



RF360  
Europe GmbH

## SAW components

### SAW Tx post PA filter

Femtocell  
TD-LTE band 40

Series/type:	B8353
Ordering code:	B39242B8353P810
Date:	February 10, 2017
Version:	2.0

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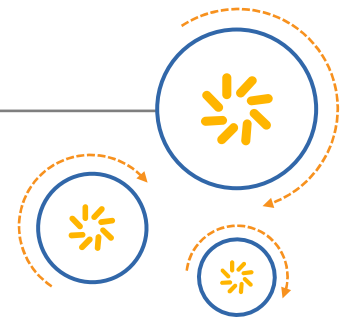
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A Qualcomm – TDK Joint Venture

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<b>SAW components</b>	<b>B8353</b>
<b>SAW Tx post PA filter</b>	<b>2350 MHz</b>

Data sheet

**Table of contents**

1 <a href="#">Application</a> .....	4
2 <a href="#">Features</a> .....	4
3 <a href="#">Package</a> .....	5
4 <a href="#">Pin configuration</a> .....	5
5 <a href="#">Matching circuit</a> .....	6
6 <a href="#">Characteristics</a> .....	7
7 <a href="#">Maximum ratings</a> .....	8
8 <a href="#">Transmission coefficient</a> .....	9
9 <a href="#">Reflection coefficients</a> .....	10
10 <a href="#">Packing material</a> .....	11
11 <a href="#">Marking</a> .....	14
12 <a href="#">Soldering profile</a> .....	15
13 <a href="#">Annotations</a> .....	16
14 <a href="#">Cautions and warnings</a> .....	17
<a href="#">Important notes</a> .....	18

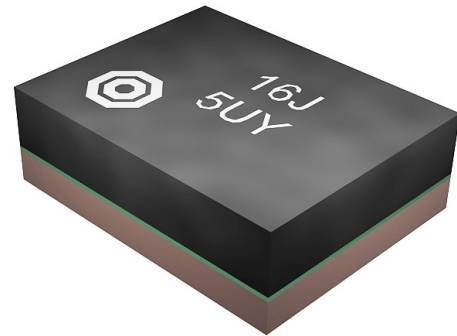
Data sheet

## 1 Application

- Band 40 Post PA TX filter.
- Low loss RF filter for mobile telephone systems.
- Usable pass band 100MHz

## 2 Features

- Package size 1.4±0.1 mm × 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.

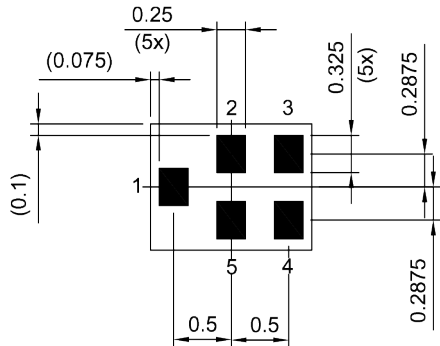
**SAW components** **B8353**

**SAW Tx post PA filter** **2350 MHz**

Data sheet

**3 Package**

BOTTOM VIEW

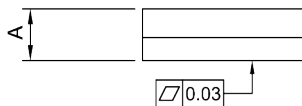


Pad and pitch tolerance ±0.05

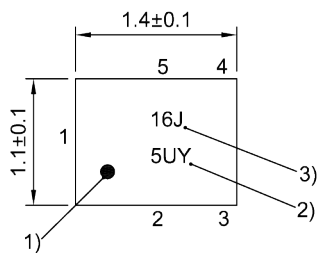
**4 Pin configuration**

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

SIDE VIEW

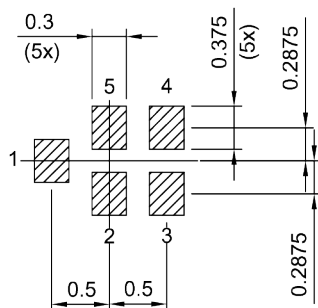


TOP VIEW



- 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

■  $L_{p1} = 4.1 \text{ nH}$

■  $L_{p4} = 5.8 \text{ nH}$

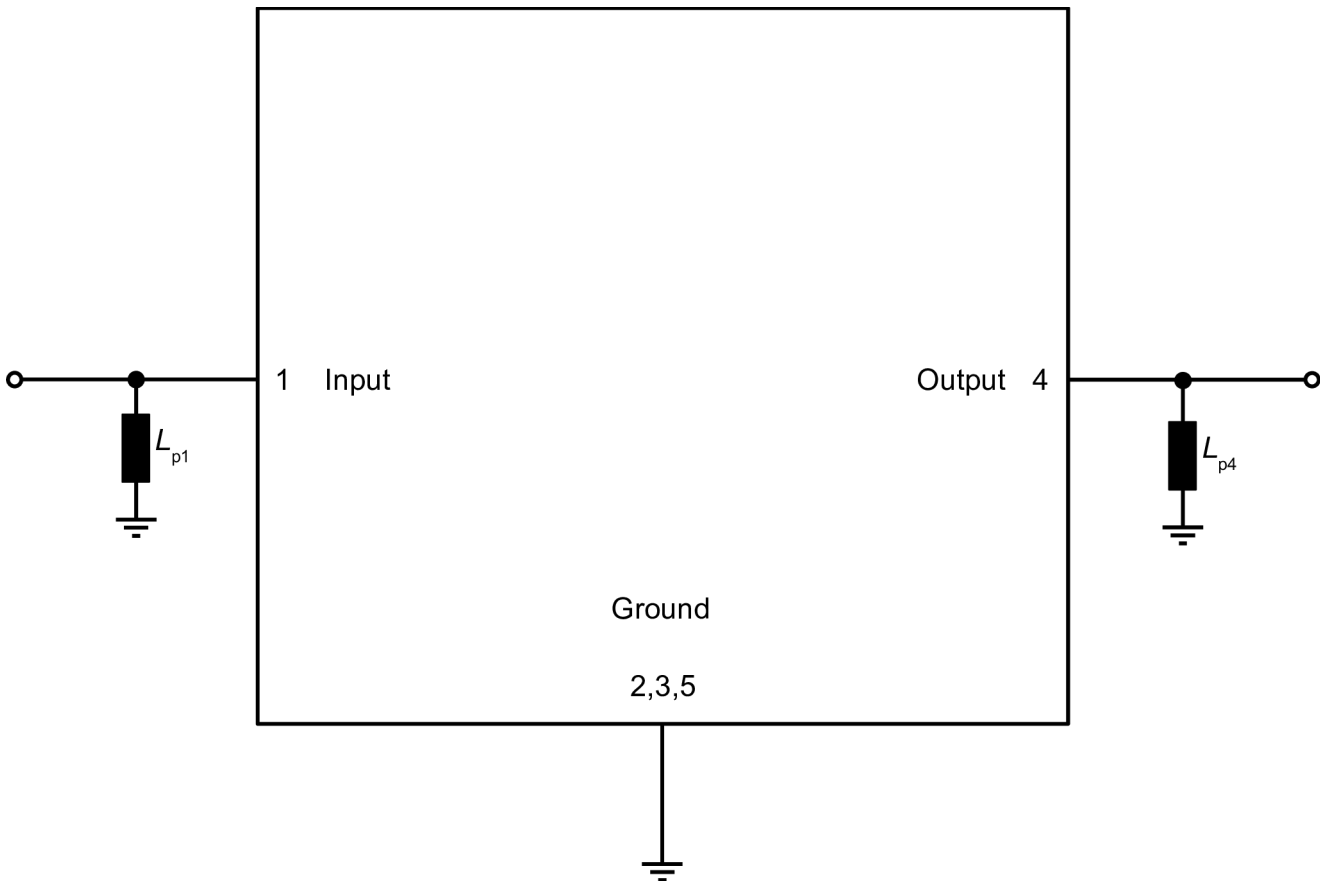


Figure 3: Schematic of matching circuit.



## SAW components

B8353

## SAW Tx post PA filter

2350 MHz

Data sheet

## 6 Characteristics

Temperature range for specification

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

Input terminating impedance

$$Z_{\text{IN}} = 50\ \Omega \text{ with par. } 4.1\ \text{nH}^{1)}$$

Output terminating impedance

$$Z_{\text{OUT}} = 50\ \Omega \text{ with par. } 5.8\ \text{nH}^{1)}$$

Characteristics <sup>2)</sup>			min. for $T_{\text{SPEC}}$	typ. @ +25 °C	max. for $T_{\text{SPEC}}$	
<b>Center frequency</b>		$f_{\text{C}}$	—	2350	—	MHz
<b>Maximum insertion attenuation</b>	2300... 2400	MHz	—	2.0	3.0	dB
		$\alpha_{\text{max}}$				
<b>Amplitude ripple (p-p)</b>	2300... 2400	MHz	—	1.0	2.0	dB
		$\Delta\alpha$				
<b>Maximum VSWR</b>						
		VSWR <sub>max</sub>				
@ input port	2300... 2400	MHz	—	1.5	2.0	
@ output port	2300... 2400	MHz	—	1.5	2.0	
<b>Average attenuation</b>						
		$\alpha_{\text{avg}}$				
	2423... 2441	MHz	6	20	—	dB
	2428... 2446	MHz	10	31	—	dB
	2433... 2451	MHz	15	43	—	dB
	2438... 2456	MHz	23	55	—	dB
	2443... 2461	MHz	35	65	—	dB
	2448... 2481	MHz	40	74	—	dB
<b>Minimum attenuation</b>						
		$\alpha_{\text{min}}$				
	50... 880	MHz	40	47	—	dB
	880... 960	MHz	40	45	—	dB
	960... 1559	MHz	28	34	—	dB
	1559... 1606	MHz	28	33	—	dB
	1606... 1680	MHz	28	33	—	dB
	1805... 1880	MHz	25	31	—	dB
	1880... 1920	MHz	25	31	—	dB
	2010... 2025	MHz	25	32	—	dB
	2110... 2170	MHz	28	34	—	dB
	2443... 2481	MHz	25	53	—	dB
	2481... 2500	MHz	40	47	—	dB
	4600... 4800	MHz	40	46	—	dB
	4900... 5950	MHz	40	50	—	dB
	6900... 7200	MHz	28	35	—	dB

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

<sup>2)</sup> T is the ambient temperature of the PCB at component position. Specified min/max values are valid for an input power of up to 20 dBm.

## SAW components

B8353

## SAW Tx post PA filter

2350 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		
	$V_{ESD}^{3)} = 50\text{ V}$	Machine model.
	$V_{ESD}^{4)} = 325\text{ V}$	Human body model.
Input power @ input port: 2300 ... 2400 MHz	$P_{IN} = 27\text{ dBm}^{5)}$	LTE5MHz downlink, ON-state power 70% DC for 27000 h @ 55 °C.

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

<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 Life Time according to accelerated power durability simulation and wear out models.

SAW components	B8353
SAW Tx post PA filter	2350 MHz

Data sheet

8 Transmission coefficient

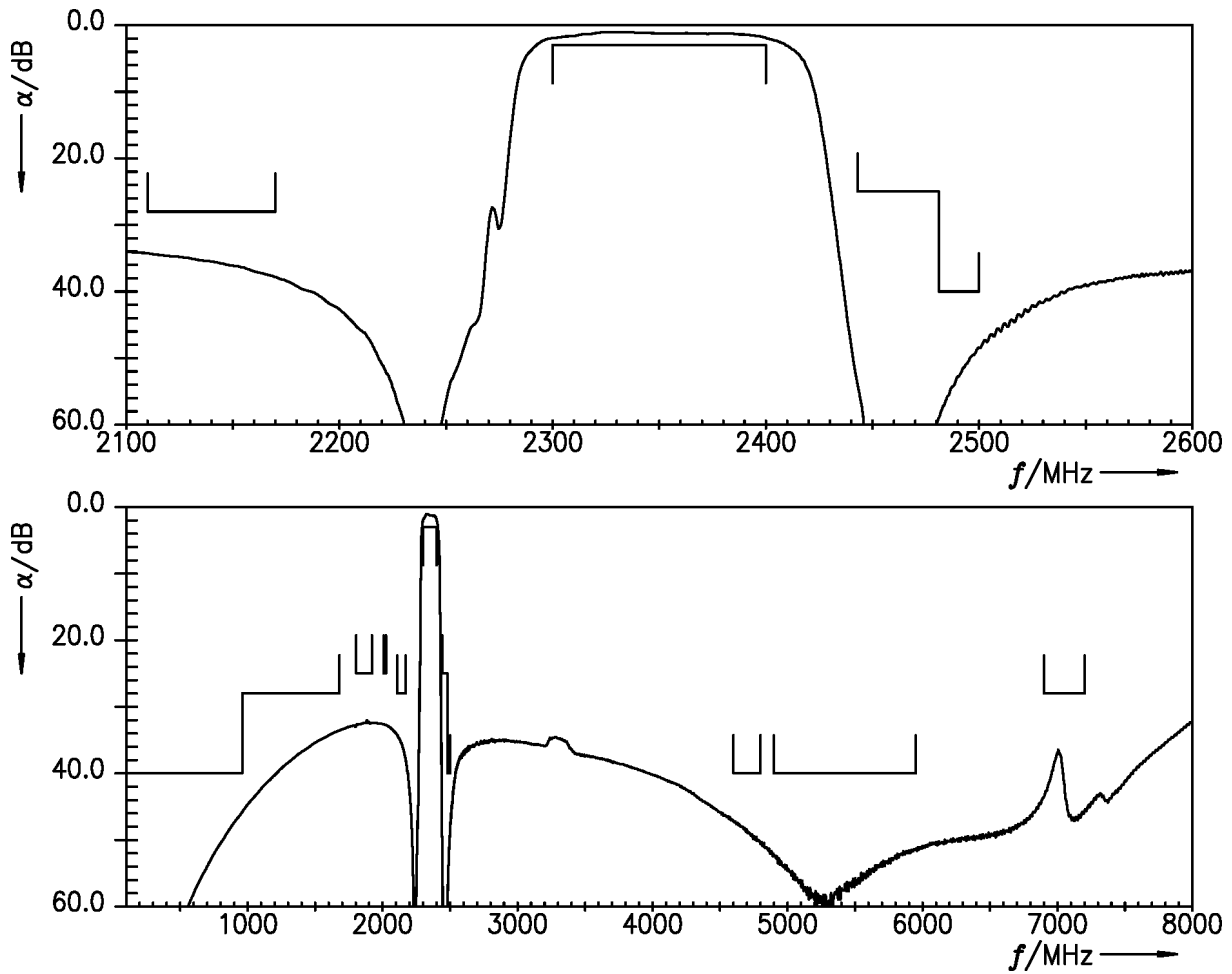


Figure 4: Attenuation.

SAW components	B8353
SAW Tx post PA filter	2350 MHz

Data sheet

9 Reflection coefficients

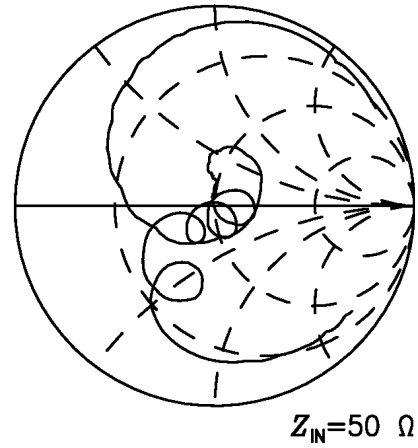
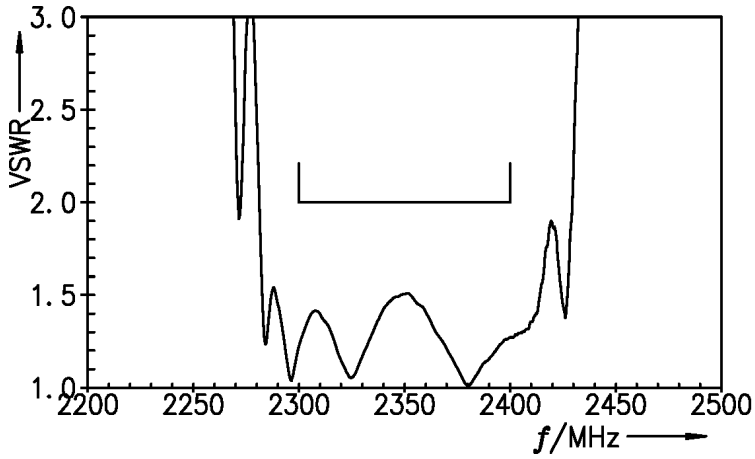


Figure 5: Reflection coefficient at IN port.

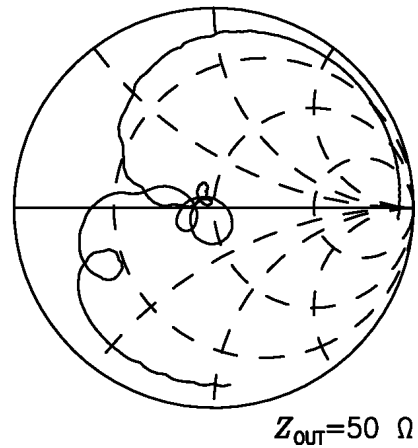
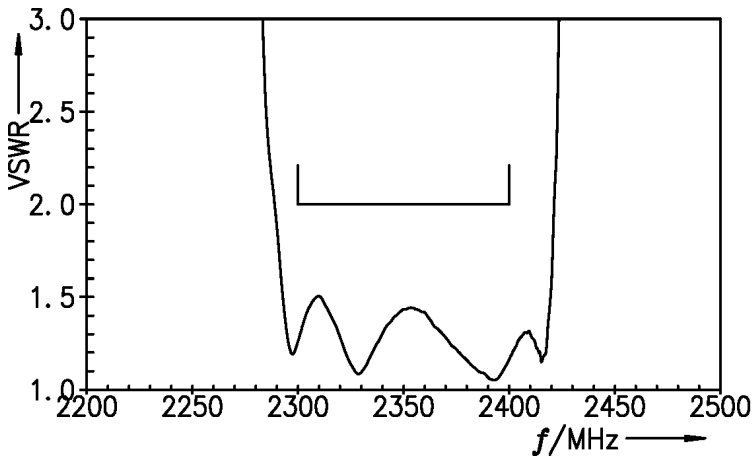


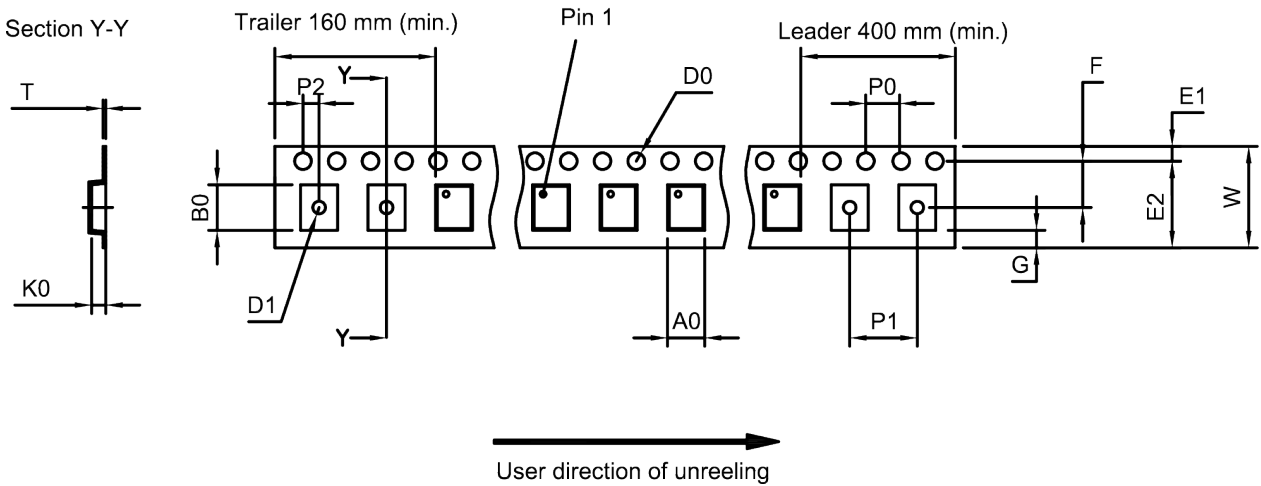
Figure 6: Reflection coefficient at OUT port.

**SAW components** **B8353**  
**SAW Tx post PA filter** **2350 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 <sub>0</sub>	1.27±0.05 mm	E <sub>2</sub>	6.25 mm (min.)	P <sub>1</sub>	4.0±0.1 mm
B <sub>0</sub>	1.57±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>	0.5±0.1 mm	K <sub>0</sub>	0.62±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	B8353
SAW Tx post PA filter	2350 MHz

Data sheet

10.2 Reel with diameter of 180 mm

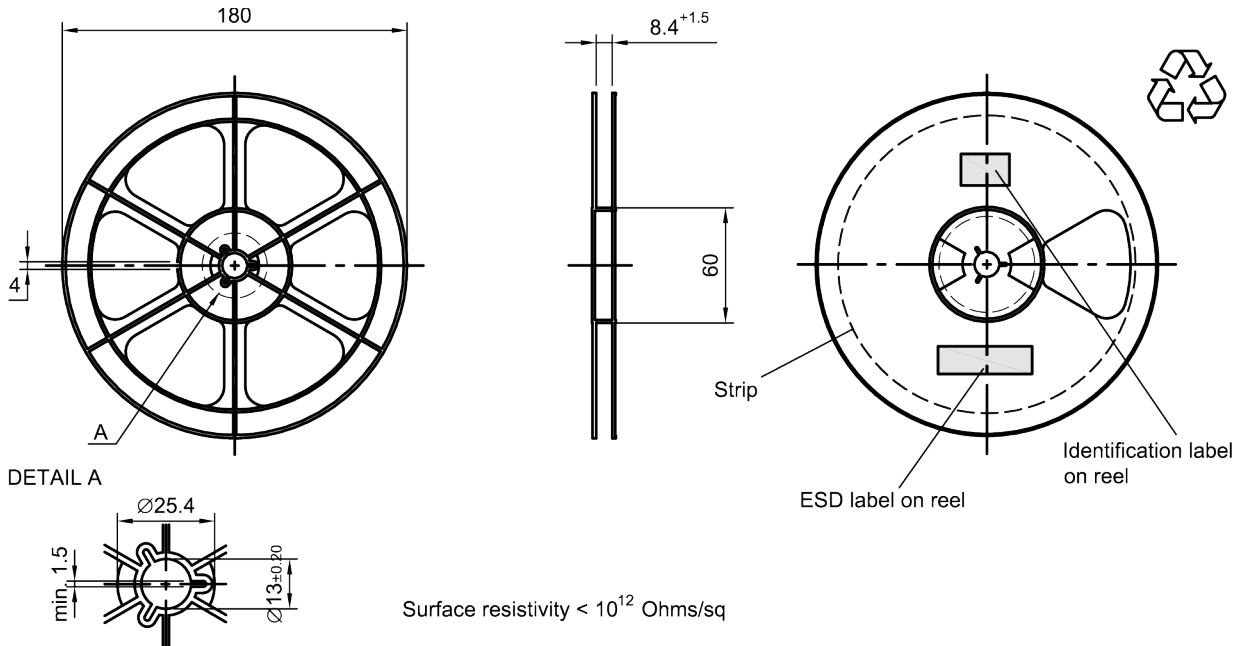


Figure 8: Drawing of reel (first-angle projection) with diameter of 180 mm.

Dimensions [mm]

X = 220+5

Y = 235+5

Sealing area 10±3

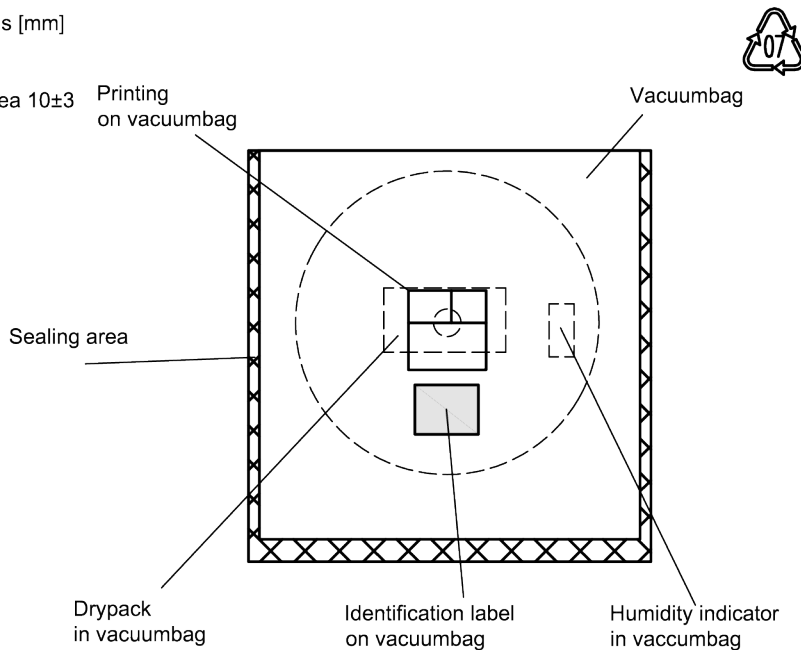
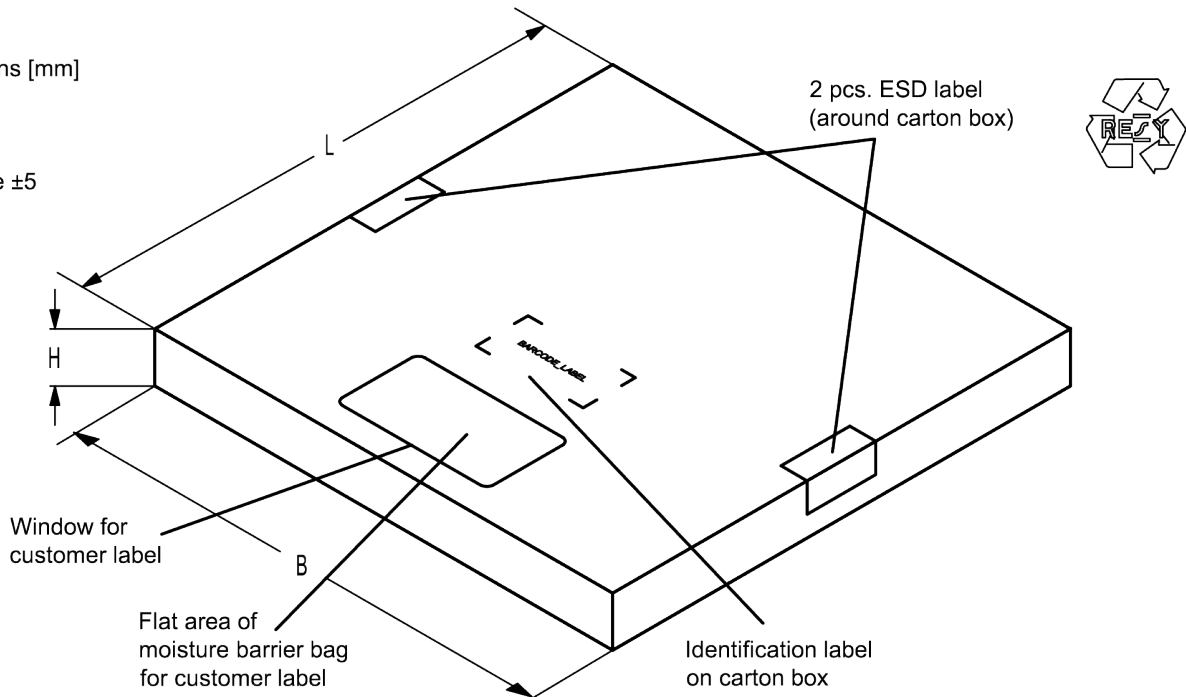


Figure 9: Drawing of moisture barrier bag (MBB) for reel with diameter of 180 mm.

**SAW components** **B8353**  
**SAW Tx post PA filter** **2350 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.

## SAW components

B8353

## SAW Tx post PA filter

2350 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.
	<b>16J</b>	<b>1234</b>
	$1 \times 32^2 + 6 \times 32^1 + 18 (=J) \times 32^0$	<b>1234</b>

The BASE32 code for product type B8353 is 851.

■ 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>12345</b>
	$5 \times 47^2 + 27 (=U) \times 47^1 + 31 (=Y) \times 47^0$	<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.



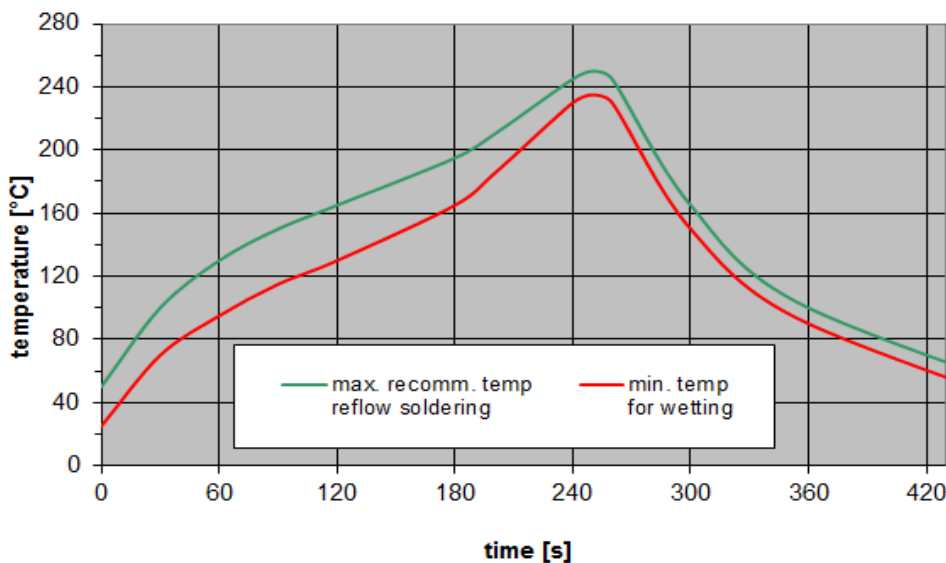
Data sheet

## 12 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
$T \geq 255$ °C	–
peak temperature $T_{\text{peak}}$	250 °C +0/-5 °C
wetting temperature $T_{\text{min}}$	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
B39242B8353P810	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](http://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

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.**
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