



RF360
Europe GmbH

SAW components

SAW RF uplink filter

Base stations
LTE band 3

Series/type: B5364
Ordering code: B39172B5364U410

Date: May 03, 2016
Version: 2.1

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SAW RF uplink filter	1747.5 MHz

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1 Application

- RF filter for base stations
- Usable pass band 75 MHz
- Unbalanced to unbalanced operation
- No external matching components required

2 Features

- Package size 3.0 ± 0.1 mm \times 3.0 ± 0.1 mm
- Package height 1.1 ± 0.125 mm
- Approximate weight 0.04 g
- RoHS compatible
- Package for Surface Mount Technology (SMT)
- Ni/Au plated terminals
- Lead free soldering compatible with J-STD20C
- Electrostatic Sensitive Device (ESD)
- Moisture Sensitivity Level 1 (MSL1)

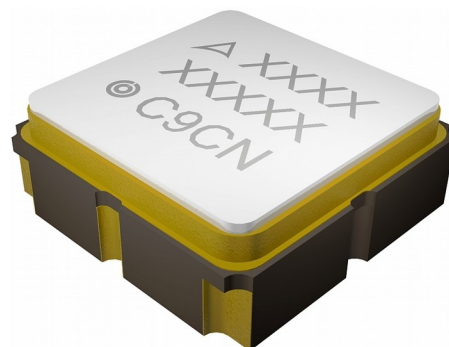
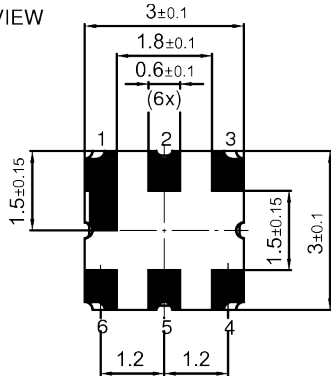


Figure 1: Picture of component with example of product marking.

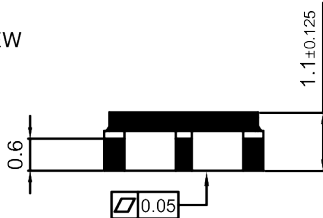
Data sheet

3 Package

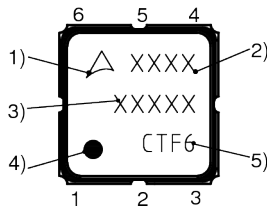
BOTTOM VIEW



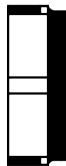
SIDE VIEW



TOP VIEW

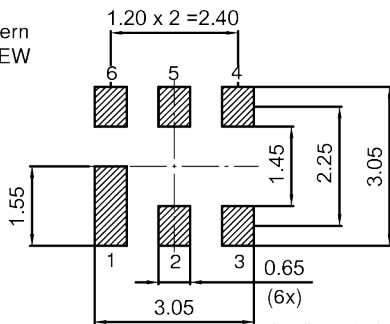


SIDE VIEW



- 1) Company logo
- 2) Device designation
- 3) Last five digits of the lot number
- 4) Marking for pad number 1
- 5) Example of production location and date code

Land pattern
THRU VIEW



Landing pad tolerance -0.02

Figure 2: Drawing of package. See Sec. Package information (p. 16).

4 Pin configuration

- 2 Input
- 5 Output
- 1, 3, 4, 6 Ground

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5 Matching circuit

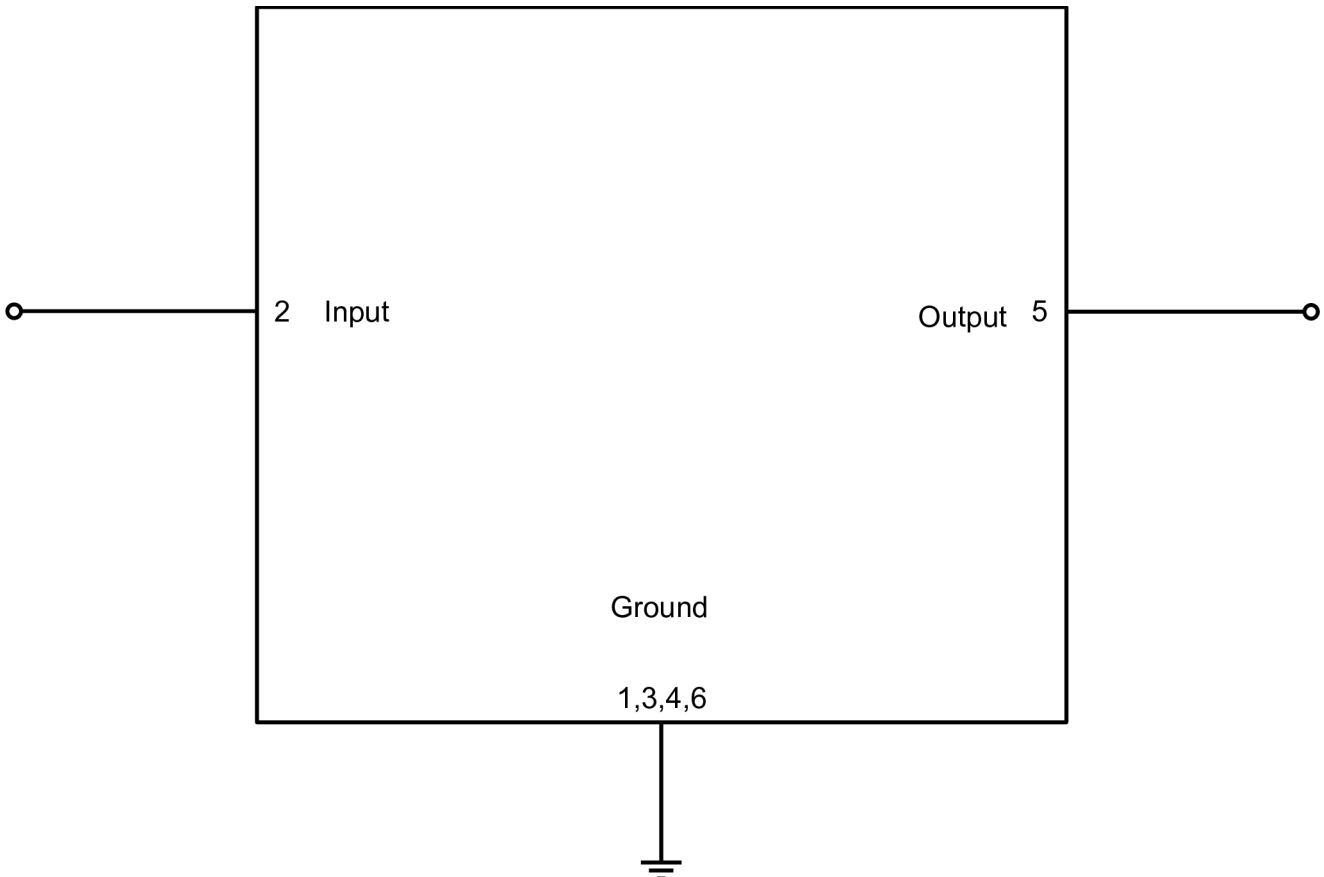


Figure 3: Schematic of matching circuit. No external matching components required.

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6 Characteristics

Temperature range for specification	$T_{SPEC}^{1)}$	= -40 °C ... +95 °C
Input terminating impedance	Z_{IN}	= 50 Ω
Output terminating impedance	Z_{OUT}	= 50 Ω

Characteristics			min. for T_{SPEC}	typ. @+25 °C	max. for T_{SPEC}	
Center frequency		f_C	—	1747.5	—	MHz
Maximum insertion attenuation	1710... 1785	MHz	α_{max}	—	2.6	3.5 ²⁾ dB
Amplitude ripple (p-p)	1710... 1785	MHz	$\Delta\alpha$	—	1.5	2.2 ³⁾ dB
Variation of group delay	1710... 1785	MHz	$\Delta\tau_{var}$	—	30	55 ns
In any 5 MHz window	1710... 1785	MHz		—	10	30 ns
Maximum VSWR			VSWR _{max}			
@ input port	1710... 1785	MHz		—	1.8	2.3
@ output port	1710... 1785	MHz		—	1.8	2.3
Minimum attenuation			α_{min}			
	10... 720	MHz		30	36	— dB
	720... 1670	MHz		30	36	— dB
	1670... 1690	MHz		20 ⁴⁾	30	— dB
	1670... 1690	MHz		10 ⁵⁾	30	— dB
	1805... 1825	MHz		45	58	— dB
	1825... 1880	MHz		44	48	— dB
	1880... 1920	MHz		44	48	— dB
	1920... 2000	MHz		44	50	— dB
	2000... 2110	MHz		38	43	— dB
	2110... 2170	MHz		31	38	— dB
	2170... 2660	MHz		26	30	— dB
	2660... 2690	MHz		26	30	— dB
	2690... 3800	MHz		8	12	— dB
	3800... 5000	MHz		5	8	— dB

¹⁾ T is the ambient temperature of the PCB at component position. Specified min./max. values are valid for an input power at input port of up to 15 dBm.

²⁾ Valid for temperature $T_{SPEC} = -20\text{ °C} \dots +95\text{ °C}$. For $-40\text{ °C} \dots -20\text{ °C}$ this value increases to 3.8 dB.

³⁾ Valid for temperature $T_{SPEC} = -20\text{ °C} \dots +95\text{ °C}$. For $-40\text{ °C} \dots -20\text{ °C}$ this value increases to 2.5 dB.

⁴⁾ Valid for temperature $T_{SPEC} = -40\text{ °C} \dots +25\text{ °C}$.

⁵⁾ Valid for temperature $T_{SPEC} = +25\text{ °C} \dots +95\text{ °C}$.

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7 Maximum ratings

Operable temperature	$T_{OP} = -40\text{ °C} \dots +95\text{ °C}$	
Storage temperature	$T_{STG} = -40\text{ °C} \dots +95\text{ °C}$	
DC voltage	$V_{DC} = 0\text{ V}$	
Input power	P_{IN}	
@ input port: 1710 ... 1785 MHz	24 dBm	Continuous wave for 3 h @ 95 °C.
@ input port: 1710 ... 1785 MHz	20 dBm	Continuous wave for 1000 h @ 95 °C.
@ input port: 1710 ... 1785 MHz	15 dBm	Continuous wave for 100000 h @ 95 °C.

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8 Transmission coefficient

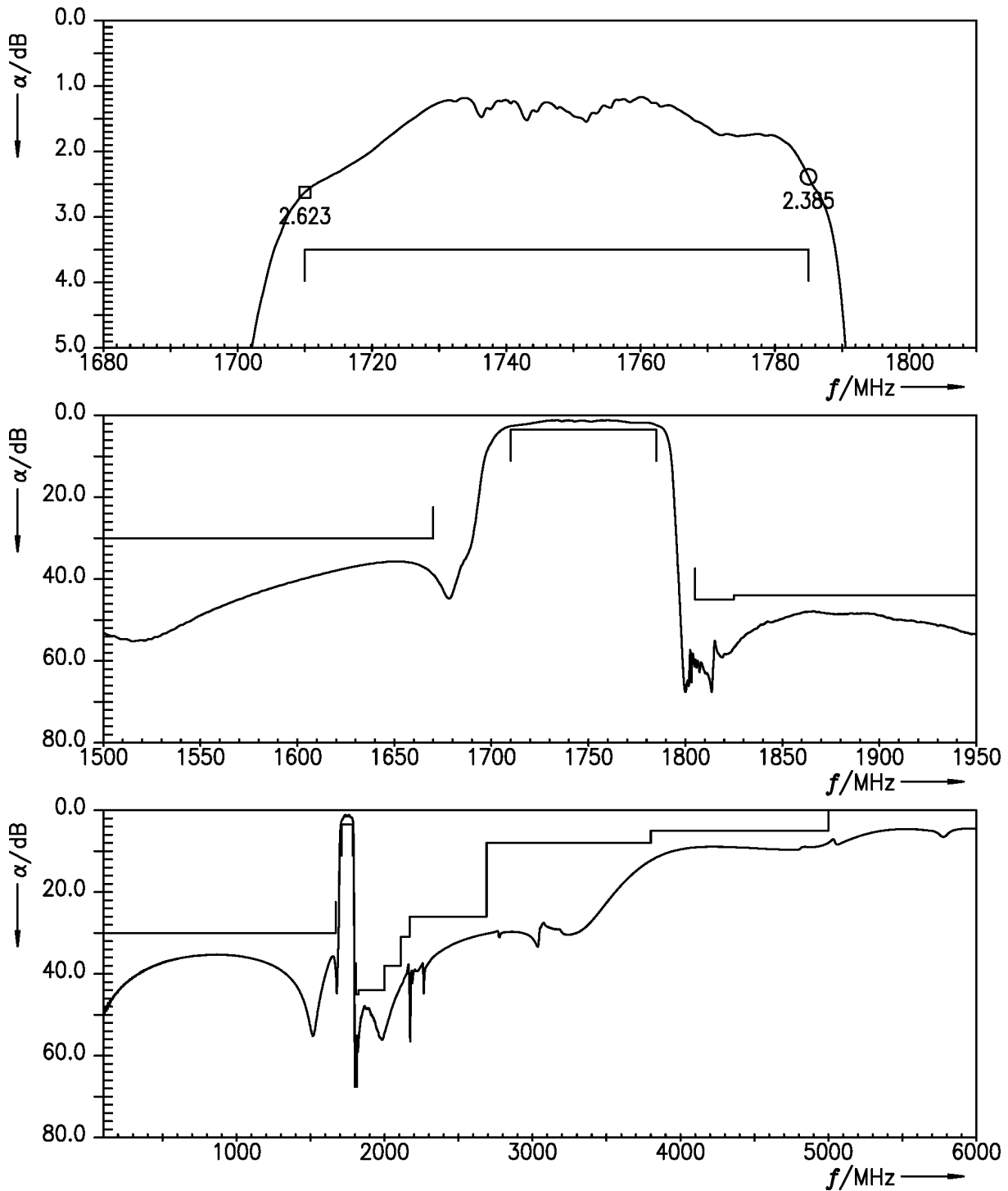


Figure 4: Attenuation.

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9 Reflection coefficients

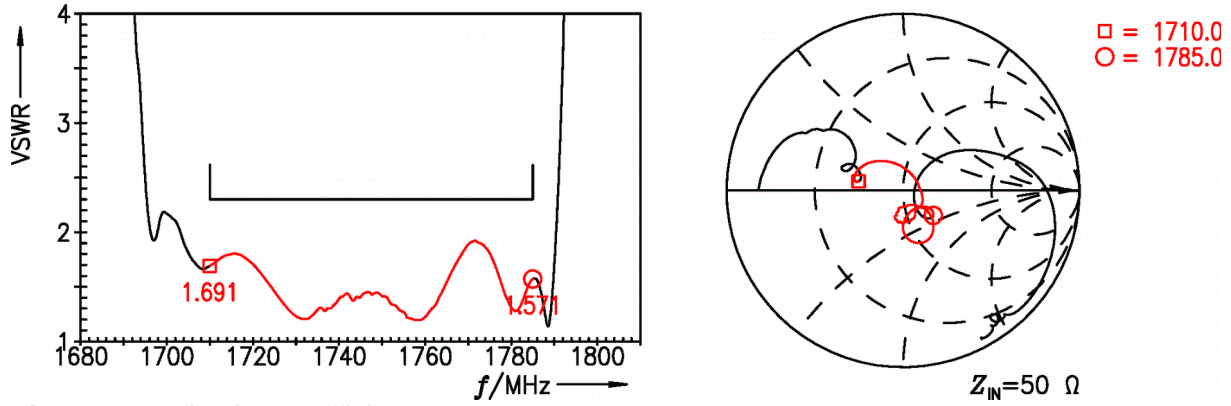


Figure 5: Reflection coefficient at IN port.

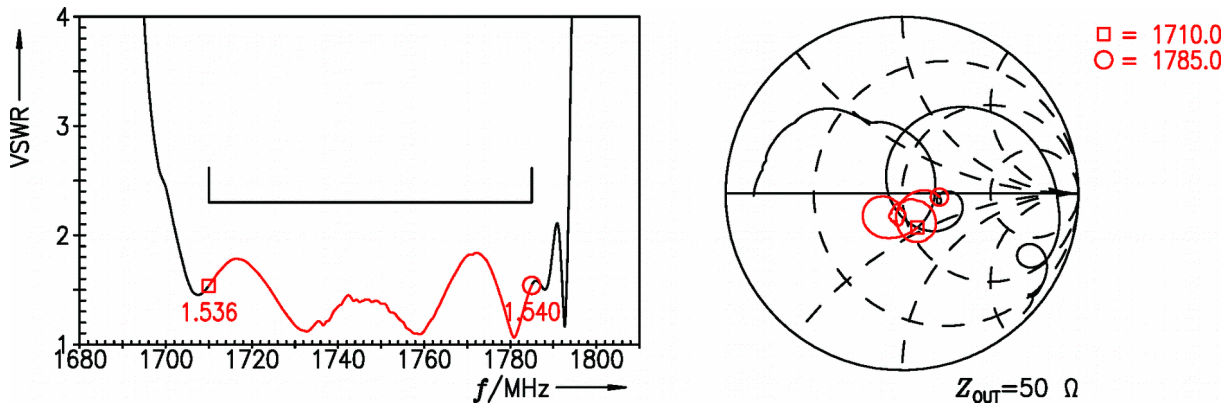


Figure 6: Reflection coefficient at OUT port.

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10 Packing material

10.1 Tape

Section Y-Y

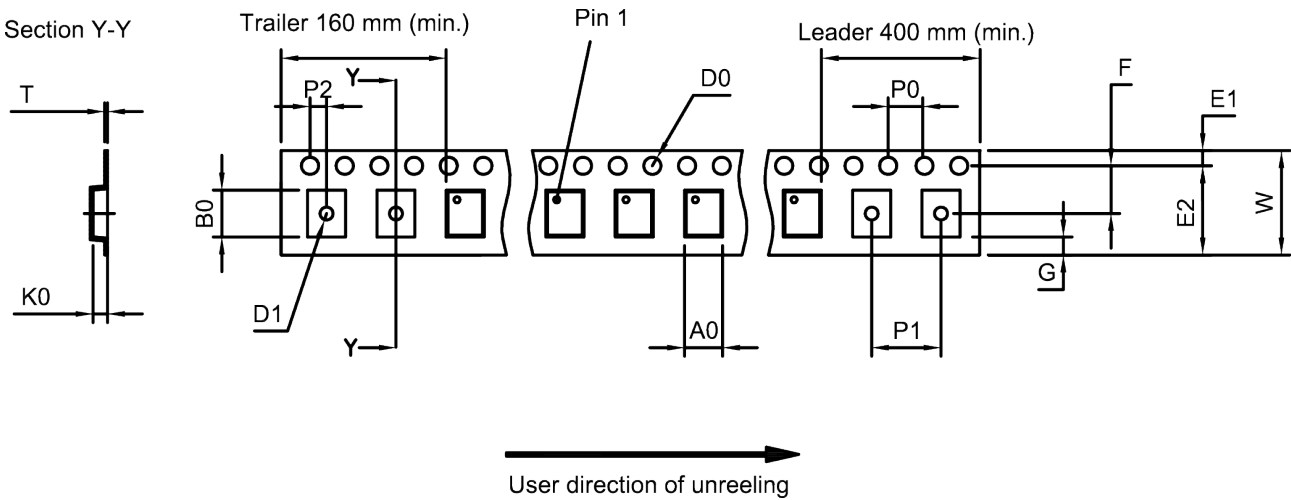


Figure 7: Drawing of tape (first-angle projection) with tape dimensions according to Table 1.

A ₀	3.25±0.1 mm	E ₂	10.25 mm (min.)	P ₁	4.0±0.1 mm
B ₀	3.3±0.1 mm	F	5.5±0.05 mm	P ₂	2.0±0.1 mm
D ₀	1.5+0.1/-0 mm	G	0.75 mm (min.)	T	0.2±0.05 mm
D ₁	1.5 mm (min.)	K ₀	1.5±0.1 mm	W	12.0+0.3/-0.1 mm
E ₁	1.75±0.1 mm	P ₀	4.0±0.1 mm		

Table 1: Tape dimensions.

10.2 Reel with diameter of 180 mm

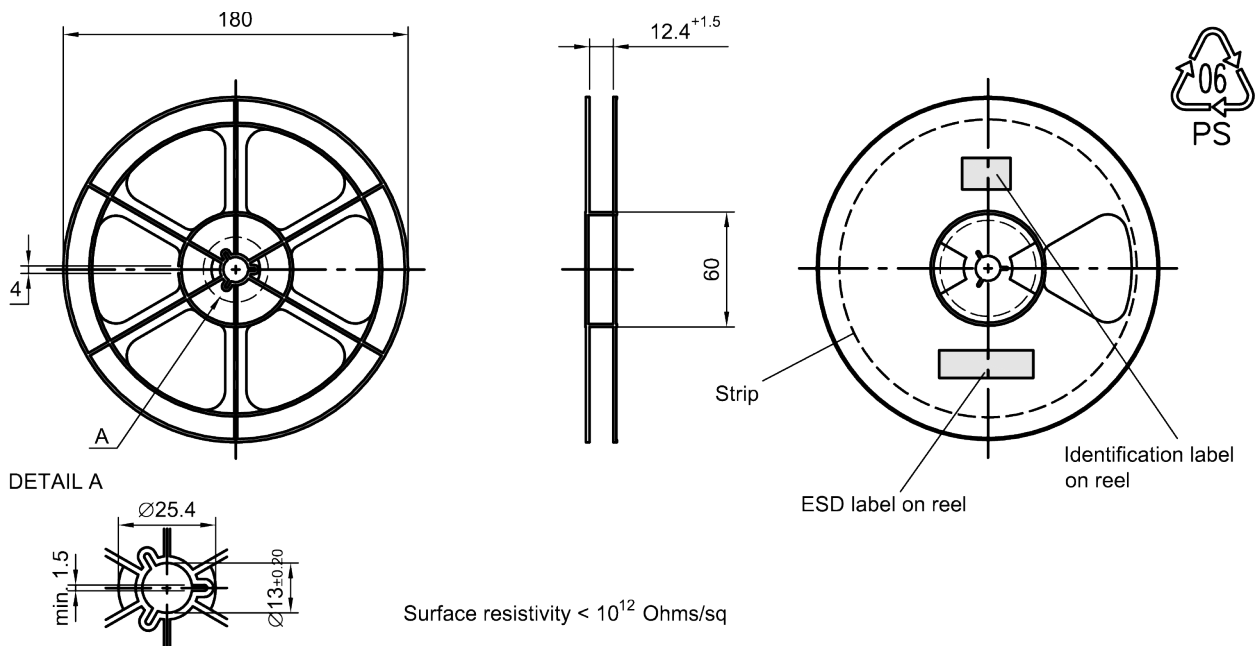
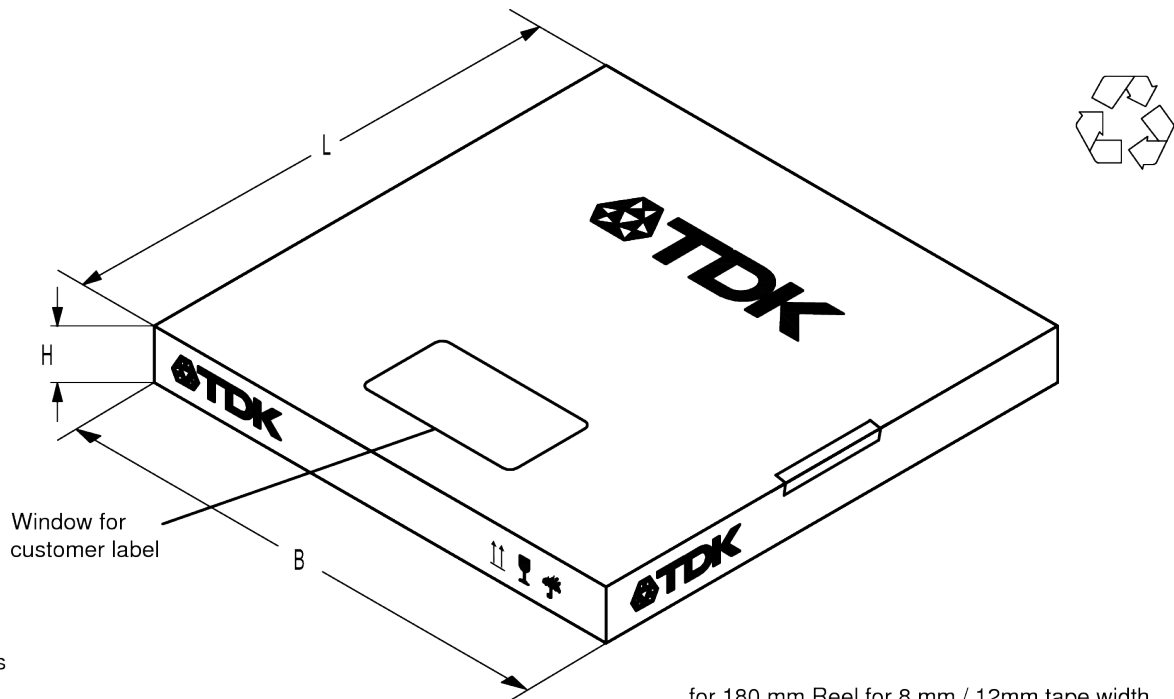


Figure 8: Drawing of reel (first-angle projection) with diameter of 180 mm.

Data sheet



Dimensions

L = 182
 B = 185
 H = 26

for 180 mm Reel for 8 mm / 12mm tape width SMD packages

Figure 9: Drawing of folding box for reel with diameter of 180 mm.

10.3 Reel with diameter of 330 mm

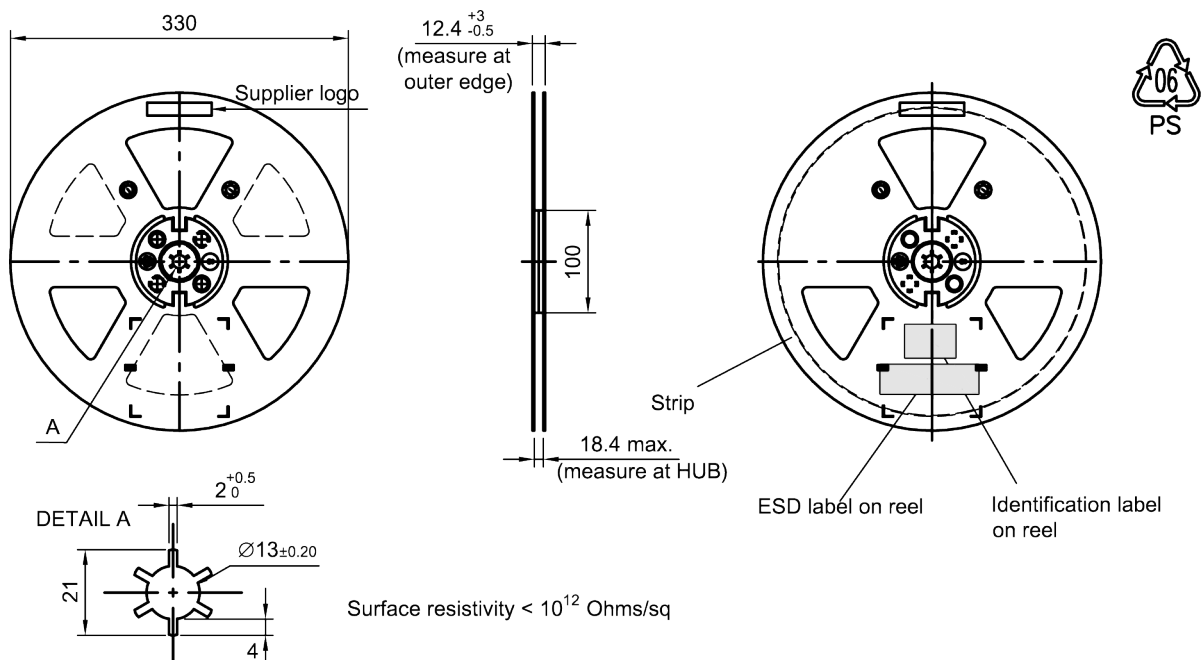
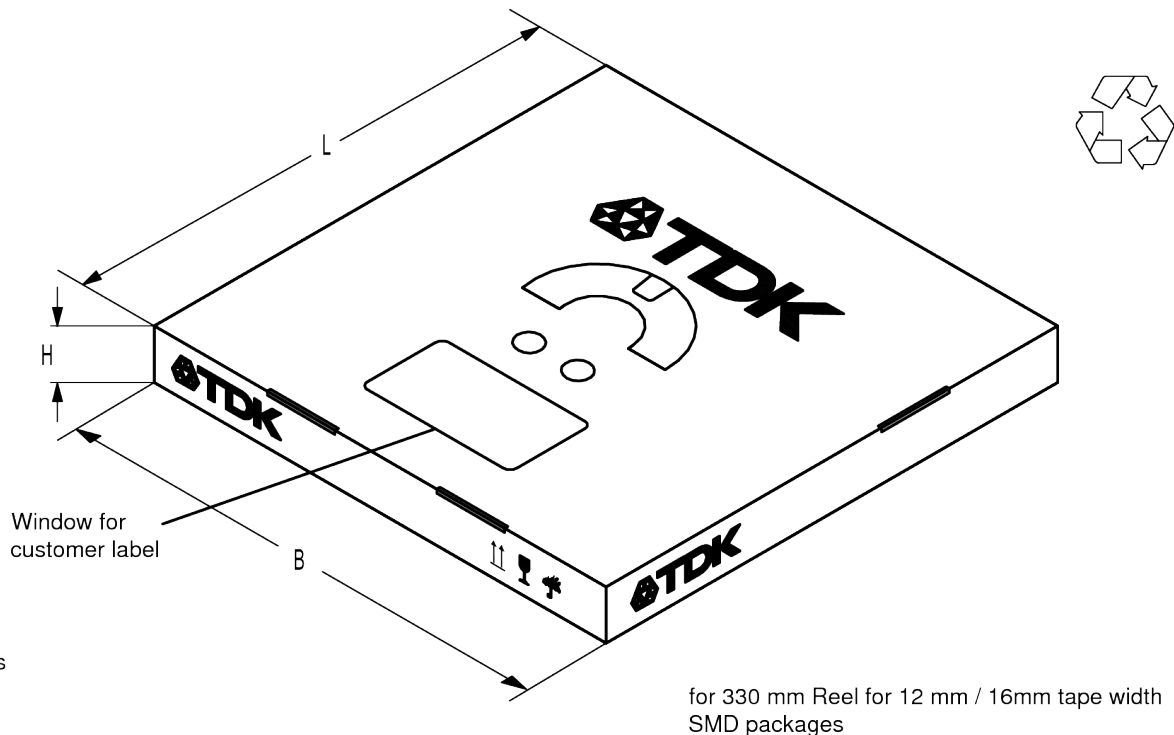


Figure 10: Drawing of reel (first-angle projection) with diameter of 330 mm.

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Dimensions

L = 340

B = 340

H = 25

Figure 11: Drawing of folding box for reel with diameter of 330 mm.

11 Marking

Products are marked with device designation, lot number, as well as production location and date code.

- Device designation: The 4-character device designation of the ordering code is used for the marking.

Example for 4-character device designation: B3xxxxB1234xxxx

- Lot number: The last 5 digits of the lot number are used for the marking.

Example: 12345

- Production location and date code: The production location is Wuxi (encoded in the first character 'C'). The production date code is encoded in the last three characters according to Table 2.

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1 st digit (day)						2 nd digit (year)				3 rd digit (month)			
Day	Code	Day	Code	Day	Code	Year	Code	Year	Code	Month	Code	Month	Code
1	1	11	A	21	M	2010	A	2022	P	Jan	1	Jul	7
2	2	12	B	22	N	2011	B	2023	R	Feb	2	Aug	8
3	3	13	C	23	P	2012	C	2024	S	Mar	3	Sep	9
4	4	14	D	24	R	2013	D	2025	T	Apr	4	Oct	0
5	5	15	E	25	S	2014	E	2026	U	May	5	Nov	N
6	6	16	F	26	T	2015	F	2027	V	Jun	6	Dec	D
7	7	17	H	27	U	2016	H	2028	W				
8	8	18	J	28	V	2017	J	2029	X				
9	9	19	K	29	W	2018	K	2030	Z				
10	0	20	L	30	X	2019	L	2031	A				
				31	Z	2020	M	2032	B				
						2021	N	and so on					

Table 2: Production date code.

Example of how to decode production location and date code:

Code: **CTF6**

Location: C → Wuxi

Day: T → 26th

Year: F → 2015

Month: 6 → June

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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).

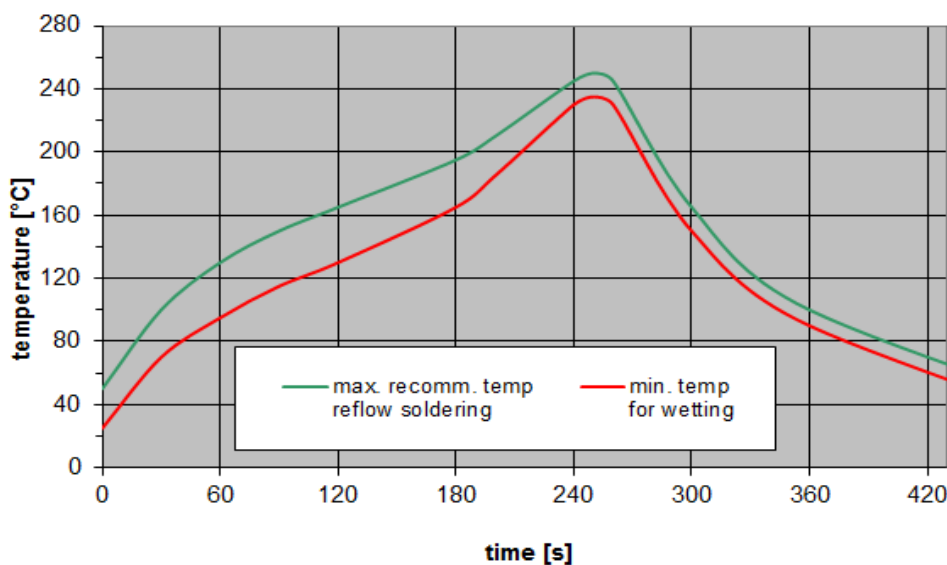


Figure 12: Recommended reflow profile for convection and infrared soldering – lead-free solder.

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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 EPCOS sales office.

13.4 Ordering codes and packing units

Ordering code	Packing unit
B39172B5364U410	9000 pcs
B39172B5364U410W 3	3000 pcs

Table 4: Ordering codes and packing units.

Data sheet

14 Cautions and warnings

14.1 Display of ordering codes for EPCOS 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 EPCOS, 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.epcos.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.

14.3 Moldability

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

14.4 Package information

Landing area

The printed circuit board (PCB) land pattern (landing area) shown is based on EPCOS 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 EPCOS, 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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