SAW Components

SAW Duplexer

LTE / E-UTRA Band 3

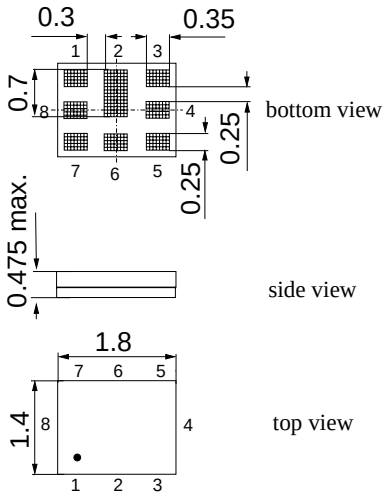
Series/type:	**B8656**
Ordering code:	**B39182B8656P810**
Date:	November 17, 2014
Version:	2.1

Application

- Low-loss SAW duplexer for mobile telephone LTE / E-UTRA Band 3 systems
- Low insertion attenuation
- Low amplitude ripple
- Usable passband 75 MHz
- Single ended to balanced transformation in Antenna - Rx path
- Impedance transformation 50Ω to 100Ω in Antenna - Rx path
- high Tx - Rx isolation
- optimized for envelope tracking

Features

- Package size 1.8 x 1.4 mm²
- Package height 0.475mm max.
- RoHS compatible
- Approximate weight 4.2mg
- Package for **S**urface **M**ount **T**echnology (**SMT**)
- Ni, gold-plated terminals
- **E**lectrostatic **S**ensitive **D**evice (**ESD**)
- **M**oisture **S**ensitive **L**evel 3



Pin configuration

3	Tx input
1, 8	Rx output (balanced)
6	Antenna
2, 4, 5, 7	To be grounded

Characteristics

Temperature range for specification: T = –30 ˚C to +85 ˚C
ANT terminating impedance: Z_{ANT} = 50Ω || 3.3 nH
RX terminating impedance: Z_{RX} = 100 Ω (balanced) +1.5 nH || 16 nH[4)]
TX terminating impedance: Z_{TX} = 50 Ω

Characteristics TX-ANT [1)]		min.	typ. @ 25˚C	max.	
Center frequency	f_C	–	1747.5	–	MHz
Maximum insertion attenuation	α_{max}				
1712.5 ... 1782.5 MHz	α_{LTE} [2)3)]	–	2.0	3.0	dB
1712.5 ... 1782.5 MHz	α_{LTE} [2)]	–	2.0	3.5	dB
Amplitude ripple per 5MHz channel	$\Delta\alpha$				
1710.24 ... 1784.76 MHz		–	0.6	–	dB
Input VSWR (Tx port)					
1710.24 ... 1784.76 MHz	[3)]	–	1.4	2.0	
1710.24 ... 1784.76 MHz		–	1.4	3.2	
Output VSWR (Ant Port)					
1710.24 ... 1784.76 MHz	[3)]	–	1.5	2.0	
1710.24 ... 1784.76 MHz		–	1.5	2.2	
Attenuation	α				
10.0 ... 1565.42 MHz		36	39	–	dB
703.0 ... 748.0 MHz		40	46	–	dB
716.0 ... 756.0 MHz		40	46	–	dB
814.0 ... 849.0 MHz		39	44	–	dB
824.0 ... 849.0 MHz		39	44	–	dB
830.0 ... 845.0 MHz		39	44	–	dB
832.0 ... 862.0 MHz		39	43	–	dB
880.0 ... 915.0 MHz		38	42	–	dB
925.0 ... 960.0 MHz		38	42	–	dB
1226.0 ... 1250.0 MHz		36	39	–	dB
1496.0 ... 1511.0 MHz		40	47	–	dB
1559.0 ... 1563.0 MHz		38	46	–	dB
1565.42 ... 1573.374MHz		37	44	–	dB
1573.374... 1577.466MHz		36	43	–	dB
1577.466... 1585.42 MHz		35	42	–	dB
1597.5515...1605.886MHz		33	39	–	dB
1605.886... 1680.0 MHz		20	34	–	dB
1805.24 ... 1879.76 MHz	[3)]	44	55	–	dB
1805.24 ... 1879.76 MHz		40	55	–	dB
1807.5 ... 1877.5 MHz	α_{LTE} [2)]	44	55	–	dB

Characteristics TX-ANT [1]				min.	typ. @ 25˚C	max.	
1920.0	...	1980.0	MHz	24	32	–	dB
2110.0	...	2170.0	MHz	24	33	–	dB
2400.0	...	2500.0	MHz	26	30	–	dB
2440.0	...	2494.0	MHz	26	30	–	dB
2500.0	...	2570.0	MHz	25	30	–	dB
2620.0	...	2690.0	MHz	24	29	–	dB
3420.0	...	3570.0	MHz	21	24	–	dB
4900.0	...	5950.0	MHz	12	22	–	dB
5100.0	...	5385.0	MHz	12	25	–	dB
5130.0	...	5355.0	MHz	12	25	–	dB
6840.0	...	7140.0	MHz	–	23	–	dB
8550.0	...	8925.0	MHz	–	24	–	dB
10260.0	...	10710.0	MHz	–	27	–	dB
11970.0	...	12495.0	MHz	–	35	–	dB

1) Specified values are valid for a testing power of +10dBm
2) Averaged value of linear s-parameter over 5 MHz
3) Valid in the temperature range from 0˚C to 85˚C
4) Alternative matching 140 Ω (balanced) ||10 nH

Datasheet SMD

Characteristics

Temperature range for specification: T = –30 ˚C to +85 ˚C
ANT terminating impedance: Z_{ANT} = 50 Ω || 3.3 nH
RX terminating impedance: Z_{RX} = 100 Ω (balanced) +1.5 nH || 16 nH[4)]
TX terminating impedance: Z_{TX} = 50 Ω

Characteristics ANT-RX[1)]		**min.**	**typ. @ 25˚C**	**max.**	
Center frequency	f_C	–	1842.5	–	MHz
Maximum insertion attenuation	α_{max}				
1807.5 ... 1877.5 MHz	α_{LTE}[2)3)]	–	2.8	3.5	dB
1807.5 ... 1877.5 MHz	α_{LTE}[2)]	–	2.8	3.8	dB
Amplitude ripple per 5MHz channel	$\Delta\alpha$				
1805.24 ... 1879.76 MHz		–	0.7	–	dB
Common mode rejection ratio					
1805.24 ... 1879.76 MHz		18	23	–	dB
Input VSWR (Ant port)					
1805.24 ... 1879.76 MHz		–	1.7	2.0	
Output VSWR (Rx Port)					
1805.24 ... 1879.76 MHz		–	1.6	2.0	
Attenuation	α				
10.0 ... 1710.0 MHz		40	50	–	dB
95.0 MHz		50	70	–	dB
718.0 ... 748.0 MHz		40	70	–	dB
814.0 ... 849.0 MHz		40	70	–	dB
832.0 ... 862.0 MHz		40	70	–	dB
880.0 ... 915.0 MHz		40	68	–	dB
1447.0 ... 1463.0 MHz		40	52	–	dB
1615.0 ... 1690.0 MHz		40	50	–	dB
1710.24 ... 1784.76 MHz		45	53	–	dB
1712.5 ... 1782.5 MHz	α_{LTE}[2)]	45	53	–	dB
1785.0 ... 1790.0 MHz		10	55	–	dB
1920.0 ... 2000.0 MHz		32	46	–	dB
2000.0 ... 2400.0 MHz		38	44	–	dB
2400.0 ... 2500.0 MHz		40	50	–	dB
2500.0 ... 2570.0 MHz		40	49	–	dB
2570.0 ... 3515.0 MHz		40	45	–	dB
3515.0 ... 3760.0 MHz		40	46	–	dB
3760.0 ... 6000.0 MHz		36	44	–	dB

Characteristics ANT-RX[1]			min.	typ. @ 25˚C	max.	
4900.0	... 5950.0	MHz	36	44	–	dB
5205.0	... 5660.0	MHz	36	45	–	dB
6000.0	... 13025.0	MHz	–	39	–	dB
7220.0	... 7520.0	MHz	–	47	–	dB
9025.0	... 9400.0	MHz	–	39	–	dB
10830.0	... 11280.0	MHz	–	43	–	dB
12635.0	... 13160.0	MHz	–	47	–	dB

1) Specified values are valid for a testing power of +10dBm
2) Averaged value of linear s-parameter over 5 MHz
3) Valid in the temperature range from 0˚C to 85˚C
4) Alternative matching 140 Ω (balanced) ||10 nH

Characteristics

Temperature range for specification: T = –30 ˚C to +85 ˚C
ANT terminating impedance: Z_{ANT} = 50 Ω || 3.3 nH
RX terminating impedance: Z_{RX} = 100 Ω (balanced) +1.5 nH || 16 nH[3)]
TX terminating impedance: Z_{TX} = 50 Ω

Characteristics TX-RX[1)]			min.	typ. @ 25˚C	max.	
Isolation		α				
1712.5 ... 1782.5	MHz	α_{LTE}[2)]	54	59	–	dB
1807.5 ... 1877.5	MHz	α_{LTE}[2)]	53	60	–	dB

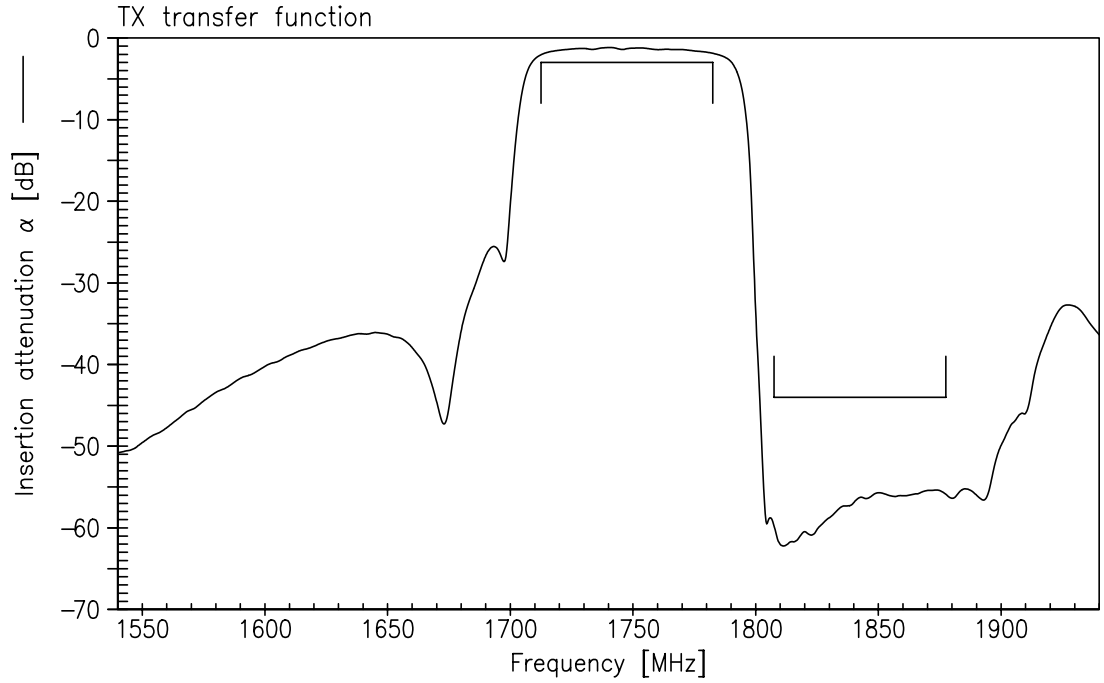
1) Specified values are valid for a testing power of +10dBm
2) Averaged value of linear s-parameter over 5 MHz
3) Alternative matching 140 Ω (balanced) ||10 nH

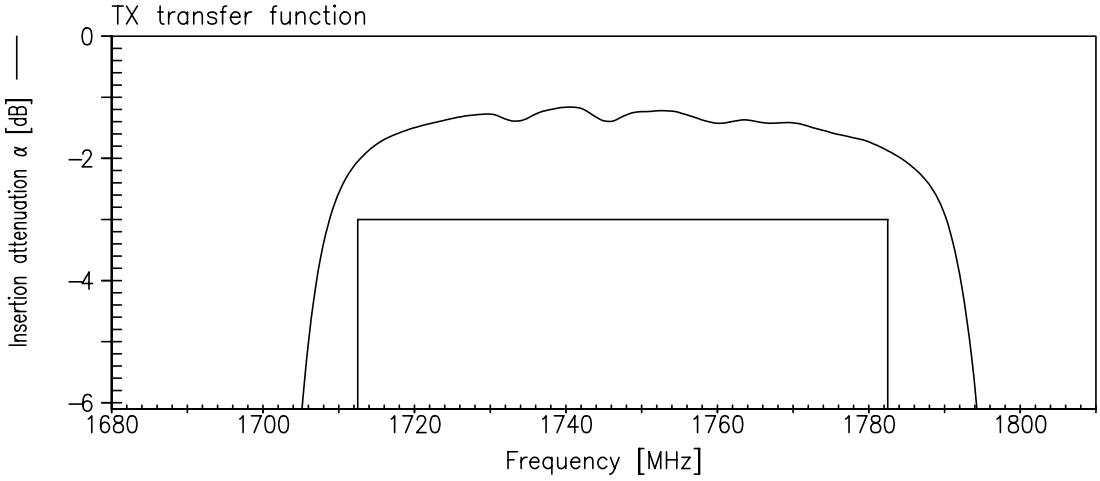
Maximum ratings

Storage temperature range	T_{stg}	–40/+90	˚C	
DC voltage	V_{DC}	0 [1)]	V	
ESD voltage	V_{ESD}	50 [2)]	V	Machine Model
	V_{ESD}	300 [3)]	V	Human Body Model
	V_{ESD}	500 [4)]	V	Charge Device Model
Input Power 1712.5 ... 1782.5 MHz	P_{IN}	29	dBm	5 MHz LTE uplink @ 50˚C, 5000h

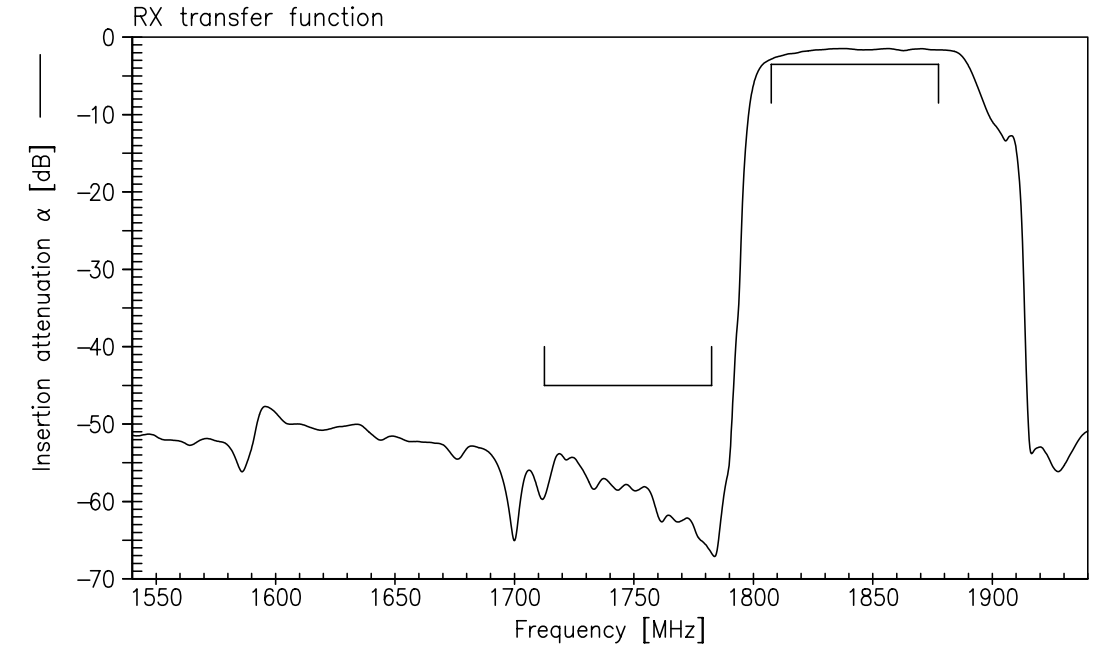
1) DC resistance at RX output might be less than 100 MΩ at elevated temperatures. Hence, we recommend usage of blocking capacitors.
2) Acc. to JESD22-A115B (machine model), 10 negative & 10 positive pulses.
3) Acc. to JESD22-A114F (human body model), 1 negative & 1 positive pulses.
4) Acc. to JESD22-C101C (charge device model), 3 negative & 3 positive pulses.

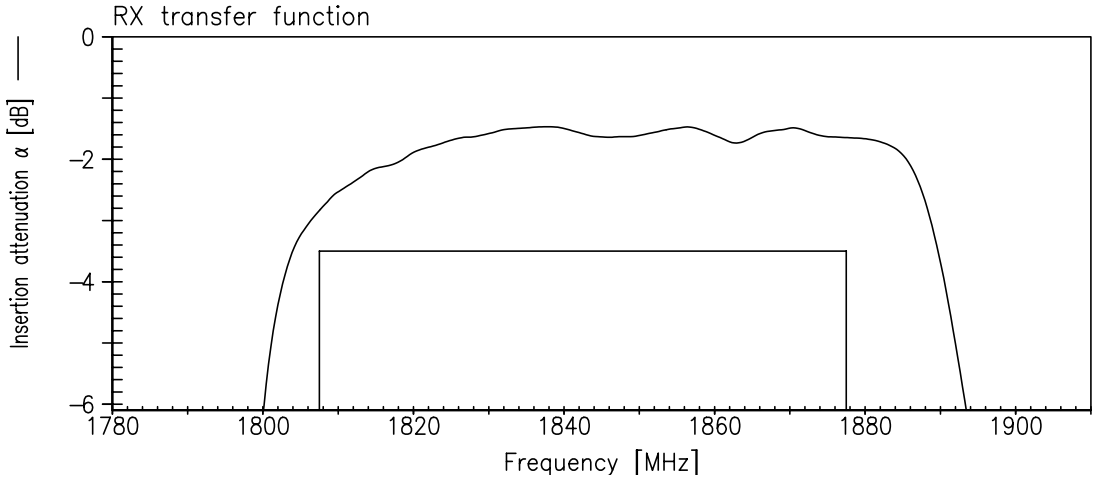
Frequency response TX - ANT



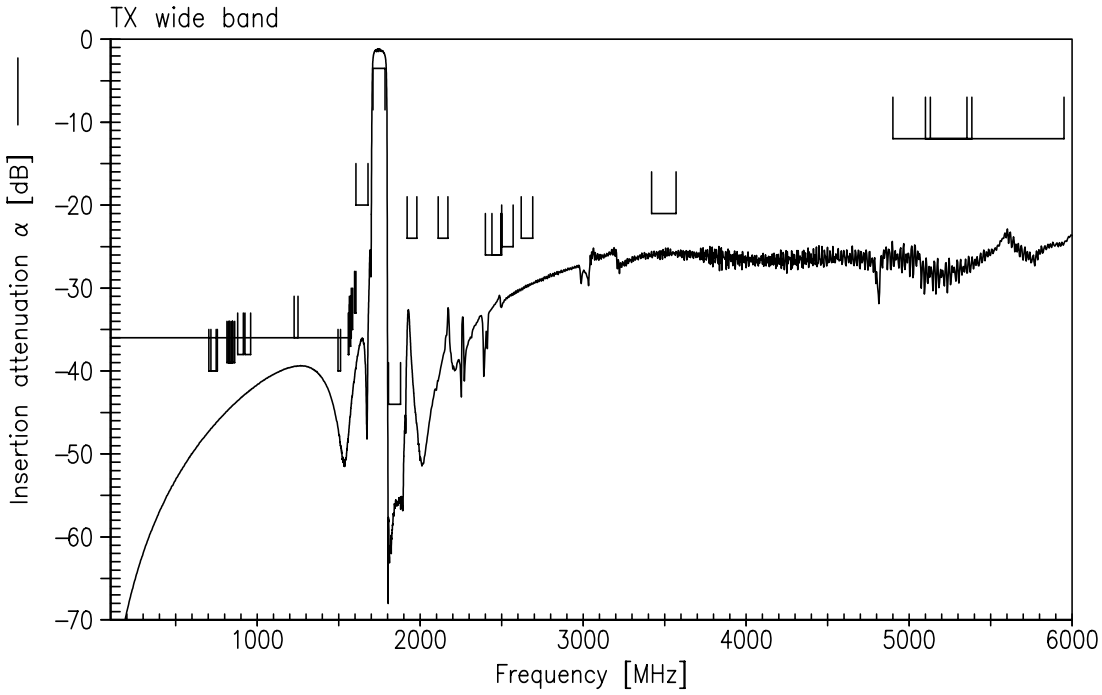


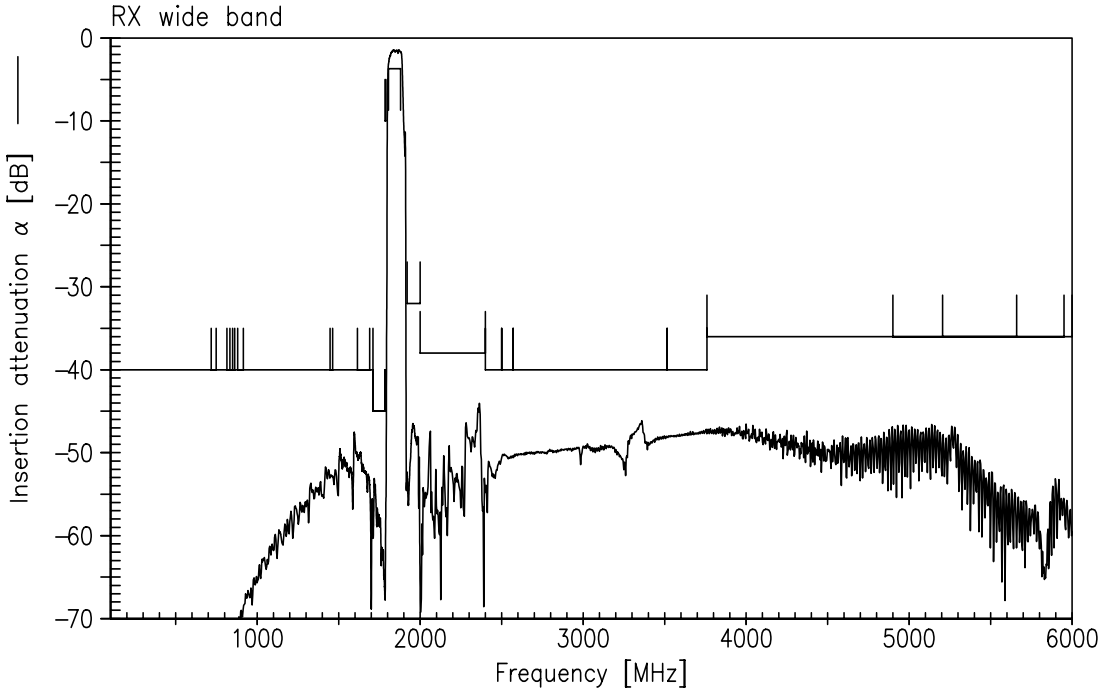
Frequency response ANT - RX



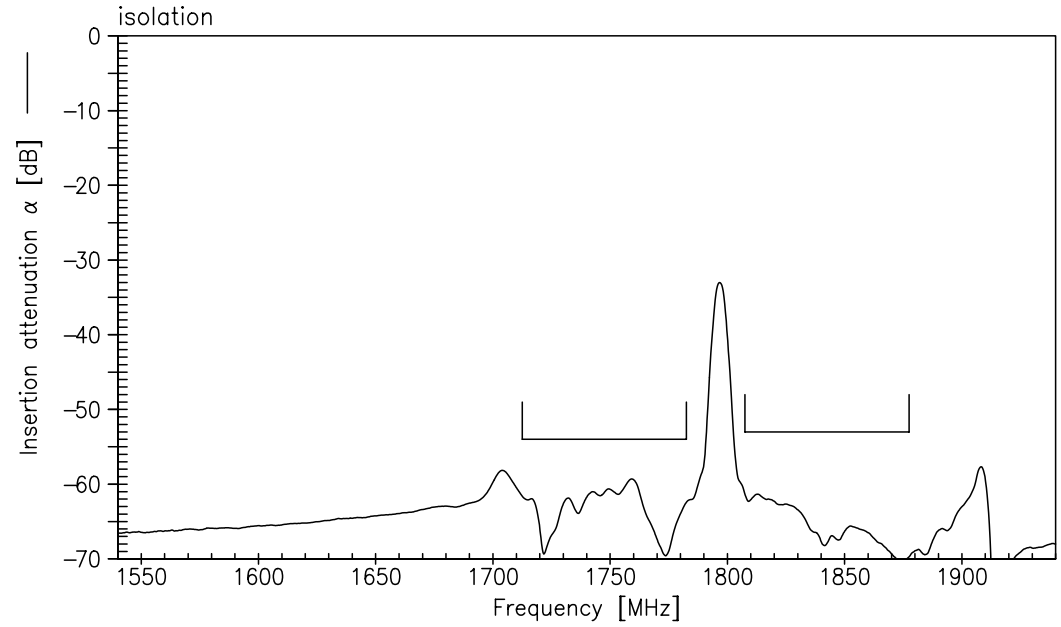


Wide band frequncy response TX - ANT and ANT - RX

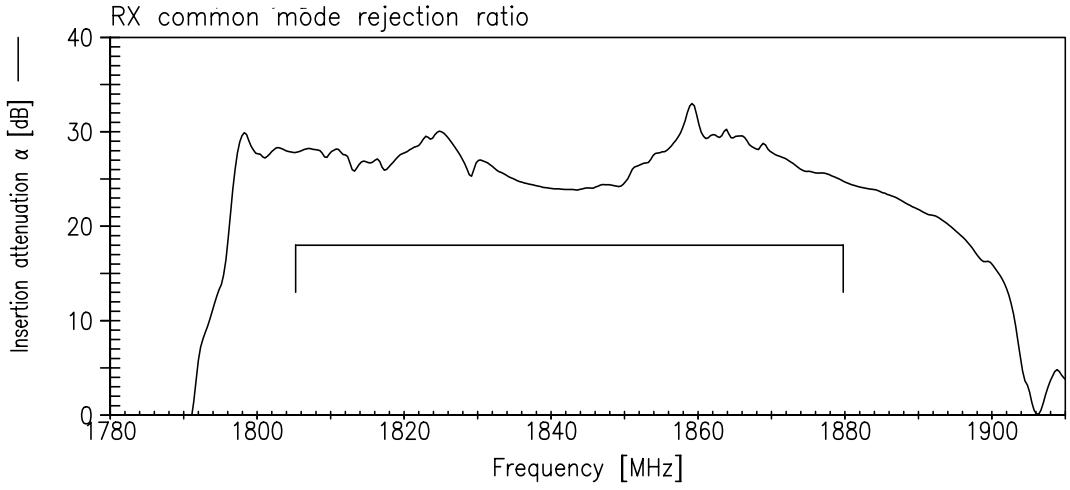




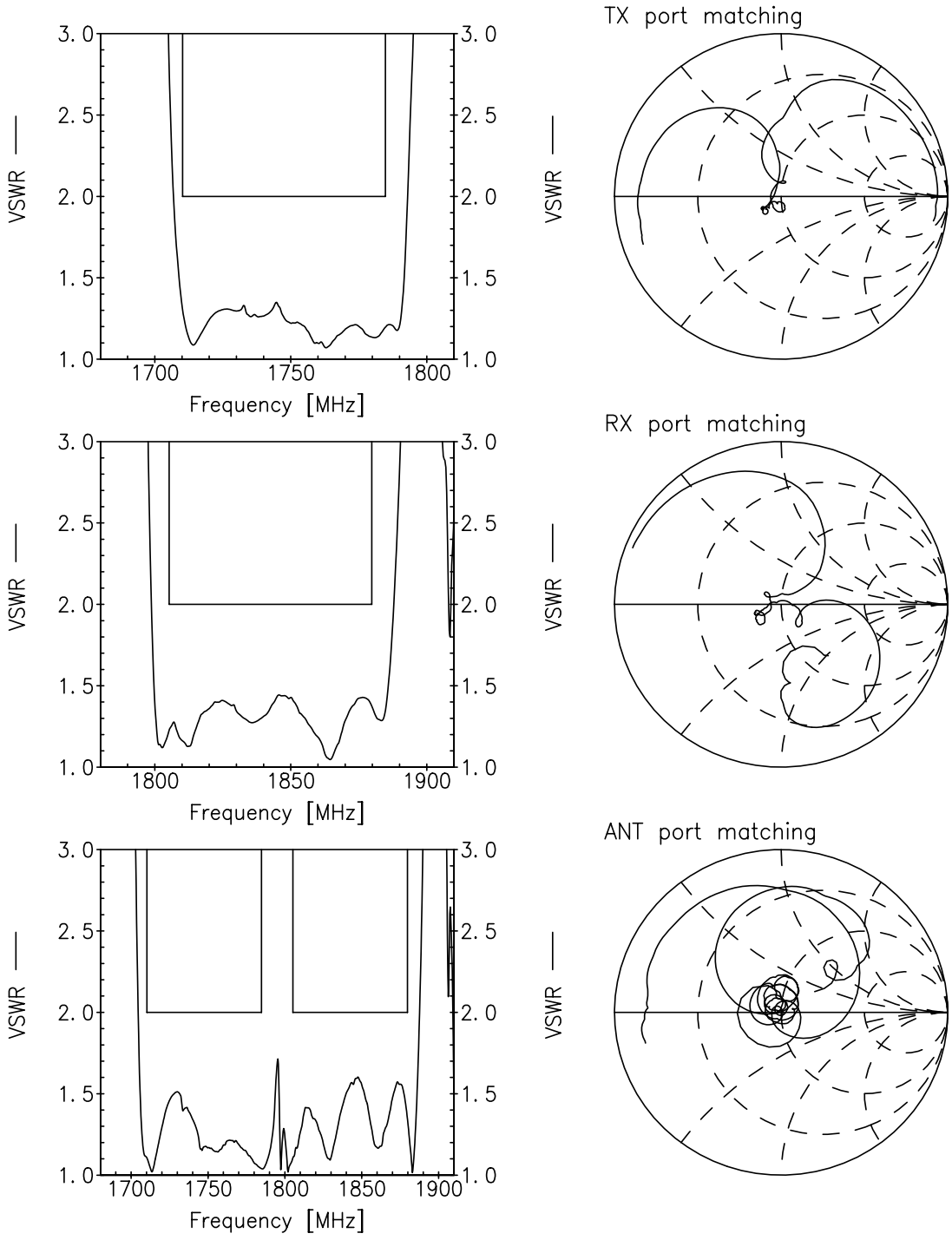
Frequency Response TX - RX



RX Common mode rejection ratio



VSWR of TX-port, RX-port and ANT-port



References

Type	B8656
Ordering code	B39182B8656P810
Marking and Package	C61157-A8-A92
Packaging	F61074-V8259-Z000
Date Codes	L_1126
S-Parameters	B8656_NB_UN.s4p (narrow band, unmatched), B8656_WB_UN.s4 (wide band, unmatched), B8656_HD_WB_UN.s4p (HD wide band, unmatched) 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.
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