Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

Integrated 802.11 b/g/n WLAN Module

FEATURES

- IEEE 802.11 b/g/n (single stream n)
- Typical WLAN Transmit Power:
  - +19.0 dBm, 1 Mbps, CCK (b)
  - +15.8 dBm, 54 Mbps, OFDM (g)
  - +15.0 dBm, HT20 MCS7 (n)
- Typical WLAN Sensitivity:
  - -90 dBm, 8% PER,11 Mbps (b)
  - -73 dBm, 10% PER, 54 Mbps (g)
  - -71 dBm, 10% PER, MCS7 (n)
- Miniature footprint: 10.5 mm x 10.5 mm
- Low height profile: 1.4 mm
- Operating voltage: 3.13V to 3.46V
- Operating temperature: -40 to +85° C
- Compact design based on Broadcom BCM4390 SoC
- Integrated ARM Cortex-M3 apps processor
- Wireless Security WEP, WPA Personal, WPA2 Personal
- Transmit and receive antenna diversity
- UART serial host interface
- Simple integration with microcontrollers and microprocessors
- Worldwide acceptance: FCC (USA), IC (Canada), and CE (Europe)
- Modular certification allows reuse of LSR FCC ID and ETSI certification without repeating the expensive testing on your end product
- RoHS compliant
- Streamlined development with LSR Design Services

APPLICATIONS

- Thermostats, appliances, HVAC controller, and remote displays, Smart Energy
- Home entertainment control
- Sensor Networks
- Medical
- Home Monitoring
- Toys

DESCRIPTION

The TiWi-C-W is a high performance 2.4 GHz WLAN module that contains an IP networking stack in a pre-certified footprint that simplifies the process of implementing internet connectivity.

The module includes the necessary PHY, MAC, and network layers to support WLAN applications on the integrated applications processor, or through a simple host interface.

Need to get to market quickly? Not an expert in 802.11. Need a custom antenna? Would you like to own the design? Would you like a custom design? Not quite sure what you need? Do you need help with your host board? LSR Design Services will be happy to develop custom hardware or software, or assist with integrating the design. Contact us at sales@lsr.com or call us at 262-375-4400.

- Home automation
- Home Network aggregators
- Remote appliance diagnostics/support
- Home security
- Remote storage devices
- Home network appliance
- Cameras and video surveillance
- Fitness
- Cable replacement for medical and personal healthcare

The information in this document is subject to change without notice.

ORDERING INFORMATION

Order Number	Description
450-0118C	TiWi-C-W Module (Cut Tape)
450-0118R	TiWi-C-W Module (Tape and Reel, SPQ = 2000)
450-0143	TiWi-C-W Development Kit featuring TiWiConnect

Table 1 Orderable TiWi-C-W Part Numbers

MODULE ACCESSORIES

	Order Number	Description
	001-0001	2.4 GHz Dipole Antenna with Reverse Polarity SMA Connector
	080-0001	U.FL to Reverse Polarity SMA Bulkhead Cable 105mm
	001-0014	2.4 GHz FlexPIFA Antenna

Table 2 Module Accessories

The information in this document is subject to change without notice.

APPLICABLE DOCUMENTS

- TiWi-C-W Module Application Guide (330-0158)
- TiWi-C-W Evaluation Platform User Guide (330-0159)
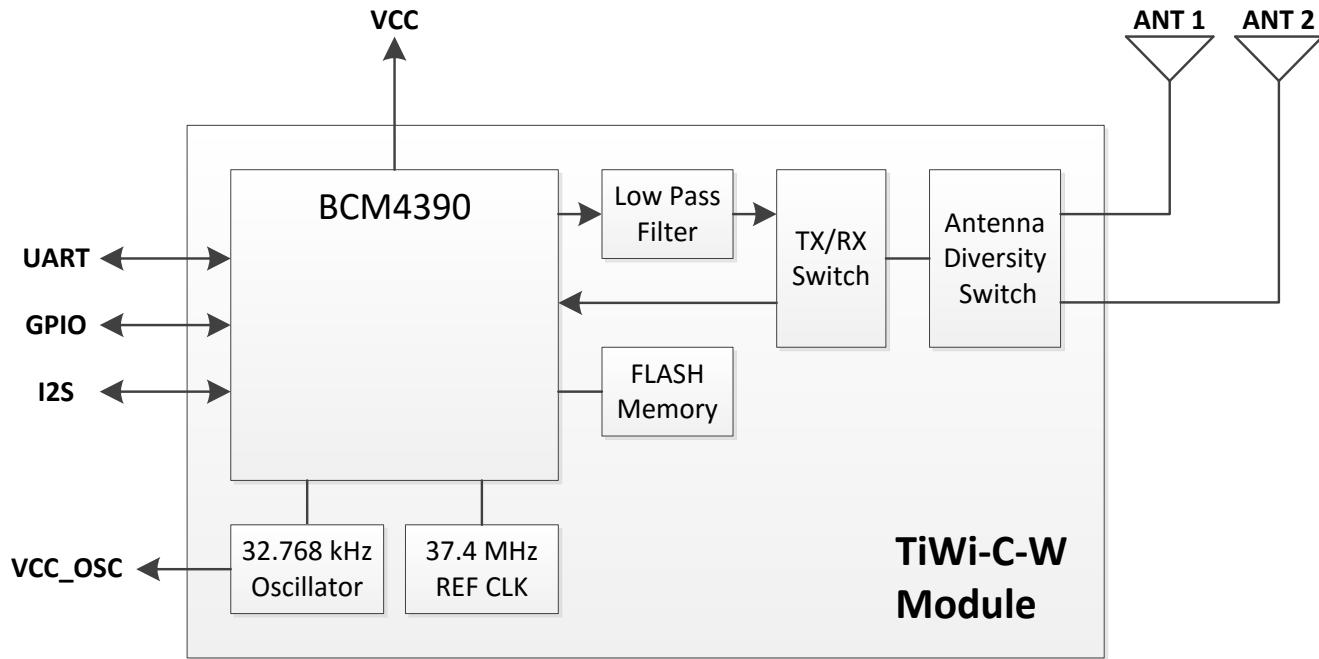
BLOCK DIAGRAM

Figure 1 TiWi-C-W Module Block Diagram – Top Level

FUNCTIONAL BLOCK FEATURES

WLAN Features

- IEEE802.11b/g/n 1x1 2.4 GHz Radio
- Single Transmit and Single or Dual Receive Antenna Support
- **Media Access Controller (MAC)**
  - o
- Baseband Processor
- **Standards**
  - o IEEE 802.11b, 802.11g, 802.11n
  - o IEEE 802.11 d/i (regulatory domains and WPA2)
  - o IEEE 802.11r (fast roaming between Aps)
  - o IEEE 802.11w (secure management frames)

Network Stack Supported Protocols

- **Transport layer:**
  - o TCP
  - o UDP
- **Network layer:**
  - o IPv4, IPv6
  - o Ping
  - o DHCP
  - o HTTP
  - o NTP
  - o DNS Client
- **Link layer:**
  - o ARP

Wireless Security System Features

- **Supported modes:**
  - o Open (no security)
  - o WEP
  - o WPA Personal
  - o WPA2 Personal
- **Supported encryption types:**
  - o Open
  - o WEP
  - o AES (hardware accelerator)
  - o TKIP (hardware accelerator)

The information in this document is subject to change without notice.

TABLE OF CONTENTS

The information in this document is subject to change without notice.

TIWI-C-W MODULE FOOTPRINT AND PIN DEFINITIONS

To apply the TiWi-C-W module, it is important to use the module pins in your application as they are designated below, and in the corresponding pin definition table found on pages 9 and 10. Not all the pins on the TiWi-C-W module may be used, as some are reserved.
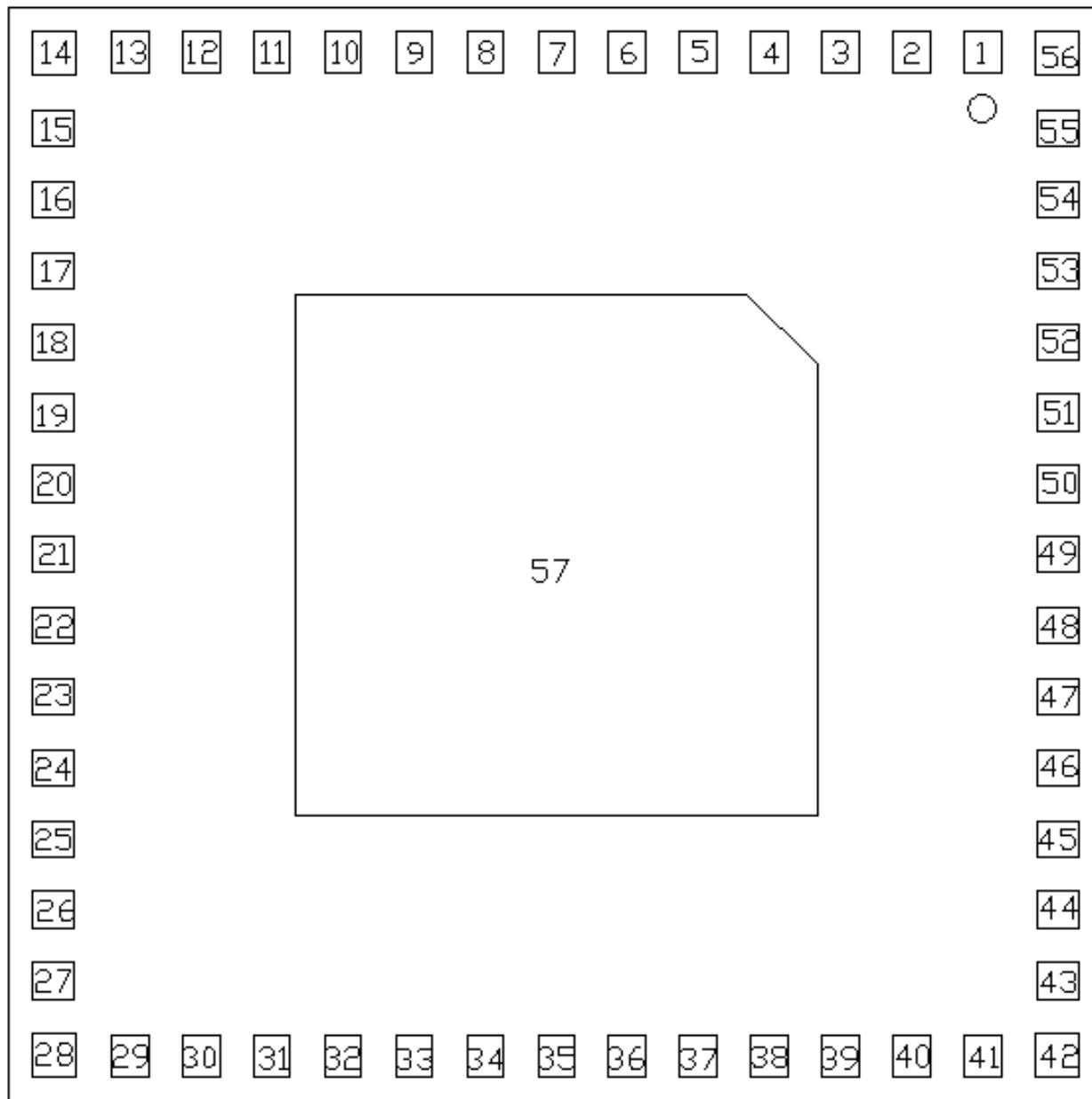
Figure 2 TiWi-C-W Pinout (Top View)

The information in this document is subject to change without notice.

PIN DESCRIPTIONS

Module Pin	Name	I/O Type	Description
1	GND	GND	GROUND
2	VCC	PI	POWER TO MODULE (3.13-3.46 VDC)
3	GND	GND	GROUND
4	RESET_N	DI	ACTIVE LOW RESET INPUT. MUST BE PULLED UP TO VCC WITH A 10k OHM RESISTOR.
5	GPIO_A11	DIO	GPIO A11
6	FLASH_OVERIDE	DIO	INTERNAL FLASH PROGRAMMING OVERIDE. CAN BE USED TO ASSIST IN A FORCED FLASH ERASE. SHOULD BE BROUGHT TO AND EXTERNAL PAD OR PIN.
7	OSC_32K_OUT	DO	32.768 kHz OSCILLATOR OUTPUT
8	VCC_OSC	PI	POWER TO 32.768 kHz OSCILLATOR (3.13-3.46 VDC)
9	GND	GND	GROUND
10	ANTENNA 1	RF	ANTENNA 1, 50 OHMS, SECONDARY RX ANTENNA
11	GND	GND	GROUND
12	GPIO_A10	DIO	GPIO A10
13	GND	GND	GROUND
14	ANTENNA 0	RF	ANTENNA 0, 50 OHMS, TX AND PRIMARY RX ANTENNA
15	GND	GND	GROUND
16	I2S_WS_UART2_TXD_A7	DIO	UART2 TRANSMIT DATA OUTPUT / GPIO A7
17	I2S_WS_UART2_RXD_A9	DIO	UART 2 RECEIVE DATA INPUT / GPIO A9
18	GPIO_A8	DIO	GPIO A8
19	GPIO_A6	DIO	GPIO A6
20	GND	GND	GROUND
21	UART1_CTS_N_A1	DIO	UART 1 ACTIVE LOW CLEAR-TO-SEND / GPIO A1
22	UART1_RXD	DI	UART 1 RECEIVE DATA INPUT
23	UART1_RTS_N_A0	DIO	UART 1 ACTIVE LOW REQUEST-TO-SEND / GPIO A0
24	UART1_TXD	DO	UART 1 TRANSMIT DATA OUTPUT
25	GND	GND	GROUND
26	VCC	PI	POWER TO MODULE (3.13-3.46 VDC)
27	GND	GND	GROUND
28	JTAG_TCK_A3	DIO	APPS JTAG TCK / GPIO A3

The information in this document is subject to change without notice.

Module Pin	Name	I/O Type	Description
29	JTAG_TD0_A5	DIO	APPS JTAG TDO / GPIO A5
30	JTAG_TMS_A2	DIO	APPS JTAG TMS / GPIO A2
31	JTAG_TDI_A4	DIO	APPS JTAG TDI / GPIO A4
32	WRF_GPIO_OUT	DIO	
33	UART4_TXD	DO	UART 4 TRANSMIT DATA OUTPUT
34	UART4_RXD	DI	UART 4 RECEIVE DATA INPUT
35	NC	-	NO CONNECT (DO NOT CONNECT)
36	NC	-	NO CONNECT (DO NOT CONNECT)
37	CLK_IN	-	UNUSED CLOCK IN. CONNECT TO GND THROUGH 1k OHM RESISTOR.
38	NC	-	NO CONNECT (DO NOT CONNECT)
39	NC	-	NO CONNECT (DO NOT CONNECT)
40	NC	-	NO CONNECT (DO NOT CONNECT)
41	GPIO_B2	DIO	GPIO B2
42	GPIO_B3	DIO	GPIO B3
43	GPIO_B5	DIO	GPIO B5
44	GPIO_B6	DIO	GPIO B6
45	GPIO_B4	DIO	GPIO B4
46	GND	GND	GROUND
47	VCC	PI	POWER TO MODULE (3.13-3.46 VDC)
48	GND	GND	GROUND
49	GPIO_B0	DIO	GPIO B0
50	GPIO_B1	DIO	GPIO B1
51	GPIO_B9	DIO	GPIO B9
52	GPIO_B10	DIO	GPIO B10
53	GPIO_B11	DIO	GPIO B11
54	GPIO_B8	DIO	GPIO B8
55	GPIO_B7	DIO	GPIO B7
56	GND	GND	GROUND
57	GND	GND	GROUND

PI = Power Input DI = Digital Input DO = Digital Output DIO = Bi-directional Digital Port RF = Bi-directional RF Port GND=Ground

Table 3 TiWi-C-W Module Pin Descriptions

The information in this document is subject to change without notice.

ELECTRICAL SPECIFICATIONS

Absolute Maximum Ratings

Parameter	Min	Max	Unit
Power supply voltage (VCC)	0	3.46	V
Oscillator power supply voltage (VCC_OSC)	0	3.46	V
Power supply voltage ripple	-2	+2	%
Voltage on digital pins	-0.5	VCC + 0.5	V
RF input power, antenna port		+10	dBm
Operating temperature	-40	+85	ºC
Storage temperature	-40	+85	ºC

Table 4 Absolute Maximum Ratings

Recommended Operating Conditions

Parameter	Min	Typical	Max	Unit
VCC	3.13	3.30	3.46	V
VCC_OSC	3.13	3.30	3.46	V
Voltage on digital pins	0	3.3	VCC	V
Ambient temperature range	-40	25	85	ºC

Table 5 Recommended Operating Conditions

The information in this document is subject to change without notice.

330-0129-R4.2 Copyright © 2015 LSR Page 11 of 39

General Characteristics

DC Characteristics – General Purpose I/O

Parameter	Test Conditions	Min	Typical	Max	Unit
Logic input low, V_{IL}		0	-	0.8	V
Logic input high, V_{IH}		2.0	-	VCC	V
Logic output low, V_{OL}	12mA	0	-	0.8	V
Logic output high, V_{OH}	12mA	2.3	-	VCC	V

Table 6 DC Characteristics General Purpose I/O

RF Characteristics

Parameter	Min	Typical	Max	Unit
RF frequency range	2412		2472	MHz
RF data rate	1	802.11 b/g/n rates supported	54	Mbps

Table 7 RF Characteristics

The information in this document is subject to change without notice.

Power Consumption

Parameter	Test Conditions	Min	Typical	Max	Unit
11b TX Current	11 Mbps, T_{amb} = +25°C, 3.3V	-	310	360	mA
11g TX Current	6 Mbps, T_{amb} = +25°C, 3.3V	-	280	320	mA
11g TX Current	54 Mbps, T_{amb} = +25°C, 3.3V	-	230	280	mA
11n TX Current	MCS0, T_{amb} = +25°C, 3.3V	-	260	310	mA
11n TX Current	MCS7, T_{amb} = +25°C, 3.3V	-	220	270	mA
11b RX Current	11 Mbps, T_{amb} = +25°C, 3.3V	-	65	-	mA
11g RX Current	54 Mbps, T_{amb} = +25°C, 3.3V	-	65	-	mA
11n RX Current	MCS7, T_{amb} = +25°C, 3.3V		65		mA
Power Down Mode		-		-	uA

Table 8 WLAN Power Consumption

Power Supply Requirements

Parameter	Min	Typical	Max	Unit
VCC	3.13	3.30	3.46	V
Supply Current	-	800	-	mA

Table 9 Power Supply Requirements

Although the Max continuous supply current to the module is >360 mA, when providing power to the module, a power source capable of supplying 800 mA peak current for a duration of ~30 mSec is required by the module transmitter during calibration.

Module calibration occurs:

(1) When the Module is initially powered up.
(2) The module is reset.
(3) When the radio is initialized.
(4) Every 2 minutes after the radio is initialized.

Note: Radio calibration will not occur while the module is in modes Doze, Deep Sleep, Power Down or if the radio is not initialized.

Figure 3 shows the current profile of the TiWi-C-W module during calibration. If current is limited to <800mA during this process, the module will fail to calibrate.

The information in this document is subject to change without notice.

330-0129-R4.2   Copyright © 2015 LSR   Page 14 of 39
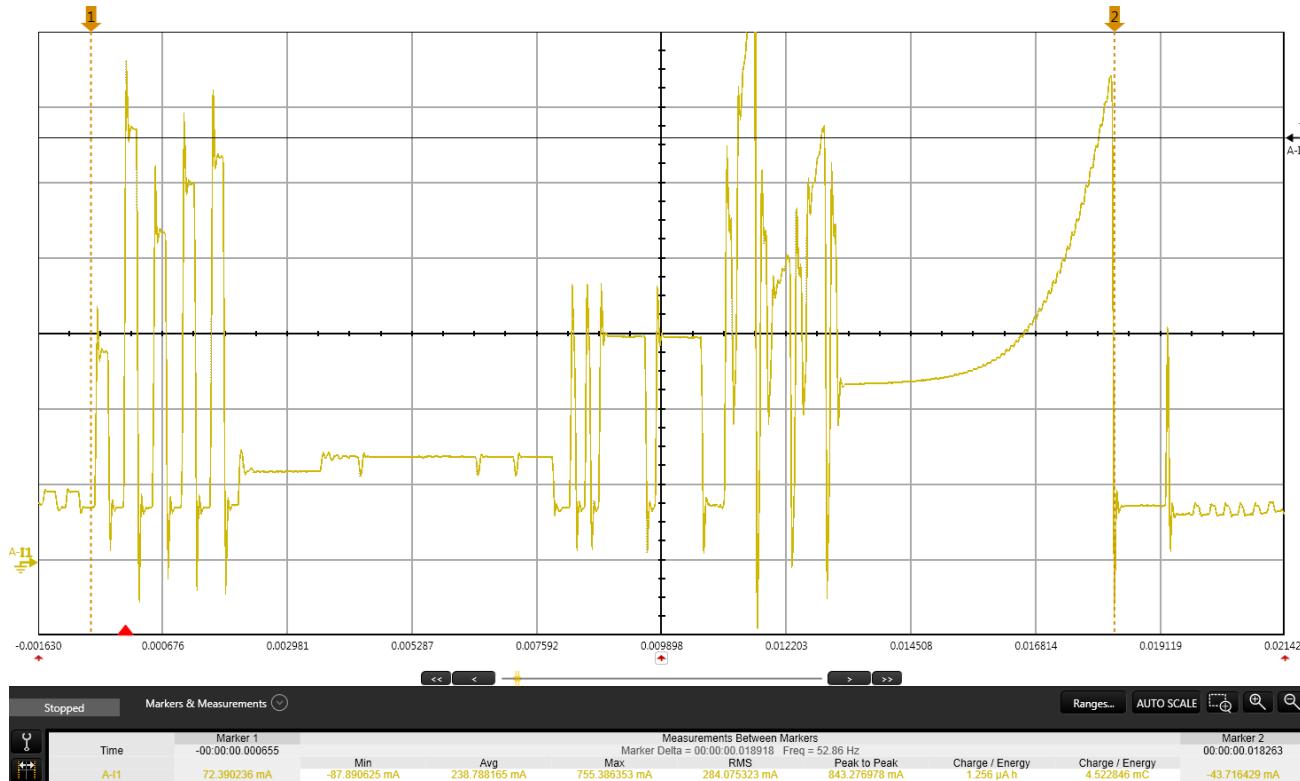
Figure 3 Module RF Calibration Current Profile

RF Characteristics

WLAN Transmitter Characteristics
(TA = +25°C, VCC = 3.3 V)

Parameter	Test Conditions	Min	Typ	Max	Unit
1 Mbps DSSS (b) TX Output Power	1 Mbps BPSK 802.11(b) Mask Compliance 35% EVM RMS power over TX packet	-	19.0	-	dBm
2 Mbps DSSS (b) TX Output Power	2 Mbps QPSK 802.11(b) Mask Compliance 35% EVM RMS power over TX packet	-	19.0	-	dBm
5.5 Mbps DSSS (b) TX Output Power	5.5 Mbps QPSK 802.11(b) Mask Compliance 35% EVM RMS power over TX packet	-	19.0	-	dBm
11 Mbps DSSS (b) TX Output Power	11 Mbps CCK 802.11(b) Mask Compliance 35% EVM RMS power over TX packet	-	19.0	-	dBm
6 Mbps OFDM (g) TX Output Power	6 Mbps BPSK 802.11(g) Mask Compliance -5 dB EVM RMS power over TX packet	-	17.5	-	dBm
9 Mbps OFDM (g) TX Output Power	9 Mbps BPSK 802.11(g) Mask Compliance -8 dB EVM RMS power over TX packet	-	17.5	-	dBm
12 Mbps OFDM (g) TX Output Power	12 Mbps QPSK 802.11(g) Mask Compliance -10 dB EVM RMS power over TX packet	-	17.5	-	dBm
18 Mbps OFDM (g) TX Output Power	18 Mbps QPSK 802.11(g) Mask Compliance -13 dB EVM RMS power over TX packet	-	17.5	-	dBm
24 Mbps OFDM (g) TX Output Power	24 Mbps 16-QAM 802.11(g) Mask Compliance -16 dB EVM RMS power over TX packet	-	15.8	-	dBm
36 Mbps OFDM (g) TX Output Power	36 Mbps 16-QAM 802.11(g) Mask Compliance -19 dB EVM RMS power over TX packet	-	15.8	-	dBm
48 Mbps OFDM (g) TX Output Power	48 Mbps 64-QAM 802.11(g) Mask Compliance -22 dB EVM RMS power over TX packet	-	15.8	-	dBm
54 Mbps OFDM (g) TX Output Power	54 Mbps 64-QAM 802.11(g) Mask Compliance -25 dB EVM RMS power over TX packet	-	15.8	-	dBm
MCS0 OFDM (n) TX Output Power	6.5 Mbps BPSK 802.11(n) Mask Compliance -5 dB EVM RMS power over TX packet	-	15.5	-	dBm
MCS1 OFDM (n) TX Output Power	13 Mbps QPSK 802.11(n) Mask Compliance -10 dB EVM RMS power over TX packet	-	15.5	-	dBm
MCS2 OFDM (n) TX Output Power	19.5 Mbps QPSK 802.11(n) Mask Compliance -13 dB EVM RMS power over TX packet	-	15.5	-	dBm
MCS3 OFDM (n) TX Output Power	26 Mbps 16-QAM 802.11(n) Mask Compliance -16 dB EVM RMS power over TX packet	-	15.0	-	dBm
MCS4 OFDM (n) TX Output Power	39 Mbps 16-QAM 802.11(n) Mask Compliance -19 dB EVM RMS power over TX packet	-	15.0	-	dBm
MCS5 OFDM (n) TX Output Power	52 Mbps 64-QAM 802.11(n) Mask Compliance -22 dB EVM RMS power over TX packet	-	15.0	-	dBm
MCS6 OFDM (n) TX Output Power	58.5 Mbps 64-QAM 802.11(n) Mask Compliance -25 dB EVM RMS power over TX packet	-	15.0	-	dBm

The information in this document is subject to change without notice.

Parameter	Test Conditions	Min	Typ	Max	Unit
MCS7 OFDM (n) TX Output Power	65 Mbps 64-QAM 802.11(n) Mask Compliance -27 dB EVM RMS power over TX packet	-	15.0	-	dBm

Table 10 WLAN Transmitter RF Characteristics

WLAN Transmitter Characteristics
(TA = +85°C, VCC = 3.3 V)

Parameter	Test Conditions	Min	Typ	Max	Unit
1 Mbps DSSS (b) TX Output Power	1 Mbps BPSK 802.11(b) Mask Compliance 35% EVM RMS power over TX packet	-	19.0	-	dBm
2 Mbps DSSS (b) TX Output Power	2 Mbps QPSK 802.11(b) Mask Compliance 35% EVM RMS power over TX packet	-	19.0	-	dBm
5.5 Mbps DSSS (b) TX Output Power	5.5 Mbps QPSK 802.11(b) Mask Compliance 35% EVM RMS power over TX packet	-	19.0	-	dBm
11 Mbps DSSS (b) TX Output Power	11 Mbps CCK 802.11(b) Mask Compliance 35% EVM RMS power over TX packet	-	19.0	-	dBm
6 Mbps OFDM (g) TX Output Power	6 Mbps BPSK 802.11(g) Mask Compliance -5 dB EVM RMS power over TX packet	-	17.6	-	dBm
9 Mbps OFDM (g) TX Output Power	9 Mbps BPSK 802.11(g) Mask Compliance -8 dB EVM RMS power over TX packet	-	17.6	-	dBm
12 Mbps OFDM (g) TX Output Power	12 Mbps QPSK 802.11(g) Mask Compliance -10 dB EVM RMS power over TX packet	-	17.6	-	dBm
18 Mbps OFDM (g) TX Output Power	18 Mbps QPSK 802.11(g) Mask Compliance -13 dB EVM RMS power over TX packet	-	17.6	-	dBm
24 Mbps OFDM (g) TX Output Power	24 Mbps 16-QAM 802.11(g) Mask Compliance -16 dB EVM RMS power over TX packet	-	15.8	-	dBm
36 Mbps OFDM (g) TX Output Power	36 Mbps 16-QAM 802.11(g) Mask Compliance -19 dB EVM RMS power over TX packet	-	15.8	-	dBm
48 Mbps OFDM (g) TX Output Power	48 Mbps 64-QAM 802.11(g) Mask Compliance -22 dB EVM RMS power over TX packet	-	15.8	-	dBm
54 Mbps OFDM (g) TX Output Power	54 Mbps 64-QAM 802.11(g) Mask Compliance -25 dB EVM RMS power over TX packet	-	15.8	-	dBm
MCS0 OFDM (n) TX Output Power	6.5 Mbps BPSK 802.11(n) Mask Compliance -5 dB EVM RMS power over TX packet	-	15.5	-	dBm
MCS1 OFDM (n) TX Output Power	13 Mbps QPSK 802.11(n) Mask Compliance -10 dB EVM RMS power over TX packet	-	15.5	-	dBm
MCS2 OFDM (n) TX Output Power	19.5 Mbps QPSK 802.11(n) Mask Compliance -13 dB EVM RMS power over TX packet	-	15.5	-	dBm
MCS3 OFDM (n) TX Output Power	26 Mbps 16-QAM 802.11(n) Mask Compliance -16 dB EVM RMS power over TX packet	-	15.0	-	dBm
MCS4 OFDM (n) TX Output Power	39 Mbps 16-QAM 802.11(n) Mask Compliance -19 dB EVM RMS power over TX packet	-	15.0	-	dBm
MCS5 OFDM (n) TX Output Power	52 Mbps 64-QAM 802.11(n) Mask Compliance -22 dB EVM RMS power over TX packet	-	15.0	-	dBm
MCS6 OFDM (n) TX Output Power	58.5 Mbps 64-QAM 802.11(n) Mask Compliance -25 dB EVM RMS power over TX packet	-	15.0	-	dBm
MCS7 OFDM (n) TX Output Power	65 Mbps 64-QAM 802.11(n) Mask Compliance -27 dB EVM RMS power over TX packet	-	15.0	-	dBm

Table 11 WLAN Transmitter RF Characteristics

The information in this document is subject to change without notice.

WLAN Transmitter Characteristics
(TA = -40°C, VCC = 3.3 V)

Parameter	Test Conditions	Min	Typ	Max	Unit
1 Mbps DSSS (b) TX Output Power	1 Mbps BPSK 802.11(b) Mask Compliance 35% EVM RMS power over TX packet	-	18.6	-	dBm
2 Mbps DSSS (b) TX Output Power	2 Mbps QPSK 802.11(b) Mask Compliance 35% EVM RMS power over TX packet	-	18.6	-	dBm
5.5 Mbps DSSS (b) TX Output Power	5.5 Mbps QPSK 802.11(b) Mask Compliance 35% EVM RMS power over TX packet	-	18.6	-	dBm
11 Mbps DSSS (b) TX Output Power	11 Mbps CCK 802.11(b) Mask Compliance 35% EVM RMS power over TX packet	-	18.6	-	dBm
6 Mbps OFDM (g) TX Output Power	6 Mbps BPSK 802.11(g) Mask Compliance -5 dB EVM RMS power over TX packet	-	17.0	-	dBm
9 Mbps OFDM (g) TX Output Power	9 Mbps BPSK 802.11(g) Mask Compliance -8 dB EVM RMS power over TX packet	-	17.0	-	dBm
12 Mbps OFDM (g) TX Output Power	12 Mbps QPSK 802.11(g) Mask Compliance -10 dB EVM RMS power over TX packet	-	17.0	-	dBm
18 Mbps OFDM (g) TX Output Power	18 Mbps QPSK 802.11(g) Mask Compliance -13 dB EVM RMS power over TX packet	-	17.0	-	dBm
24 Mbps OFDM (g) TX Output Power	24 Mbps 16-QAM 802.11(g) Mask Compliance -16 dB EVM RMS power over TX packet	-	15.5	-	dBm
36 Mbps OFDM (g) TX Output Power	36 Mbps 16-QAM 802.11(g) Mask Compliance -19 dB EVM RMS power over TX packet	-	15.5	-	dBm
48 Mbps OFDM (g) TX Output Power	48 Mbps 64-QAM 802.11(g) Mask Compliance -22 dB EVM RMS power over TX packet	-	15.5	-	dBm
54 Mbps OFDM (g) TX Output Power	54 Mbps 64-QAM 802.11(g) Mask Compliance -25 dB EVM RMS power over TX packet	-	15.5	-	dBm
MCS0 OFDM (n) TX Output Power	6.5 Mbps BPSK 802.11(n) Mask Compliance -5 dB EVM RMS power over TX packet	-	15.0	-	dBm
MCS1 OFDM (n) TX Output Power	13 Mbps QPSK 802.11(n) Mask Compliance -10 dB EVM RMS power over TX packet	-	15.0	-	dBm
MCS2 OFDM (n) TX Output Power	19.5 Mbps QPSK 802.11(n) Mask Compliance -13 dB EVM RMS power over TX packet	-	15.0	-	dBm
MCS3 OFDM (n) TX Output Power	26 Mbps 16-QAM 802.11(n) Mask Compliance -16 dB EVM RMS power over TX packet	-	14.7	-	dBm
MCS4 OFDM (n) TX Output Power	39 Mbps 16-QAM 802.11(n) Mask Compliance -19 dB EVM RMS power over TX packet	-	14.7	-	dBm
MCS5 OFDM (n) TX Output Power	52 Mbps 64-QAM 802.11(n) Mask Compliance -22 dB EVM RMS power over TX packet	-	14.7	-	dBm
MCS6 OFDM (n) TX Output Power	58.5 Mbps 64-QAM 802.11(n) Mask Compliance -25 dB EVM RMS power over TX packet	-	14.7	-	dBm
MCS7 OFDM (n) TX Output Power	65 Mbps 64-QAM 802.11(n) Mask Compliance -27 dB EVM RMS power over TX packet	-	14.7	-	dBm

The information in this document is subject to change without notice.

Table 12 WLAN Transmitter RF Characteristics

Copyright © 2015 LSR

WLAN Receiver Characteristics
(TA = +25°C, VCC = 3.10V, 3.30V, & 3.46V)

Parameter	Test Conditions	Min	Typ	Max	Unit
1 Mbps DSSS (b) RX Sensitivity	8% PER	-	-90	-	dBm
2 Mbps DSSS (b) RX Sensitivity	8% PER	-	-90	-	dBm
5.5 Mbps DSSS (b) RX Sensitivity	8% PER	-	-89	-	dBm
11 Mbps DSSS (b) RX Sensitivity	8% PER	-	-87	-	dBm
6 Mbps OFDM (g) RX Sensitivity	10% PER	-	-90	-	dBm
9 Mbps OFDM (g) RX Sensitivity	10% PER	-	-89	-	dBm
12 Mbps OFDM (g) RX Sensitivity	10% PER	-	-85	-	dBm
18 Mbps OFDM (g) RX Sensitivity	10% PER	-	-84.5	-	dBm
24 Mbps OFDM (g) RX Sensitivity	10% PER	-	-82	-	dBm
36 Mbps OFDM (g) RX Sensitivity	10% PER	-	-79	-	dBm
48 Mbps OFDM (g) RX Sensitivity	10% PER	-	-75	-	dBm
54 Mbps OFDM (g) RX Sensitivity	10% PER	-	-73	-	dBm
MCS0 (6.5 Mbps) OFDM (n) RX Sensitivity	10% PER	-	-90	-	dBm
MCS1 (13 Mbps) OFDM (n) RX Sensitivity	10% PER	-	-87	-	dBm
MCS2 (19.5 Mbps) OFDM (n) RX Sensitivity	10% PER	-	-85	-	dBm
MCS3 26 Mbps OFDM (n) RX Sensitivity	10% PER	-	-82	-	dBm
MCS4 39 Mbps OFDM (n) RX Sensitivity	10% PER	-	-79	-	dBm
MCS5 52 Mbps OFDM (n) RX Sensitivity	10% PER	-	-74	-	dBm
MCS6 58.5 Mbps OFDM (n) RX Sensitivity	10% PER	-	-73	-	dBm
MCS7 65 Mbps OFDM (n) RX Sensitivity	10% PER	-	-71	-	dBm
11b RX Overload Level	8% PER, 11 Mbps	-10	-	-	dBm
11g RX Overload Level	10% PER, 54 Mbps	-20	-	-	dBm
11n RX Overload Level	10% PER, MCS7	-20	-	-	dBm

Table 13 WLAN Receiver RF Characteristics

The information in this document is subject to change without notice.

WLAN Receiver Characteristics
(TA = +85°C, VCC = 3.10V, 3.30V, & 3.46V)

Parameter	Test Conditions	Min	Typ	Max	Unit
1 Mbps DSSS (b) RX Sensitivity	8% PER	-	-89	-	dBm
2 Mbps DSSS (b) RX Sensitivity	8% PER	-	-89	-	dBm
5.5 Mbps DSSS (b) RX Sensitivity	8% PER	-	-88	-	dBm
11 Mbps DSSS (b) RX Sensitivity	8% PER	-	-86	-	dBm
6 Mbps OFDM (g) RX Sensitivity	10% PER	-	-89	-	dBm
9 Mbps OFDM (g) RX Sensitivity	10% PER	-	-88	-	dBm
12 Mbps OFDM (g) RX Sensitivity	10% PER	-	-84	-	dBm
18 Mbps OFDM (g) RX Sensitivity	10% PER	-	-83.5	-	dBm
24 Mbps OFDM (g) RX Sensitivity	10% PER	-	-82	-	dBm
36 Mbps OFDM (g) RX Sensitivity	10% PER	-	-78	-	dBm
48 Mbps OFDM (g) RX Sensitivity	10% PER	-	-74	-	dBm
54 Mbps OFDM (g) RX Sensitivity	10% PER	-	-72	-	dBm
MCS0 (6.5 Mbps) OFDM (n) RX Sensitivity	10% PER	-	-89	-	dBm
MCS1 (13 Mbps) OFDM (n) RX Sensitivity	10% PER	-	-86	-	dBm
MCS2 (19.5 Mbps) OFDM (n) RX Sensitivity	10% PER	-	-84	-	dBm
MCS3 26 Mbps OFDM (n) RX Sensitivity	10% PER	-	-81	-	dBm
MCS4 39 Mbps OFDM (n) RX Sensitivity	10% PER	-	-78	-	dBm
MCS5 52 Mbps OFDM (n) RX Sensitivity	10% PER	-	-73	-	dBm
MCS6 58.5 Mbps OFDM (n) RX Sensitivity	10% PER	-	-72	-	dBm
MCS7 65 Mbps OFDM (n) RX Sensitivity	10% PER	-	-70	-	dBm
11b RX Overload Level	8% PER, 11 Mbps	-10	-	-	dBm
11g RX Overload Level	10% PER, 54 Mbps	-20	-	-	dBm
11n RX Overload Level	10% PER, MCS7	-20	-	-	dBm

Table 14 WLAN Receiver RF Characteristics

The information in this document is subject to change without notice.

Copyright © 2015 LSR

WLAN Receiver Characteristics
(TA = -40°C, VCC = 3.10V, 3.30V, & 3.46V)

Parameter	Test Conditions	Min	Typ	Max	Unit
1 Mbps DSSS (b) RX Sensitivity	8% PER	-	-91	-	dBm
2 Mbps DSSS (b) RX Sensitivity	8% PER	-	-91	-	dBm
5.5 Mbps DSSS (b) RX Sensitivity	8% PER	-	-90	-	dBm
11 Mbps DSSS (b) RX Sensitivity	8% PER	-	-88	-	dBm
6 Mbps OFDM (g) RX Sensitivity	10% PER	-	-91	-	dBm
9 Mbps OFDM (g) RX Sensitivity	10% PER	-	-90	-	dBm
12 Mbps OFDM (g) RX Sensitivity	10% PER	-	-86	-	dBm
18 Mbps OFDM (g) RX Sensitivity	10% PER	-	-85.5	-	dBm
24 Mbps OFDM (g) RX Sensitivity	10% PER	-	-83	-	dBm
36 Mbps OFDM (g) RX Sensitivity	10% PER	-	-80	-	dBm
48 Mbps OFDM (g) RX Sensitivity	10% PER	-	-76	-	dBm
54 Mbps OFDM (g) RX Sensitivity	10% PER	-	-74	-	dBm
MCS0 (6.5 Mbps) OFDM (n) RX Sensitivity	10% PER	-	-91	-	dBm
MCS1 (13 Mbps) OFDM (n) RX Sensitivity	10% PER	-	-88	-	dBm
MCS2 (19.5 Mbps) OFDM (n) RX Sensitivity	10% PER	-	-86	-	dBm
MCS3 26 Mbps OFDM (n) RX Sensitivity	10% PER	-	-83	-	dBm
MCS4 39 Mbps OFDM (n) RX Sensitivity	10% PER	-	-80	-	dBm
MCS5 52 Mbps OFDM (n) RX Sensitivity	10% PER	-	-75	-	dBm
MCS6 58.5 Mbps OFDM (n) RX Sensitivity	10% PER	-	-74	-	dBm
MCS7 65 Mbps OFDM (n) RX Sensitivity	10% PER	-	-72	-	dBm
11b RX Overload Level	8% PER, 11 Mbps	-10	-	-	dBm
11g RX Overload Level	10% PER, 54 Mbps	-20	-	-	dBm
11n RX Overload Level	10% PER, MCS7	-20	-	-	dBm

Table 15 WLAN Receiver RF Characteristics

The information in this document is subject to change without notice.

UART HOST INTERFACE

The main interface to the TiWi-C-W Module is a Universal Asynchronous Receiver Transmitter (UART). This section describes the UART host interface.

Overview

The UART is a standard TTL level 4-wire interface (RX, TX, RTS, and CTS) with support for baud rates from 9600 bps to 4.0 Mbps. Default parameters are 115200 baud, 8 data bits, no parity bits, 1 stop bit, hardware flow control disabled.

UART Interface
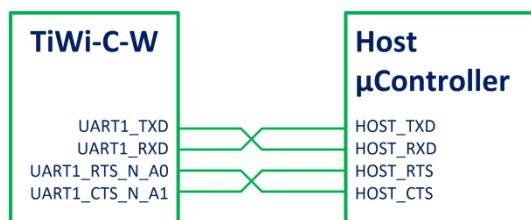
Figure 4 UART Connection from TiWi-C-W to Host

UART Signal Description

Port Name	Input/Output	Description
UART1_TXD	DO	UART 1 TRANSMIT DATA OUTPUT
UART1_RXD	DI	UART 1 RECEIVE DATA INPUT
UART1_RTS_N_A0	DO	UART 1 ACTIVE LOW REQUEST-TO-SEND
UART1_CTS_N_A1	DI	UART 1 ACTIVE LOW CLEAR-TO-SEND

Table 16 UART Interface Signal Description

UART TIMING
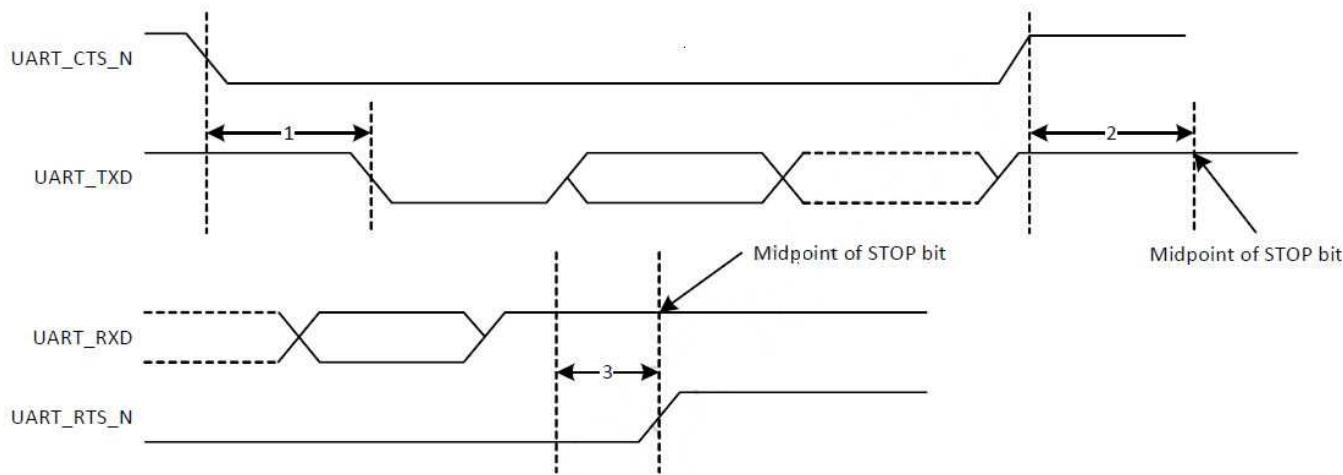
Figure 5 UART Timing

The information in this document is subject to change without notice.

Soldering Recommendations

Reflow for Lead Free Solder Paste

- Optimal solder reflow profile depends on solder paste properties and should be optimized as part of an overall process development.
- It is important to provide a solder reflow profile that matches the solder paste supplier's recommendations.
- Temperature ranges beyond that of the solder paste supplier's recommendation could result in poor solderability.
- All solder paste suppliers recommend an ideal reflow profile to give the best solderability.

**Recommended Reflow Profile for Lead Free Solder**
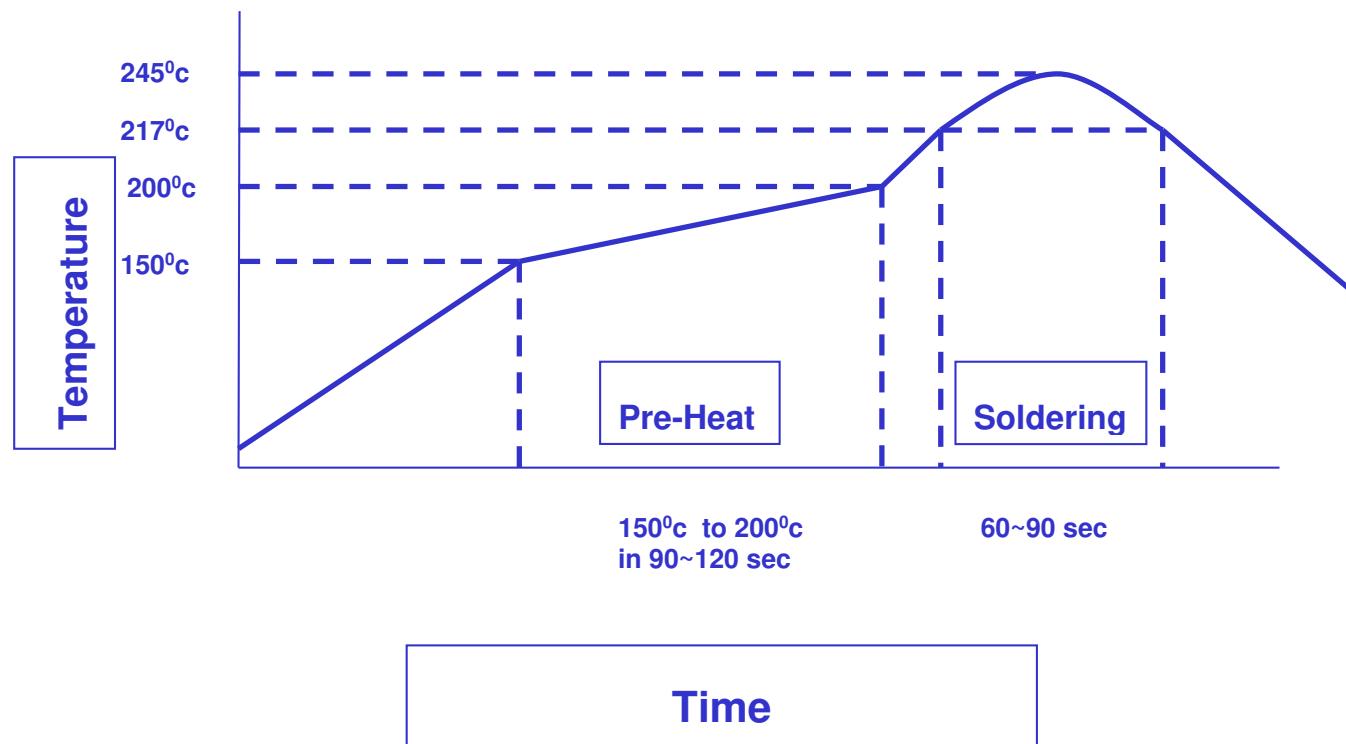
Figure 6 Recommended Soldering Profile

Note: The quality of solder joints on the surface mount pads where they contact the host board should meet the appropriate IPC Specification. See IPC-A-610-D Acceptability of Electronic Assemblies, section 8.2.1 "Bottom Only Terminations."

The information in this document is subject to change without notice.