



PRODUCT TERMINATION NOTIFICATION

PTN SPG-SUB/13/8169
Dated 16 Oct 2013

Bluetooth SPBT2532 phase out

Table 1. Termination Implementation Schedule

Forecasted date of STMicroelectronics 'alternative products replacement' for customer	09-Oct-2013
Last Order entry date (6 months from the notice for final shipment according to JEDEC standard JESD48-A 'Product Discontinuance')	16-Apr-2014
Last Order delivery date (12 months from the notice for final shipment according to JEDEC standard JESD48-A 'Product Discontinuance')	16-Oct-2014

Table 2. Termination Identification

Product Identification Commercial Product(s) to be terminated	SPBT2532C2.AT and SPBT2532C2.AT2
Reason for termination	core radio STLC2500 will be terminated within 2013 year end
Alternate product(s) replacement	See attached

Table 3. List of Attachments

Customer Part numbers list	
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DOCUMENT APPROVAL

Name	Function
Corazzo, Fulvio	Marketing Manager
Orsi, Paola	Product Manager

Features

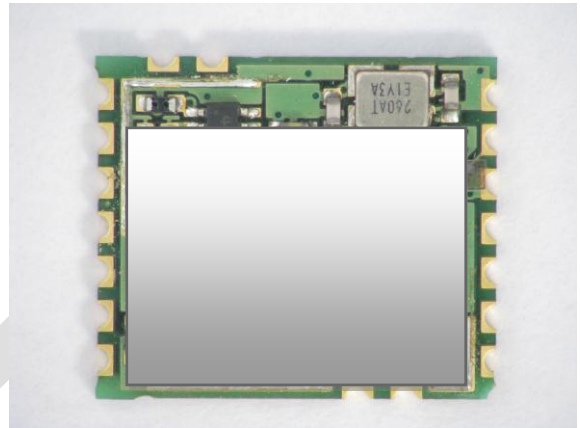
- **Bluetooth Radio**
 - Fully embedded Bluetooth v3.0 with profiles
 - Class 2 radio
 - 128-bit encryption security
 - CE & Bluetooth qualified(*Pending)
 - 50 Ohm external antenna
 - Mutipoint capability

- **ST Micro Cortex-M3 ULTRA LOW POWER microprocessor up to 32MHz**

- **Serial Interface**
 - UART

- **General I/O**
 - 5 general purpose I/O
 - 1 LPO input

- **User Interface**
 - AT command set (abSerial)
 - Firmware upgrade over UART



Preliminary module picture
11.5 mm x 13.5 mm

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1 Description

The SPBT2632LC2 is an easy to use Bluetooth module, compliant with Bluetooth v3.0. The module provides a complete RF platform in a tiny form factor.

The SPBT2632LC2 enables electronic devices with wireless connectivity, not requiring any RF experience or expertise for integration into the final product. The SPBT2632LC2 module, being a certified solution, optimizes the time to market of the final applications.

The module is designed for maximum performance in a minimal space including fast speed UART and 5 general purpose I/O lines, several serial interface options. Optimized design allows the integration of a complete working Bluetooth modem in the minimum possible size; an additional external LPO (low power oscillator) is required to enable low power mode capability. Antenna is external to ensure high degree of choice to adapt the antenna design to any specific application.

The SPBT2632LC2 is a surface mount PCB module that provides fully embedded, ready to use Bluetooth wireless technology. The reprogrammable Flash memory contains embedded firmware for serial cable replacement using the Bluetooth SPP profile.

Embedded Bluetooth AT2 command firmware is a friendly interface, which realizes a simple control for cable replacement, enabling communication with most Bluetooth enabled devices, provided that the devices support the SPP profile. The SPBT2632LC2, supporting iAP profile, provides communication with Android, smartphone, and Apple® iOS Bluetooth enabled devices.

An Apple authentication IC is required to exchange data with an Apple device or access an Apple device application. The AT2 FW includes the Bluetooth SPP profile capable of recognizing the Apple authentication chip.

Customers using the Apple authentication IC must register as developers to become an Apple certified MFI member. License fees may apply, for additional information visit: <http://developer.apple.com/programs/which-program/index.html> .

Certified MFI developers developing electronic accessories that connect to the iPod®, iPhone®, and iPad® gain access to technical documentation, hardware components, technical support and certification logos.

Customized firmware for peripheral device interaction, power optimization, security, and other proprietary features may be supported and can be ordered pre-loaded and configured.

2 RoHS compliance

ST Bluetooth modules comply with the ECOPACK2 level of RoHS compliance grade.

3 Applications

- Serial cable replacement
- M2M industrial control
- Service diagnostic
- Data acquisition equipment
- Machine control
- Sensor monitoring
- Security system
- Mobile health

4 Software Architecture

Lower Layer Stack

- Bluetooth v3.0
- Device power modes: active, sleep and deep sleep
- Wake on Bluetooth feature optimized power consumption of host CPU
- Authentication and encryption
- Encryption key length from 8-bits to 128-bits
- Persistent FLASH memory for BD Address and user parameter storage
- All ACL (Asynchronous Connection Less) packet types
- Sniff modes: fully supported to maximum allowed intervals
- Master slave switch, supported during connection and post connection
- Dedicated Inquiry access code, for improved inquiry scan performance
- Dynamic packet selection channel quality driven data rate to optimize link performance
- Dynamic power control
- Bluetooth radio natively supports 802.11b co-existence: AFH

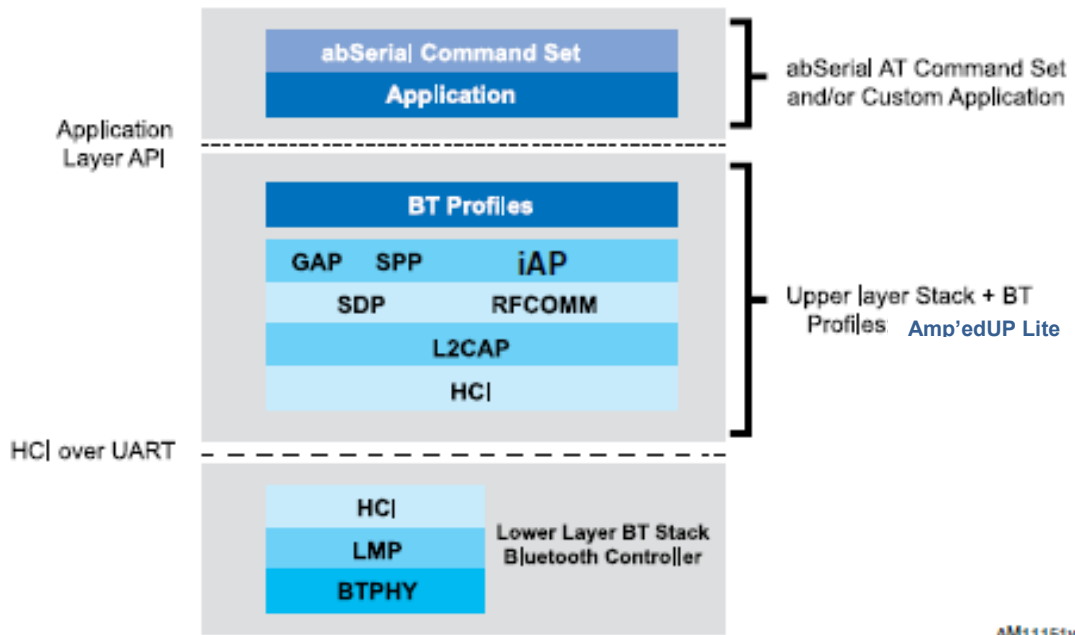
Upper Layer Stack: Amp'ed UP

- SPP, , SDAP, GAP, and protocols
- RFCOMM, SDP, and L2CAP supported

AT Command Set: abSerial

- The complete command list including the iAP commands is reported in the user manual UM1547.

Bluetooth Firmware implementation



5 Hardware Specifications

General Conditions ($V_{IN}= 2.2V$ and $25^{\circ}C$)

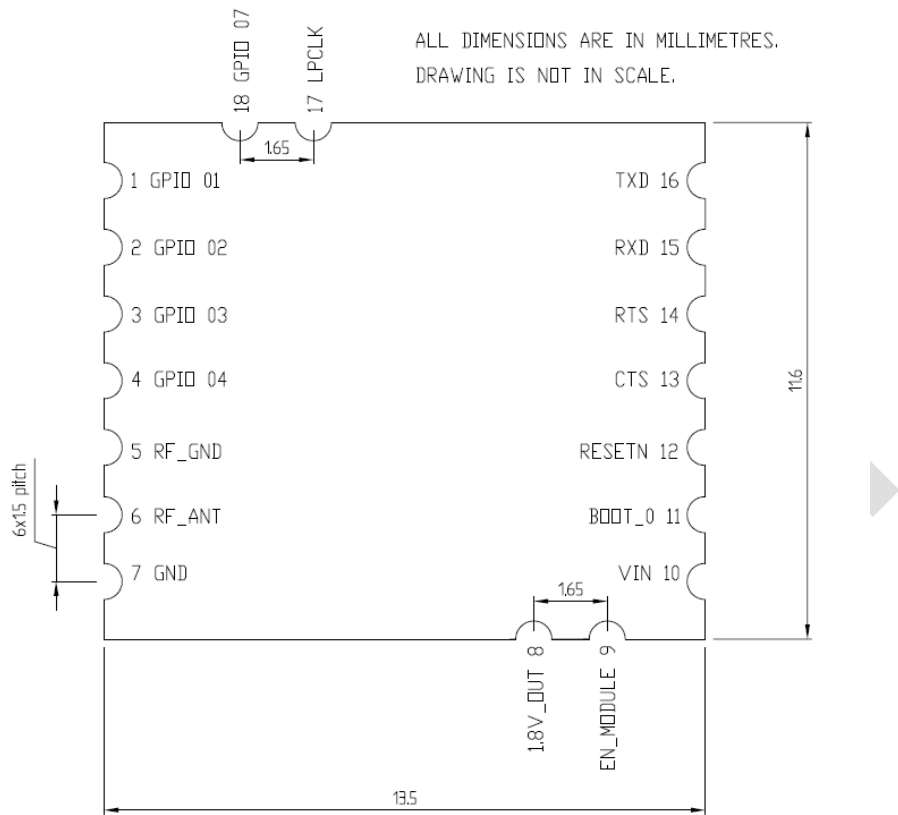
Recommended Operating Conditions

Rating	Min	Typical	Max	Unit
Operating Temperature Range	-40	-	85	$^{\circ}C$
Supply Voltage V_{IN}	1.9	3.0	3.6	Volts
Signal Pin Voltage	-	1.8	-	Volts
RF Frequency	2402	-	2480	MHz

Absolute Maximum Ratings

Rating	Min	Typical	Max	Unit
Storage temperature range	-55	-	+105	$^{\circ}C$
Supply voltage, V_{IN}	-0.3	-	+ 5.0	Volts
I/O pin Voltage (V_{IO} five-volt tolerant pin)	-0.3	-	+ 5.5	Volts
RF input power	-	-	-3	dBm

Pin connection diagram



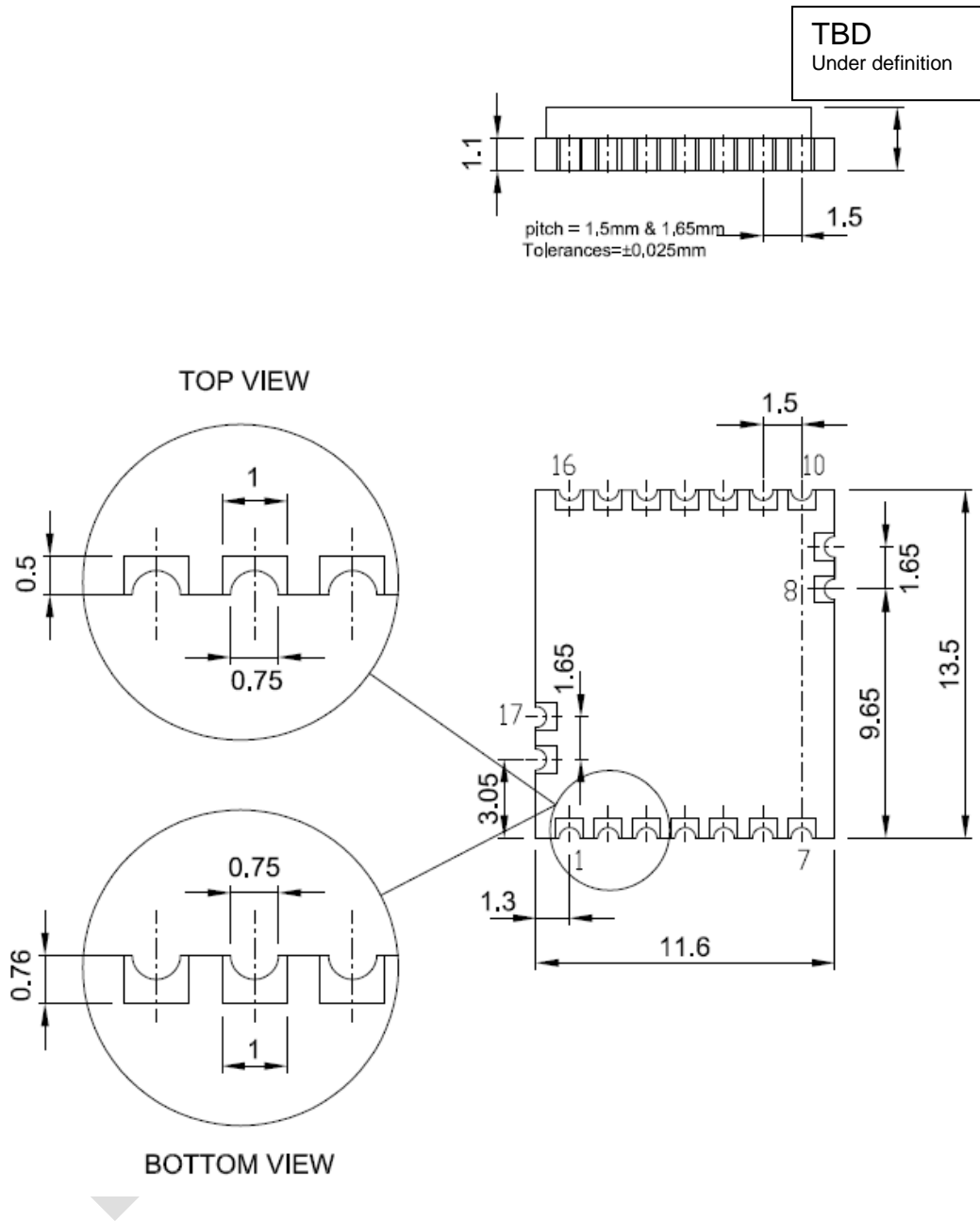
The SPBT2632LC2 module is pin to pin compatible with the oldest SPBT2532C2.

Footprint is 1 mm longer respect the SPBT2532C2 footprint, (13.5 x 11.6) mm vs (13.5 x 10.5) mm

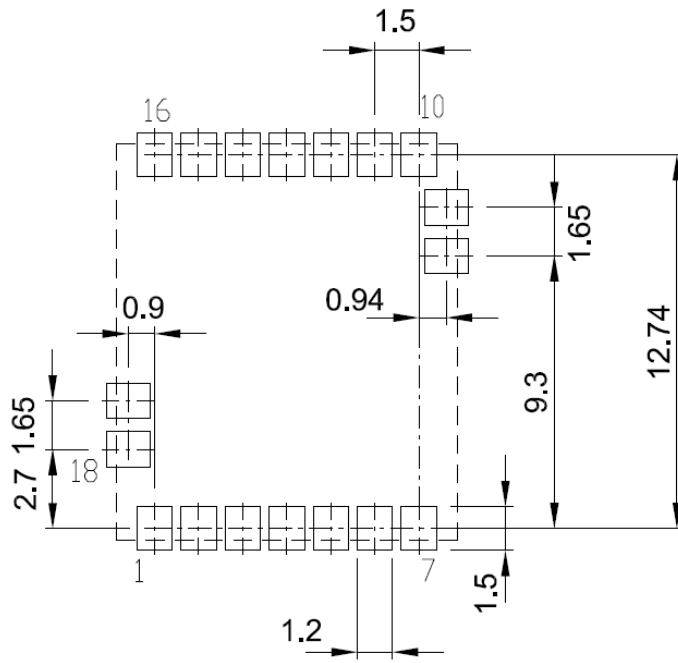
Pin Assignment

Name	Type	Pin #	Description	ALT Function	5V Tolerant	Initial State
UART Interface						
RXD	I	15	Receive data		Y	
TXD	O	16	Transmit data		Y	
RTS	O	14	Clear to send (active low)		Y	
CTS	I	13	Request to send (active low)		Y	
Boot Loader						
Boot 0	I	11	Boot 0			
Power and Ground						
V _{in}		10	V _{in}			
GND		7	GND			
Reset						
RESETN	I	12	Reset input (active low for 5 ms)		(1.8V + 0.3V) max.	
LPO						
LPCLK	I	17	LPO input			
GPIO – General Purpose Input/Output						
GPIO [1]	I/O	1	General Purpose Input/Output		Y	Input pull down
GPIO [2]	I/O	2	General Purpose Input/Output		Y	Floating
GPIO [3]	I/O	3	General Purpose Input/Output		Y	Input pull down
GPIO [4]	I/O	4	General Purpose Input/Output		Y	Input pull down
GPIO [7]	I/O	18	General Purpose Input/Output		Y	Input pull down
Module signals service						
1.8V_OUT	O	8	Available 1.8V power supply for external LPO supply use (Max. 10 mA current)			Max. 10 mA output current
EN_MODULE	I	9	Available ENABLE MODULE digital signal (H = Enable, L = Disable)			(Max. V _{in} + 0.3V, Module Internally pulled-up)
RF input / output						
RF_GND		5	Radiofrequency dedicated GND			
RF_ANT	RF I/O	6	Radiofrequency I/O signal (Must be connected to a Bluetooth External ANTENNA)			

Mechanical dimension



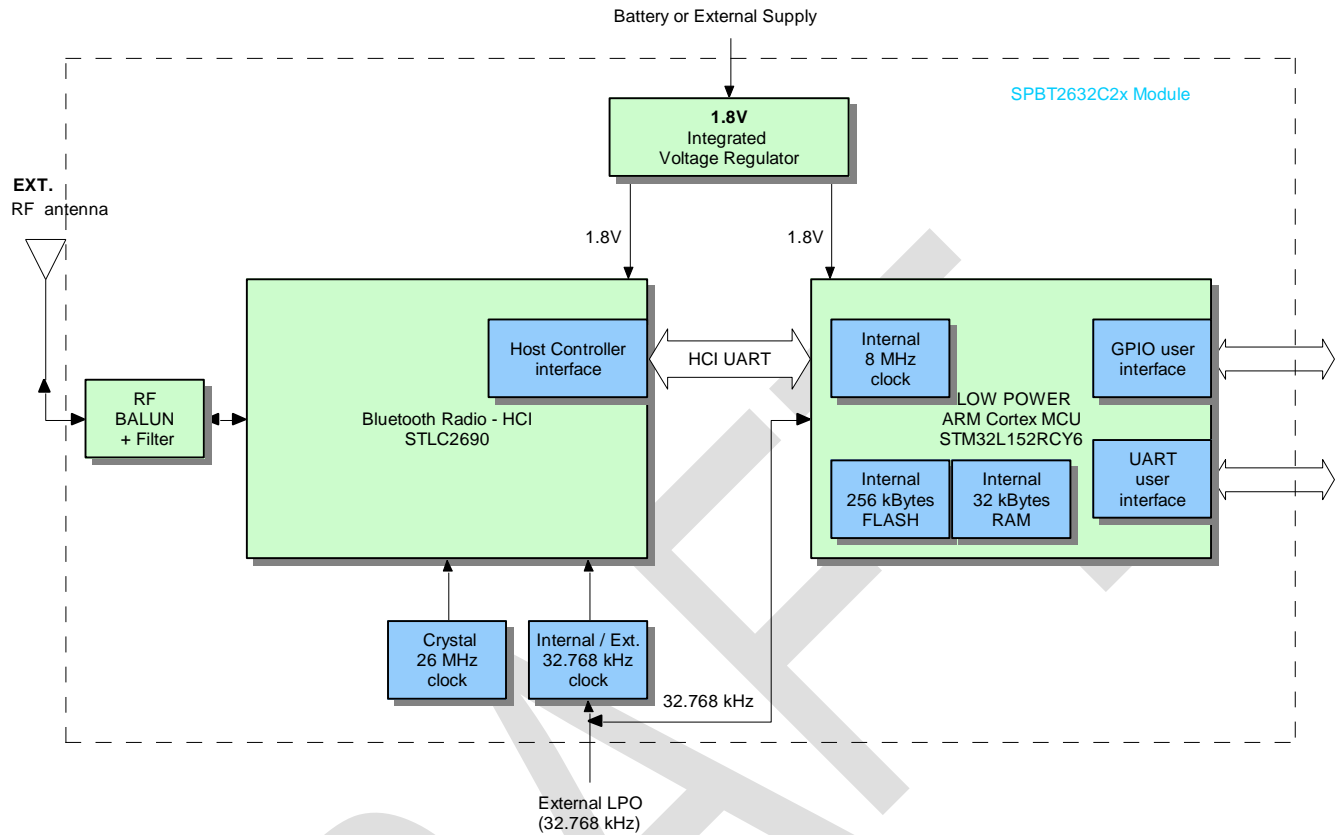
Recommend land pattern



RECOMMENDED LAND PATTERN TOP VIEW

DR

6 Hardware Block Diagram



Hardware Design

SPBT2632LC2 module supports UART and GPIO hardware interfaces.

Notes

- All unused pins should be left floating; do not ground.
- All GND pins must be well grounded.
- The area around the module should be free of any ground planes, power planes, trace routings, or metal for 6 mm from the RF_ANT module antenna pin output, in all directions.
- Traces should not be routed underneath the module.

Module Reflow Installation

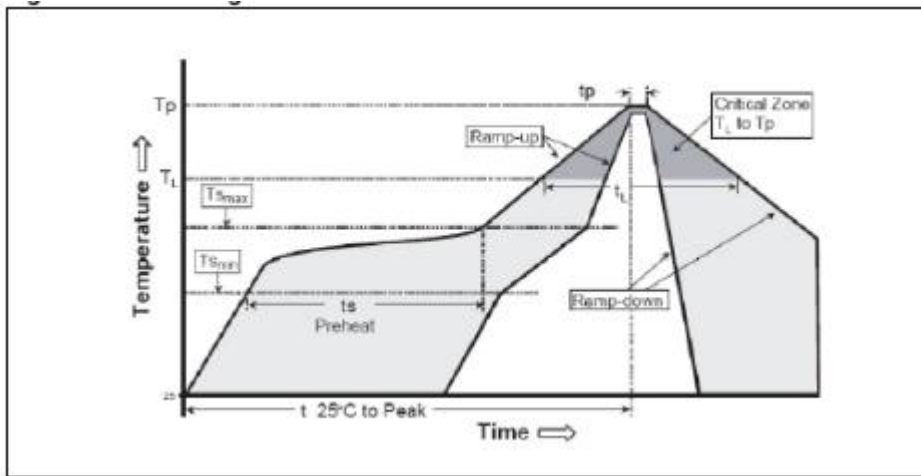
The SPB2632LC2 is a surface mount Bluetooth module supplied on a 16 pin, 6-layer PCB. The final assembly recommended reflow profiles are indicated here below.

Soldering phase has to be executed with care: In order to avoid undesired melting phenomenon, particular attention has to be taken on the set up of the peak temperature. Here following some suggestions for the temperature profile based on IPC/JEDEC J-STD-020C, July 2004 recommendations.

Soldering

Profile feature	PB-free assembly
Average ramp up rate ($T_{S\text{MAX}}$ to T_P)	3°C / sec max
Preheat	
Temperature min (T_S min)	150 °C
Temperature max (T_S max)	200 °C
Time (t_S min to t_S max) (t_S)	60-100 sec
Time maintained above:	
Temperature T_L	217 °C
Time t_L	60-70 sec
Peak temperature (T_P)	240 ± 0 °C
Time within 5 °C of actual peak temperature (t_P)	10-20 sec
Ramp down rate	6 °C / sec
Time from 25 °C to peak temperature	8 minutes max

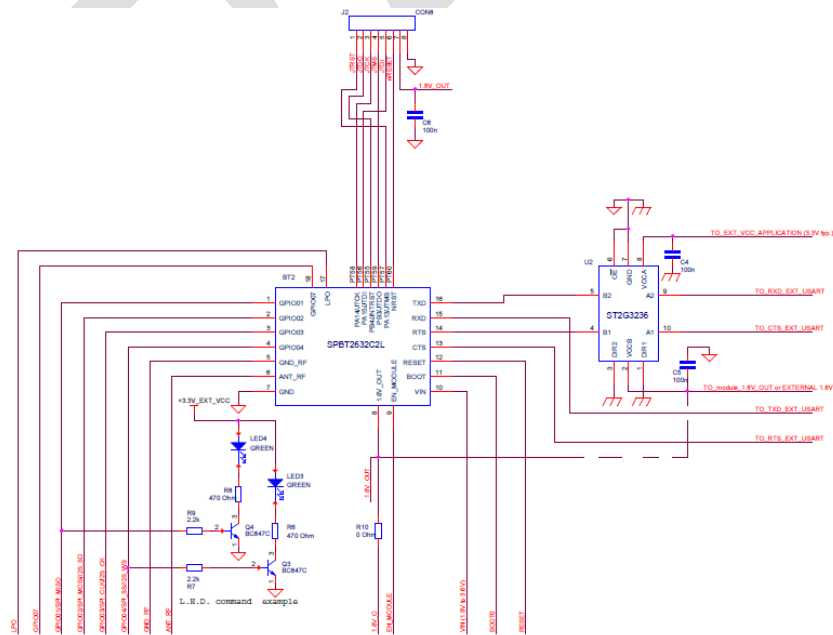
Soldering profiles



GPIO Interface

All GPIOs are capable of sinking and sourcing 4mA of I/O current. GPIO [1] to GPIO [7] are internally pulled down with 100KΩ (nominal) resistors. Maximum output voltage available at GPIO pin is 1.8V, limited by the internal regulator.

If the customer application requires an interface voltage higher than the 1.8V standard voltage provided as output and input signals of the module, the use of a level translator is suggested. The following diagram can be used as reference.



7 Traceability

Each module is univocally identified by serial number stored in a 2D data matrix laser marked on the bottom side of the module itself.

The serial number has the following format:

WW YY D FF NNN

where

WW = week

YY = year

D = product ID family

FF = production panel coordinate identification

NNN = progressive serial number.

Each module bulk is identified by a bulk ID.

BULK ID and module 2D data matrix are linked by a reciprocal traceability link.

The module 2D data matrix traces the lot number of any raw material used

8 Ordering Information

Order code	Description	Packing	MOQ
SPBT2632LC2	Class 2 OEM Bluetooth External Antenna Module	Jedec tray	2448 pcs

9 Revision History

Data	Revision	Description
2-Oct-2013	1	First preliminary release

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