SAW Components

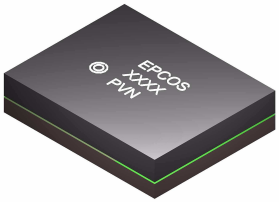
SAW Duplexer

LTE Band 2 / CDMA BC1

Series/type:	**B8522**
Ordering code:	**B39202B8522P810**
Date:	January 07, 2015
Version:	2.1

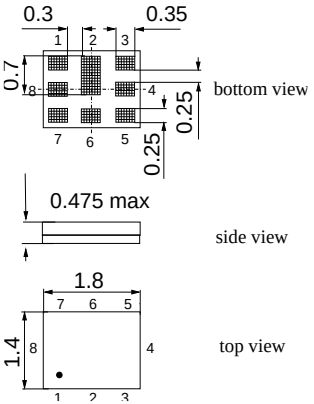
Application

- Low-loss SAW duplexer for mobile telephone LTE Band 2 and CDMA BC1 systems
- Low insertion attenuation
- Low amplitude ripple
- Usable passband 60 MHz



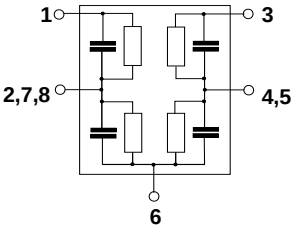
Features

- Package size 1.8 x 1.4 mm², max. height 0.475 mm
- RoHS compatible
- Approx. weight 0.0035g
- Package for **S**urface **M**ount **T**echnology (**SMT**)
- Ni, gold-plated terminals
- Fully matched by integrated matching network except for RX port matching
- **E**lectrostatic **S**ensitive **D**evice (**ESD**)
- **M**oisture **S**ensitivity **L**evel 3



Pin configuration

3	TX input
1	RX output
6	Antenna
2, 4, 5, 7, 8	To be grounded



Data sheet SMD

Characteristics

Temperature range for specification: T = –20 ˚C to +90 ˚C

TX terminating impedance: Z_{TX} = 50 Ω
ANT terminating impedance: Z_{ANT} = 50 Ω
RX terminating impedance: Z_{RX} = 50 Ω + 2.2nH

		B8522			
Characteristics TX - ANT[1)]		**min.**	**typ. @ 25˚C**	**max.**	
Center frequency	f_C	—	1880	—	MHz
Maximum insertion attenuation	α_{max}				
1850.24 ... 1909.76 MHz	α_{LTE}	—	2.0	2.9	dB
1851.25 ... 1908.75 MHz	α_{CDMA}	—	1.9	2.7[2)]	dB
@$f_{Carrier}$ 1852.40 ... 1907.60 MHz	α_{WCDMA}[3)]	—	1.8	2.4[4)]	dB
Error Vector Magnitude	EVM [5)]				
@$f_{Carrier}$ 1852.40 ... 1907.60 MHz		—	0.9	3.0	%
@$f_{Carrier}$ 1852.40 ... 1907.60 MHz		—	0.9	2.5[6)]	%
Input VSWR (TX port)					
1850.24 ... 1909.76 MHz		—	1.5	2.0	
Output VSWR (ANT port)					
1850.24 ... 1909.76 MHz		—	1.5	2.0	
Attenuation	α				
10.0 ... 894.0 MHz		37	40	—	dB
1565.4 ... 1605.9 MHz		45	50	—	dB
1605.9 ... 1680.0 MHz		30	49	—	dB
1930.24 ...1989.76 MHz		44	51	—	dB
2010.0 ... 2025.0 MHz		20	45	—	dB
2110.0 ... 2155.0 MHz		44	48	—	dB
2400.0 ... 2500.0 MHz		25	32	—	dB
3690.0 ... 3830.0 MHz		21	26	—	dB
5150.0 ... 5850.0 MHz		18	23	—	dB

1) Specified min./max. values are valid for a testing power of +10 dBm.
2) Valid for extended temperature range from -30 ˚C to +90 ˚C
3) Attenuation of WCDMA signal (“Powertransferfunction”). Please refer to annotation on page (6).
4) Valid for reduced temperature range from -20 ˚C to +85 ˚C
5) Error Vector Magnitude (EVM) based on definition given in 3GPP TS 25.141.
6) Valid for room temperature 25 ˚C

Characteristics

Temperature range for specification: T = –20 ˚C to +90 ˚C

TX terminating impedance: Z_{TX} = 50 Ω
ANT terminating impedance: Z_{ANT} = 50 Ω
RX terminating impedance: Z_{RX} = 50 Ω + 2.2nH

		B8522			
Characteristics ANT - RX[1)]		**min.**	**typ. @ 25˚C**	**max.**	
Center frequency	f_C	—	1960	—	MHz
Maximum insertion attenuation	α_{max}				
1930.24 ... 1989.76MHz	α_{LTE}	—	2.3	3.4	dB
1931.25 ... 1988.75MHz	α_{CDMA}	—	2.2	3.2[2)]	dB
@$f_{Carrier}$ 1932.40 ... 1987.60MHz	α_{WCDMA}[3)]	—	2.1	2.9[4)]	dB
Input VSWR (ANT port)					
1930.24 ... 1989.76 MHz		—	1.5	2.0	
Output VSWR (RX port)					
1930.24 ... 1989.76 MHz		—	1.4	2.0	
Attenuation	α				
1.0 ... 700.0 MHz		40	43	—	dB
80.0 MHz		50	58	—	dB
700.0 ... 1850.0 MHz		34	37	—	dB
1850.24 ...1909.76 MHz		45	53	—	dB
2050.0 ... 2075.0 MHz		25	38	—	dB
2075.0 ... 2400.0 MHz		27	32	—	dB
2400.0 ... 2550.0 MHz		25	29	—	dB
2550.0 ... 3000.0 MHz		33	38	—	dB
3000.0 ... 6000.0 MHz		40	46	—	dB

1) Specified min./max. values are valid for a testing power of +10 dBm.
2) Valid for extended temperature range from -30 ˚C to +90 ˚C
3) Attenuation of WCDMA signal (“Powertransferfunction”). Please refer to annotation on page (6).
4) Valid for reduced temperature range from -20 ˚C to +85 ˚C

Characteristics

Temperature range for specification: T = –20 ˚C to +90 ˚C

TX terminating impedance: Z_{TX} = 50 Ω
ANT terminating impedance: Z_{ANT}= 50 Ω
RX terminating impedance: Z_{RX} = 50 Ω + 2.2nH

	B8522			
Characteristics TX - RX[1)]	**min.**	**typ. @ 25 ˚C**	**max.**	
Isolation				
1574.00 ... 1577.00 MHz	40	60	—	dB
1850.24 ... 1909.76 MHz	53	56	—	dB
1930.24 ... 1989.76 MHz	50	54	—	dB
3700.00 ... 3820.00 MHz	20	58	—	dB
5550.00 ... 5850.00 MHz	20	53	—	dB

1) Specified min./max. values are valid for a testing power of +10 dBm.

	B8522			
Linearity	**min.**	**typ. @ 25 ˚C**	**max.**	
Triple beat test[1)]	—	70	—	dB
IMD product levels[2)]				
IMD2, Blocker 1 80.0 MHz	—	105	—	dBm
IMD2, Blocker 2 3780.0 ... 3900.0 MHz	—	115	—	dBm
IMD3, Blocker 3 1770.0 ... 1830.0 MHz	—	107	—	dBm
IMD3, Blocker 4 5630.0 ... 5810.0MHz	—	120	—	dBm

1) Blocker1 - Tx + Blocker2 @ CW input powers at Ant.-port, Setup1/2/3: Tx: 1855/1880/1911 MHz @ +21.5 dBm, Blocker1: 1856/1881/1911 MHz @ +21.5 dBm, Blocker2: 1935/1960/1990 MHz @ -27 dBm, TB Product: 1934&1936/1959&1961/1989&1991 MHz

2) @ f_{TX}=[1850 ... 1910 MHz], f_{RX}=[1930 ... 1990MHz], f_{RX} - f_{TX}=80MHz**,** IMD product levels for power levels P_{TX}=21dBm (antenna port output power) and $P_{Blocker}$=-15dBm (antenna port input power)

Maximum ratings

Operable temperature range	T	–30/+90	˚C	
Storage temperature range	T_{stg}	–40/+90	˚C	
DC voltage	V_{DC}	0	V	
ESD voltage	V_{ESD}	300[1)]	V	human body model, 1 pulse
	V_{ESD}	600[2)]	V	charged device model, 3 pulses
Input power at	P_{IN}			source and load impedance 50 Ω
1850.24 ... 1909.76 MHz		28	dBm	} continuous wave
elsewhere		10	dBm	T = 50˚C, >5.000 h

1) acc. to JESD22-A114F (human body model), 1 negative & 1 positive pulse.

2) acc. to JESD22-C101C (charged device model), 3 negative & 3 positive pulses.

Annotation for characteristics section

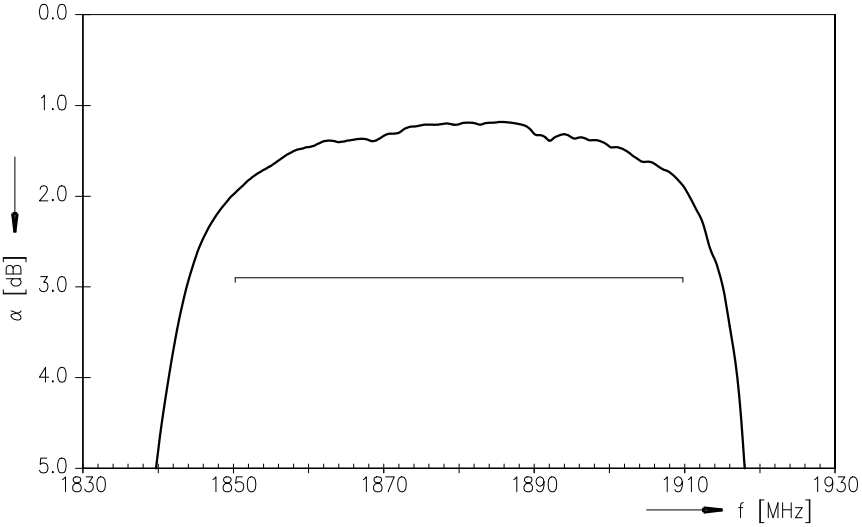
Attenuation of WCDMA signal (“Powertransferfunction”, α_{WCDMA}) is determined by

$$\int_{\infty}^{\infty} \left| S_{ds21}(f) H_{RRC}(f - f_{Carrier}) \right|^2 df$$

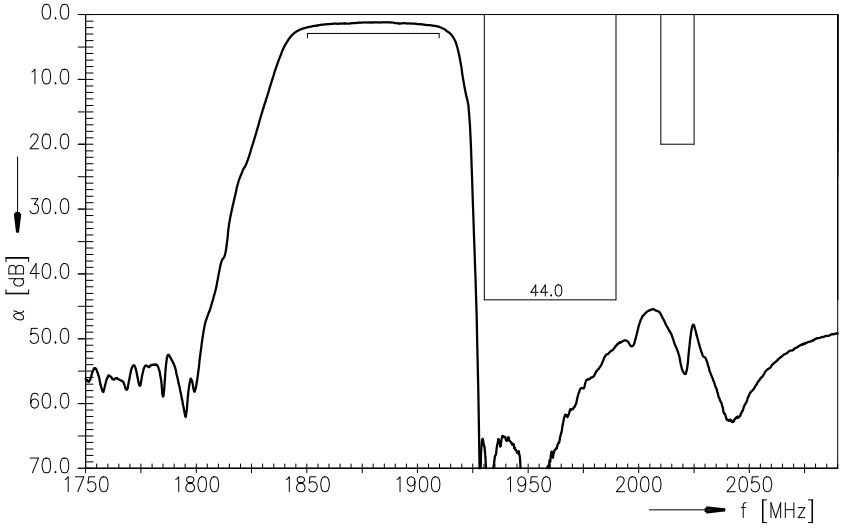
$f_{Carrier}$ according to 3GPP TS 25.101 (e.g. for WCDMA Band 2 Passband, $f_{Carrier}$ ranges from 1852.4 MHz (lowest Tx channel) to 1907.6 MHz (highest Tx channel)). $H_{RRC}(f)$ is the transfer function of the root-raised cosine transmit pulse shaping filter according to 3GPP TS 25.101 with the following normalization:

$$\int_{\infty}^{\infty} \left| H_{RRC}(f) \right|^2 df = 1$$

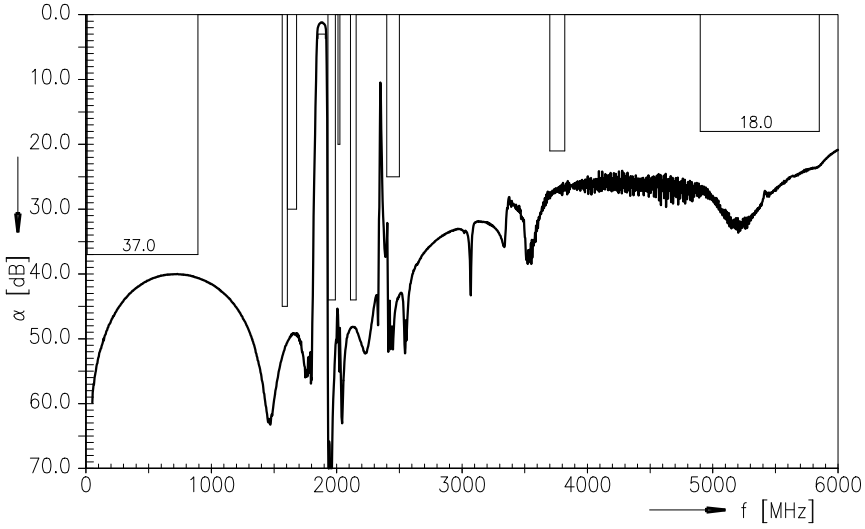
Frequency response TX - ANT (passband, LTE specification)



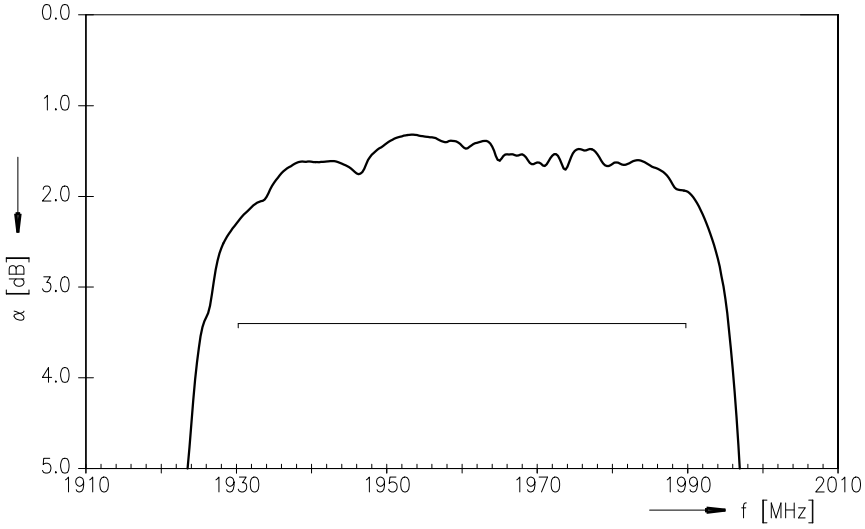
Frequency response TX - ANT



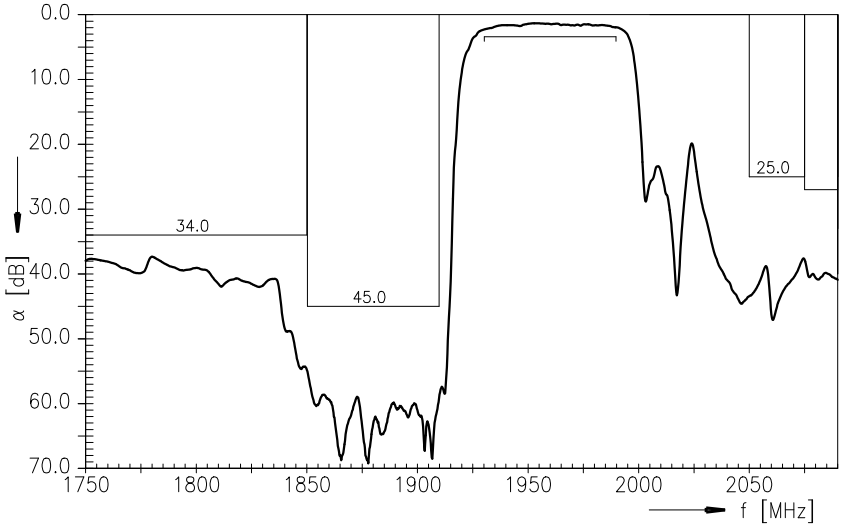
Frequency response TX - ANT (wideband)



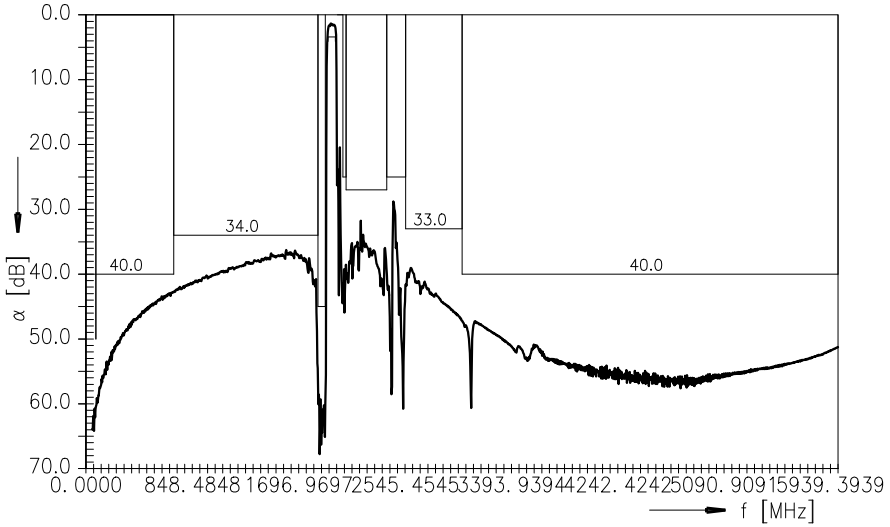
Frequency response ANT - RX (passband, LTE specification)



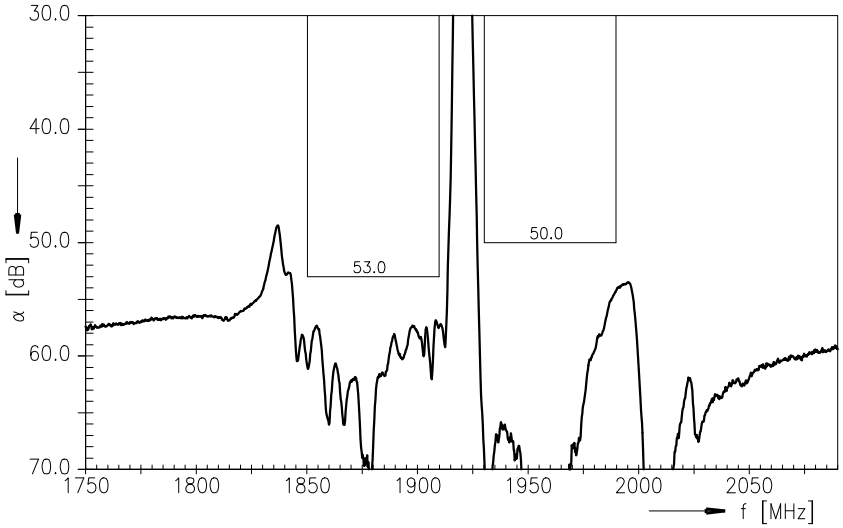
Frequency response ANT - RX



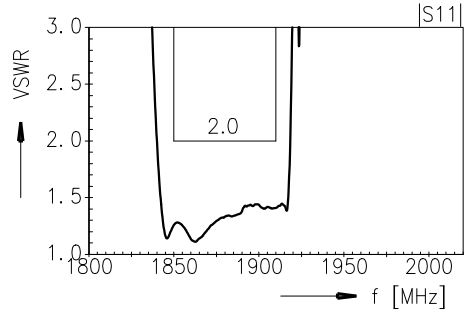
Frequency response ANT - RX (wideband)

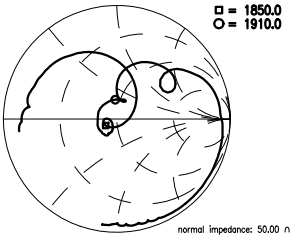


Frequency response TX - RX isolation

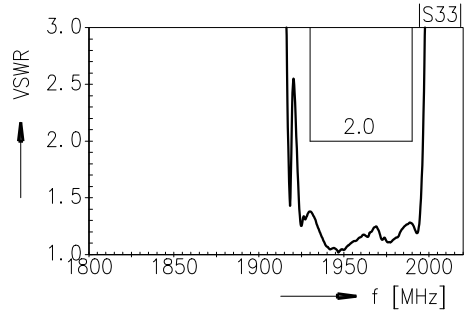


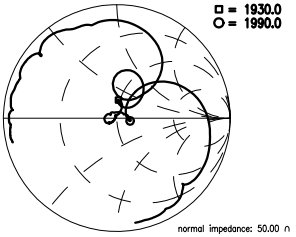
VSWR S_{11} TX-port



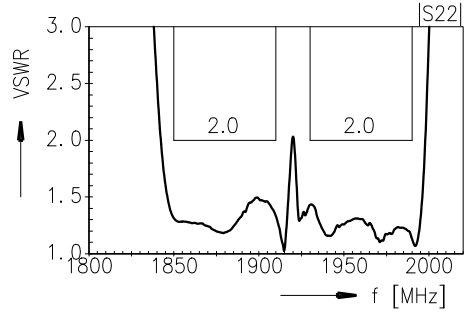


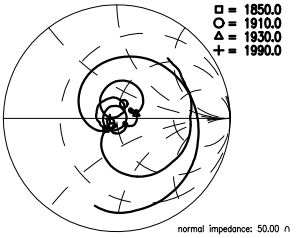
VSWR S_{33} RX-port





VSWR S_{22} ANT-port





References

Type	B8522
Ordering Code	B39202-B8522-P810
Marking and package	C61157-A8-A87
Packaging	F61074-V8259-Z000
Date codes	L_1126
S-parameters	B8522_NB_UN.s3p (unmatched, narrow band) B8522_WB_UN.s3p (unmatched, wide band) see file header for port/pin assignment table
Soldering profile	S_6001
RoHS compatible	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.
Moldability	Before using in overmolding environment, please contact your EPCOS sales office.
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