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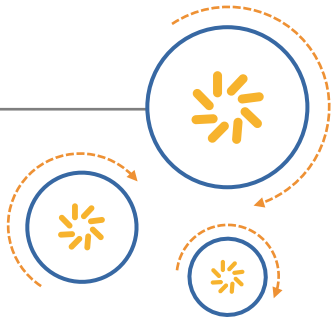

SAW Components

SAW Duplexer

Cellular / LTE / WCDMA Band 5

Series/type:	B8626
Ordering code:	B30881B8626P810
Date:	May 31, 2016
Version:	2.6

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SAW components

SAW Duplexer

Cellular / LTE / WCDMA Band 5

Series/type:	B8626
Ordering code:	B39881B8626P810
Date:	May 31, 2016
Version:	2.6

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Table of contents

1 Application

- Multimode SAW duplexer for mobile telephone Cellular / LTE / WCDMA Band 5 systems
- Low insertion attenuation
- Low amplitude ripple

2 Features

- Package size 1.8±0.1 mm × 1.4±0.1 mm
- Package height 0.475 mm (max.)
- Approximate weight 4 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.

3 Package

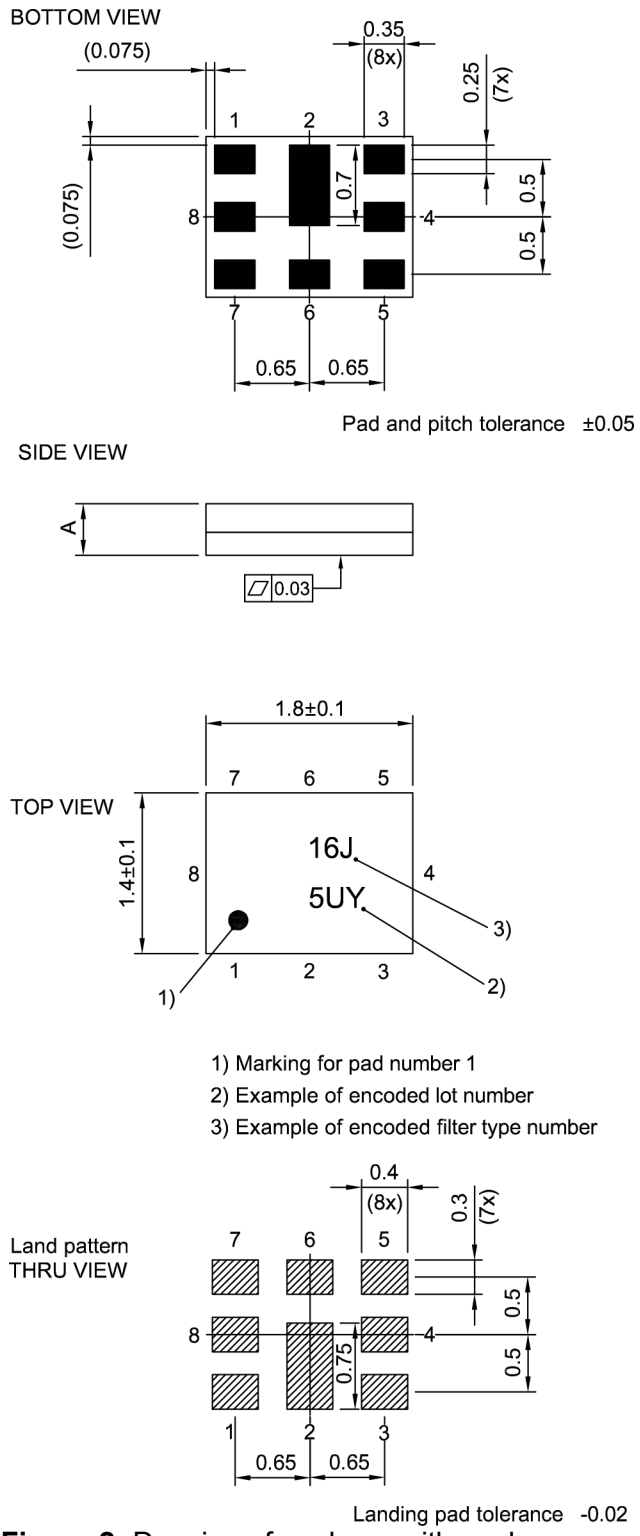

Figure 2: Drawing of package with package height A = 0.475 mm (max.). See Sec. Package information (p. 26).

4 Pin configuration

- 1 RX
- 3 TX
- 6 ANT
- 2, 4, 5, 7, 8 Ground

5 Matching circuit

- L_{p6} = 8.2 nH

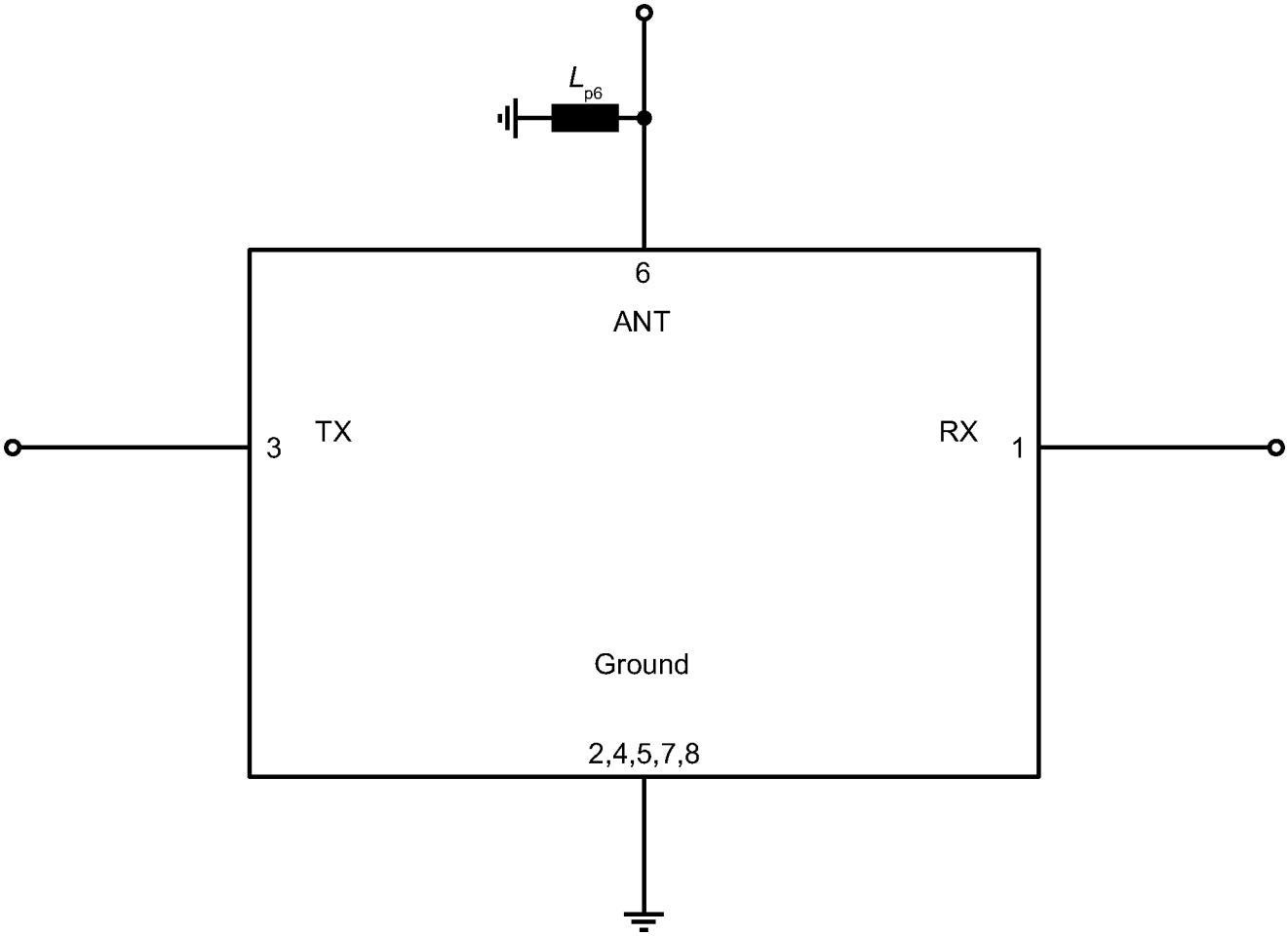

Figure 3: Schematic of matching circuit.

6 Characteristics

6.1 TX – ANT

Temperature range for specification T_{SPEC} = −30 °C ... +90 °C
TX terminating impedance Z_{TX} = 50 Ω
ANT terminating impedance Z_{ANT} = 50 Ω with par. 8.2 nH[1)]
RX terminating impedance Z_{RX} = 50 Ω

Characteristics TX – ANT					min. for T_{SPEC}	typ. @+25 °C	max. for T_{SPEC}	
Center frequency				f_C	—	836.5	—	MHz
Maximum insertion attenuation								
	824 ... 849	MHz		α_{max}	—	1.4	2.0	dB
@$f_{carrier}$	826.4 ... 846.6	MHz		$\alpha_{WCDMA,max}$ [2)]	—	1.4	1.8	dB
Amplitude ripple (p-p)								
	824 ... 849	MHz		$\Delta\alpha$	—	0.5	1.1	dB
	824 ... 849	MHz		$\Delta\alpha$ [3)]	—	0.4	1.0	dB
@$f_{carrier}$	826.4 ... 846.6	MHz		$\Delta\alpha_{WCDMA}$ [2)]	—	0.5	0.9	dB
Maximum VSWR				$VSWR_{max}$				
@ TX port	824 ... 849	MHz			—	1.6	2.0	
@ ANT port	824 ... 849	MHz			—	1.6	2.0	
Maximum error vector magnitude				EVM_{max} [4)]				
	826.4 ... 846.6	MHz			—	1.3	2.5	%
Minimum attenuation								
	10 ... 420	MHz		α_{min}	35	43	—	dB
	420 ... 494	MHz		α_{min}	35	40	—	dB
	494 ... 701	MHz		α_{min}	32	35	—	dB
	701 ... 728	MHz		α_{min}	32	35	—	dB
	728 ... 764	MHz		α_{min}	32	35	—	dB
	764 ... 804	MHz		α_{min}	30	37	—	dB
	860 ... 864	MHz		α_{min}	3	10	—	dB
	864 ... 869	MHz		α_{min}	14	51	—	dB
	869 ... 894	MHz		α_{min}	44	50	—	dB
@$f_{carrier}$	871.4 ... 891.6	MHz		$\alpha_{WCDMA,min}$ [2)]	45	52	—	dB
	1559 ... 1563	MHz		α_{min}	39	42	—	dB
	1565.42 ... 1573.374	MHz		α_{min}	39	42	—	dB
	1573.374 ... 1577.466	MHz		α_{min}	39	42	—	dB
	1577.466 ... 1585.42	MHz		α_{min}	39	42	—	dB
	1597.5515 ... 1605.886	MHz		α_{min}	39	43	—	dB
	1638 ... 1708	MHz		α_{min}	39	42	—	dB
	1844.9 ... 1879.9	MHz		α_{min}	40	47	—	dB

Characteristics TX – ANT				min. for T_{SPEC}	typ. @+25 °C	max. for T_{SPEC}	
1884.5 ... 1919.6	MHz	α_{min}		40	49	—	dB
1930 ... 1990	MHz	α_{min}		44	49	—	dB
2110 ... 2170	MHz	α_{min}		44	47	—	dB
2400 ... 2547	MHz	α_{min}		36	39	—	dB
3286 ... 3406	MHz	α_{min}		30	35	—	dB
4110 ... 4255	MHz	α_{min}		20	35	—	dB
4900 ... 5950	MHz	α_{min}		24	30	—	dB

1) See Sec. Matching circuit (p. 5).
2) Attenuation of WCDMA signal ("power transfer function"). Please refer to definition of Power Transfer Function (PTF) of WCDMA signal (p. 25).
3) Over any channel with band width of 5 MHz.
4) Error Vector Magnitude (EVM) based on definition given in 3GPP TS 25.141.

6.2 ANT – RX

Temperature range for specification T_{SPEC} = −30 °C ... +90 °C
TX terminating impedance Z_{TX} = 50 Ω
ANT terminating impedance Z_{ANT} = 50 Ω with par. 8.2 nH[1)]
RX terminating impedance Z_{RX} = 50 Ω

Characteristics ANT – RX					min. for T_{SPEC}	typ. @+25 °C	max. for T_{SPEC}	
Center frequency				f_C	—	881.5	—	MHz
Maximum insertion attenuation								
	869 ... 894	MHz		α_{max}	—	1.5	2.1	dB
@$f_{carrier}$	871.4 ... 891.6	MHz		$\alpha_{WCDMA,max}$ [2)]	—	1.4	1.8	dB
Amplitude ripple (p-p)								
	869 ... 894	MHz		$\Delta\alpha$	—	0.3	0.9	dB
	869 ... 894	MHz		$\Delta\alpha$ [3)]	—	0.5	0.8	dB
@$f_{carrier}$	871.4 ... 891.6	MHz		$\Delta\alpha_{WCDMA}$ [2)]	—	0.2	0.6	dB
Maximum VSWR				$VSWR_{max}$				
@ ANT port	869 ... 894	MHz			—	1.6	2.0	
@ RX port	869 ... 894	MHz			—	1.6	2.0	
Maximum error vector magnitude				EVM_{max} [4)]				
	871.4 ... 891.6	MHz			—	1.8	2.5	%
Minimum attenuation								
	10 ... 477	MHz		α_{min}	50	65	—	dB
	45	MHz		α_{min}	50	100	—	dB
	477 ... 824	MHz		α_{min}	50	59	—	dB
	779 ... 804	MHz		α_{min}	50	68	—	dB
	824 ... 849	MHz		α_{min}	45	60	—	dB
@$f_{carrier}$	826.4 ... 846.6	MHz		$\alpha_{WCDMA,min}$ [2)]	51	61	—	dB
	849 ... 854	MHz		α_{min}	30	57	—	dB
	909 ... 920	MHz		α_{min}	10	18	—	dB
	920 ... 979	MHz		α_{min}	25	29	—	dB
	979 ... 1710	MHz		α_{min}	45	51	—	dB
	1693 ... 1743	MHz		α_{min}	45	53	—	dB
	1710 ... 1785	MHz		α_{min}	50	53	—	dB
	1785 ... 1788	MHz		α_{min}	45	53	—	dB
	1850 ... 1920	MHz		α_{min}	45	52	—	dB
	1920 ... 1980	MHz		α_{min}	45	52	—	dB
	1980 ... 2400	MHz		α_{min}	40	49	—	dB
	2400 ... 2500	MHz		α_{min}	40	49	—	dB
	2517 ... 2592	MHz		α_{min}	40	47	—	dB

Characteristics ANT – RX				min. for T_{SPEC}	typ. @+25 °C	max. for T_{SPEC}	
2607 ... 2682	MHz	α_{min}		40	48	—	dB
3476 ... 3576	MHz	α_{min}		40	47	—	dB
4345 ... 4470	MHz	α_{min}		40	49	—	dB
4900 ... 5950	MHz	α_{min}		40	52	—	dB
5214 ... 5364	MHz	α_{min}		40	57	—	dB

1) See Sec. Matching circuit (p. 5).
2) Attenuation of WCDMA signal ("power transfer function"). Please refer to definition of Power Transfer Function (PTF) of WCDMA signal (p. 25).
3) Over any channel with band width of 5 MHz.
4) Error Vector Magnitude (EVM) based on definition given in 3GPP TS 25.141.

6.3 TX – RX

Temperature range for specification	T_{SPEC}	= −30 °C ... +90 °C
TX terminating impedance	Z_{TX}	= 50 Ω
ANT terminating impedance	Z_{ANT}	= 50 Ω with par. 8.2 nH[1)]
RX terminating impedance	Z_{RX}	= 50 Ω

Characteristics TX – RX					**min.** for T_{SPEC}	**typ.** @+25 °C	**max.** for T_{SPEC}	
Minimum isolation								
		824 ... 849	MHz	α_{min}	55	60	—	dB
	@$f_{carrier}$	826.4 ... 846.6	MHz	$\alpha_{WCDMA,min}$ [2)]	55	63	—	dB
		869 ... 894	MHz	α_{min}	50	54	—	dB
	@$f_{carrier}$	871.4 ... 891.6	MHz	$\alpha_{WCDMA,min}$ [2)]	50	55	—	dB
		1574 ... 1577	MHz	α_{min}	40	59	—	dB
		1638 ... 1708	MHz	α_{min}	20	58	—	dB
		2462 ... 2557	MHz	α_{min}	20	53	—	dB

1) See Sec. Matching circuit (p. 5).
2) Attenuation of WCDMA signal ("power transfer function"). Please refer to definition of Power Transfer Function (PTF) of WCDMA signal (p. 25).

6.4 Linearity

Temperature range for specification T_{SPEC} = −30 °C ... +90 °C
TX terminating impedance Z_{TX} = 50 Ω
ANT terminating impedance Z_{ANT} = 50 Ω with par. 8.2 nH[1)]
RX terminating impedance Z_{RX} = 50 Ω

Characteristics Linearity			**min.** for T_{SPEC}	**typ.** @+25 °C	**max.** for T_{SPEC}	
IMD product levels[2)]						
IMD2						
Blocker 1	45	MHz	—	−128	−109	dBm
Blocker 3	1718	MHz	—	−104	−94	dBm
IMD3						
Blocker 2	791.5	MHz	—	−106	−96	dBm
Blocker 4	2554.5	MHz	—	−110	−100	dBm

1) See Sec. Matching circuit (p. 5).
2) @ f_{TX} = 836.5 MHz, f_{RX} = 881.5 MHz, f_{RX} - f_{TX} = 45 MHz, IMD product level limits for power levels P_{TX} = 21.5 dBm (ANT port output power) and $P_{blocker}$ = -15 dBm (ANT port input power).

7 Maximum ratings

Storage temperature	T_{STG} = −40 °C ... +85 °C	
DC voltage	V_{DC} = 5.0 V (max.)[1]	
ESD voltage		
	V_{ESD}[2] = 100 V (max.)	Machine model.
	V_{ESD}[3] = 225 V (max.)	Human body model.
	V_{ESD}[4] = 600 V (max.)	Charged device model.
Input power	P_{IN}	
@ TX port: 824 ... 849 MHz	29 dBm	Continuous wave for 3000 h @ 50 °C.
@ TX port: other frequency range(s)	10 dBm	Continuous wave for 3000 h @ 50 °C.

1) 168h Damp Heat Steady State acc. IEC 60068-2-67 Cy.
2) According to JESD22-A115B (MM – Machine Model), 10 negative & 10 positive pulses.
3) According to JESD22-A114F (HBM – Human Body Model), 1 negative & 1 positive pulse.
4) According to JESD22-C101C (CDM – Field Induced Charged Device Model), 3 negative & 3 positive pulses.

8 Transmission coefficients

8.1 TX – ANT

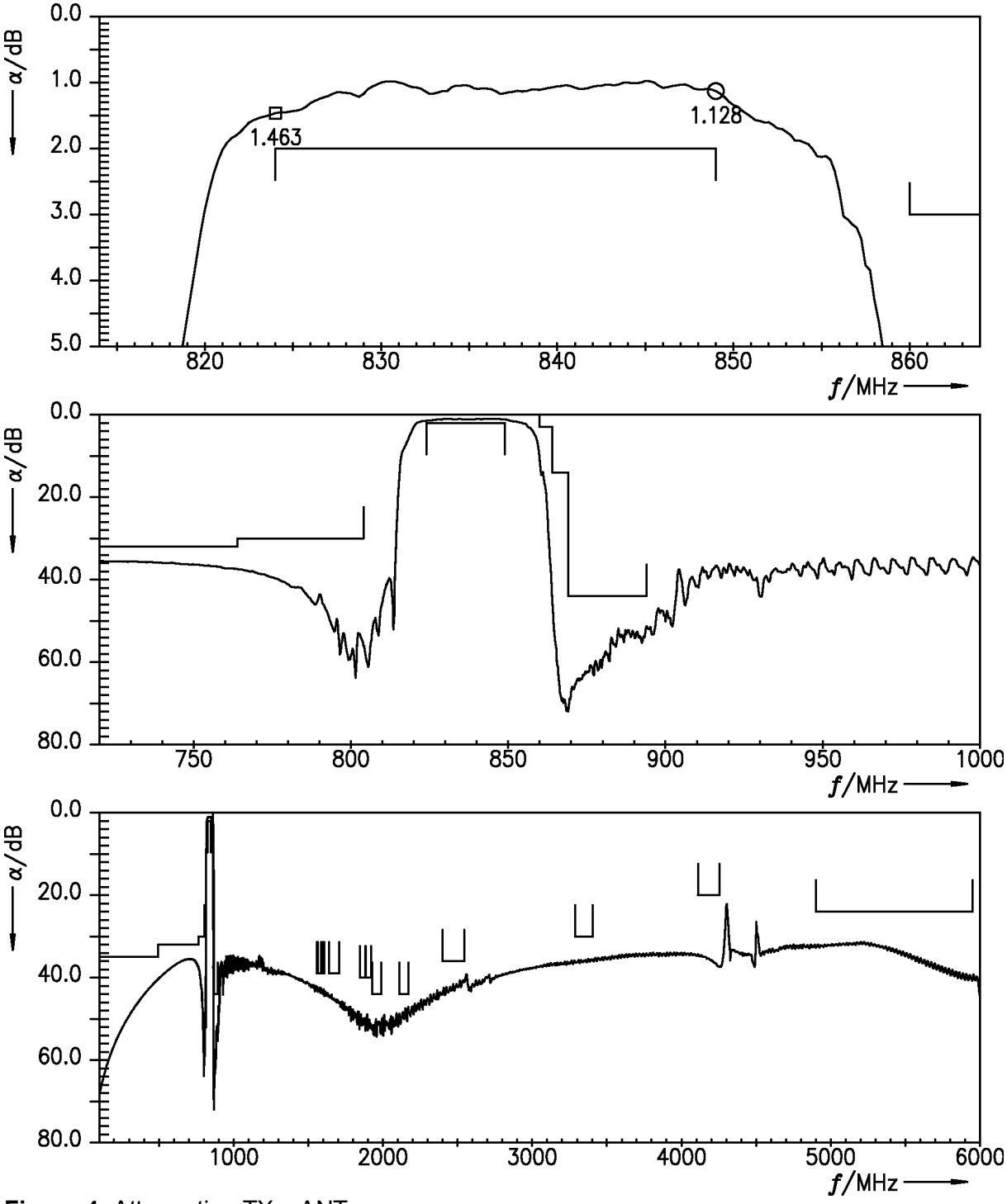

Figure 4: Attenuation TX – ANT.

8.2 ANT – RX

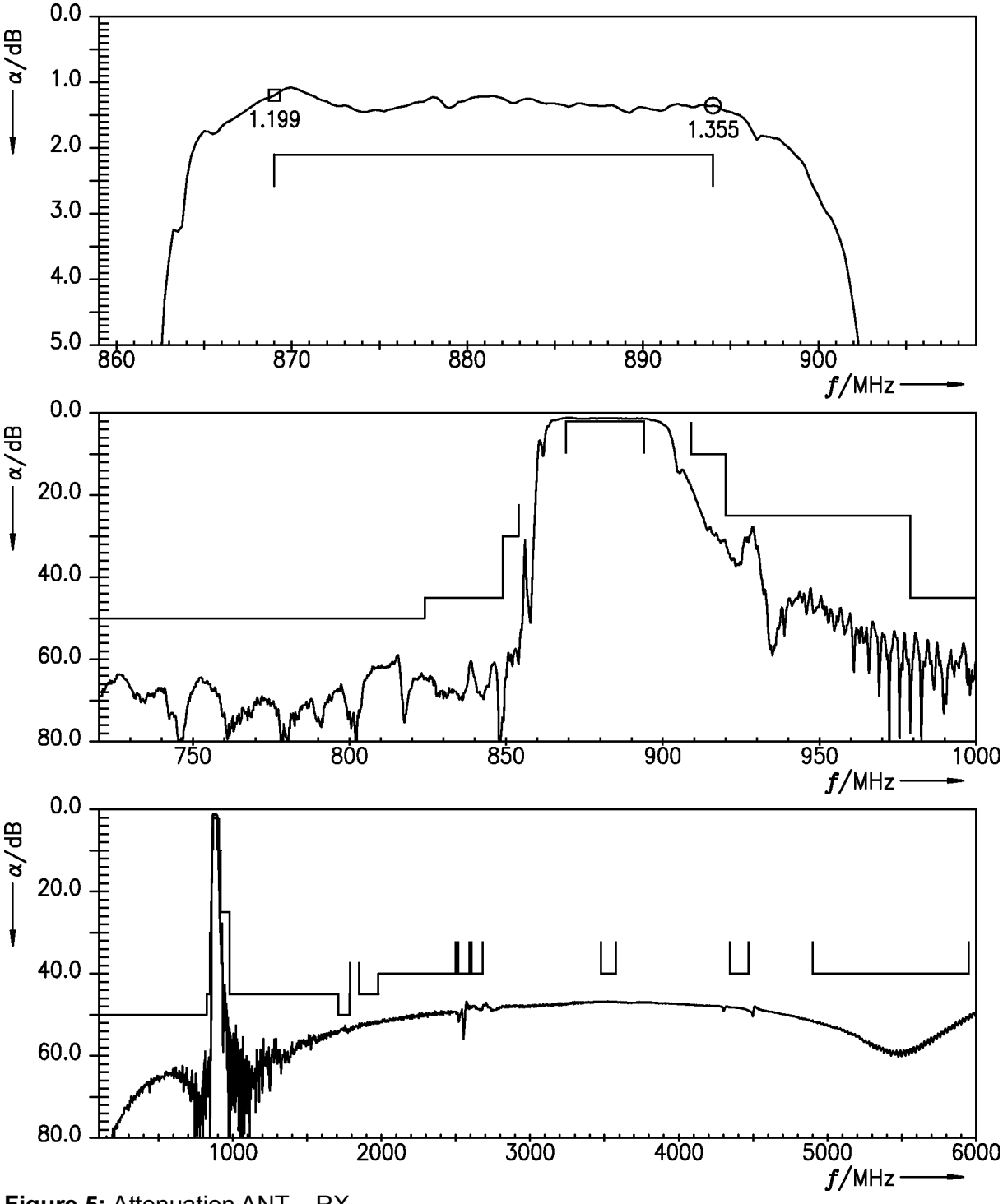

Figure 5: Attenuation ANT – RX.

8.3 TX – RX

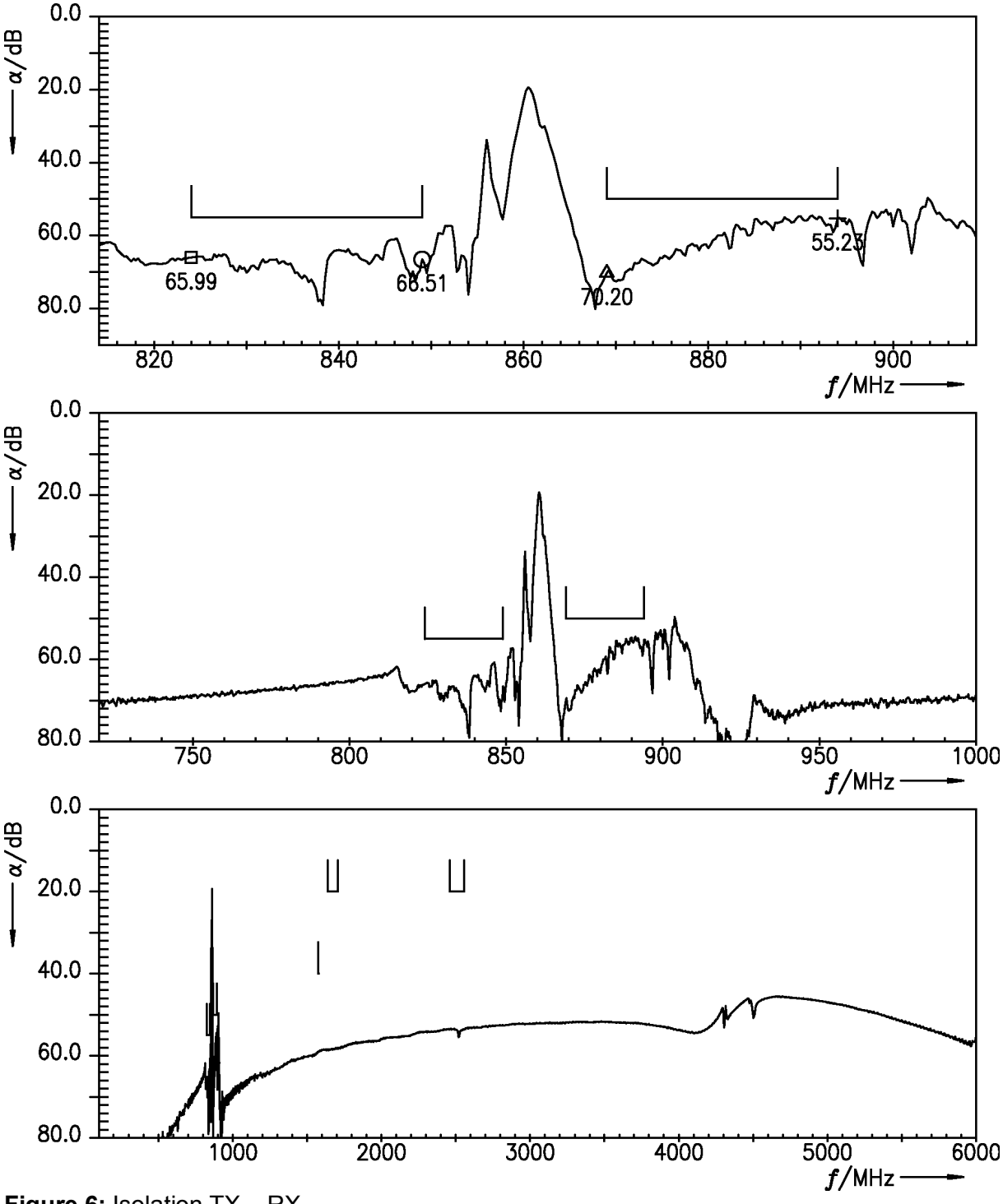

Figure 6: Isolation TX – RX.

9 Reflection coefficients

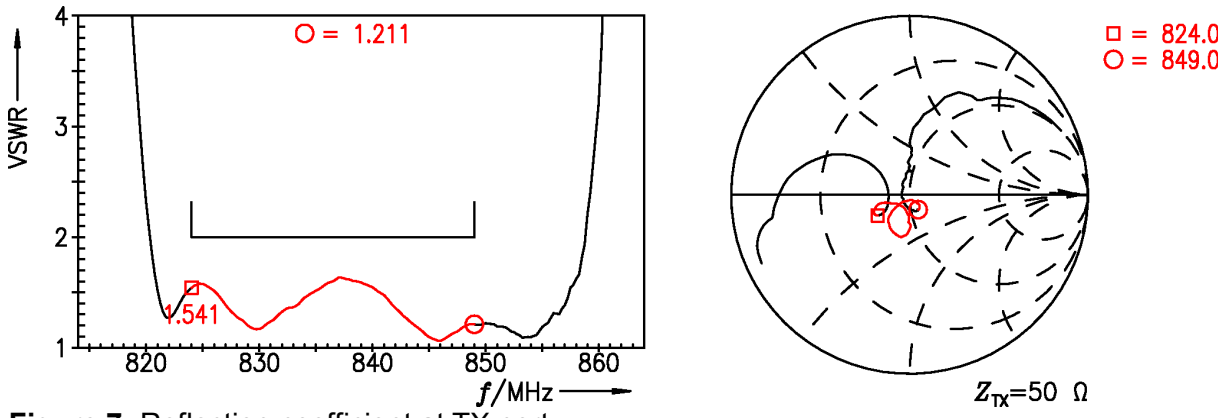

Figure 7: Reflection coefficient at TX port.

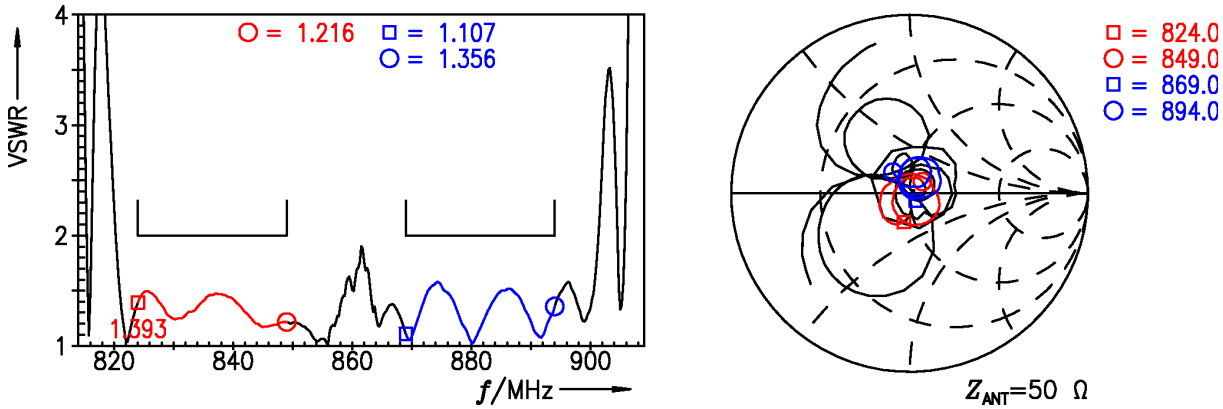

Figure 8: Reflection coefficient at ANT port (TX and RX frequencies).

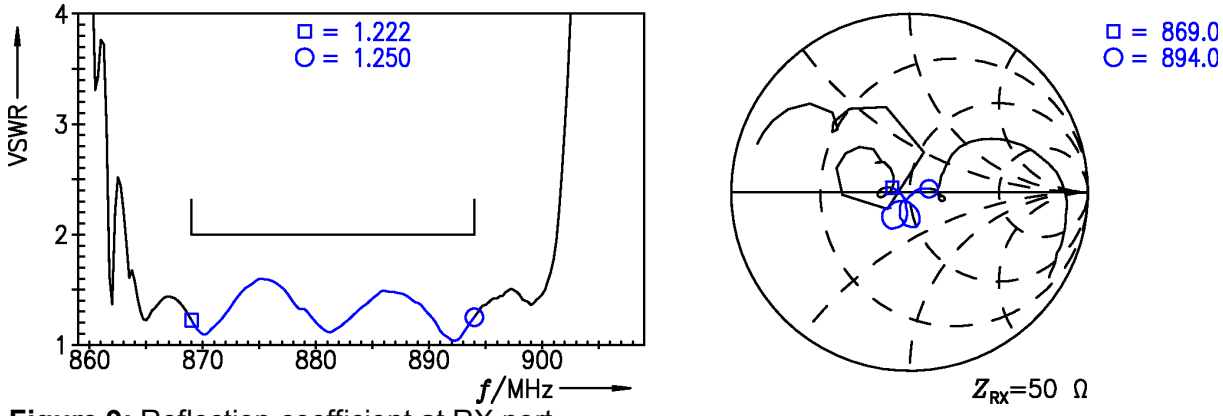

Figure 9: Reflection coefficient at RX port.

10 EVMs

10.1 TX – ANT

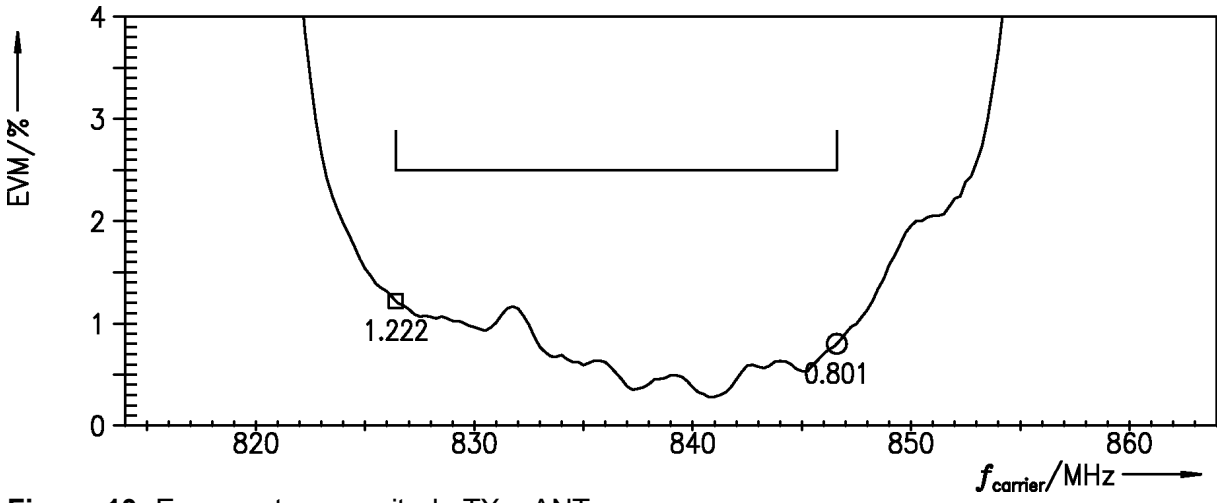

Figure 10: Error vector magnitude TX – ANT.

10.2 ANT – RX

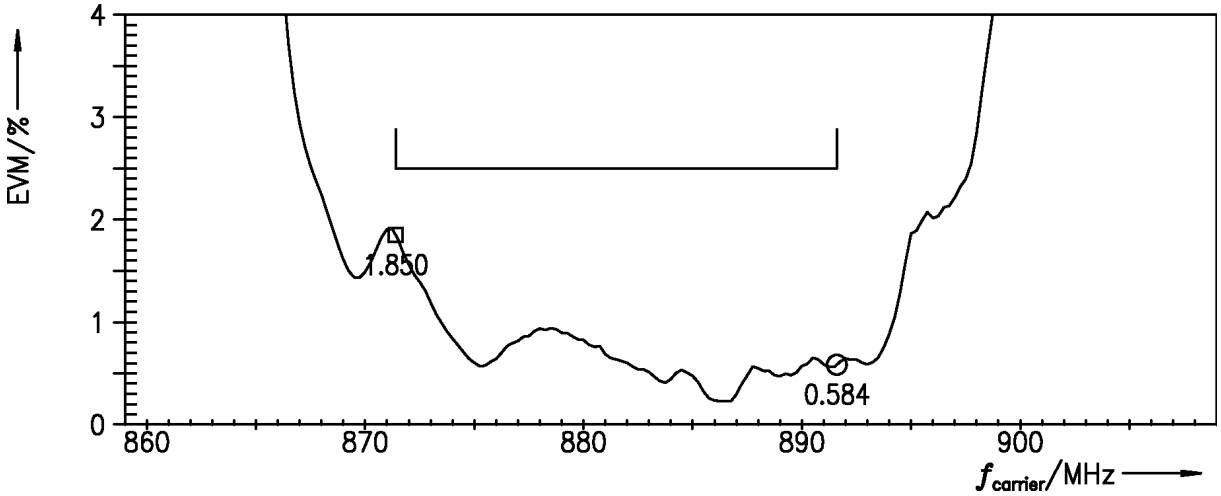

Figure 11: Error vector magnitude ANT – RX.

11 Packing material

11.1 Tape

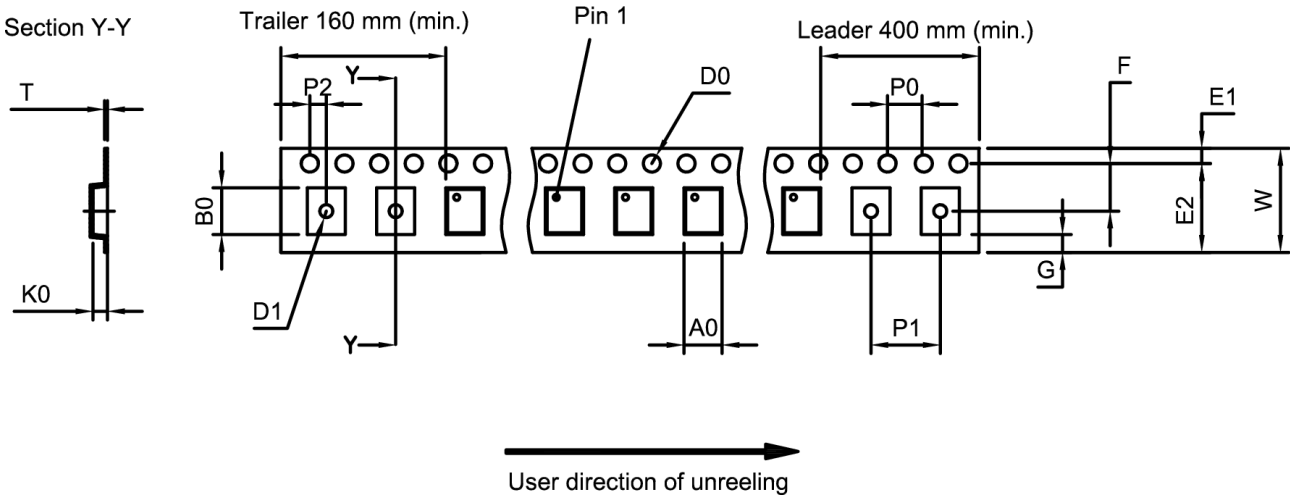

Figure 12: Drawing of tape (first-angle projection) with tape dimensions according to Table 1.

A_0	1.62±0.05 mm
B_0	2.04±0.05 mm
D_0	1.5±0.05 mm
D_1	0.8±0.05 mm
E_1	1.75±0.1 mm

E_2	6.25 mm (min.)
F	3.5±0.05 mm
G	0.75 mm (min.)
K_0	0.62±0.05 mm
P_0	4.0±0.1 mm

P_1	4.0±0.1 mm
P_2	2.0±0.05 mm
T	0.25±0.02 mm
W	8.0±0.1 mm

Table 1: Tape dimensions.

11.2 Reel with diameter of 180 mm

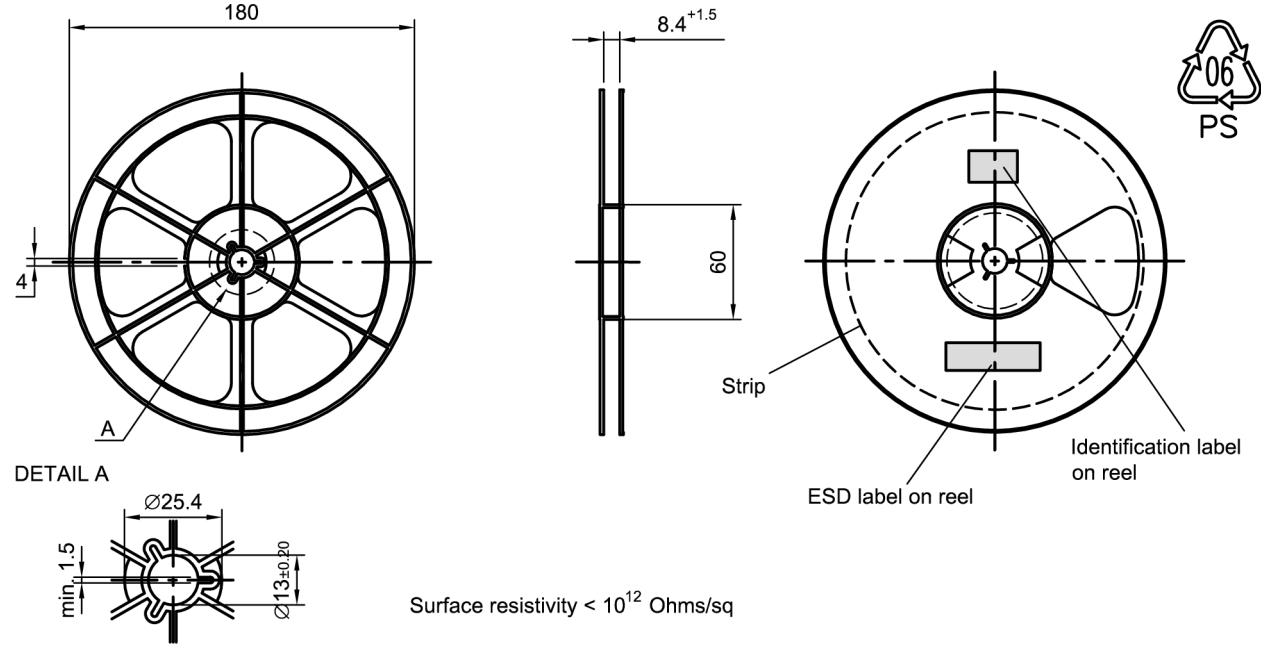

Figure 13: Drawing of reel (first-angle projection) with diameter of 180 mm.

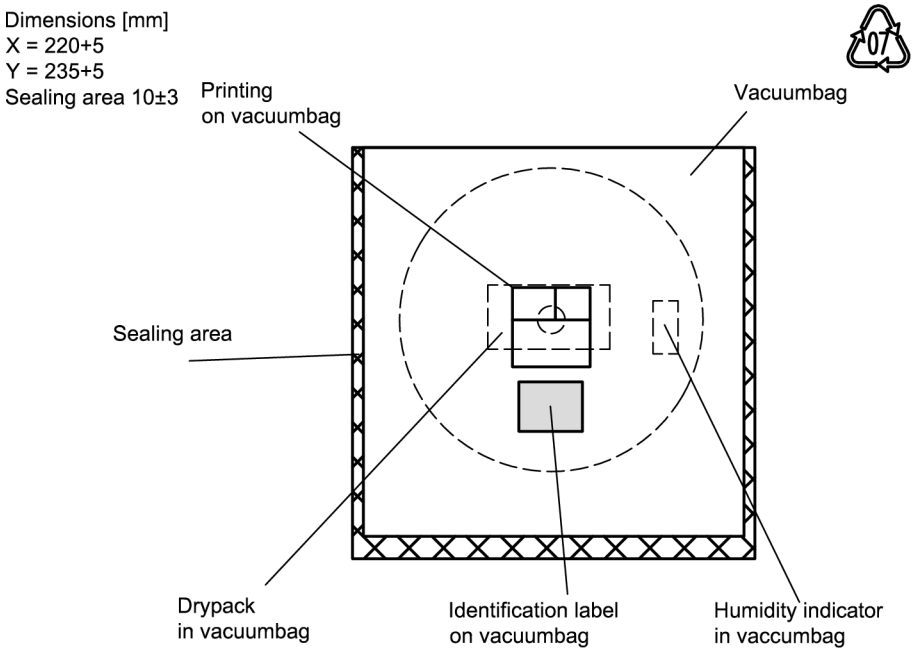

Figure 14: Drawing of moisture barrier bag (MBB) for reel with diameter of 180 mm.

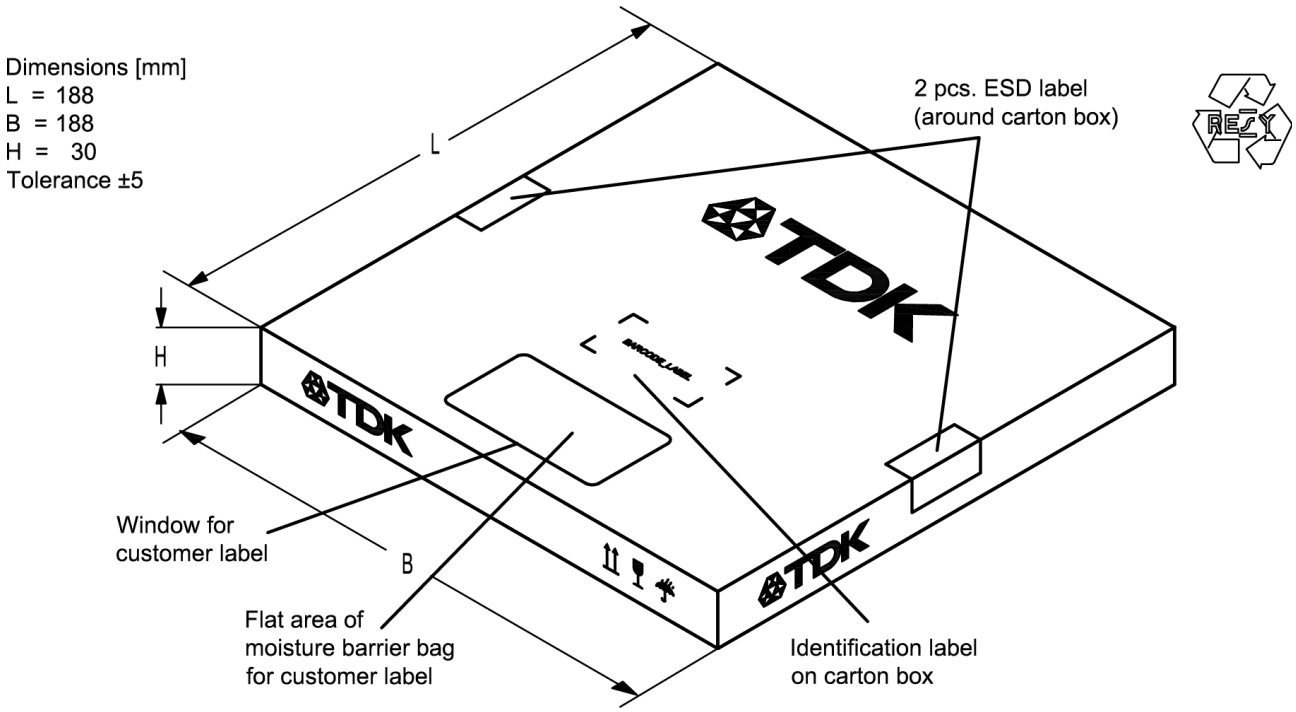

Figure 15: Drawing of folding box for reel with diameter of 180 mm.

11.3 Reel with diameter of 330 mm

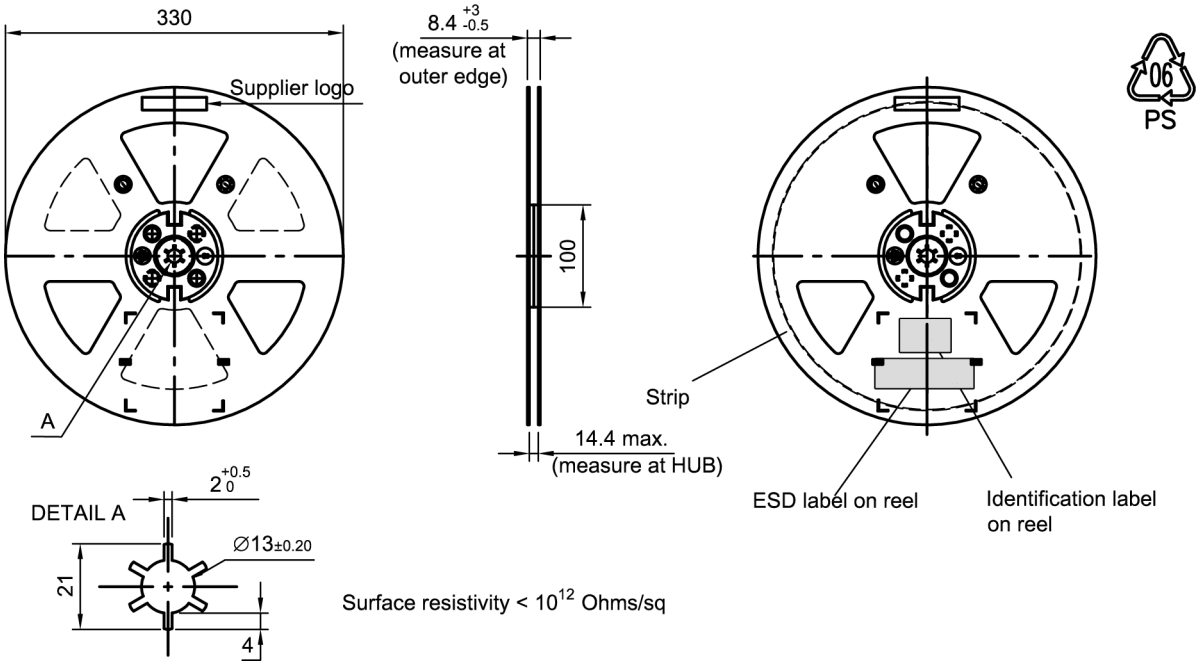

Figure 16: Drawing of reel (first-angle projection) with diameter of 330 mm.

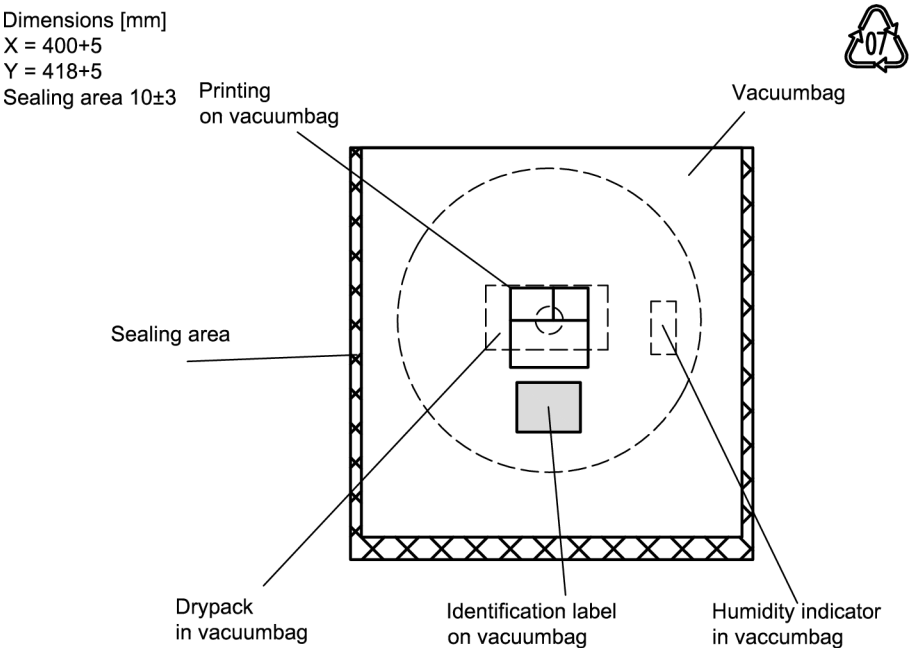

Figure 17: Drawing of moisture barrier bag (MBB) for reel with diameter of 330 mm.

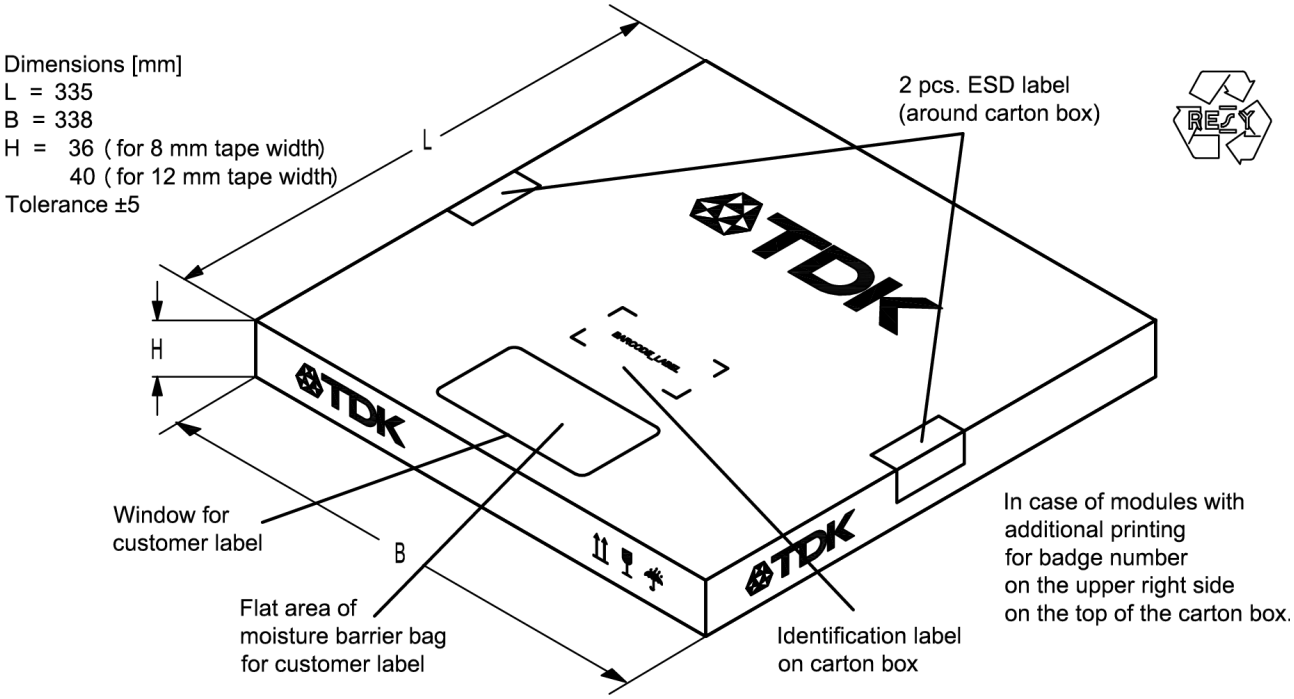

Figure 18: Drawing of folding box for reel with diameter of 330 mm.

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 32^2 + **6** x 32^1 + **18 (=J)** x 32^0	**=**	**1234**

  The BASE32 code for product type B8626 is 8DJ.

- 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	**=>**	**12345**
5 x 47^2 + **27 (=U)** x 47^1 + **31 (=Y)** x 47^0	**=**	**12345**

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.