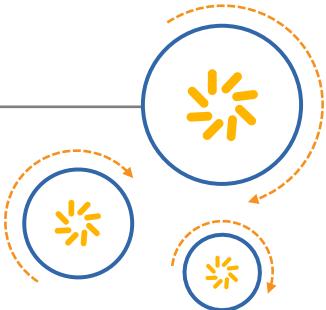




RF360 Europe GmbH

A Qualcomm – TDK Joint Venture



## SAW Components

### SAW Rx 2in1 input diplex 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 diplex filter GSM1900 / GSM1800

**Series/type:** B9817  
**Ordering code:** B39202B9817P810  
**Date:** September 26, 2011  
**Version:** 2.0

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## SAW Components

B9817

### SAW Rx 2in1 input diplex filter

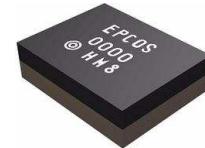
1960.0 / 1842.5 MHz

Data sheet

**SMD**

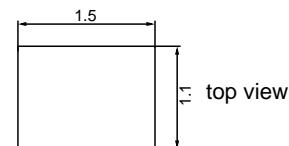
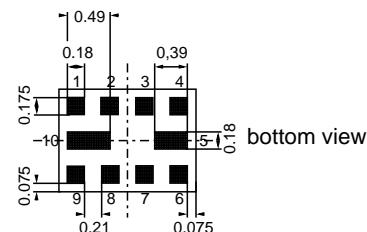
#### Application

- 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



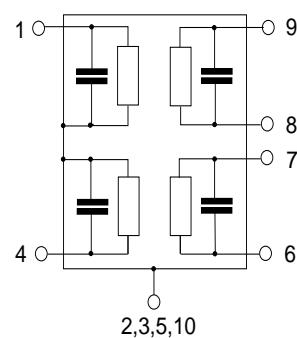
#### Features

- Package size  $1.5 \times 1.1 \times 0.4 \text{ mm}^3$
- 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 [Diplex]
- 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 diplex filter**
**1960.0 / 1842.5 MHz**
**Data sheet**

**Characteristics of Filter 1 (GSM1900)**

 Temperature range for specification:  $T = -30 \text{ }^{\circ}\text{C} \text{ to } +85 \text{ }^{\circ}\text{C}$ 

 Terminating source impedance:  $Z_S = 50 \Omega \parallel 3.3\text{nH}$ 

 Terminating load impedance:  $Z_L = 150 \Omega \parallel 27\text{nH}$ 

		<b>min.</b>	<b>typ. @ 25 °C</b>	<b>max.</b>	
<b>Center frequency</b>	$f_C$	—	1960.0	—	MHz
<b>Maximum insertion attenuation</b> 1930.0 ... 1990.0 MHz	$\alpha_{\max}$	—	2.0	2.9	dB
<b>Amplitude ripple (p-p)</b> 1930.0 ... 1990.0 MHz	$\Delta\alpha$	—	0.9	1.8	dB
<b>Input VSWR</b> 1930.0 ... 1990.0 MHz		—	1.6	2.2	
<b>Output VSWR</b> 1930.0 ... 1990.0 MHz		—	1.8	2.3	
<b>CMRR ( S<sub>21</sub>-S<sub>31</sub> / S<sub>21</sub>+S<sub>31</sub> )</b> 1930.0 ... 1990.0 MHz	20 <sup>1)</sup>	28	—	—	dB
<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 diplex filter****1960.0 / 1842.5 MHz**

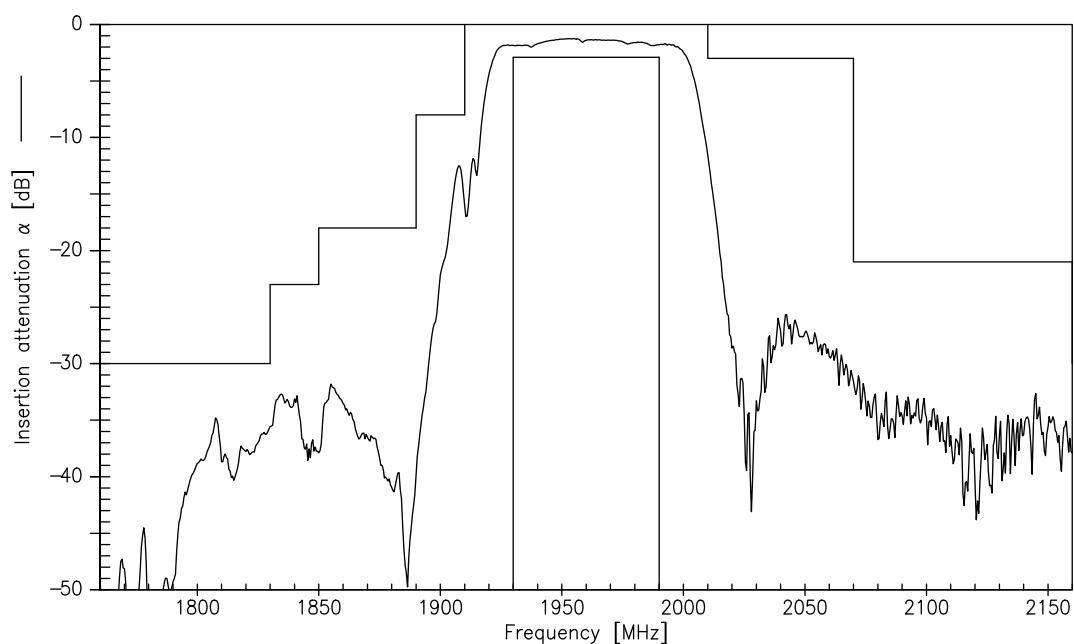
Data sheet

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

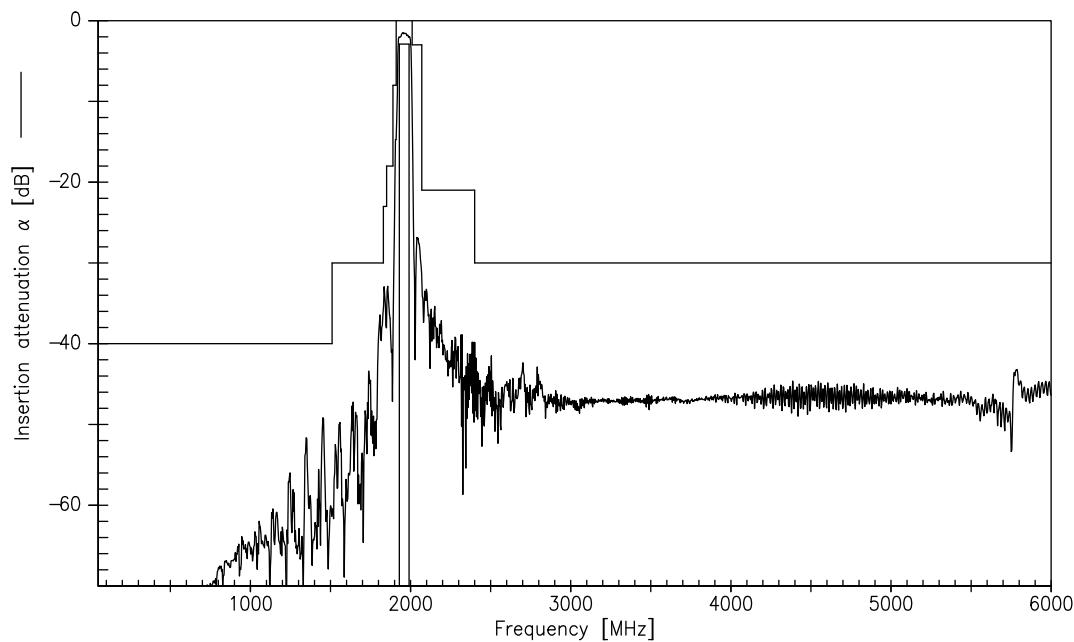
Operable temperature range	T	-40/+85	°C	
Storage temperature range	T <sub>stg</sub>	-40/+85	°C	
DC voltage	V <sub>DC</sub>	5	V	
ESD voltage	V <sub>ESD</sub>	50 <sup>1)</sup>	V	machine model, 1 pulse
Input Power at				
GSM 850, GSM 900	P <sub>IN</sub>	15	dBm	effective power in the on-state,
GSM 1800,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

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

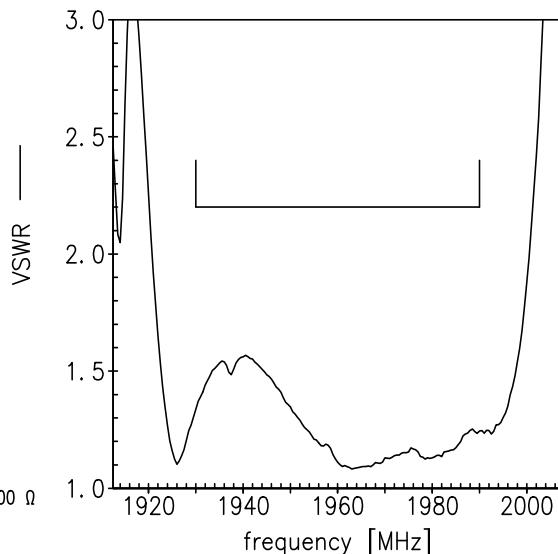
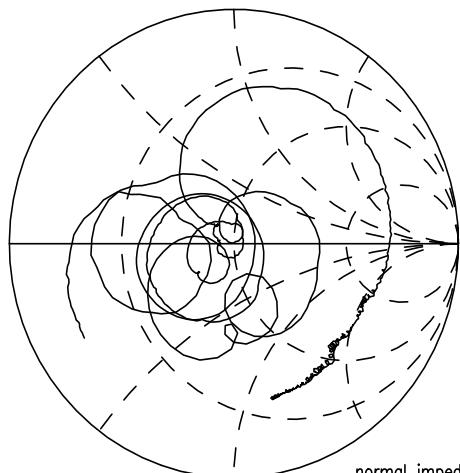
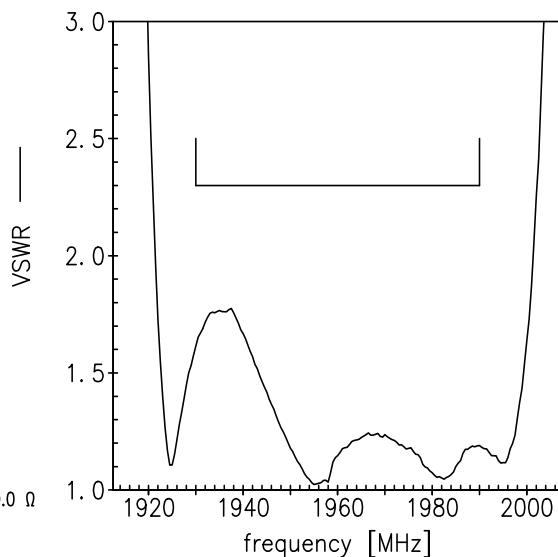
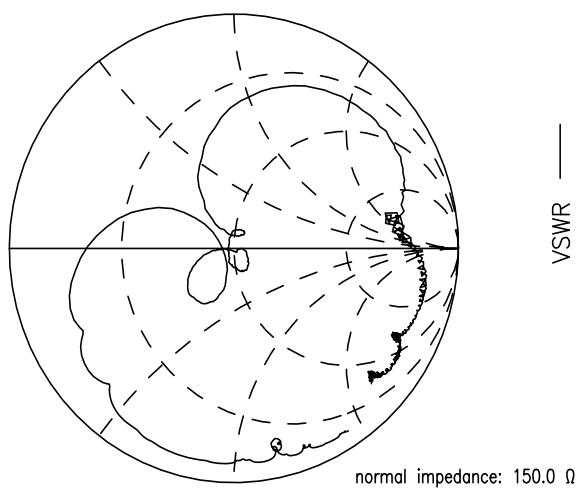
<b>SAW Components</b>	<b>B9817</b>
<b>SAW Rx 2in1 input diplex filter</b>	<b>1960.0 / 1842.5 MHz</b>
<b>Data sheet</b>	
<b>Transfer function Filter 1 (GSM1900)</b>	



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



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

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

 **$S_{22}$  function**


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

**Characteristics of Filter 2 (GSM1800)**

 Temperature range for specification:  $T = -30 \text{ }^{\circ}\text{C} \text{ to } +85 \text{ }^{\circ}\text{C}$ 

 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> 1805.0 ... 1880.0 MHz	$\alpha_{\max}$	—	2.1	2.8	dB
<b>Amplitude ripple (p-p)</b> 1805.0 ... 1880.0 MHz	$\Delta\alpha$	—	1.0	1.8	dB
<b>Input VSWR</b> 1805.0 ... 1880.0 MHz		—	1.7	2.2	
<b>Output VSWR</b> 1805.0 ... 1880.0 MHz		—	1.8	2.2	
<b>CMRR ( S<sub>21</sub>-S<sub>31</sub> / S<sub>21</sub>+S<sub>31</sub> )</b> 1805.0 ... 1880.0 MHz	18 <sup>1)</sup>	23	—	—	dB
<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

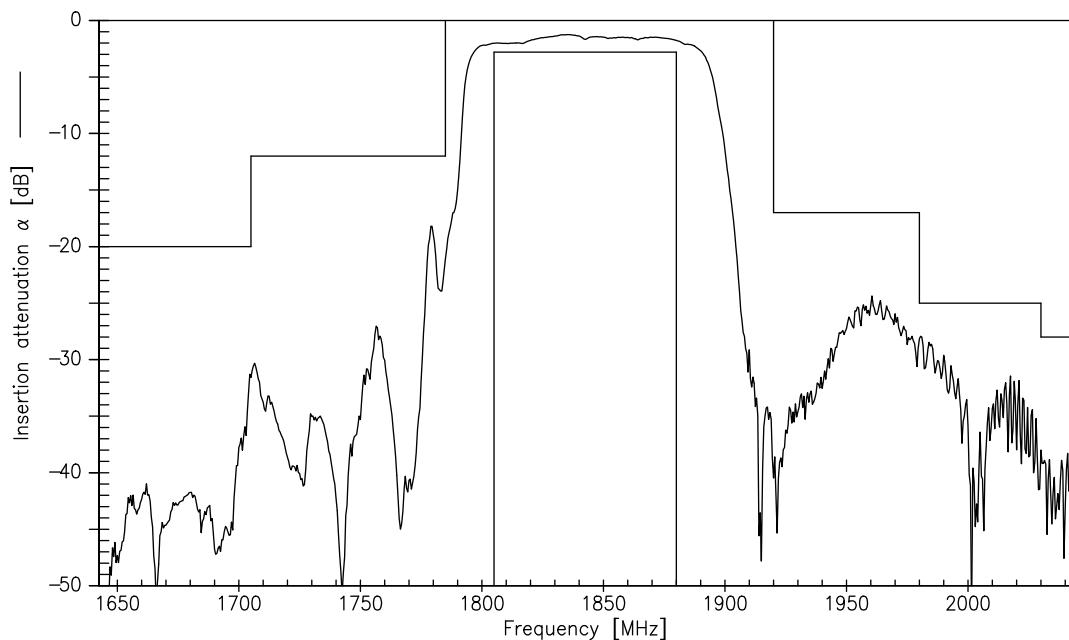
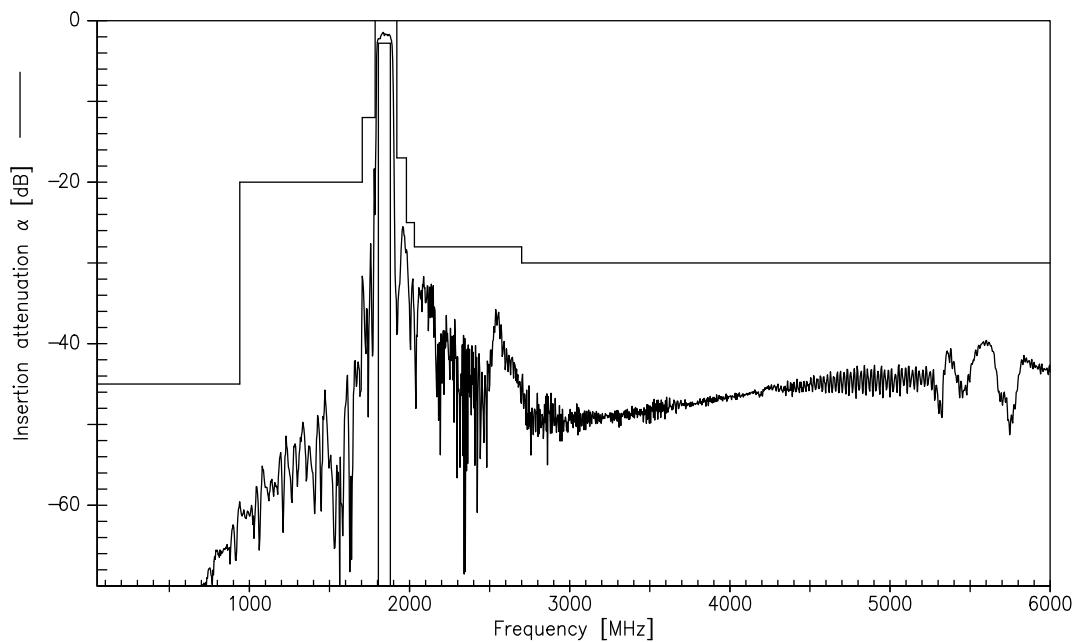
**SAW Components**
**B9817**
**SAW Rx 2in1 input diplex filter**
**1960.0 / 1842.5 MHz**
**Data sheet**

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

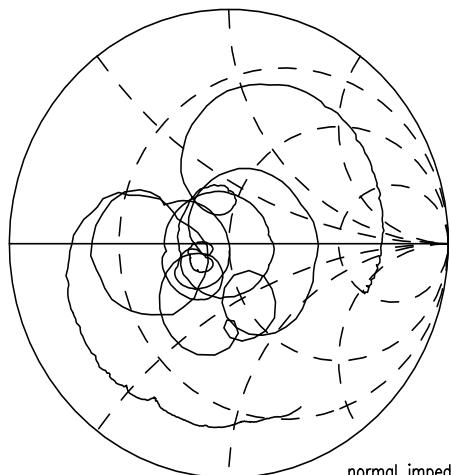
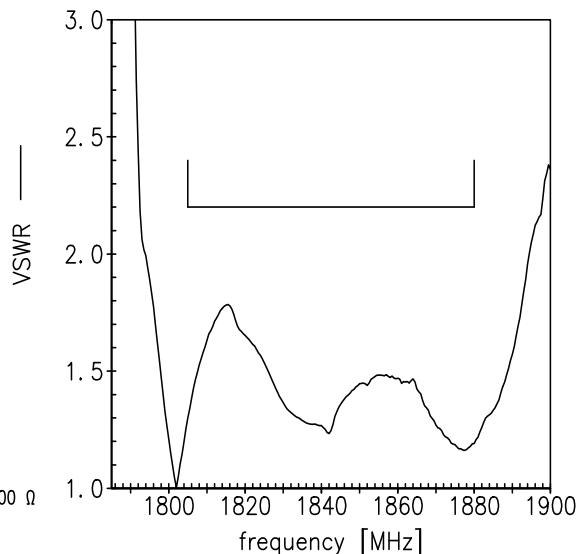
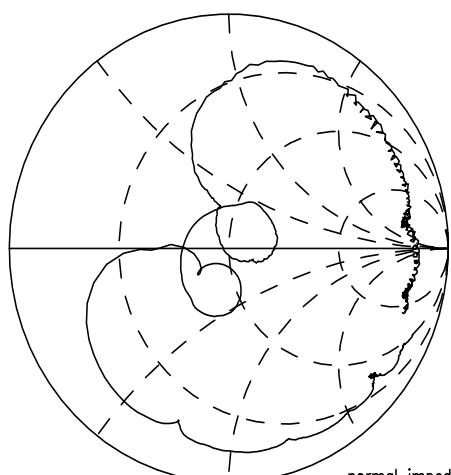
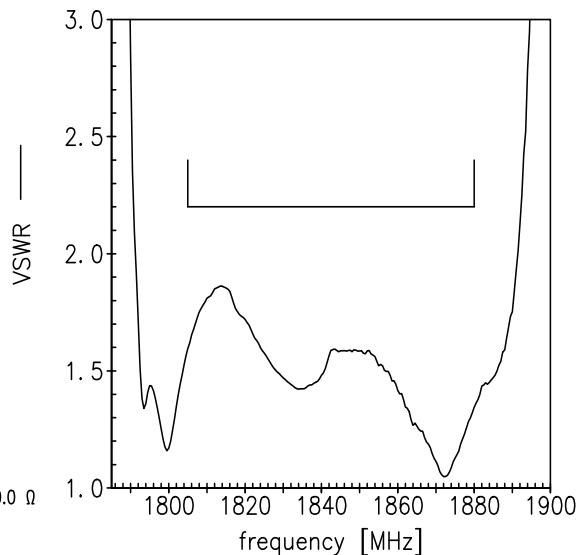
Operable temperature range	T	-40/+85	°C	
Storage temperature range	T <sub>stg</sub>	-40/+85	°C	
DC voltage	V <sub>DC</sub>	5	V	
ESD voltage	V <sub>ESD</sub>	50 <sup>1)</sup>	V	machine model, 1 pulse
Input Power at GSM 850, GSM 900 GSM 1800, GSM 1900	P <sub>IN</sub>	15	dBm	effective power in the on-state,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

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

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

**Transfer function Filter 2 (GSM1800)**

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


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

**Smith charts Filter 2 (GSM1800)**
 **$S_{11}$  function**

normal impedance: 50.00  $\Omega$ 

 **$S_{22}$  function**

normal impedance: 150.0  $\Omega$ 


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

## 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."
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<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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