



# SAW Components

Data Sheet B9203

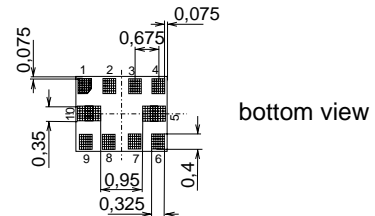




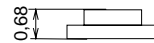
Chip sized SAW package **QCS10F**

**Features**

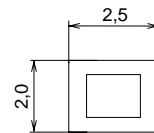
- Low-loss 2-in-1 RF filter for mobile telephone GSM850 and GSM1900 bands, receive path
- Usable passband:  
Filter 1 (GSM1900): 60 MHz  
Filter 2 (GSM850): 25 MHz
- Unbalanced to balanced operation of both filters
- Impedance transformation from 50 Ω to 150 Ω of both filters
- Suitable for GPRS class 1 to 12
- Package for **Surface Mounted Technology (SMT)**



bottom view



side view



top view

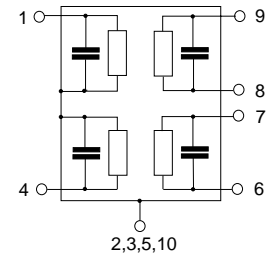
Dimensions in mm, approx weight tbd.

**Terminals**

- Ni, gold-plated

**Pin configuration**

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



Type	Ordering code	Marking and Package according to	Packing according to
B9203	B39202-B9203-G810	C61157-A7-A133	F61074-V8153-Z000

**Electrostatic Sensitive Device (ESD)**

**Maximum ratings**

Operable temperature range	$T$	- 40 / + 85	°C	Machine Model, 10 pulses
Storage temperature range	$T_{stg}$	- 40 / + 85	°C	
DC voltage	$V_{DC}$	3	V	
ESD voltage	$V_{ESD}^*$	50*	V	
Input power at GSM850, GSM900, GSM1800, GSM1900 Tx bands:				peak power of GSM signal, duty cycle 4:8
Filter 1 (GSM1900-Rx)	$P_{IN}$	15	dBm	
Filter 2 (GSM850-Rx)	$P_{IN}$	15	dBm	

\* - acc. to JESD22-A115A (Machine Model), 10 negative & 10 positive pulses



Data Sheet



Characteristics of Filter 1 (GSM1900)

Operating temperature range:  $T = 25\text{ }^{\circ}\text{C}$   
 Terminating source impedance:  $Z_S = 50\ \Omega$   
 Terminating load impedance:  $Z_L = 150\ \Omega \parallel 12\text{nH}$

		min.	typ.	max.	
<b>Center frequency</b>	$f_C$	—	1960,0	—	MHz
<b>Maximum insertion attenuation</b>	$\alpha_{\max}$	—	1,5	1,9	dB
1930,0 ... 1990,0 MHz					
<b>Amplitude ripple (p-p)</b>	$\Delta\alpha$	—	0,7	1,0	dB
1930,0 ... 1990,0 MHz					
<b>Input VSWR</b>		—	1,8	2,2	
1930,0 ... 1990,0 MHz					
<b>Output VSWR</b>		—	1,9	2,2	
1930,0 ... 1990,0 MHz					
<b>Output phase balance (<math>\phi(S_{31}) - \phi(S_{21}) + 180^{\circ}</math>)</b>		-10	-3 / 1	10	degree
1930,0 ... 1990,0 MHz					
<b>Output amplitude balance (<math> S_{31}/S_{21} </math>)</b>		-1,0	-0,5 / 0,2	1,0	dB
1930,0 ... 1990,0 MHz					
<b>Attenuation</b>	$\alpha$				
0,0 ... 1000,0 MHz		40	54	—	dB
1000,0 ... 1810,0 MHz		28	35	—	dB
1810,0 ... 1890,0 MHz		23	29	—	dB
1890,0 ... 1910,0 MHz		12	18	—	dB
2010,0 ... 2070,0 MHz		12	14	—	dB
2070,0 ... 2400,0 MHz		22	29	—	dB
2400,0 ... 2500,0 MHz		35	45	—	dB
2500,0 ... 3860,0 MHz		30	36	—	dB
3860,0 ... 3980,0 MHz		45	62	—	dB
3980,0 ... 5790,0 MHz		30	52	—	dB
5790,0 ... 6000,0 MHz		40	50	—	dB



Data Sheet



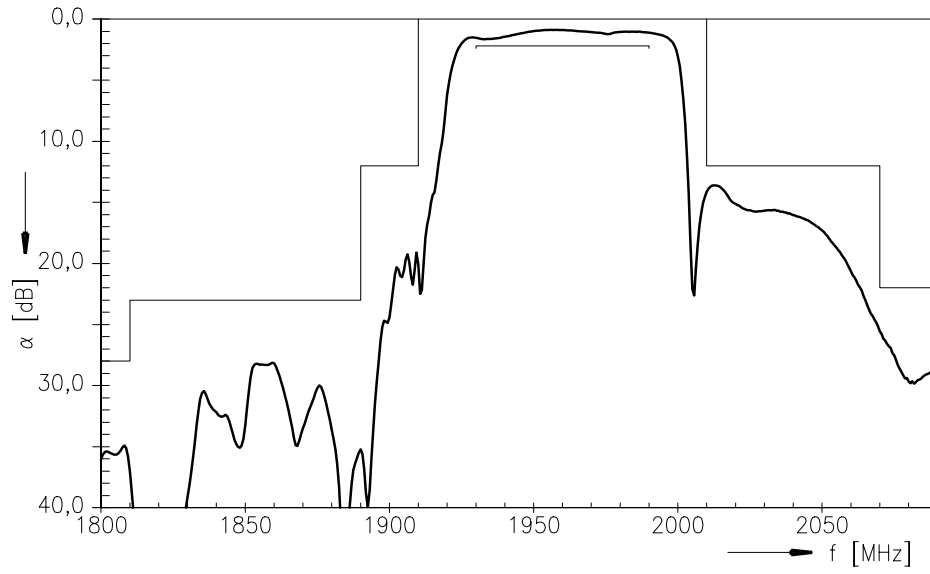
Characteristics of Filter 1 (GSM1900)

Operating temperature range:  $T = -20$  to  $+75$  °C  
 Terminating source impedance:  $Z_S = 50 \Omega$   
 Terminating load impedance:  $Z_L = 150 \Omega \parallel 12\text{nH}$

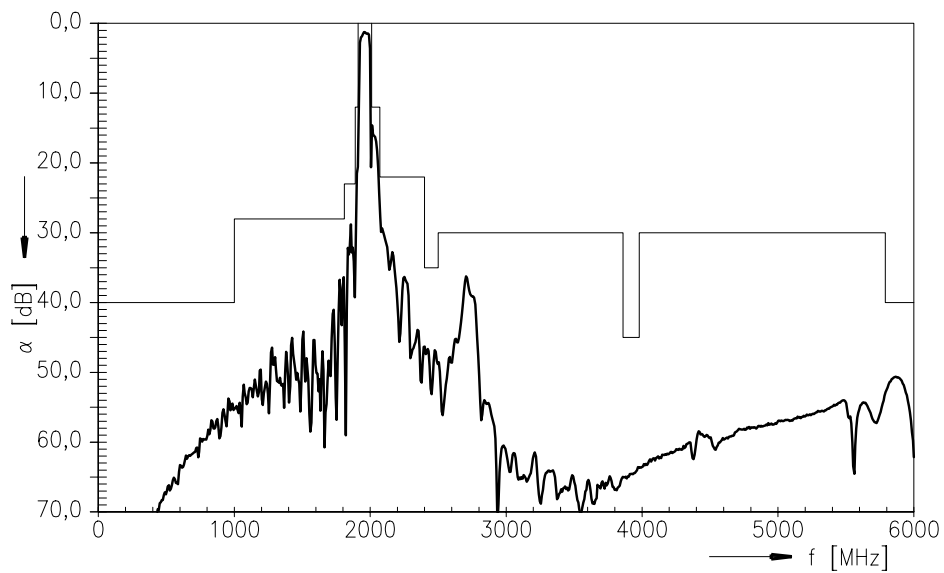
		min.	typ.	max.	
<b>Center frequency</b>	$f_C$	—	1960,0	—	MHz
<b>Maximum insertion attenuation</b>	$\alpha_{\text{max}}$	—	1,5	2,2	dB
1930,0 ... 1990,0 MHz					
<b>Amplitude ripple (p-p)</b>	$\Delta\alpha$	—	0,7	1,3	dB
1930,0 ... 1990,0 MHz					
<b>Input VSWR</b>		—	1,8	2,2	
1930,0 ... 1990,0 MHz					
<b>Output VSWR</b>		—	1,9	2,2	
1930,0 ... 1990,0 MHz					
<b>Output phase balance (<math>\phi(S_{31}) - \phi(S_{21}) + 180^\circ</math>)</b>		-10	-3 / 1	10	degree
1930,0 ... 1990,0 MHz					
<b>Output amplitude balance (<math> S_{31}/S_{21} </math>)</b>		-1,0	-0,5 / 0,2	1,0	dB
1930,0 ... 1990,0 MHz					
<b>Attenuation</b>	$\alpha$				
0,0 ... 1000,0 MHz		40	54	—	dB
1000,0 ... 1810,0 MHz		28	35	—	dB
1810,0 ... 1890,0 MHz		23	29	—	dB
1890,0 ... 1910,0 MHz		12	18	—	dB
2010,0 ... 2070,0 MHz		12	14	—	dB
2070,0 ... 2400,0 MHz		22	29	—	dB
2400,0 ... 2500,0 MHz		35	45	—	dB
2500,0 ... 3860,0 MHz		30	36	—	dB
3860,0 ... 3980,0 MHz		45	62	—	dB
3980,0 ... 5790,0 MHz		30	52	—	dB
5790,0 ... 6000,0 MHz		40	50	—	dB



Transfer function of filter 1 (measured at room temperature):



Transfer function of filter 1 (wideband, measured at room temperature):





**Characteristics of Filter 2 (GSM850)**

Operating temperature range:  $T = 25\text{ °C}$   
 Terminating source impedance:  $Z_S = 50\ \Omega$   
 Terminating load impedance:  $Z_L = 150\ \Omega \parallel 82\text{nH}$

		min.	typ.	max.	
<b>Center frequency</b>	$f_C$	—	881,5	—	MHz
<b>Maximum insertion attenuation</b>	$\alpha_{max}$				
869,0 ... 894,0 MHz		—	1,4	1,7	dB
<b>Amplitude ripple (p-p)</b>	$\Delta\alpha$				
869,0 ... 894,0 MHz		—	0,6	0,9	dB
<b>Input VSWR</b>					
869,0 ... 894,0 MHz		—	1,8	2,1	
<b>Output VSWR</b>					
869,0 ... 894,0 MHz		—	1,8	2,1	
<b>Output phase balance</b> ( $\phi(S_{31}) - \phi(S_{21}) + 180^\circ$ )					
869,0 ... 894,0 MHz		-10	-3 / 2	10	degree
<b>Output amplitude balance</b> ( $ S_{31}/S_{21} $ )					
869,0 ... 894,0 MHz		-1,0	-0,5 / 0,1	1,0	dB
<b>Attenuation</b>					
0,0 ... 434,0 MHz		45	54	—	dB
434,0 ... 447,0 MHz		45	54	—	dB
447,0 ... 849,0 MHz		30	36	—	dB
914,0 ... 1000,0 MHz		24	27	—	dB
1000,0 ... 1300,0 MHz		32	37	—	dB
1300,0 ... 6000,0 MHz		40	45	—	dB



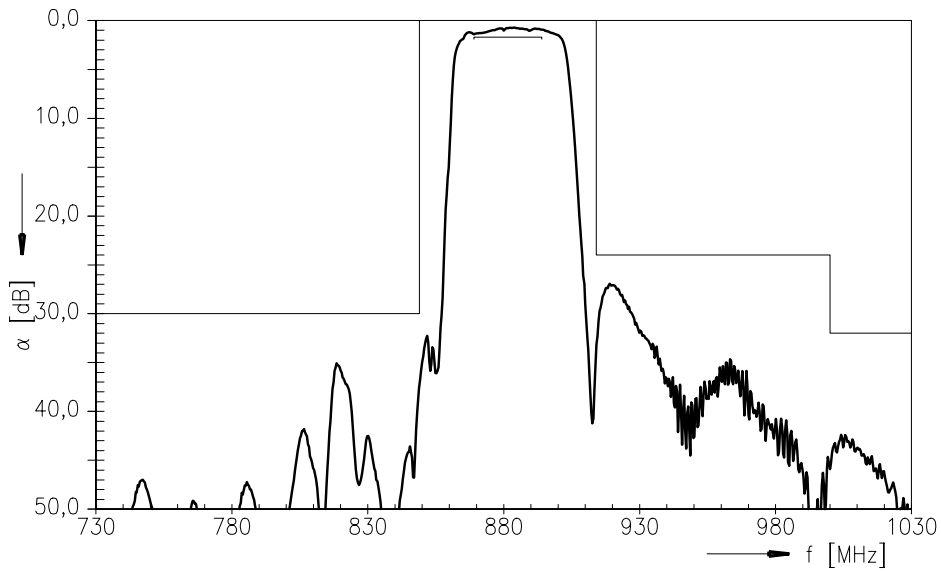
**Characteristics of Filter 2 (GSM850)**

Operating temperature range:  $T = -20$  to  $+75$  °C  
 Terminating source impedance:  $Z_S = 50 \Omega$   
 Terminating load impedance:  $Z_L = 150 \Omega \parallel 82nH$

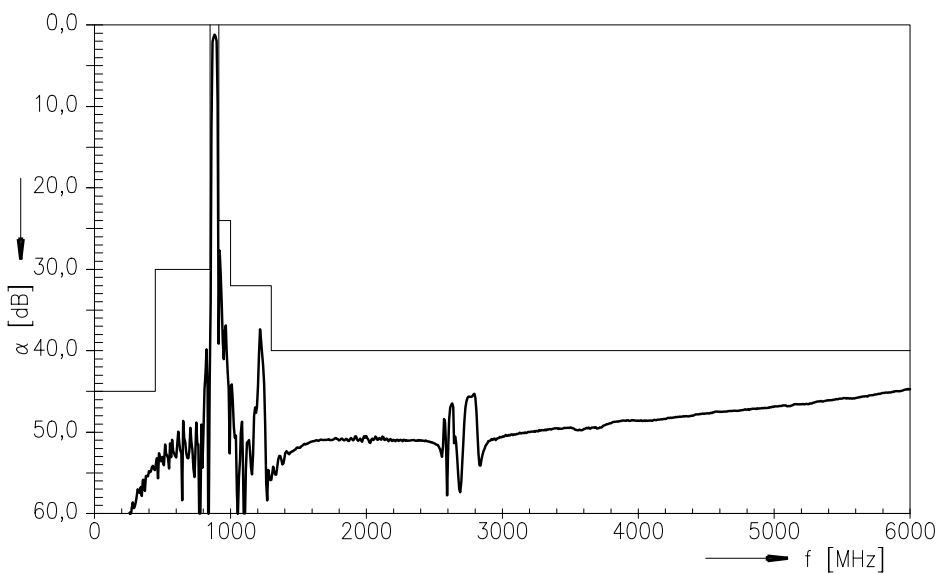
		min.	typ.	max.	
<b>Center frequency</b>	$f_C$	—	881,5	—	MHz
<b>Maximum insertion attenuation</b>	$\alpha_{max}$				
869,0 ... 894,0 MHz		—	1,4	1,7	dB
<b>Amplitude ripple (p-p)</b>	$\Delta\alpha$				
869,0 ... 894,0 MHz		—	0,6	0,9	dB
<b>Input VSWR</b>					
869,0 ... 894,0 MHz		—	1,8	2,1	
<b>Output VSWR</b>					
869,0 ... 894,0 MHz		—	1,8	2,1	
<b>Output phase balance</b> ( $\phi(S_{31}) - \phi(S_{21}) + 180^\circ$ )					
869,0 ... 894,0 MHz		-10	-3 / 2	10	degree
<b>Output amplitude balance</b> ( $ S_{31} / S_{21} $ )					
869,0 ... 894,0 MHz		-1,0	-0,5 / 0,1	1,0	dB
<b>Attenuation</b>					
0,0 ... 434,0 MHz		45	54	—	dB
434,0 ... 447,0 MHz		45	54	—	dB
447,0 ... 849,0 MHz		30	36	—	dB
914,0 ... 1000,0 MHz		24	27	—	dB
1000,0 ... 1300,0 MHz		32	37	—	dB
1300,0 ... 6000,0 MHz		40	45	—	dB



Transfer function of filter 2 (measured at room temperature):



Transfer function of filter 2 (wideband, measured at room temperature):







**SAW Components**

**B9203**

**Low-Loss Dual Band Filter for Mobile Communication**

**1960 / 881,5 MHz**

Data Sheet



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