

# Datasheet

## BTR310

### Key Features

- A small and cost effective Bluetooth® System
- Bluetooth® specification v2.0 EDR compliant
- Class 2, up to 10-meter range
- Complete 2.4GHz Bluetooth® System including:
  - Hardware: Radio, Baseband and Crystal & Memory
  - Standard Firmware: HCI or RFCOMM stack
- Power management: low power 1.8V operation for Bluetooth® core
- Compact size: 24.5 mm x 15 mm x 2.8 mm
- External antenna
- Support multiple connections
- UART or I<sup>2</sup>C interface interfaced with echo-cancellation circuit
- Allow dual boot
- Surface mount module for embedded applications
- Several firmware options
- Rewritable flash memory for easy upgrade route
- Custom firmware production available



### Description

The **Bluetron™ BTR310 module** from AvantWave is a complete Bluetooth® solution for fast implementation, cutting your time-to-market. It is a short-range, compact and cost effective radio/baseband module that can be implemented in any kind of electronic devices, such as hands-free car kit, portable hands-free application, etc.

In standard configuration the module includes a baseband processor with on board 8Mbit Flash memory, a radio front-end, antenna interface, supporting circuitry, together with some higher-level software protocols and applications such as L2CAP, SDP, SPP, HSP and HFP are resided in the Flash.

The **Bluetron™ BTR310 module** is a power class 2 Bluetooth® devices, and is in compliance with version 2.0 EDR of the Bluetooth® specification. It is supplied with Bluetooth® protocol stack firmware which runs on the internal microprocessor. **Bluetron™ BTR310 module** is built on CSR BC04 External core with an 8Mbit Flash memory for firmware and application software storage.

### Applications

- Automotive car kit applications
- Car radio systems
- High-speed USB dongle
- PDAs and other portable terminals
- Cable replacement between Bluetooth enabled devices
- Point-of-sales (POS) systems
- Telemetry and machine-to-machine devices
- Fitness and sports telemetry devices
- Industrial PCs and laptops

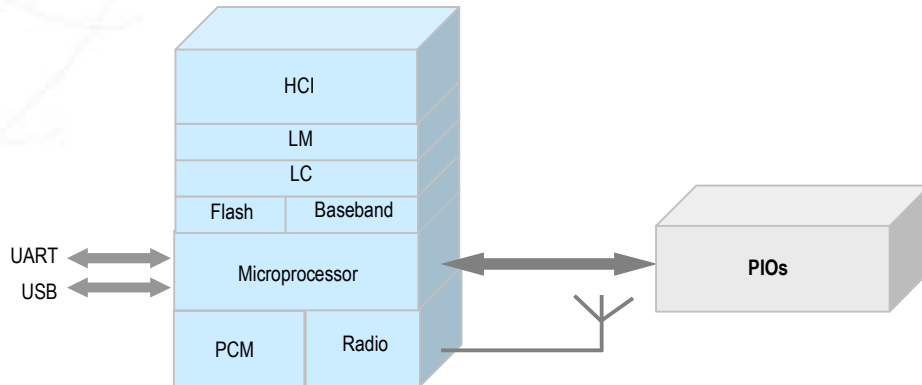


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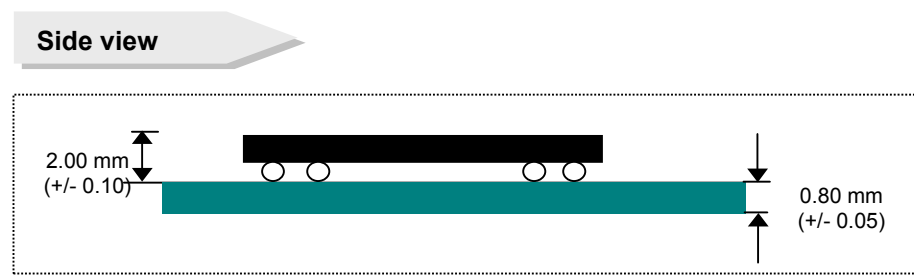
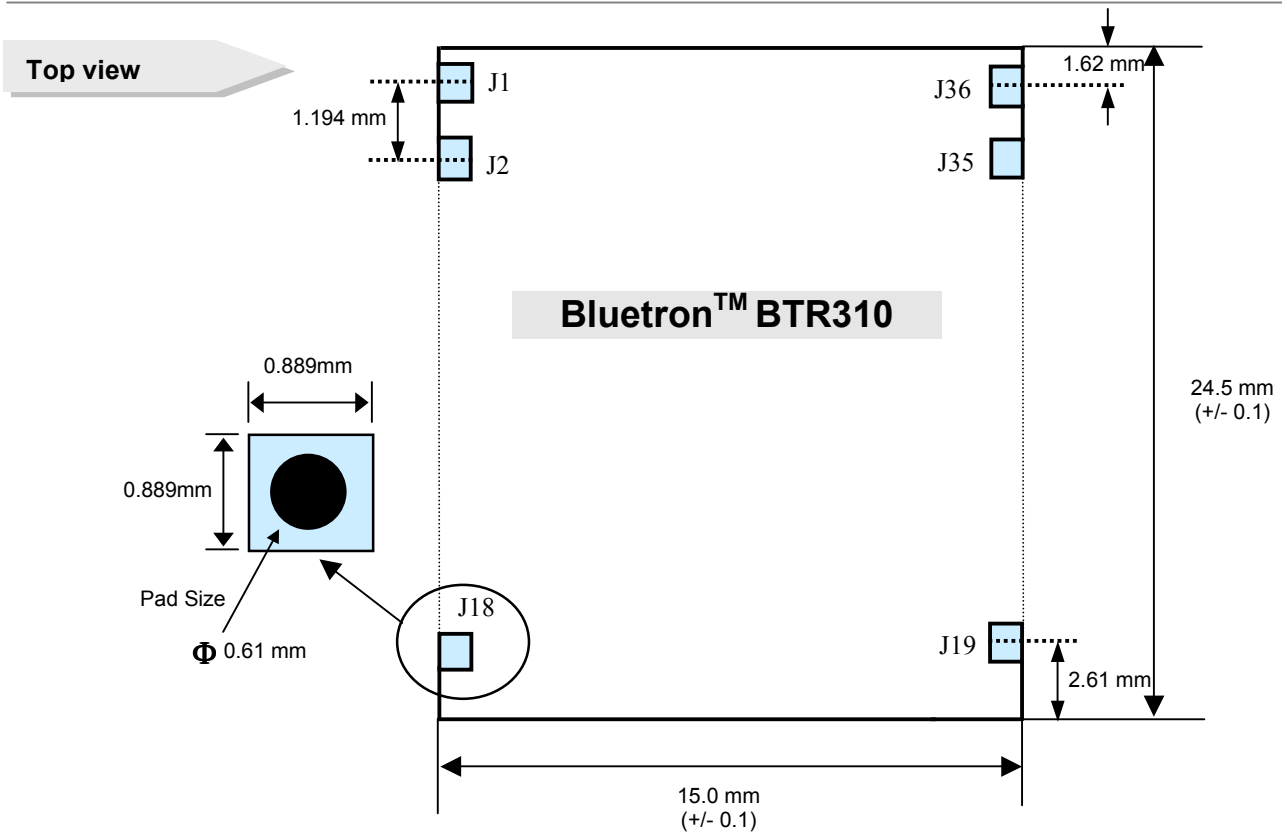
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## Software



## Mechanical Specification



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## Pin Assignment

Assumption: Data communication are performed via UART interface

Terminal	Name	Description
1	ANT	50Ω antenna port
2	AIO[0]	Programmable input/output line
3	AIO[1]	Programmable input/output line
4	AIO[2]	Programmable input/output line
5	RESET	Active 'HIGH'. Input must be high for >5ms
6	DUAL_BOOT	For testing purpose only
7	UART_RTS	UART request to send active 'LOW'
8	UART_CTS	UART clear to send active 'LOW'
9	UART_TX	UART data output
10	UART_RX	UART data input
11	SPI_CSB	Chip select for Synchronous Serial Interface active "LOW"
12	SPI_MOSI	Serial Peripheral Interface data input
13	SPI_MISO	Serial Peripheral Interface data output
14	SPI_CLK	Serial Peripheral Interface clock
15	+1.8V Output	1.8V output for internal analogue circuit (N.C.)
16	+3.3V	Positive supply for core, flash memory, and PIOs
17	GND	Ground connection
18	PCM_CLK	PCM Synchronous data clock
19	PCM_OUT	PCM data output
20	PCM_IN	PCM data input
21	PCM_SYNC	PCM data SYNC
22	USB_D-	USB data minus
23	USB_D+	USB data plus
24	PIO[0]	Programmable input/output line
25	PIO[1]	Programmable input/output line
26	PIO[2]	Programmable input/output line



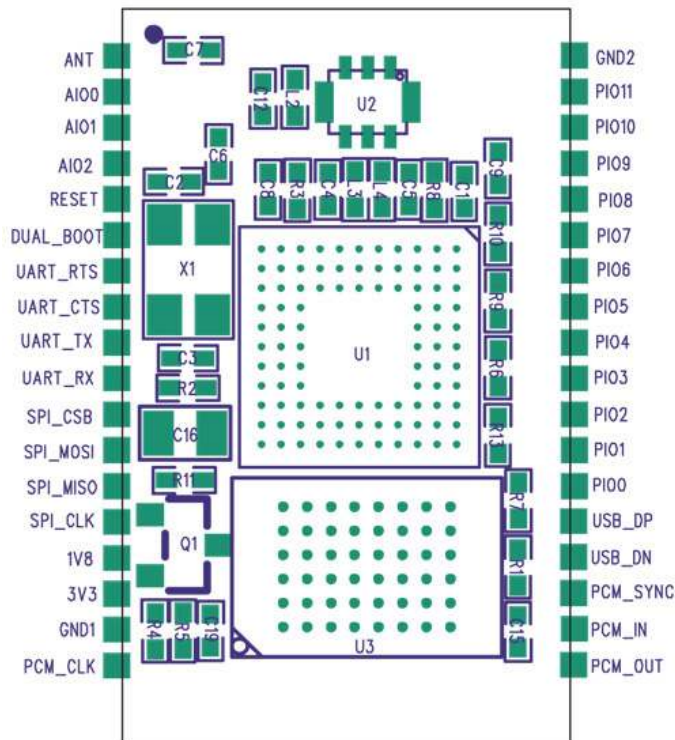
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27	PIO[3]	Programmable input/output line
28	PIO[4]	Programmable input/output line
29	PIO[5]	Programmable input/output line
30	PIO[6]	Programmable input/output line
31	PIO[7]	Programmable input/output line
32	PIO[8]	Programmable input/output line
33	PIO[9]	Programmable input/output line
34	PIO[10]	Programmable input/output line
35	PIO[11]	Programmable input/output line
36	GND	Ground connection

## PIN Assignment (Silkscreen Topside)



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## General Specifications

	Minimum	Typical	Maximum
Supply Voltage (Radio, VCO, ANA, Core)	1.7V	1.8V	1.9V
Supply Voltage (PIO, Memory)	3.0V	3.3V	3.6V
Operating Temperature range	-20°C	-	75°C
Storage Temperature range	-40°C	-	100°C
Frequency Range	2.4 GHz	-	2.4835 GHz

Remarks: 1.8V is generated by internal regulator

## RF Specifications

Voltage Supply = 3.3V  
 Temperature = 25°C  
 Frequency = 2.441GHz

Receiver	Min	Typ	Max	Bluetooth Specification	Unit
Sensitivity (DH1/3/5) at 0.1% BER	-	-80	-	-70	dBm
Maximum received signal	-20	10	-	-20	dBm
C/I Co-channel		9	-	≤11	dB
C/I Adjacent channel (1MHz)	-	-5	-	≤0	dB
C/I Image rejection (carrier -3MHz)	-	-22	-	≤-9	dB
Transmitter	Min	Typ	Max	Bluetooth Specification	Unit
Average Output Power	-1.5	0.5	-	-6 to +4	dBm
20dB bandwidth	-	885	-	≤ 1000	kHz
2 <sup>nd</sup> ACP (+/-2MHz)	-	-31	-	-20	dBc
3 <sup>rd</sup> ACP (+/-3MHz)	-	-43	-	-40	dBc

## Power Consumption

**Voltage Supply** = 3.3V  
**Temperature** = 25°C  
**Frequency** = 2.441GHz

Mode	Average	Peak	Unit
SCO connection HV3 (30ms interval sniff mode) (slave)	21	-	mA
SCO connection HV3 (30ms interval sniff mode) (Master)	21	-	mA
SCO connection HV1 (Slave)	42	-	mA
SCO Connection HV1 (Master)	42	-	mA
ACL data transfer 115.2kbps UART (Master)	5	-	mA
ACL data transfer 720kbps USB (Slave)	45	-	mA
ACL data transfer 720kbps USB (Master)	45	-	mA
ACL connection, Sniff Mode 40ms interval, 38.4kbps UART	3.2	-	mA
ACL connection, Sniff Mode 1.28s interval, 38.4kbps UART	0.45	-	mA
Parked Slave, 1.28s beacon interval, 38.kbps UART	0.55	-	mA
Peak RF current during RF burst	80	-	mA
Deep Sleep Mode	15	-	uA

## Solder Profiles

In order to setup your application, it is required to have the soldering profile which based on various parameters.

Zone	Sensor	Description
Preheat Zone	1-2	This zone raises the temperature at a controlled rate
Equilibrium Zone	3	This zone brings the board to a uniform temperature and also activates the flux. The duration in this zone will need to be adjusted to optimize the out gassing of the flux
Reflow Zone	4	The peak temperature should be high enough to achieve good wetting but not so high as to cause component discoloration or damage. Excessive soldering time can lead to intermetallic growth which can result in a brittle joint.
Cooling Zone	5-6	The cooling rate should be fast, to keep the solder grains small which will give longer lasting joint.



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**Solder Re-Flow Profile for Devices with Lead-Free Solder Balls**

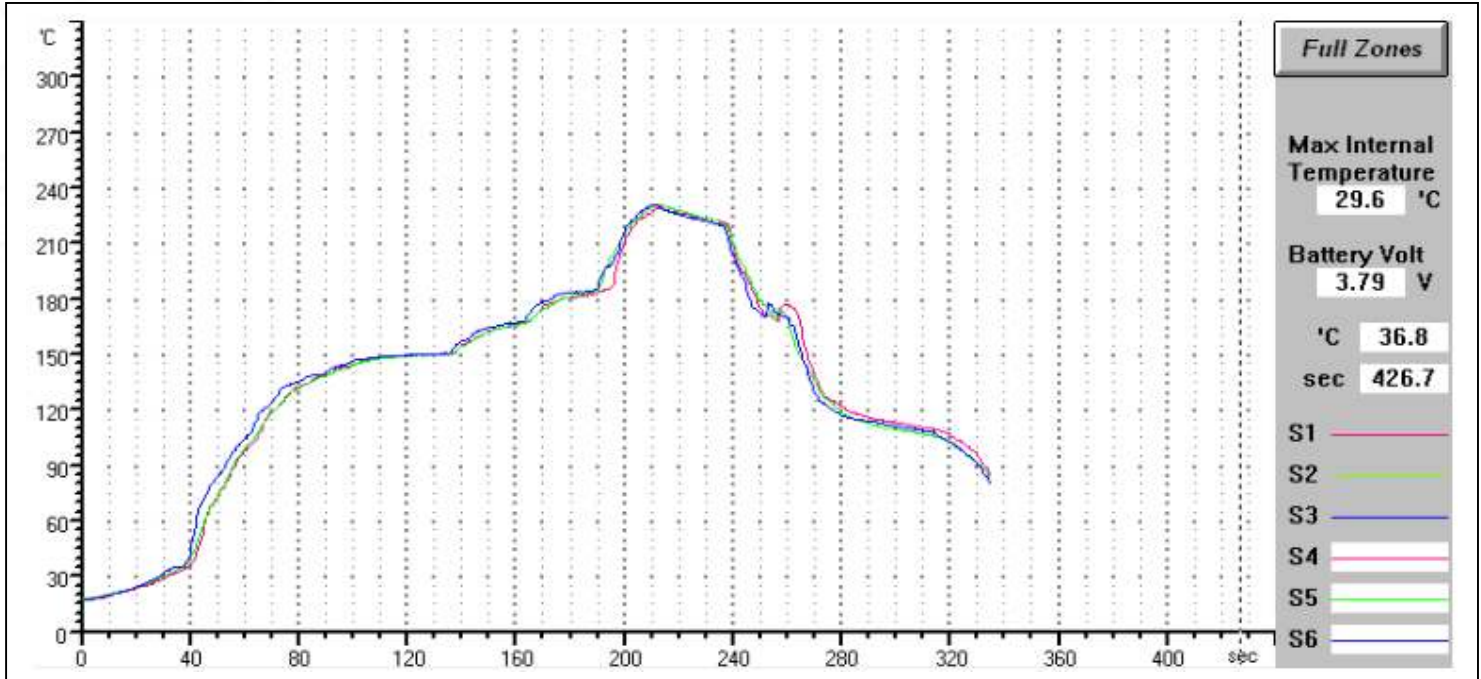


Figure 1.1: Typical Lead-Free Re-flow Solder Profile

**Temperature Analysis at 200°C**

Sensor	Max °C	Max at (s)	Over (s)
S4	229.5	212.5	44
S5	230.6	212.5	49
S6	231.1	211.5	45

**Remarks**

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