



**RF360**  
**Europe GmbH**

## **SAW components**

### **SAW duplexer**

Small cell & femtocell  
LTE band 7

|                |                   |
|----------------|-------------------|
| Series/type:   | B8043             |
| Ordering code: | B39272B8043P810   |
| Date:          | November 24, 2017 |
| Version:       | 2.3               |

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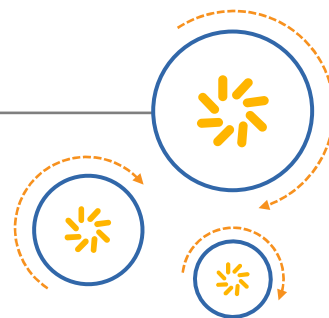
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## SAW components

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|                |                 |
|----------------|-----------------|
| SAW components | B8043           |
| SAW duplexer   | 2535 / 2655 MHz |

Data sheet

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## SAW components

B8043

## SAW duplexer

2535 / 2655 MHz

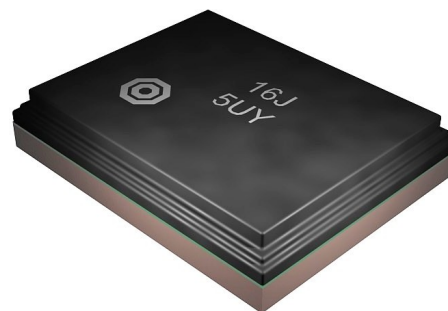
Data sheet

## 1 Application

- Low-loss SAW duplexer for 3G/LTE small cell and femtocell systems (band 7)
- Low insertion attenuation
- Usable pass band 70 MHz
- High isolation between TX and RX
- RX = uplink = 2500-2570 MHz
- TX = downlink = 2620-2690 MHz

## 2 Features

- Industrial grade qualified family
- Package size  $2.5 \pm 0.1 \text{ mm} \times 2.0 \pm 0.1 \text{ mm}$
- Package height 0.5 mm (max.)
- Approximate weight 0.01 g
- RoHS compatible
- Package for Surface Mount Technology (SMT)
- Ni/Au-plated terminals
- Electrostatic Sensitive Device (ESD)
- Moisture Sensitivity Level 2a (MSL2a)



**Figure 1:** Picture of component with example of product marking.

## SAW components

B8043

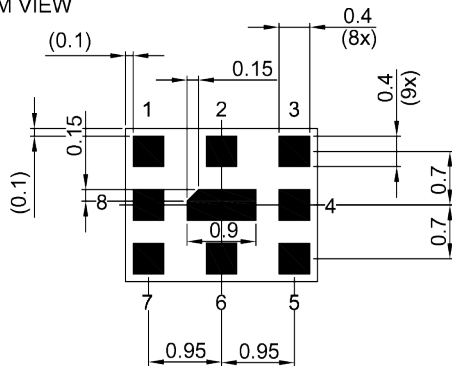
## SAW duplexer

2535 / 2655 MHz

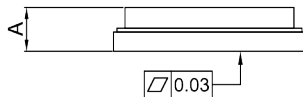
## Data sheet

## 3 Package

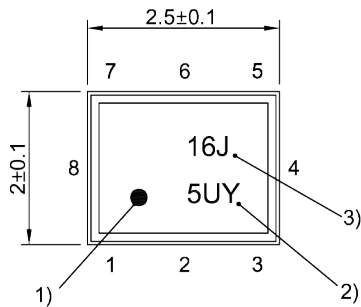
BOTTOM VIEW

Pad and pitch tolerance  $\pm 0.05$ 

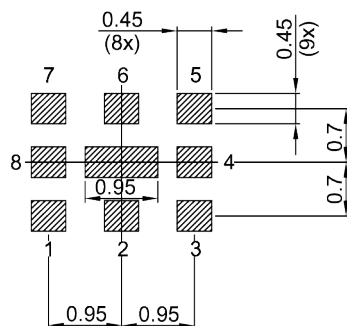
SIDE VIEW



TOP VIEW



- 1) Marking for pad number 1
- 2) Example of encoded lot number
- 3) Example of encoded filter type number

Land pattern  
THRU VIEWLanding pad tolerance  $-0.02$ 

**Figure 2:** Drawing of package with package height  $A = 0.5$  mm (max.). See Sec. Package information (p. 28).

## 4 Pin configuration

- 1 TX
- 3 RX
- 6 ANT
- 2, 4, 5, 7, 8, 9 Ground

## SAW components

B8043

## SAW duplexer

2535 / 2655 MHz

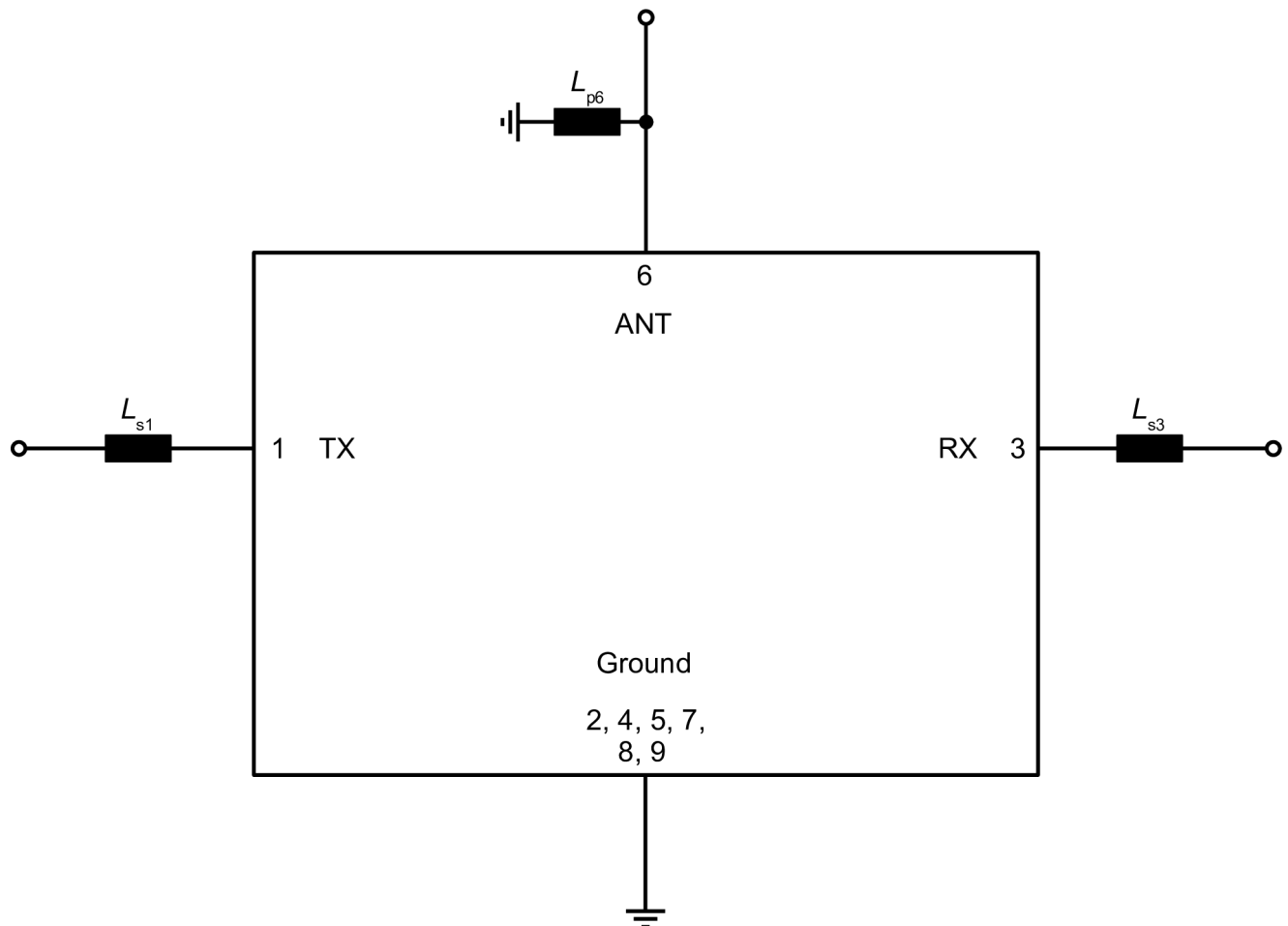
Data sheet

## 5 Matching circuit

$$\blacksquare L_{p6} = 3.3 \text{ nH}$$

$$\blacksquare L_{s3} = 0.8 \text{ nH}$$

$$\blacksquare L_{s1} = 0.5 \text{ nH}$$

**Figure 3:** Schematic of matching circuit.



## SAW components

B8043

## SAW duplexer

2535 / 2655 MHz

## Data sheet

## 6 Characteristics

## 6.1 ANT – TX

Temperature range for specification

 $T_{\text{SPEC}}$  = -10 °C ... +85 °C

TX terminating impedance

 $Z_{\text{TX}}$  = 50  $\Omega$  with ser. 0.5 nH<sup>1)</sup>

ANT terminating impedance

 $Z_{\text{ANT}}$  = 50  $\Omega$  with par. 3.3 nH<sup>1)</sup>

RX terminating impedance

 $Z_{\text{RX}}$  = 50  $\Omega$  with ser. 0.8 nH<sup>1)</sup>

| Characteristics ANT – TX       |   |     | min.<br>for $T_{\text{SPEC}}$ | typ.<br>@ +25 °C | max.<br>for $T_{\text{SPEC}}$ |     |
|--------------------------------|---|-----|-------------------------------|------------------|-------------------------------|-----|
| Center frequency               | $f_c$                                   |     | —                             | 2655             | —                             | MHz |
| Average insertion attenuation  | $\alpha_{\text{INT,avg}}$ <sup>2)</sup> |     |                               |                  |                               |     |
|                                | 2620 ... 2625                           | MHz | —                             | 1.9              | 2.8                           | dB  |
|                                | 2625 ... 2685                           | MHz | —                             | 1.7              | 2.5                           | dB  |
|                                | 2685 ... 2690                           | MHz | —                             | 1.7              | 2.8                           | dB  |
| Maximum insertion attenuation  | $\alpha_{\text{max}}$                   |     |                               |                  |                               |     |
|                                | 2620 ... 2690                           | MHz | —                             | 1.9              | 3.0                           | dB  |
| Amplitude ripple (p-p)         | $\Delta\alpha$                          |     |                               |                  |                               |     |
|                                | 2620 ... 2690                           | MHz | —                             | 0.6              | 2.0                           | dB  |
| Maximum VSWR                   | $\text{VSWR}_{\text{max}}$              |     |                               |                  |                               |     |
| @ TX port                      | 2620 ... 2690                           | MHz | —                             | 1.5              | 2.0                           |     |
| @ ANT port                     | 2620 ... 2690                           | MHz | —                             | 1.6              | 2.0                           |     |
| Maximum error vector magnitude | $\text{EVM}_{\text{max}}$ <sup>3)</sup> |     |                               |                  |                               |     |
|                                | 2622.4 ... 2687.6                       | MHz | —                             | 0.7              | 3.0                           | %   |
| Minimum attenuation            | $\alpha_{\text{min}}$                   |     |                               |                  |                               |     |
|                                | 100 ... 500                             | MHz | 50                            | 65               | —                             | dB  |
|                                | 500 ... 1710                            | MHz | 36                            | 46               | —                             | dB  |
|                                | 1710 ... 2400                           | MHz | 36                            | 45               | —                             | dB  |
|                                | 2400 ... 2500                           | MHz | 36                            | 49               | —                             | dB  |
|                                | 2500 ... 2570                           | MHz | 46                            | 53               | —                             | dB  |
|                                | 2715 ... 2750                           | MHz | 2.5                           | 7                | —                             | dB  |
|                                | 2750 ... 6000                           | MHz | 38                            | 50               | —                             | dB  |

<sup>1)</sup> See Sec. Matching circuit (p. 6).<sup>2)</sup> Integrated attenuation  $\alpha_{\text{INT}}$ : Averaged power  $|S_{ij}|^2$  over the center 4.5 MHz of LTE 5 MHz (25 RB) channels.<sup>3)</sup> Error Vector Magnitude (EVM) based on definition in 3GPP TS 25.141.

## SAW components

B8043

## SAW duplexer

2535 / 2655 MHz

## Data sheet

|                                     |            |  |
|-------------------------------------|------------|--|
| Temperature range for specification | $T_{SPEC}$ | = -40 °C ... +95 °C                          |
| TX terminating impedance            | $Z_{TX}$   | = 50 $\Omega$ with ser. 0.5 nH <sup>1)</sup> |
| ANT terminating impedance           | $Z_{ANT}$  | = 50 $\Omega$ with par. 3.3 nH <sup>1)</sup> |
| RX terminating impedance            | $Z_{RX}$   | = 50 $\Omega$ with ser. 0.8 nH <sup>1)</sup> |

| Characteristics ANT – TX              |                   |     | min.<br>for $T_{SPEC}$ | typ.<br>@ +25 °C | max.<br>for $T_{SPEC}$ |    |
|---------------------------------------|-------------------|-----|------------------------|------------------|------------------------|----|
| <b>Average insertion attenuation</b>  |                   |     |                        |                  |                        |    |
|                                       | 2620 ... 2625     | MHz | —                      | 1.9              | 3.3                    | dB |
|                                       | 2625 ... 2685     | MHz | —                      | 1.7              | 3.0                    | dB |
|                                       | 2685 ... 2690     | MHz | —                      | 1.7              | 3.3                    | dB |
| <b>Maximum insertion attenuation</b>  |                   |     |                        |                  |                        |    |
|                                       | 2620 ... 2690     | MHz | —                      | 1.9              | 3.8                    | dB |
| <b>Amplitude ripple (p-p)</b>         |                   |     |                        |                  |                        |    |
|                                       | 2620 ... 2690     | MHz | —                      | 0.6              | 2.8                    | dB |
| <b>Maximum VSWR</b>                   |                   |     |                        |                  |                        |    |
| @ TX port                             | 2620 ... 2690     | MHz | —                      | 1.5              | 2.5                    |    |
| @ ANT port                            | 2620 ... 2690     | MHz | —                      | 1.6              | 2.3                    |    |
| <b>Maximum error vector magnitude</b> |                   |     |                        |                  |                        |    |
|                                       | 2622.4 ... 2687.6 | MHz | —                      | 0.7              | 4.5                    | %  |
| <b>Minimum attenuation</b>            |                   |     |                        |                  |                        |    |
|                                       | 100 ... 500       | MHz | 50                     | 65               | —                      | dB |
|                                       | 500 ... 1710      | MHz | 36                     | 46               | —                      | dB |
|                                       | 1710 ... 2400     | MHz | 36                     | 45               | —                      | dB |
|                                       | 2400 ... 2500     | MHz | 36                     | 49               | —                      | dB |
|                                       | 2500 ... 2570     | MHz | 43                     | 53               | —                      | dB |
|                                       | 2715 ... 2750     | MHz | 1.5                    | 7                | —                      | dB |
|                                       | 2750 ... 6000     | MHz | 38                     | 50               | —                      | dB |

<sup>1)</sup> See Sec. Matching circuit (p. 6).

<sup>2)</sup> Integrated attenuation  $\alpha_{INT}$ : Averaged power  $|S_{ij}|^2$  over the center 4.5 MHz of LTE 5 MHz (25 RB) channels.

<sup>3)</sup> Error Vector Magnitude (EVM) based on definition in 3GPP TS 25.141.

## SAW components

B8043

## SAW duplexer

2535 / 2655 MHz

## Data sheet

## 6.2 RX – ANT

Temperature range for specification

 $T_{\text{SPEC}}$  = -10 °C ... +85 °C

TX terminating impedance

 $Z_{\text{TX}}$  = 50  $\Omega$  with ser. 0.5 nH<sup>1)</sup>

ANT terminating impedance

 $Z_{\text{ANT}}$  = 50  $\Omega$  with par. 3.3 nH<sup>1)</sup>

RX terminating impedance

 $Z_{\text{RX}}$  = 50  $\Omega$  with ser. 0.8 nH<sup>1)</sup>

| Characteristics RX – ANT       |                   |   |  | min.<br>for $T_{\text{SPEC}}$ | typ.<br>@ +25 °C | max.<br>for $T_{\text{SPEC}}$ |     |
|--------------------------------|-------------------|---|--|-------------------------------|------------------|-------------------------------|-----|
| Center frequency               |                   | $f_{\text{C}}$                          |  | —                             | 2535             | —                             | MHz |
| Average insertion attenuation  |                   | $\alpha_{\text{INT,avg}}$ <sup>2)</sup> |  | —                             |                  |                               |     |
|                                | 2500 ... 2505     | MHz                                     |  | —                             | 2.0              | 3.0                           | dB  |
|                                | 2505 ... 2565     | MHz                                     |  | —                             | 1.7              | 2.5                           | dB  |
|                                | 2565 ... 2570     | MHz                                     |  | —                             | 1.6              | 2.5                           | dB  |
| Maximum insertion attenuation  |                   | $\alpha_{\text{max}}$                   |  | —                             |                  |                               |     |
|                                | 2500 ... 2570     | MHz                                     |  | —                             | 2.1              | 2.8 <sup>3)</sup>             | dB  |
|                                | 2500 ... 2570     | MHz                                     |  | —                             | 2.1              | 3.3 <sup>4)</sup>             | dB  |
|                                | 2500 ... 2570     | MHz                                     |  | —                             | 2.1              | 3.7                           | dB  |
| Amplitude ripple (p-p)         |                   | $\Delta\alpha$                          |  | —                             |                  |                               |     |
|                                | 2500 ... 2570     | MHz                                     |  | —                             | 0.9              | 2.0 <sup>3)</sup>             | dB  |
|                                | 2500 ... 2570     | MHz                                     |  | —                             | 0.9              | 2.4 <sup>4)</sup>             | dB  |
|                                | 2500 ... 2570     | MHz                                     |  | —                             | 0.9              | 2.8                           | dB  |
| Maximum VSWR                   |                   | $\text{VSWR}_{\text{max}}$              |  | —                             |                  |                               |     |
| @ ANT port                     | 2500 ... 2570     | MHz                                     |  | —                             | 1.4              | 2.0                           |     |
| @ RX port                      | 2500 ... 2570     | MHz                                     |  | —                             | 1.5              | 2.0                           |     |
| Maximum error vector magnitude |                   | $\text{EVM}_{\text{max}}$ <sup>5)</sup> |  | —                             |                  |                               |     |
|                                | 2502.4 ... 2567.6 | MHz                                     |  | —                             | 0.8              | 4.0 <sup>3)</sup>             | %   |
|                                | 2502.4 ... 2567.6 | MHz                                     |  | —                             | 0.8              | 5.0                           | %   |
| Minimum attenuation            |                   | $\alpha_{\text{min}}$                   |  |                               |                  |                               |     |
|                                | 100 ... 500       | MHz                                     |  | 50                            | 58               | —                             | dB  |
|                                | 500 ... 1710      | MHz                                     |  | 31                            | 37               | —                             | dB  |
|                                | 1710 ... 2400     | MHz                                     |  | 30                            | 35               | —                             | dB  |
|                                | 2400 ... 2472     | MHz                                     |  | 39                            | 44               | —                             | dB  |
| Ch12                           | 2458.1 ... 2475.9 | MHz                                     | $\alpha_{\text{WLAN,min}}$ <sup>6)</sup> | 27                            | 45               | —                             | dB  |
| Ch13                           | 2463.1 ... 2480.9 | MHz                                     | $\alpha_{\text{WLAN,min}}$ <sup>6)</sup> | 14                            | 44               | —                             | dB  |
|                                | 2472 ... 2481     | MHz                                     | $\alpha_{\text{min}}$                    | 6                             | 41               | —                             | dB  |
|                                | 2620 ... 2690     | MHz                                     | $\alpha_{\text{min}}$                    | 46                            | 53               | —                             | dB  |
|                                | 2690 ... 5300     | MHz                                     | $\alpha_{\text{min}}$                    | 35                            | 39               | —                             | dB  |
|                                | 5300 ... 6000     | MHz                                     | $\alpha_{\text{min}}$                    | 32                            | 44               | —                             | dB  |

<sup>1)</sup> See Sec. Matching circuit (p. 6).

**SAW components****B8043****SAW duplexer****2535 / 2655 MHz**

## Data sheet

- 2) Integrated attenuation  $\alpha_{\text{INT}}$ : Averaged power  $|S_{ij}|^2$  over the center 4.5 MHz of LTE 5 MHz (25 RB) channels.
- 3) Valid for temperature  $T = +25\text{ °C} \dots +85\text{ °C}$ .
- 4) Valid for temperature  $T = 0\text{ °C} \dots +85\text{ °C}$ .
- 5) Error Vector Magnitude (EVM) based on definition in 3GPP TS 25.141.
- 6) Average over each WLAN channel with band width of 17.8 MHz.

## SAW components

B8043

## SAW duplexer

2535 / 2655 MHz

## Data sheet

|                                     |            |  |
|-------------------------------------|------------|--|
| Temperature range for specification | $T_{SPEC}$ | = -40 °C ... +95 °C                          |
| TX terminating impedance            | $Z_{TX}$   | = 50 $\Omega$ with ser. 0.5 nH <sup>1)</sup> |
| ANT terminating impedance           | $Z_{ANT}$  | = 50 $\Omega$ with par. 3.3 nH <sup>1)</sup> |
| RX terminating impedance            | $Z_{RX}$   | = 50 $\Omega$ with ser. 0.8 nH <sup>1)</sup> |

| Characteristics RX – ANT              |                   |                                  | min.<br>for $T_{SPEC}$            | typ.<br>@ +25 °C | max.<br>for $T_{SPEC}$ |      |
|---------------------------------------|-------------------|----------------------------------|-----------------------------------|------------------|------------------------|------|
| <b>Average insertion attenuation</b>  |                   |                                  |                                   |                  |                        |      |
|                                       |                   | $\alpha_{INT,avg}$ <sup>2)</sup> |                                   |                  |                        |      |
|                                       | 2500 ... 2505     | MHz                              | —                                 | 2.0              | 3.8                    | dB   |
|                                       | 2505 ... 2565     | MHz                              | —                                 | 1.7              | 3.0                    | dB   |
|                                       | 2565 ... 2570     | MHz                              | —                                 | 1.6              | 3.0                    | dB   |
| <b>Maximum insertion attenuation</b>  |                   |                                  |                                   |                  |                        |      |
|                                       | 2500 ... 2570     | MHz                              | —                                 | 2.1              | 4.7                    | dB   |
| <b>Amplitude ripple (p-p)</b>         |                   |                                  |                                   |                  |                        |      |
|                                       | 2500 ... 2570     | MHz                              | —                                 | 0.9              | 3.9                    | dB   |
| <b>Maximum VSWR</b>                   |                   |                                  |                                   |                  |                        |      |
|                                       |                   | VSWR <sub>max</sub>              |                                   |                  |                        |      |
| @ ANT port                            | 2500 ... 2570     | MHz                              | —                                 | 1.4              | 2.3                    |      |
| @ RX port                             | 2500 ... 2570     | MHz                              | —                                 | 1.5              | 2.3                    |      |
| <b>Maximum error vector magnitude</b> |                   |                                  |                                   |                  |                        |      |
|                                       |                   | EVM <sub>max</sub> <sup>3)</sup> |                                   |                  |                        |      |
|                                       | 2502.4 ... 2567.6 | MHz                              | —                                 | 0.8              | 8.0                    | %    |
| <b>Minimum attenuation</b>            |                   |                                  |                                   |                  |                        |      |
|                                       | 100 ... 500       | MHz                              | $\alpha_{min}$                    | 50               | 58                     | — dB |
|                                       | 500 ... 1710      | MHz                              | $\alpha_{min}$                    | 31               | 37                     | — dB |
|                                       | 1710 ... 2400     | MHz                              | $\alpha_{min}$                    | 30               | 35                     | — dB |
|                                       | 2400 ... 2472     | MHz                              | $\alpha_{min}$                    | 35               | 44                     | — dB |
| Ch12                                  | 2458.1 ... 2475.9 | MHz                              | $\alpha_{WLAN,min}$ <sup>4)</sup> | 25               | 45                     | — dB |
| Ch13                                  | 2463.1 ... 2480.9 | MHz                              | $\alpha_{WLAN,min}$ <sup>4)</sup> | 12               | 44                     | — dB |
|                                       | 2472 ... 2481     | MHz                              | $\alpha_{min}$                    | 5                | 41                     | — dB |
|                                       | 2620 ... 2690     | MHz                              | $\alpha_{min}$                    | 43               | 53                     | — dB |
|                                       | 2690 ... 5300     | MHz                              | $\alpha_{min}$                    | 35               | 39                     | — dB |
|                                       | 5300 ... 6000     | MHz                              | $\alpha_{min}$                    | 32               | 44                     | — dB |

<sup>1)</sup> See Sec. Matching circuit (p. 6).

<sup>2)</sup> Integrated attenuation  $\alpha_{INT}$ : Averaged power  $|S_{ij}|^2$  over the center 4.5 MHz of LTE 5 MHz (25 RB) channels.

<sup>3)</sup> Error Vector Magnitude (EVM) based on definition in 3GPP TS 25.141.

<sup>4)</sup> Average over each WLAN channel with band width of 17.8 MHz.

|                |                 |
|----------------|-----------------|
| SAW components | B8043           |
| SAW duplexer   | 2535 / 2655 MHz |

Data sheet

6.3 RX – TX

|                                     |            |  |
|-------------------------------------|------------|--|
| Temperature range for specification | $T_{SPEC}$ | = -10 °C ... +85 °C                          |
| TX terminating impedance            | $Z_{TX}$   | = 50 $\Omega$ with ser. 0.5 nH <sup>1)</sup> |
| ANT terminating impedance           | $Z_{ANT}$  | = 50 $\Omega$ with par. 3.3 nH <sup>1)</sup> |
| RX terminating impedance            | $Z_{RX}$   | = 50 $\Omega$ with ser. 0.8 nH <sup>1)</sup> |

| Characteristics RX – TX |                                  |     | min.<br>for $T_{SPEC}$ | typ.<br>@ +25 °C | max.<br>for $T_{SPEC}$ |    |
|-------------------------|----------------------------------|-----|------------------------|------------------|------------------------|----|
| Average isolation       | $\alpha_{INT,avg}$ <sup>2)</sup> |     |                        |                  |                        |    |
|                         | 2500 ... 2570                    | MHz | 50                     | 55               | —                      | dB |
|                         | 2620 ... 2690                    | MHz | 50                     | 56               | —                      | dB |
| Minimum isolation       | $\alpha_{min}$                   |     |                        |                  |                        |    |
|                         | 2500 ... 2570                    | MHz | 50                     | 55               | —                      | dB |
|                         | 2620 ... 2690                    | MHz | 50                     | 55               | —                      | dB |

1) See Sec. Matching circuit (p. 6).  
2) Integrated attenuation  $\alpha_{INT}$ : Averaged power  $|S_{ij}|^2$  over the center 4.5 MHz of LTE 5 MHz (25 RB) channels.

SAW components

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SAW duplexer

2535 / 2655 MHz

Data sheet

|                                     |            |  |
|-------------------------------------|------------|--|
| Temperature range for specification | $T_{SPEC}$ | = -40 °C ... +95 °C                          |
| TX terminating impedance            | $Z_{TX}$   | = 50 $\Omega$ with ser. 0.5 nH <sup>1)</sup> |
| ANT terminating impedance           | $Z_{ANT}$  | = 50 $\Omega$ with par. 3.3 nH <sup>1)</sup> |
| RX terminating impedance            | $Z_{RX}$   | = 50 $\Omega$ with ser. 0.8 nH <sup>1)</sup> |

| Characteristics RX – TX |                                  |     | min.<br>for $T_{SPEC}$ | typ.<br>@ +25 °C | max.<br>for $T_{SPEC}$ |    |
|-------------------------|----------------------------------|-----|------------------------|------------------|------------------------|----|
| Average isolation       | $\alpha_{INT,avg}$ <sup>2)</sup> |     |                        |                  |                        |    |
|                         |                                  |     |                        |                  |                        |    |
|                         | 2500 ... 2570                    | MHz | 50                     | 55               | —                      | dB |
|                         | 2620 ... 2690                    | MHz | 49                     | 56               | —                      | dB |
| Minimum isolation       | $\alpha_{min}$                   |     |                        |                  |                        |    |
|                         |                                  |     |                        |                  |                        |    |
|                         | 2500 ... 2570                    | MHz | 48                     | 55               | —                      | dB |
|                         | 2620 ... 2690                    | MHz | 48                     | 55               | —                      | dB |

1) See Sec. Matching circuit (p. 6).

2) Integrated attenuation  $\alpha_{INT}$ : Averaged power  $|S_{ij}|^2$  over the center 4.5 MHz of LTE 5 MHz (25 RB) channels.

## SAW components

B8043

## SAW duplexer

2535 / 2655 MHz

## Data sheet

## 7 Maximum ratings

|  |  |   |
|--|--|---|
| Operable temperature   | $T_{OP} = -40\text{ °C} \dots +95\text{ °C}$       |   |
| Storage temperature  | $T_{STG}^{1)} = -40\text{ °C} \dots +95\text{ °C}$ |   |
| DC voltage   | $ V_{DC} ^{2)} = 0\text{ V}$                       |   |
| ESD voltage  |  |   |
|  | $V_{ESD}^{3)} = 200\text{ V}$                      | Machine model.  |
|  | $V_{ESD}^{4)} = 400\text{ V}$                      | Human body model.   |
| Input power  | $P_{IN}$   |   |
| @ TX port: 2620 ... 2690 MHz   | 28 dBm <sup>6), 7)</sup>                           | $P_{IN}$ 28 dBm average -<br>39dBm peak<br>LTE 5 MHz downlink for<br>100000 h @ 55 °C. Source<br>and load impedance 50 Ω. |
| @ RX port: 2500 ... 2570 MHz   | 24 dBm <sup>5)</sup>                               | LTE 5 MHz uplink for<br>100000 h @ 55 °C. Source<br>and load impedance 50 Ω.  |
| Operating lifetime with output power at antenna<br>2620 ... 2690 MHz | $P_{OUT}^{8)} = 24\text{ dBm}$                     | Continuous wave for<br>100000 h @ 55 °C. Source<br>and load impedance 50 Ω.   |

<sup>1)</sup> Not valid for packaging material. Storage temperature for packaging material is -25 °C to +40 °C.

<sup>2)</sup> In case of applied DC voltage blocking capacitors are mandatory.

<sup>3)</sup> According to JESD22-A115B (MM – Machine Model), 10 negative & 10 positive pulses.

<sup>4)</sup> According to JESD22-A114F (HBM – Human Body Model), 1 negative & 1 positive pulse.

<sup>5)</sup> Expected lifetime according to power durability simulations and wear out models.

<sup>6)</sup> Expected lifetime according to accelerated power durability test and wear out models.

<sup>7)</sup>  $T_{SPEC}$  is the ambient temperature of the PCB at component position. Specified min./max values from section 6

"characteristics" for maximum input power 28dBm are valid for temperature up to 80°C.

<sup>8)</sup> According to accelerated high temperature operating life (HTOL) test.



## Data sheet

## 8 Transmission coefficients

## 8.1 ANT – TX

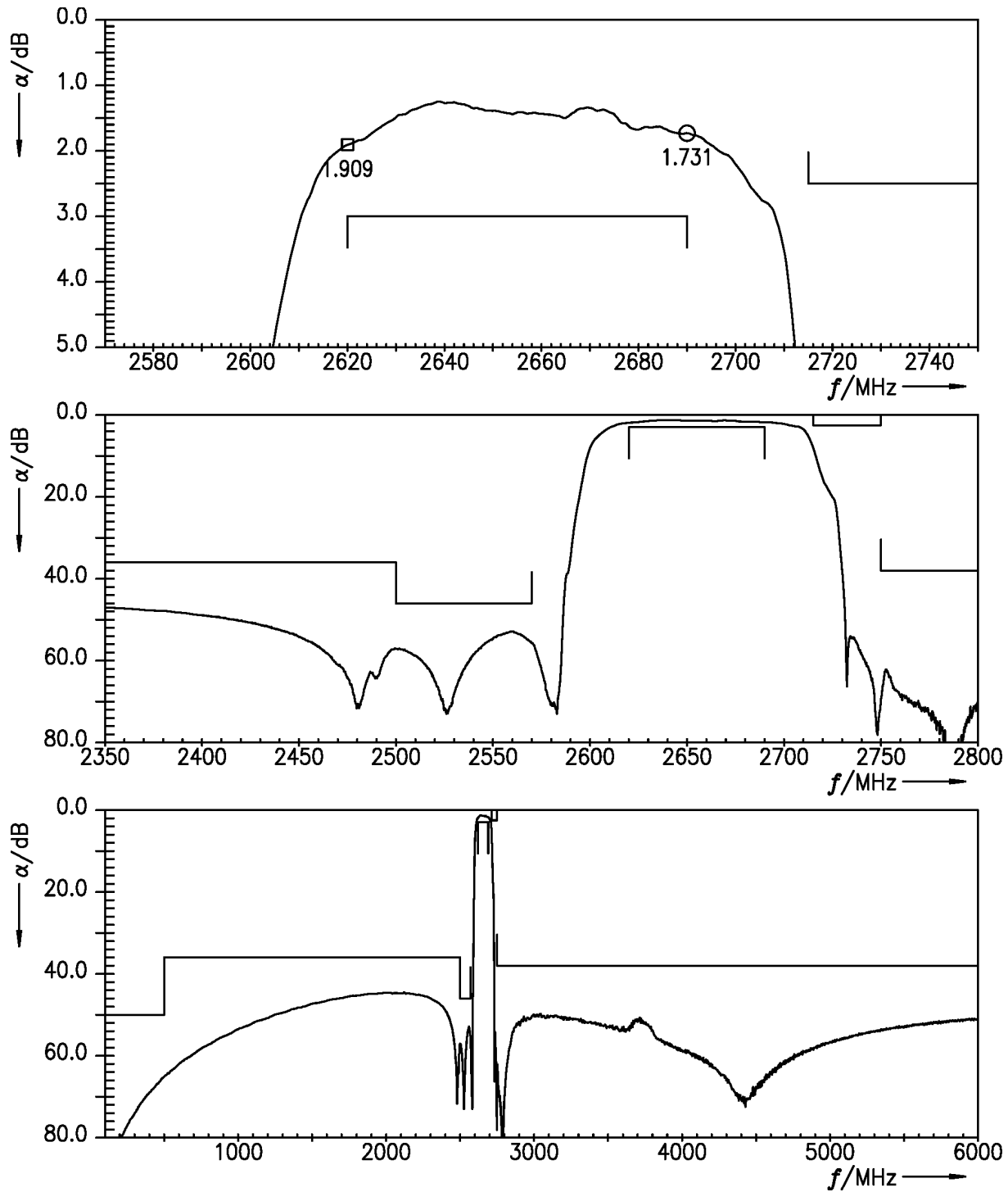


Figure 4: Attenuation ANT – TX.

## Data sheet

## 8.2 RX – ANT

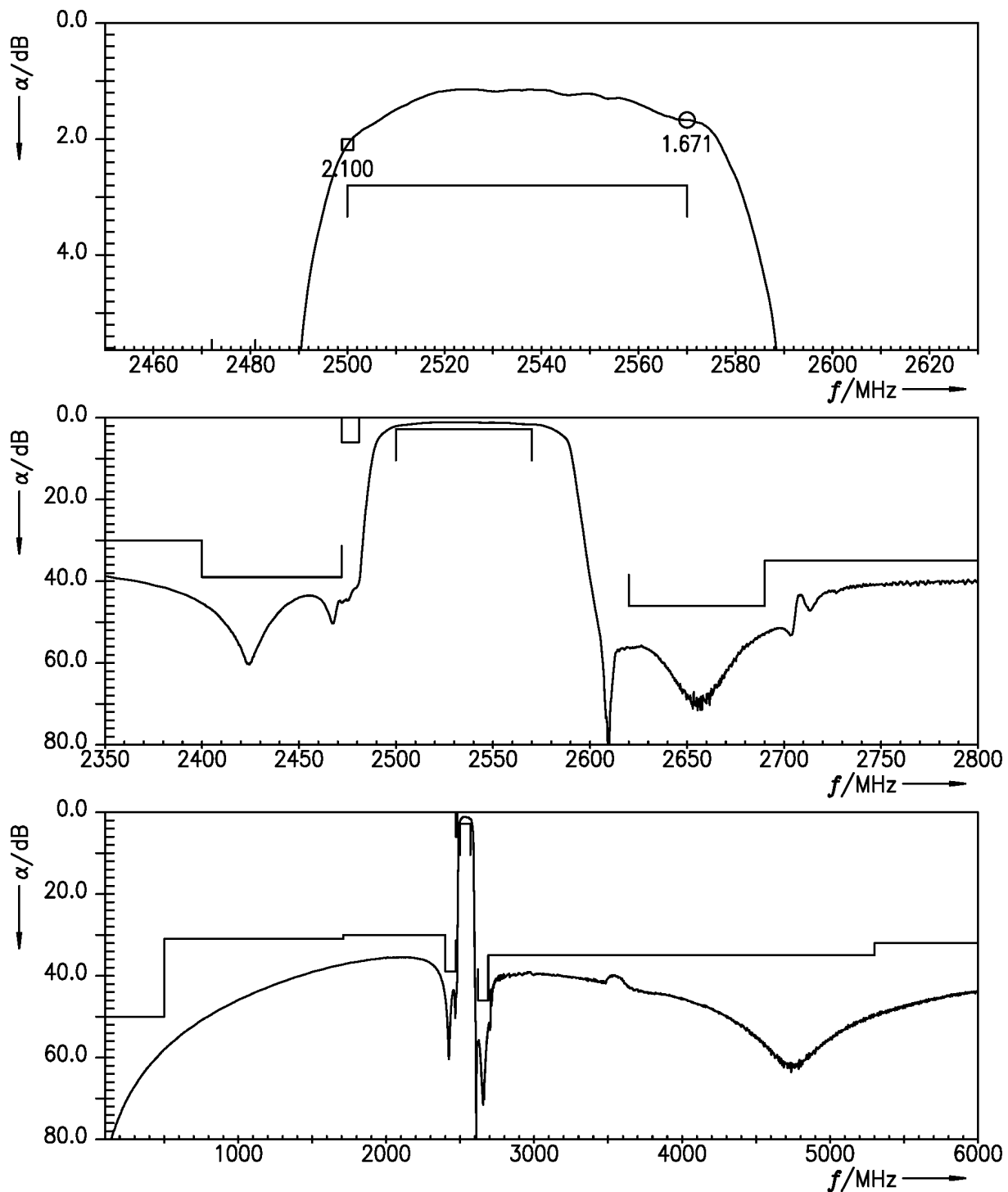


Figure 5: Attenuation RX – ANT.

|                |                 |
|----------------|-----------------|
| SAW components | B8043           |
| SAW duplexer   | 2535 / 2655 MHz |

Data sheet

8.3 RX – TX

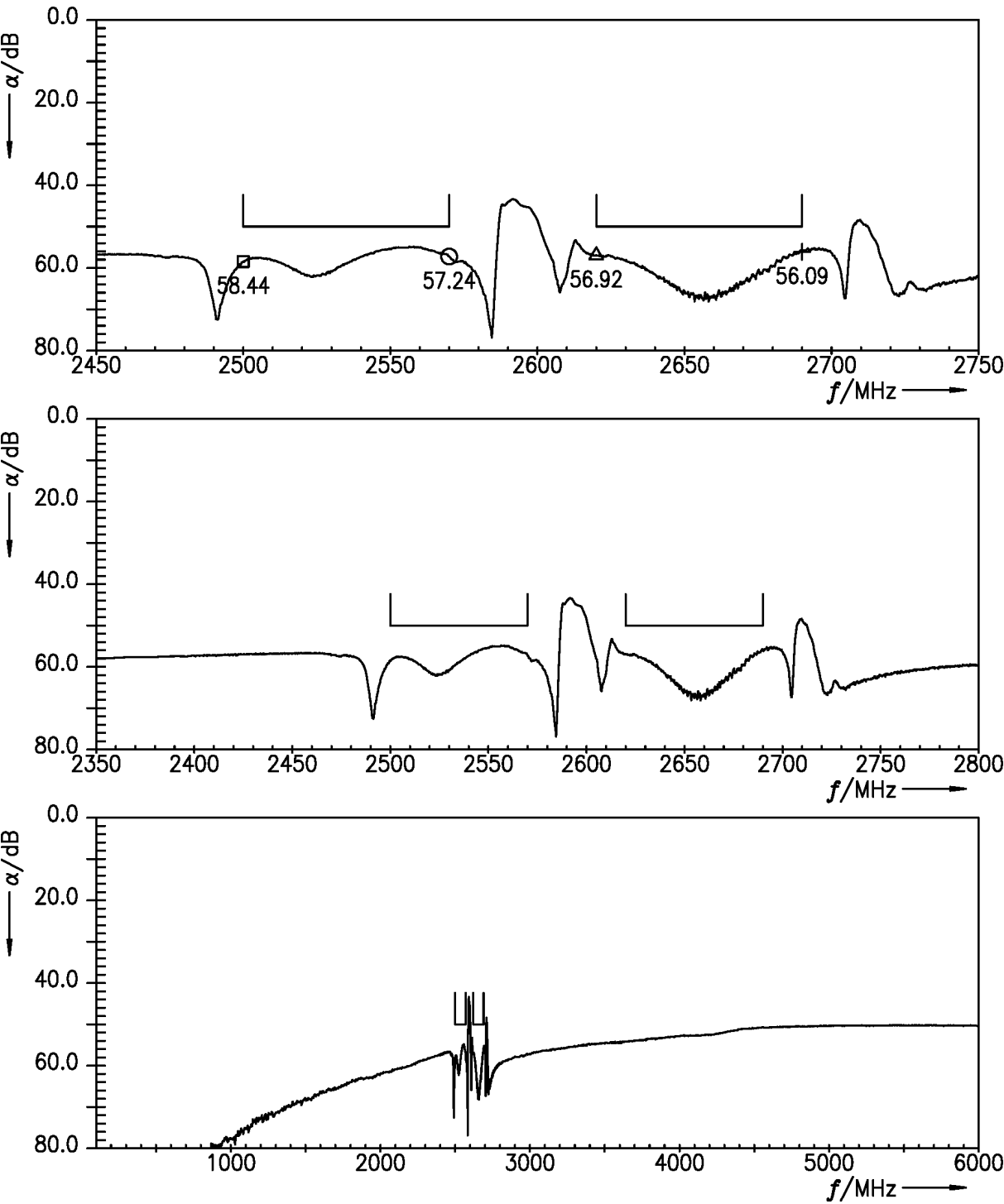


Figure 6: Isolation RX – TX.

Data sheet

9 Reflection coefficients

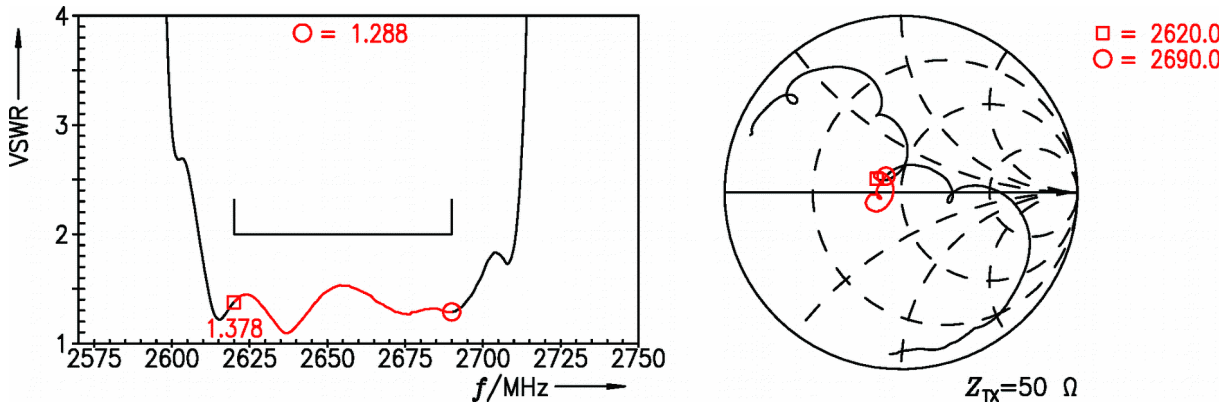


Figure 7: Reflection coefficient at TX port.

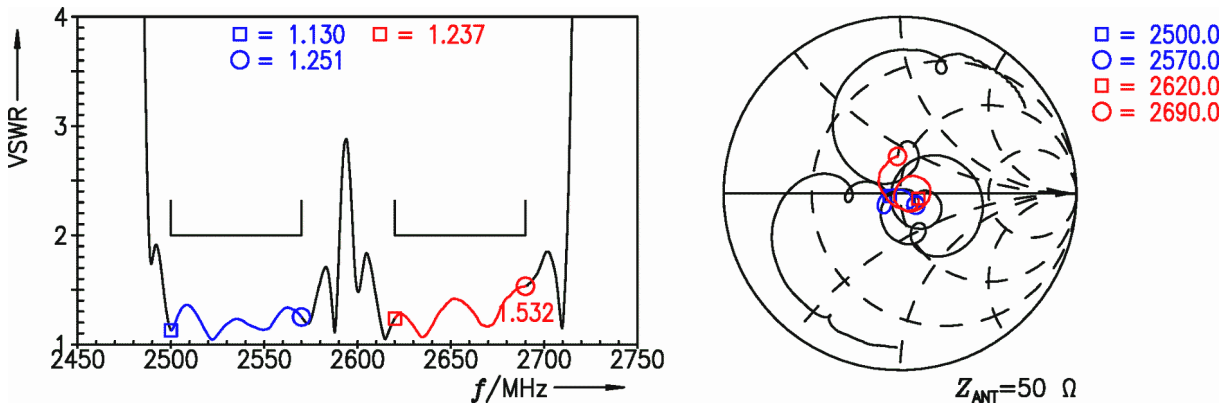


Figure 8: Reflection coefficient at ANT port.

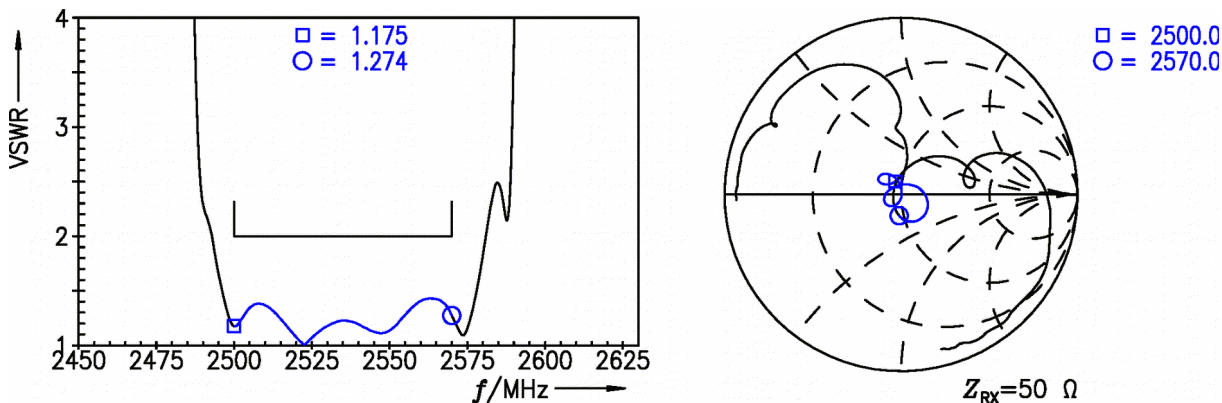


Figure 9: Reflection coefficient at RX port.

|                |                 |
|----------------|-----------------|
| SAW components | B8043           |
| SAW duplexer   | 2535 / 2655 MHz |

Data sheet

10 EVMs

10.1 ANT – TX

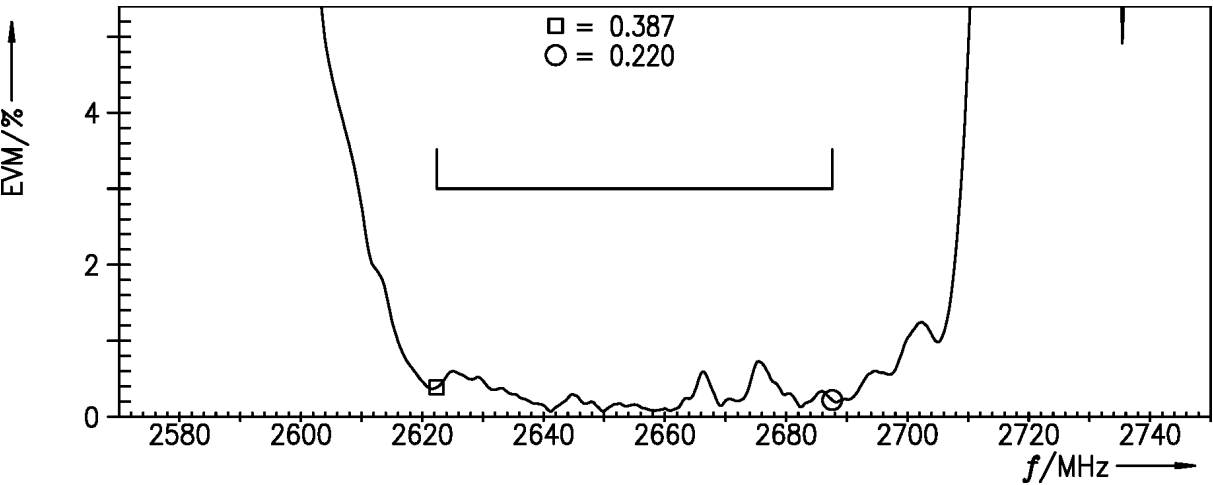


Figure 10: Error vector magnitude ANT – TX.

|                |                 |
|----------------|-----------------|
| SAW components | B8043           |
| SAW duplexer   | 2535 / 2655 MHz |

Data sheet

10.2 RX – ANT

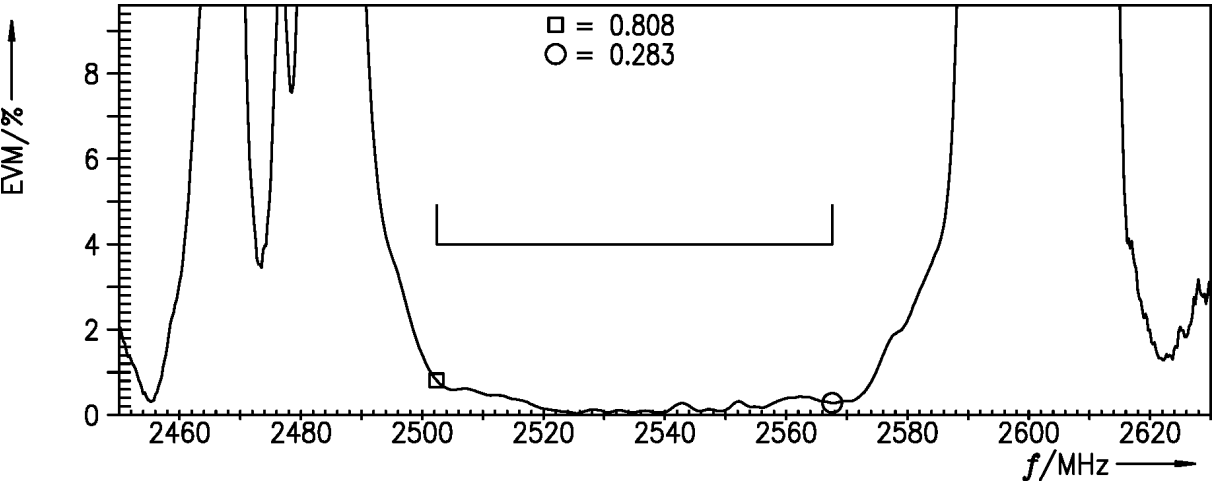


Figure 11: Error vector magnitude RX – ANT.

Data sheet

11 Packing material

11.1 Tape

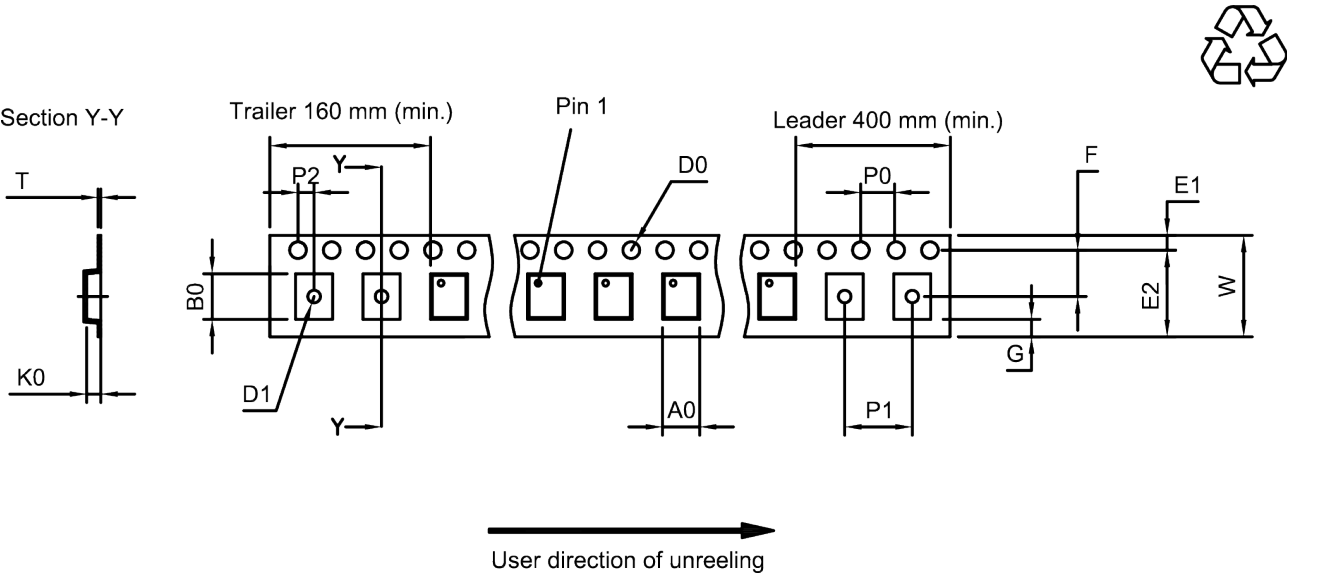


Figure 12: Drawing of tape (first-angle projection) with tape dimensions according to Table 1.

|                |               |                |                |                |                 |
|----------------|---------------|----------------|----------------|----------------|-----------------|
| A <sub>0</sub> | 2.25±0.05 mm  | E <sub>2</sub> | 6.25 mm (min.) | P <sub>1</sub> | 4.0±0.1 mm      |
| B <sub>0</sub> | 2.75±0.05 mm  | F              | 3.5±0.05 mm    | P <sub>2</sub> | 2.0±0.05 mm     |
| D <sub>0</sub> | 1.5+0.1/-0 mm | G              | 0.75 mm (min.) | T              | 0.25±0.03 mm    |
| D <sub>1</sub> | 1.0 mm (min.) | K <sub>0</sub> | 0.6±0.05 mm    | W              | 8.0+0.3/-0.1 mm |
| E <sub>1</sub> | 1.75±0.1 mm   | P <sub>0</sub> | 4.0±0.1 mm     |                |                 |

Table 1: Tape dimensions.

|                |                 |
|----------------|-----------------|
| SAW components | B8043           |
| SAW duplexer   | 2535 / 2655 MHz |

Data sheet

11.2 Reel with diameter of 180 mm

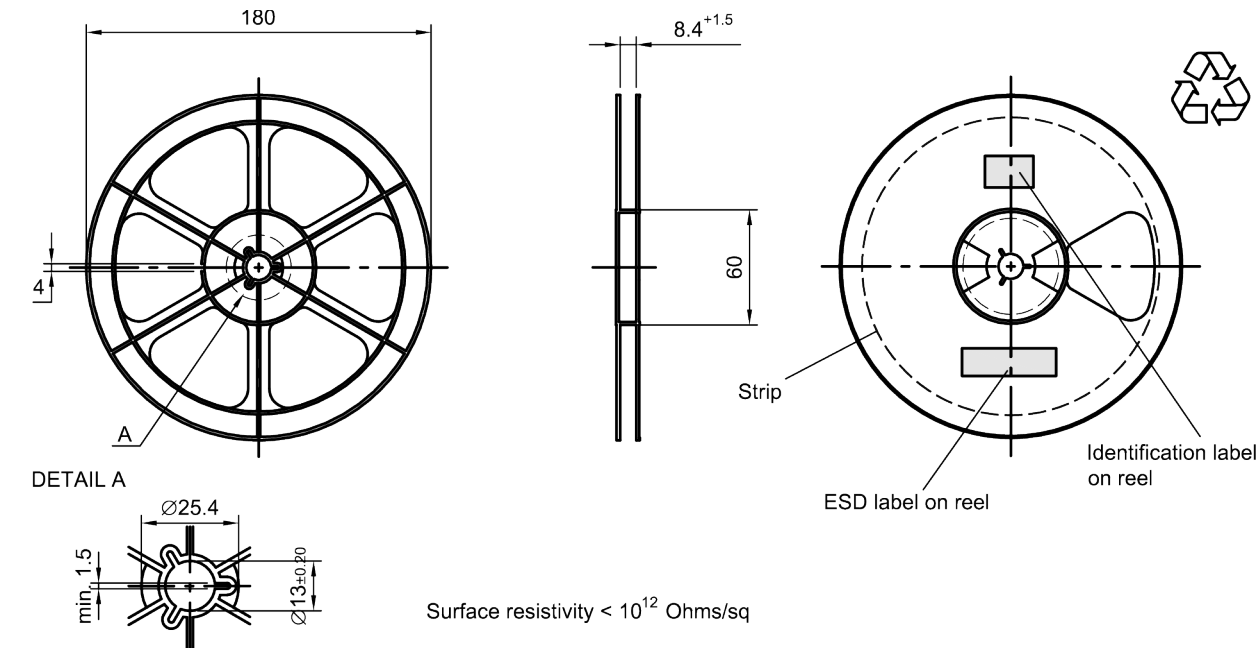


Figure 13: Drawing of reel (first-angle projection) with diameter of 180 mm.

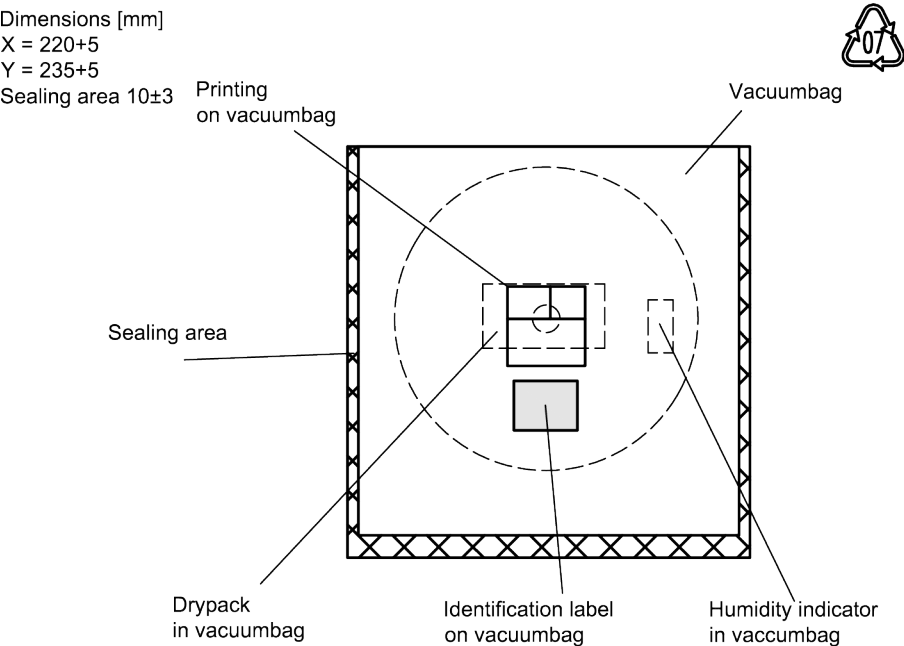


Figure 14: Drawing of moisture barrier bag (MBB) for reel with diameter of 180 mm.



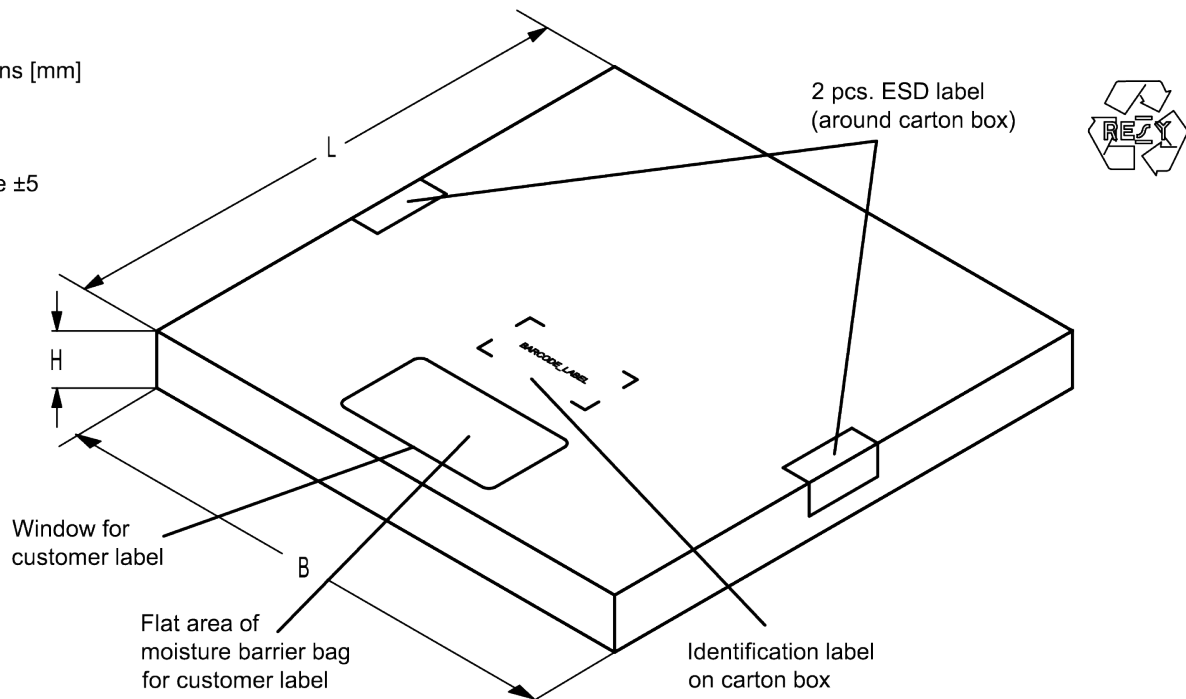
## Data sheet

## Dimensions [mm]

L = 188

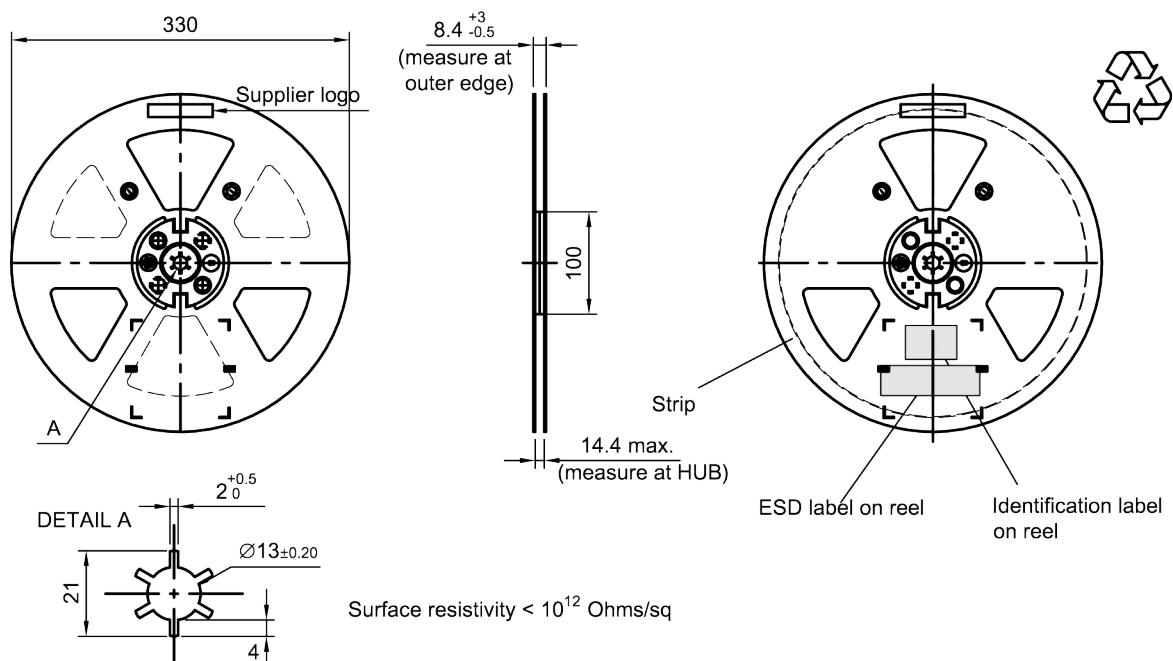
B = 188

H = 30

Tolerance  $\pm 5$ 

**Figure 15:** Drawing of folding box for reel with diameter of 180 mm.

### 11.3 Reel with diameter of 330 mm



**Figure 16:** Drawing of reel (first-angle projection) with diameter of 330 mm.

## SAW components

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## SAW duplexer

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## Data sheet

Dimensions [mm]

X = 400±5

Y = 418±5

Sealing area 10±3

Printing  
on vacuumbag

Sealing area

Drypack  
in vacuumbagIdentification label  
on vacuumbag

Vacuumbag

Humidity indicator  
in vacuumbag

**Figure 17:** Drawing of moisture barrier bag (MBB) for reel with diameter of 330 mm.

Dimensions [mm]

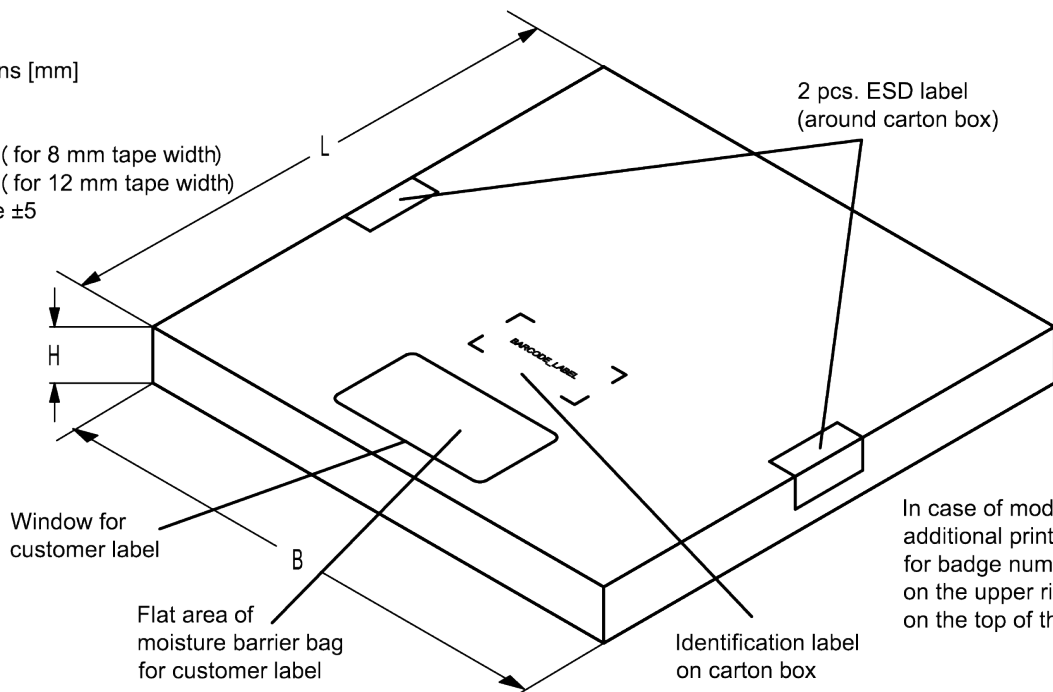
L = 335

B = 338

H = 36 ( for 8 mm tape width)

40 ( for 12 mm tape width)

Tolerance ±5



**Figure 18:** Drawing of folding box for reel with diameter of 330 mm.

## SAW components

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## SAW duplexer

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## Data sheet

## 12 Marking

Products are marked with product type number and lot number encoded according to Table 2:

## ■ Type number:

The 4 digit type number of the ordering code, e.g., B3xxxxB**1234**xxxx,  
is encoded by a special BASE32 code into a 3 digit marking.

|   |                               |                  |
|---|-------------------------------|------------------|
| Example of decoding                                   | type number marking on device | in decimal code. |
| <b>16J</b>  | <b>=&gt;</b>                  | <b>1234</b>      |
| $1 \times 32^2 + 6 \times 32^1 + 18 (=J) \times 32^0$ | <b>=</b>                      | <b>1234</b>      |

The BASE32 code for product type B8043 is 7VB.

## ■ Lot number:

The last 5 digits of the lot number, e.g., **12345**,  
are encoded based on a special BASE47 code into a 3 digit marking.

|   |              |                  |
|---|--------------|------------------|
| Example of decoding lot number marking on device            |              | in decimal code. |
| <b>5UY</b>  | <b>=&gt;</b> | <b>12345</b>     |
| $5 \times 47^2 + 27 (=U) \times 47^1 + 31 (=Y) \times 47^0$ | <b>=</b>     | <b>12345</b>     |

| Adopted BASE32 code for type number |             |               |             |
|-------------------------------------|-------------|---------------|-------------|
| Decimal value                       | Base32 code | Decimal value | Base32 code |
| 0                                   | 0           | 16            | G           |
| 1                                   | 1           | 17            | H           |
| 2                                   | 2           | 18            | J           |
| 3                                   | 3           | 19            | K           |
| 4                                   | 4           | 20            | M           |
| 5                                   | 5           | 21            | N           |
| 6                                   | 6           | 22            | P           |
| 7                                   | 7           | 23            | Q           |
| 8                                   | 8           | 24            | R           |
| 9                                   | 9           | 25            | S           |
| 10                                  | A           | 26            | T           |
| 11                                  | B           | 27            | V           |
| 12                                  | C           | 28            | W           |
| 13                                  | D           | 29            | X           |
| 14                                  | E           | 30            | Y           |
| 15                                  | F           | 31            | Z           |

| Adopted BASE47 code for lot number |             |               |             |
|------------------------------------|-------------|---------------|-------------|
| Decimal value                      | Base47 code | Decimal value | Base47 code |
| 0                                  | 0           | 24            | R           |
| 1                                  | 1           | 25            | S           |
| 2                                  | 2           | 26            | T           |
| 3                                  | 3           | 27            | U           |
| 4                                  | 4           | 28            | V           |
| 5                                  | 5           | 29            | W           |
| 6                                  | 6           | 30            | X           |
| 7                                  | 7           | 31            | Y           |
| 8                                  | 8           | 32            | Z           |
| 9                                  | 9           | 33            | b           |
| 10                                 | A           | 34            | d           |
| 11                                 | B           | 35            | f           |
| 12                                 | C           | 36            | h           |
| 13                                 | D           | 37            | n           |
| 14                                 | E           | 38            | r           |
| 15                                 | F           | 39            | t           |
| 16                                 | G           | 40            | v           |
| 17                                 | H           | 41            | \           |
| 18                                 | J           | 42            | ?           |
| 19                                 | K           | 43            | {           |
| 20                                 | L           | 44            | }           |
| 21                                 | M           | 45            | <           |
| 22                                 | N           | 46            | >           |
| 23                                 | P           |               |             |

**Table 2:** Lists for encoding and decoding of marking.

|                |                 |
|----------------|-----------------|
| SAW components | B8043           |
| SAW duplexer   | 2535 / 2655 MHz |

Data sheet

13 Soldering profile

The recommended soldering process is in accordance with IEC 60068-2-58 – 3<sup>rd</sup> edit and IPC/JEDEC J-STD-020B.

|                                      |  |
|--------------------------------------|--|
| ramp rate                            | ≤ 3 K/s  |
| preheat                              | 125 °C to 220 °C, 150 s to 210 s, 0.4 K/s to 1.0 K/s |
| T > 220 °C                           | 30 s to 70 s   |
| T > 230 °C                           | min. 10 s  |
| T > 245 °C                           | max. 20 s  |
| T ≥ 255 °C                           | –  |
| peak temperature T <sub>peak</sub>   | 250 °C +0/-5 °C                                      |
| wetting temperature T <sub>min</sub> | 230 °C +5/-0 °C for 10 s ± 1 s                       |
| cooling rate                         | ≤ 3 K/s  |
| soldering temperature T              | measured at solder pads                              |

Table 3: Characteristics of recommended soldering profile for lead-free solder (Sn95.5Ag3.8Cu0.7).

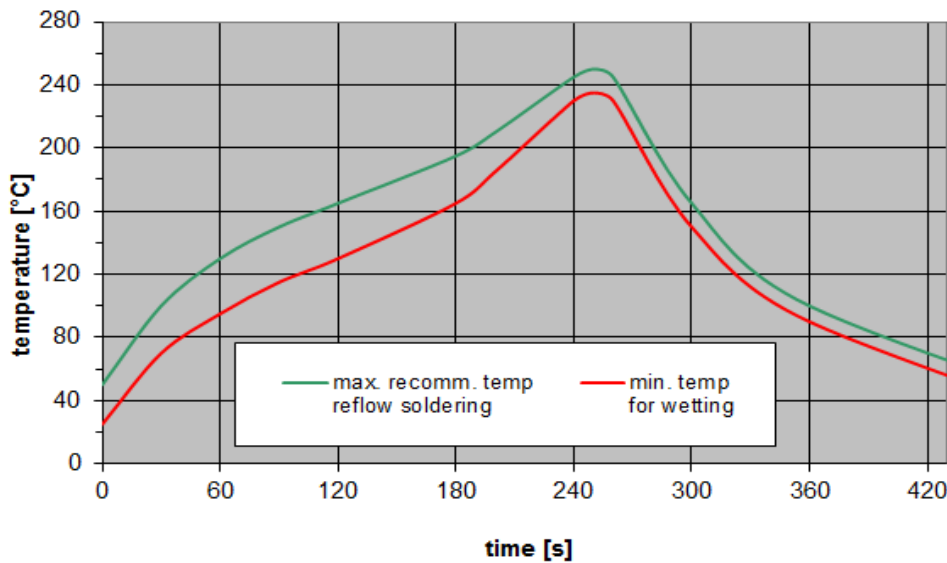


Figure 19: Recommended reflow profile for convection and infrared soldering – lead-free solder.

**SAW components****B8043****SAW duplexer****2535 / 2655 MHz**

Data sheet

**14 Annotations****14.1 Matching coils**

See TDK inductor pdf-catalog <http://www.tdk.co.jp/tefe02/coil.htm#aname1> and Data Library for circuit simulation <http://www.tdk.co.jp/etvcl/index.htm>.

**14.2 RoHS compatibility**

ROHS-compatible means that products are compatible with the requirements according to Art. 4 (substance restrictions) of Directive 2011/65/EU of the European Parliament and of the Council of June 8th, 2011, on the restriction of the use of certain hazardous substances in electrical and electronic equipment ("Directive") with due regard to the application of exemptions as per Annex III of the Directive in certain cases.

**14.3 Scattering parameters (S-parameters)**

The pin/port assignment is available in the headers of the S-parameter files. Please contact your local RF360 sales office.

**14.4 Ordering codes and packing units**

| Ordering code   | Packing unit |
|-----------------|--------------|
| B39272B8043P810 | 5000 pcs     |

**Table 4:** Ordering codes and packing units.

Data sheet

## 15 Cautions and warnings

### 15.1 Display of ordering codes for RF360 products

The ordering code for one and the same product can be represented differently in data sheets, data books, other publications and the website of RF360, or in order-related documents such as shipping notes, order confirmations and product labels. The varying representations of the ordering codes are due to different processes employed and do not affect the specifications of the respective products. Detailed information can be found on the Internet under [www.rf360jv.com/orderingcodes](http://www.rf360jv.com/orderingcodes).

### 15.2 Material information

Due to technical requirements components may contain dangerous substances. For information on the type in question please also contact one of our sales offices.

For information on recycling of tapes and reels please contact one of our sales offices.

### 15.3 Moldability

Before using in overmolding environment, please contact your local RF360 sales office.

### 15.4 Package information

#### Landing area

The printed circuit board (PCB) land pattern (landing area) shown is based on RF360 internal development and empirical data and illustrated for example purposes, only. As customers' SMD assembly processes may have a plenty of variants and influence factors which are not under control or knowledge of RF360, additional careful process development on customer side is necessary and strongly recommended in order to achieve best soldering results tailored to the particular customer needs.

#### Dimensions

Unless otherwise specified all dimensions are understood using unit millimeter (mm).

Dimensions do not include burrs.

#### Projection method

Unless otherwise specified first-angle projection is applied.

## Important notes

The following applies to all products named in this publication:

1. Some parts of this publication contain **statements about the suitability of our products for certain areas of application**. These statements are based on our knowledge of typical requirements that are often placed on our products in the areas of application concerned. We nevertheless expressly point out **that such statements cannot be regarded as binding statements about the suitability of our products for a particular customer application**. As a rule, RF360 Europe GmbH and its affiliates are either unfamiliar with individual customer applications or less familiar with them than the customers themselves. For these reasons, it is always ultimately incumbent on the customer to check and decide whether an RF360 product with the properties described in the product specification is suitable for use in a particular customer application.
2. We also point out that **in individual cases, a malfunction of electronic components or failure before the end of their usual service life cannot be completely ruled out in the current state of the art, even if they are operated as specified**. In customer applications requiring a very high level of operational safety and especially in customer applications in which the malfunction or failure of an electronic component could endanger human life or health (e.g. in accident prevention or life-saving systems), it must therefore be ensured by means of suitable design of the customer application or other action taken by the customer (e.g. installation of protective circuitry or redundancy) that no injury or damage is sustained by third parties in the event of malfunction or failure of an electronic component.
3. **The warnings, cautions and product-specific notes must be observed.**
4. In order to satisfy certain technical requirements, **some of the products described in this publication may contain substances subject to restrictions in certain jurisdictions (e.g. because they are classed as hazardous)**. Useful information on this will be found in our Material Data Sheets on the Internet ([www.rf360jv.com/material](http://www.rf360jv.com/material)). Should you have any more detailed questions, please contact our sales offices.
5. We constantly strive to improve our products. Consequently, **the products described in this publication may change from time to time**. The same is true of the corresponding product specifications. Please check therefore to what extent product descriptions and specifications contained in this publication are still applicable before or when you place an order. We also **reserve the right to discontinue production and delivery of products**. Consequently, we cannot guarantee that all products named in this publication will always be available.  
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