SAW Components

SAW Duplexer for Smallcell

Band 3 (3G/LTE)

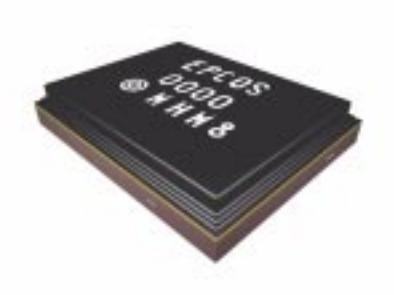
Series/type:	**B8018**
Ordering code:	**B39182B8018P810**
Date:	February 25, 2015
Version:	2.1

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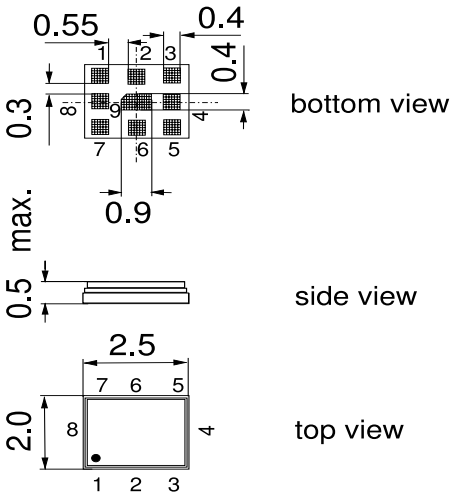
Application

- Low-loss SAW duplexer for LTE smallcell systems (Band 3)
- Low insertion attenuation
- High power durability
- Industrial qualification
- Usable passband 75 MHz
- Rx = Uplink = *1710-1785* MHz
- Tx = Downlink = *1805-1880* MHz



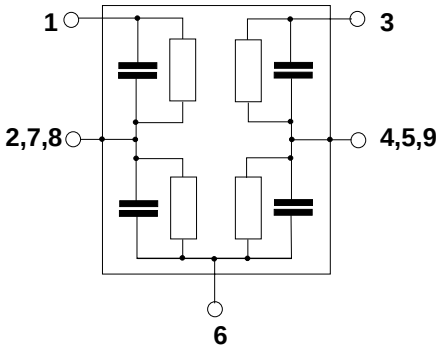
Features

- Package size 2.5 * 2.0 * 0.5 mm^3
- max. Package height 0.5 mm
- RoHS compatible
- Package for **S**urface **M**ount **T**echnology (**SMT**)
- Ni, Au-plated terminals
- **E**lectrostatic **S**ensitive **D**evice (**ESD**)
- Moisture Sentivity Level 3



Pin configuration

3	RX output
1	TX input
6	Antenna
2, 4, 5, 7, 8, 9	To be grounded



Characteristics

Temperature range for specification: T = –10 ˚C to +85 ˚C
Antenna terminating impedance: Z_{ANT}= 50 Ω || 3.6 nH
RX terminating impedance: Z_{RX} = 50 Ω ||9.1 nH
TX terminating impedance: Z_{TX} = 50 Ω || 8.2 nH

Characterisitcs ANT - RX		min.	typ. @ 25 ˚C	max.	
Center frequency	f_C		1747.5		MHz
Maximum insertion attenuation	α_{max}				
1710.0 ... 1785.0 MHz		-	3.5	5.3	dB
1745.0 ... 1775.0 MHz		-	2.5	3.0	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
1710.0 ... 1785.0 MHz		-	2.2	4.0	dB
1745.0 ... 1775.0 MHz		-	1.0	1.5	dB
Error Vector Magnitude	EVM[1)]				
@$f_{carrier}$ 1712.5 ... 1783.5 MHz		-	2.5	4.0	%
Input VSWR (ANT port)					
1710.0 ... 1785.0 MHz		-	1.6	2.0	
Output VSWR (RX port)					
1710.0 ... 1785.0 MHz		-	1.8	2.2	
Attenuation	α				
10.0 ... 1500.0 MHz		40	49	-	dB
1500.0 ... 1660.0 MHz		40	48	-	dB
1660.0 ... 1690.0 MHz		10	15	-	dB
1805.0 ... 1840.0 MHz		40	44	-	dB
1840.0 ... 1880.0 MHz		43	47	-	dB
1880.0 ... 2400.0 MHz		40	45	-	dB
2400.0 ... 2500.0 MHz		40	45	-	dB
2500.0 ... 3490.0 MHz		35	50	-	dB
3490.0 ... 3550.0 MHz		35	51	-	dB
3500.0 ... 5235.0 MHz		35	42	-	dB
5235.0 ... 5325.0 MHz		35	42	-	dB

1) Error Vector Magnitude (EVM) based on definition given in 3GPP TS 25.141

Characteristics

Temperature range for specification: T = –10 ˚C to +85 ˚C
Antenna terminating impedance: Z_{ANT}= 50 Ω || 3.6 nH
RX terminating impedance: Z_{RX} = 50 Ω ||9.1 nH
TX terminating impedance: Z_{TX} = 50 Ω || 8.2 nH

Characterisitcs TX - ANT			min.	typ. @ 25 ˚C	max.	
Center frequency	f_C			1842.5		MHz
Maximum insertion attenuation	α_{max}					
1805.0 ... 1880.0 MHz			-	2.6	4.0	dB
1840.0 ... 1870.0 MHz			-	1.7	2.5	dB
Amplitude ripple (p-p)	$\Delta\alpha$					
1805.0 ... 1880.0 MHz			-	1.2	3.0	dB
1840.0 ... 1870.0 MHz			-	0.3	1.0	dB
Error Vector Magnitude	EVM[1)]					
@$f_{carrier}$ 1807.5 ... 1877.5 MHz			-	1.6	3.5	%
Input VSWR (TX port)						
1805.0 ... 1880.0 MHz			-	1.4	2.0	
Output VSWR (ANT port)						
1805.0 ... 1880.0 MHz			-	1.5	2.0	
Attenuation	α					
10.0 ... 1710.0 MHz			30	34	-	dB
1710.0 ... 1745.0 MHz			42	46	-	dB
1745.0 ... 1780.0 MHz			45	49	-	dB
1780.0 ... 1785.0 MHz			35	48	-	dB
1900.0 ... 1911.0 MHz			5	18	-	dB
1911.0 ... 1920.0 MHz			20	63	-	dB
1920.0 ... 1980.0 MHz			40	45	-	dB
1980.0 ... 2400.0 MHz			35	40	-	dB
2400.0 ... 2500.0 MHz			35	41	-	dB
2500.0 ... 3680.0 MHz			30	41	-	dB
3680.0 ... 3740.0 MHz			30	49	-	dB
3740.0 ... 5150.0 MHz			30	38	-	dB
5150.0 ... 5725.0 MHz			25	33	-	dB

1) Error Vector Magnitude (EVM) based on definition given in 3GPP TS 25.141

Characteristics

Temperature range for specification: T = –10 ˚C to +85 ˚C
Antenna terminating impedance: Z_{ANT}= 50 Ω || 3.6 nH
RX terminating impedance: Z_{RX} = 50 Ω || 9.1 nH
TX terminating impedance: Z_{TX} = 50 Ω || 8.2 nH

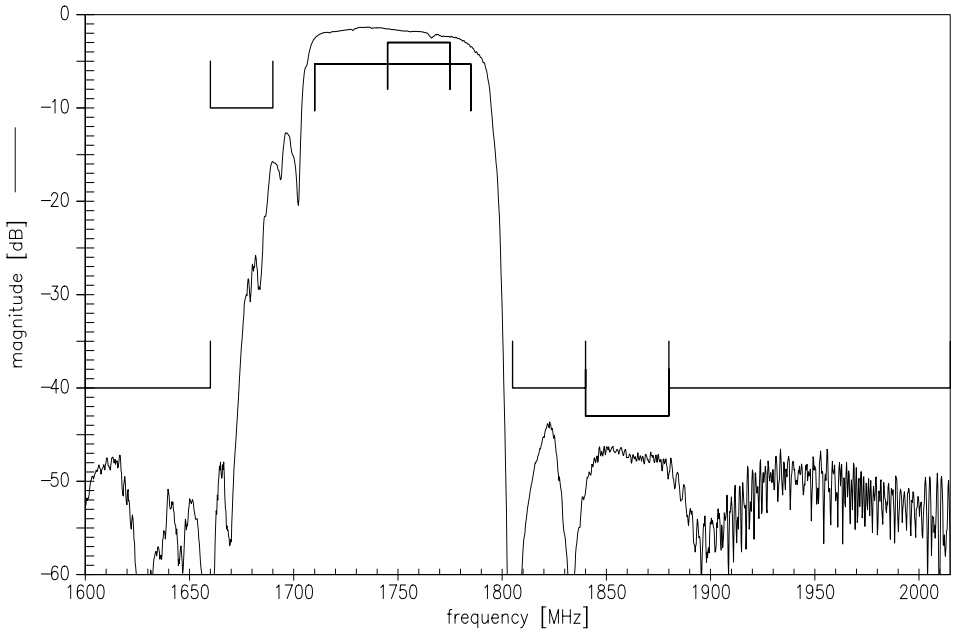
Characteristics TX-RX		min.	typ. @ 25 ˚C	max.	
Attenuation	α				
1710.0 ... 1745.0 MHz		43	46	-	dB
1745.0 ... 1780.0 MHz		45	49	-	dB
1780.0 ... 1785.0 MHz		37	49	-	dB
1805.0 ... 1840.0 MHz		40	43	-	dB
1840.0 ... 1880.0 MHz		45	48	-	dB

Maximum Ratings

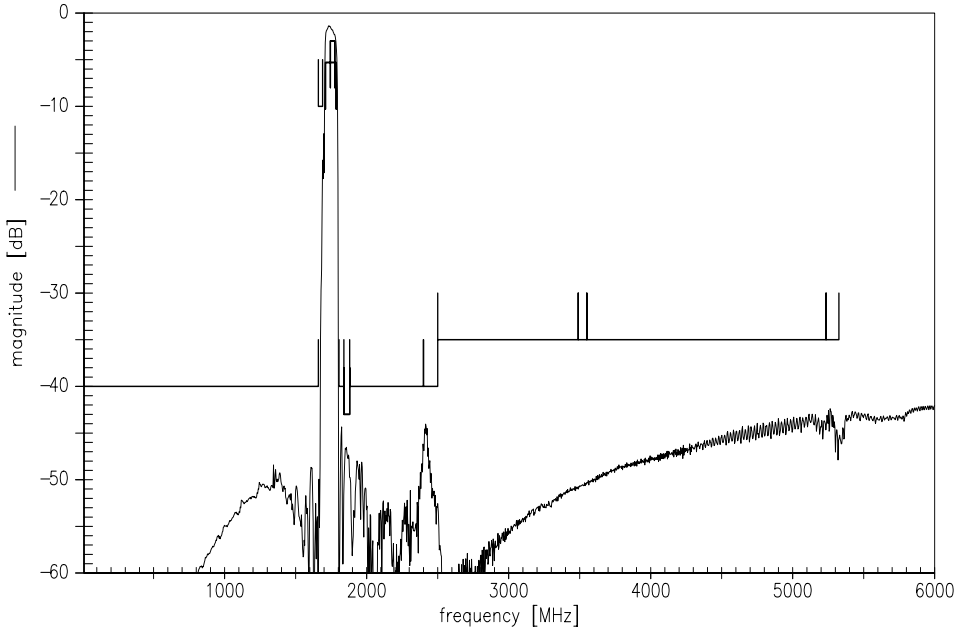
Storage temperature range	T_{stg}	–40/+85	˚C	
DC voltage	V_{DC}	0	V	
ESD voltage	V_{ESD}	50[1)]	V	machine model, 1 pulse
Input power at pin 1				source and load impedance 50 Ω
1805.0 ...1880.0 MHz	P_{in}	27[2)]	dBm	} Pin 27dBm average - 38 dBm peak LTE 5 MHz downlink T = 55˚C, 50.000 h
elsewhere	P_{in}	10	dBm	
Operating lifetime with Output power at antenna				source and load impedance 50 Ω
1805.0 ...1880.0 MHz	P_{out}	tbc[3)]	dBm	Continuous wave T=55˚C, 100khrs

1) According to JESD22-A115A (machine model), 1 negative and 1 positive pulses.
2) Time to failure (TTF) according to accelerated power durability tests, and wear out models.
3) According to accelerated High Temperature Operating Life (HOTL) test.

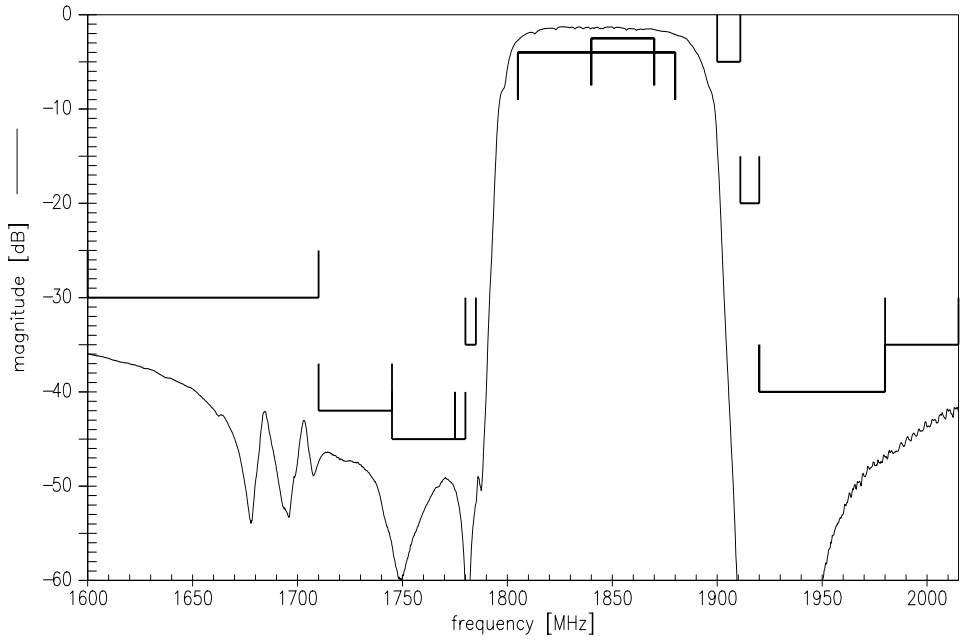
Frequency Response ANT-RX



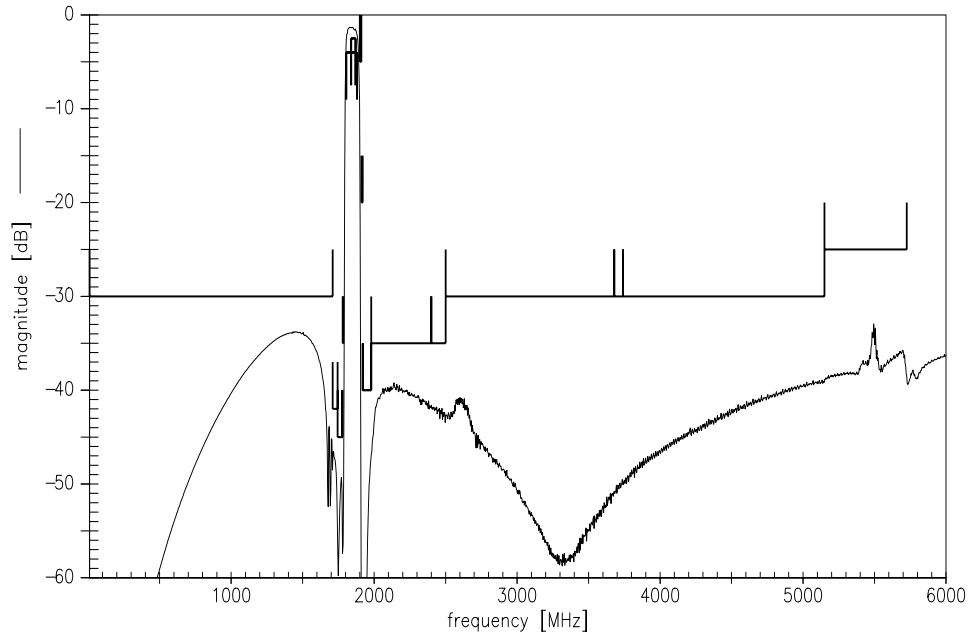
Frequency Response ANT-RX



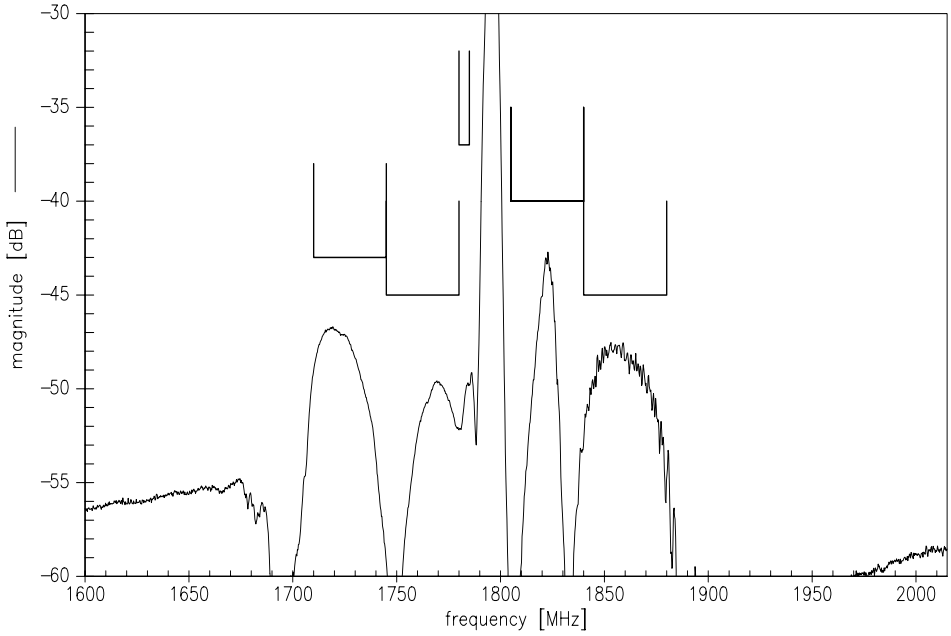
Frequency Response TX-ANT



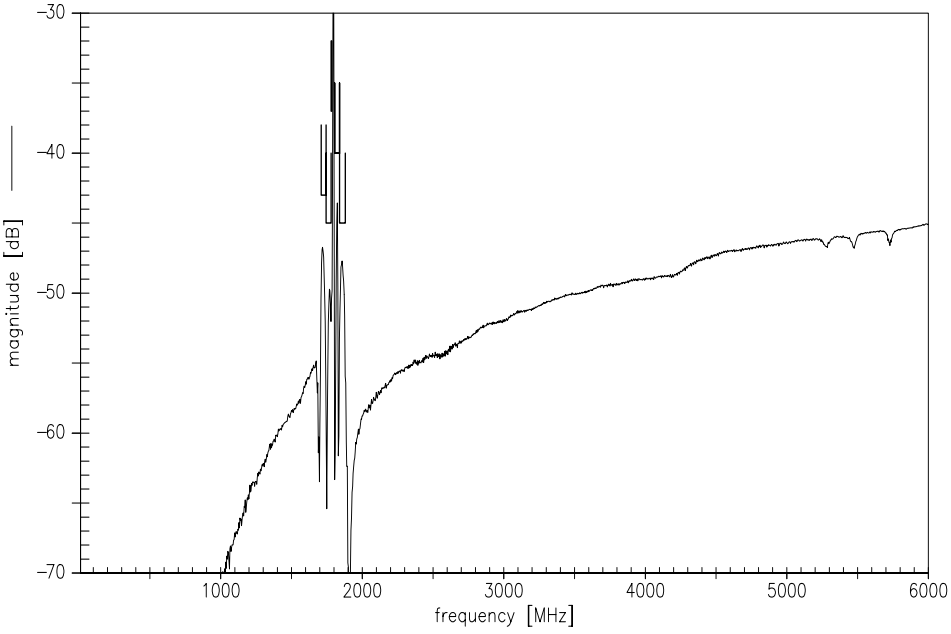
Frequency Response TX-ANT



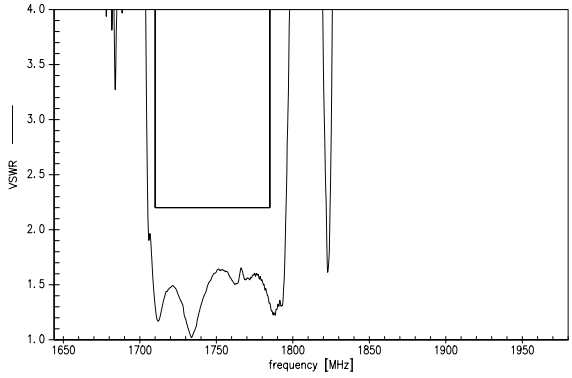
Frequency Response TX-RX

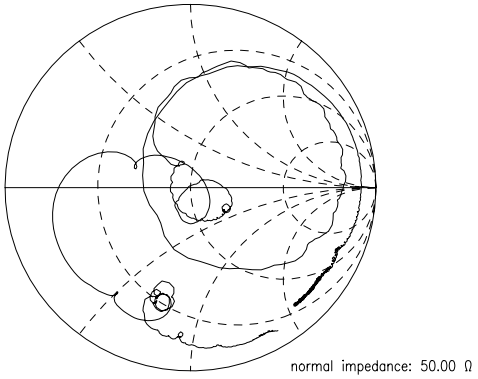


Frequency Response TX-RX

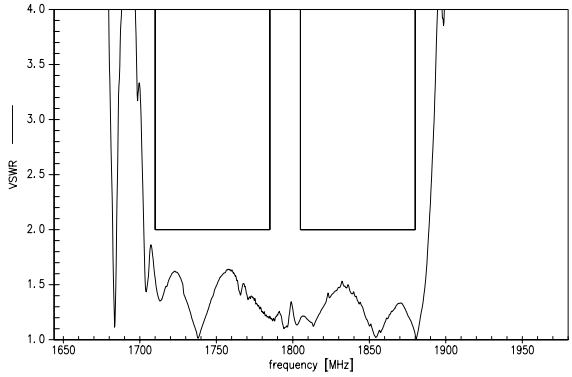


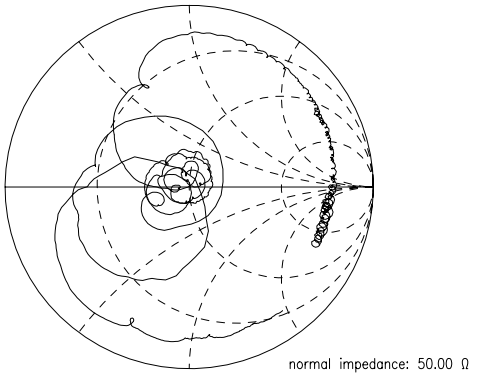
S11 VSWR (RX)



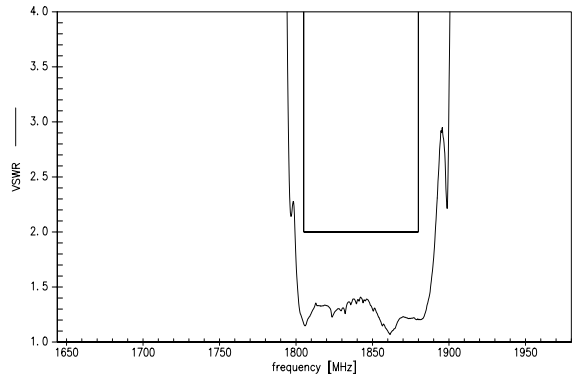


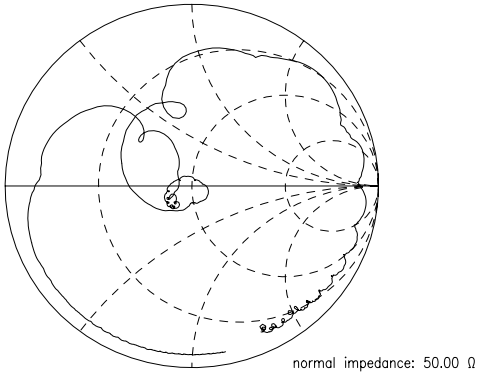
S22 VSWR (ANT)



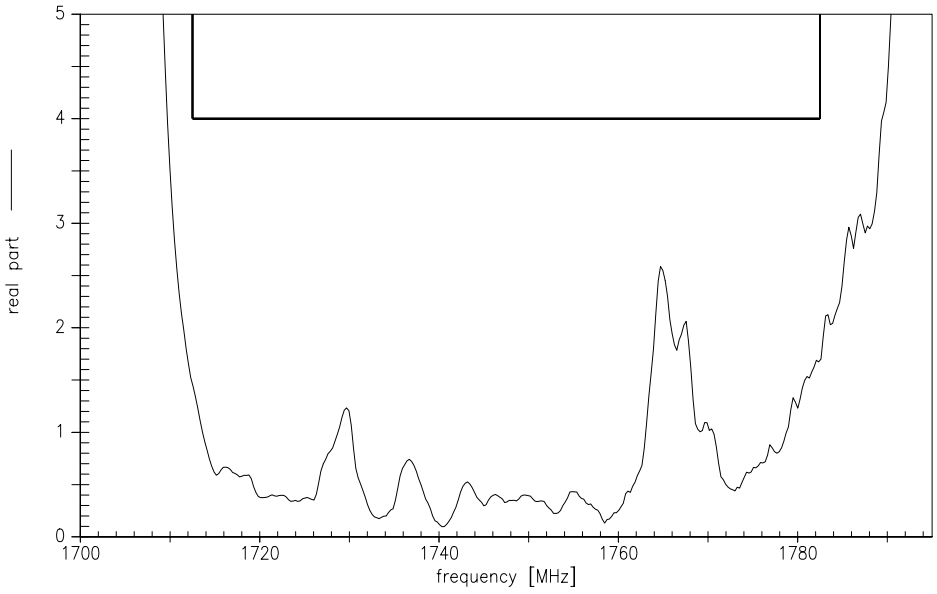


S33 VSWR (TX)

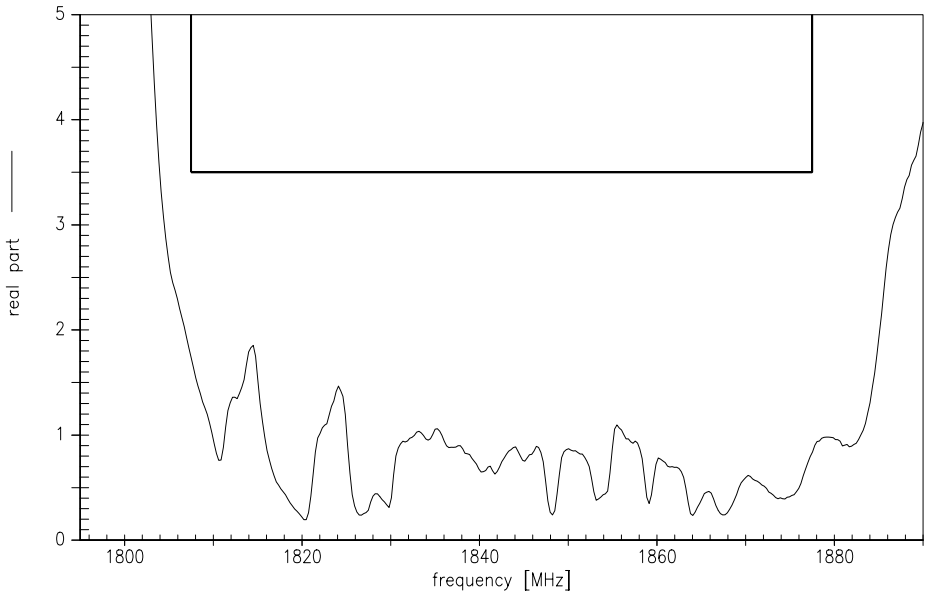




EVM RX


real part
frequency [MHz]
0
1
2
3
4
5
1700
1720
1740
1760
1780

EVM TX


real part
frequency [MHz]
0
1
2
3
4
5
1800
1820
1840
1860
1880

References

Type	B8018
Ordering code	B39182B8018P810
Marking and package	C61157-A3-A27
Packaging	F61074-V8232-Z000
Date codes	L_1126
S-parameters	B8018_NB.s3p, B8018_WB.s3p 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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Matching coils	See 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

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Published by EPCOS AG
Systems, Acoustics, Waves Business Group
P.O. Box 80 17 09, 81617 Munich, GERMANY

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