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Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China





# SAW Components

## SAW Duplexer for Femtocell and Small-cell

Band 3 (3G/LTE)

<b>Series/type:</b>	<b>B8019</b>
<b>Ordering code:</b>	<b>B39182B8019P810</b>
<b>Date:</b>	<b>October 23, 2014</b>
<b>Version:</b>	<b>2.0</b>

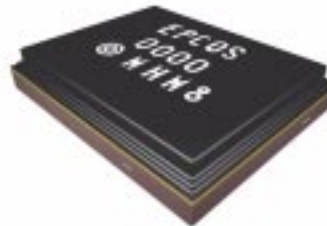
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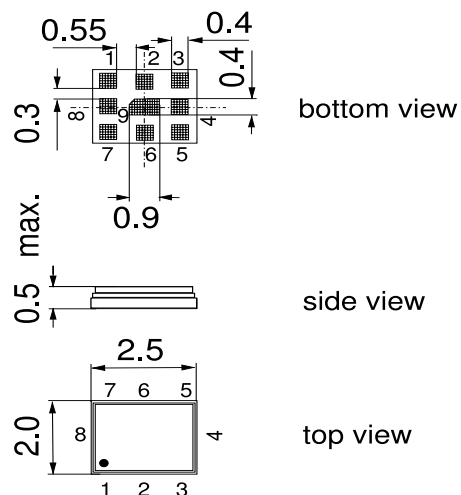
**Data Sheet**

**Application**

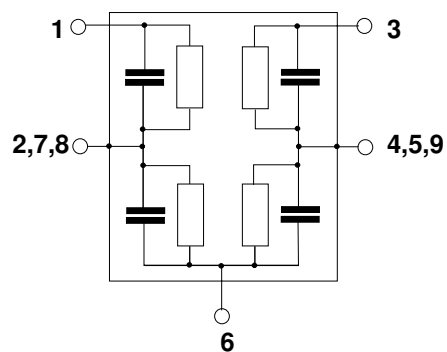
- Low-loss SAW duplexer for LTE femtocell and small-cell systems (Band 3)
- Low insertion attenuation
- Low amplitude ripple
- Usable passband 75 MHz
- High power durability
- Rx = Uplink = 1710-1785 MHz
- Tx = Downlink = 1805-1880 MHz


**Features**

- Package size 2.5 \* 2.0 \* 0.5 mm<sup>3</sup>
- max. Package height 0.5 mm
- RoHS compatible
- Package for **Surface Mount Technology (SMT)**
- Ni, Au-plated terminals
- **Electrostatic Sensitive Device (ESD)**
- Moisture Sensitivity Level 3


**Pin configuration**

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



**Data Sheet**

**Characteristics**

Temperature range for specification:	T = -10 °C to +85 °C
Antenna terminating impedance:	Z <sub>ANT</sub> = 50 Ω    3.6 nH
RX terminating impedance:	Z <sub>RX</sub> = 50 Ω    9.1 nH
TX terminating impedance:	Z <sub>TX</sub> = 50 Ω    8.2 nH

Characteristics ANT - RX		min.	typ. @ 25 °C	max.	
<b>Center frequency</b>	f <sub>C</sub>		1747.5		MHz
<b>Maximum insertion attenuation</b>	α <sub>max</sub>				
1710.0 ... 1785.0 MHz		-	3.5	5.3	dB
1745.0 ... 1775.0 MHz		-	2.5	3.0	dB
<b>Amplitude ripple (p-p)</b>	Δα				
1710.0 ... 1785.0 MHz		-	2.2	4.0	dB
1745.0 ... 1775.0 MHz		-	1.0	1.5	dB
<b>Error Vector Magnitude</b>	EVM <sup>1)</sup>				
@f <sub>carrier</sub> 1712.5 ... 1783.5 MHz		-	2.5	4.0	%
<b>Input VSWR (ANT port)</b>					
1710.0 ... 1785.0 MHz		-	1.6	2.0	
<b>Output VSWR (RX port)</b>					
1710.0 ... 1785.0 MHz		-	1.8	2.2	
<b>Attenuation</b>	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

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

**Data Sheet**

**Characteristics**

Temperature range for specification:	T = -10 °C to +85 °C
Antenna terminating impedance:	Z <sub>ANT</sub> = 50 Ω    3.6 nH
RX terminating impedance:	Z <sub>RX</sub> = 50 Ω    9.1 nH
TX terminating impedance:	Z <sub>TX</sub> = 50 Ω    8.2 nH

Characteristics TX - ANT		min.	typ. @ 25 °C	max.	
<b>Center frequency</b>	f <sub>C</sub>		1842.5		MHz
<b>Maximum insertion attenuation</b>	α <sub>max</sub>				
1805.0 ... 1880.0 MHz		-	2.6	4.0	dB
1840.0 ... 1870.0 MHz		-	1.7	2.5	dB
<b>Amplitude ripple (p-p)</b>	Δα				
1805.0 ... 1880.0 MHz		-	1.2	3.0	dB
1840.0 ... 1870.0 MHz		-	0.3	1.0	dB
<b>Error Vector Magnitude</b>	EVM <sup>1)</sup>				
@f <sub>carrier</sub> 1807.5 ... 1877.5 MHz		-	1.6	3.5	%
<b>Input VSWR (TX port)</b>					
1805.0 ... 1880.0 MHz		-	1.4	2.0	
<b>Output VSWR (ANT port)</b>					
1805.0 ... 1880.0 MHz		-	1.5	2.0	
<b>Attenuation</b>	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 ... 1932.0 MHz		20	63	-	dB
1932.0 ... 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

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

**Data Sheet**

**Characteristics**

Temperature range for specification:	T = -10 °C to +85 °C
Antenna terminating impedance:	Z <sub>ANT</sub> = 50 Ω    3.6 nH
RX terminating impedance:	Z <sub>RX</sub> = 50 Ω    9.1 nH
TX terminating impedance:	Z <sub>TX</sub> = 50 Ω    8.2 nH

<b>Characteristics TX-RX</b>				<b>min.</b>	<b>typ. @ 25 °C</b>	<b>max.</b>	
<b>Attenuation</b>			$\alpha$				
	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

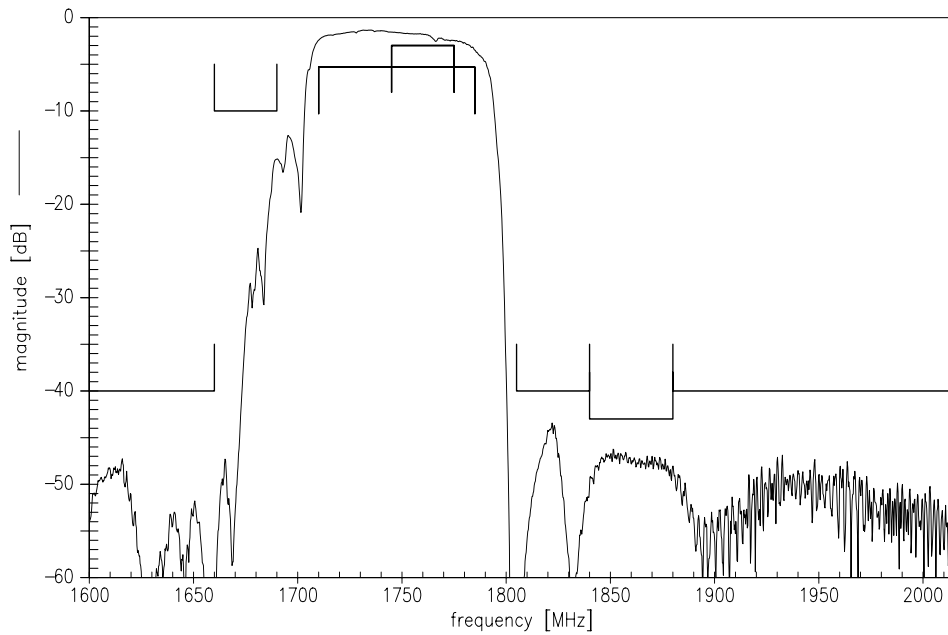
**Maximum Ratings**

Storage temperature range	T <sub>stg</sub>	-40/+85	°C	
DC voltage	V <sub>DC</sub>	0	V	
ESD voltage	V <sub>ESD</sub>	50 <sup>1)</sup>	V	machine model, 1 pulse source and load impedance 50 Ω LTE 5 MHz downlink } average power T = 55°C, 50.000 h
Input power at pin 1				
1805.0 ... 1880.0 MHz	P <sub>in</sub>	27	dBm	
elsewhere	P <sub>in</sub>	10	dBm	

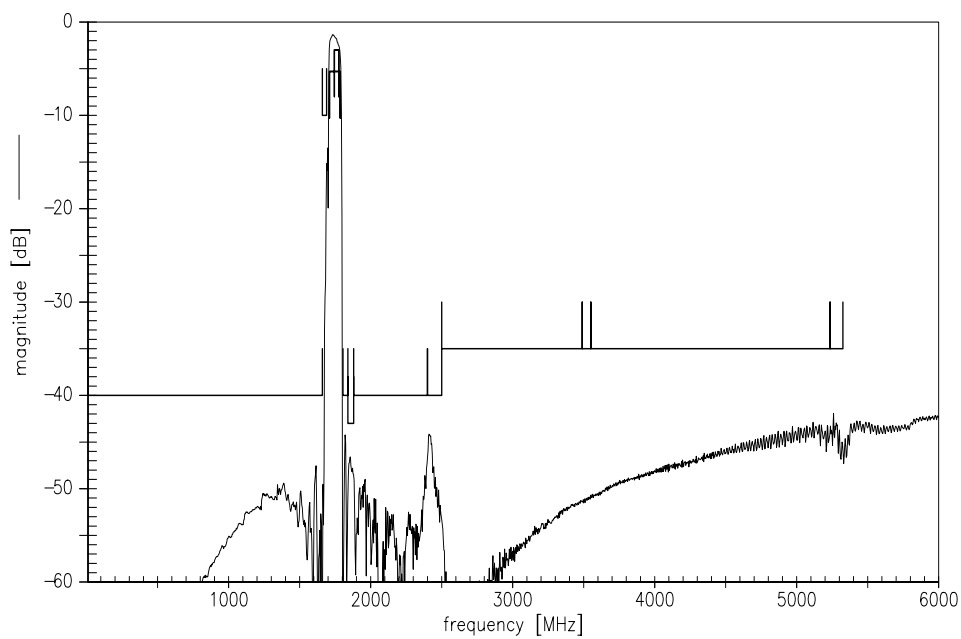
<sup>1)</sup> According to JESD22-A115A (machine model), 1 negative and 1 positive pulses.



Frequency Response ANT-RX

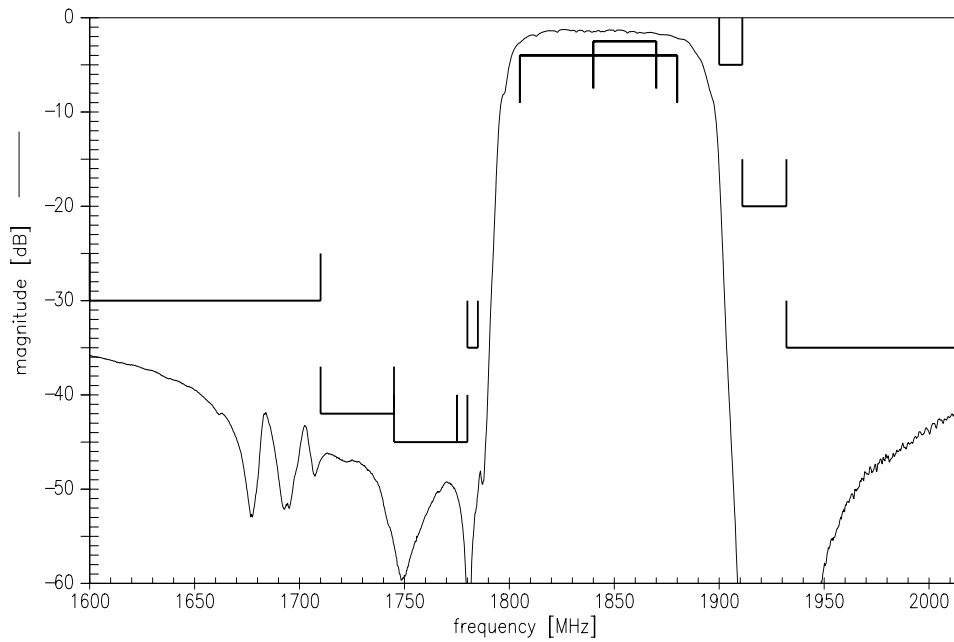


Frequency Response ANT-RX

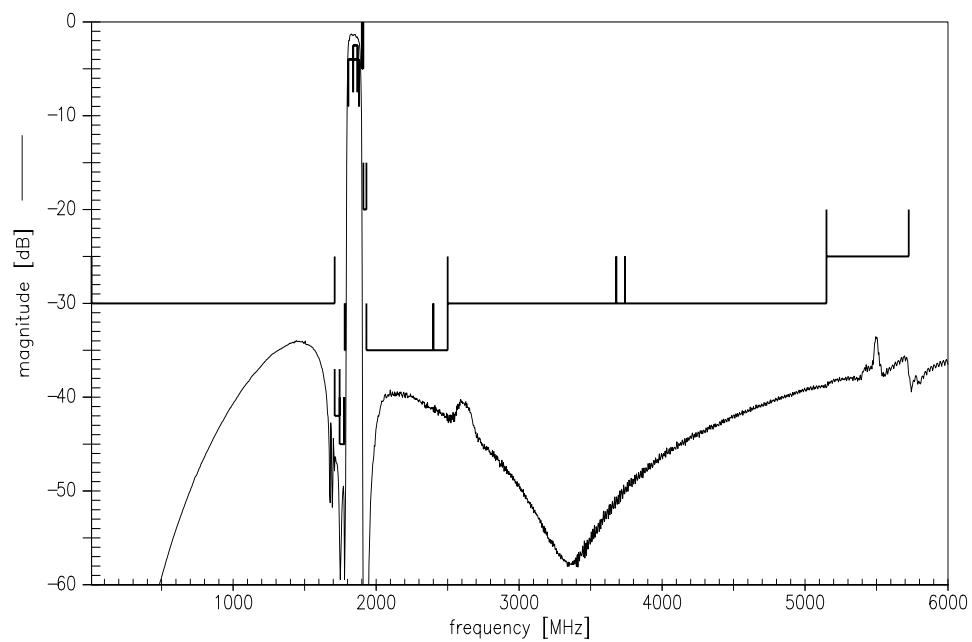




Frequency Response TX-ANT



Frequency Response TX-ANT



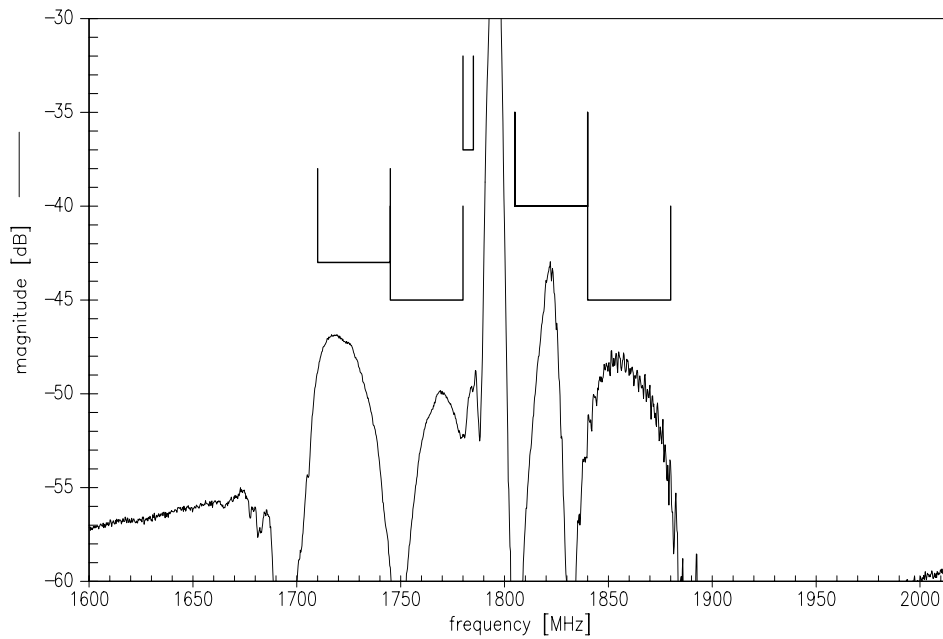
Please read *cautions and warnings* and *important notes* at the end of this document.



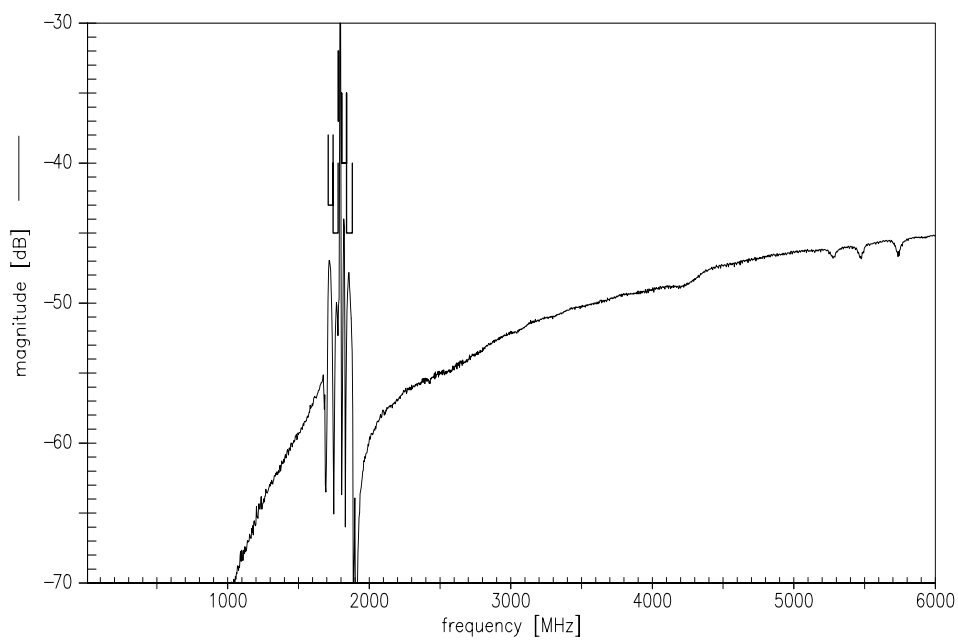
Data Sheet



Frequency Response TX-RX



Frequency Response TX-RX

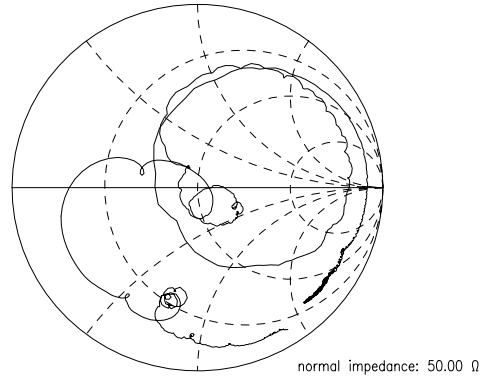
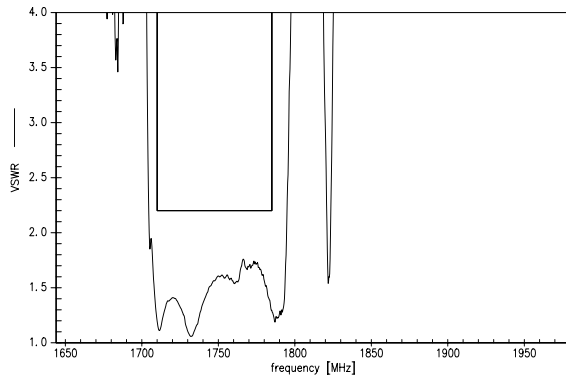


Please read *cautions and warnings* and *important notes* at the end of this document.

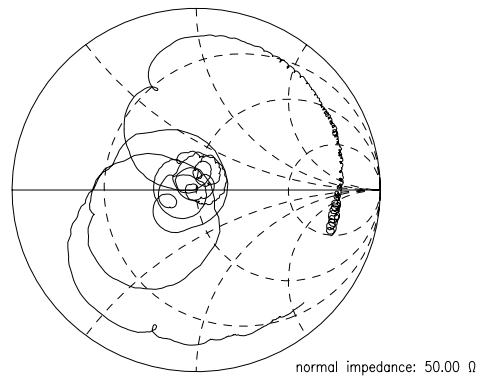
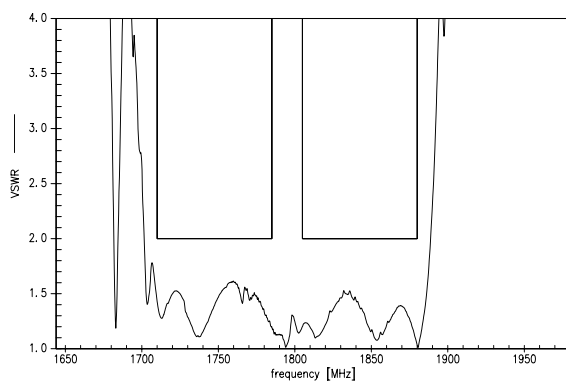
**Data Sheet**



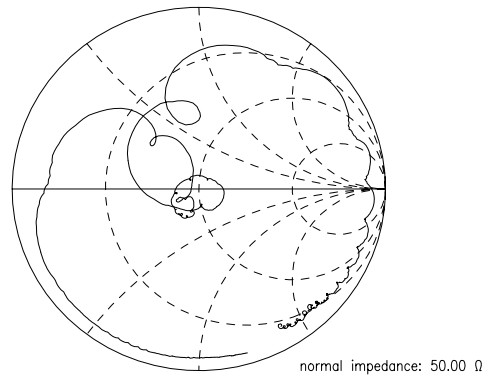
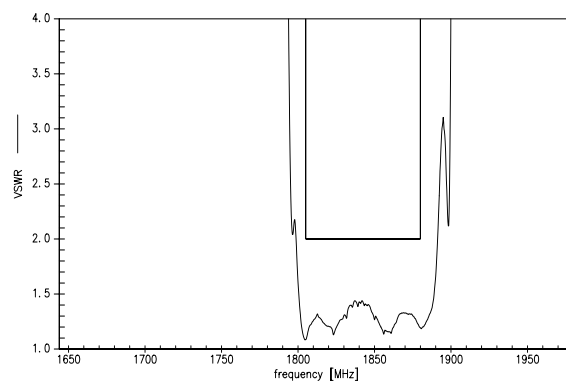
**S11 VSWR (RX)**



**S22 VSWR (ANT)**



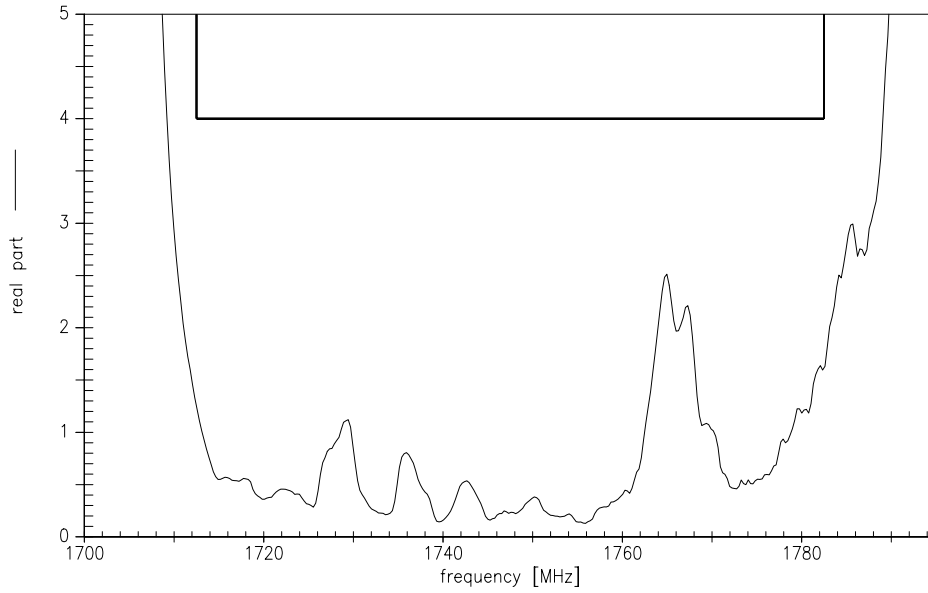
**S33 VSWR (TX)**



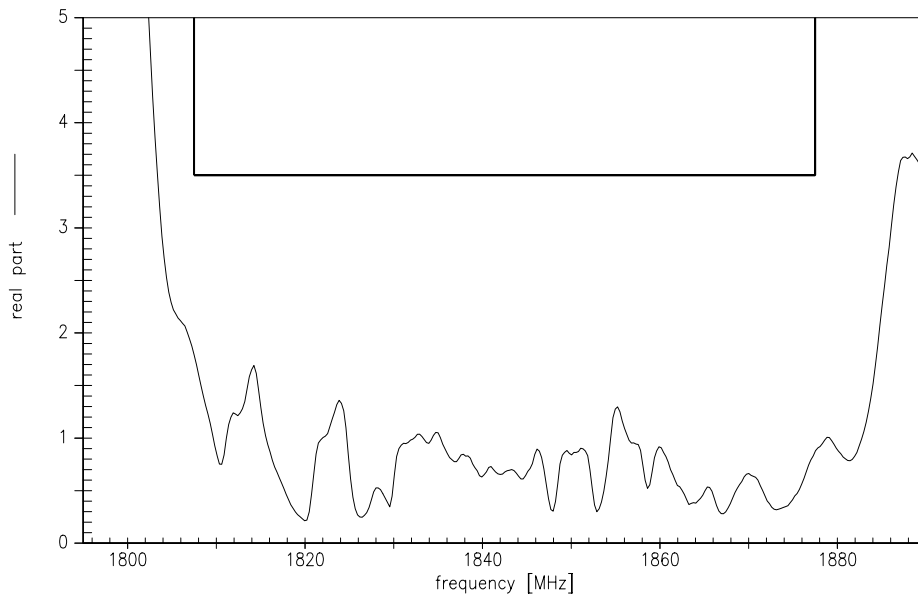
**Data Sheet**



**EVM RX**



**EVM TX**





<b>Type</b>	B8019
<b>Ordering code</b>	B39182B8019P810
<b>Marking and package</b>	C61157-A3-A27
<b>Packaging</b>	F61074-V8232-Z000
<b>Date codes</b>	L_1126
<b>S-parameters</b>	B8019_NB.s3p, B8019_WB.s3p See file header for port/pin assignment table
<b>Soldering profile</b>	S_6001
<b>RoHS compatible</b>	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 8 <sup>th</sup> , 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.
<b>Moldability</b>	Before using in overmolding environment, please contact your EPCOS sales office.
<b>Matching coils</b>	See Inductor pdf-catalog <a href="http://www.tdk.co.jp/tefe02/coil.htm#aname1">http://www.tdk.co.jp/tefe02/coil.htm#aname1</a> and Data Library for circuit simulation <a href="http://www.tdk.co.jp/etvcl/index.htm">http://www.tdk.co.jp/etvcl/index.htm</a>

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