RS9116 ABx Certification, Ordering, and Packaging Datasheet Addendum

This document is an Addendum to the RS9116 Data Sheet AB0 and AB1 modules and is used for the Compliance and Certification Standards of model numbers M7DB6 and M7DB. The M7DB6 module is silicon revision 1.3, while the M7DB is silicon revision 1.4. The document highlights the FCC, IC, CE, MIC, and UKCA statements required for certification purposes. The document also describes the qualified antenna types based on the latest Regulatory Certification standards.

The document also mentions the modules' Ordering and Packaging Information.

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1 RS9116 ABx Certification, Ordering and Packaging Information

1.1 Certification Information

This section will outline the regulatory certification information for the RS9116 modules for the countries listed below. This information will be updated when available.

1. United States
2. Canada
3. Europe
4. Japan
5. United Kingdom
6. Other Regulatory Jurisdictions

The RS9116 Dual band AB0 and AB1 modules from Silicon Labs have undergone modular certification for FCC, IC, MIC, CE/ETSI (including EN 300 328 v2.2.2), and UKCA. Note that any changes to the module's configuration, including (but not limited to) the programming values of the RF Transceiver and Baseband, can cause the performance to change beyond the scope of the certification. These changes, if made, may result in the module having to be certified afresh. The table below lists the details of the regulatory certifications. The certification for geographies not listed in the table is in progress.

1.2 Compliance and Certification

M7DB6 and M7DB modules are FCC/IC/CE/MIC/UKCA certified. This section outlines the regulatory information for the M7DB6/M7DB modules. This allows for integrating the modules into an end product without the need to obtain subsequent and separate approvals from these regulatory agencies. This process is valid if no other intentional or unintentional radiator components are incorporated into the product and no change in the module circuitry. Without these certifications, an end product cannot be marketed in the relevant regions.

- RF Testing Software is provided for any end-product certification requirements.

1.2.1 Federal Communication Commission Statement

Any changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

Note:

This equipment was tested and complied with the limits for a Class B digital device, according 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.

Suppose this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on. In that case, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

1.2.1.1 RF Exposure Statements

1. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2. This equipment complies with the set FCC RF radiation exposure limits for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body or nearby persons.

For a host using a certified modular with a standard fixed label, if (1) the module's FCC ID is not visible when installed in the host, or (2) if the host is marketed so that end users do not have straightforward, commonly used methods for access to remove the module so that the FCC ID of the module is visible; then an additional permanent label referring to the enclosed module should be used. For the M7DB6 module, "Contains Transmitter Module FCC ID: XF6-M7DB6" or "Contains FCC ID: XF6-M7DB6" must be used; for the M7DB module, "Contains Transmitter Module FCC ID: XF6-M7DB7" or "Contains FCC ID: XF6-M7DB7" must be used. The host OEM user manual must also contain clear instructions on how end users can find and/or access the module and the FCC ID.

1.2.1.2 Labeling and User Information

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.

1.2.2 Industry Canada/ISED Statement

This product meets the applicable Innovation, Science, and Economic Development Canada technical specifications. Ce produit repond aux specifications techniques applicables a l'innovation, Science et Developpement economique Canada.

1.2.2.1 Radiation Exposure Statement

This equipment complies with the set IC radiation exposure limits for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.
Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilize avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

This device complies with Industry Canada license-exempt RSSs. 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 present appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisee aux deux conditions suivantes:

1. l'appareil ne doit pas produire de brouillage;
2. l'utilisateur de l'appareil doit accepter tout brouillage radioelectrique subi, meme si le brouillage est susceptible d'en compromettre le fonctionnement.

1.2.2.2 Labeling and User Information

Innovation, Science and Economic Development Canada ICES003 Compliance Label: *CAN ICES-3 (B)/NMB-3(B)*

The M7DB6 and M7DB modules have been labeled with their own IC ID number (8407A-M7DB6 and 8407A-M7DB7). Suppose the IC ID is not visible when the module is installed inside another device. In that case, the outside of the finished product into which the module is installed, must also display a label referring to the enclosed module. This exterior label can use the following wording: For M7DB6 modules, Contains Transmitter Module IC ID: 8407A-M7DB6 or Contains IC ID: 8407A-M7DB6. For M7DB modules, Contains Transmitter Module IC ID: 8407A-M7DB7 or Contains IC ID: 8407A-M7DB7. User manuals for license-exempt radio apparatus shall contain the statement as mentioned above or equivalent notice in a conspicuous location in the user manual, alternatively on the device, or both.

Warning:

1. The device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems.
2. For devices with detachable antenna(s), the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall be such that the equipment still complies with the e.i.r.p. limit.
3. For devices with detachable antenna(s), the maximum antenna gain permitted for devices in the band 5725-5850 MHz shall be such that the equipment still complies with the e.i.r.p. limits specified for point-to-point and non-point-to-point operation as appropriate; and

   The high-power radars are allocated as primary users (i.e., priority users) of the bands 5250-5350 MHz and 5650-5850 MHz, and these radars could cause interference and/or damage to LE-LAN devices.

   DFS (Dynamic Frequency Selection) products operate in the 5250- 5350 MHz, 5470-5600MHz, and 5650-5725MHz bands.

   This device cannot transmit in the band 5600-5650 MHz in Canada.

Avertissement:

1. Le dispositif fonctionnant dans la bande 5150-5250 MHz est réservé uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;
2. Le gain maximal d'antenne permis pour les dispositifs avec antenne(s) amovible(s) utilisant les bandes 5250-5350 MHz et 5470-5725 MHz doit se conformer à la imitation P.I.R.E.
3. Le gain maximal d'antenne permis pour les dispositifs avec antenne(s) amovible(s) utilisant la bande 5725-5850 MHz doit se conformer à la limitation P.I.R.E spécifiée pour l'exploitation point à point et non-point à point, selon le cas.

   En outre, les utilisateurs devraient aussi être avisés que les utilisateurs de radars de haute puissance sont désignés utilisateurs principaux (c.-à-d., qu'ils ont la priorité) pour les bandes 5250-5350 MHz et 5650-5850 MHz et que ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN-EL.

   Les produits utilisant la technique d'atténuation DFS (sélection dynamique des réquences) sur les bandes 5250-5350 MHz, 5470-5600MHz et 5650-5725MHz.

   Cet appareil ne peut pas émettre dans la bande 5600-5650 MHz au Canada.

1.2.3 CE

The modules conform with the essential requirements and other relevant requirements of the R&TTE Directive (1999/5/EC) for M7DB6 and RE Directive 2014/53/EU for M7DB. The product conforms with the following standards and/or normative documents.

- EMC EN 301 489 – 1 V2.2.3(2019-11) & EN 301 489 – 17 V3.2.4 (2020-09)
- Radiated emissions EN 300 328 V2.2.2 (2019-07)
- Safety standards: IEC62368 – 1:2014(Second Edition & EN62368 – 1:2014 / A11:2017

1.2.4 MIC

Telefication, operating as Conformity Assessment Body (CAB ID Number:201 and 211) with respect to Japan, declares that the M7DB6 and M7DB comply with Technical Regulations Conformity Certification of Specified Radio equipment (ordinance of MPT N^{o} 37,1981)

- The validity of this certificate is limited to products that are equal to the one examined in the type-examination
- When the manufacturer (or holder of this certificate) places the product on the Japanese market, the product must be affixed with the following Specified Radio Equipment marking R201-190292 for M7DB6 and R211-210212 for M7DB.

1.2.5 Qualified Antenna Types

This device has been designed to operate with the antennas listed below. Antennas not included in this list or having a gain greater than the listed gains in each region are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

Any antenna that is of the same type and of equal or less directional gain can be used without a need for retesting. 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 permitted for successful communication. Using an antenna of a different type or gain more than the certified gain will require additional testing.

1.2.5.1 M7DB6

Brand	Antenna Model	Antenna Type	Gain		Qualified Region
			2.4 GHz	5 GHz	
Taoglas	GW.71.5153	Dipole Antenna	3.8 dBi (Bent) 3.3 dBi (Straight)	5.5 dBi (Bent) 4.9 dBi (Straight)	FCC/IC, MIC

Table 1. Qualified Antenna List for M7DB6

1.2.5.2 M7DB

Brand	Antenna Model	Antenna Type	Gain		Qualified Region
			2.4 GHz	5 GHz	
Taoglas	GW.71.5153	Dipole Antenna	3.8 dBi (Bent) 3.3 dBi (Straight)	5.5 dBi (Bent) 4.9 dBi (Straight)	FCC/IC, CE, MIC, UKCA
Smarteq	4211613980	PIFA	0 dBi	2.0 dBi	FCC/IC, CE, MIC, UKCA
Inside WLAN	PRO-IS-299	Dipole	2.5 dBi	1.6 dBi	FCC/IC, CE, MIC, UKCA
Joinsoon Electronics Mfg. Co., Ltd	MARS-31A8 Wi-Fi Antenna	PIFA	2.0 dBi	2.0 dBi	FCC/IC, CE, MIC, UKCA

Table 2. Qualified Antenna List for M7DB

Note:

PCB Trace Antenna is also certified in the AB1 module (models M7DB6 & M7DB) for FCC/IC, CE, MIC, and UKCA. PCB Trace Antenna details are below.

Brand: Silicon Labs
Antenna Model : RSIA7
Gain : 2.4GHz = 0.712 dBi, 5GHz = 1.25 dBi

1.3 Ordering Information

Part Number	Wireless and Memory	Package
Hosted Connectivity (n-Link)		
RS9116N-DB00-AB0-B00	DBW+BT5; Rev 1.4 Silicon	100 pcs cut tape
RS9116N-DB00-AB0-B00R	DBW+BT5; Rev 1.4 Silicon	1000 pcs reel
Embedded Connectivity (WiSeConnect)		
RS9116W-DB00-AB0-B2A	DBW+BT5; Rev 1.4 Silicon; Firmware Version: 2.0 to 2.4	100 pcs cut tape
RS9116W-DB00-AB0-B2AR	DBW+BT5; Rev 1.4 Silicon; Firmware Version: 2.0 to 2.4	1000 pcs reel
RS9116W-DB00-AB0-B2B	DBW+BT5; Rev 1.4 Silicon; Firmware Version: 2.5 or higher	100 pcs cut tape
RS9116W-DB00-AB0-B2BR	DBW+BT5; Rev 1.4 Silicon; Firmware Version: 2.5 or higher	1000 pcs reel

Table 3. Part Ordering Options for AB0

Part Number	Wireless and Memory	Package
Hosted Connectivity (n-Link)		
RS9116N-DB00-AB1-B00	DBW+BT5; Rev 1.4 Silicon	100 pcs cut tape
RS9116N-DB00-AB1-B00R	DBW+BT5; Rev 1.4 Silicon	800 pcs reel
Embedded Connectivity (WiSeConnect)		
RS9116W-DB00-AB1-B2A	DBW+BT5; Rev 1.4 Silicon; Firmware Version: 2.0 to 2.4	100 pcs cut tape
RS9116W-DB00-AB1-B2AR	DBW+BT5; Rev 1.4 Silicon; Firmware Version: 2.0 to 2.4	800 pcs reel
RS9116W-DB00-AB1-B2B	DBW+BT5; Rev 1.4 Silicon; Firmware Version: 2.5 or higher	100 pcs cut tape
RS9116W-DB00-AB1-B2BR	DBW+BT5; Rev 1.4 Silicon; Firmware Version: 2.5 or higher	800 pcs reel

Table 4. Part Ordering Options for AB1

Note:

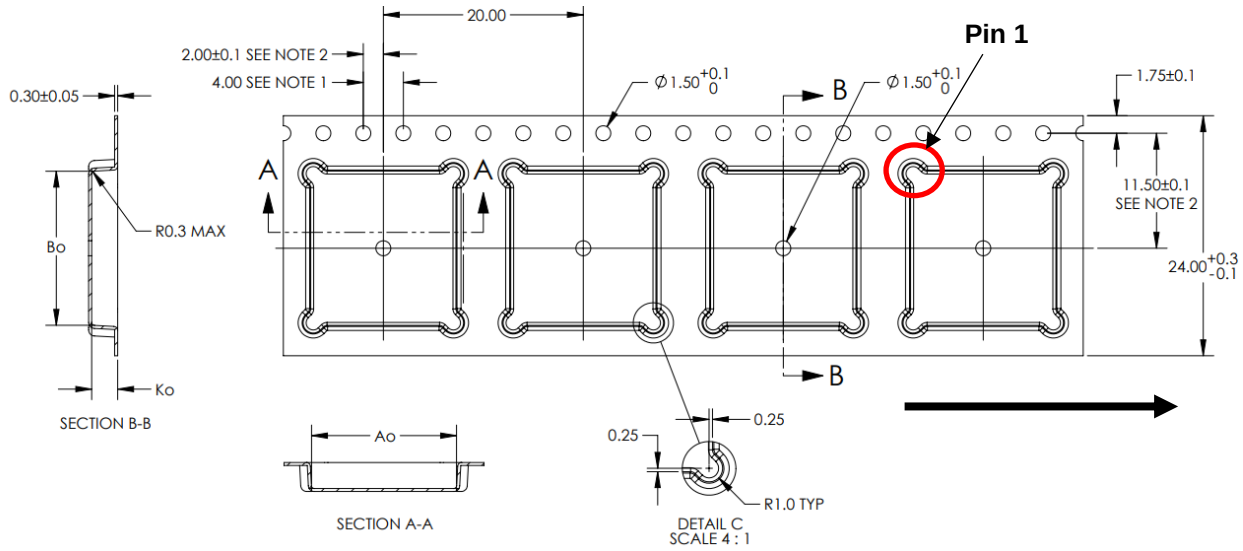
- The above WiSeConnect parts are considered MIC certified if they are updated to Firmware Version 2.5 or higher.
- The above n-Link part is considered MIC certified if loaded with driver version 2.5.1 or higher.
- DBW: Dual Band Wi-Fi (2.4/5 GHz)
- Customers should include provisions for programming or updating the firmware at manufacturing.

1.4 Packaging Information

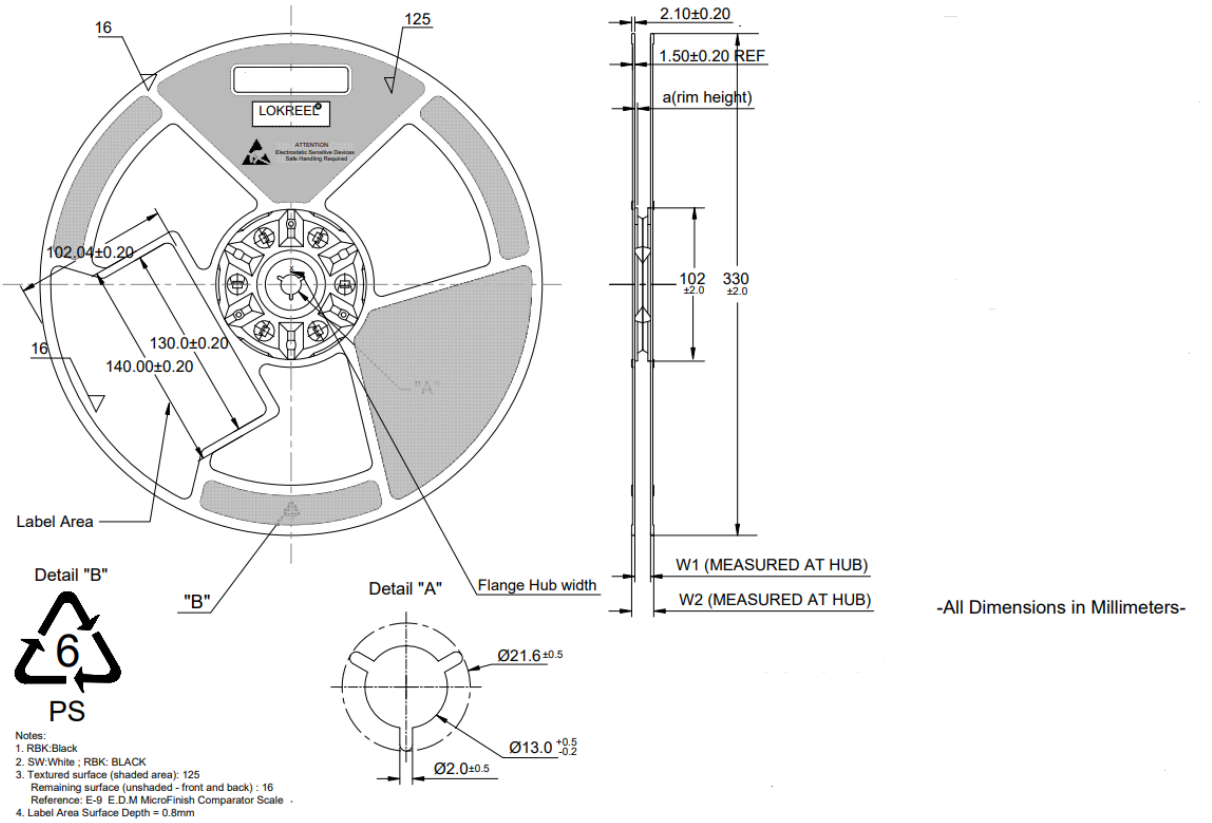
1.4.1 RS9116x-xxxx-AB0-xxx

The modules are packaged and shipped in reel.

Tape and Reel RS9116x-xxxx-AB0-xxx modules are delivered to the customer in cut tape (100 pcs) or reel (1000 pcs) packing with the dimensions below. All dimensions are given in mm unless otherwise indicated. Pin 1 is found in Quadrant 1 (upper left side of carrier) with respect to the direction of feed indicated by the arrow in the figure.



	DIM	+/-
Ao	14.40	0.10
Bo	15.40	0.10
Ko	2.60	0.10

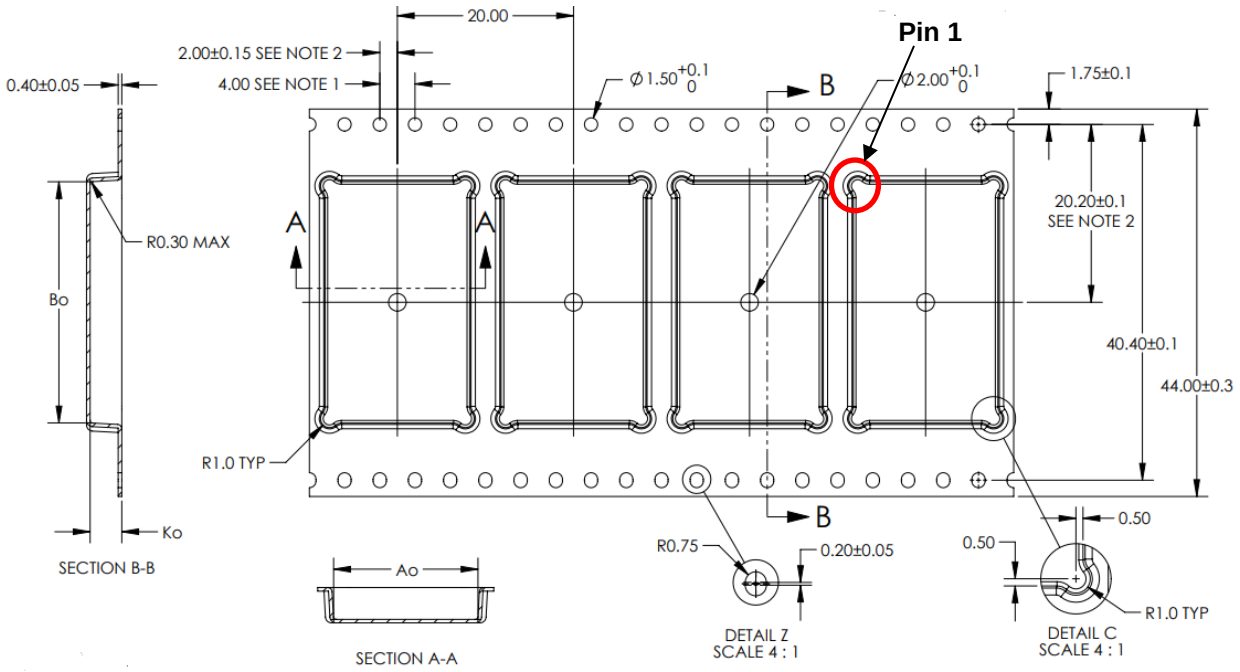


Assembled Hub Width	W1	W2 MAX
24mm	24.8mm +1.6/-0.4	30.4mm

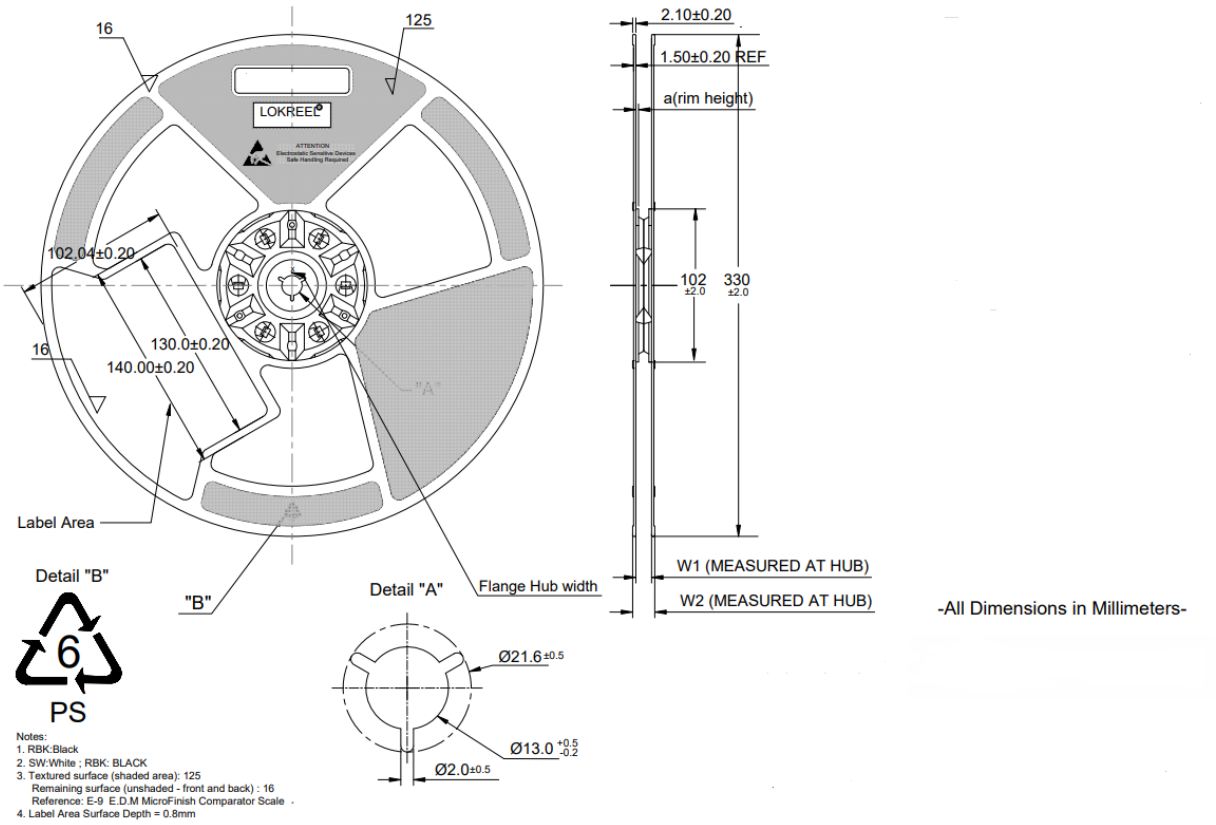
1.4.2 RS9116x-xxxx-AB1-xxx

The modules are packaged and shipped in reel.

Tape and Reel RS9116x-xxxx-AB1-xxxmodules are delivered to the customer in cut tape (100 pcs) or reel (800 pcs) packing with the dimensions below. All dimensions are given in mm unless otherwise indicated. Pin 1 is found in Quadrant 1 (upper left side of carrier) with respect to the direction of feed indicated by the arrow in the figure.



	DIM	+/-
Ao	16.40	0.10
Bo	27.40	0.10
Ko	3.60	0.10



Assembled Hub Width	W1	W2 MAX
44mm	44.8mm +1.6/ -0.4	50.4mm

2 RS9116 ABx Datasheet Addendum Revision History

Rev No	Ver No	Date	Changes
1	1.0	November 2022	• Initial version
2	1.1	December 2022	• Added UKCA certification details
3	1.2	December 2023	• Updated Section 1.3. Ordering Information • Added Section 1.4. Packaging Information • Replaced Telec with MIC in all relevant sections

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