

RF360 Europe GmbH

A Qualcomm – TDK Joint Venture

## SAW Components

### SAW Rx 2in1 input duplex filter

GSM1900 / GSM1800

Series/type: B9817  
Ordering code: B39202B9817P810

Date: September 26, 2011  
Version: 2.0

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# SAW Components

## SAW Rx 2in1 input duplex filter

GSM1900 / GSM1800

<b>Series/type:</b>	<b>B9817</b>
<b>Ordering code:</b>	<b>B39202B9817P810</b>

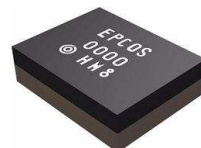
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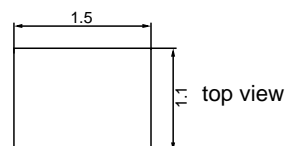
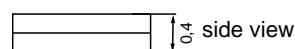
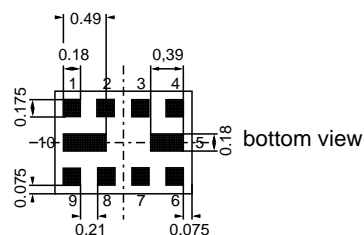
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**Application**

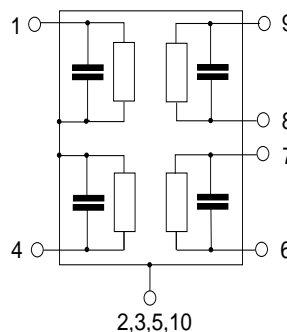
- Low-loss 2in1 RF filter for mobile telephone GSM1900 and GSM1800 systems, receive path (Rx)
- Usable passband:  
Filter 1 (GSM1900): 60 MHz  
Filter 2 (GSM1800): 75 MHz
- Unbalanced to balanced operation for both filters
- Impedance transformation from 50  $\Omega$  to 150  $\Omega$  for both filters
- Low amplitude ripple
- Suitable for GPRS class 1 to 12


**Features**

- Package size 1.5 x 1.1 x 0.4 mm<sup>3</sup>
- Moisture Sensitive Level 3
- RoHS compatible
- Approx. weight 0.003g
- Package for Surface Mount Technology (SMT)
- Ni, gold-plated terminals
- **Electrostatic Sensitive Device (ESD)**


**Pin configuration**

- 1 Input [Duplex]
- 8,9 Output balanced [Filter 1]
- 6,7 Output balanced [Filter 2]
- 2,3,4,5,10 Case-ground



**SAW Components**
**B9817**
**SAW Rx 2in1 input duplex filter**
**1960.0 / 1842.5 MHz**
**Data sheet**

**Characteristics of Filter 1 (GSM1900)**

Temperature range for specification:  $T = -30\text{ }^{\circ}\text{C to }+85\text{ }^{\circ}\text{C}$   
 Terminating source impedance:  $Z_S = 50\text{ }\Omega \parallel 3.3\text{nH}$   
 Terminating load impedance:  $Z_L = 150\text{ }\Omega \parallel 27\text{nH}$

		min.	typ. @ 25 °C	max.	
<b>Center frequency</b>	$f_C$	—	1960.0	—	MHz
<b>Maximum insertion attenuation</b>	$\alpha_{\max}$	—	2.0	2.9	dB
1930.0 ... 1990.0 MHz					
<b>Amplitude ripple (p-p)</b>	$\Delta\alpha$	—	0.9	1.8	dB
1930.0 ... 1990.0 MHz					
<b>Input VSWR</b>		—	1.6	2.2	
1930.0 ... 1990.0 MHz					
<b>Output VSWR</b>		—	1.8	2.3	
1930.0 ... 1990.0 MHz					
<b>CMRR</b> ( $ S_{21}-S_{31} / S_{21}+S_{31} $ )		20 <sup>1)</sup>	28	—	dB
1930.0 ... 1990.0 MHz					
<b>Attenuation</b>	$\alpha$				
10.0 ... 1510.0 MHz		40	49	—	dB
1510.0 ... 1830.0 MHz		30	35	—	dB
1830.0 ... 1850.0 MHz		23	33	—	dB
1850.0 ... 1890.0 MHz		18	31	—	dB
1890.0 ... 1910.0 MHz		8	12	—	dB
2010.0 ... 2070.0 MHz		3	10	—	dB
2070.0 ... 2400.0 MHz		21	30	—	dB
2400.0 ... 6000.0 MHz		30	40	—	dB

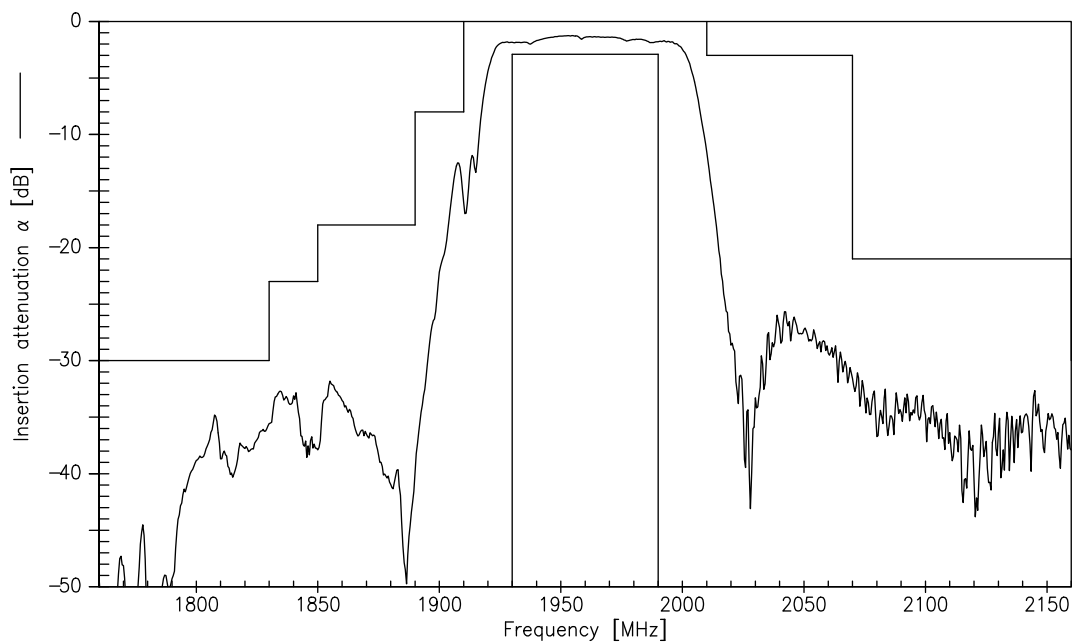
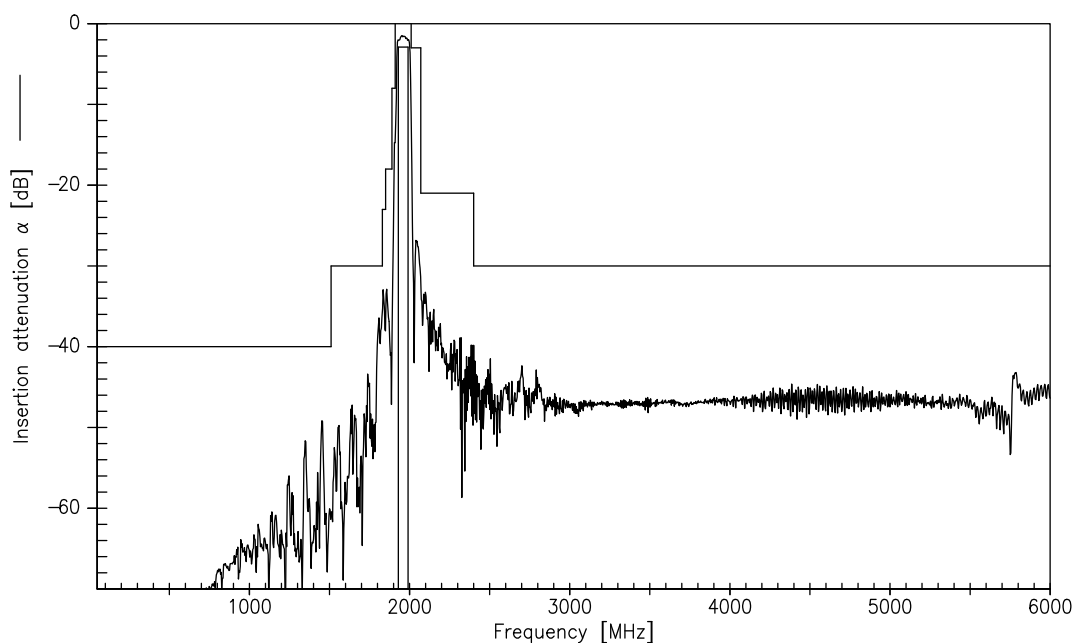
<sup>1)</sup> A CMRR of 19.6dB corresponds to a phase balance of 10° together with an amplitude balance of 1.0dB

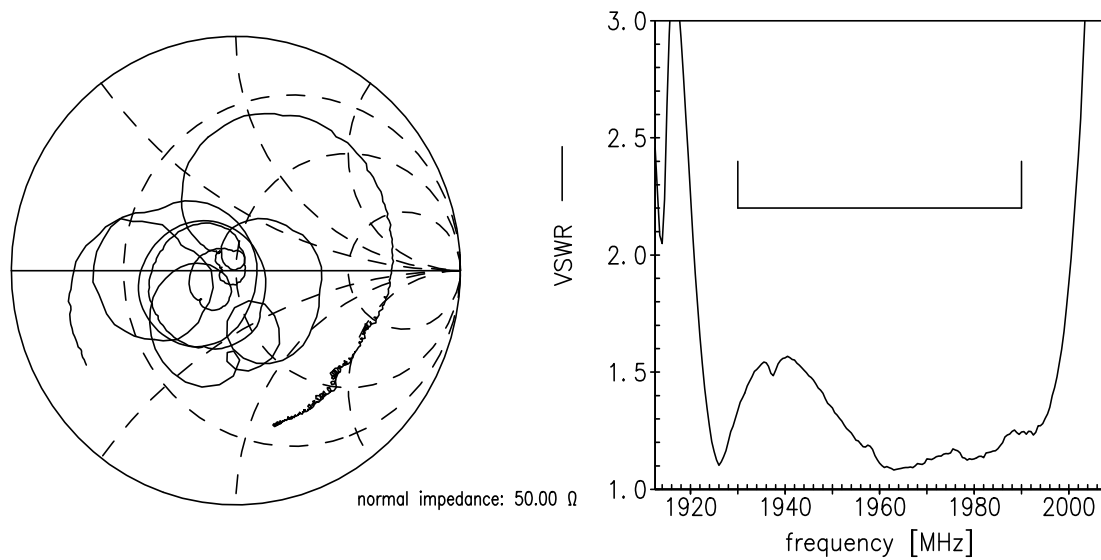
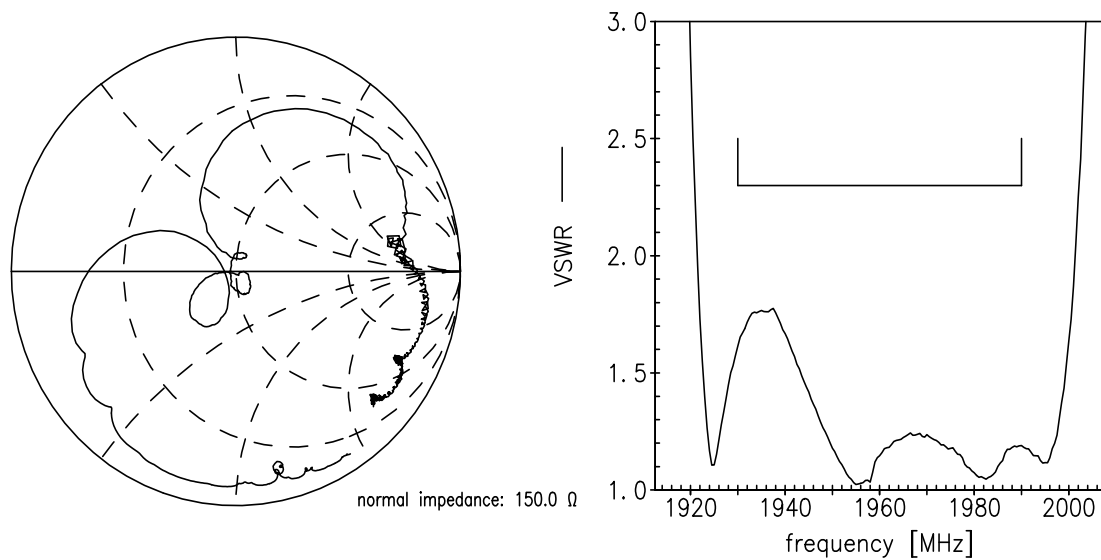
SAW Components		B9817
SAW Rx 2in1 input duplex filter		1960.0 / 1842.5 MHz
Data sheet		

#### Maximum ratings of Filter 1 (GSM1900)

Operable temperature range	T	−40/+85	°C	
Storage temperature range	T <sub>stg</sub>	−40/+85	°C	
DC voltage	V <sub>DC</sub>	5	V	
ESD voltage	V <sub>ESD</sub>	50 <sup>1)</sup>	V	machine model, 1 pulse
Input Power at				
GSM 850, GSM 900	P <sub>IN</sub>	15	dBm	effective power in the on-state, duty cycle 4:8
GSM 1800, GSM 1900	P <sub>IN</sub>	15	dBm	
Tx bands				

<sup>1)</sup> acc. to JESD22-A115A (machine model), 1 negative & 1 positive pulse.

**Transfer function Filter 1 (GSM1900)**

**Transfer function Filter 1 (GSM1900) - Wideband**


**Smith charts Filter 1 (GSM1900)**
 **$S_{11}$  function**

 **$S_{22}$  function**




**SAW Components**
**B9817**
**SAW Rx 2in1 input duplex filter**
**1960.0 / 1842.5 MHz**
**Data sheet**

**Characteristics of Filter 2 (GSM1800)**

Temperature range for specification:  $T = -30\text{ }^{\circ}\text{C}$  to  $+85\text{ }^{\circ}\text{C}$   
 Terminating source impedance:  $Z_S = 50\text{ }\Omega \parallel 3.3\text{nH}$   
 Terminating load impedance:  $Z_L = 150\text{ }\Omega \parallel 18\text{nH}$

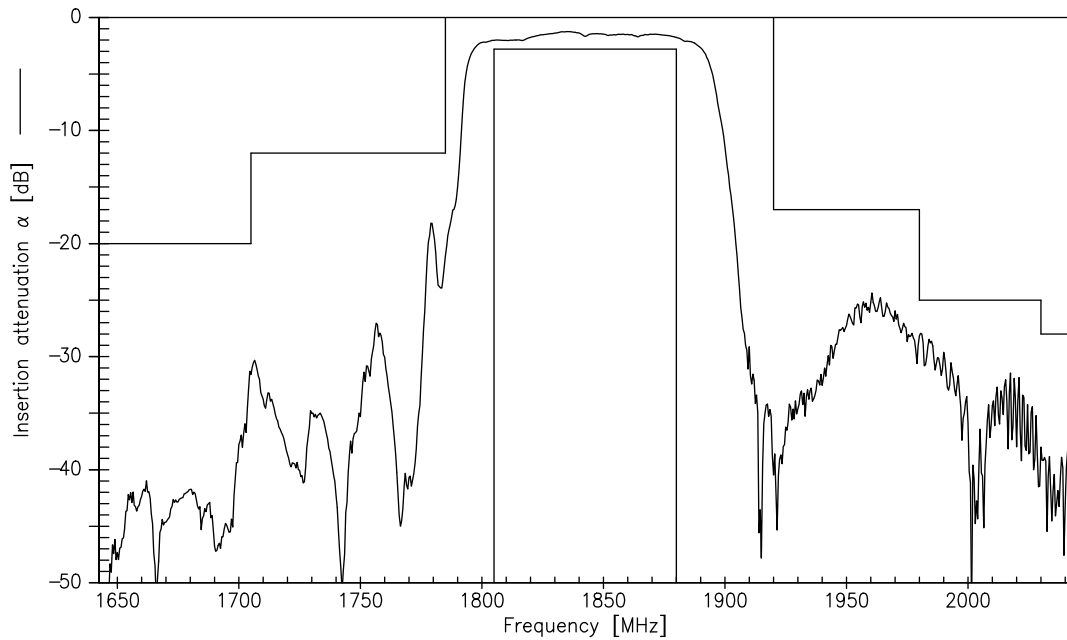
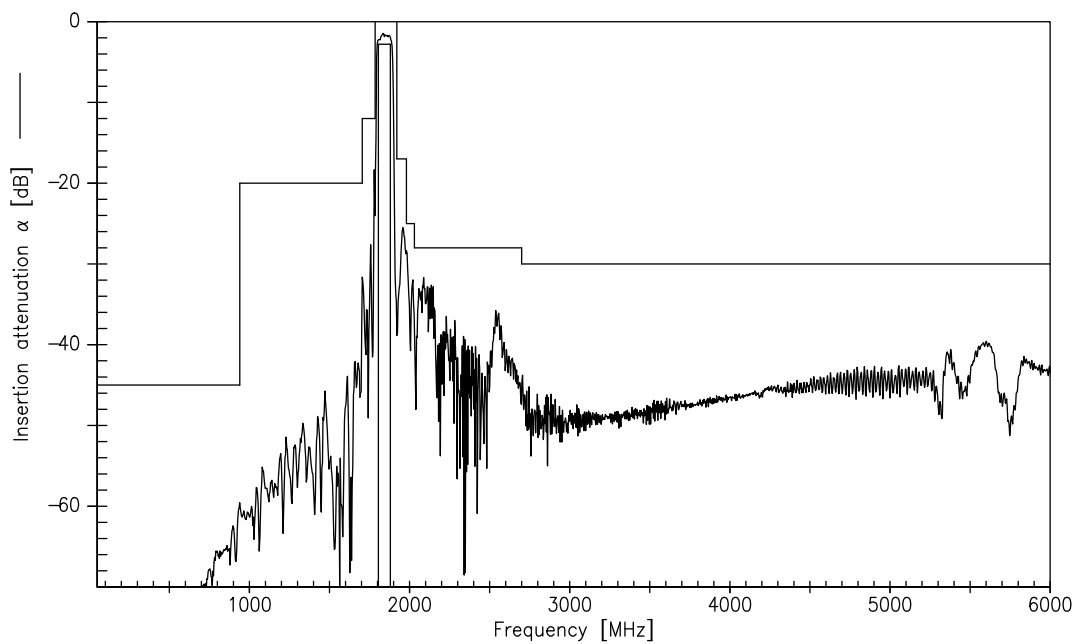
		min.	typ. @ 25 °C	max.	
<b>Center frequency</b>	$f_C$	—	1842.5	—	MHz
<b>Maximum insertion attenuation</b>	$\alpha_{\max}$	—	2.1	2.8	dB
1805.0 ... 1880.0 MHz					
<b>Amplitude ripple (p-p)</b>	$\Delta\alpha$	—	1.0	1.8	dB
1805.0 ... 1880.0 MHz					
<b>Input VSWR</b>		—	1.7	2.2	
1805.0 ... 1880.0 MHz					
<b>Output VSWR</b>		—	1.8	2.2	
1805.0 ... 1880.0 MHz					
<b>CMRR</b> ( $ S_{21}-S_{31} / S_{21}+S_{31} $ )		18 <sup>1)</sup>	23	—	dB
1805.0 ... 1880.0 MHz					
<b>Attenuation</b>	$\alpha$				
10.0 ... 940.0 MHz		45	60	—	dB
940.0 ... 1705.0 MHz		20	31	—	dB
1705.0 ... 1785.0 MHz		12	18	—	dB
1920.0 ... 1980.0 MHz		17	24	—	dB
1980.0 ... 2030.0 MHz		25	28	—	dB
2030.0 ... 2700.0 MHz		28	32	—	dB
2700.0 ... 6000.0 MHz		30	39	—	dB

<sup>1)</sup> A CMRR of 18.0dB corresponds to a phase balance of 12° together with an amplitude balance of 1.2dB

**Maximum ratings of Filter 2 (GSM1800)**

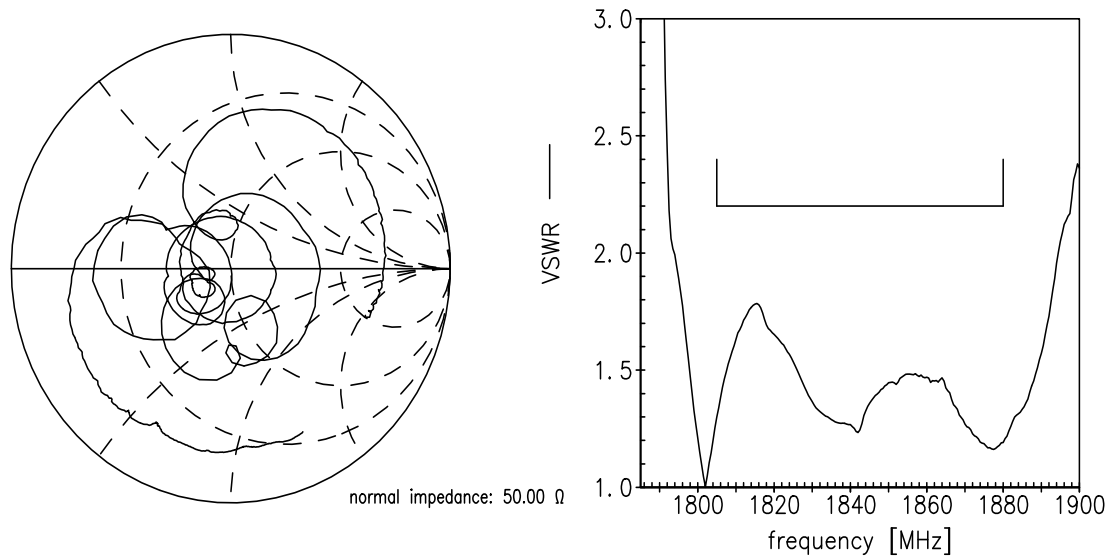
Operable temperature range	T	−40/+85	°C	
Storage temperature range	T <sub>stg</sub>	−40/+85	°C	
DC voltage	V <sub>DC</sub>	5	V	
ESD voltage	V <sub>ESD</sub>	50 <sup>1)</sup>	V	machine model, 1 pulse
Input Power at				
GSM 850, GSM 900	P <sub>IN</sub>	15	dBm	effective power in the on-state, duty cycle 4:8
GSM 1800, GSM 1900	P <sub>IN</sub>	15	dBm	
Tx bands				

<sup>1)</sup> acc. to JESD22-A115A (machine model), 1 negative & 1 positive pulse.

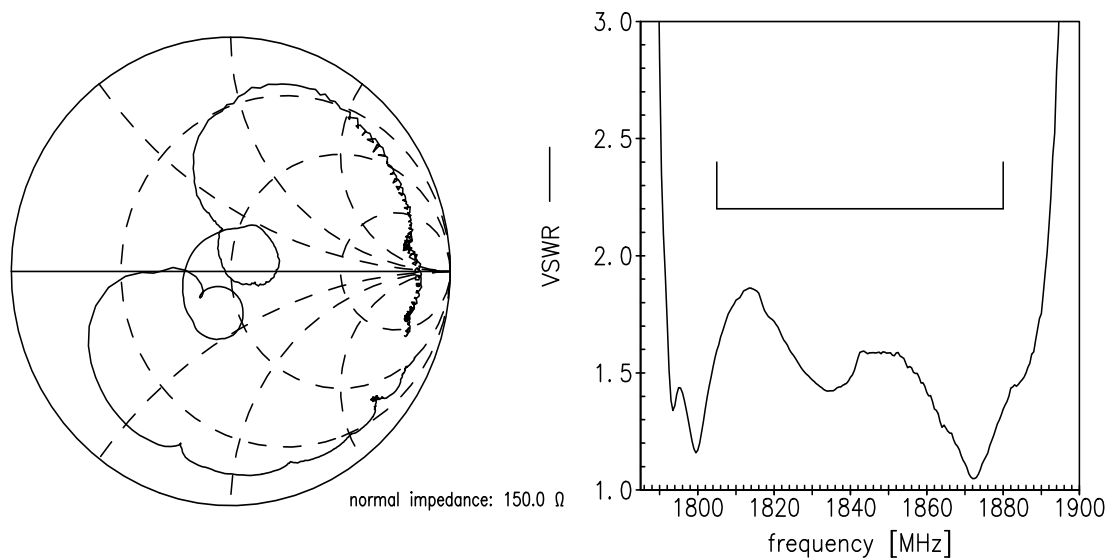
**Transfer function Filter 2 (GSM1800)**

**Transfer function Filter 2 (GSM1800) - Wideband**


Smith charts Filter 2 (GSM1800)

$S_{11}$  function



$S_{22}$  function



<b>SAW Components</b>	<b>B9817</b>
<b>SAW Rx 2in1 input diplex filter</b>	<b>1960.0 / 1842.5 MHz</b>
<b>Data sheet</b>	<b>SMD</b>

## References

<b>Type</b>	B9817
<b>Ordering code</b>	B39202B9817P810
<b>Marking and package</b>	C61157-A8-A19
<b>Packaging</b>	F61074-V8227-Z000
<b>Date codes</b>	L_1126
<b>S-parameters</b>	B9817_LB_NB.s3p, B9817_LB_WB.s3p B9817_UB_NB.s3p, B9817_UB_WB.s3p See file header for port/pin assignment table.
<b>Soldering profile</b>	S_6001
<b>RoHS compatible</b>	defined as compatible with the following documents: "DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment. 2005/618/EC from April 18th, 2005, amending Directive 2002/95/EC of the European Parliament and of the Council for the purposes of establishing the maximum concentration values for certain hazardous substances in electrical and electronic equipment."
<b>Moldability</b>	Before using in overmolding environment, please contact your EPCOS sales office.
<b>Matching coils</b>	See <a href="http://www.tdk.co.jp/tefe02/coil.htm#aname1">http://www.tdk.co.jp/tefe02/coil.htm#aname1</a> <a href="http://www.tdk.co.jp/etvcl/index.htm">http://www.tdk.co.jp/etvcl/index.htm</a> for a large variety of matching coils.

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