

RF360 Europe GmbH

A Qualcomm – TDK Joint Venture

SAW Components

SAW Filter

TD-LTE / TD-SCDMA 1900

Series/type: B8837
Ordering code: B39192B8837P810
DCN: 80-PA243-24 Rev. A

Date: February 3, 2017
Version: 2.2

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Series/type:	B8837
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SAW Components	B8837
SAW Filter	1900.0 MHz

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1 Application

- Low-loss SAW RF filter for mobile telephone TD-LTE/TD-SCDMA systems.
- Unbalanced to unbalanced operation.
- Usable pass band 40 MHz.
- No matching network required for operation at 50Ω.
- Suitable for GPRS class 1 to 12.

2 Features

- Package size 1.1 mm × 0.9 mm.
- Package height 0.45 mm max.
- RoHS compatible.
- Approximate weight 0.001 g.
- Package for Surface Mount Technology (SMT).
- Ni, gold-plated terminals.
- Electrostatic Sensitive Device (ESD).
- Moisture Sensitivity Level 3 (MSL3).

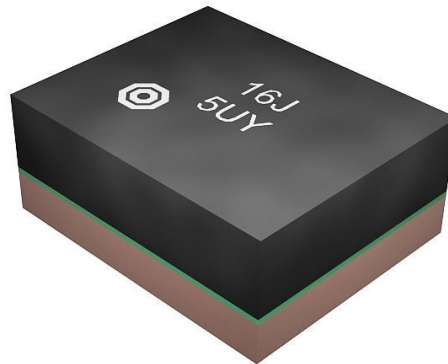
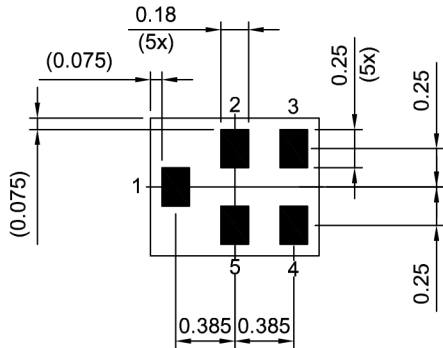


Figure 1: Picture of component with example of marking.

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3 Package

BOTTOM VIEW

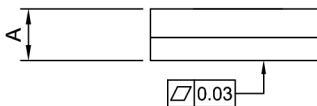


Pad and pitch tolerance ± 0.05

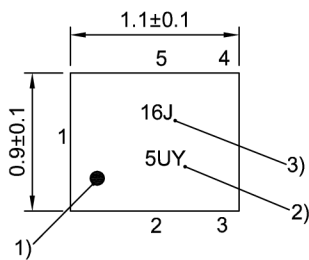
4 Pin configuration

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

SIDE VIEW

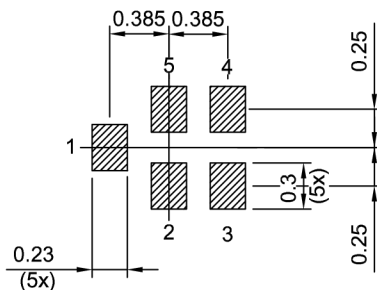


TOP VIEW



- 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 Simplified drawings (p. 16).

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5 Matching circuit

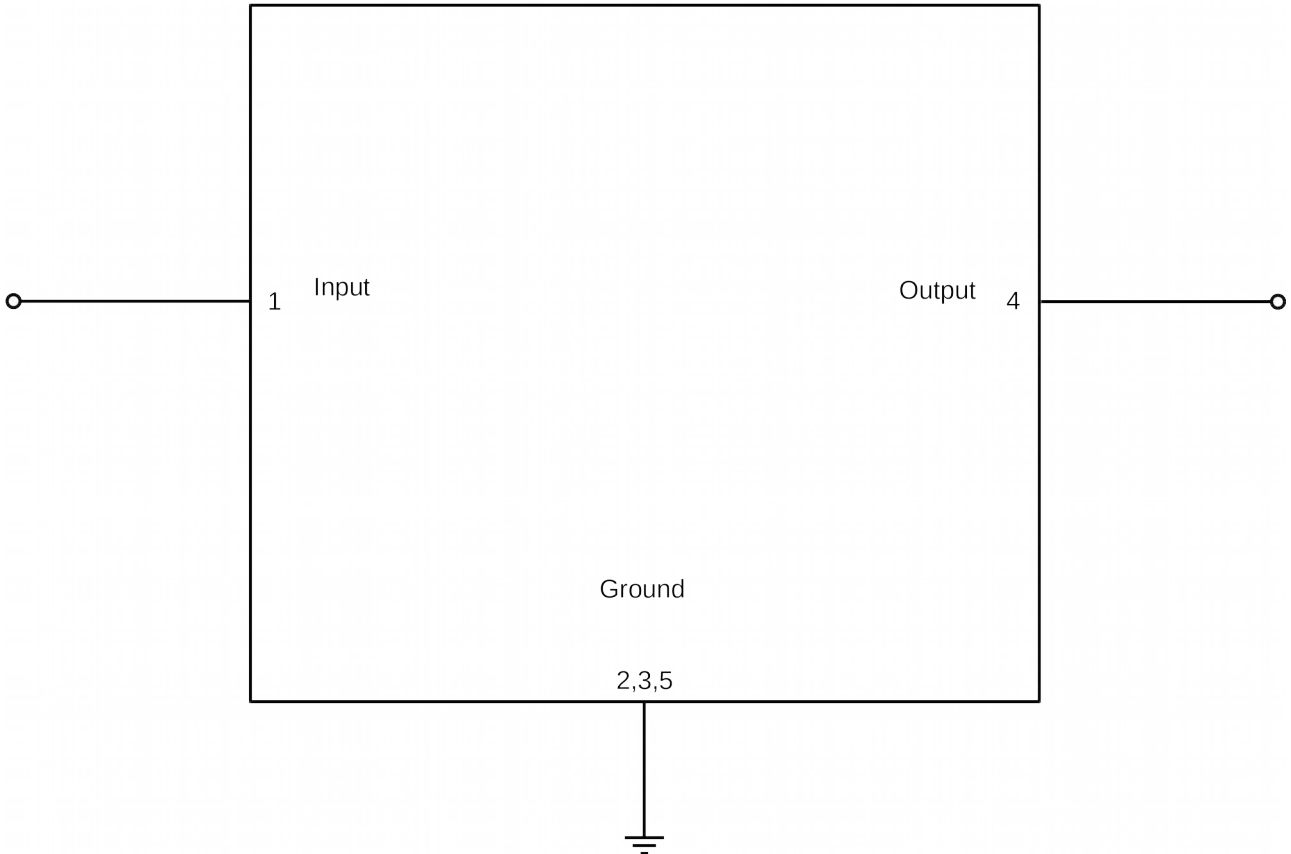


Figure 3: Schematic of matching circuit. No external matching components required.

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6 Characteristics

Temperature range for specification T = -30 °C to +85 °C
 Input terminating impedance Z_{IN} = 50 Ω
 Output terminating impedance Z_{OUT} = 50 Ω

Characteristics	min.	typ. @+25 °C	max.		
Center frequency	f_c	—	1900	—	MHz
Maximum insertion attenuation	α_{max}	—	1.4	1.9	dB
	1880... 1920 MHz				
Amplitude ripple (p-p)	$\Delta\alpha$	—	0.5	1.2	dB
	1880... 1920 MHz				
Maximum VSWR	$VSWR_{max}$				
@ input port	1880... 1920 MHz	—	1.7	2.0	
@ output port	1880... 1920 MHz	—	1.7	2.0	
Minimum attenuation	α_{min}				
	10... 915 MHz	40	43	—	dB
	915... 1710 MHz	40	43	—	dB
	1710... 1735 MHz	38	42	—	dB
	1735... 1785 MHz	38	41	—	dB
	1785... 1830 MHz	28	31	—	dB
	1830... 1850 MHz	30	32	—	dB
	1980... 2025 MHz	23	27	—	dB
	2025... 2400 MHz	30	36	—	dB
	2400... 2500 MHz	40	43	—	dB
	2496... 2690 MHz	32	36	—	dB
	4900... 5950 MHz	26	31	—	dB
	5640... 5760 MHz	30	35	—	dB
	7520... 7680 MHz	27	33	—	dB

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7 Maximum ratings

Storage temperature	$T_{STG} = -40\text{ °C to }+85\text{ °C}^{1)}$	
DC voltage	$V_{DC} = 5.0\text{ V (max.)}^{2)}$	
ESD voltage		
	$V_{ESD}^{3)}$ 50 V (max.)	Machine model.
	$V_{ESD}^{4)}$ 100 V (max.)	Human body model.
	$V_{ESD}^{5)}$ 500 V (max.)	Charged device model.
Input power @ input port: 1880 ... 1920 MHz	$P_{IN} = 11\text{ dBm}$	Effective power in the on-state, duty cycle 4:8.

¹⁾ Extended upper limit: 168h@125°C acc. to IEC 60068-2-2 Bb.

²⁾ 168h Damp Heat Steady State acc. to IEC 60068-2-67 Cy.

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⁾ According to JESD22-C101C (CDM – Field Induced Charged Device Model), 3 negative & 3 positive pulses.

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8 Transmission coefficient

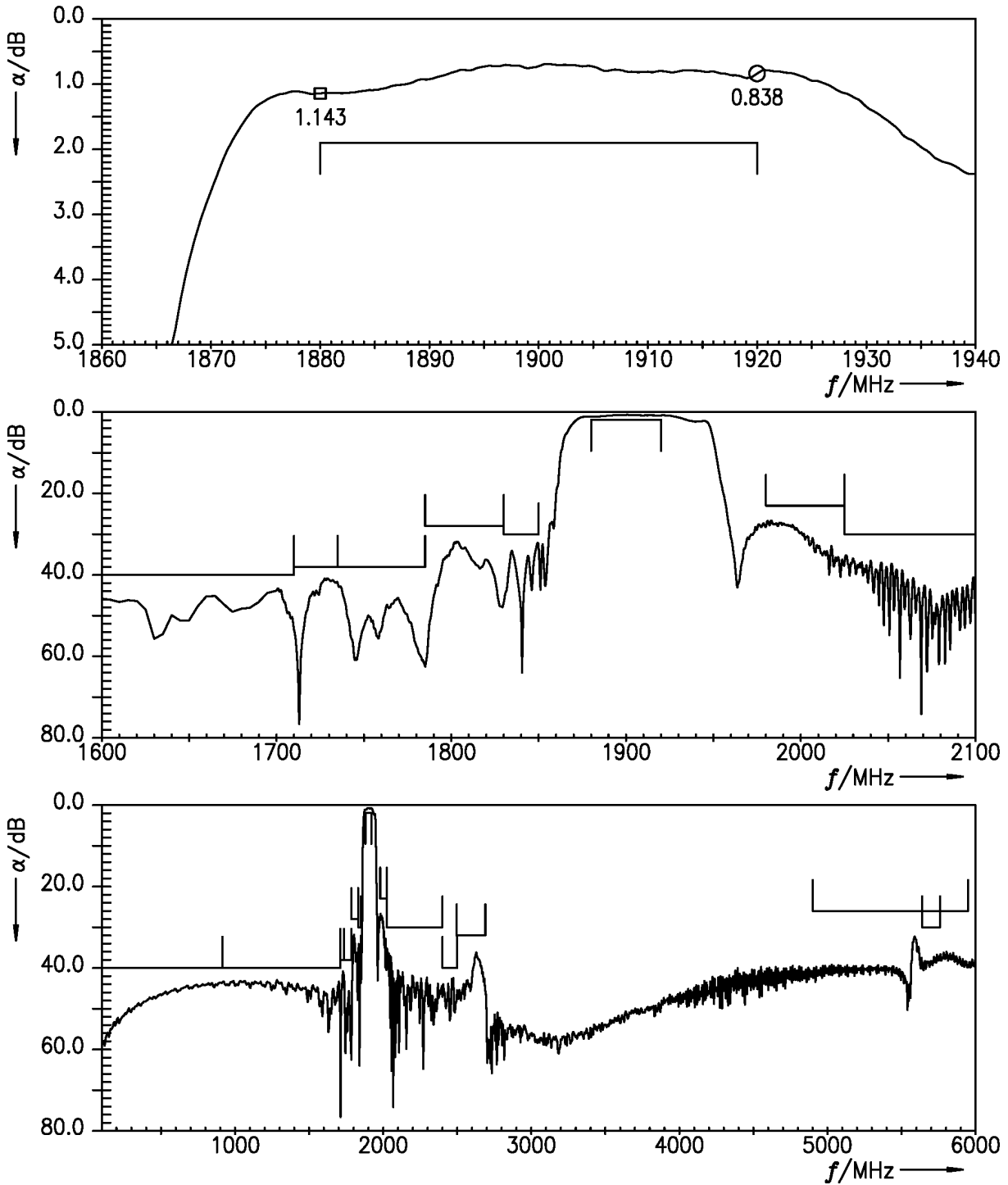


Figure 4: Attenuation.

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9 Reflection coefficients

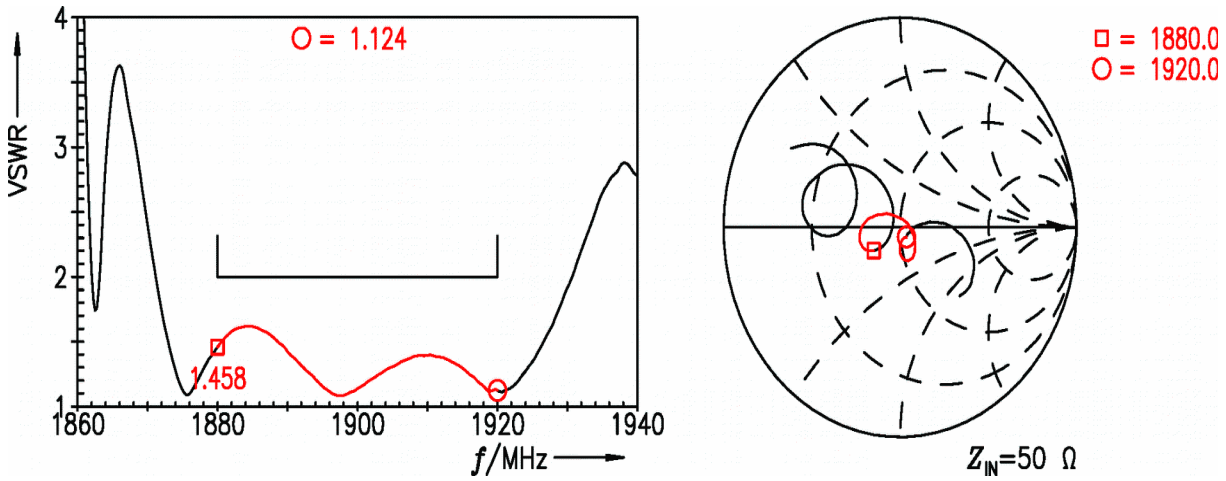


Figure 5: Reflection coefficient at IN port.

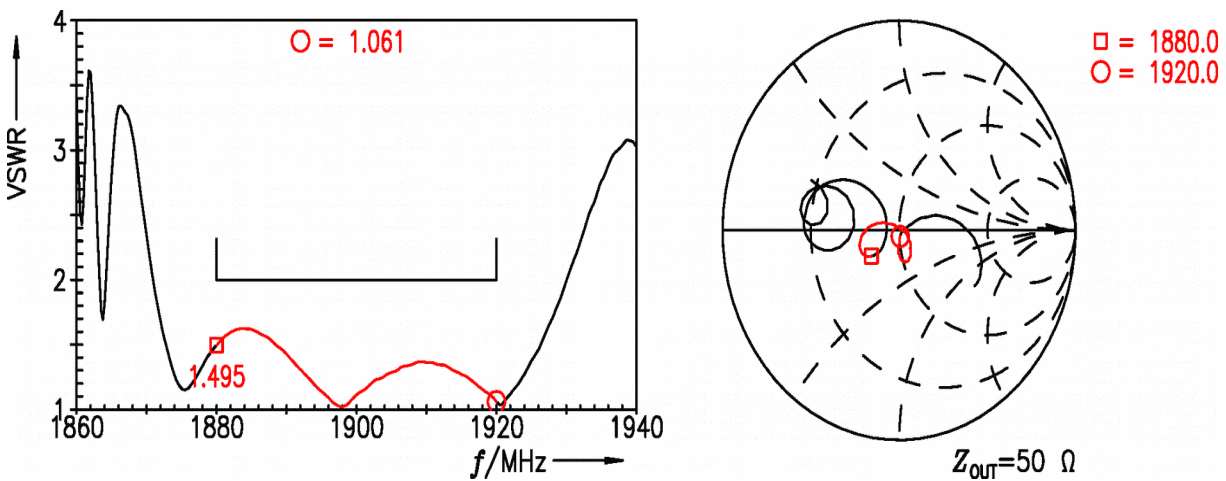


Figure 6: Reflection coefficient at OUT port.

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10 Packing material

10.1 Tape

Section Y-Y

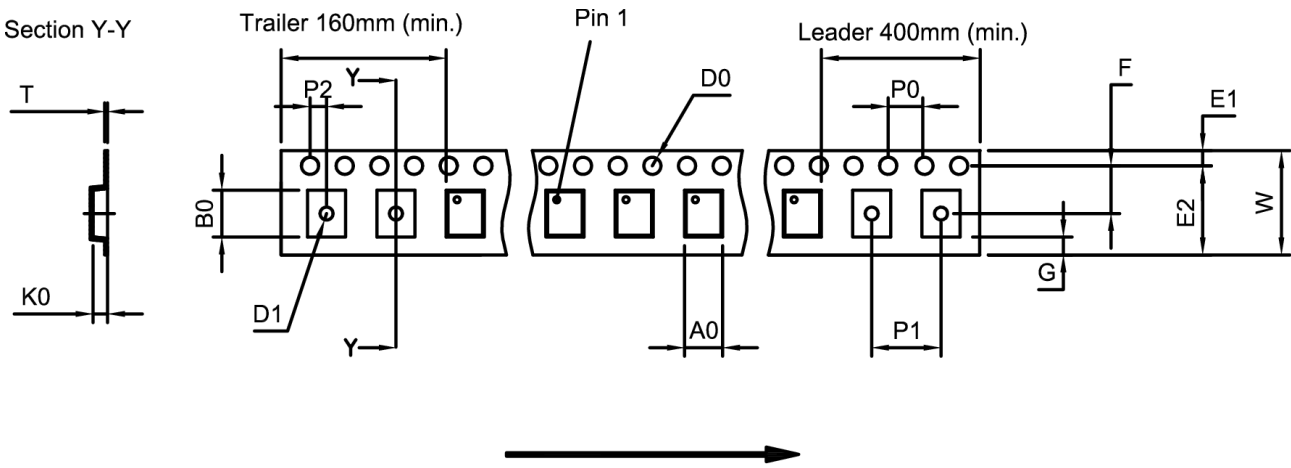


Figure 7: Drawing of tape (first-angle projection) with tape dimensions according to Table 1.

A ₀	1.02±0.05 mm
B ₀	1.22±0.05 mm
D ₀	1.55±0.05 mm
D ₁	0.55±0.1 mm
E ₁	1.75±0.1 mm

E ₂	6.25 mm (min.)
F	3.5±0.05 mm
G	–
K ₀	0.6±0.05 mm
P ₀	4.0±0.1 mm

P ₁	2.0±0.1 mm
P ₂	2.0±0.05 mm
T	0.25±0.03 mm
W	8.0+0.3/-0.1 mm

Table 1: Tape dimensions.

10.2 Reel with diameter of 180 mm

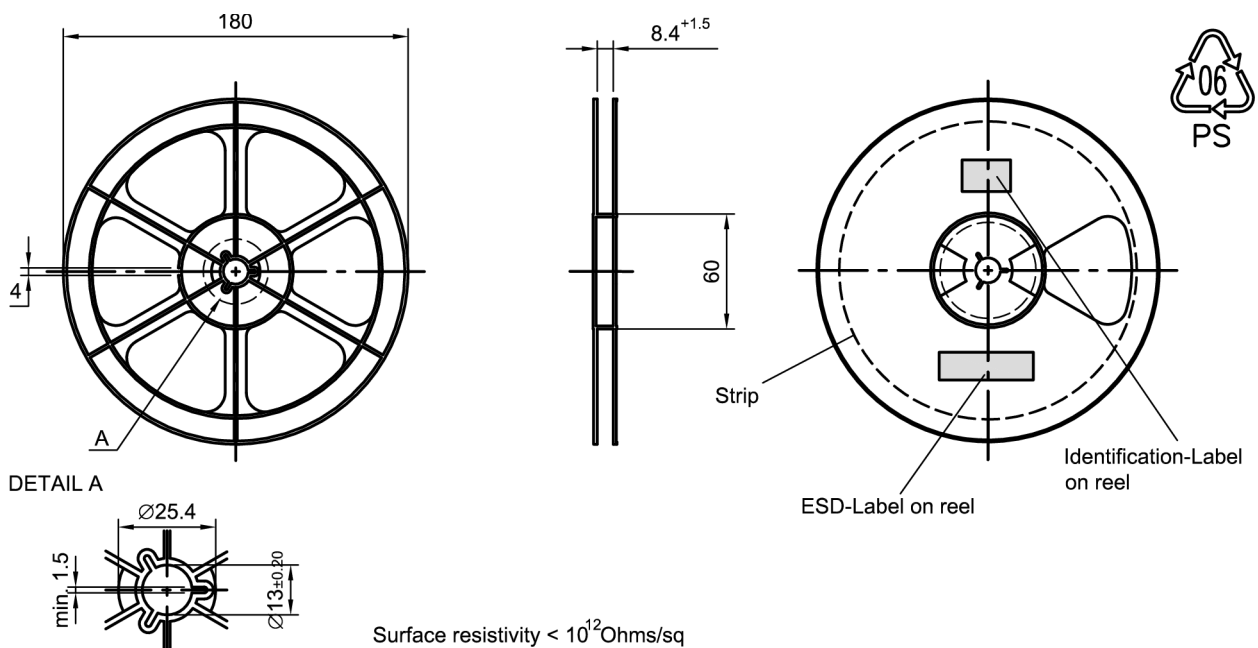


Figure 8: Drawing of reel (first-angle projection) with diameter of 180 mm.

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Dimensions [mm]

X = 220±5

Y = 235±5

Sealing area 10 ±3

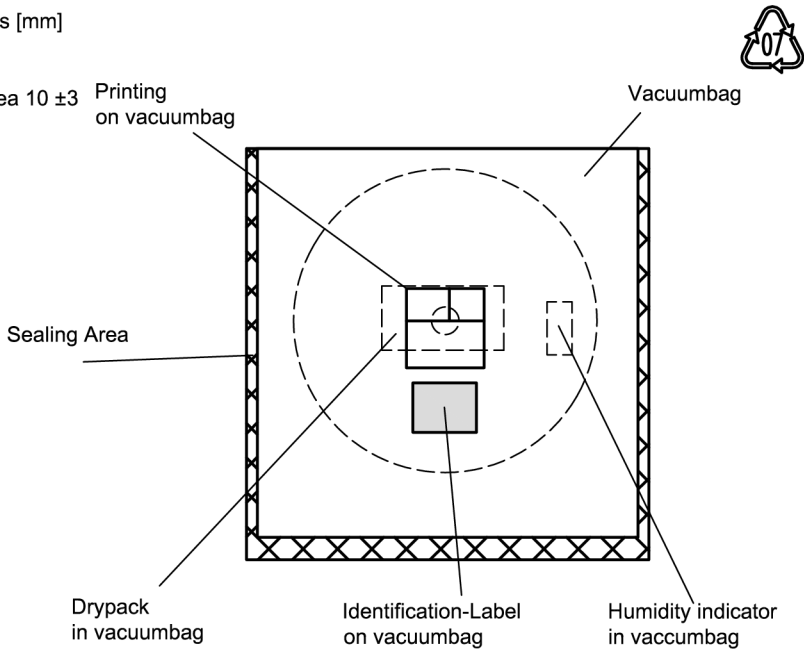


Figure 9: Drawing of moisture barrier bag (MBB) for reel with diameter of 180 mm.

Dimensions [mm]

L = 188

B = 188

H = 30

Tolerance ±5

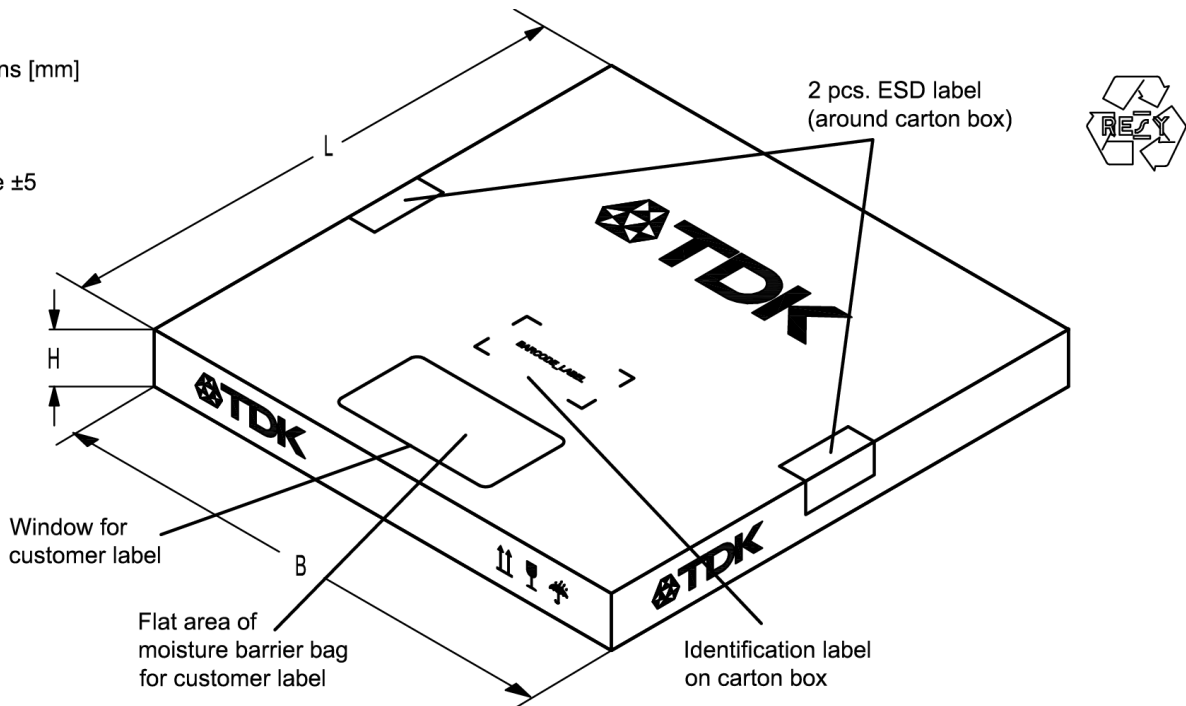


Figure 10: Drawing of folding box for reel with diameter of 180 mm.

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10.3 Reel with diameter of 330 mm

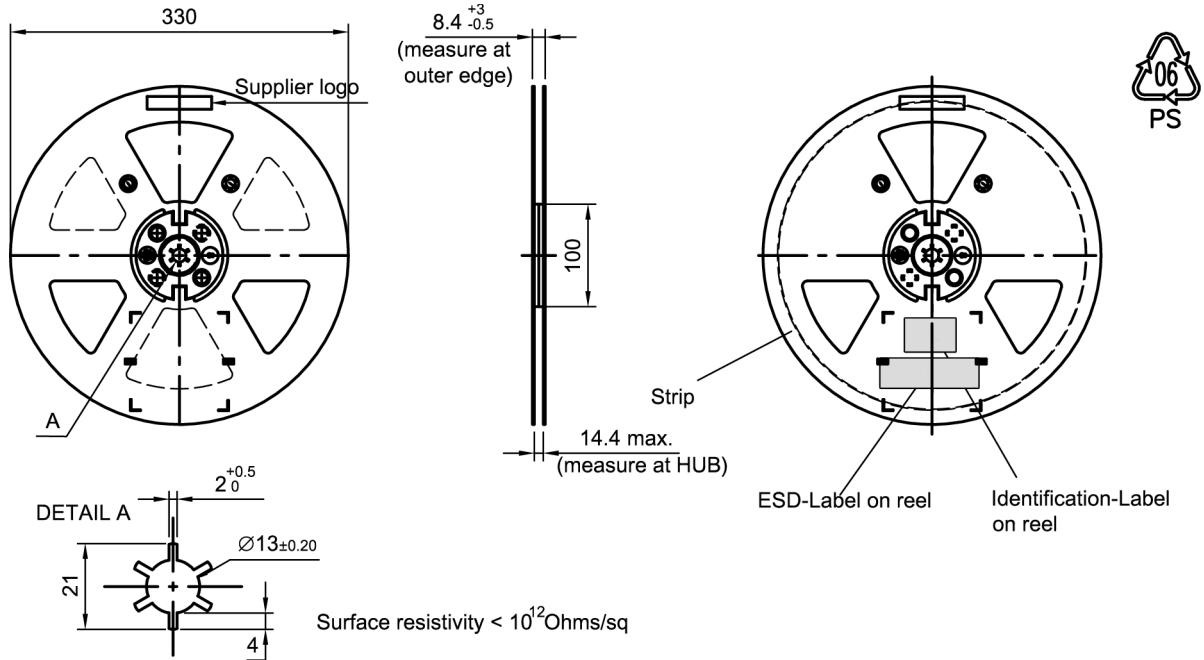


Figure 11: Drawing of reel (first-angle projection) with diameter of 330 mm.

Dimensions [mm]
 X = 400+5
 Y = 418+5
 Sealing area 10 ± 3

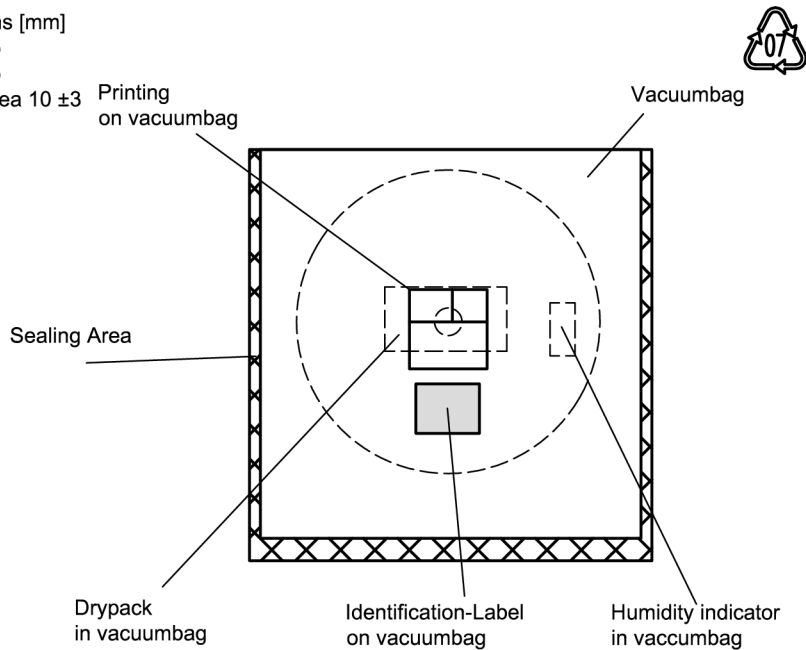


Figure 12: Drawing of moisture barrier bag (MBB) for reel with diameter of 330 mm.

Data sheet

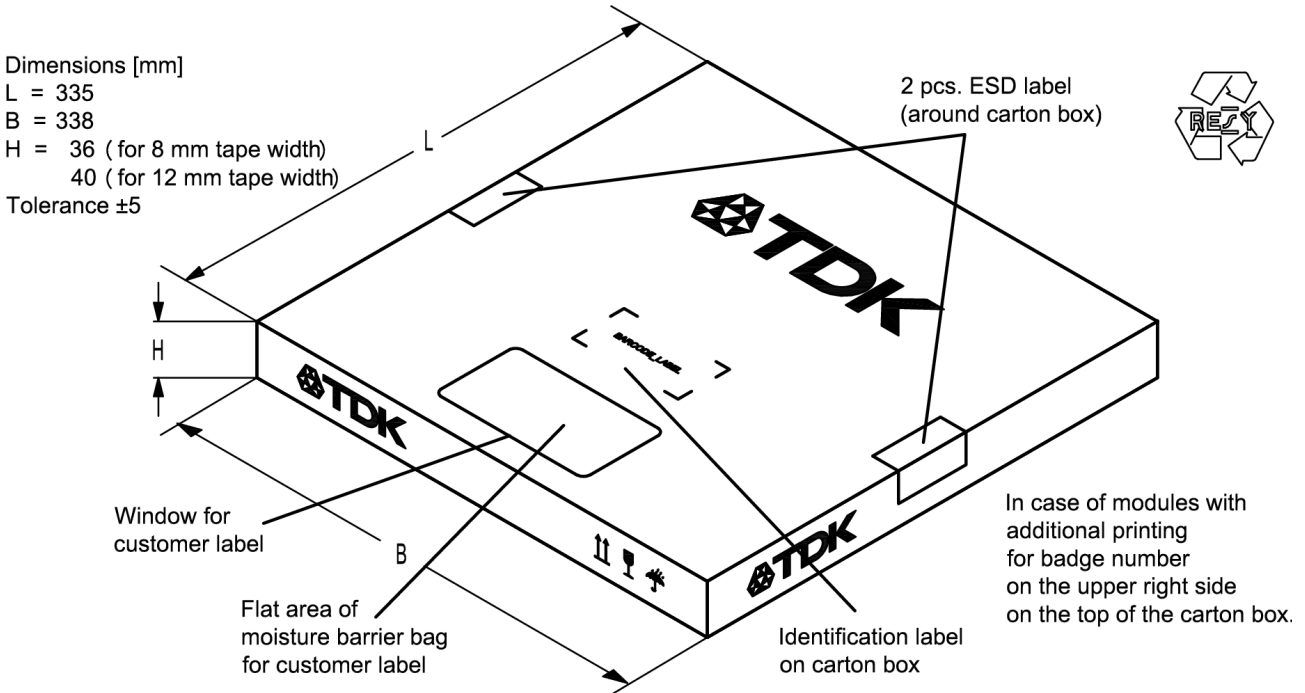


Figure 13: Drawing of folding box for reel with diameter of 330 mm.

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

The BASE32 code for product type B8837 is 8M5.

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

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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.

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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
$T > 220\text{ °C}$	30 s to 70 s
$T > 230\text{ °C}$	min. 10 s
$T > 245\text{ °C}$	max. 20 s
$T \geq 255\text{ °C}$	–
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).

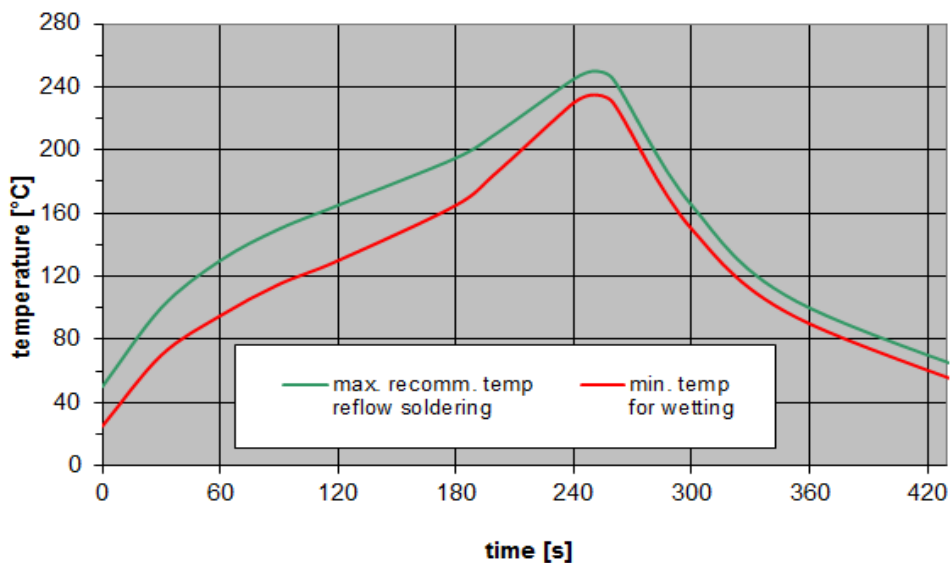


Figure 14: Recommended reflow profile for convection and infrared soldering – lead-free solder.

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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 code and packing units

Ordering code	Packing units
B39192B8837P810S	15000 pcs
B39192B8837P810S 5	5000 pcs

Table 4: Ordering codes and packing units.

14 Cautions and warnings

14.1 Moldability

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

14.2 Simplified drawings

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.

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Contact and Important notes

For further information please contact your local EPCOS sales office or visit our web page at www.epcos.com.

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