

ECN/PCN No.: R0043

| For Manufacturer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                            |                                                                                                                        |                                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <b>Product Description:</b><br>Bluetooth modules                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Abrakon Part Number / Part Series:</b><br>ABBTM Bluetooth module series | <input type="checkbox"/> Documentation only<br><input type="checkbox"/> ECN<br><input checked="" type="checkbox"/> EOL | <input checked="" type="checkbox"/> Series<br><input type="checkbox"/> Part Number |
| <b>Affected Revision:</b><br>N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>New Revision:</b><br>EOL                                                | <b>Application:</b><br><input type="checkbox"/> Safety<br><input checked="" type="checkbox"/> Non-Safety               |                                                                                    |
| <b>Prior to Change:</b> ABBTM-2.4GHZ, ABBTM-2.4GHZ-31, ABBTM-2.4GHZ-31-T, ABBTM-2.4GHZ-33, ABBTM-2.4GHZ-33-T, ABBTM-2.4GHZ-51, ABBTM-2.4GHZ-51-T, ABBTM-2.4GHZ-52, ABBTM-2.4GHZ-52-T, ABBTM-2.4GHZ-EVAL, ABBTM-2.4GHZ-T, ABBTM-2.4GHZ-T2, ABBTM-NVC-EVK-56, ABBTM-NVC-EVK-71, ABBTM-NVC-EVK-71-MESH, ABBTM-NVC-MB-EVK, ABBTM-NVC-MDCS42A-CON, ABBTM-NVC-MDCS71, ABBTM-NVC-MDCS71-CON, ABBTM-NVC-MDCS71-MESH, ABBTM-NVC-MDCS71-MESH-CON, ABBTM-NVC-MDCS71-101, ABBTM-NVC-MDCS86-101, ABBTM-101-2.4GHZ-T, ABBTM-2.4GHZ-51-101-, ABBTM-2.4GHZ-52-101, ABBTM-53-2.4GHZ-T, ABBTM-103-2.4GHZ-T, ABBTM-2.4GHZ-T; VER.10, ABBTM-NVC-MDCS42A-101, ABBTM-NVC-MDCS42A-F07, and ABBTM-NVC-MDCS56-102. |                                                                            |                                                                                                                        |                                                                                    |
| <b>After Change:</b><br>All 32 EOL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                            |                                                                                                                        |                                                                                    |
| <b>Cause/Reason for Change:</b><br>Due to low demand, the Bluetooth Module ABBTM series is discontinued.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                            |                                                                                                                        |                                                                                    |
| Change Plan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                            |                                                                                                                        |                                                                                    |
| <b>Effective Date:</b><br>06/08/2021                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Additional Remarks:</b><br>N/A                                          |                                                                                                                        |                                                                                    |
| <b>Change Declaration:</b><br>EOL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                            |                                                                                                                        |                                                                                    |
| <b>Issued Date:</b><br>06/08/2021                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Issued By:</b><br><i>Nicholas El-Takach</i>                             | <b>Issued Department:</b><br>Engineering                                                                               |                                                                                    |
| <b>Approval:</b><br><i>Syed Raza</i><br>Engineering VP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Approval:</b><br><i>Reuben Quintanilla</i><br>Quality Director          | <b>Approval:</b><br><i>Ying Huang</i><br>Purchasing Director                                                           |                                                                                    |
| For Abracon EOL only                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                            |                                                                                                                        |                                                                                    |
| <b>Last Time Buy (if applicable):</b><br>No last time buy.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                            | <b>Alternate Part Number / Part Series:</b><br>N/A                                                                     |                                                                                    |
| <b>Additional Approval:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Additional Approval:</b>                                                | <b>Additional Approval:</b>                                                                                            |                                                                                    |
| Customer Approval (If Applicable)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                            |                                                                                                                        |                                                                                    |
| <b>Qualification Status:</b><br><input type="checkbox"/> Approved <input type="checkbox"/> Not accepted<br><i>Note: It is considered approved if there is no feedback from the customer 1 month after ECN/PCN is released.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                            |                                                                                                                        |                                                                                    |
| <b>Customer Part Number:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                            | <b>Customer Project:</b>                                                                                               |                                                                                    |
| <b>Company Name:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Company Representative:</b>                                             | <b>Representative Signature:</b>                                                                                       |                                                                                    |
| <b>Customer Remarks:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                            |                                                                                                                        |                                                                                    |

# 26.9 x 13.0 x 2.5 mm SMT Bluetooth Module

**ABBTM-2.4GHz-T**

FCC ID# A8RABBTM2-4G

Compliant to MSL level 3



**RoHS**  
Compliant



26.9 x 13.0 x 2.5 mm SMT

## FEATURES:

- Bluetooth Spec v2.0+EDR Compliant
- Class 2, up to 10-meter range
- Complete 2.4GHz Bluetooth® System
- Power management: low power 1.8V operation for Bluetooth® core
- Compact size: 26.9mm (L) x 13 (W) mm x 2.5mm (H)
- Bluetooth® Profile Supported: SPP, OPP, PBAP
- Internal antenna
- On-board flash memory (8Mbits)
- Surface mount module for embedded applications
- Several firmware options
- Rewritable flash memory for easy upgrade route
- Custom firmware production available

## APPLICATIONS:

- Hand-held devices
- Printers
- Personal Navigation Devices
- PDAs and other portable terminals

## GENERAL DESCRIPTION

Abracon's ABBTM is a complete Bluetooth® solution. It is built on CSR BC04-External Core and 8Mbit Flash memory. It's a short range, compact and cost effective module. Designed to be embedded into electronic devices needing Bluetooth® connectivity. The ABBTM module is a power class2 Bluetooth® device, and is in compliance with version 2.0+EDR of the Bluetooth® specification. It includes CSR BC04-External Core and 8Mbit Flash memory, internal antenna, supporting circuitry, together with higher-level software protocols and applications such as L2CAP, SDP, GAP, OPP and PBAP are resident in the flash memory.

|                          |                                      |
|--------------------------|--------------------------------------|
| Operating Frequency Band | 2.4GHz ~ 2.48GHz Unlicensed ISM Band |
| Bluetooth Specification  | V2.0 + EDR                           |
| Output Power Class       | Class 2                              |
| Operating Voltage        | +3.3V                                |
| Host Interface           | UART                                 |
| Audio Interface          | PCM Interface                        |
| Flash Memory Size        | 8 Mb                                 |

## ELECTRICAL SPECIFICATIONS:

| Absolute Maximum Ratings |          |          |
|--------------------------|----------|----------|
|                          | Minimum  | Maximum  |
| Storage temperature      | -40°C    | +150°C   |
| Supply voltage: VBAT     | -0.4V    | 5.6V     |
| Other terminal voltages  | VSS-0.4V | VDD+0.4V |

| Recommended Operating Conditions |         |         |
|----------------------------------|---------|---------|
|                                  | Minimum | Maximum |
| Operating temperature range      | -40°C   | +85°C   |
| Guaranteed RF performance range  | -40°C   | +85°C   |
| Supply voltage: VBAT             | 2.2V    | 4.2V    |



# 26.9 x 13.0 x 2.5 mm SMT Bluetooth Module

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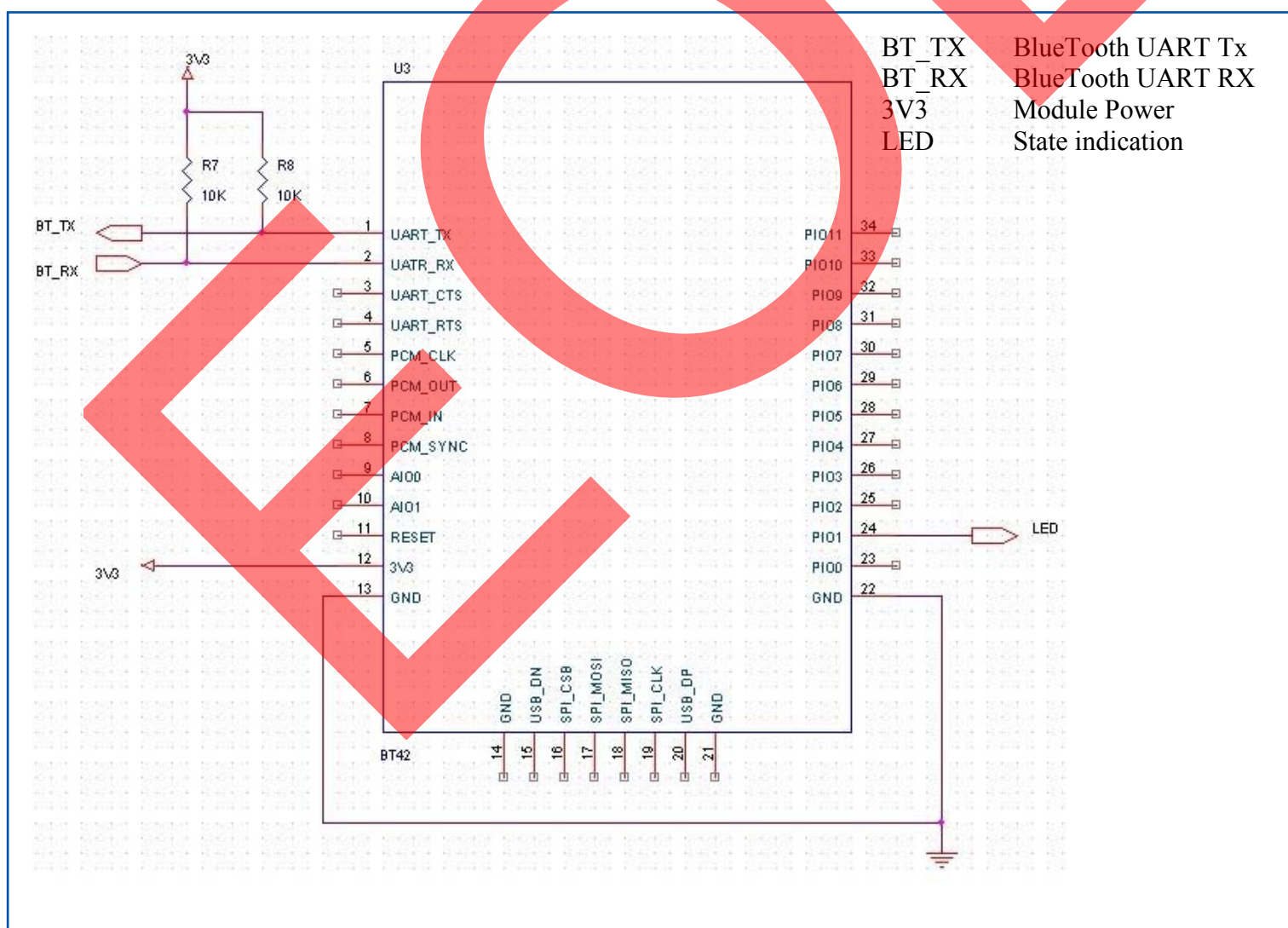
26.9 x 13.0 x 2.5 mm SMT

## POWER CONSUMPTION

| Operation Mode          | Connection Type | UART Rate (kbps) | Average | Unit |
|-------------------------|-----------------|------------------|---------|------|
| Page scan               | -               | 115.2            | 0.42    | mA   |
| ACL No traffic          | Master          | 115.2            | 4.60    | mA   |
| ACL With file transfer  | Master          | 115.2            | 10.3    | mA   |
| ACL 1.28s sniff         | Master          | 38.4             | 0.37    | mA   |
| ACL 1.28s sniff         | Slave           | 38.4             | 0.42    | mA   |
| SCO HV3 30ms sniff      | Master          | 38.4             | 19.8    | mA   |
| SCO HV3 30ms sniff      | Slave           | 38.4             | 19.0    | mA   |
| Standby Host connection | -               | 38.4             | 40      | μA   |

**Note:** Low power mode on the linear regulator is entered and exited automatically when the chip enters/leaves Deep Sleep mode.

## REFERENCE CIRCUIT



# 26.9 x 13.0 x 2.5 mm SMT Bluetooth Module

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26.9 x 13.0 x 2.5 mm SMT

## Firmware Configuration

- a) UART Baud: 115200 , N, 8, 1
- b) BlueTooth Name: ABBTM
- c) Pin Code: 0000

## Software Description

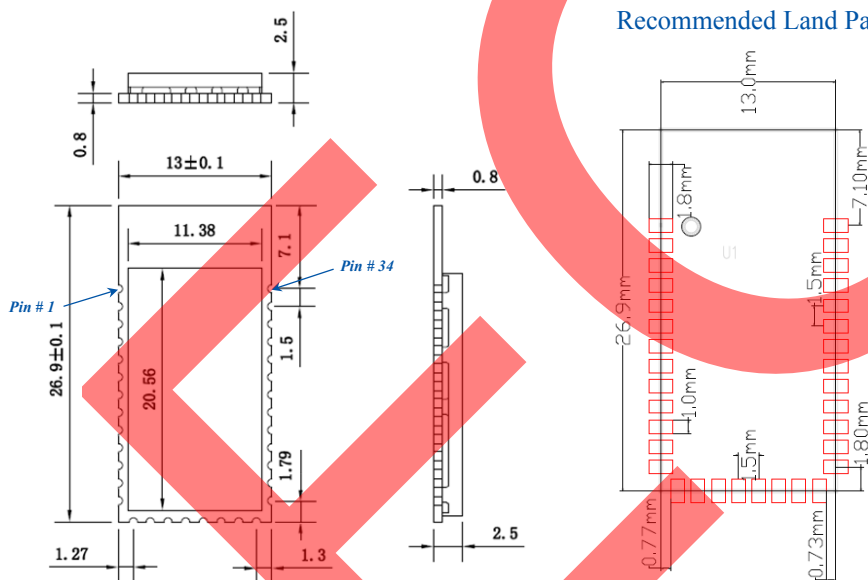
1. After Power on 3V3, the module is connectable and Pairing
2. ABBTM-2.4GHz-T can be found with the name “ABBTM” via any Bluetooth device
3. Input the Pincode “0000”, you can pair with the module named “ABBTM”
4. Then the ABBTM can be connected
5. Data can be transferred between the ABBTM and any other Bluetooth device

## State Indicator

- a) Connectable and discoverable LED: 100mS High Level per 2S
- b) Connected LED: always on

## MECHANICAL DIMENSIONS

Recommended Land Pattern



| No. | Pin Name | No. | Pin Name | No. | Pin Name |
|-----|----------|-----|----------|-----|----------|
| 1   | UART-TX  | 13  | GND      | 25  | PIO (2)  |
| 2   | UART-RX  | 14  | GND      | 26  | PIO (3)  |
| 3   | UART-CTS | 15  | NC       | 27  | PIO (4)  |
| 4   | UART-RTS | 16  | SPI-CSB  | 28  | PIO (5)  |
| 5   | PCM-CLK  | 17  | SPI-MOSI | 29  | PIO (6)  |
| 6   | PCM-OUT  | 18  | SPI-MISO | 30  | PIO (7)  |
| 7   | PCM-IN   | 19  | SPI-CLK  | 31  | PIO (8)  |
| 8   | PCM-SYNC | 20  | NC       | 32  | PIO (9)  |
| 9   | AIO (0)  | 21  | GND      | 33  | PIO (10) |
| 10  | AIO (1)  | 22  | GND      | 34  | PIO (11) |
| 11  | RESET    | 23  | PIO (0)  |     |          |
| 12  | +3.3V    | 24  | PIO (1)  |     |          |

Note: Specified dimensions without tolerance are listed for reference purposes only.

Dimensions: mm.



# 26.9 x 13.0 x 2.5 mm SMT Bluetooth Module

ABBTM-2.4GHz-T

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26.9 x 13.0 x 2.5 mm SMT

## PIN DESCRIPTION

| Pin # | Name     | Type                                      | Function                                                                        |
|-------|----------|-------------------------------------------|---------------------------------------------------------------------------------|
| 1     | UART-TX  | CMOS Output                               | UART Data Output                                                                |
| 2     | UART-RX  | CMOS Input                                | UART Data Input                                                                 |
| 3     | UART-CTS | CMOS Input                                | UART Clear To Send Active Low                                                   |
| 4     | UART-RTS | CMOS Output                               | UART Request To Send Active Low                                                 |
| 5     | PCM-CLK  | Bi-directional                            | Synchronous Data Clock                                                          |
| 6     | PCM-OUT  | CMOS Output                               | Synchronous Data Output                                                         |
| 7     | PCM-IN   | CMOS Input                                | Synchronous Data Input                                                          |
| 8     | PCM-SYNC | Bi-directional                            | Synchronous Data Sync                                                           |
| 9     | AIO(0)   | Bi-directional                            | Programmable Input/Output Line                                                  |
| 10    | AIO(1)   | Bi-directional                            | Programmable Input/Output Line                                                  |
| 11    | RESETB   | CMOS Input                                | Reset if low. Input debounced so must be low for >5ms to cause a reset          |
| 12    | 3.3V     | POWER                                     | +3.3V Supply                                                                    |
| 13    | GND      | GND                                       | Ground                                                                          |
| 14    | GND      | GND                                       | Ground                                                                          |
| 15    | NC       | NC                                        |                                                                                 |
| 16    | SPI-CSB  | CMOS Input                                | Chip Select For Synchronous Serial Interface                                    |
| 17    | SPI-MOSI | CMOS Input                                | Serial Peripheral Interface Data Input                                          |
| 18    | SPI-MISO | CMOS Output                               | Serial Peripheral Interface Data Output                                         |
| 19    | SPI-CLK  | CMOS Input                                | Serial Peripheral Interface Clock                                               |
| 20    | NC       | NC                                        |                                                                                 |
| 21    | GND      | GND                                       | Ground                                                                          |
| 22    | GND      | GND                                       | Ground                                                                          |
| 23    | PIO(0)   | Bi-directional with programmable strength | Control output for external LNA (if fitted)                                     |
| 24    | PIO(1)   | Bi-directional with programmable strength | Control output for external PA (if fitted)                                      |
| 25    | PIO(2)   | Bi-directional                            | Programmable Input/Output Line                                                  |
| 26    | PIO(3)   | Bi-directional                            | Programmable Input/Output Line                                                  |
| 27    | PIO(4)   | Bi-directional with programmable strength | Programmable Input/Output Line or optional<br>BT_Priority/CH_Clk output for co- |
| 28    | PIO(5)   | Bi-directional with programmable strength | Programmable Input/Output Line or optional<br>BT_Active output for co-existence |
| 29    | PIO(6)   | Bi-directional with programmable strength | Programmable Input/Output Line or optional<br>WLAN_Active/Ch_Data input for co- |
| 30    | PIO(7)   | Bi-directional                            | Programmable Input/Output Line                                                  |
| 31    | PIO(8)   | Bi-directional                            | Programmable Input/Output Line                                                  |
| 32    | PIO(9)   | Bi-directional                            | Programmable Input/Output Line                                                  |
| 33    | PIO(10)  | Bi-directional                            | Programmable Input/Output Line                                                  |
| 34    | PIO(11)  | Bi-directional                            | Programmable Input/Output Line                                                  |





# 26.9 x 13.0 x 2.5 mm SMT Bluetooth Module

ABBTM-2.4GHz-T

FCC ID# A8RABBTM2-4G



RoHS  
Compliant



26.9 x 13.0 x 2.5 mm SMT

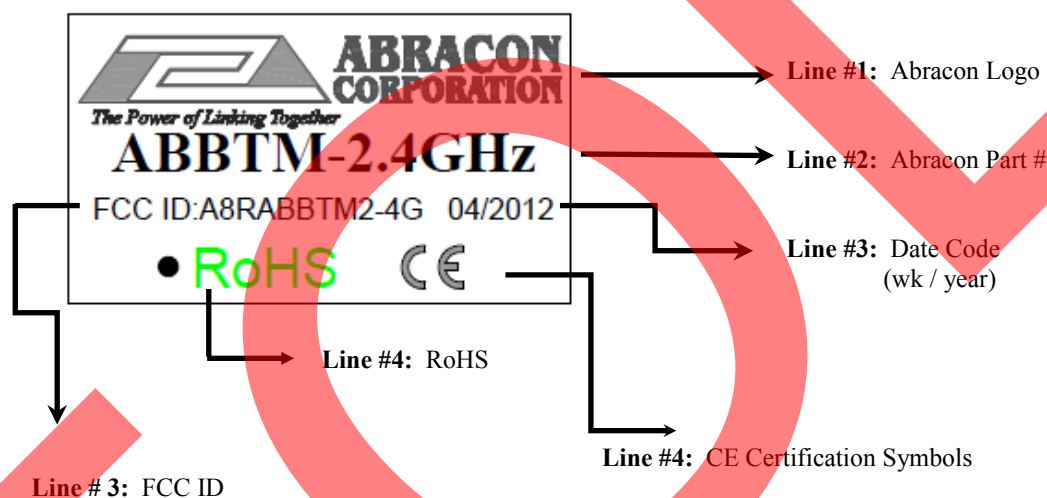
## PART IDENTIFICATION:

ABBTM-2.4GHz - ■ ■

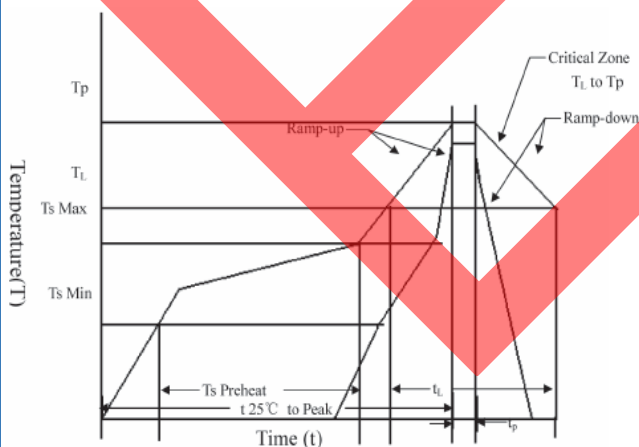
### Tape & Reel Options

|    |                    |
|----|--------------------|
| T  | 500 units per reel |
| T2 | 250 units per reel |

## MARKING



## REFLOW PROFILE



|                                                                  |                           |
|------------------------------------------------------------------|---------------------------|
| $T_s$ max to $T_l$ (Ramp-up Rate)                                | 3°C/second max.           |
| Preheat                                                          |                           |
| Temperature Min. ( $T_s$ Min.)                                   | 150°C                     |
| Temperature Typical ( $T_s$ Typ.)                                | 175°C                     |
| Temperature Max. ( $T_s$ Max.)                                   | 200°C                     |
| Time ( $t_s$ )                                                   | 60 ~ 180 seconds          |
| Ramp-up rate ( $T_l$ to $T_p$ )                                  | 3°C/second max.           |
| Time Maintained Above:<br>--Temperature ( $T_l$ )/Time ( $T_l$ ) | 217°C/60 ~ 150 seconds    |
| Peak Temperature ( $T_p$ )                                       | 250°C max. for 10 seconds |
| Target Peak Temperature ( $T_p$ Target)                          | 250°C +0/-5°C             |
| Time within 5°C of actual peak ( $t_p$ )                         | 20 ~ 40 seconds           |
| Ramp-down Rate                                                   | 6°C/second max.           |
| Tune 25°C to Peak Temperature (t)                                | 8 minutes max.            |



# 26.9 x 13.0 x 2.5 mm SMT Bluetooth Module

ABBTM-2.4GHz-T

FCC ID# A8RABBTM2-4G



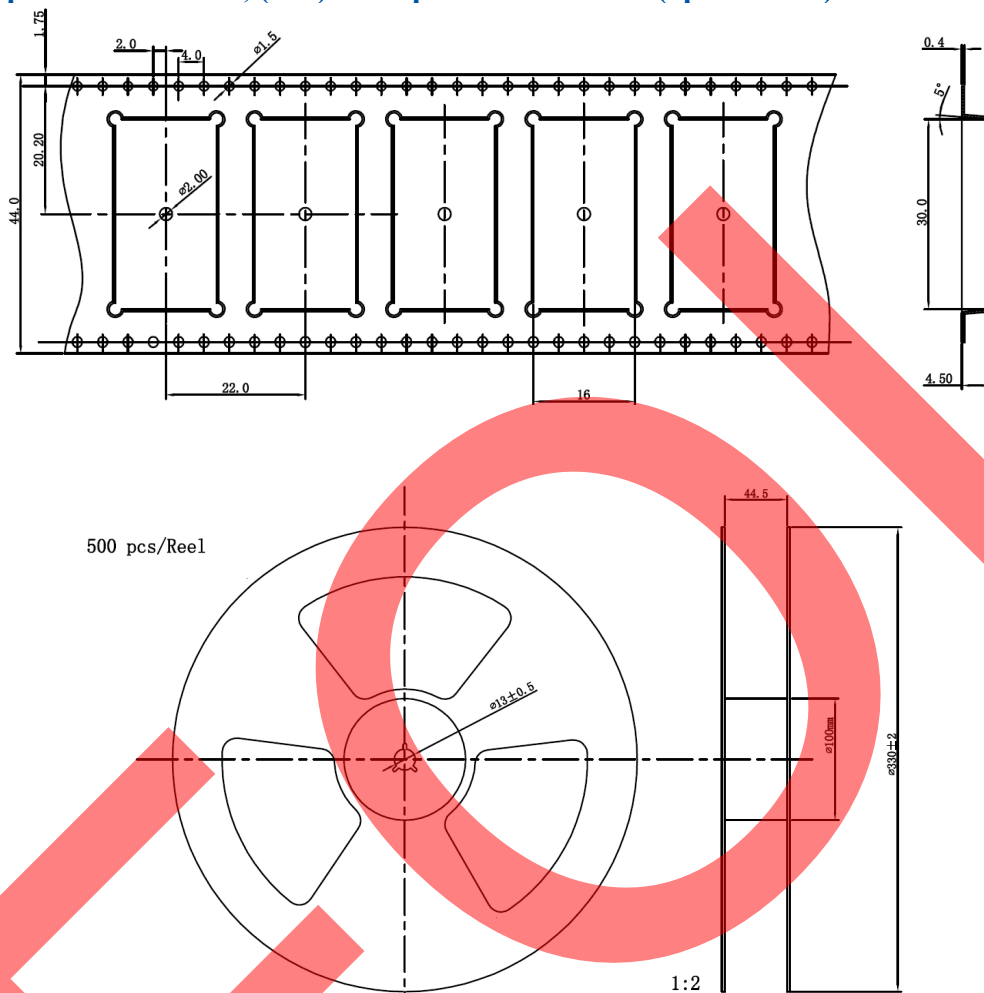
RoHS  
Compliant



26.9 x 13.0 x 2.5 mm SMT

## PACKAGING:

(500) units per reel standard, (250) units per reel available (option # T2)



- a) Unless otherwise specified, the tolerance is  $\pm 0.1$  mm
- b) The carrier tape material thickness is 0.4 mm
- c) Unless otherwise specified, the round corner is R0.3; the peeling angle is no greater than  $5^\circ$
- d) The finished products has no rough edges and no damage; cover tape should be sealed
- e) Material is ROHS compliant

## Packaging:

ABBTM-2.4GHz-T and ABBTM-2.4GHz-T2 devices will be packaged per MSL level-3 requirements; Labeled as MSL 3, Tape-Packed + Vacuum-Packed with Antistatic bag, Desiccant, Humidity Indicator Card (HIC). Ref: IPC/JEDEC J-STD-033B.1

**ATTENTION:** Abracon Corporation's products are COTS – Commercial-Off-The-Shelf products; suitable for Commercial, Industrial and, where designated, Automotive Applications. Abracon's products are not specifically designed for Military, Aviation, Aerospace, Life-dependant Medical applications or any application requiring high reliability where component failure could result in loss of life and/or property. For applications requiring high reliability and/or presenting an extreme operating environment, written consent and authorization from Abracon Corporation is required. Please contact Abracon Corporation for more information.

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Revised: 01.14.15