Qualcomm

RF360
Europe GmbH

Data sheet

SAW multiplexer

EN-DC 4G/5G band n20 + EN-DC 4G/5G band n28a + EN-DC 4G/5G band n8

Part number:	B8943
Ordering code:	B39941B8943L210
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Version:	2.1

DCN: 80-PA243-530 Rev. A

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1 Application

- Low-loss SAW multiplexer for mobile telephone EN-DC 4G/5G Band 28a systems,EN-DC 4G/5G Band 20 systems and EN-DC 4G/5G Band 8 systems
- EN-DC 4G/5G band n8 downlink: 942.5 MHz (pass band 35 MHz)
- EN-DC 4G/5G band n20 uplink: 847 MHz (pass band 30 MHz)
- EN-DC 4G/5G band n20+28a downlink: 876.5 MHz (pass band 35 MHz)
- EN-DC 4G/5G band n28a uplink: 718 MHz (pass band 30 MHz)
- Usable pass bands: 30 MHz for Band 28a, 30 MHz for Band 20 and 35 for Band 8
- High out of band selectivity
- Low insertion attenuation
- Unbalanced to unbalanced operation
- Terminating impedances 50 Ω

2 Features

- Package size $3.0_{\pm 0.05}$ mm × $2.0_{\pm 0.05}$ mm
- Package height 0.65 mm (max.)
- Approximate weight 0.01 g
- RoHS compatible
- Package for Surface Mount Technology (SMT)
- Ni/Au-plated terminals
- Electrostatic Sensitive Device (ESD)
- Moisture Sensitivity Level 3 (MSL3)

3 Package

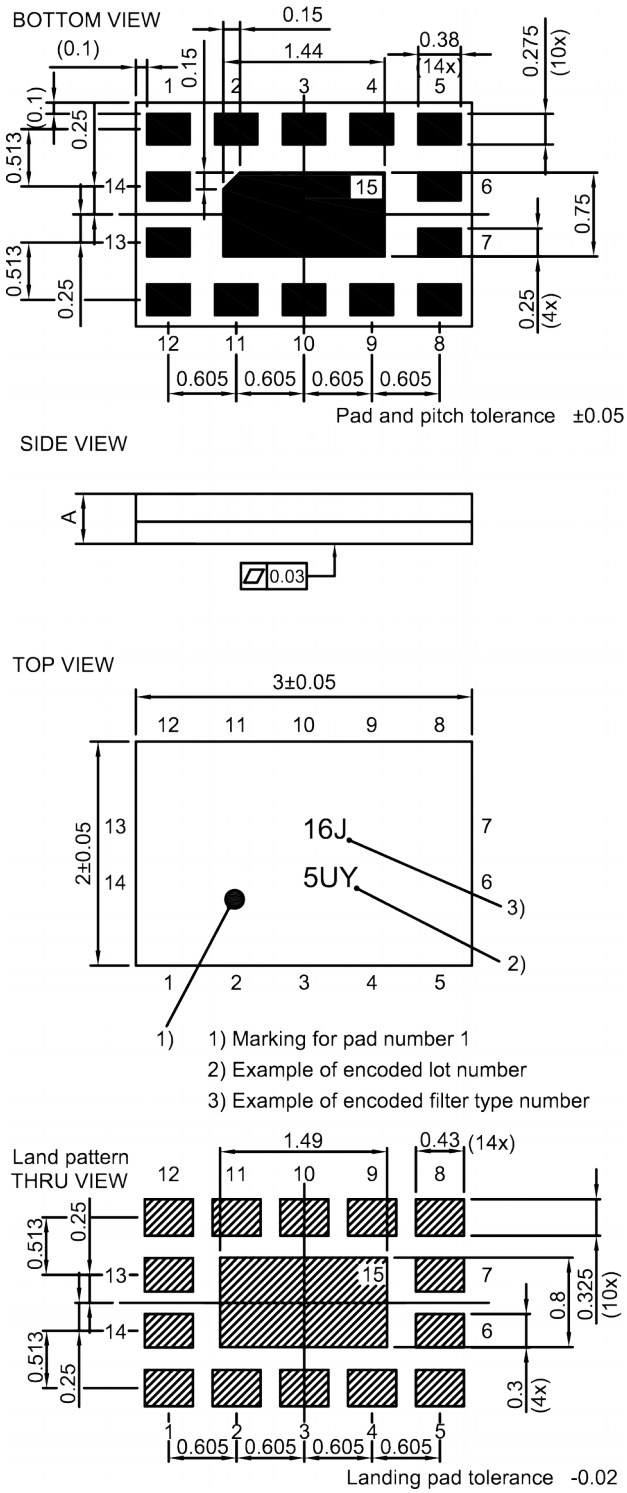

Figure 1: Drawing of package with package height A = 0.65 mm (max.). See Sec. Package information (p. 40).

4 Pin configuration

- 1 RX (n20+28a)
- 5 TX (n20)
- 8 TX (n28a)
- 10 ANT (n8, n20, n20+28a, & n28a)
- 12 RX (n8)
- 2, 3, 4, 6, 7, 9, 11, 13, 14, 15 Ground

5 Matching circuit

- C_{p10c} = 2.5 pF
- L_{p1} = 12 nH
- L_{p10a} = 7.5 nH
- L_{s5} = 5.0 nH
- L_{s8} = 3.5 nH
- L_{s10b} = 8.5 nH
- L_{s12} = 7.0 nH

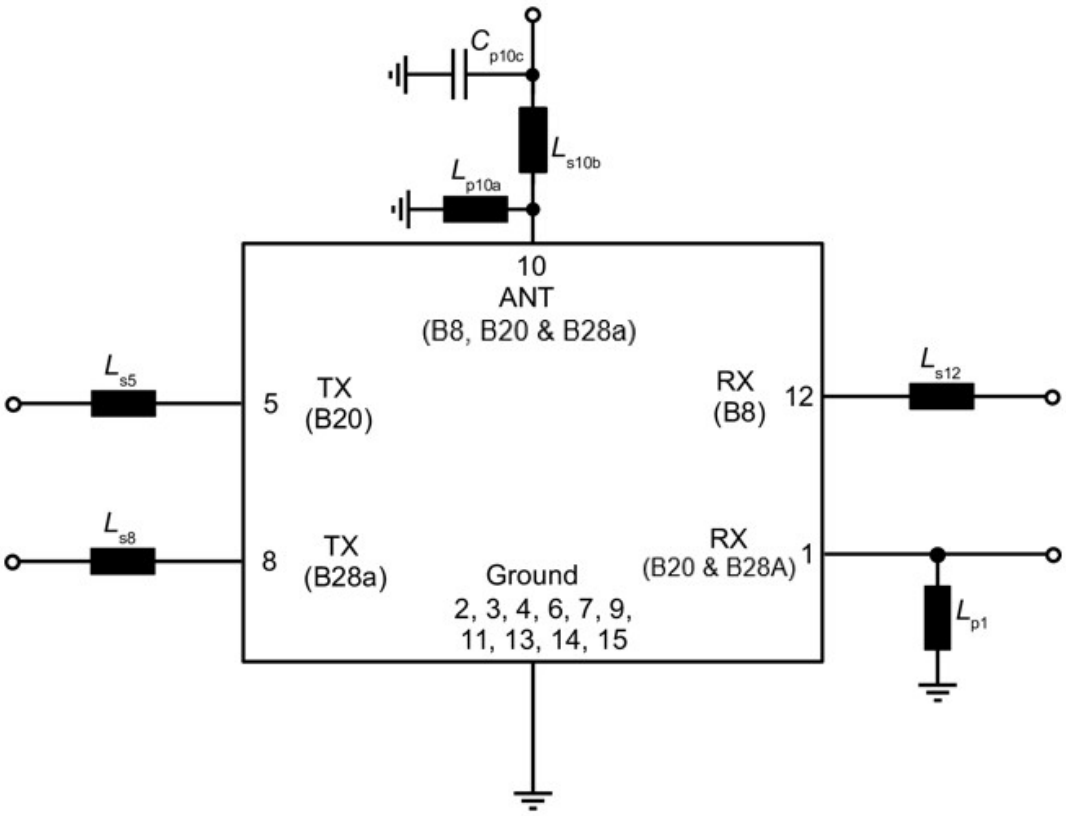

Figure 2: Schematic of matching circuit.

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

6 Characteristics EN-DC 4G/5G n8

Temperature range for specification T_{SPEC} = −30 °C ... +85 °C
ANT terminating impedance Z_{ANT} = 50 Ω with ext. circuitry.[1)]
N8 RX terminating impedance $Z_{n8\ RX}$ = 50 Ω + 7.0 nH[1)]

Characteristics EN-DC 4G/5G n8 ANT – RX				min. for T_{SPEC}	typ. @ +25 °C	max. for T_{SPEC}	
Center frequency			f_C	—	942.5	—	MHz
Maximum insertion attenuation			α_{max}				
	925.24... 959.76	MHz		—	3.0	3.2	dB
Amplitude ripple (p-p)			$\Delta\alpha$				
	925.24... 959.76	MHz		—	1.3	2.0	dB
Maximum VSWR			$VSWR_{max}$				
@ ANT port	925.24... 959.76	MHz		—	1.9	2.0	
@ n8 RX port	925.24... 959.76	MHz		—	2.2	2.5	
Minimum attenuation			α_{min}				
	10... 880	MHz		42	47	—	dB
	880... 915	MHz		35	39	—	dB
	980... 1045	MHz		25	30	—	dB
	1045... 1100	MHz		35	43	—	dB
	1100... 6000	MHz		45	48	—	dB
	2400... 2500	MHz		50	55	—	dB

1) See Sec. Matching circuit (p. 6).

7 Characteristics EN-DC 4G/5G n20

Temperature range for specification T_{SPEC} = −30 °C ... +85 °C
N20 TX terminating impedance $Z_{n20\ TX}$ = 50 Ω + 5.0 nH[1)]
ANT terminating impedance Z_{ANT} = 50 Ω with ext. circuitry.[1)]

Characteristics EN-DC 4G/5G n20 TX – ANT				**min.** for T_{SPEC}	**typ.** @ +25 °C	**max.** for T_{SPEC}	
Center frequency			f_C	—	847	—	MHz
Maximum insertion attenuation			α_{max}				
	832.34 ... 861.66	MHz		—	1.8	2.5	dB
Amplitude ripple (p-p)			$\Delta\alpha$				
	832.34 ... 861.66	MHz		—	0.8	2.0	dB
Maximum VSWR			$VSWR_{max}$				
@ n20 TX port	832.34 ... 861.66	MHz		—	1.6	2.0	
@ ANT port	832.34 ... 861.66	MHz		—	1.6	2.0	
Minimum attenuation			α_{min}				
	10 ... 703	MHz		40	46	—	dB
	703.24 ... 732.76	MHz		45	50	—	dB
	758.24 ... 787.76	MHz		45	55	—	dB
	791.34 ... 820.66	MHz		45	53	—	dB
	880 ... 915	MHz		45	52	—	dB
	925 ... 960	MHz		45	54	—	dB
	1166 ... 1187	MHz		44	49	—	dB
	1225 ... 1250	MHz		34	47	—	dB
	1559 ... 1607	MHz		40	45	—	dB
	1664 ... 1724	MHz		43	48	—	dB
	1710 ... 2170	MHz		43	48	—	dB
	2400 ... 2500	MHz		47	52	—	dB
	2496 ... 2586	MHz		47	52	—	dB
	2570 ... 2620	MHz		50	55	—	dB
	2620 ... 2690	MHz		45	50	—	dB
	3300 ... 4200	MHz		53	58	—	dB
	4160 ... 4310	MHz		57	62	—	dB
	4400 ... 5000	MHz		59	64	—	dB
	4992 ... 5875	MHz		58	63	—	dB

[1)] See Sec. Matching circuit (p. 6).

8 Characteristics EN-DC 4G/5G n20+28a

Temperature range for specification T_{SPEC} = −30 °C ... +85 °C
ANT terminating impedance Z_{ANT} = 50 Ω with ext. circuitry.[1)]
n20+28a RX terminating impedance $Z_{n20+28a\ RX}$ = 50 Ω // 12 nH[1)]

Characteristics EN-DC 4G/5G n20+28a ANT – RX				min. for T_{SPEC}	typ. @ +25 °C	max. for T_{SPEC}	
Center frequency			f_C	—	789.5	—	MHz
Maximum insertion attenuation							
	758.24 ... 787.76	MHz	α_{max}	—	1.8	2.5	dB
	791 ... 821	MHz	$\alpha_{INT,max}$ [2)]	—	2.6	2.9	dB
Amplitude ripple (p-p)							
	758.24 ... 787.76	MHz	$\Delta\alpha$	—	1.1	2.0	dB
	791 ... 821	MHz	$\Delta\alpha_{INT}$ [2)]	—	1.6	2.4	dB
Maximum VSWR			$VSWR_{max}$				
@ ANT port	758.24 ... 787.76	MHz		—	1.6	2.0	
	791.34 ... 820.66	MHz		—	1.5	2.0	
@ n20+28a RX port	758.24 ... 787.76	MHz		—	1.6	2.0	
	791.34 ... 820.66	MHz		—	1.5	2.0	
Minimum attenuation							
	10 ... 703	MHz	α_{min}	32	37	—	dB
	703.24 ... 732.76	MHz	α_{min}	45	56	—	dB
	733.24 ... 747.76	MHz	α_{min}	10	16	—	dB
	832 ... 862	MHz	$\alpha_{INT,min}$ [2)]	45	49	—	dB
	880 ... 915	MHz	α_{min}	35	40	—	dB
	1710 ... 1980	MHz	α_{min}	31	36	—	dB
	2400 ... 2500	MHz	α_{min}	41	46	—	dB
	2496 ... 2690	MHz	α_{min}	45	50	—	dB
	3300 ... 4200	MHz	α_{min}	60	65	—	dB
	4400 ... 5000	MHz	α_{min}	60	68	—	dB
	5150 ... 5875	MHz	α_{min}	50	62	—	dB

1) See Sec. Matching circuit (p. 6).
2) Integrated attenuation α_{INT}: Averaged power $|S_{ij}|^2$ over the center 4.5 MHz of LTE 5 MHz (25 RB) channels.

9 Characteristics EN-DC 4G/5G n28a

Temperature range for specification T_{SPEC} = −30 °C ... +85 °C
N28a TX terminating impedance $Z_{n28a\ TX}$ = 50 Ω + 3.5 nH[1)]
ANT terminating impedance Z_{ANT} = 50 Ω with ext. circuitry.[1)]

Characteristics EN-DC 4G/5G n28a TX – ANT				**min.** for T_{SPEC}	**typ.** @ +25 °C	**max.** for T_{SPEC}	
Center frequency			f_C	—	718	—	MHz
Maximum insertion attenuation			α_{max}				
	703.24... 732.76	MHz		—	1.8	2.5[2)]	dB
	703.24... 732.76	MHz		—	1.8	3.0	dB
Amplitude ripple (p-p)			$\Delta\alpha$				
	703.24... 732.76	MHz		—	1.0	1.5	dB
Maximum VSWR			$VSWR_{max}$				
@ n28a TX port	703.24... 732.76	MHz		—	1.5	2.0	
@ ANT port	703.24... 732.76	MHz		—	1.4	2.0	
Average attenuation			α_{avg}				
	470... 694	MHz		30[2),3)]	36[3)]	—	dB
	470... 694	MHz		27[3)]	36[3)]	—	dB
	692... 698	MHz		10[2),4)]	14[4)]	—	dB
	692... 698	MHz		8[4)]	14[4)]	—	dB
Minimum attenuation			α_{min}				
	10... 670	MHz		28	33	—	dB
	670... 694	MHz		25	30	—	dB
	694... 695	MHz		12	17	—	dB
	758.24... 787.76	MHz		45	57	—	dB
	791.34... 820.66	MHz		45	53	—	dB
	832.34... 861.66	MHz		42	47	—	dB
	880... 915	MHz		37	42	—	dB
	925... 960	MHz		41	46	—	dB
	1166... 1187	MHz		32	37	—	dB
	1225... 1250	MHz		32	37	—	dB
	1406... 1466	MHz		35	40	—	dB
	1559... 1607	MHz		36	41	—	dB
	1710... 1785	MHz		35	40	—	dB
	1805... 1880	MHz		34	42	—	dB
	1920... 1980	MHz		37	42	—	dB
	2109... 2199	MHz		38	43	—	dB
	2400... 2500	MHz		40	45	—	dB
	2500... 2570	MHz		40	45	—	dB
	2570... 2620	MHz		41	46	—	dB
	2812... 2932	MHz		42	47	—	dB
	3300... 4200	MHz		42	47	—	dB

Characteristics EN-DC 4G/5G n28a TX – ANT			min. for T_{SPEC}	typ. @ +25 °C	max. for T_{SPEC}	
	4218... 4398	MHz	45	50	—	dB
	4400... 5000	MHz	50	56	—	dB
	4921... 5875	MHz	55	60	—	dB

1) See Sec. Matching circuit (p. 6).
2) Valid for typical temperature T = +25 °C.
3) Over any channel with band width of 8MHz.
4) Over any channel with band width of 6MHz.

10 Cross-isolations

10.1 EN-DC 4G/5G n20 TX – EN-DC 4G/5G n8 RX

Temperature range for specification T_{SPEC} = −30 °C ... +85 °C
N20 TX terminating impedance $Z_{n20\ TX}$ = 50 Ω + 5.0 nH[1)]
N8 RX terminating impedance $Z_{n8\ RX}$ = 50 Ω + 7.0 nH[1)]

Characteristics cross-isolation EN-DC 4G/5G n20 TX – EN-DC 4G/5G n8 RX			**min.** for T_{SPEC}	**typ.** @ +25 °C	**max.** for T_{SPEC}	
Minimum cross-isolation	α_{min}					
832.34... 861.66	MHz		47	50	—	dB
925.24... 959.76	MHz		52	55	—	dB

1) See Sec. Matching circuit (p. 6).

10.2 EN-DC 4G/5G n20 TX – EN-DC 4G/5G n20+28a RX

Temperature range for specification T_{SPEC} = −30 °C ... +85 °C
N20 TX terminating impedance $Z_{n20\ TX}$ = 50 Ω + 5.0 nH[1)]
n20+28a RX terminating impedance $Z_{n20+28a\ RX}$ = 50 Ω // 12 nH[1)]

Characteristics cross-isolation EN-DC 4G/5G n20 TX – EN-DC 4G/5G n20+28a RX				min. for T_{SPEC}	typ. @ +25 °C	max. for T_{SPEC}	
Minimum cross-isolation							
	758.24 ... 787.76	MHz	α_{min}	55	60	—	dB
	791.34 ... 820.66	MHz	α_{min}	50	54	—	dB
	832 ... 862	MHz	$\alpha_{INT,min}$ [2)]	50	59	—	dB
	832.34 ... 861.66	MHz	α_{min}	55[3)]	59	—	dB
	1664 ... 1724	MHz	α_{min}	40	64	—	dB
	2496 ... 2586	MHz	α_{min}	40	50	—	dB

1) See Sec. Matching circuit (p. 6).
2) Integrated attenuation α_{INT}: 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.

10.3 EN-DC 4G/5G n28a TX – EN-DC 4G/5G n8 RX

Temperature range for specification T_{SPEC} = −30 °C ... +85 °C
N28a TX terminating impedance $Z_{n28a\ TX}$ = 50 Ω + 3.5 nH[1)]
N8 RX terminating impedance $Z_{n8\ RX}$ = 50 Ω + 7.0 nH[1)]

Characteristics cross-isolation EN-DC 4G/5G n28a TX – EN-DC 4G/5G n8 RX				min. for T_{SPEC}	typ. @ +25 °C	max. for T_{SPEC}	
Minimum cross-isolation							
	703.24... 732.76	MHz	α_{min}	55	59	—	dB
	925... 960	MHz	$\alpha_{INT,min}$ [2)]	50	53	—	dB

1) See Sec. Matching circuit (p. 6).
2) Integrated attenuation α_{INT}: Averaged power $|S_{ij}|^2$ over the center 4.5 MHz of LTE 5 MHz (25 RB) channels.

10.4 EN-DC 4G/5G n28a TX – EN-DC 4G/5G n20+28a RX

Temperature range for specification T_{SPEC} = −30 °C ... +85 °C
N28a TX terminating impedance $Z_{n28a\ TX}$ = 50 Ω + 3.5 nH[1)]
n20+28a RX terminating impedance $Z_{n20+28a\ RX}$ = 50 Ω // 12 nH[1)]

Characteristics cross-isolation EN-DC 4G/5G n28a TX – EN-DC 4G/5G n20+28a RX				min. for T_{SPEC}	typ. @ +25 °C	max. for T_{SPEC}	
Minimum cross-isolation							
	703.24 ... 732.76	MHz	α_{min}	55	58	—	dB
	758.24 ... 787.76	MHz	α_{min}	55	60	—	dB
	791 ... 821	MHz	$\alpha_{INT,min}$ [2)]	55	58	—	dB
	1406 ... 1466	MHz	α_{min}	50	65	—	dB
	2109 ... 2199	MHz	α_{min}	50	56	—	dB
	2812 ... 2932	MHz	α_{min}	50	56	—	dB

1) See Sec. Matching circuit (p. 6).
2) Integrated attenuation α_{INT}: Averaged power $|S_{ij}|^2$ over the center 4.5 MHz of LTE 5 MHz (25 RB) channels.

11 Maximum ratings

Storage temperature	T_{STG} [1] = −40 °C ... +85 °C	
DC voltage	$\|V_{DC}\|$ [2] = 0 V (max.)	
ESD voltage		
	V_{ESD} [3] = 150 V (max.)	Machine model.
	V_{ESD} [4] = 700 V (max.)	Charged device model.
	V_{ESD} [5] = 425 V (max.)	Human body model.
Input power	P_{IN}	
Outside @ n20 TX port: 832 ... 862 MHz	30 dBm	5 MHz 5G uplink signal (1RB24) for 5000 h @ 55 °C.
Outside @ n20 TX port: other frequency ranges	10 dBm	
@ n28a TX port: 703 ... 733 MHz	30 dBm	5 MHz 5G uplink signal (1RB24) for 5000 h @ 55 °C.
@ n28a TX port: 703 ... 733 MHz	30 dBm	5 MHz 5G uplink signal (FullRB) for 5000 h @ 55 °C.
@ n28a TX port: other frequency ranges	10 dBm	5 MHz 5G uplink signal (1RB24) for 5000 h @ 85 °C.

[1] Not valid for packaging material. Storage temperature for packaging material is −25 °C to +40 °C.
[2] In case of applied DC voltage blocking capacitors are mandatory.
[3] According to JESD22-A115B (MM – Machine Model), 10 negative & 10 positive pulses.
[4] According to JESD22-C101C (CDM – Field Induced Charged Device Model), 3 negative & 3 positive pulses.
[5] According to JESD22-A114F (HBM – Human Body Model), 1 negative & 1 positive pulse.

12 Transmission coefficient EN-DC 4G/5G n8

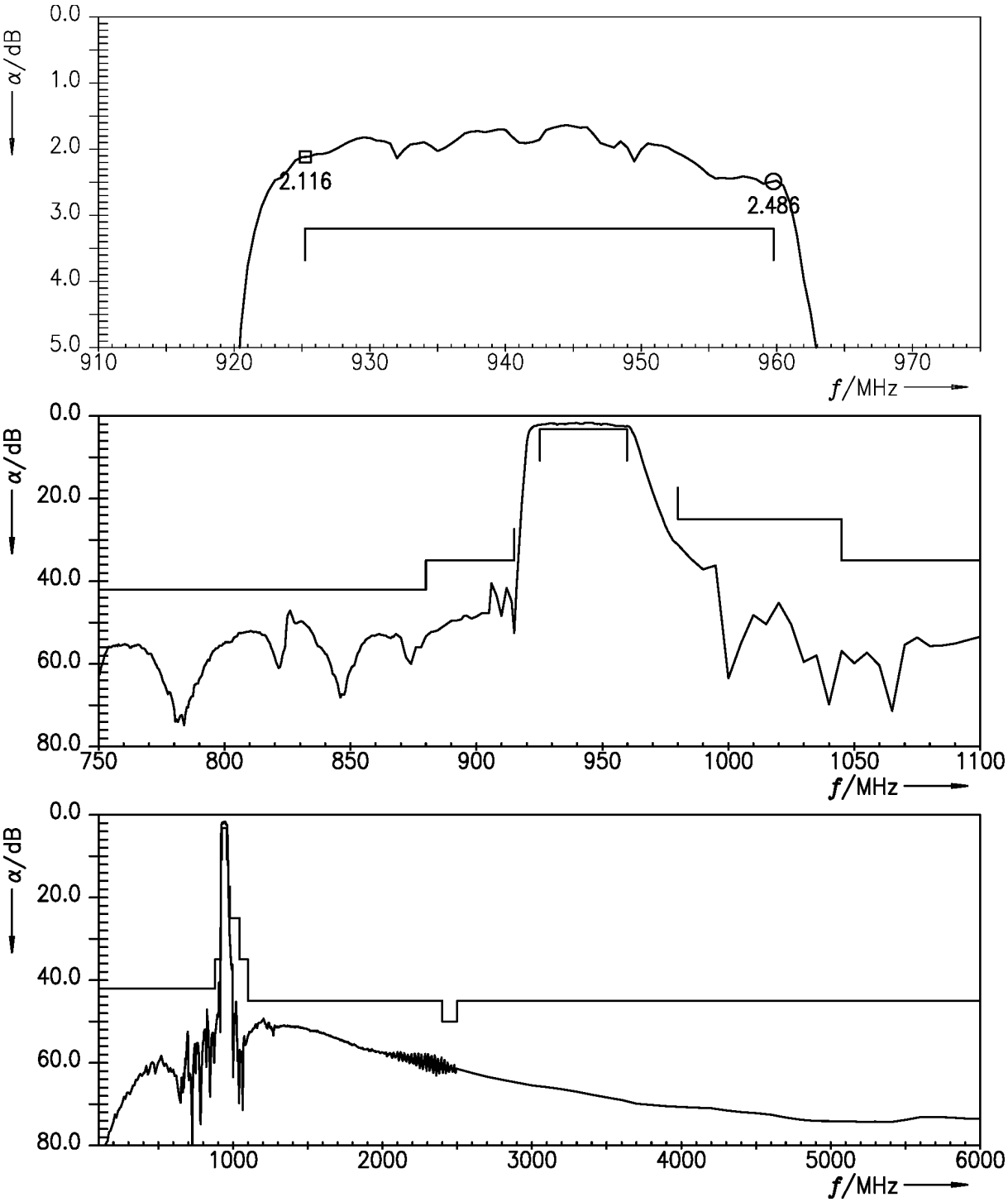

Figure 3: Attenuation ANT – RX.

13 Reflection coefficients EN-DC 4G/5G n8

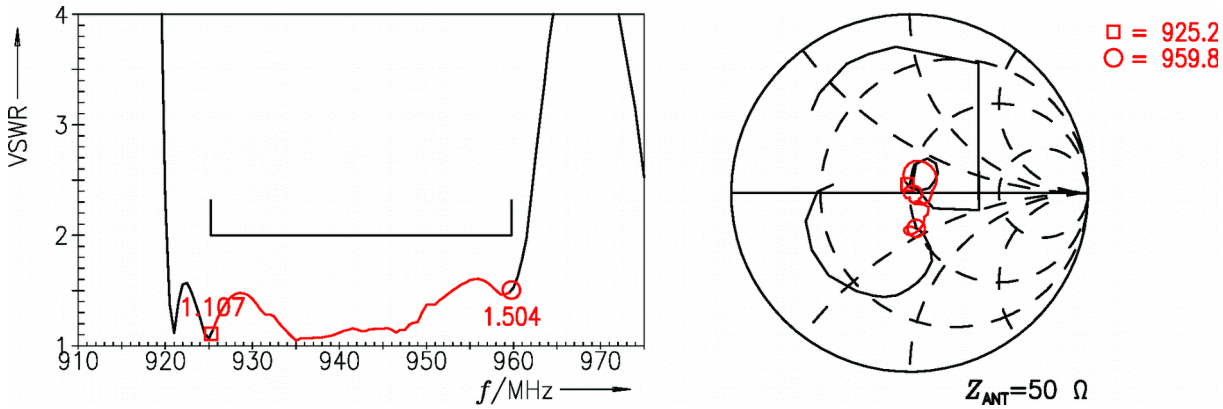

Figure 4: Reflection coefficient at ANT port.

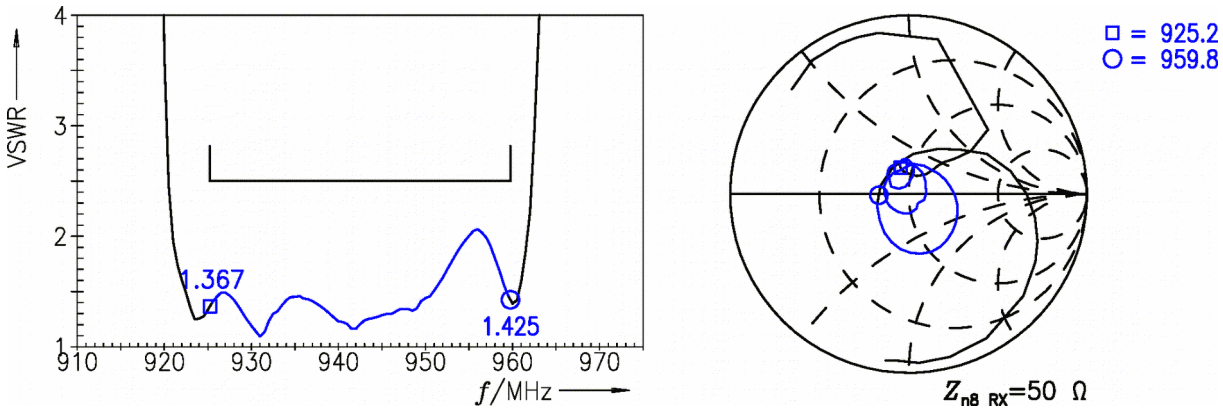

Figure 5: Reflection coefficient at n8 RX port.

14 Transmission coefficient EN-DC 4G/5G n20

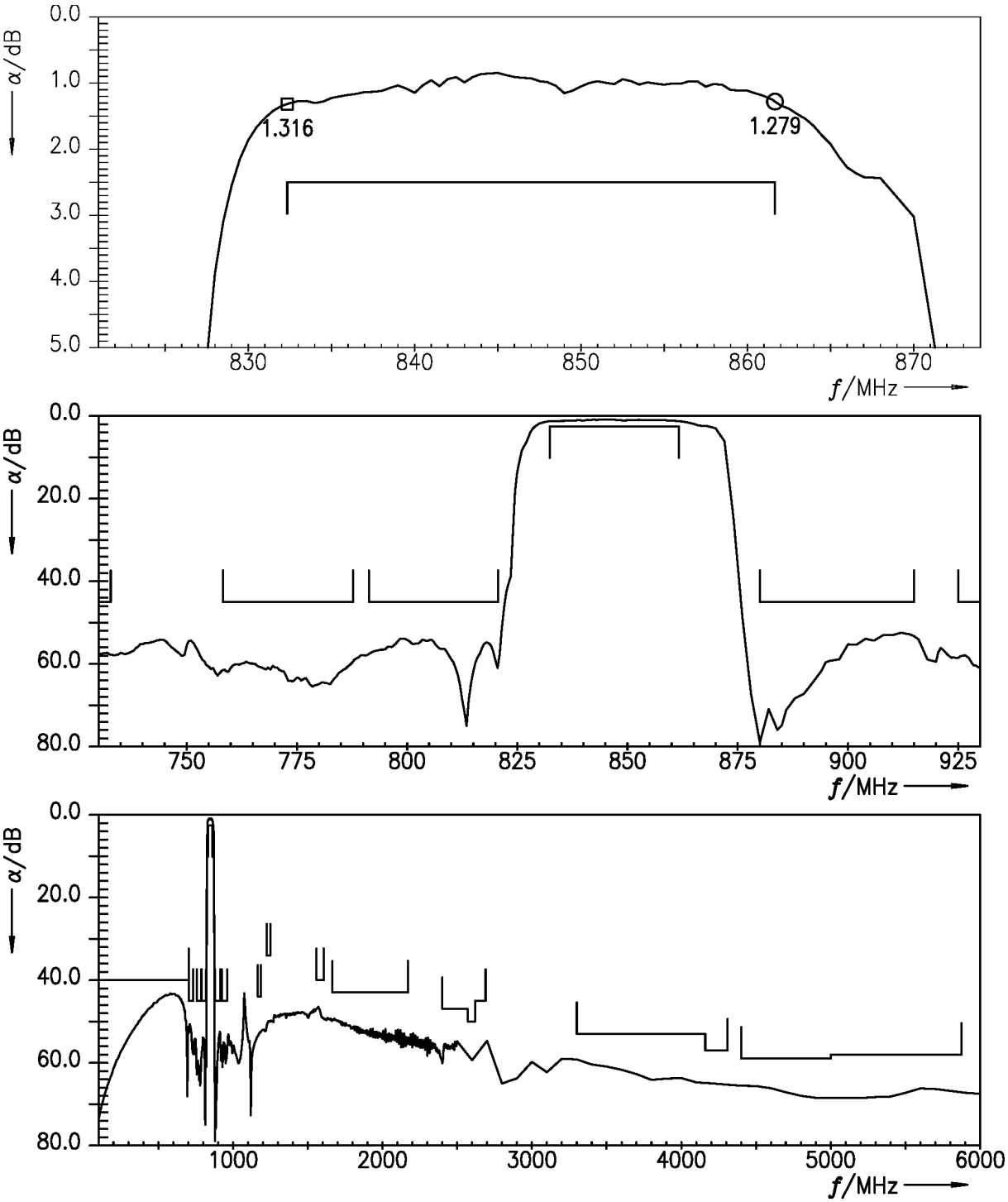

Figure 6: Attenuation TX – ANT.

15 Reflection coefficients EN-DC 4G/5G n20

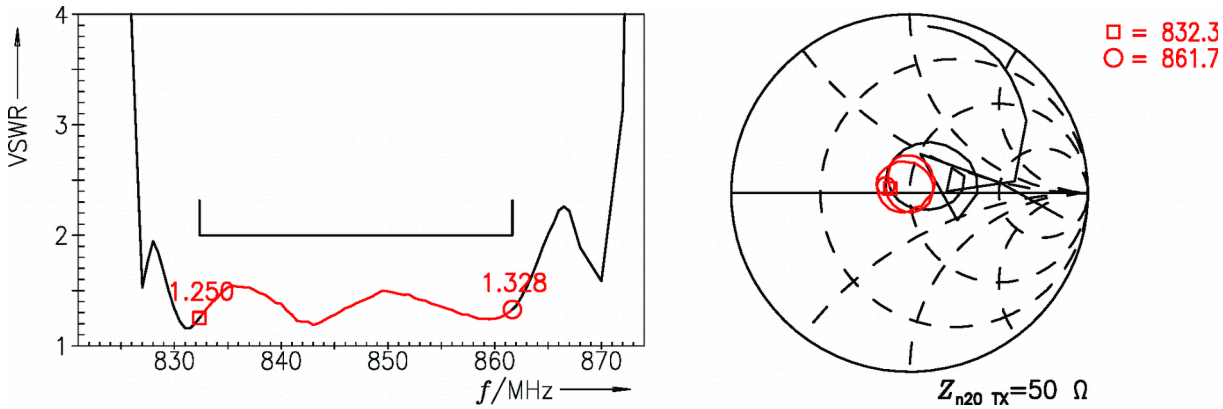

Figure 7: Reflection coefficient at n20 TX port.

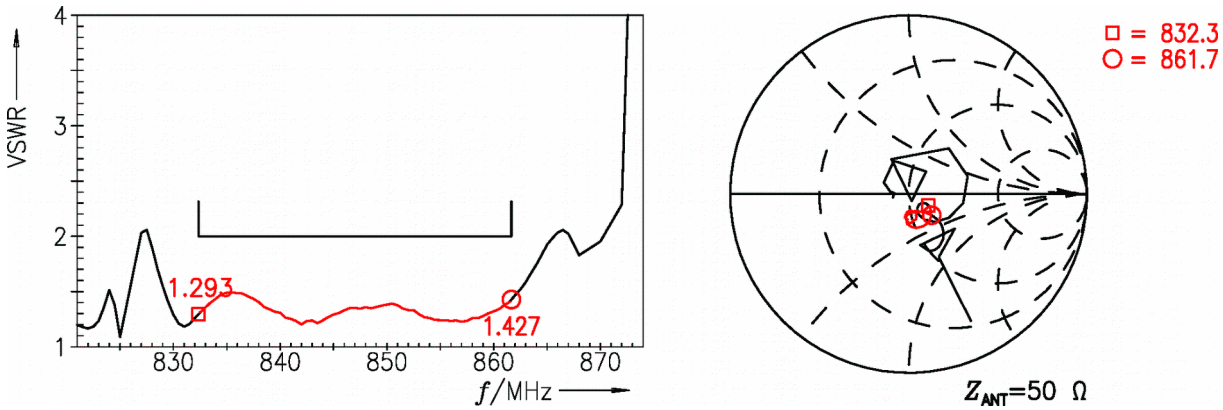

Figure 8: Reflection coefficient at ANT port.

16 Transmission coefficient EN-DC 4G/5G n20+28a

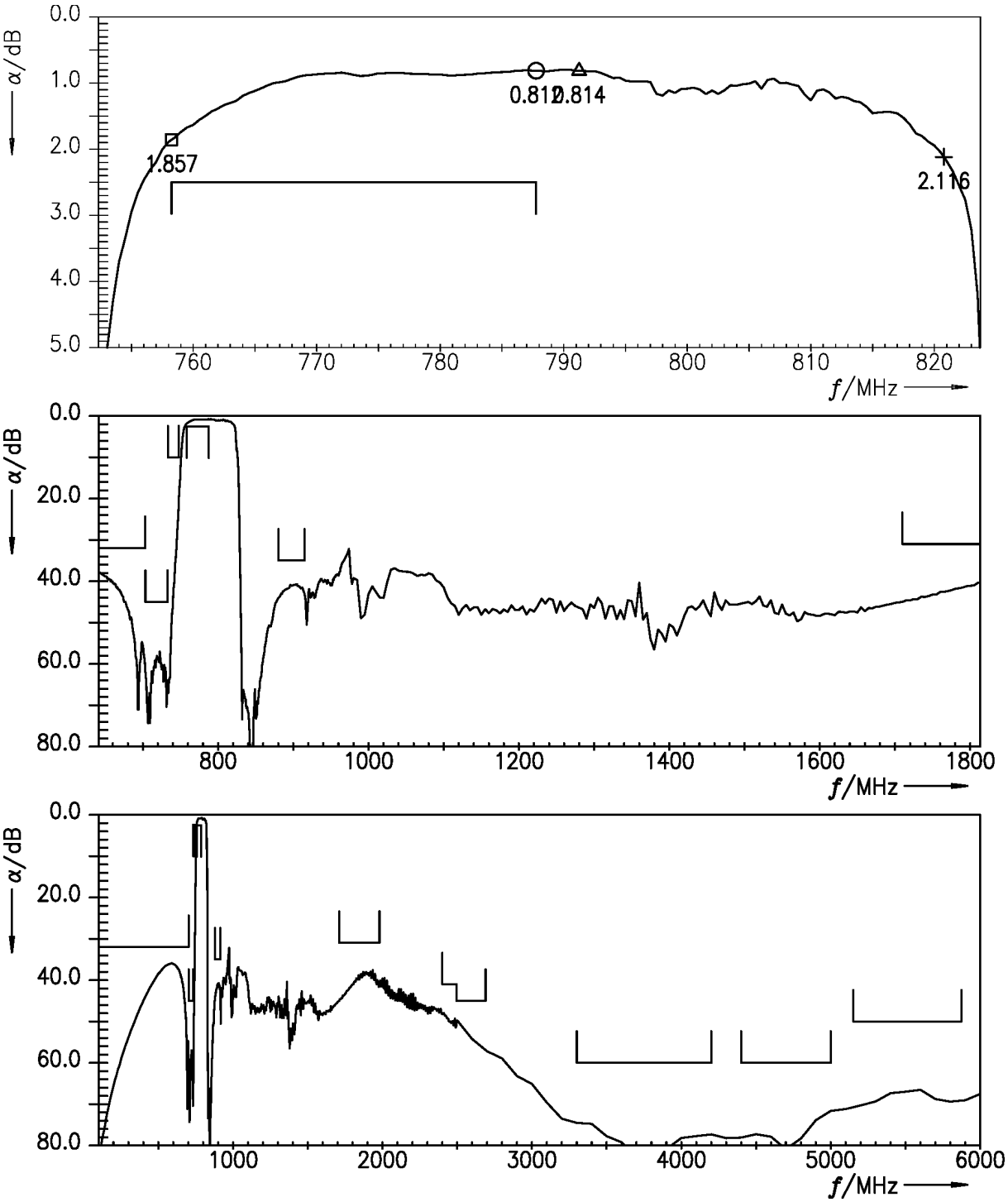

Figure 9: Attenuation ANT – RX.

17 Transmission coefficient (LTE) EN-DC 4G/5G n20+28a

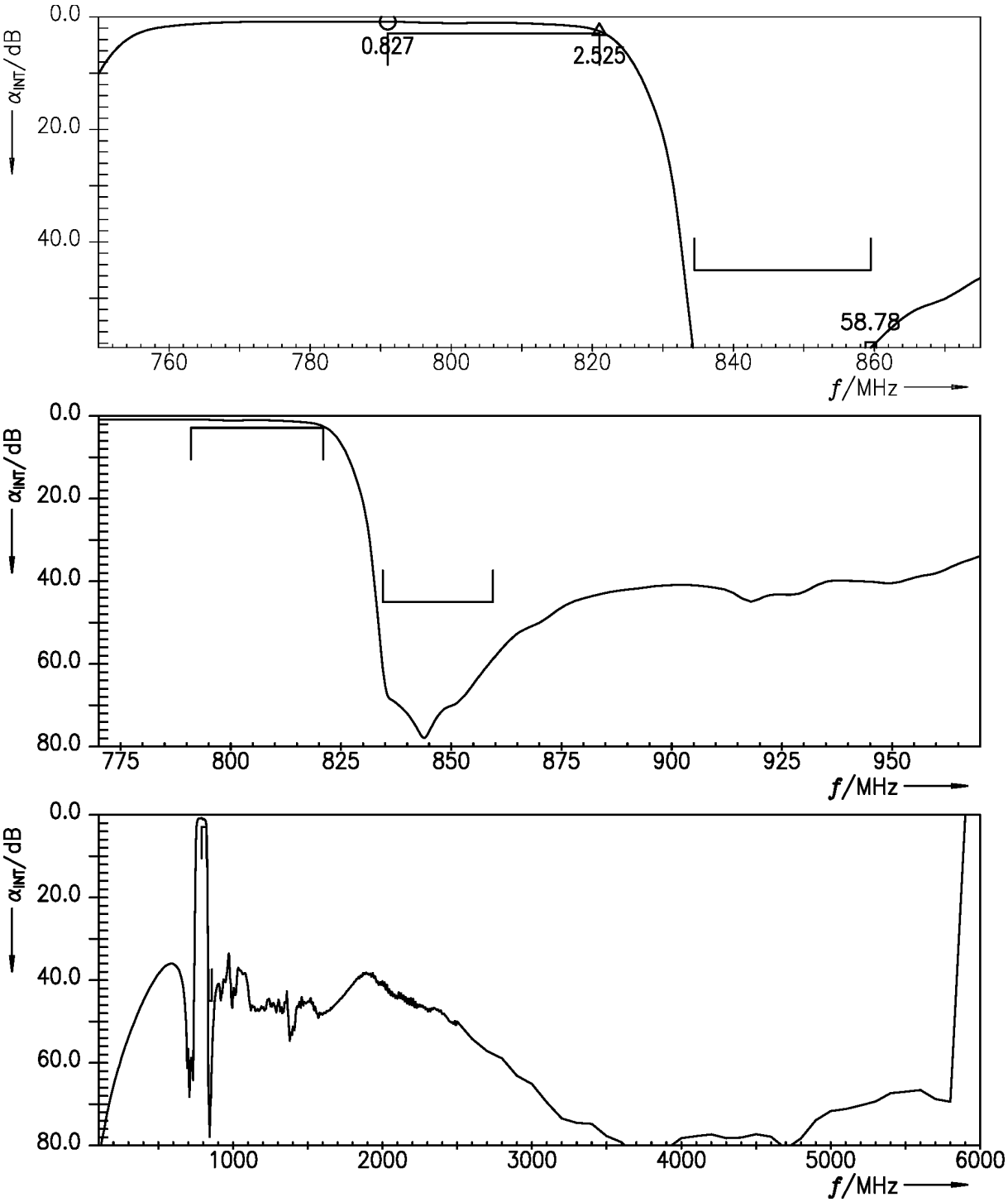

Figure 10: Attenuation (LTE) (integration window = 5 MHz) ANT – RX.

18 Reflection coefficients EN-DC 4G/5G n20+28a

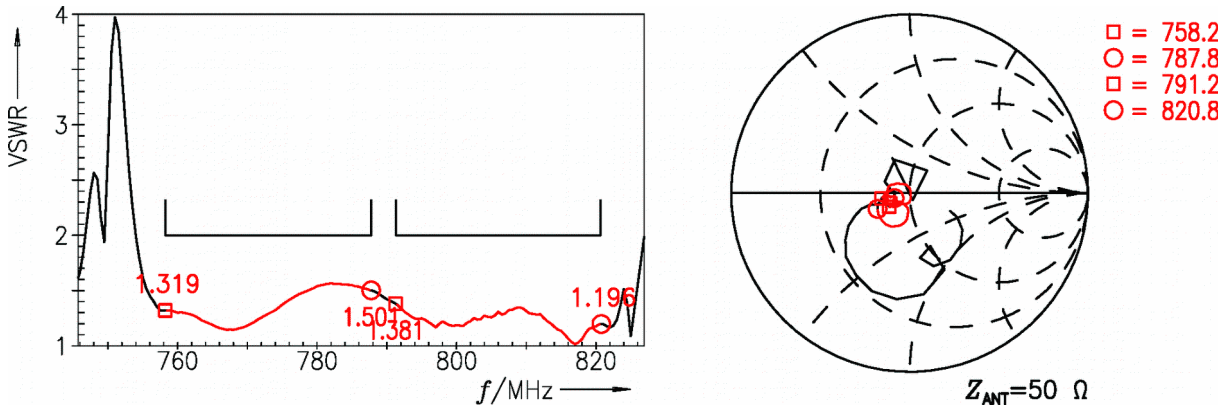

Figure 11: Reflection coefficient at ANT port.

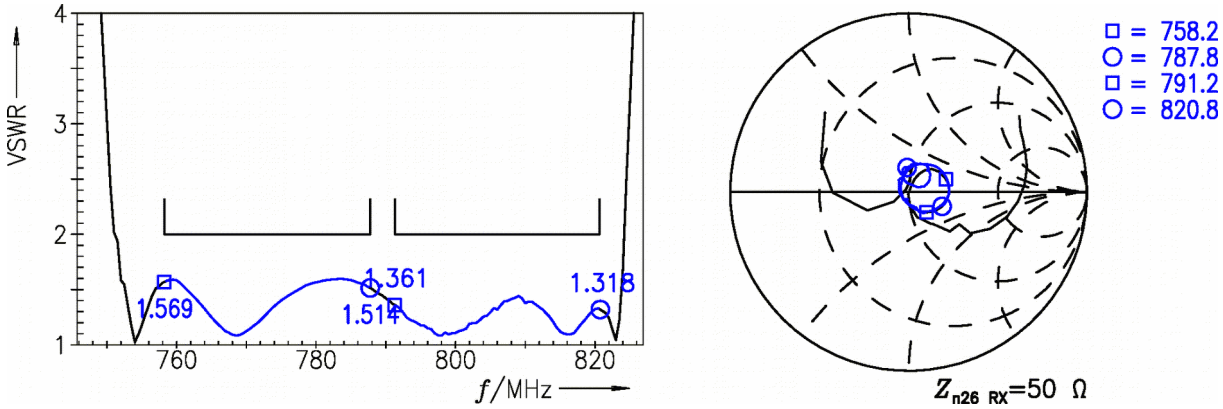

Figure 12: Reflection coefficient at n20+28a RX port.

19 Transmission coefficient EN-DC 4G/5G n28a

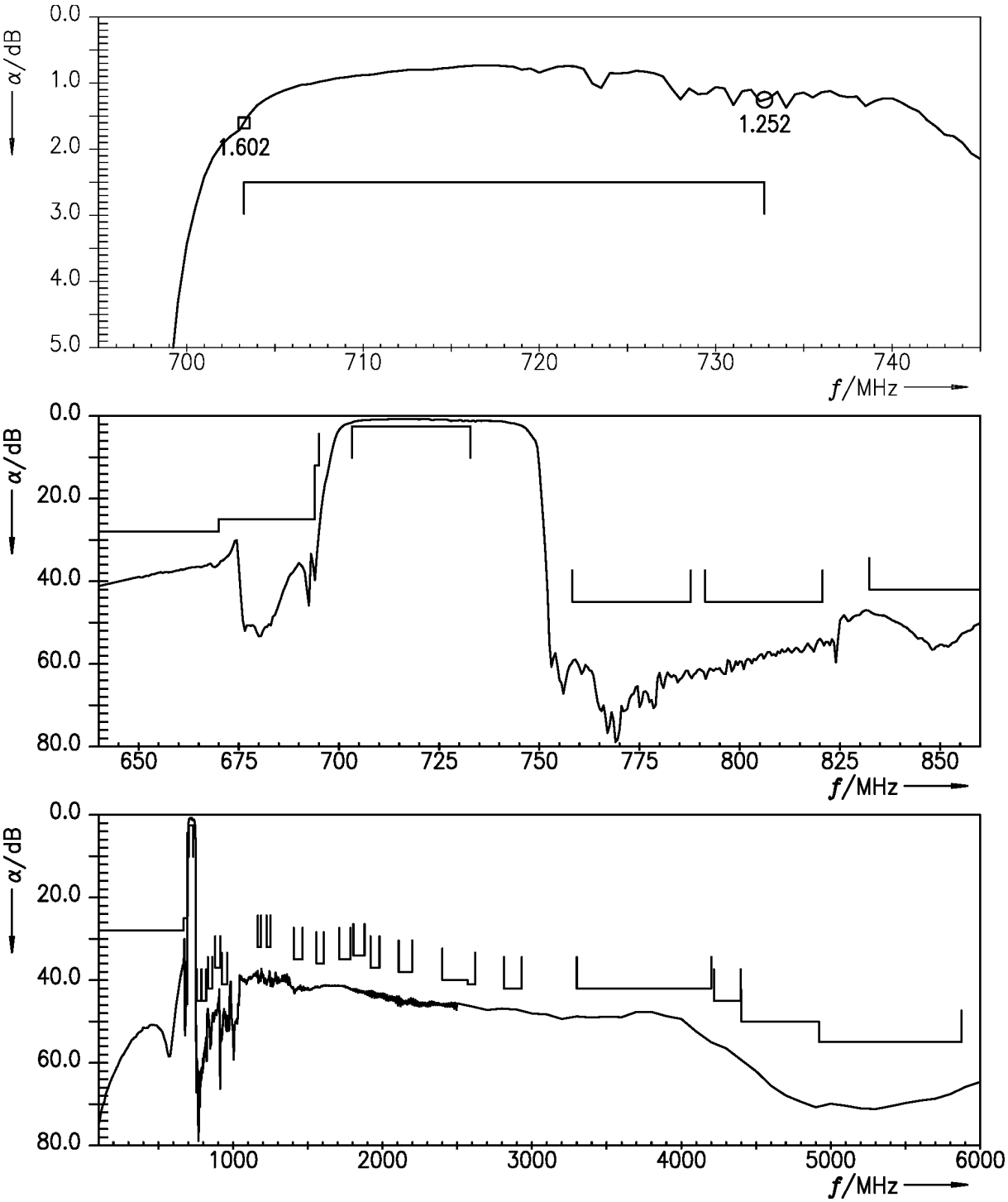

Figure 13: Attenuation TX – ANT.

20 Reflection coefficients EN-DC 4G/5G n28a

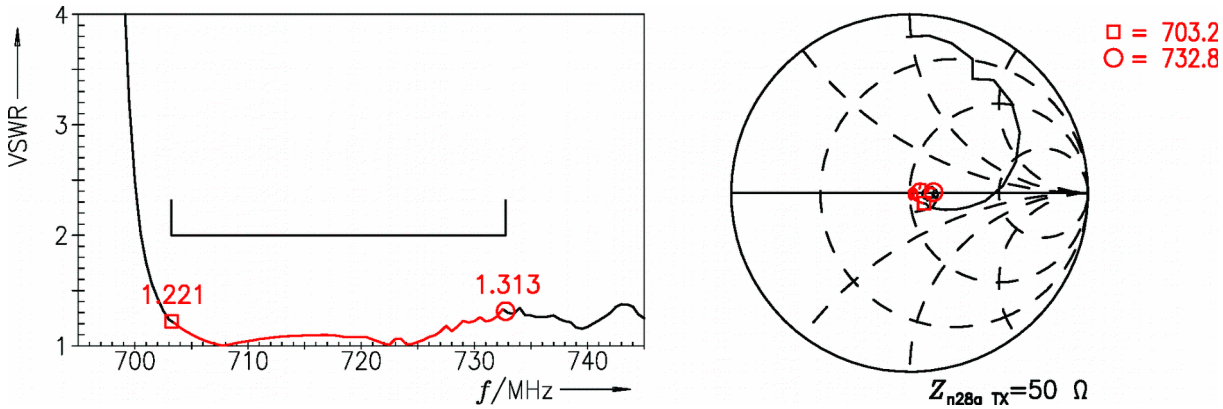

Figure 14: Reflection coefficient at n28a TX port.

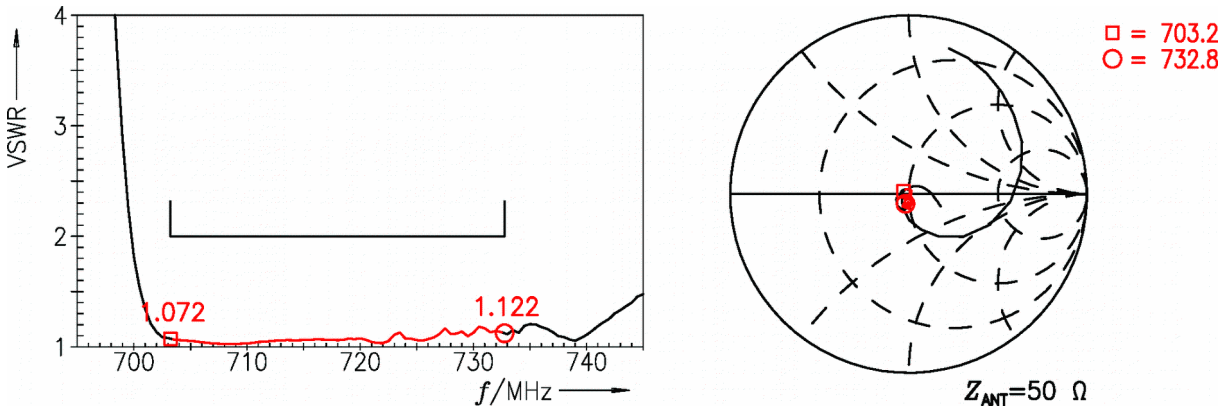

Figure 15: Reflection coefficient at ANT port.

21 Transmission coefficients cross-isolations

21.1 EN-DC 4G/5G n20 TX – EN-DC 4G/5G n8 RX

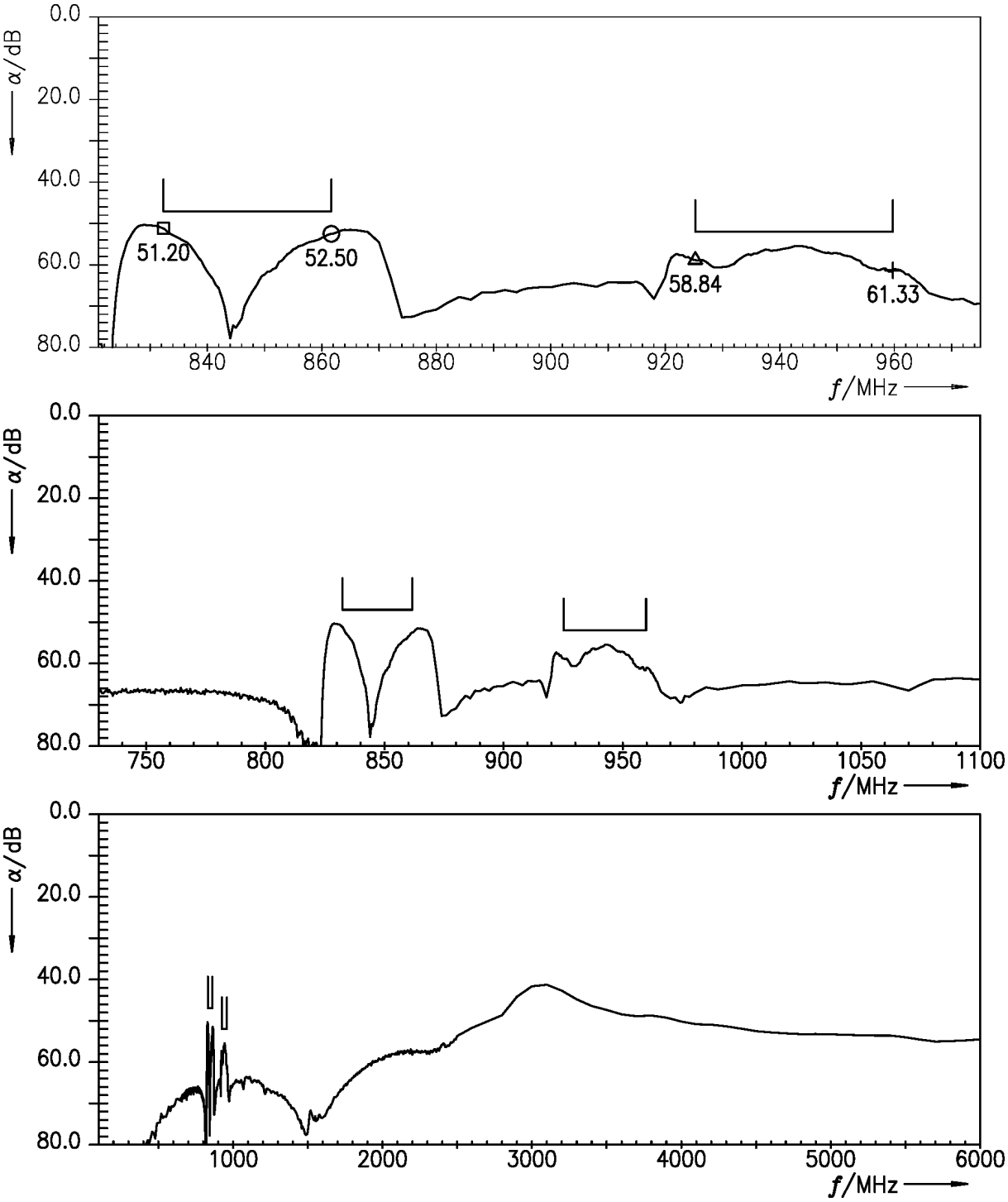

Figure 16: Cross-isolation EN-DC 4G/5G n20 TX – EN-DC 4G/5G n8 RX.

21.2 EN-DC 4G/5G n20 TX – EN-DC 4G/5G n20+28a RX

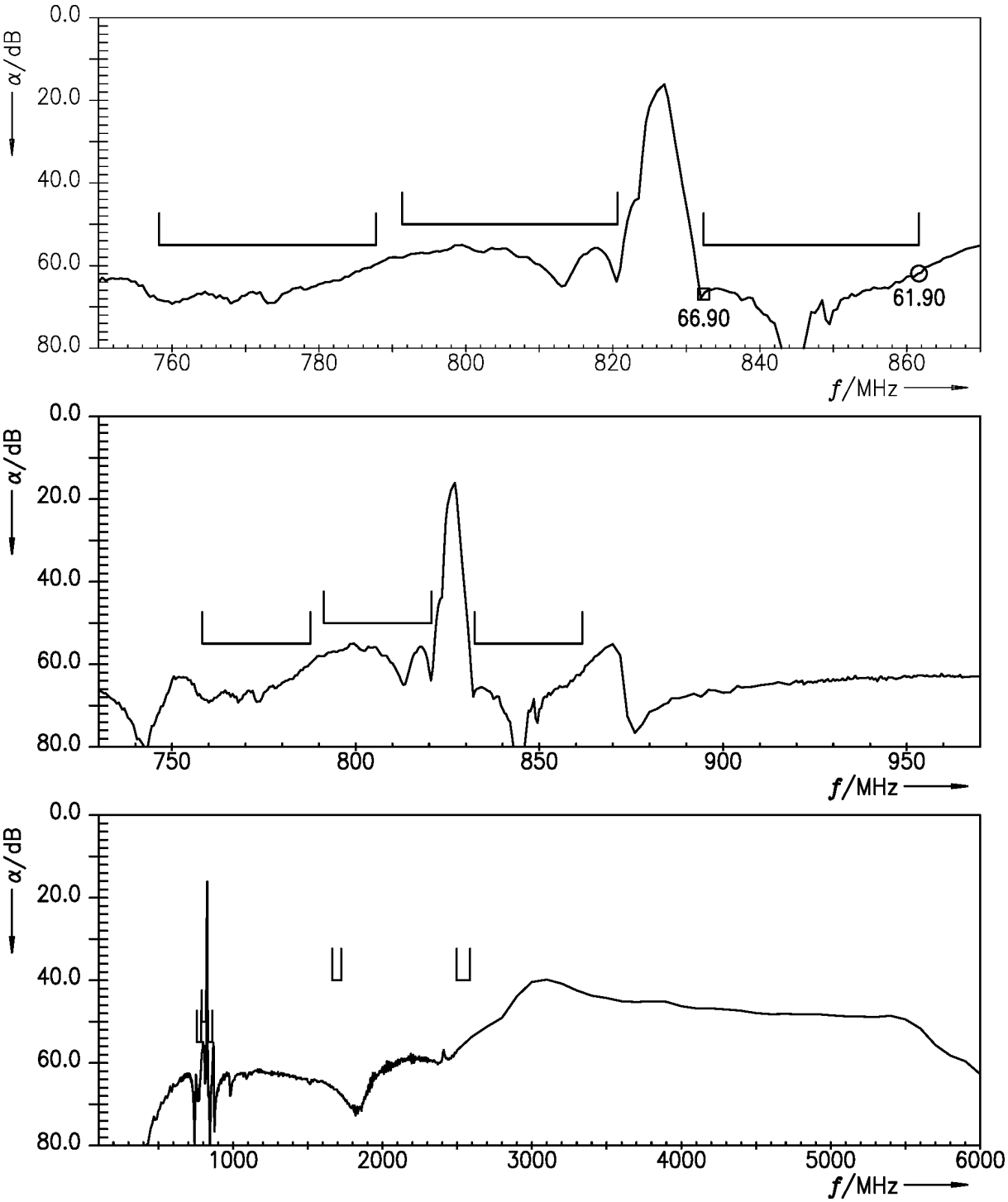

Figure 17: Cross-isolation EN-DC 4G/5G n20 TX – EN-DC 4G/5G n20+28a RX.

21.3 EN-DC 4G/5G n28a TX – EN-DC 4G/5G n8 RX

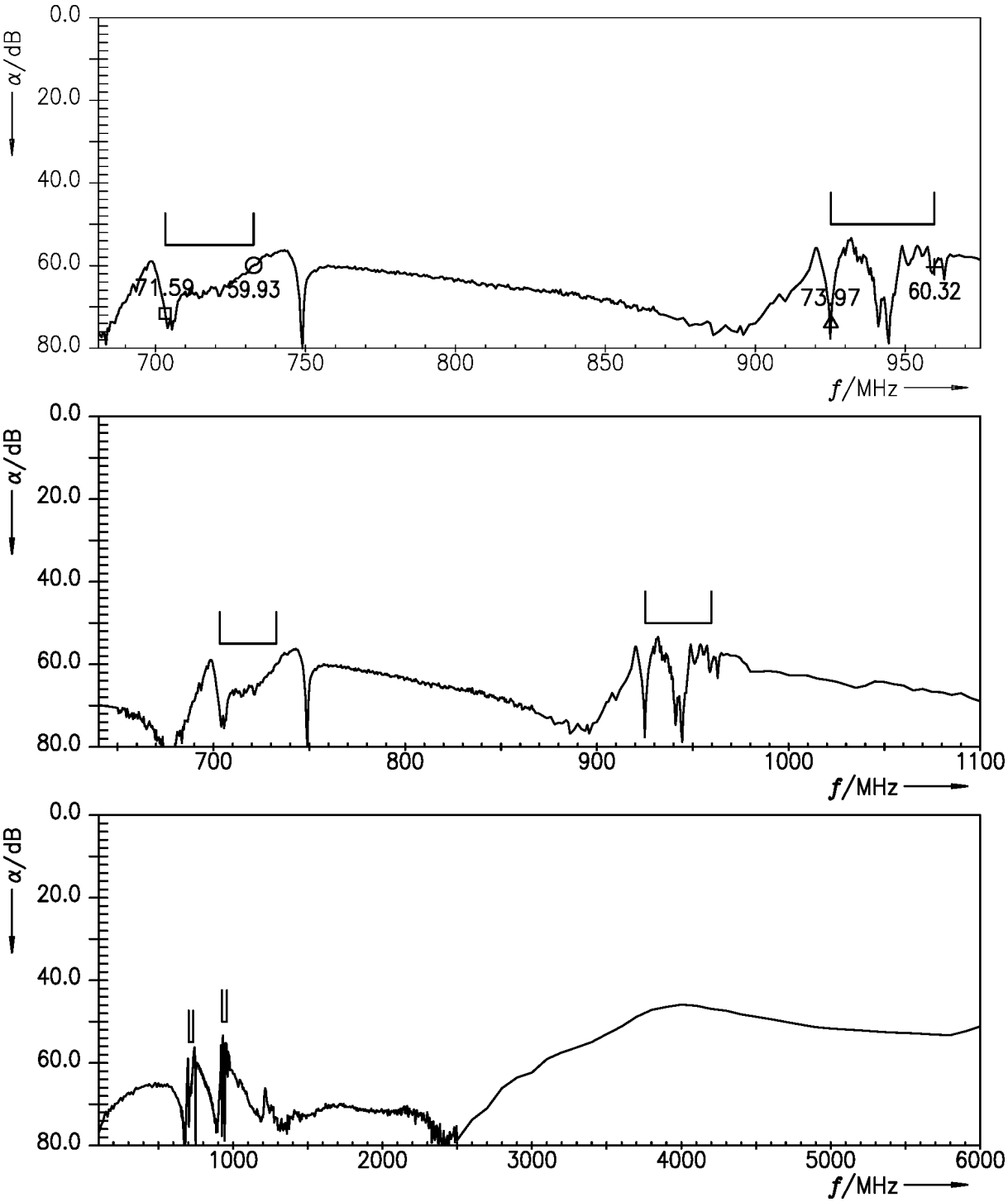

Figure 18: Cross-isolation EN-DC 4G/5G n28a TX – EN-DC 4G/5G n8 RX.

21.4 EN-DC 4G/5G n28a TX – EN-DC 4G/5G n20+28a RX

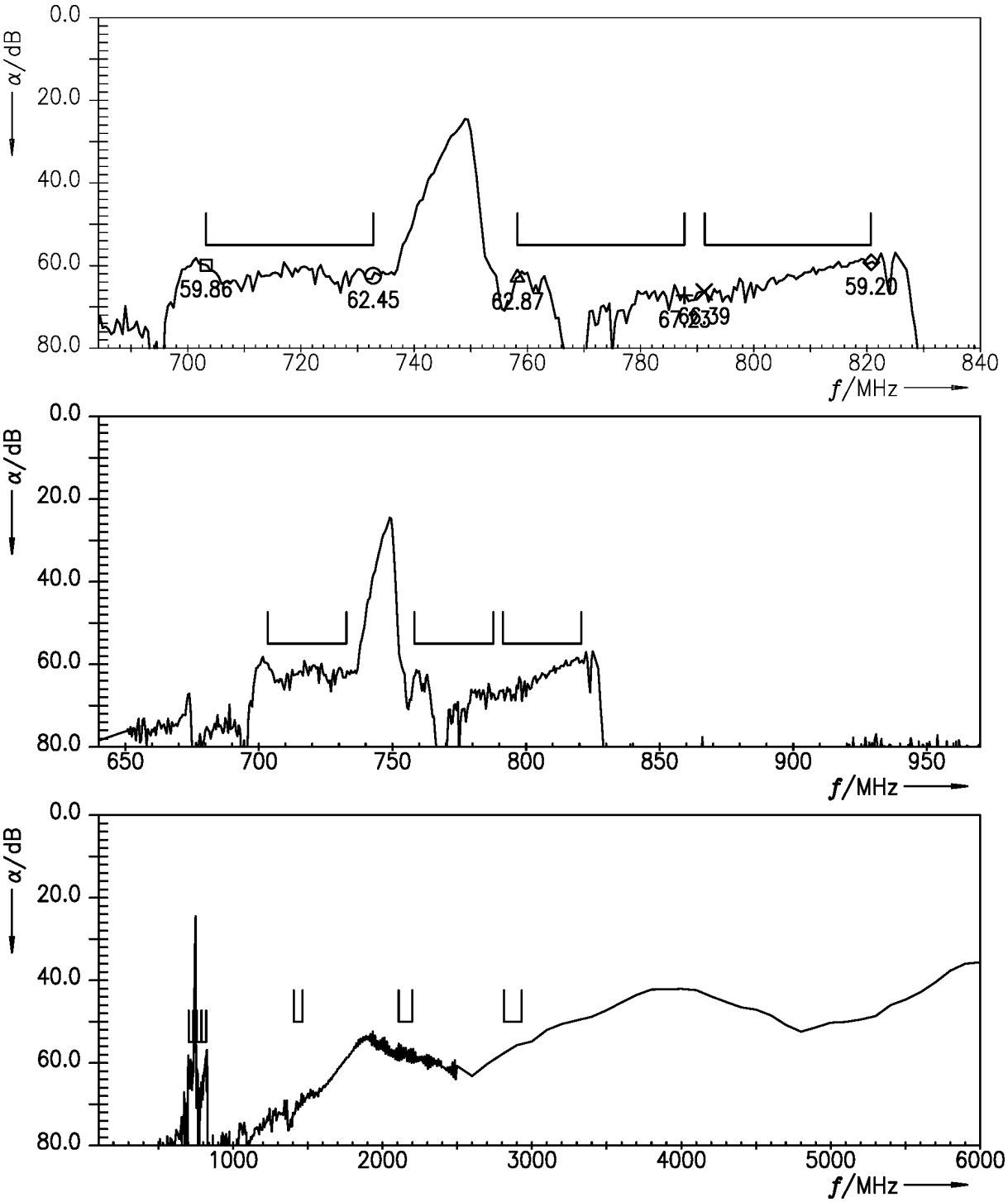

Figure 19: Cross-isolation EN-DC 4G/5G n28a TX – EN-DC 4G/5G n20+28a RX.

22 Transmission coefficients (LTE) cross-isolations

22.1 EN-DC 4G/5G n20 TX – EN-DC 4G/5G n20+28a RX

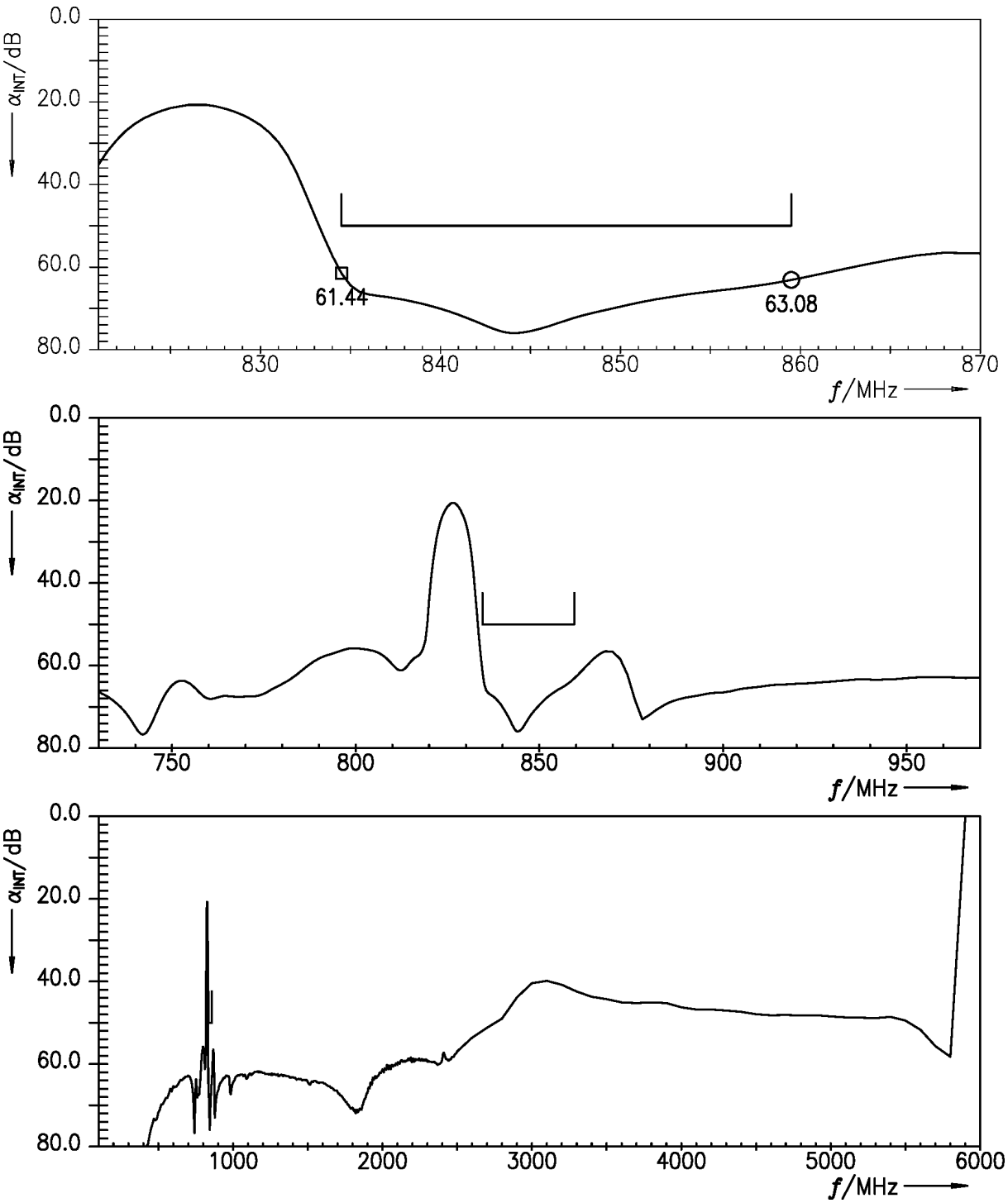

Figure 20: Cross-isolation (LTE) (integration window = 5 MHz) EN-DC 4G/5G n20 TX – EN-DC 4G/5G n20+28a RX.

22.2 EN-DC 4G/5G n28a TX – EN-DC 4G/5G n8 RX

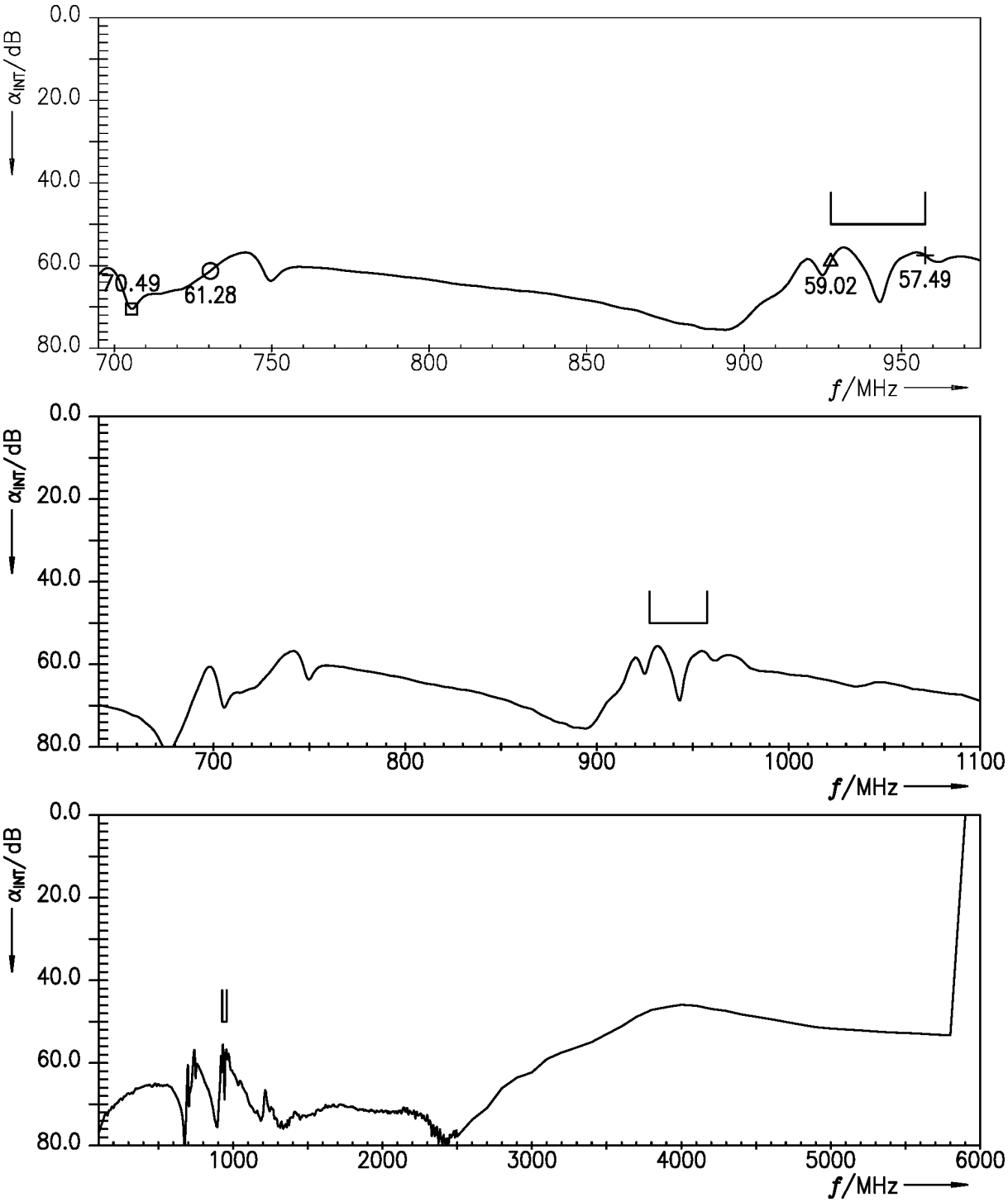

Figure 21: Cross-isolation (LTE) (integration window = 5 MHz) EN-DC 4G/5G n28a TX – EN-DC 4G/5G n8 RX.

22.3 EN-DC 4G/5G n28a TX – EN-DC 4G/5G n20+28a RX

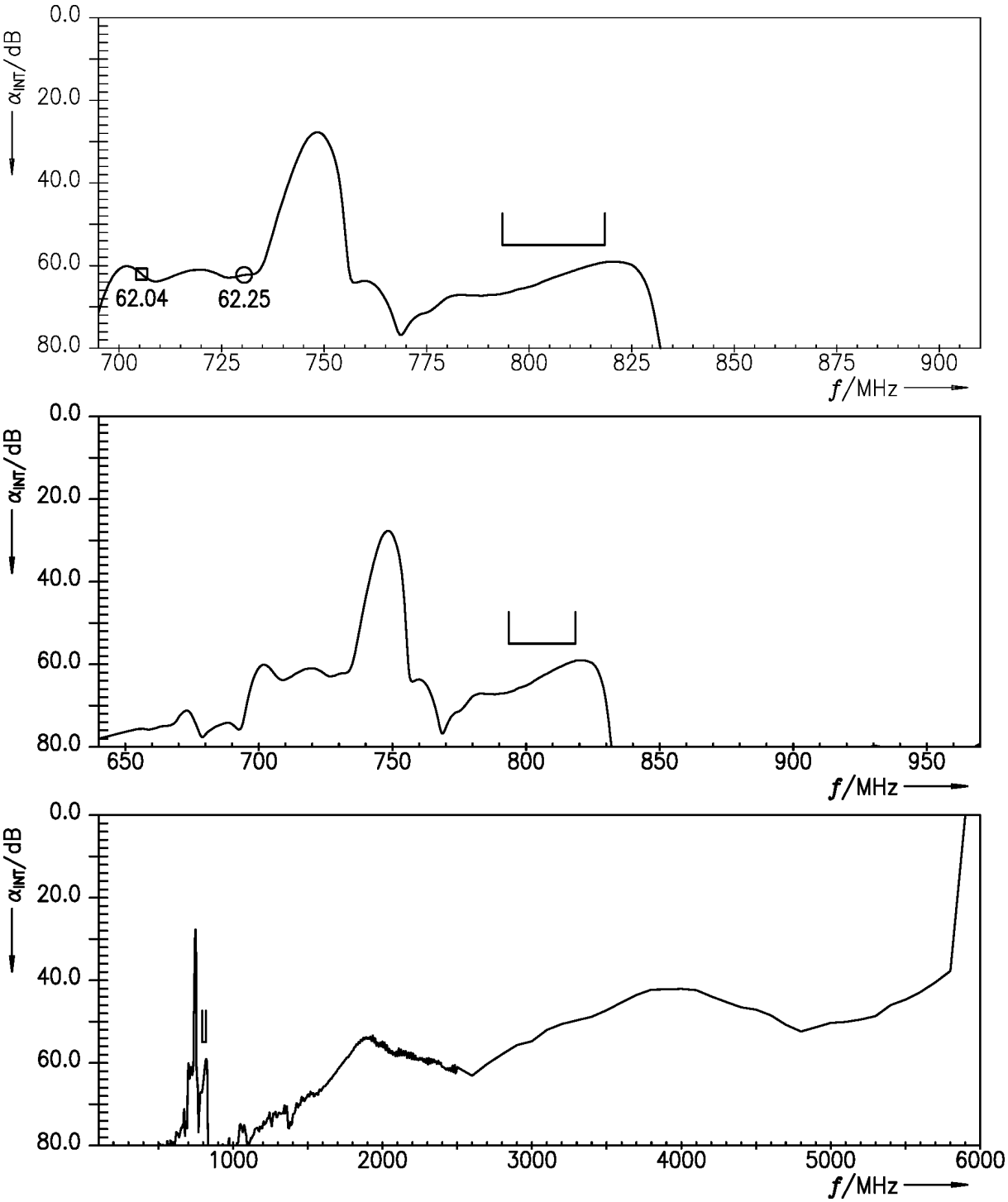

Figure 22: Cross-isolation (LTE) (integration window = 5 MHz) EN-DC 4G/5G n28a TX – EN-DC 4G/5G n20+28a RX.

23 Packing material

23.1 Tape

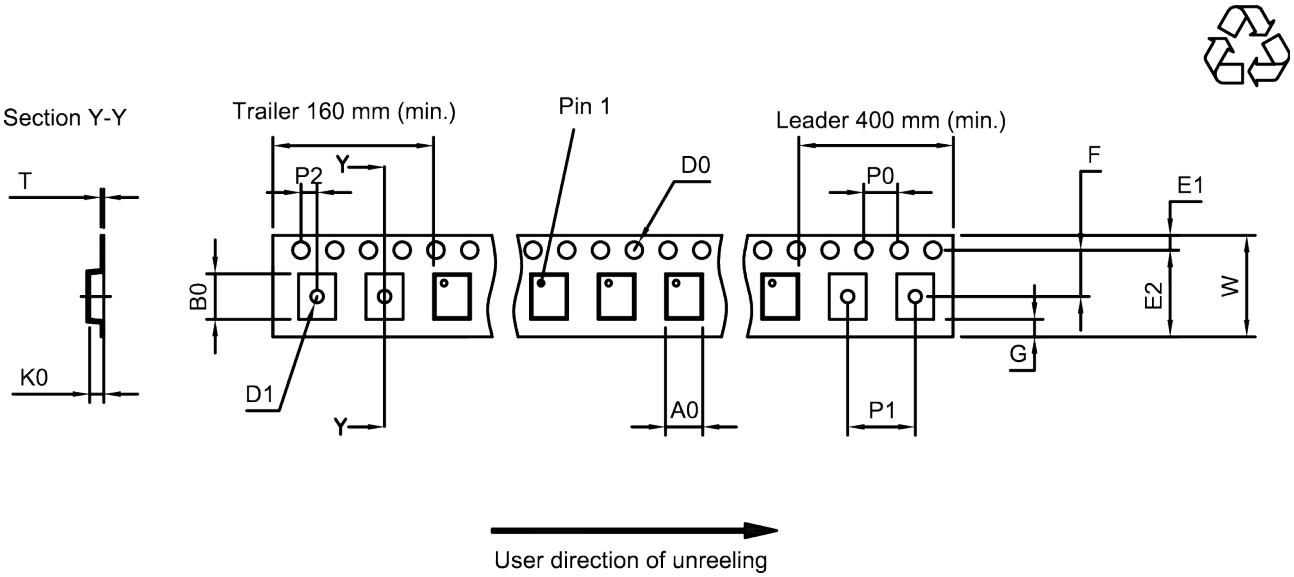

Figure 23: Drawing of tape (first-angle projection) for illustration only and not to scale. The valid tape dimensions are listed in Table 1.

A_0	2.25±0.05 mm
B_0	3.25±0.05 mm
D_0	1.5+0.1/−0 mm
D_1	1.5 mm (min.)
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	0.7±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±0.03 mm
W	8.0+0.3/−0.1 mm

Table 1: Tape dimensions.

23.2 Reel with diameter of 180 mm

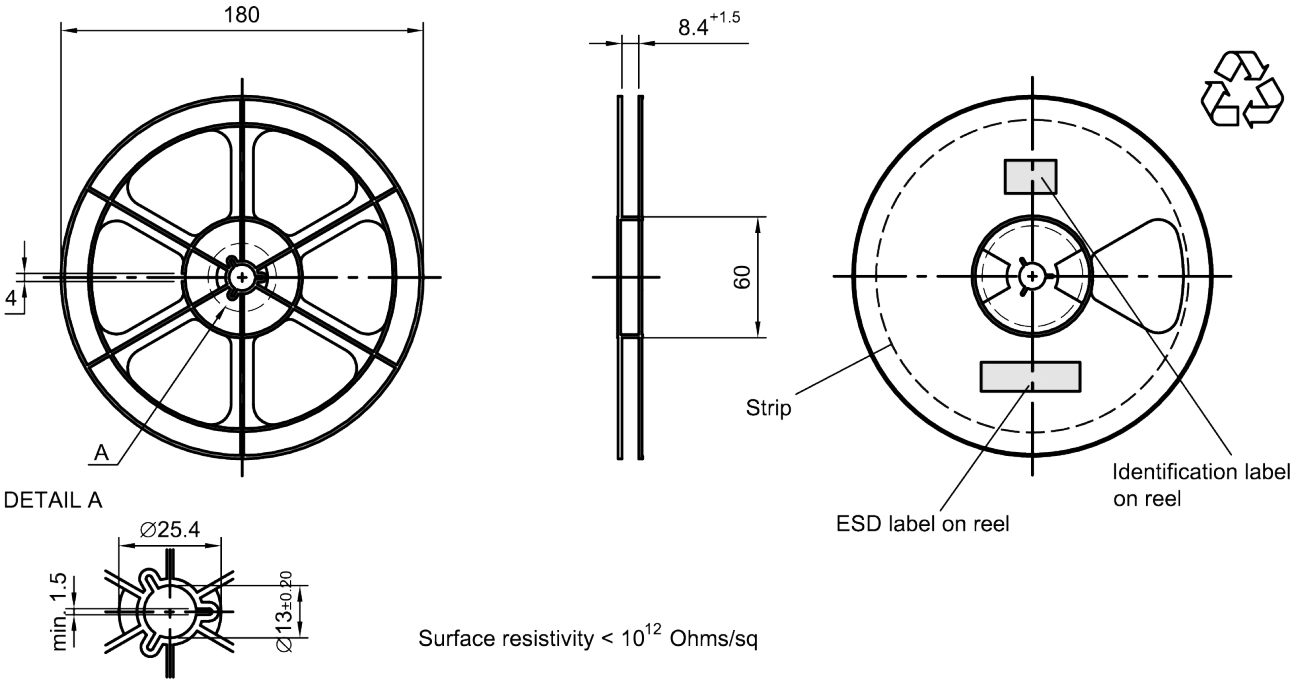

Figure 24: Drawing of reel (first-angle projection) with diameter of 180 mm.

Dimensions [mm]
X = 220+5
Y = 235+5
Sealing area 10±3

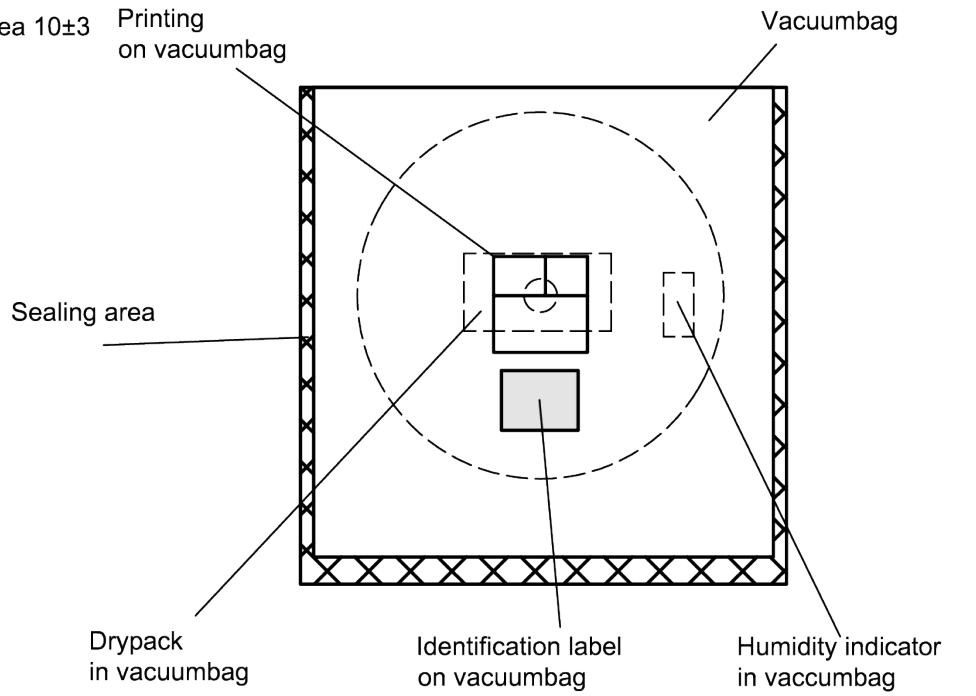

Figure 25: Drawing of moisture barrier bag (MBB) for reel with diameter of 180 mm.

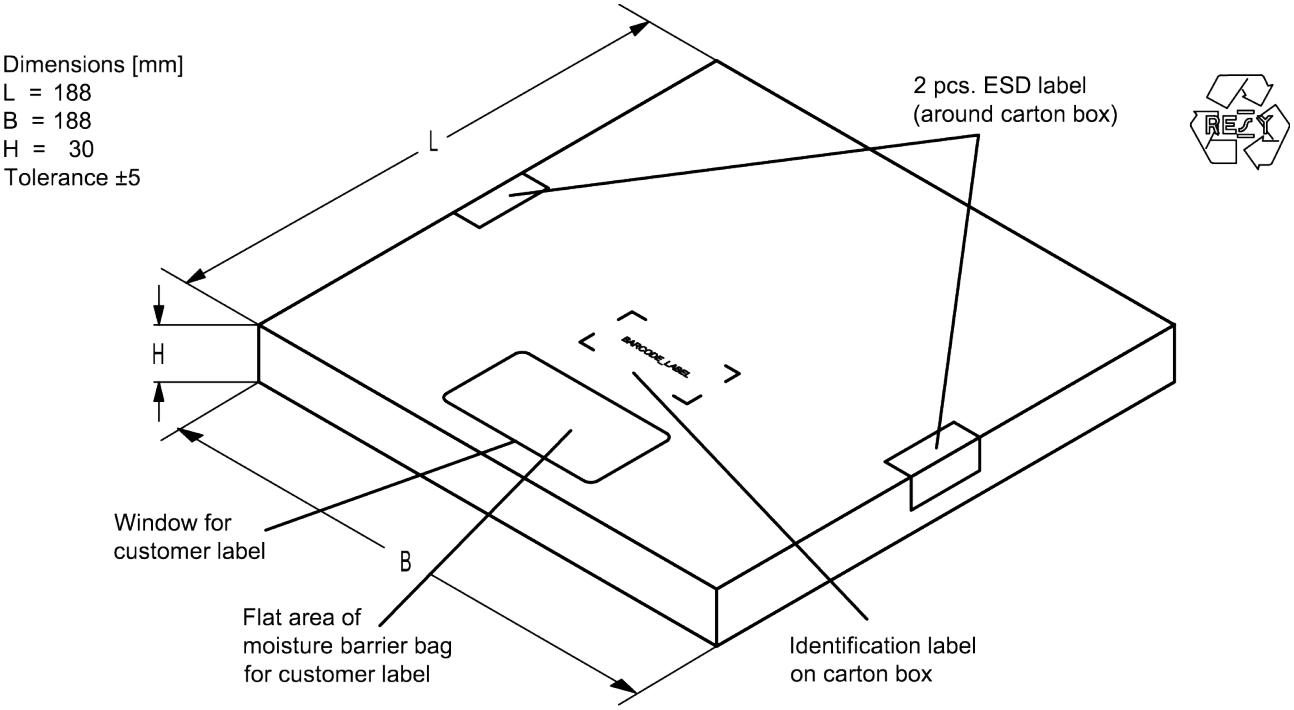

Figure 26: Drawing of folding box for reel with diameter of 180 mm.

23.3 Reel with diameter of 330 mm

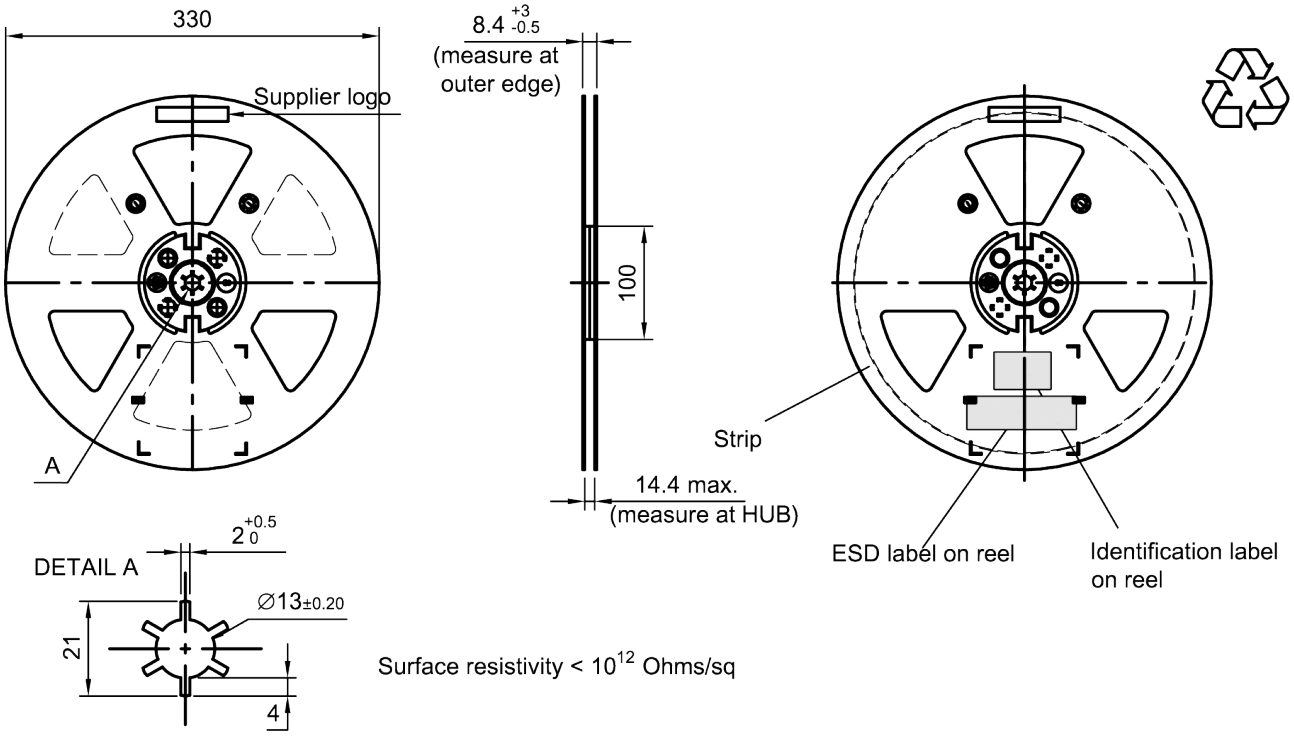

Figure 27: Drawing of reel (first-angle projection) with diameter of 330 mm.

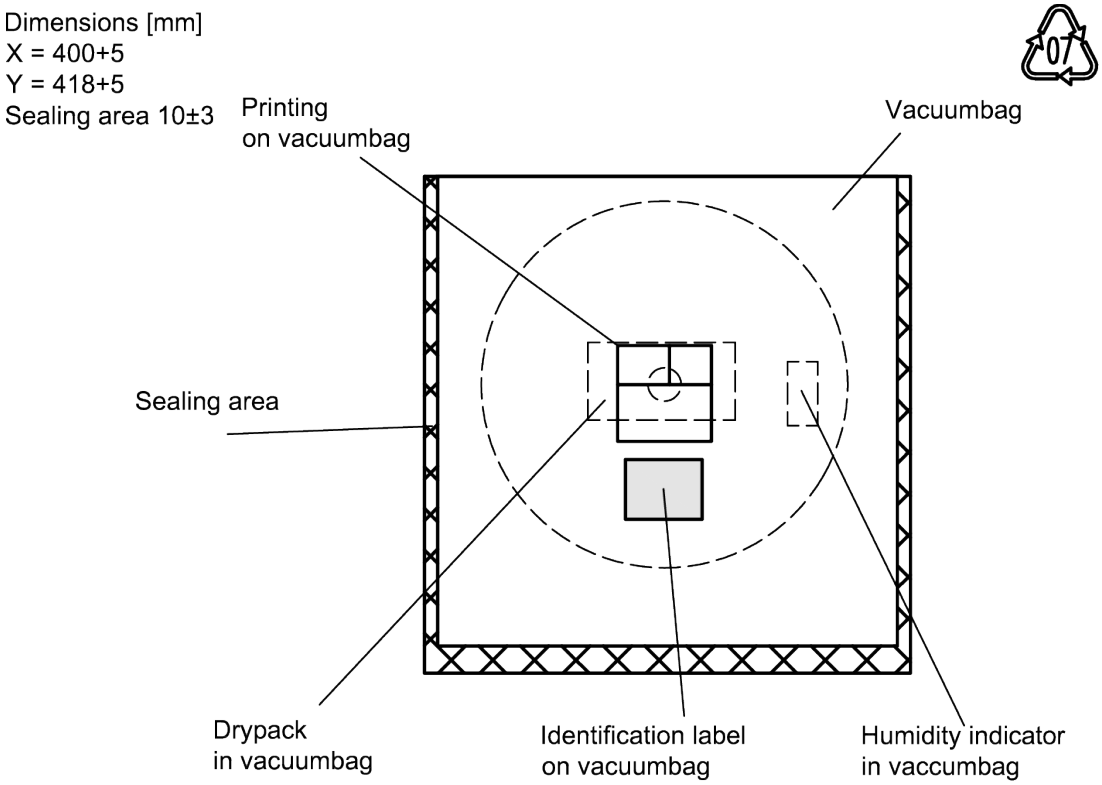

Figure 28: Drawing of moisture barrier bag (MBB) for reel with diameter of 330 mm.

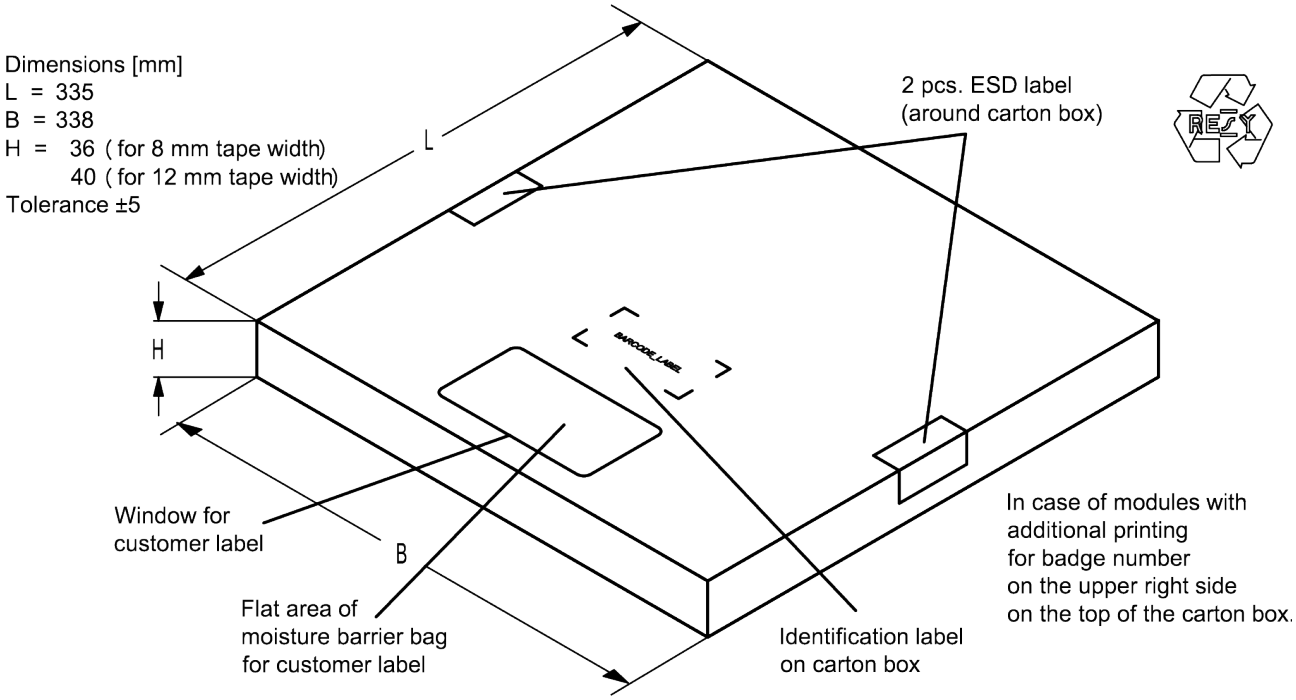

Figure 29: Drawing of folding box for reel with diameter of 330 mm.

24 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 B8943 is 8QF.

- 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.

25 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 ≥ 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).

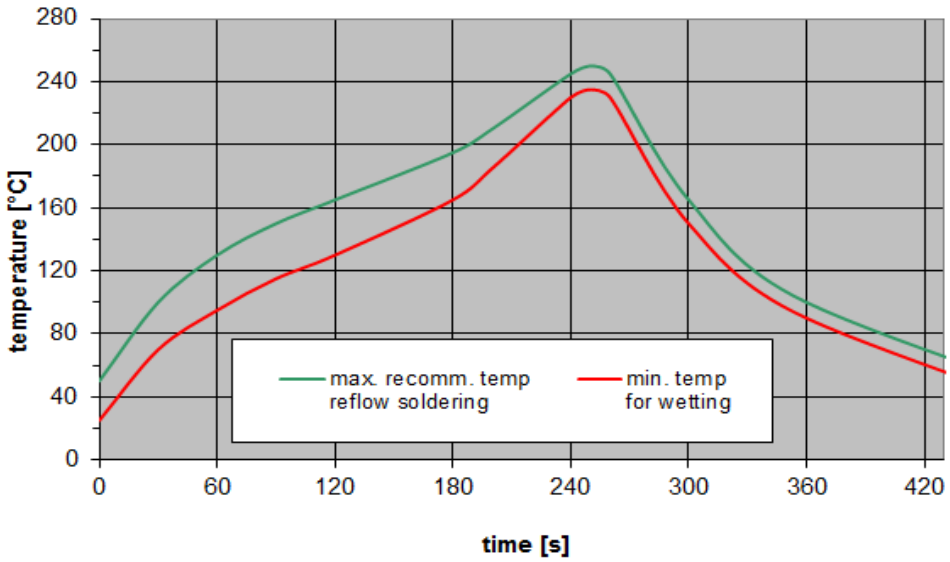

Figure 30: Recommended reflow profile for convection and infrared soldering – lead-free solder.

26 Annotations

26.1 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.

26.2 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.

26.3 Ordering codes and packing units

Ordering code	Packing unit
B39941B8943L210	15000 pcs
B39941B8943L210S 5	5000 pcs

Table 4: Ordering codes and packing units.

27 Cautions and warnings

27.1 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 https://rffe.qualcomm.com/.

27.2 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.

27.3 Moldability

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

27.4 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.

28 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 (https://rffe.qualcomm.com). Should you have any more detailed questions, please contact our sales offices.
5. We constantly strive to improve our products. Consequently, **the products described in this publication may change from time to time**. The same is true of the corresponding product specifications. Please check therefore to what extent product descriptions and specifications contained in this publication are still applicable before or when you place an order. We also **reserve the right to discontinue production and delivery of products**. Consequently, we cannot guarantee that all products named in this publication will always be available.
   The aforementioned does not apply in the case of individual agreements deviating from the foregoing for customer-specific products.

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