.3	5.0	V
VCC	DC Supply Voltage	3.0	3.3	3.6	V
VDD_IO	DC Supply Voltage (I/O)	1.62	1.8	1.98	V
		2.97	3.3	3.63	
V <sub>IL</sub>	Low Level Input Voltage (VDDO = 3.3V)	-	-	0.8	V
V <sub>IH</sub>	High Level Input Voltage (VDDO = 3.3V)	2.0	-	-	V
V <sub>IL</sub>	Low Level Input Voltage (VDDO = 1.8V)	-	-	0.6	V
V <sub>IH</sub>	High Level Input Voltage (VDDO = 1.8V)	1.1	-	-	V
V <sub>OL</sub>	Low Level Output Voltage (100 $\mu$ A load)	-	-	0.2	V
V <sub>OH</sub>	High Level Output Voltage (-100 $\mu$ A load)	VDDIO – 0.2V	-	-	V
I <sub>IL</sub>	Low Current Input	-	0.3	-	$\mu$ A
I <sub>IH</sub>	High Current Input	-	0.3	-	$\mu$ A
I <sub>OL</sub>	Low Current Output (VDDO = 3.3V, V <sub>OL</sub> = 0.4V)	-	-	3.0	mA
I <sub>OH</sub>	High Current Output (VDDO = 3.3V, V <sub>OH</sub> = 2.9V)	-	-	3.0	mA
C <sub>IN</sub>	Input Capacitance	-	-	5	pF

## SDIO Timing Diagrams

The following figure (Figure 2) and table display SDIO default mode timing.

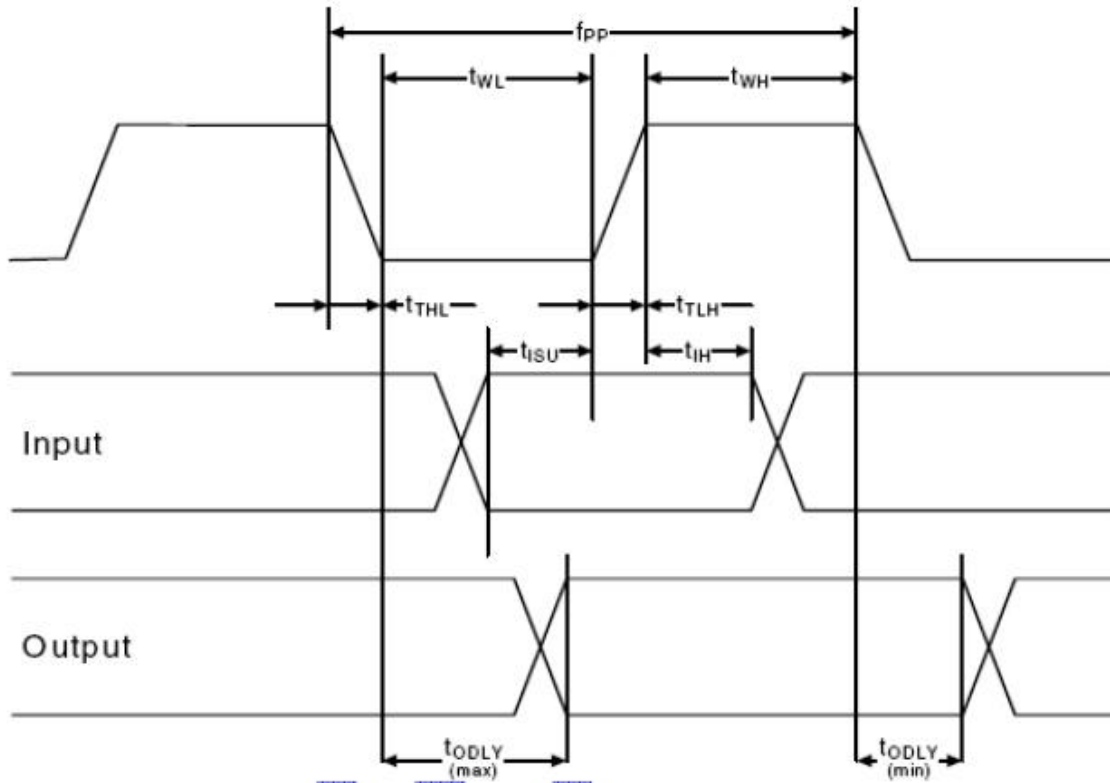


Figure 1: SDIO Timing Diagram

Parameter	Symbol	Min	Typical	Max	Unit
<b>Clock CLK (All values are referred to min. VIH and max. VIL)</b>					
Frequency – Data Transfer Mode	$f_{PP}$	0	-	25	MHz
Frequency – Identification Mode	$f_{OD}$	0	-	400	kHz
Clock Low Time	$t_{WL}$	10	-	-	ns
Clock High Time	$t_{WH}$	10	-	-	ns
Clock Rise Time	$t_{TLH}$	-	-	10	ns
Clock Low Time	$t_{THL}$	-	-	10	ns
<b>Inputs: CMD, DAT (referenced to CLK)</b>					
Input Setup Time	$t_{ISU}$	5	-	-	ns
Input Hold Time	$t_{IH}$	5	-	-	ns
<b>Outputs: CMD, DAT (referenced to CLK)</b>					
Output Delay time – Data Transfer Mode	$t_{ODLY}$	0	-	14	ns
Output Delay time – Identification Mode	$t_{ODLY}$	0	-	50	ns



## Pin Definitions

**Note:** In regards to **GND** (Ground) pins, only one must be tied down. The remaining pins identified as **GND** can either be tied down or floated, depending on individual radio board design needs.

Pin Number	Pin Name	I/O	Voltage Reference	Description
1	GND	-		Ground
2	GND	-		Ground
3	N/C	N/C		No Connect
4	N/C	N/C		No Connect
5	N/C	N/C		No Connect
6	N/C	N/C		No Connect
7	SYS_RST_L	I	VDDIO	Resets the radio, active low. Will be held low for ~300nSec by a RC reset circuit when power is applied. Do not connect when not used.
8	N/C	N/C		No Connect
9	N/C	N/C		No Connect
10	WL_GPIO_1	O	VDDIO	Wake on Wireless Wake on Wireless is not currently supported in the software. May be left open.
11	SDIO_SEL	I	VDDIO	SDIO Selection, hold low.
12		N/C		No Connect
13	VDDIO	-		3.3/1.8V I/O Power This is the reference pin for all I/O signaling pins. It accepts 1.8VDC to 3.3VDC
14	CLK_32K	I		32k Ext Sleep Clock <b>Note:</b> This pin should have a 100k pull-down (resistor to ground).
15	SDIO_CLK	I	VDDIO	SDIO Input Clock from Host (50 MHz max) External pull-up resistor is optional
16	GND	-I		Ground
17	SDIO_DATA_0	I/O	VDDIO	SDIO Data 0 – Internal pull-up. External pull-up resistor required

Pin Number	Pin Name	I/O	Voltage Reference	Description
18	SDIO_DATA_2	I/O	VDDIO	SDIO Data 2 – Internal pull-up. External pull-up resistor required
19	SDIO_CMD	I/O	VDDIO	SDIO Command – Internal pull-up. External pull-up resistor required
20	SDIO_DATA_3	I/O	VDDIO	SDIO Data 3 – Internal pull-up. External pull-up resistor required
21	SDIO_DATA_1	I/O	VDDIO	SDIO Data 1 – Internal pull-up. External pull-up resistor required
22	N/C	N/C		No Connect
23	N/C	N/C		No Connect
24	BT_ACTIVE	I/O	VDDIO	No connect Not currently supported in the firmware. When not in use, leave open (float).
25	BT_PRIORITY	I/O	VDDIO	No connect Not currently supported in the firmware. When not in use, leave open (float).
26	GND	-		Ground
27	VCC3_3	-		3.3V Module Power
28	VCC3_3	-		3.3V Module Power
29	VIN_IP2LDO-L	O		Unsupported direct battery power output. Connect to Pin 30 with a 3.3uH inductor.
30	VIN_1P2LDO	I		Unsupported direct battery power input. Connect to Pin 29 with a 3.3uH inductor.
31	CHIP_PWD_L	I	VDDIO	Powers down the radio, active low; 4.7K pull-up resistor to VDDIO is recommended
32	BT_FREQ	I	VDDIO	Input from BT device. Indicates that the coexistence BT is about to transmit on a restricted channel Tie to GND when not in use
33	WLAN_ACTIVE	O	VDDIO	Output to BT device. When high, indicates that WLAN is transmitting or receiving. Do not connect when not used
34	GND	-		Ground
35	GND	-		Ground
36	N/C	N/C		No Connect
37	GND	-		Ground

Pin Number	Pin Name	I/O	Voltage Reference	Description
38	N/C	N/C		No Connect
39	N/C	N/C		No Connect
40	GND	-		Ground
41	GND	-I		Ground
42	GND	-		Ground
43	N/C	N/C		No Connect
44	N/C	N/C		No Connect
45	GND	-		Ground
46	GND	-		Ground
47	GND	-		Ground
48	GND	-		Ground
49	N/C	N/C		No Connect
50	N/C	N/C		No Connect
51	N/C	N/C		No Connect
52	N/C	N/C		No Connect
53	N/C	N/C		No Connect
54	GND	-		Ground
55	GND	-		Ground
56	ANT_1	I/O		Antenna 1 (Main)
57-66	GND	-		Ground

### *Integration Considerations*

The following Wi-Fi information should be taken into consideration when integrating the SSD40L.

#### **Wi-Fi**

Series resistors are recommended in all six SDIO lines (27-56 ohms typically):

- SDIO\_CLK
- SDIO\_CMD
- SDIO\_DATA\_0
- SDIO\_DATA\_1
- SDIO\_DATA\_2
- SDIO\_DATA\_3

**Note:** Although these values may vary with the properties of your host interface and the PCB, they are a reasonable starting point.

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**Note:** The series resistors in the SDIO bus provide several design benefits:

- If a host controller has too high of a drive strength, then bus ringing may result. Series resistors can reduce this ringing on the I/O lines.
  - Adding 27-56 ohms of series resistance on the SDIO bus will reduce sharp transitional edges, which may reduce EMI.
  - Having the series resistors in the PCB layout allows for design flexibility; If they are later found to be unnecessary, zero (0) ohm jumpers may be used in their place
- 

The following are also recommended:

- 47 K ohm pull-ups on the CMD line and four data lines: SDIO\_CMD, SDIO\_DATA\_0, SDIO\_DATA\_1, SDIO\_DATA\_2, SDIO\_DATA\_3
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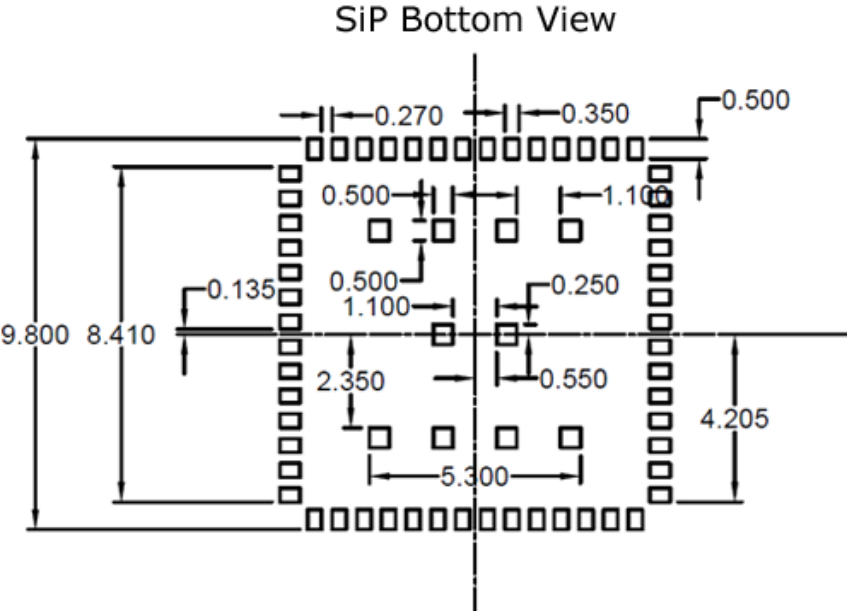
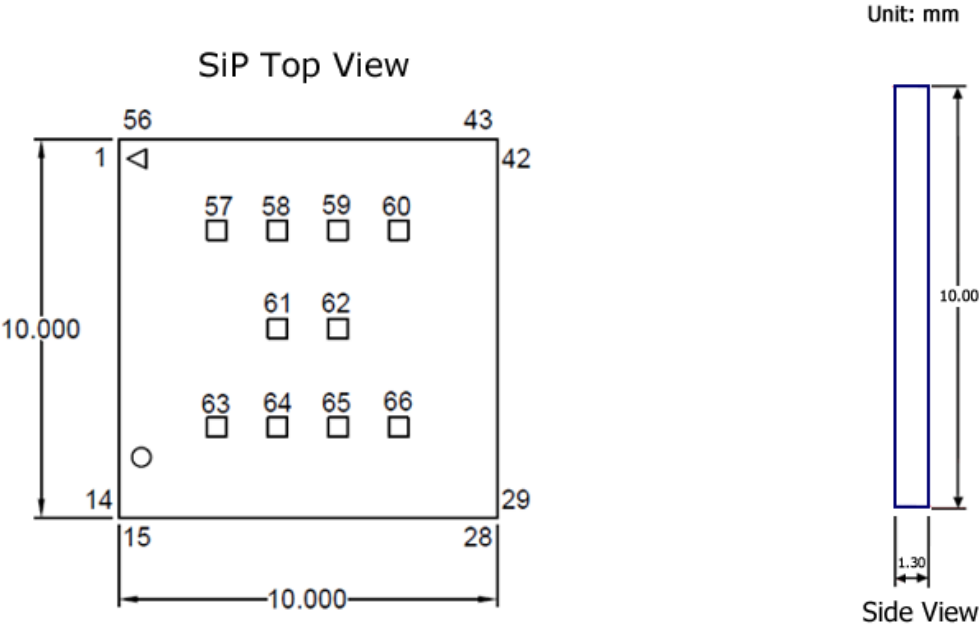
**Note:** No pull-up is required on the CLK line.

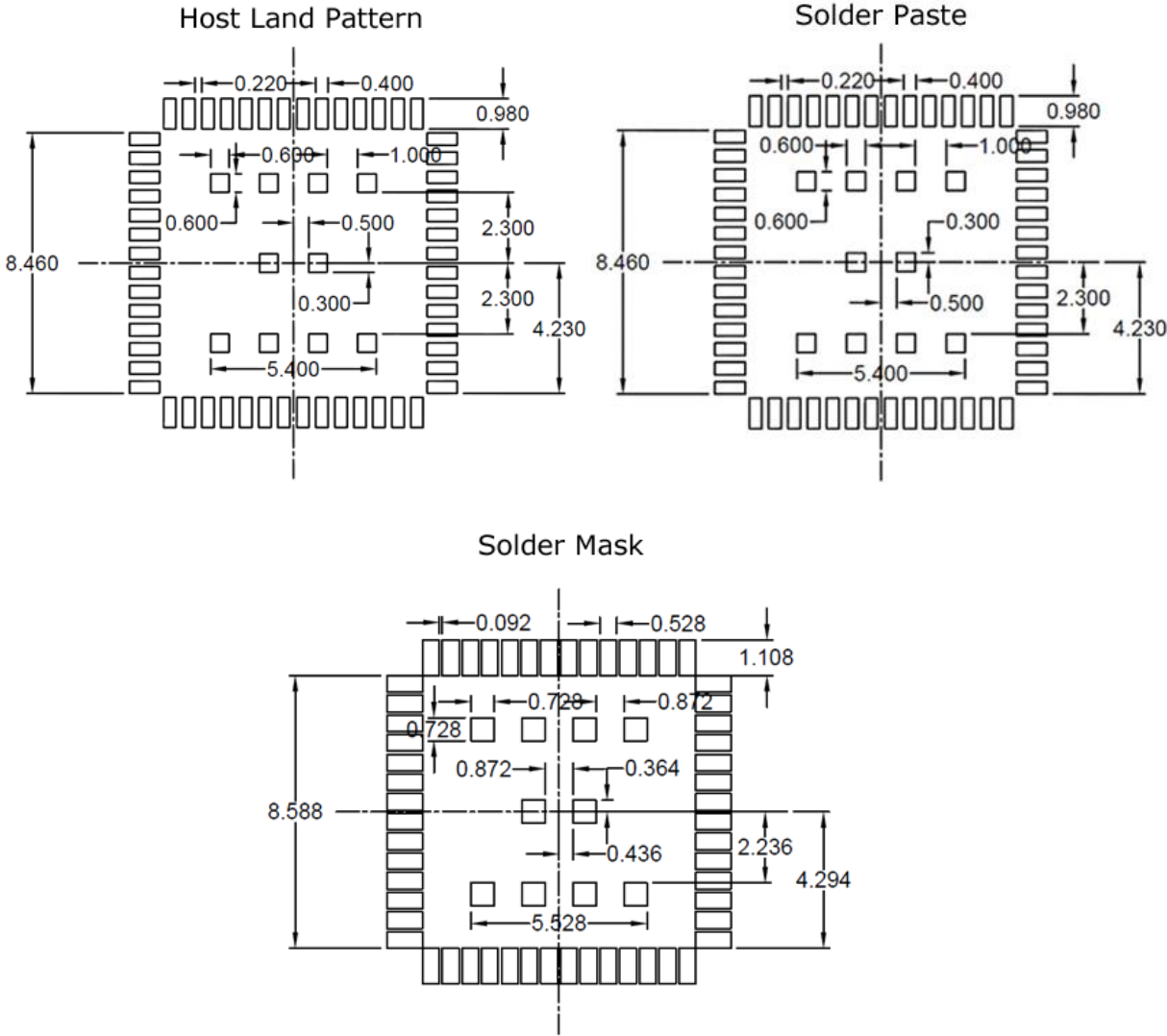
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**Note:** Make sure to apply the proper voltage on the VDDIO input to the SiP to match the signaling voltage of the SDIO host interface (1.8V or 3.3V typically, but it can be anything in between these values).

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# Mechanical Specifications





### Mounting

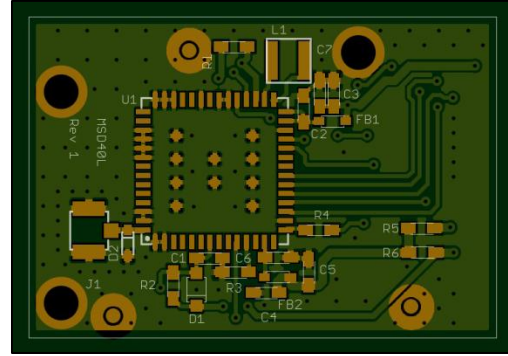
Summit specializes in the design and manufacturing of Wi-Fi radio modules and cards. Although we understand that every system is different, our expertise does not extend to the system level. Because of this, we can provide only integration guidelines and not individual design reviews and approvals.

The SDC-SSD40L is a Quad Flat pack with No Leads (QFN) System in Package (SiP). Summit has mounted this device to a PCB with a host and antenna connectors and markets that radio module as the SDC-MSD40L. The following information results from Summit's experience in producing the SDC-MSD40NBT. Summit provides these data for informational purposes only and provides no warranties or claims with regard to the applicability of this information to a particular design.

Solder Stencil Opening for Pads: 1:1 to 1:0.9 (dependent on solder type)

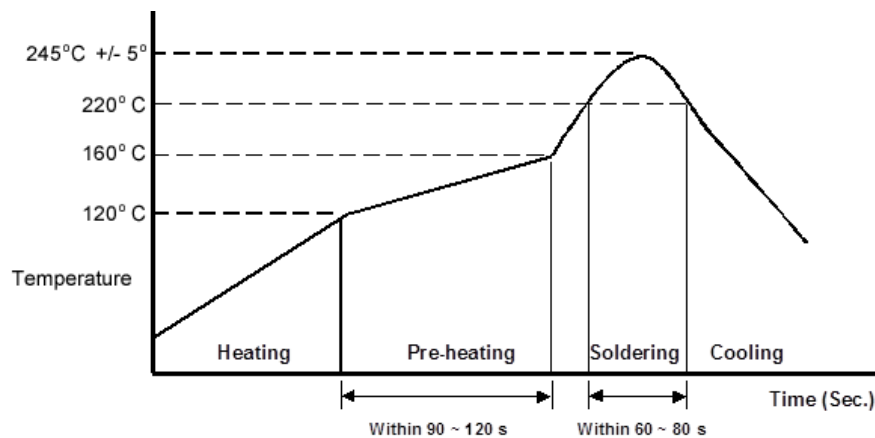
Solder Paste Type: No-Clean as the soldered part to board clearance will not allow for adequate post solder cleaning.

Rework is technically challenging due to parts on the SIP reflowing at the same temperature needed for rework. The SDC-SSD40L cannot be lifted by the shield during rework. As such, removal of part for rework is not recommended. Reflow without removal has been successfully used to clear shorts found during x-ray inspection.



Footprint from the Summit MSD30/40 PCB

Reflow: The SDC-SSD40L is RoHS compliant and as such is sensitive to heat. The below graphic details a typical profile for such and device and is provided for reference purposes.



## 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.

## Regulatory

Summit has received a Limited Modular Approval for this radio with the limitation that it must essentially be mounted on an MSD40L layout in order to have the Summit FCC ID attached to the device.

- [Design Implementation Requirements](#)
- [Documentation Requirements](#)

### Design Implementation Requirements

To ensure regulatory compliance when integrating the SDC-SSD40L (Model # SDC-SSD40L) into a host device, it is necessary to follow the design implementation requirements listed below in order to have the Summit certification ID (FCC, IC, and ETSI) applied to the device.

#### A. Circuit design and components selection considerations

When integrating the SDC-SSD40L (Model # SDC-SSD40L) into customer's device, please follow the schematic shown in appendix A. There are several key and critical implementations and components need to exactly followed to have Summit certification ID (FCC, IC, and ETSI...) applied to the device.

REFDES	DESCRIPTION	MANUFACTURER	MANUFACTURER_PN
C1, C3, C4	CAP CERM 0.10UF 50V X7R 0603	KEMET	C0603C104K5RACTU
C2, C6	CAP CERM 100PF	TDK CORP	445-1281-1-ND
C5, C7	CAP CERM 2.2UF	AVX CORP	478-6212-1-ND
D1	DIODE SS 100V 4.0NS SOD-323F	FAIRCHILD	1N4148WS
D2	PROTECTION DIODE	LITTLEFUSE INC	PGB1010603MR
FB1, FB2	FERRITE CHIP 330 OHM 1200MA 0603	MURATA	BLM18PG331SN1D
J2	CONN RECEPT 60POS 1.5MM SMD 0.5MM	MOLEX	54722-0607-C
J1	CONN RECPT ULTRA-MINI COAX SMD	HIROSE	U.FL-R-SMT(10)
L1	IND 3.3UH	TDK CORP	VLS3012T-3R3M1R3
R5	RES 0.0 OHM 1/10W 5% 0603 SMD	ROHM	MCR03EZPJ000
R4, R6	RES 0.0 OHM 1/10W 5% 0603 SMD	ROHM	MCR03EZPJ000
R1, R2	RES 4.7K OHM 1/10W 5% 0603 SMD	ROHM	MCR03EZPJ472
R3	RES 10K OHM 1/10W 5% 0603 SMD	ROHM	RC0603JR-0710KL
U1	MODULE XCVR 802.11A/B/G/N BLUETOOTH SDIO	SUMMIT DATA	SDC-SSD40L
Antenna	CISCO Aironet 2.4GHz Dipole antenna	CISCO	AIR-ANT4941

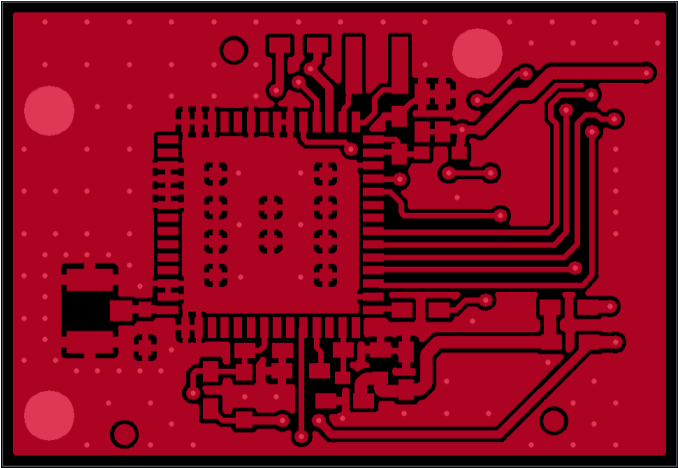


**B. PCB layout considerations**

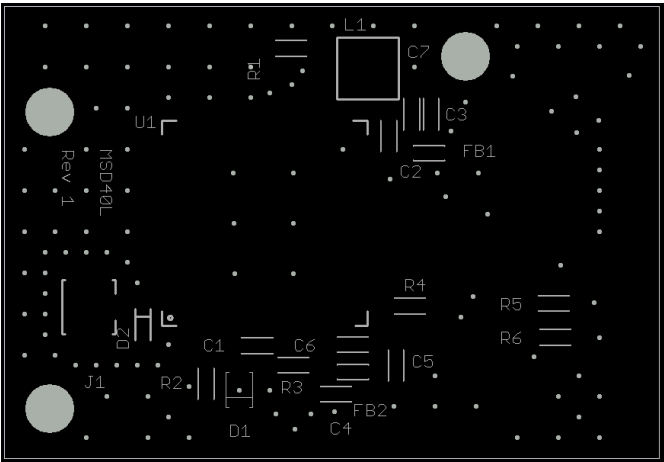
The PCB board stack is shown below using 2-Layer FR4, lead-free solder finish plating, green solder mask on both sides and white silkscreen on both sides.



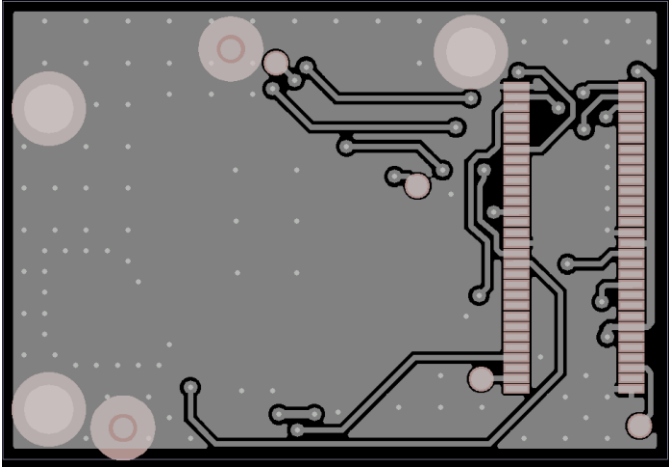
Gerber files are shown below in detail.



*Figure 2: Components placement and trace route on the top layer. Via hole is of 10 mils size*



*Figure 3: Components location of the top layer*



**Figure 4: Bottom layer**

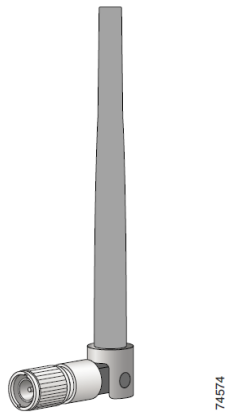
On the bottom layer, a complete ground plane under the SSD40L is must to ensure the rf signal is well referenced. Also, the RF trace impedance between the SDC-SSD40L (Pin 56) and the antenna connector (J1) should be controlled within 50 ohm +/-10% and keep the trace as short as possible (recommend less than 100 mils) to reduce the trace lose. Place 10 mils through via hole with distance 40 mil around the RF connector (J1) and beside the RF trace to avoid the possible radiation for harmonic signal.

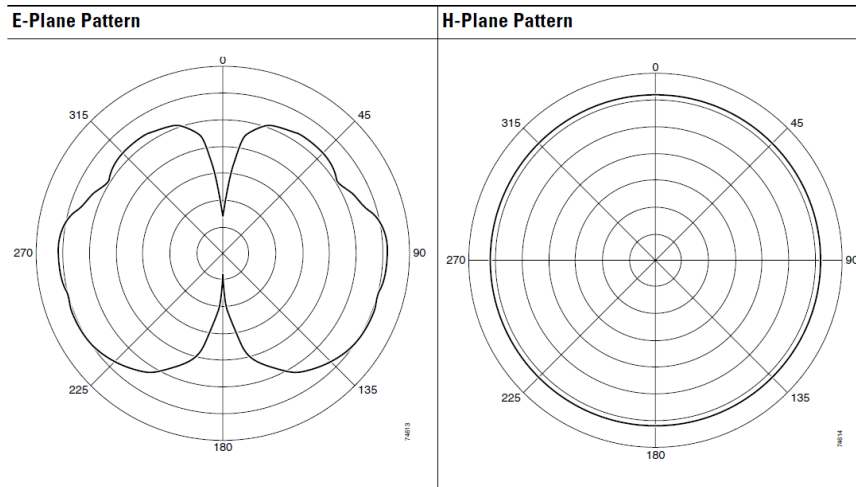
**C. Antenna Specification**

An external dipole antenna was tested with SSD40L to get Summit certification ID (FCC, IC, and ETSI). Detail information will be obtained on <http://www.cisco.com/en/US/docs/wireless/antenna/installation/guide/4941.html>

**Note:** Section 15.203 of the FCC Rules requires a unique antenna connector between the modular transmitter and the chosen antenna. The specified antenna meets this requirement since it uses a reverse polarity TNC connector but a length of antenna cable must be provided between the MMCX modular transmitter connector and the reverse polarity TNC connector on the antenna.

Antenna type	Dipole
Operating frequency range	2402-2495 MHz
Nominal input impedance	50 Ω
2:1 VSWR bandwidth	2385 - 2515 Mhz
Peak gain	2 dBi
Polarization	Linear, vertical
E-Plane 3-dB beamwidth	70 degrees
H-Plane 3-dB beamwidth	Omnidirectional
Dimensions	5.5 in. (13 cm)
Weight	1 oz.
Connector type	RP-TNC plug
Environment	Indoor
Operating temperature range	32°F to 140°F (0°C to 60°C)





#### D. Design and testing verification for ensuring compliance

- Follow the reference design using the same components as when integrating the SDC-SSD40L.
- Use the same PCB material (FR4) with the same board stake thickness (0.062”).
- The RF trace between the SDC-SSD40L (Pin 56) and the antenna connector (J1) should be controlled within 50 ohm +/-10%; keep the trace as short as possible (less than 100 mils is recommended) to reduce the trace loss.
- Place 10 mils through via hole with 40 mils distance apart.
- Use TDR to confirm the RF trace is within 50 ohm +/-10%.
- Use the spectrum analyzer to confirm the radiate signal is within the certification limit.

### Documentation Requirements

In order to ensure regulatory compliance, when integrating the SDC-SSD40L (Model # SDC-SSD40L) into a host device, 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-SSD40L is integrated.

#### *FCC*

**Note:** You must place “Contains FCC ID: TWG-SDCSSD40L” on the host product in such a location that it can be seen by an operator at the time of purchase.

## User's Guide Requirements

As outlined in the Operational Description, the SDC-SSD40L complies with [FCC Part 15 Rules](#) for a Modular Approval. To leverage Summit's grant, the conditions below must be met for the host device into which the SDC-SSD40L is integrated:

1. The antenna is installed with 20 cm maintained between the antenna and users.
2. The transmitter module is not co-located with any other transmitter or antenna that is capable of simultaneous operation.
3. The antenna used must be a dipole antenna of gain equal to or less than 2dBi.

As long as the conditions above are met, further *transmitter* testing is typically not required. However, the OEM integrator is still responsible for testing its end-product for any additional compliance requirements required with this module installed, such as (but not limited to) digital device emissions and PC peripheral requirements.

### IMPORTANT!

In the event that the three conditions above **cannot be met** (for example certain device configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID **cannot** be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

When using Summit's FCC grant for the SDC-SSD40L, the integrator must include specific information in the user's guide for the device into which the SDC-SSD40L 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-SSD40L 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-SSD40L is integrated:

**"IMPORTANT NOTE:** To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter."

### 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.
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.

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**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.

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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.

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**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.

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## ***Industry Canada***

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**Note:** You must place "Contains IC ID: 6616A-SDC SSD40L" on the host product in such a location that it can be seen by an operator at the time of purchase.

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### **User's Guide Requirements (for Model # SDC-SSD40L)**

#### ***RF Radiation Hazard Warning***

To ensure compliance with FCC and Industry Canada RF exposure requirements, this device must be installed in a location where the antennas of the device will have a minimum distance of at least 20 cm from all persons. Using higher gain antennas and types of antennas not certified for use with this product is not allowed. The device shall not be co-located with another transmitter.

Installez l'appareil en veillant à conserver une distance d'au moins 20 cm entre les éléments rayonnants et les personnes. Cet avertissement de sécurité est conforme aux limites d'exposition définies par la norme CNR-102 at relative aux fréquences radio.

#### ***Maximum Antenna Gain – If the integrator configures the device such that the antenna is detectable from the host product.***

This radio transmitter (IC ID: 6616A-SDC SSD40L) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Le présent émetteur radio (IC ID: 6616A-SDC SSD40L) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

## *European Union*

### **User's Guide Requirements**

The integrator must include specific information in the user's guide for the device into which the SDC-SSD40L 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-SSD40L 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 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 V1.5.1 (2008-12)**

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.

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

<b>Ελληνική</b> [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ [ <i>name of manufacturer</i> ] ΔΗΛΩΝΕΙ ΟΤΙ [ <i>type of equipment</i> ] ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
<b>Français</b> [French]	Par la présente [ <i>nom du fabricant</i> ] déclare que l'appareil [ <i>type d'appareil</i> ] est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
<b>Italiano</b> [Italian]	Con la presente [ <i>nome del costruttore</i> ] dichiara che questo [ <i>tipo di apparecchio</i> ] è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
<b>Latviski</b> [Latvian]	Ar šo [ <i>name of manufacturer / izgatavotāja nosaukums</i> ] deklarē, ka [ <i>type of equipment / iekārtas tips</i> ] atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
<b>Lietuvių</b> [Lithuanian]	Šiuo [ <i>manufacturer name</i> ] deklaruoja, kad šis [ <i>equipment type</i> ] atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
<b>Nederlands</b> [Dutch]	Hierbij verklaart [ <i>naam van de fabrikant</i> ] dat het toestel [ <i>type van toestel</i> ] in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
<b>Malti</b> [Maltese]	Hawnhekk, [ <i>isem tal-manifattur</i> ], jiddikjara li dan [ <i>il-mudel tal-prodott</i> ] jikkonforma mal-htigijiet essenzjali u ma provvedimenti oħrajn rilevanti li hemm fid-Dirrettiva 1999/5/EC.
<b>Magyar</b> [Hungarian]	Alulírott, [ <i>gyártó neve</i> ] nyilatkozom, hogy a [ <i>... típus</i> ] megfelel a vonatkozó alapvető követelményeknek és az 1999/5/EC irányelv egyéb előírásainak.
<b>Polski</b> [Polish]	Niniejszym [ <i>nazwa producenta</i> ] oświadczam, że [ <i>nazwa wyrobu</i> ] jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.
<b>Português</b> [Portuguese]	[ <i>Nome do fabricante</i> ] declara que este [ <i>tipo de equipamento</i> ] está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
<b>Slovensko</b> [Slovenian]	[ <i>Ime proizvajalca</i> ] izjavlja, da je ta [ <i>tip opreme</i> ] v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
<b>Slovensky</b> [Slovak]	[ <i>Meno výrobcu</i> ] týmto vyhlasuje, že [ <i>typ zariadenia</i> ] spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
<b>Suomi</b> [Finnish]	[ <i>Valmistaja = manufacturer</i> ] vakuuttaa täten että [ <i>type of equipment = laitteen tyyppimerkintä</i> ] tyypinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.



 **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.