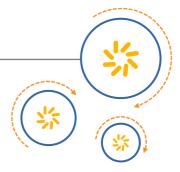


RF360 Europe GmbH
A Qualcomm – TDK Joint Venture



SAW components

SAW duplexer LTE band 71

Series/type: B1237

Ordering code: B39661-B1237-L210

Date: April 20, 2018

Version: 1.1

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SAW duplexer 634.5 / 680.5 MHz

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634.5 / 680.5 MHz

SAW components B1237

SAW duplexer

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SAW duplexer 634.5 / 680.5 MHz

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1 Application

■ Duplexer for LTE band 71

2 Features

- Package size 2.5±0.1 mm × 2.0±0.1 mm
- Package height 0.7 mm (max.)
- Approximate weight 9 mg
- RoHS compatible
- Package for Surface Mount Technology (SMT)
- Ni/Au-plated terminals
- Electrostatic Sensitive Device (ESD)
- Moisture Sensitivity Level 3 (MSL3)

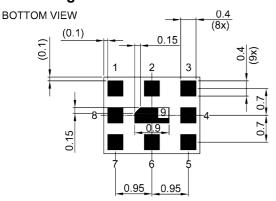


Figure 1: Picture of component with example of product marking.

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Preliminary data sheet

3 Package



4 Pin configuration

1 RX

3 TX

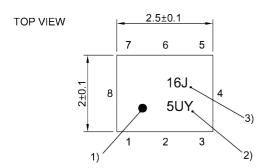
■ 6 ANT

2, 4, 5, 7, Ground 8, 9

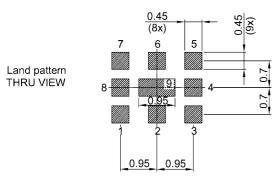
Pad and pitch tolerance ±0.05

SIDE VIEW





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



Landing pad tolerance -0.02

Figure 2: Drawing of package with package height A = 0.7 mm (max.). See Sec. Package information (p. 25).



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SAW duplexer 634.5 / 680.5 MHz

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5 Matching circuit

■ L_{p6} = 16 nH

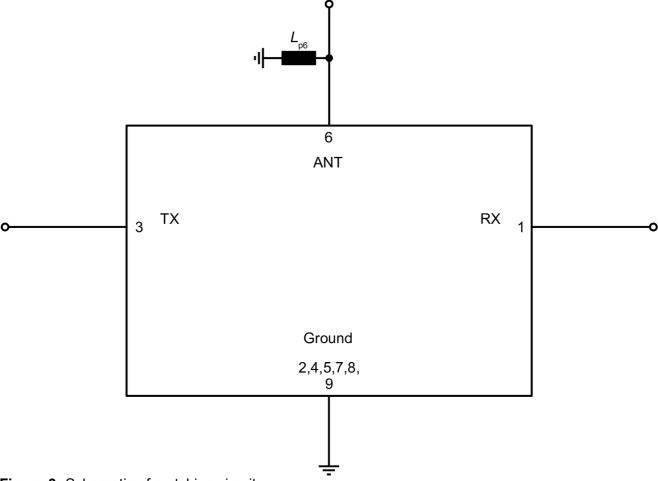


Figure 3: Schematic of matching circuit.

External shunt inductor for ESD protection is recommended at any ports towards antenna.



SAW duplexer 634.5 / 680.5 MHz

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6 Characteristics

6.1 TX - ANT

Temperature range for specification $T_{\text{SPEC}} = -30 \,^{\circ}\text{C} \dots +85 \,^{\circ}\text{C}$

TX terminating impedance $Z_{TY} = 50 \Omega$

ANT terminating impedance $Z_{ANT}^{(i)} = 50 \Omega$ with par. 16 nH¹⁾

RX terminating impedance $Z_{RX} = 50 \Omega$

Characteristics TX – ANT				$\begin{array}{c} \text{min.} \\ \text{for } T_{\text{SPEC}} \end{array}$	typ. @ +25 °C	$\begin{array}{c} \text{max.} \\ \text{for } T_{\text{\tiny SPEC}} \end{array}$	
Center frequency			f _C	_	680.5	_	MHz
Maximum insertion attenuation							
	663 698	MHz	$\alpha_{\text{INT,max}}^{2)}$	_	1.5	2.2	dB
	663.34 697.66	MHz	$\boldsymbol{\alpha}_{\text{max}}$	_	2.0	2.73)	dB
	663.34 697.66	MHz	$\boldsymbol{\alpha}_{\text{max}}$	_	2.0	3.0	dB
Amplitude ripple (p-p)			$\Delta \alpha^{\scriptscriptstyle 4)}$				
	663.34 697.66	MHz		_	0.9	2.0	dB
Maximum VSWR			$VSWR_{max}$				
@ TX port	663.34 697.66	MHz		_	1.2	2.0	
@ ANT port	663.34 697.66	MHz		_	1.3	2.0	
Minimum attenuation			$\boldsymbol{\alpha}_{\text{min}}$				
	10 608	MHz		30	47	_	dB
	608 614	MHz		50	57	_	dB
	617.34 651.66	MHz		48	60	_	dB
	717 728	MHz		15	25	_	dB
	722 729	MHz		10	43	_	dB
	729 746	MHz		45	67	_	dB
	746 768	MHz		45	52	_	dB
	768 805	MHz		40	52	_	dB
	824 849	MHz		30	36	_	dB
	859 894	MHz		40	48	_	dB
	1164 1250	MHz		40	52	_	dB
	1326 1396	MHz		30	49	_	dB
	1559 1563	MHz		45	69	_	dB
	1565.42 1573.374			45	69	_	dB
	1573.374 1577.644			45 45	70	_	dB
	1577.644 1585.42 1597.551 1605.886			45	70		dB
	1710 1755	MHz		45 30	70 60	_	dB dB
	1805 1880	MHz		30	56		dВ
	1930 1990	MHz		45	56	_	dB
	1989 2094	MHz		45	56	_	dB
	2110 2200	MHz		40	57	_	dB



SAW components	B1237
SAW duplexer	634.5 / 680.5 MHz

Characteristics TX – ANT	$\begin{array}{c} \textbf{min.} \\ \text{for } T_{_{\mathrm{SPI}}} \end{array}$	typ. @ +25 °C	$\begin{array}{c} \text{max.} \\ \text{for } T_{\text{\tiny SPEC}} \end{array}$	
2400 2484 M	1Hz 35	53	_	dB
2652 2792 M	1Hz 30	51	_	dB
4900 5950 M	1Hz 15	27	_	dB

¹⁾ See Sec. Matching circuit (p. 6).

Integrated attenuation $\alpha_{|NT|}$: Averaged power $|S_{ij}|^2$ over the center 4.5 MHz of LTE 5 MHz (25 RB) channels.

³⁾ Valid for typical temperature T = +25 °C.

⁴⁾ Over any 5 MHz.



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6.2 RX - ANT

Temperature range for specification $T_{\text{SPEC}} = -30 \,^{\circ}\text{C} \dots +85 \,^{\circ}\text{C}$

TX terminating impedance $Z_{Tx} = 50 \Omega$

ANT terminating impedance $Z_{ANT} = 50 \Omega$ with par. 16 nH¹⁾

RX terminating impedance $Z_{RX} = 50 \Omega$

Maximum insertion attenuation 617 652 MHz α _{INT,max} 617.34 651.66 MHz α _r 617.34 651.66 MHz α _r Amplitude ripple (p-p) 617.34 651.66 MHz Maximum VSWR VSWR _r @ ANT port 617.34 651.66 MHz @ RX port 617.34 651.66 MHz Average attenuation 608 612 MHz Minimum attenuation 1.0 608 MHz α _{INT,mi} 35 55 MHz α 657.56 662.44 MHz α _{WLAN,mi}		1.6 2.0 2.0	for T _{SPEC} 2.3 2.7 ³⁾ 3.3	MHz dB dB
Maximum insertion attenuation 617 652 MHz α _{INT,max} 617.34 651.66 MHz α _r 617.34 651.66 MHz α _r Amplitude ripple (p-p) 617.34 651.66 MHz Maximum VSWR VSWR _r @ ANT port 617.34 651.66 MHz @ RX port 617.34 651.66 MHz Average attenuation 608 612 MHz Minimum attenuation 1.0 608 MHz α _{INT,mi} 35 55 MHz α 657.56 662.44 MHz α _{WLAN,mi}	2)	2.0	2.73)	
617.34 651.66 MHz α _r 617.34 651.66 MHz α _r 617.34 651.66 MHz α _r 617.34 651.66 MHz Maximum VSWR VSWR, @ ANT port 617.34 651.66 MHz @ RX port 617.34 651.66 MHz Average attenuation 608 612 MHz Minimum attenuation 1.0 608 MHz α _{INT.mi} 35 55 MHz α _{WLAN.mi}		2.0	2.73)	
617.34 651.66 MHz α _r 617.34 651.66 MHz α _r Amplitude ripple (p-p) 617.34 651.66 MHz Maximum VSWR VSWR _r @ ANT port 617.34 651.66 MHz RX port 617.34 651.66 MHz Φ RX port 617.34 651.66 MHz Average attenuation 608 612 MHz Minimum attenuation 1.0 608 MHz α _{INT,mi} 35 55 MHz α WLAN,mi		2.0		dB
Amplitude ripple (p-p) Amplitude ripple (p-p) 617.34 651.66 MHz Maximum VSWR Ø ANT port 617.34 651.66 MHz Ø RX port 617.34 651.66 MHz Average attenuation 608 612 MHz Minimum attenuation 1.0 608 MHz 35 55 MHz α 657.56 662.44 MHz α WLAN, minimum attenuation			3.3	
Amplitude ripple (p-p) Δα 617.34 651.66 MHz Maximum VSWR VSWR @ ANT port 617.34 651.66 MHz @ RX port 617.34 651.66 MHz Average attenuation 608 612 MHz Minimum attenuation 1.0 608 MHz α 35 55 MHz α 657.56 662.44 MHz α WLAN, min	—	0.0	1	dB
Maximum VSWR VSWR @ ANT port 617.34 651.66 MHz @ RX port 617.34 651.66 MHz Average attenuation 608 612 MHz Minimum attenuation 1.0 608 MHz α _{INT.mi} 35 55 MHz α 657.56 662.44 MHz α _{WLAN.mi}	max —	0.0		
@ ANT port 617.34 651.66 MHz @ RX port 617.34 651.66 MHz Average attenuation 608 612 MHz Minimum attenuation 1.0 608 MHz α _{INT.mi} 35 55 MHz α 657.56 662.44 MHz α WLAN.mi	nax	0.8	2.5	dB
Average attenuation $608 \ 612 \qquad \text{MHz}$ Minimum attenuation $1.0 \ 608 \qquad \text{MHz} \qquad \alpha_{\text{INT,min}}$ $35 \ 55 \qquad \text{MHz} \qquad \alpha_{\text{WLAN,min}}$ $657.56 \ 662.44 \qquad \text{MHz} \qquad \alpha_{\text{WLAN,min}}$	_	1.5	2.0	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	_	1.5	2.0	
Minimum attenuation $1.0~608 \qquad MHz \qquad \alpha_{_{INT,min}}$ $35~55 \qquad MHz \qquad \alpha_{_{WLAN,min}}$ $657.56~662.44 \qquad MHz \qquad \alpha_{_{WLAN,min}}$	avg			
$1.0~608$ MHz $lpha_{_{ extsf{INT,min}}}$ $35~55$ MHz $lpha_{_{ extsf{WLAN,min}}}$ $657.56~662.44$ MHz $lpha_{_{ extsf{WLAN,min}}}$	3	8	_	dB
35 55 MHz α 657.56 662.44 MHz α _{WLAN,mi}				
657.56 662.44 MHz $\alpha_{_{WLAN,mi}}$		35	_	dB
VVLAN,mI	_{min} 50	70	_	dB
663.34 697.66 MHz α	⁶⁾ 12	27	_	dB
000.01 007.00	_{min} 45	56	-	dB
709 740 MHz α	_{min} 20	41	_	dB
776 793 MHz α	_{min} 35	39	-	dB
793 805 MHz α	_{min} 35	39	_	dB
824 849 MHz α	_{min} 35	40	_	dB
1058 1138 MHz α	_{min} 25	42	_	dB
1163 1204 MHz α	_{min} 35	41	_	dB
1233 1281 MHz α	_{min} 35	40	_	dB
1461 1484 MHz α	_{min} 35	56	_	dB
1653 1698 MHz α	_{min} 25	45	_	dB
	min 40	45	_	dB
	min 40	47	_	dB
	min 40	47	_	dB
2305 2315 MHz α		43	_	dB
	min ZU			
2400 2500 MHz α	min 20 20	43	_	dB



SAW duplexer 634.5 / 680.5 MHz

Characteristics RX – ANT				$\begin{array}{c} \text{min.} \\ \text{for } T_{\text{SPEC}} \end{array}$	typ. @ +25 °C	$\begin{array}{c} \text{max.} \\ \text{for } T_{\text{SPEC}} \end{array}$	
	2468 2608	MHz	α_{min}	20	42	_	dB
	2922 2967	MHz	$\boldsymbol{\alpha}_{\text{min}}$	20	40	_	dB
	4037 4162	MHz	$\alpha_{_{min}}$	20	29	_	dB
	4317 4472	MHz	$\alpha_{_{min}}$	15	22	_	dB
	4900 5950	MHz	α_{min}	10	18	_	dB

¹⁾ See Sec. Matching circuit (p. 6).

Integrated attenuation α_{INT} : Averaged power $|S_{ii}|^2$ over the center 4.5 MHz of LTE 5 MHz (25 RB) channels.

³⁾ Valid for typical temperature T = +25 °C.

⁴⁾ Over any 5 MHz.

⁵⁾ Integrated over 6 MHz.

⁶⁾ Average over each WLAN channel with band width of 4.875 MHz.



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6.3 TX – RX

Temperature range for specification $T_{\text{SPEC}} = -30 \,^{\circ}\text{C} \dots +85 \,^{\circ}\text{C}$

TX terminating impedance $Z_{TY} = 50 \Omega$

ANT terminating impedance $Z_{ANT} = 50 \Omega$ with par. 16 nH¹⁾

RX terminating impedance $Z_{RX} = 50 \Omega$

Characteristics TX – RX			$\begin{array}{c} \textbf{min.} \\ \textbf{for } T_{\text{SPEC}} \end{array}$	typ. @ +25 °C	$\begin{array}{c} \text{max.} \\ \text{for } T_{\text{\tiny SPEC}} \end{array}$	
Minimum isolation		$\alpha_{_{m}}$	n			
	617.34 651.66	MHz	55	62	_	dB
	663.34 697.66	MHz	55 ²⁾	58	_	dB
	663.34 697.66	MHz	50	58	_	dB
	1326 1396	MHz	30	61	_	dB
	1989 2094	MHz	30	57	_	dB
	2652 2792	MHz	30	54	_	dB

See Sec. Matching circuit (p. 6).

²⁾ Valid for temperature T = 0 °C...+85 °C.



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7 Maximum ratings

Storage temperature	T _{STG} ²⁾ = −40 °C +85 °C	
DC voltage	$ V_{DC} ^{1)} = 0 \text{ V (max.)}$	
ESD voltage		
	$V_{ESD}^{3)} = 200 \text{ V (max.)}$	Machine model.
	$V_{ESD}^{4)} = 500 \text{ V (max.)}$	Human body model.
	$V_{ESD}^{5)} = 700 \text{ V (max.)}$	Charged device model.
Input power	P _{IN}	
@ TX port: 663.34 697.66 MHz	t.b.d. dBm (max.)	5 MHz LTE uplink signal (25 RB) for 5000 h @ 85 °C.
@ TX port: other frequency ranges	10 dBm (max.)	Continuous wave for 5000 h @ 50 °C.

¹⁾ In case of applied DC voltage blocking capacitors are mandatory.

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

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

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 coefficients

8.1 TX – ANT

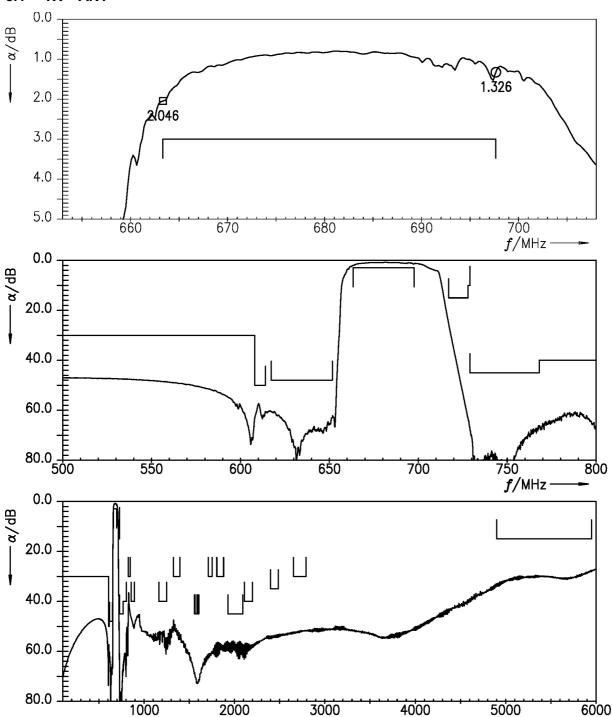


Figure 4: Attenuation TX – ANT.

*f/*MHz -



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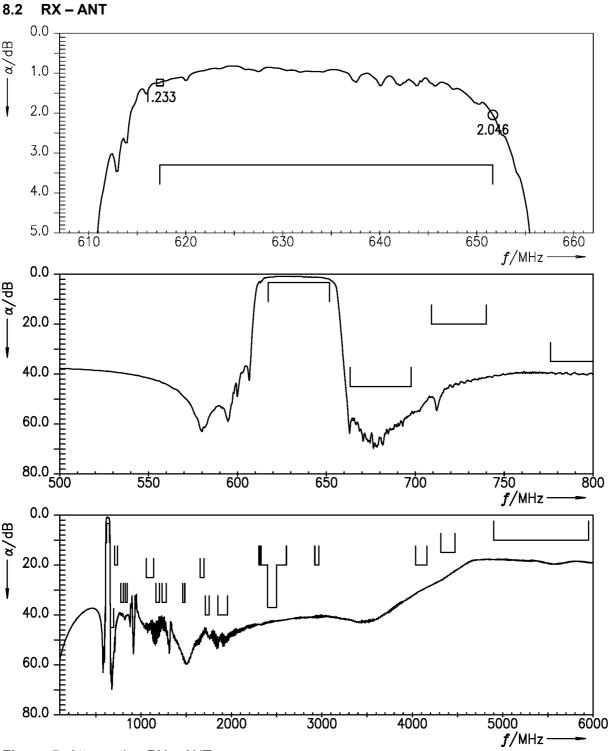


Figure 5: Attenuation RX – ANT.



SAW duplexer 634.5 / 680.5 MHz

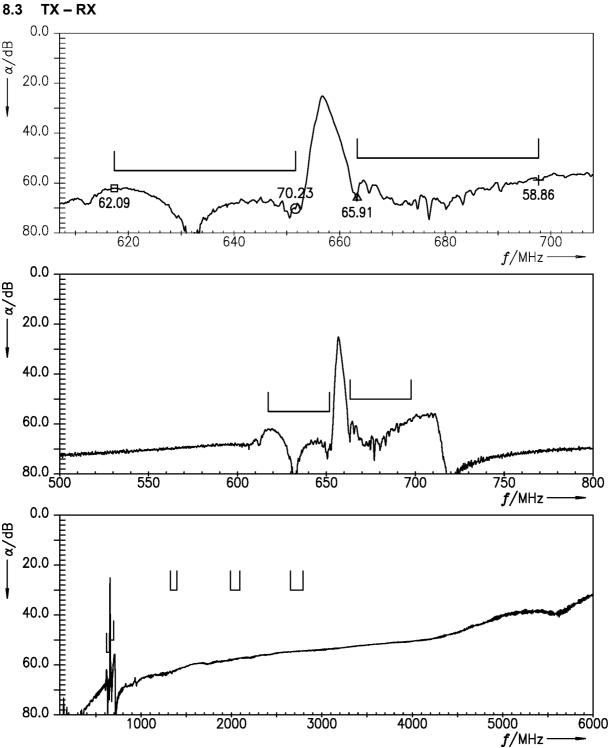


Figure 6: Isolation TX – RX.



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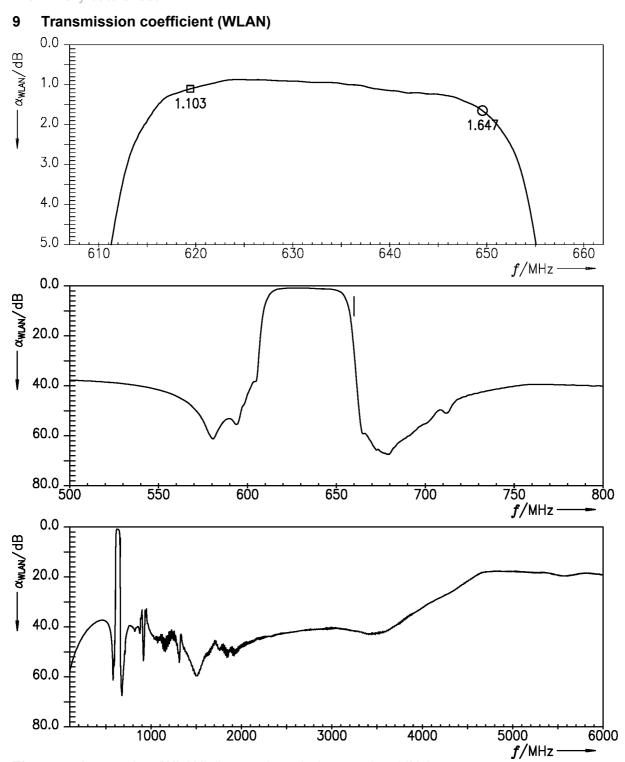


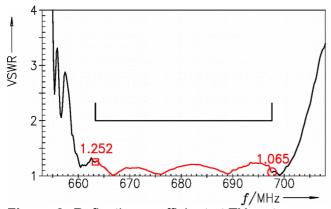
Figure 7: Attenuation (WLAN) (integration window = 4.875 MHz).



SAW duplexer 634.5 / 680.5 MHz

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10 Reflection coefficients



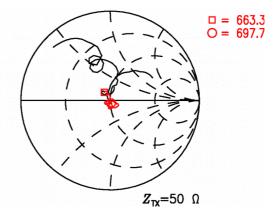
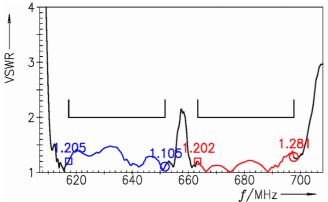


Figure 8: Reflection coefficient at TX port.



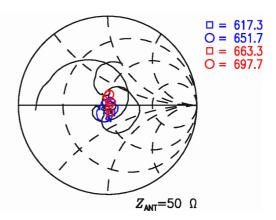
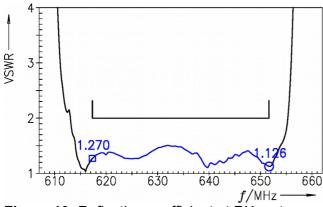


Figure 9: Reflection coefficient at ANT port.



 $\Box = 617.3$ $\bigcirc = 651.7$ $Z_{RX} = 50 \Omega$

Figure 10: Reflection coefficient at RX port.

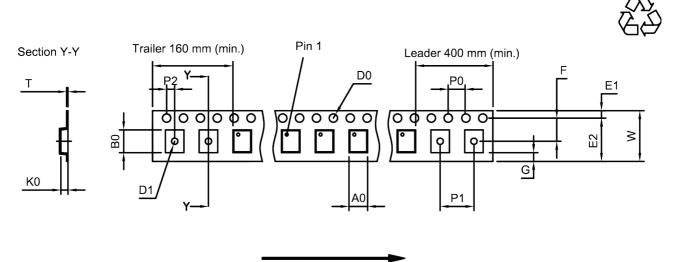


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11 Packing material

11.1 Tape



User direction of unreeling

Figure 11: Drawing of tape (first-angle projection) with tape dimensions according to Table 1.

A_0	2.3±0.05 mm	_	E_2	6.25 mm (min.)	_	P_1	4.0 _{±0.1} mm
B ₀	2.8±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.)		Т	0.25±0.03 mm
D ₁	1.0 mm (min.)		K ₀	0.85±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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11.2 Reel with diameter of 180 mm

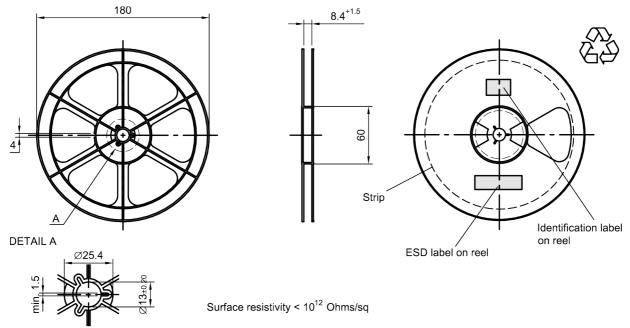


Figure 12: Drawing of reel (first-angle projection) with diameter of 180 mm.

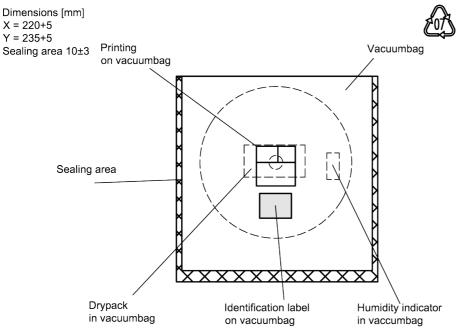


Figure 13: Drawing of moisture barrier bag (MBB) for reel with diameter of 180 mm.



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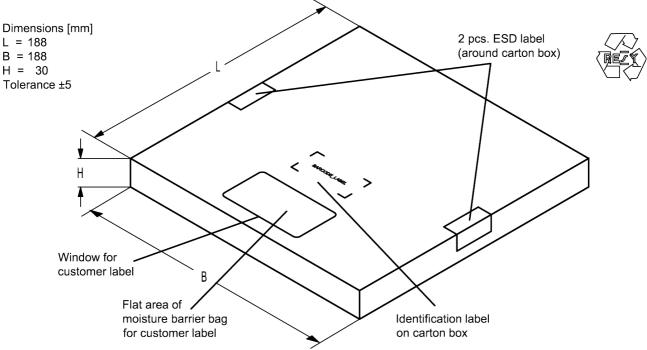


Figure 14: Drawing of folding box for reel with diameter of 180 mm.

11.3 Reel with diameter of 330 mm

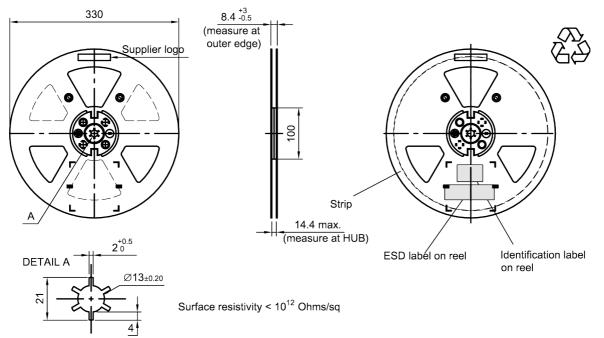


Figure 15: Drawing of reel (first-angle projection) with diameter of 330 mm.



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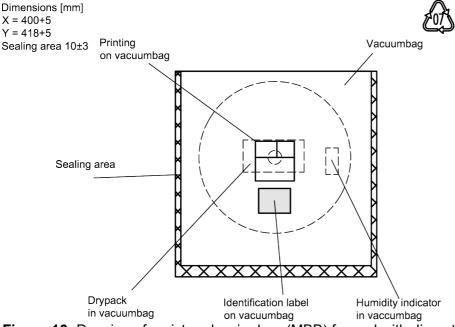


Figure 16: Drawing of moisture barrier bag (MBB) for reel with diameter of 330 mm.

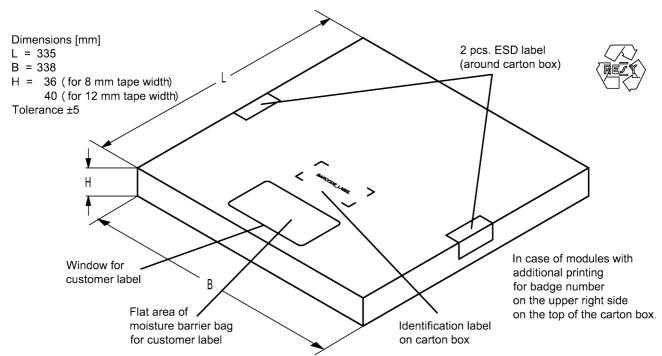


Figure 17: Drawing of folding box for reel with diameter of 330 mm.



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12 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 x 32² + 6 x 32¹ + 18 (=J) x 32⁰ = 1234

The BASE32 code for product type B1237 is 16N.

■ Lot number:

The last 5 digits of the lot number, e.g., 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

Adopte	Adopted BASE32 code for type number					
Decimal	Base32	Decimal	Base32			
value	code	value	code			
0	0	16	G			
1	1	17	Н			
2	2	18	J			
3	3	19	K			
4	4	20	M			
5	5	21	N			
6	6	22	Р			
7	7	23	Q			
8	8	24	R			
9	9	25	S			
10	Α	26	Т			
11	В	27	V			
12	С	28	W			
13	D	29	Х			
14	E	30	Y			
15	F	31	Z			

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	Adopted BASE47 code for lot number						
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	7						
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							
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							
3 3 27 U 4 4 28 V 5 5 5 29 W 6 6 6 30 X 7 7 7 31 Y 8 8 8 32 Z 9 9 9 33 b 10 A 34 d 11 B 35 f 12 C 36 h							
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							
5 5 29 W 6 6 6 30 X 7 7 31 Y 8 8 8 32 Z 9 9 9 33 b 10 A 34 d 11 B 35 f 12 C 36 h							
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							
7 7 31 Y 8 8 32 Z 9 9 33 b 10 A 34 d 11 B 35 f 12 C 36 h							
8 8 32 Z 9 9 33 b 10 A 34 d 11 B 35 f 12 C 36 h							
9 9 33 b 10 A 34 d 11 B 35 f 12 C 36 h							
10 A 34 d 11 B 35 f 12 C 36 h							
11 B 35 f 12 C 36 h							
12 C 36 h							
40 5							
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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13 Soldering profile

The recommended soldering process is in accordance with IEC $60068-2-58-3^{rd}$ 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
<i>T</i> ≥ 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).

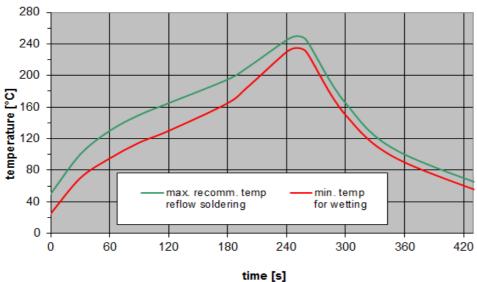


Figure 18: Recommended reflow profile for convection and infrared soldering – lead-free solder.



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14 Annotations

14.1 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.

14.2 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.

14.3 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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15 Cautions and warnings

15.1 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.

15.2 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.

15.3 Moldability

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

15.4 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.



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16 Revision history

Changes compared to previously issued iteration.

Version	Originator	Detailed specification changes	Date
1.0	G. Bourjade	Initial preliminary datasheet.	Apr 03, 2018
1.1	G. Bourjade	Detailed Rx and Tx wideband rejection.	Apr 20, 2018



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.
- 4. In order to satisfy certain technical requirements, some of the products described in this publication may contain substances subject to restrictions in certain jurisdictions (e.g. because they are classed as hazardous). Useful information on this will be found in our Material Data Sheets on the Internet (www.rf360jv.com/material). Should you have any more detailed questions, please contact our sales offices.
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