



RF360
Europe GmbH

SAW components

SAW RF filter

Base stations
Trunked Radio

Series/type:	B4240
Ordering code:	B39861B4240H410
Date:	May 03, 2018
Version:	2.2

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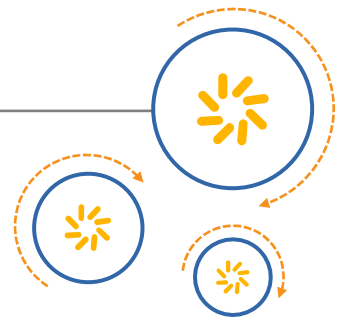
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RF360 Europe GmbH
A Qualcomm – TDK Joint Venture

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SAW components**B4240****SAW filter****860.5/769MHz**

Data sheet

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SAW components	B4240
SAW filter	860.5/769MHz

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Data sheet

1 Application

- Usable pass band 19/14MHz
- Low loss 2 in 1 RF filter for Trunked Radio
- Low amplitude ripple

2 Features

- Package code QCC8E
- Package size 3.0 ± 0.08 mm \times 2.5 ± 0.08 mm
- Package height 0.98 ± 0.115 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)

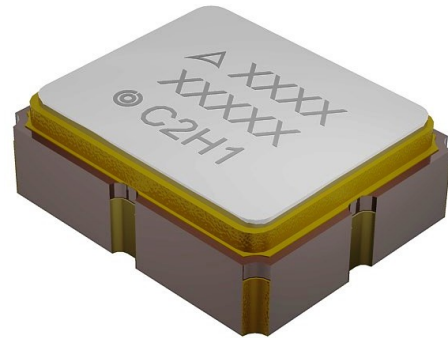


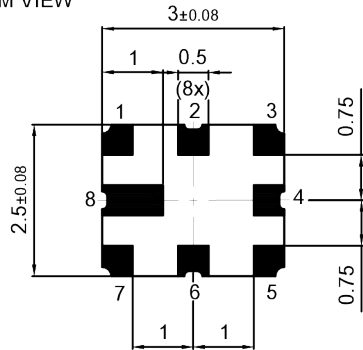
Figure 1: Picture of component with example of product marking.

SAW components **B4240**
SAW filter **860.5/769MHz**

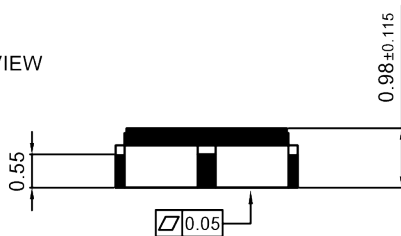
Data sheet

3 Package

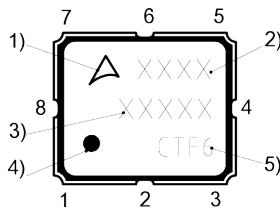
BOTTOM VIEW



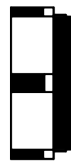
SIDE VIEW



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

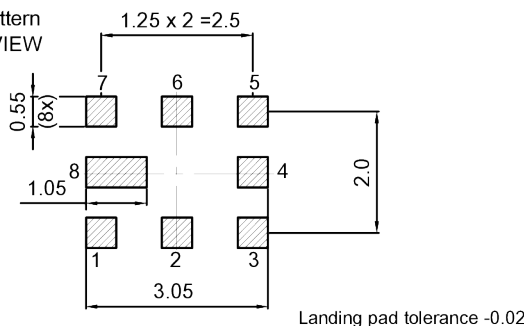


Figure 2: Drawing of package. See Sec. Package information (p. 20).

4 Pin configuration

- 1 Input (Filter1)
- 3 Input (Filter2)
- 5 Output (Filter2)
- 7 Output (Filter1)
- 2, 4, 6, 8 Ground

Data sheet

5 Matching circuit

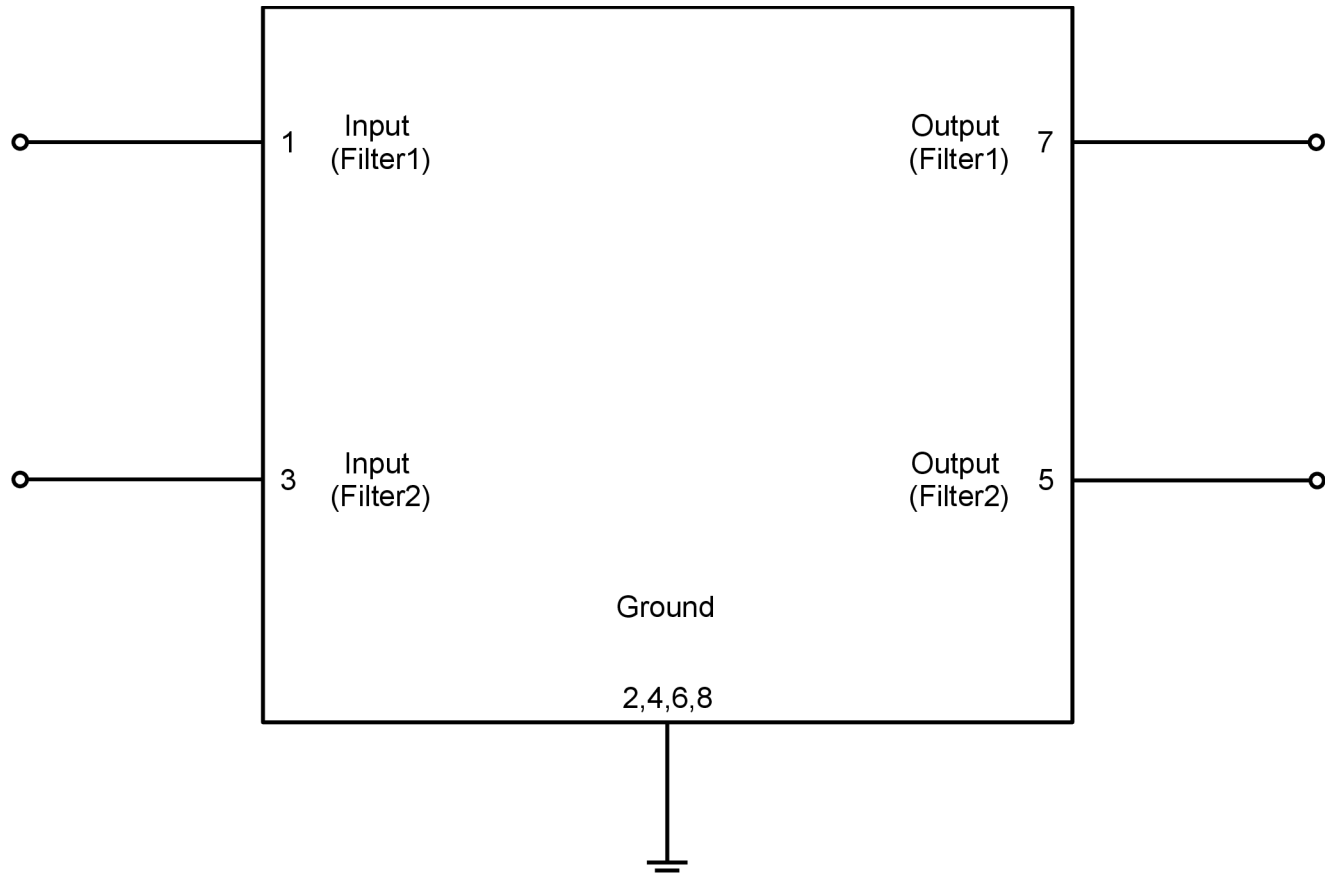


Figure 3: Schematic of matching circuit. No external matching components required.

SAW components

B4240

SAW filter

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6 Characteristics Filter1

Temperature range for specification

$$T_{\text{SPEC}} = -40\text{ °C} \dots +85\text{ °C}$$

Filter1 input terminating impedance

$$Z_{\text{Filter1 IN}} = 50\ \Omega$$

Filter1 output terminating impedance

$$Z_{\text{Filter1 OUT}} = 50\ \Omega$$

Characteristics Filter1			min. for T_{SPEC}	typ. @ +25 °C	max. for T_{SPEC}	
Center frequency			—	860.5	—	MHz
Maximum insertion attenuation						
	851... 870	MHz	—	1.8	2.7	dB
Amplitude ripple (p-p)						
	851... 870	MHz	—	0.5	1.1	dB
Minimum return loss						
@ Filter1 input port	851... 870	MHz	10	16	—	dB
@ Filter1 output port	851... 870	MHz	10	16	—	dB
Minimum attenuation						
	100... 723	MHz	50	56	—	dB
	723... 833	MHz	18	34	—	dB
	887... 997	MHz	15	22	—	dB
	997... 1500	MHz	36	39	—	dB

SAW components

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SAW filter

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7 Characteristics Filter2

Temperature range for specification

$$T_{\text{SPEC}} = -40\text{ °C} \dots +85\text{ °C}$$

Filter2 input terminating impedance

$$Z_{\text{Filter2 IN}} = 50\ \Omega$$

Filter2 output terminating impedance

$$Z_{\text{Filter2 OUT}} = 50\ \Omega$$

Characteristics Filter2			min. for T_{SPEC}	typ. @ +25 °C	max. for T_{SPEC}	
Center frequency			—	769	—	MHz
Maximum insertion attenuation						
	762... 776	MHz	—	1.6	2.0	dB
Amplitude ripple (p-p)						
	762... 776	MHz	—	0.4	1.0	dB
Minimum return loss						
@ Filter2 input port	762... 776	MHz	12	15	—	dB
@ Filter2 output port	762... 776	MHz	12	14	—	dB
Minimum attenuation						
	100... 628	MHz	50	58	—	dB
	628... 739	MHz	25	47	—	dB
	788... 910	MHz	12	17	—	dB
	910... 1500	MHz	40	42	—	dB

SAW components

B4240

SAW filter

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8 Maximum ratings

Operable temperature	$T_{OP} = -40\text{ °C} \dots +125\text{ °C}$	
Storage temperature	$T_{STG}^{1)} = -40\text{ °C} \dots +125\text{ °C}$	
DC voltage	$ V_{DC} = 5.0\text{ V}$	
ESD voltage	$V_{ESD}^{2)} = 100\text{ V}$	Machine model.
Input power	P_{IN}	
@ Filter1 input port: 136 ... 174 MHz	25 dBm	Continuous wave for 10000 h @ 55 °C.
@ Filter1 input port: 380 ... 520 MHz	25 dBm	Continuous wave for 10000 h @ 55 °C.
@ Filter1 input port: 851 ... 870 MHz	15 dBm	Continuous wave for 10000 h @ 55 °C.
@ Filter2 input port: 136 ... 174 MHz	25 dBm	Continuous wave for 10000 h @ 55 °C.
@ Filter2 input port: 380 ... 520 MHz	25 dBm	Continuous wave for 10000 h @ 55 °C.
@ Filter2 input port: 762 ... 776 MHz	15 dBm	Continuous wave for 10000 h @ 55 °C.

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

²⁾ According to JESD22-A115B (MM – Machine Model), 10 negative & 10 positive pulses.

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SAW filter	860.5/769MHz

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9 Transmission coefficient Filter1

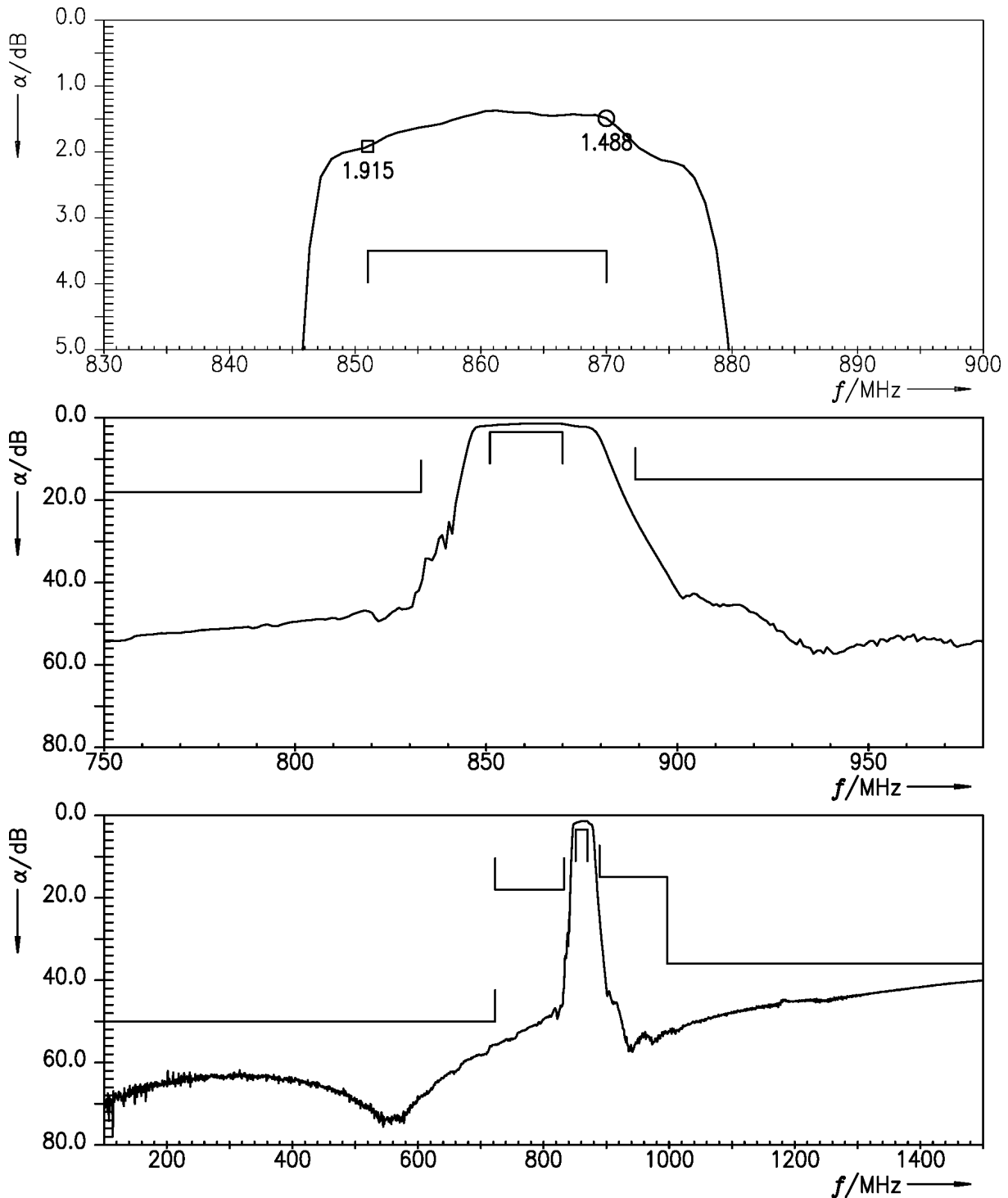


Figure 4: Attenuation Filter1.

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SAW filter	860.5/769MHz

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10 Return loss Filter1

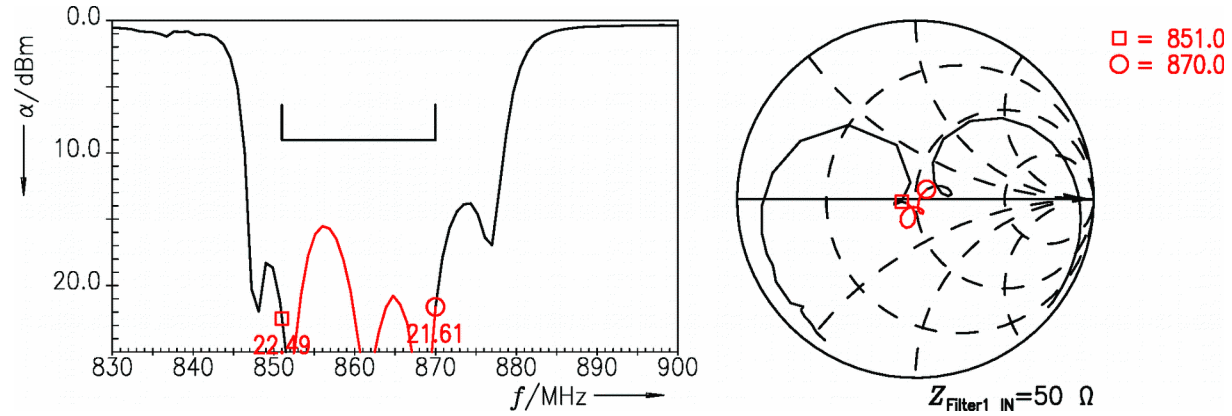


Figure 5: Return loss Filter1 at IN port.

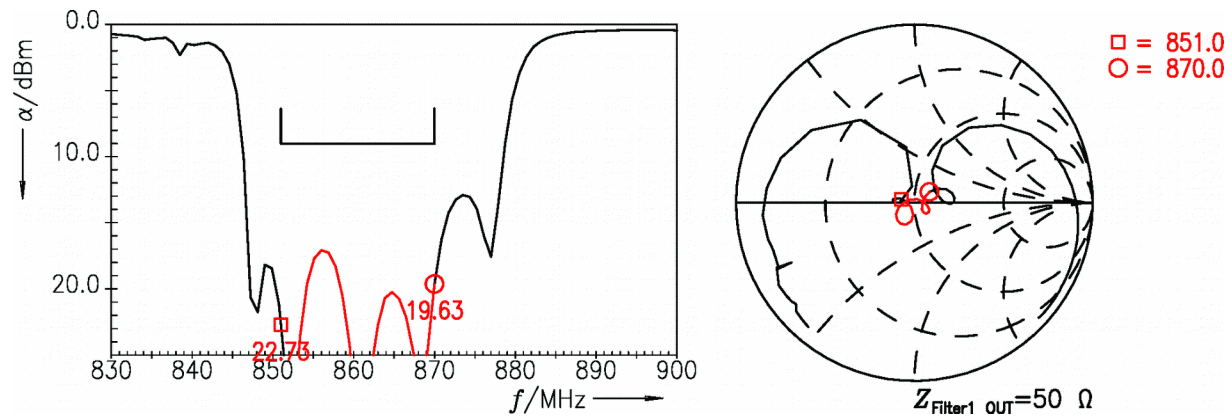


Figure 6: Return loss Filter1 at OUT port.

SAW components	B4240
SAW filter	860.5/769MHz

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11 Transmission coefficient Filter2

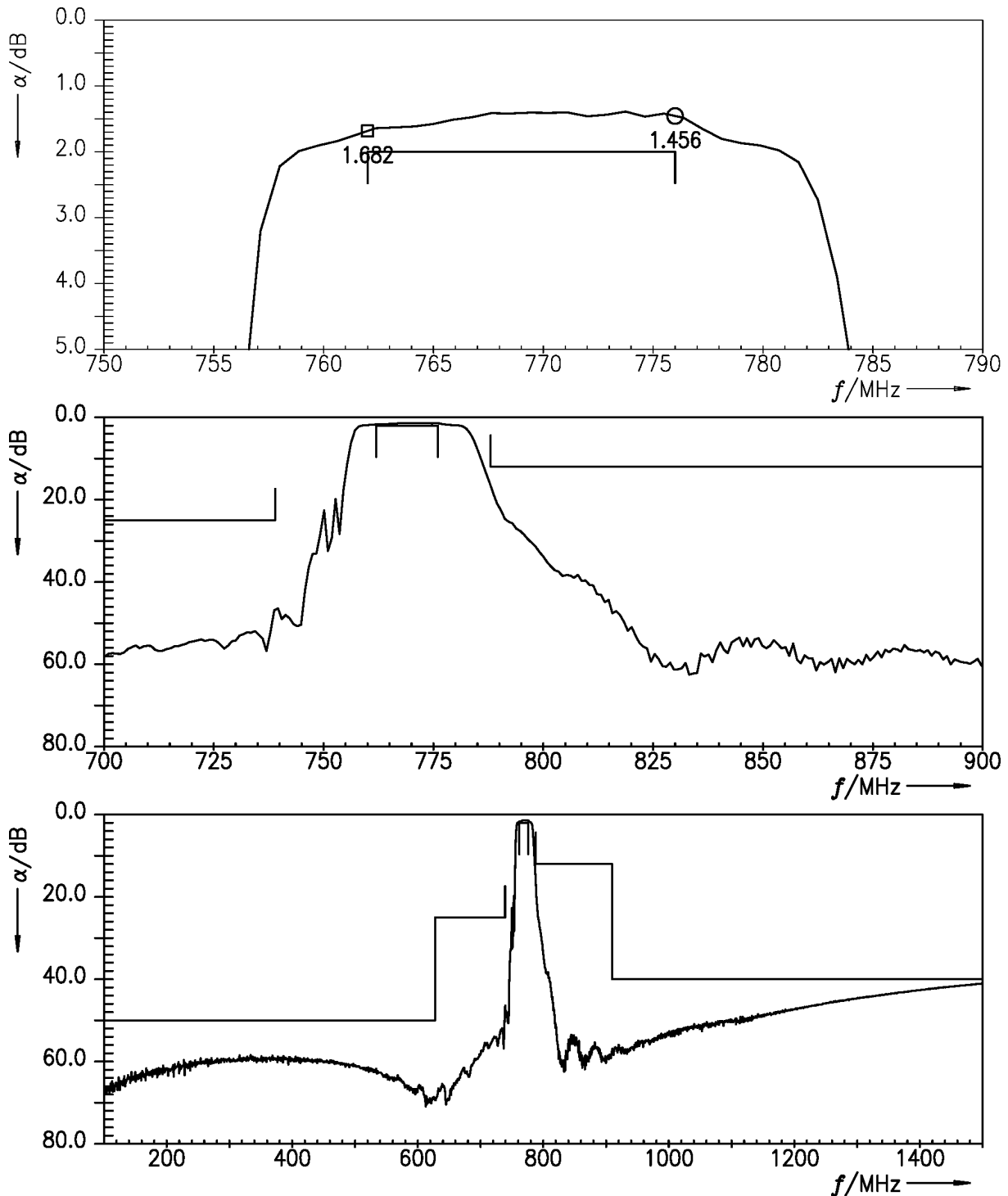


Figure 7: Attenuation Filter2.

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SAW filter	860.5/769MHz

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12 Return loss Filter2

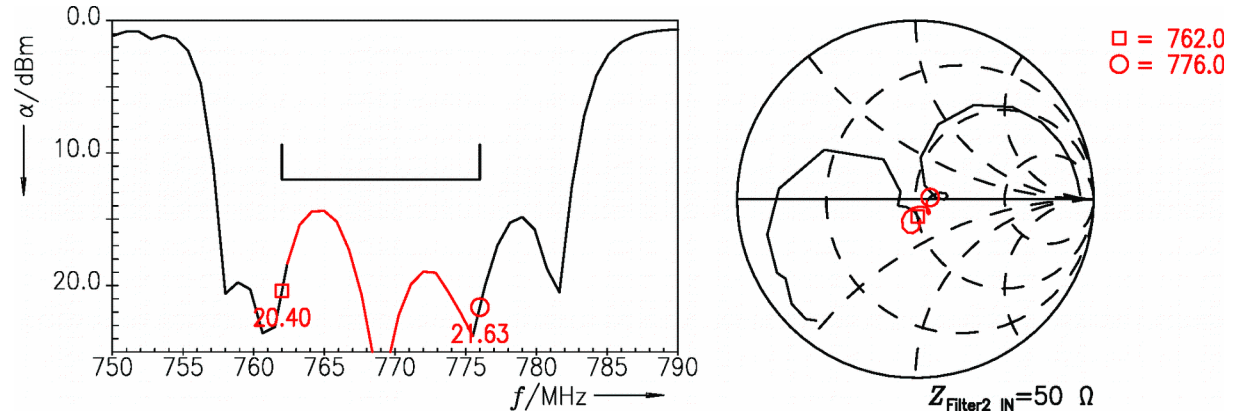


Figure 8: Return loss Filter2 at IN port.

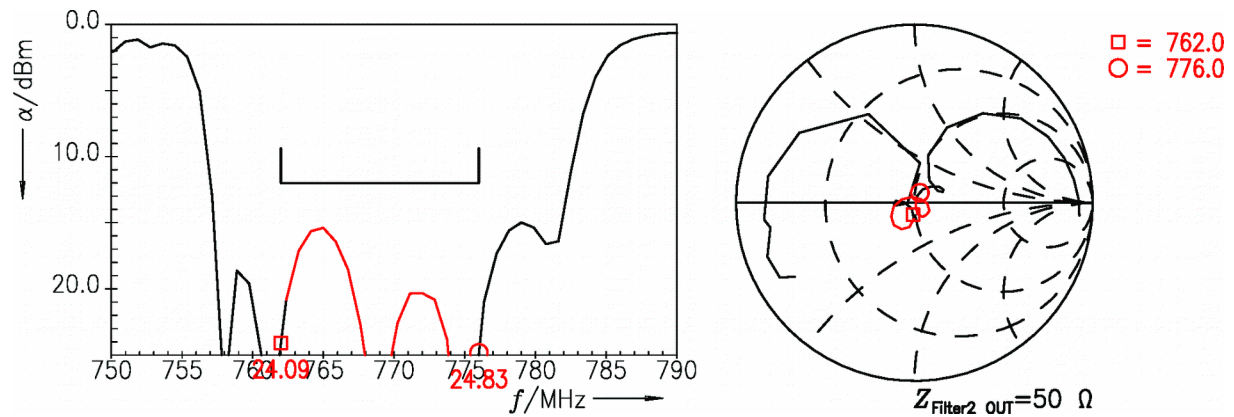


Figure 9: Return loss Filter2 at OUT port.

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SAW filter	860.5/769MHz

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13 Packing material

13.1 Tape

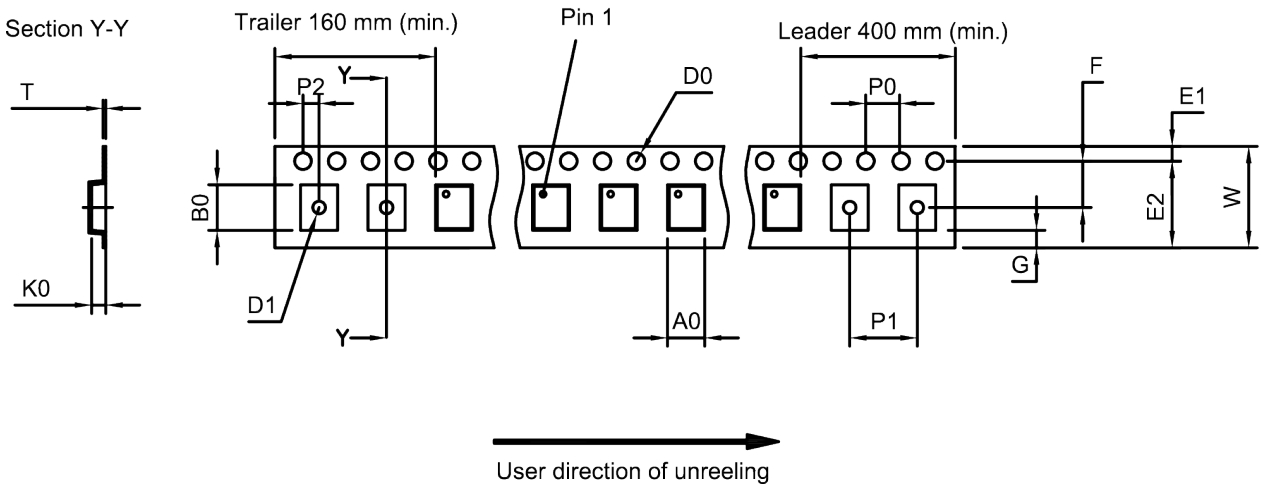


Figure 10: Drawing of tape (first-angle projection) with tape dimensions according to Table 1.

A ₀	2.85±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	0.3±0.05 mm
D ₁	1.5 mm (min.)	K ₀	1.3±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.

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SAW filter	860.5/769MHz

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13.2 Reel with diameter of 180 mm

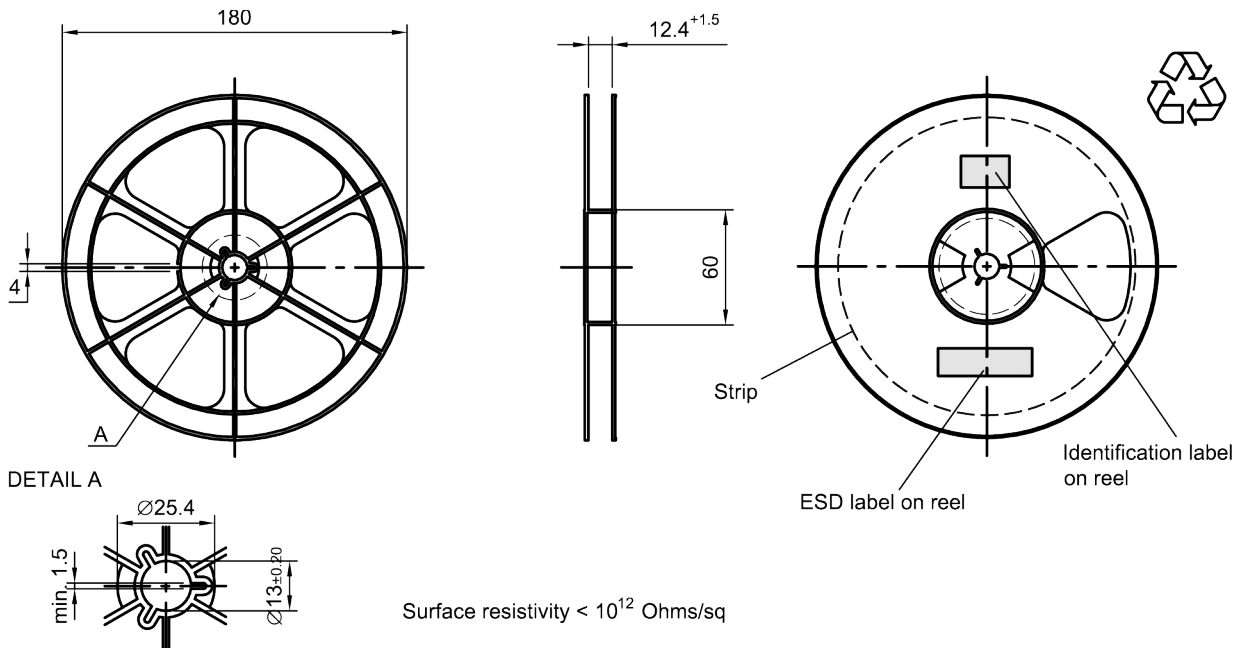
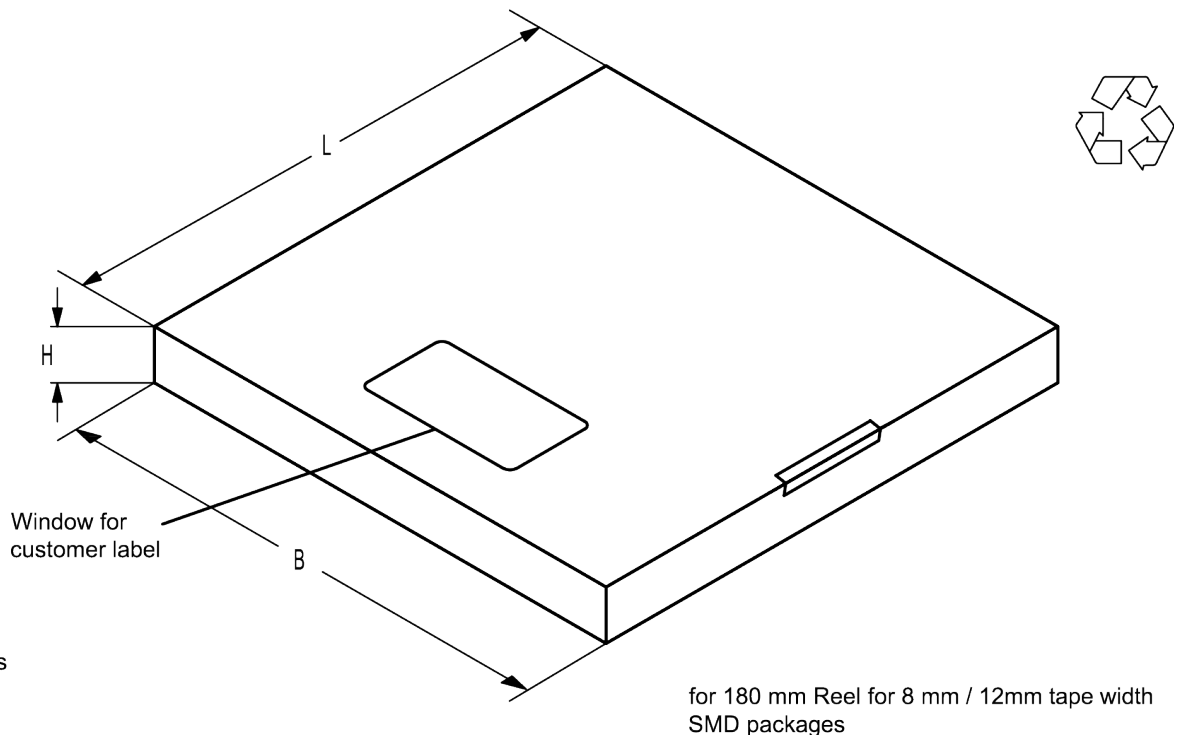


Figure 11: Drawing of reel (first-angle projection) with diameter of 180 mm.



Dimensions

- L = 182
- B = 185
- H = 26

Figure 12: Drawing of folding box for reel with diameter of 180 mm.

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13.3 Reel with diameter of 330 mm

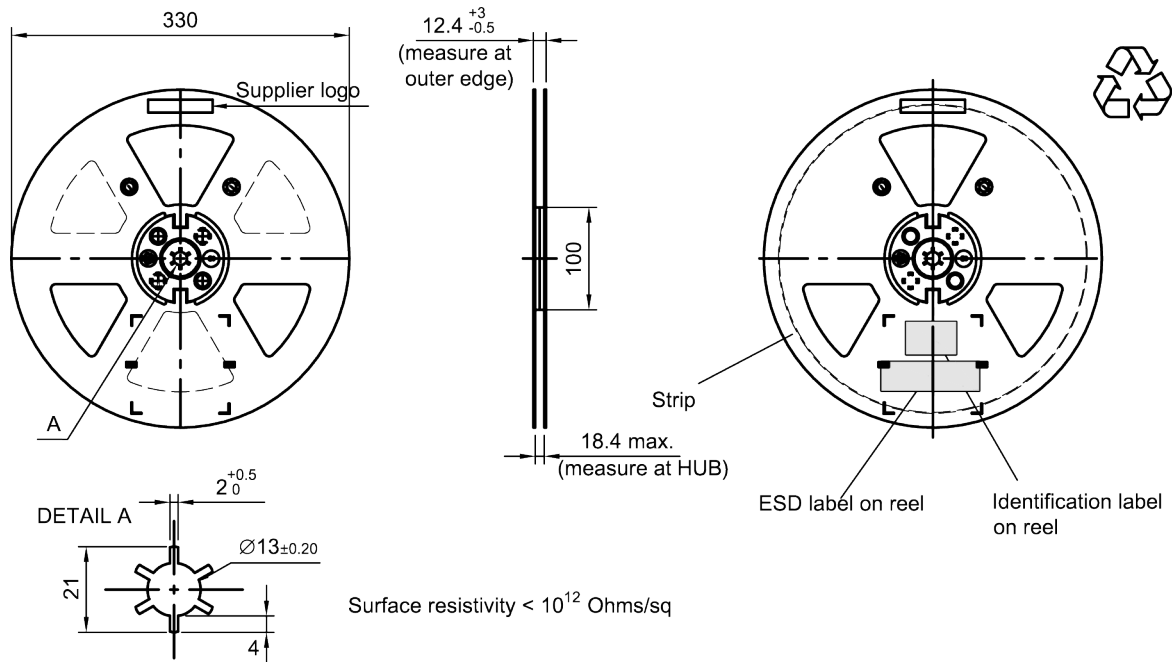
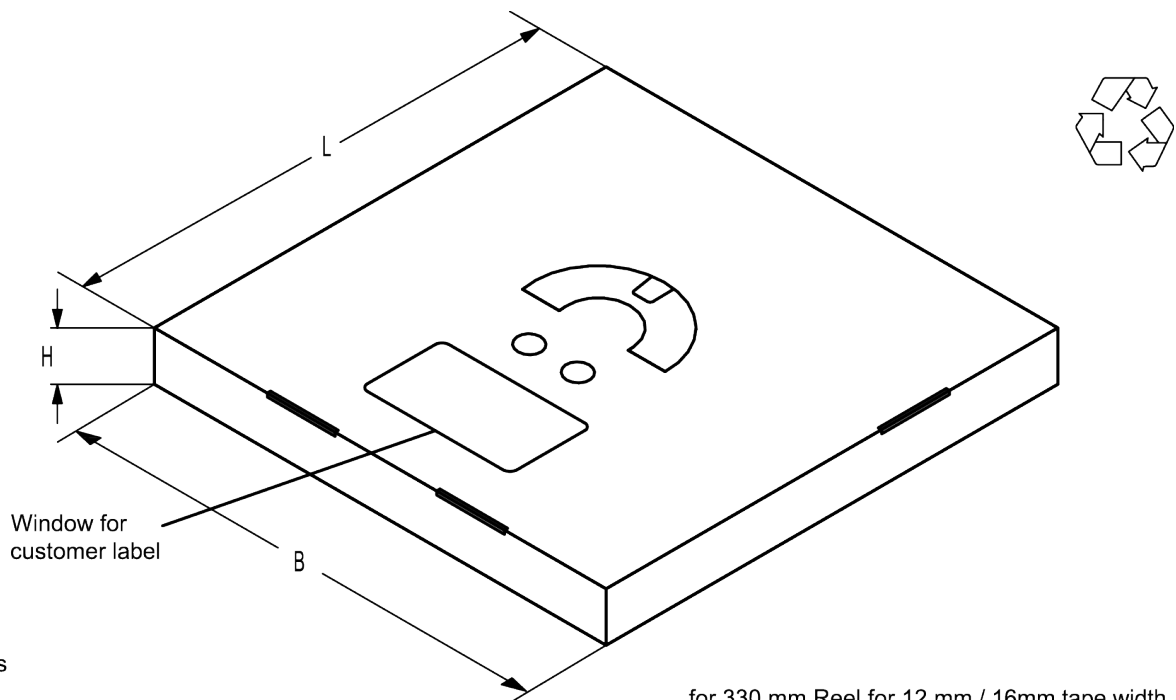


Figure 13: Drawing of reel (first-angle projection) with diameter of 330 mm.



Dimensions

- L = 340
- B = 340
- H = 25

for 330 mm Reel for 12 mm / 16mm tape width SMD packages

Figure 14: Drawing of folding box for reel with diameter of 330 mm.

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14 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: B3xxxxB**1234**xxxx

- 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.

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: **C T F 6**

Location: **C** → Wuxi

Day: **T** → 26th

Year: **F** → 2015

Month: **6** → June

Data sheet

15 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).

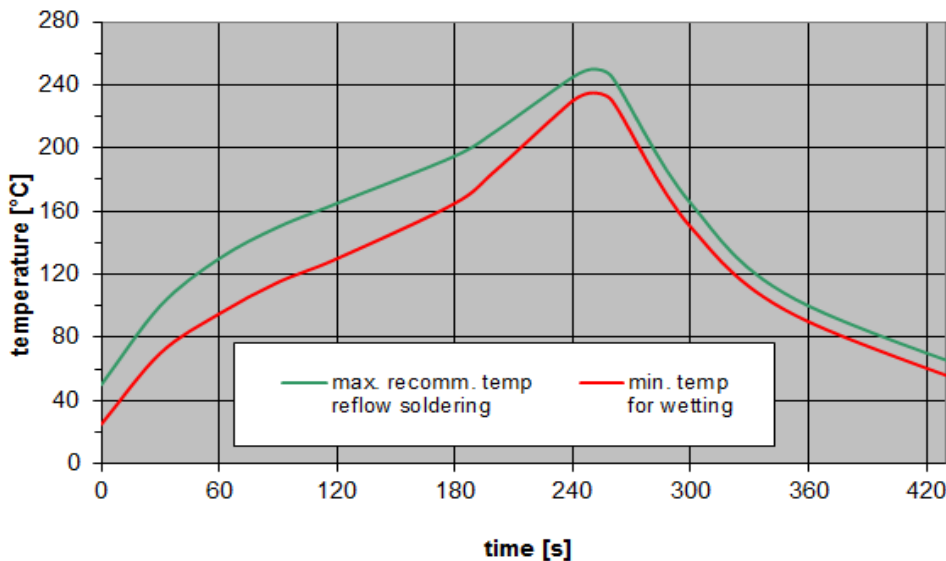


Figure 15: Recommended reflow profile for convection and infrared soldering – lead-free solder.

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16 Annotations

16.1 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>.

16.2 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.

16.3 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.

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17 Cautions and warnings

17.1 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.

17.2 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.

17.3 Moldability

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

17.4 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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3. **The warnings, cautions and product-specific notes must be observed.**
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