



RF360
Europe GmbH

SAW components

SAW Tx post PA filter

Femtocell

TD-LTE band 41 (2555-2655 MHz)

| | |
|----------------|-----------------|
| Series/type: | B8354 |
| Ordering code: | B39262B8354P810 |
| Date: | March 30, 2017 |
| Version: | 2.0 |

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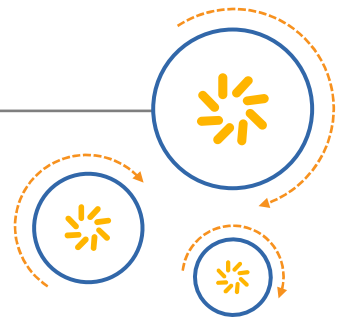
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A Qualcomm – TDK Joint Venture

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| | |
|------------------------------|-----------------|
| SAW components | B8354 |
| SAW Tx post PA filter | 2605 MHz |

Data sheet

Table of contents

| | |
|--|----|
| 1 Application | 4 |
| 2 Features | 4 |
| 3 Package | 5 |
| 4 Pin configuration | 5 |
| 5 Matching circuit | 6 |
| 6 Characteristics | 7 |
| 7 Maximum ratings | 8 |
| 8 Transmission coefficient | 9 |
| 9 Reflection coefficients | 10 |
| 10 Packing material | 11 |
| 11 Marking | 14 |
| 12 Soldering profile | 15 |
| 13 Annotations | 16 |
| 14 Cautions and warnings | 17 |
| Important notes | 18 |

Data sheet

1 Application

- Low-loss RF filter for femtocell systems (LTE Band 41)
- Usable pass band 100MHz
- High power durability

2 Features

- Package size 1.4 ± 0.1 mm \times 1.1 ± 0.1 mm
- Package height 0.45 mm (max.)
- Approximate weight 3 mg
- RoHS compatible
- Package for Surface Mount Technology (SMT)
- Ni/Au-plated terminals
- Electrostatic Sensitive Device (ESD)
- Moisture Sensitivity Level 3 (MSL3)

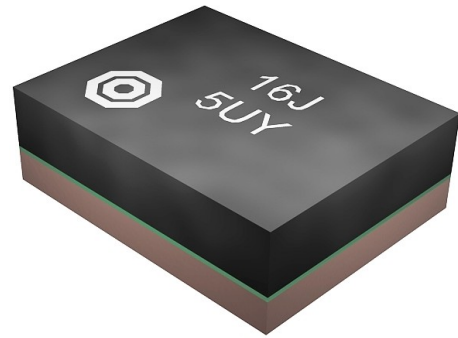


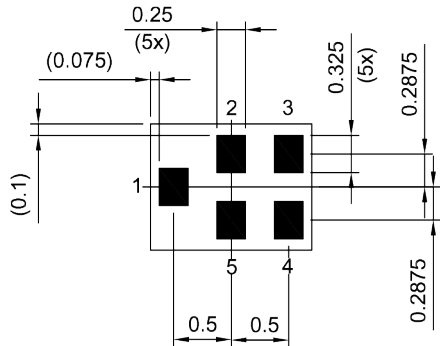
Figure 1: Picture of component with example of product marking.

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SAW Tx post PA filter **2605 MHz**

Data sheet

3 Package

BOTTOM VIEW

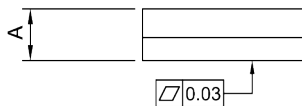


Pad and pitch tolerance ±0.05

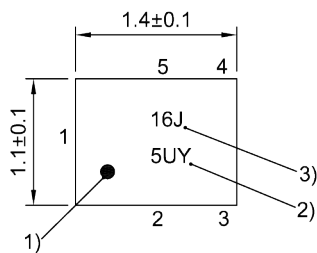
4 Pin configuration

- 1 Input
- 4 Output
- 2, 3, 5 Ground

SIDE VIEW

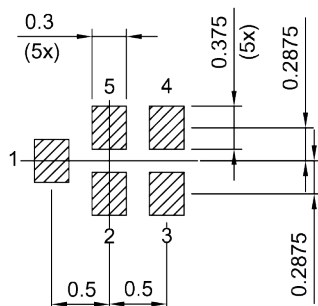


TOP VIEW



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

Land pattern THRU VIEW



Landing pad tolerance -0.02

Figure 2: Drawing of package with package height A = 0.45 mm (max.). See Sec. Package information (p. 17).

Data sheet

5 Matching circuit

$$\blacksquare L_{p1} = 3.6 \text{ nH}$$

$$\blacksquare L_{p4} = 4.7 \text{ nH}$$

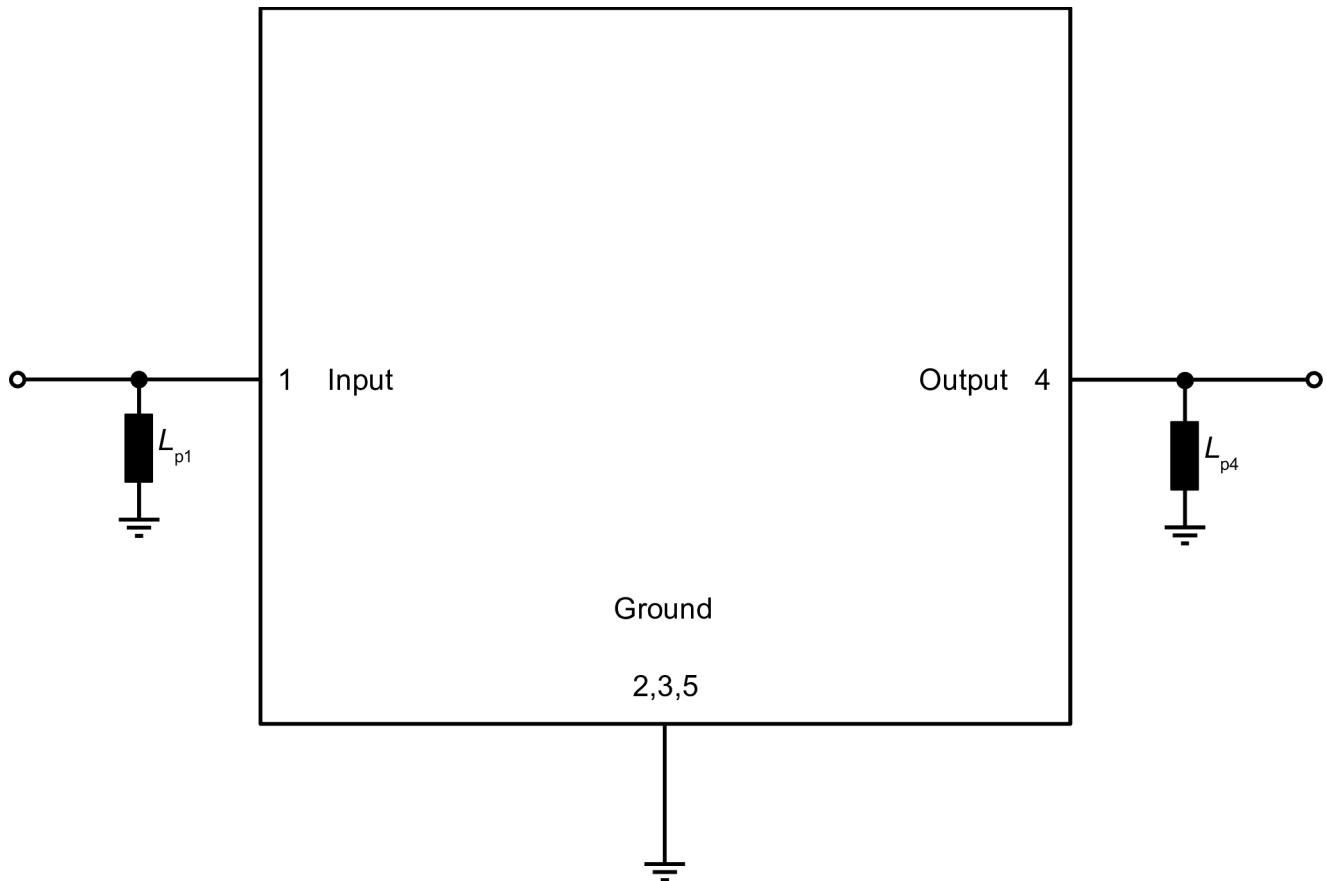


Figure 3: Schematic of matching circuit.

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B8354

SAW Tx post PA filter

2605 MHz

Data sheet

6 Characteristics

Temperature range for specification

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

Input terminating impedance

$$Z_{\text{IN}} = 50\ \Omega \text{ with par. } 3.6\ \text{nH}^{1)}$$

Output terminating impedance

$$Z_{\text{OUT}} = 50\ \Omega \text{ with par. } 4.7\ \text{nH}^{1)}$$

| Characteristics | | min. for T_{SPEC} | typ. @ +25 °C | max. for T_{SPEC} | |
|--------------------------------------|-----------------------|-------------------------------|------------------|-------------------------------|-----|
| Center frequency | f_{C} | — | 2605 | — | MHz |
| Maximum insertion attenuation | α_{max} | | | | |
| | 2555... 2575 MHz | — | 1.6 | 3.0 | dB |
| | 2555... 2655 MHz | — | 1.7 | 3.0 | dB |
| | 2575... 2635 MHz | — | 1.2 | 2.5 | dB |
| | 2635... 2655 MHz | — | 1.7 | 3.0 | dB |
| Amplitude ripple (p-p) | $\Delta\alpha$ | | | | |
| | 2555... 2655 MHz | — | 0.9 | 2.2 | dB |
| Maximum VSWR | VSWR _{max} | | | | |
| @ input port | 2555... 2655 MHz | — | 1.6 | 2.0 | |
| @ output port | 2555... 2655 MHz | — | 1.5 | 2.0 | |
| Minimum attenuation | α_{min} | | | | |
| | 10... 699 MHz | 40 | 54 | — | dB |
| | 699... 916 MHz | 37 | 46 | — | dB |
| | 916... 925 MHz | 37 | 46 | — | dB |
| | 925... 960 MHz | 37 | 45 | — | dB |
| | 960... 1440 MHz | 28 | 34 | — | dB |
| | 1440... 1565 MHz | 28 | 33 | — | dB |
| | 1565... 1615 MHz | 28 | 32 | — | dB |
| | 1615... 1805 MHz | 28 | 31 | — | dB |
| | 1805... 1830 MHz | 28 | 31 | — | dB |
| | 1830... 2120 MHz | 28 | 31 | — | dB |
| | 2120... 2400 MHz | 28 | 32 | — | dB |
| | 2400... 2490 MHz | 40 | 43 | — | dB |
| | 2490... 2510 MHz | 30 | 44 | — | dB |
| | 2775... 4990 MHz | 32 | 37 | — | dB |
| | 4990... 5900 MHz | 28 | 34 | — | dB |
| | 6000... 6900 MHz | 25 | 31 | — | dB |
| | 7000... 7990 MHz | 20 | 29 | — | dB |

¹⁾ See Sec. Matching circuit (p. 6).

SAW components

B8354

SAW Tx post PA filter

2605 MHz

Data sheet

7 Maximum ratings

| | | |
|---|--|---|
| Operable temperature | $T_{OP} = -40\text{ °C} \dots +85\text{ °C}$ | |
| Storage temperature | $T_{STG}^{1)} = -40\text{ °C} \dots +85\text{ °C}$ | |
| DC voltage | $ V_{DC} ^{2)} = 0\text{ V}$ | |
| ESD voltage | | |
| | $V_{ESD}^{3)} = 250\text{ V}$ | Machine model. |
| | $V_{ESD}^{4)} = 225\text{ V}$ | Human body model. |
| Input power @ input port: 2555 ... 2655 MHz | $P_{IN} = 26.5\text{ dBm}^{5), 6)}$ | Source and load impedance 50 Ω. 26.5dBm ON state. 5 MHz LTE downlink signal 70% DC for 27000 h @ 55 °C. |

¹⁾ Not valid for packaging material. Storage temperature for packaging material is -25 °C to $+40\text{ °C}$.

²⁾ In case of applied DC voltage blocking capacitors are mandatory.

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

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

⁵⁾ Expected Life Time according to accelerated power durability simulations and to wear out models.

⁶⁾ T_{SPEC} is the ambient temperature of the PCB at component position. Specified min./max values from Section 6.

“Characteristics” for maximum input power 26.5dBm are valid for temperature up to 62 °C .

| | |
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| SAW Tx post PA filter | 2605 MHz |

Data sheet

8 Transmission coefficient

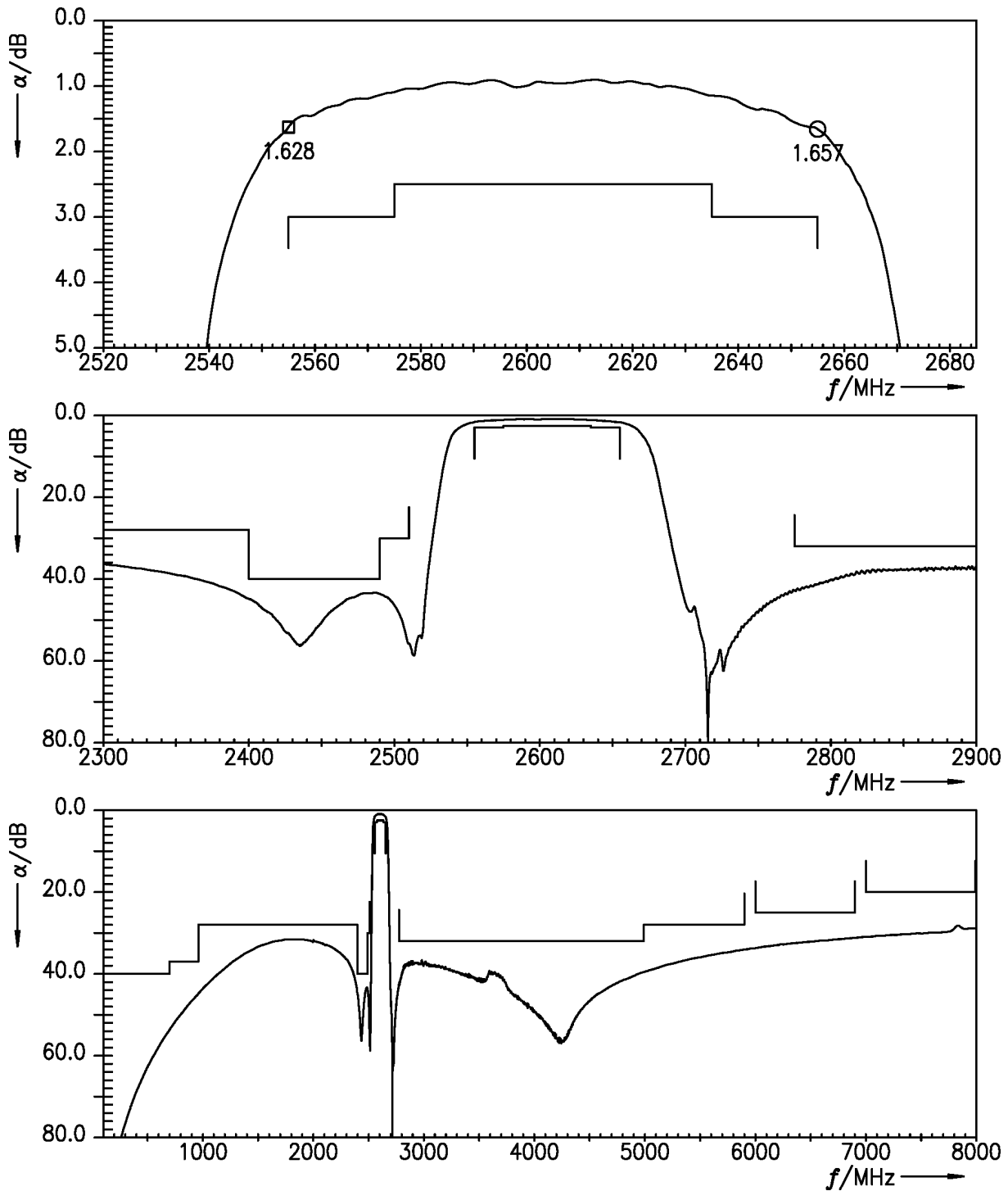


Figure 4: Attenuation.

Data sheet

9 Reflection coefficients

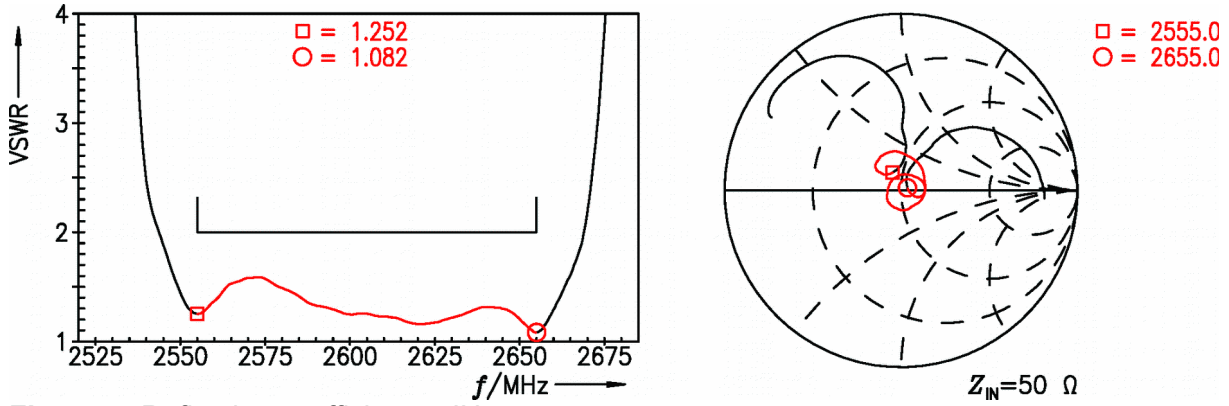


Figure 5: Reflection coefficient at IN port.

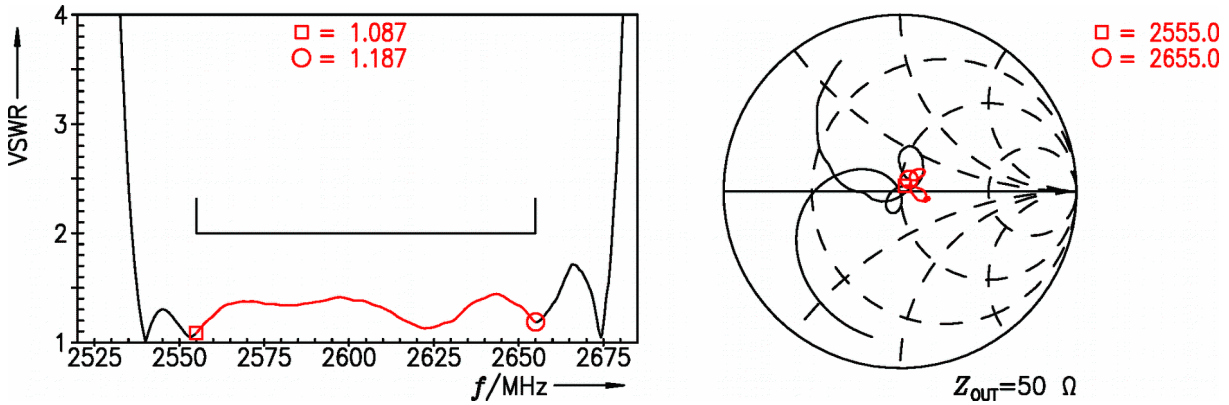


Figure 6: Reflection coefficient at OUT port.

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SAW Tx post PA filter **2605 MHz**

Data sheet

10 Packing material

10.1 Tape

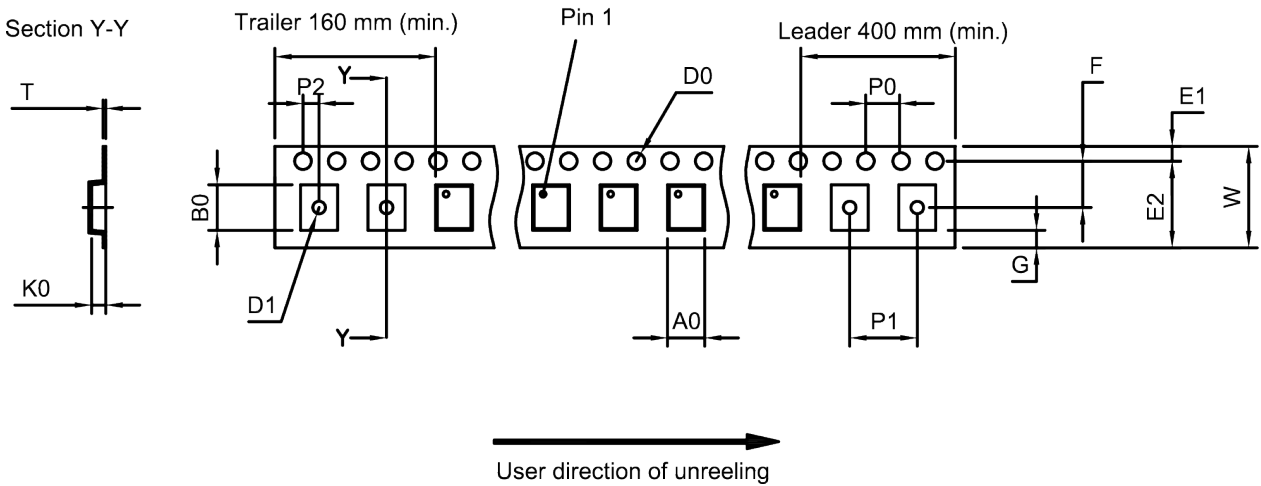


Figure 7: Drawing of tape (first-angle projection) with tape dimensions according to Table 1.

| | | | | | |
|----------------|---------------|----------------|----------------|----------------|-----------------|
| A ₀ | 1.27±0.05 mm | E ₂ | 6.25 mm (min.) | P ₁ | 4.0±0.1 mm |
| B ₀ | 1.57±0.05 mm | F | 3.5±0.05 mm | P ₂ | 2.0±0.05 mm |
| D ₀ | 1.5+0.1/-0 mm | G | 0.75 mm (min.) | T | 0.25±0.03 mm |
| D ₁ | 0.5±0.1 mm | K ₀ | 0.62±0.05 mm | W | 8.0+0.3/-0.1 mm |
| E ₁ | 1.75±0.1 mm | P ₀ | 4.0±0.1 mm | | |

Table 1: Tape dimensions.

| | |
|-----------------------|----------|
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| SAW Tx post PA filter | 2605 MHz |

Data sheet

10.2 Reel with diameter of 180 mm

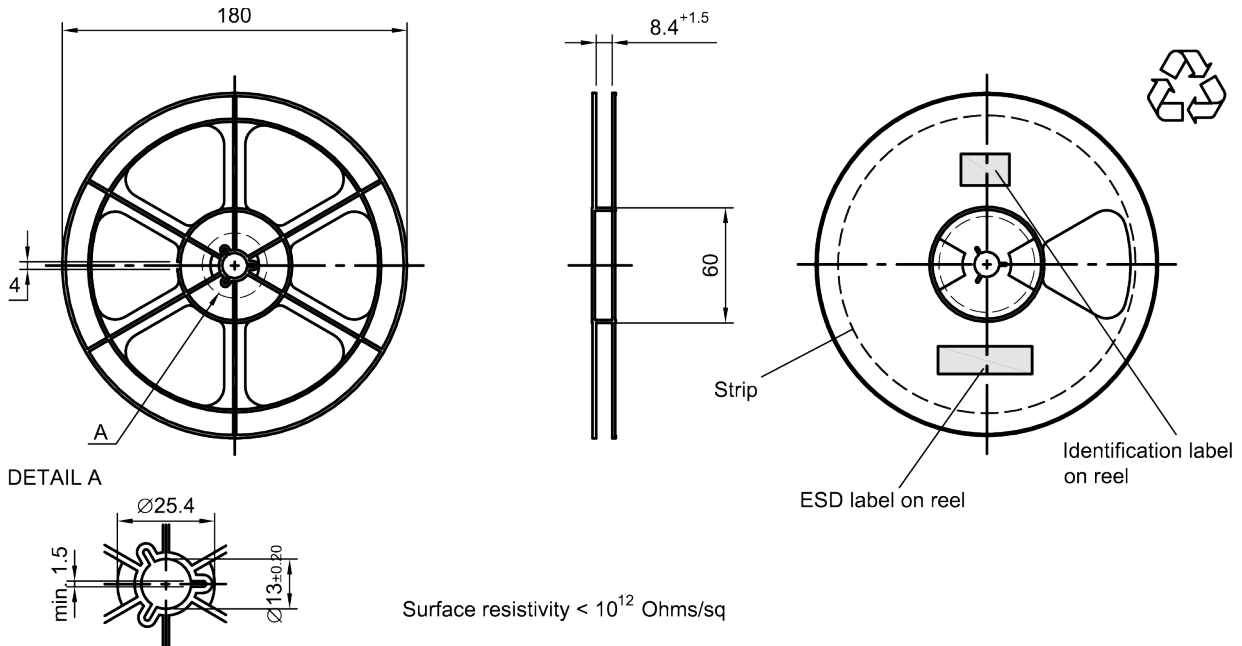


Figure 8: Drawing of reel (first-angle projection) with diameter of 180 mm.

Dimensions [mm]

X = 220+5

Y = 235+5

Sealing area 10±3

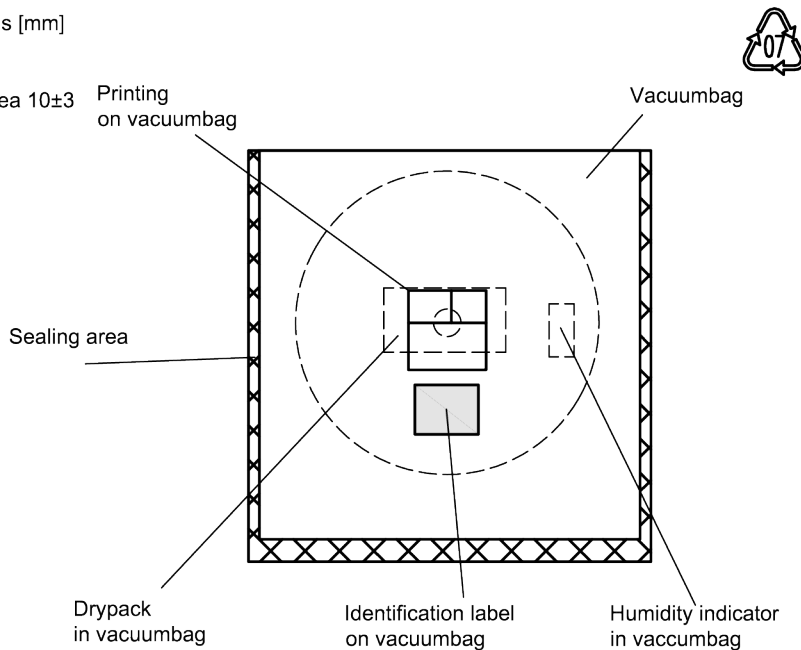


Figure 9: Drawing of moisture barrier bag (MBB) for reel with diameter of 180 mm.

| | |
|------------------------------|-----------------|
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| SAW Tx post PA filter | 2605 MHz |

Data sheet

Dimensions [mm]
 L = 188
 B = 188
 H = 30
 Tolerance ±5

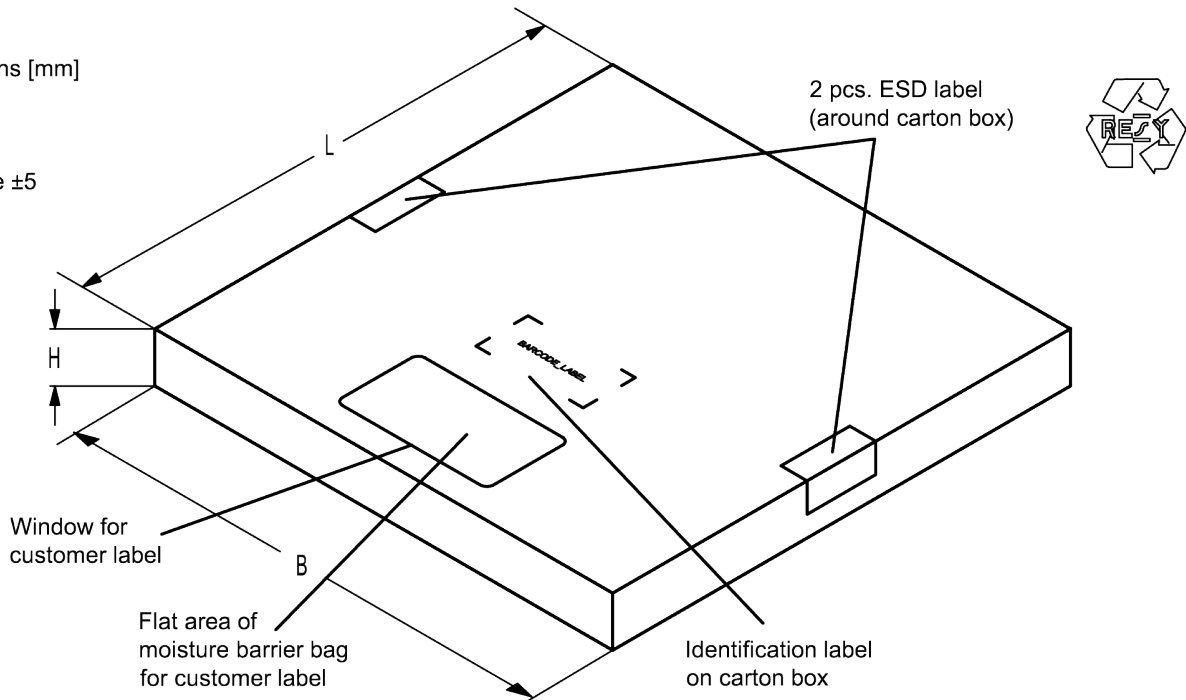


Figure 10: Drawing of folding box for reel with diameter of 180 mm.

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B8354

SAW Tx post PA filter

2605 MHz

Data sheet

11 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. |
| | 16J | = | 1234 |
| | $1 \times 32^2 + 6 \times 32^1 + 18 (=J) \times 32^0$ | = | 1234 |

The BASE32 code for product type B8354 is 852.

■ 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. |
| 5UY | = | 12345 |
| $5 \times 47^2 + 27 (=U) \times 47^1 + 31 (=Y) \times 47^0$ | = | 12345 |

| 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.

Data sheet

12 Soldering profile

The recommended soldering process is in accordance with IEC 60068-2-58 – 3rd 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 |
| $T \geq 255$ °C | – |
| peak temperature T_{peak} | 250 °C +0/-5 °C |
| wetting temperature T_{min} | 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).

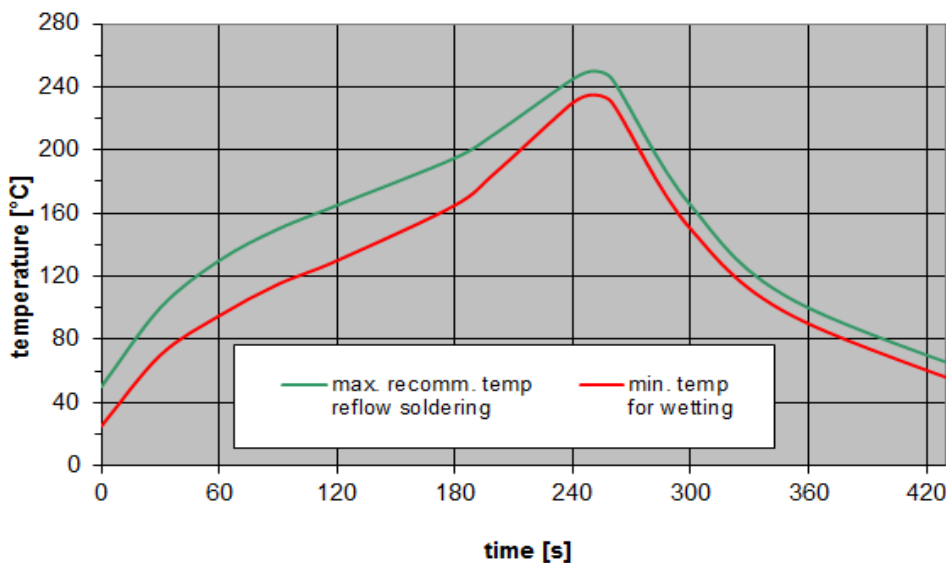


Figure 11: Recommended reflow profile for convection and infrared soldering – lead-free solder.

Data sheet

13 Annotations

13.1 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>.

13.2 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.

13.3 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.

13.4 Ordering codes and packing units

| Ordering code | Packing unit |
|-----------------|--------------|
| B39262B8354P810 | 5000 pcs |

Table 4: Ordering codes and packing units.

Data sheet

14 Cautions and warnings

14.1 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.

14.2 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.

14.3 Moldability

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

14.4 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).

Projection method

Unless otherwise specified first-angle projection is applied.

Important notes

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