



# *SAW Components*

*Data Sheet B7820*





**SAW Components**

**B7820**

**Low-Loss Filter for Mobile Communication**

**942,5 MHz**

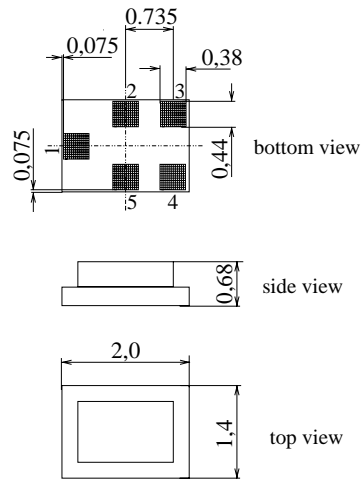
**Data Sheet**



**Features**

- Low-loss RF filter for mobile telephone EGSM system, receive path
- Low amplitude ripple
- Usable passband 35 MHz
- Unbalanced to balanced operation
- Excellent symmetry
- Impedance transformation from 50 Ω to 150 Ω
- Suitable for GPRS class 1 to 12
- Ceramic package for **Surface Mounted Technology (SMT)**

**Chip sized SAW package QCS5C**



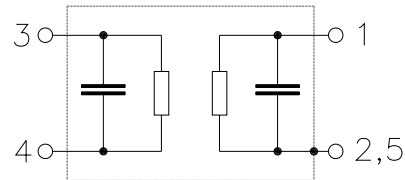
**Terminals**

- Ni, gold-plated

Dimensions in mm, approx. weight 0,007 g

**Pin configuration**

- 1 Input, unbalanced
- 3, 4 Output, balanced
- 2, 5 Case ground



Type	Ordering code	Marking and Package according to	Packing according to
B7820	B39941-B7820-C710	C61157-A7-A111	F61074-V8151-Z000

Electrostatic Sensitive Device (ESD)

**Maximum ratings**

Operable temperature range	$T$	- 30 / + 85	°C	human body model
Storage temperature range	$T_{stg}$	- 40 / + 85	°C	
DC voltage	$V_{DC}$	5	V	
ESD voltage	$V_{ESD}$	250	V	
Input power at GSM850, GSM900, GSM1800, GSM1900 Tx bands	$P_{IN}$	15	dBm	peak power of GSM signal, duty cycle 4:8



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**Characteristics**

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

			min.	typ.	max.	
<b>Center frequency</b>	$f_C$		—	942,5	—	MHz
<b>Maximum insertion attenuation</b>	$\alpha_{max}$					
	925,0 ... 960,0 MHz		—	1,9	2,3	dB
<b>Amplitude ripple (p-p)</b>	$\Delta\alpha$					
	925,0 ... 960,0 MHz		—	0,8	1,4	dB
<b>Input VSWR</b>						
	925,0 ... 960,0 MHz		—	2,0	2,3	
<b>Output VSWR</b>						
	925,0 ... 960,0 MHz		—	2,1	2,3	
<b>Output phase balance</b>	$\phi(S_{31}) - \phi(S_{21})$					
	925,0 ... 960,0 MHz		-5	0	5	degree
<b>Output amplitude balance</b>	$( S_{31}/S_{21} )$					
	925,0 ... 960,0 MHz		-0,5	0	0,5	dB
<b>Attenuation</b>	$\alpha$					
	0,0 ... 880,0 MHz		50	65	—	dB
	880,0 ... 905,0 MHz		30	41	—	dB
	905,0 ... 915,0 MHz		22	26	—	dB
	980,0 ... 1050,0 MHz		27	31	—	dB
	1050,0 ... 2775,0 MHz		50	64	—	dB
	2775,0 ... 2880,0 MHz		54	62	—	dB
	2880,0 ... 6000,0 MHz		50	60	—	dB



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**Characteristics**

Operating temperature range:  $T = -10$  to  $+80$  °C  
 Terminating source impedance:  $Z_S = 50 \Omega$   
 Terminating load impedance:  $Z_L = 150 \Omega$

		min.	typ.	max.	
<b>Center frequency</b>	$f_C$	—	942,5	—	MHz
<b>Maximum insertion attenuation</b>	$\alpha_{max}$	—	1,9	2,7	dB
925,0 ... 960,0 MHz					
<b>Amplitude ripple (p-p)</b>	$\Delta\alpha$	—	0,8	1,8	dB
925,0 ... 960,0 MHz					
<b>Input VSWR</b>		—	2,0	2,3	
925,0 ... 960,0 MHz					
<b>Output VSWR</b>		—	2,1	2,3	
925,0 ... 960,0 MHz					
<b>Output phase balance</b> $\phi(S_{31})-\phi(S_{21})$		-5	0	5	degree
925,0 ... 960,0 MHz					
<b>Output amplitude balance</b> $( S_{31}/S_{21} )$		-0,5	0	0,5	dB
925,0 ... 960,0 MHz					
<b>Attenuation</b>	$\alpha$	50	65	—	dB
0,0 ... 880,0 MHz					
880,0 ... 905,0 MHz		30	38	—	
905,0 ... 915,0 MHz		20	26	—	
980,0 ... 1050,0 MHz		26	29	—	
1050,0 ... 2775,0 MHz		50	64	—	
2775,0 ... 2880,0 MHz		54	62	—	
2880,0 ... 6000,0 MHz		50	60	—	



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**Characteristics**

Operating temperature range:  $T = -20$  to  $+85$  °C  
 Terminating source impedance:  $Z_S = 50 \Omega$   
 Terminating load impedance:  $Z_L = 150 \Omega$

		min.	typ.	max.	
<b>Center frequency</b>	$f_C$	—	942,5	—	MHz
<b>Maximum insertion attenuation</b>	$\alpha_{max}$	—	1,9	2,8	dB
925,0 ... 960,0 MHz					
<b>Amplitude ripple (p-p)</b>	$\Delta\alpha$	—	0,8	1,8	dB
925,0 ... 960,0 MHz					
<b>Input VSWR</b>		—	2,0	2,3	
925,0 ... 960,0 MHz					
<b>Output VSWR</b>		—	2,1	2,3	
925,0 ... 960,0 MHz					
<b>Output phase balance</b> $\phi(S_{31})-\phi(S_{21})$		-5	0	5	degree
925,0 ... 960,0 MHz					
<b>Output amplitude balance</b> $( S_{31}/S_{21} )$		-0,5	0	0,5	dB
925,0 ... 960,0 MHz					
<b>Attenuation</b>	$\alpha$	50	65	—	dB
0,0 ... 880,0 MHz					
880,0 ... 905,0 MHz		30	38	—	
905,0 ... 915,0 MHz		20	26	—	
980,0 ... 1050,0 MHz		25	29	—	
1050,0 ... 2775,0 MHz		50	64	—	
2775,0 ... 2880,0 MHz		54	62	—	
2880,0 ... 6000,0 MHz		50	60	—	



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**Characteristics**

Operating temperature range:  $T = -30$  to  $+80$  °C  
 Terminating source impedance:  $Z_S = 50 \Omega$   
 Terminating load impedance:  $Z_L = 150 \Omega$

		min.	typ.	max.	
<b>Center frequency</b>	$f_C$	—	942,5	—	MHz
<b>Maximum insertion attenuation</b>	$\alpha_{max}$	—	1,9	3,0	dB
925,0 ... 960,0 MHz					
<b>Amplitude ripple (p-p)</b>	$\Delta\alpha$	—	0,8	2,1	dB
925,0 ... 960,0 MHz					
<b>Input VSWR</b>		—	2,0	2,3	
925,0 ... 960,0 MHz					
<b>Output VSWR</b>		—	2,1	2,3	
925,0 ... 960,0 MHz					
<b>Output phase balance</b> $\phi(S_{31})-\phi(S_{21})$		-5	0	5	degree
925,0 ... 960,0 MHz					
<b>Output amplitude balance</b> $( S_{31}/S_{21} )$		-0,5	0	0,5	dB
925,0 ... 960,0 MHz					
<b>Attenuation</b>	$\alpha$	50	65	—	dB
0,0 ... 880,0 MHz					
880,0 ... 905,0 MHz		30	38	—	
905,0 ... 915,0 MHz		20	26	—	
980,0 ... 1050,0 MHz		25	27	—	
1050,0 ... 2775,0 MHz		50	64	—	
2775,0 ... 2880,0 MHz		54	62	—	
2880,0 ... 6000,0 MHz		50	60	—	



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**Characteristics**

Operating temperature range:  $T = +25\text{ }^{\circ}\text{C}$   
 Terminating source impedance:  $Z_S = 50\ \Omega$   
 Terminating load impedance:  $Z_L = 200\ \Omega$  and  $200\ \Omega \parallel 100\ \text{nH}$

			min.	typ.	max.	
<b>Center frequency</b>	$f_C$		—	942,5	—	MHz
<b>Maximum insertion attenuation</b>	$\alpha_{\text{max}}$	925,0 ... 960,0 MHz	—	1,8	2,3	dB
<b>Amplitude ripple (p-p)</b>	$\Delta\alpha$	925,0 ... 960,0 MHz	—	0,8	1,4	dB
<b>Input VSWR</b>		925,0 ... 960,0 MHz	—	1,8	2,3	
<b>Output VSWR</b>		925,0 ... 960,0 MHz	—	1,8	2,3	
<b>Output phase balance</b> $\phi(S_{31})-\phi(S_{21})$		925,0 ... 960,0 MHz	-5	0	5	degree
<b>Output amplitude balance</b> $( S_{31}/S_{21} )$		925,0 ... 960,0 MHz	-0,5	0	0,5	dB
<b>Attenuation</b>	$\alpha$	0,0 ... 880,0 MHz	50	65	—	dB
		880,0 ... 905,0 MHz	30	41	—	dB
		905,0 ... 915,0 MHz	22	26	—	dB
		980,0 ... 1050,0 MHz	27	30	—	dB
		1050,0 ... 2775,0 MHz	50	64	—	dB
		2775,0 ... 2880,0 MHz	54	62	—	dB
		2880,0 ... 6000,0 MHz	50	60	—	dB



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**Characteristics**

Operating temperature range:  $T = -10$  to  $+80$  °C  
 Terminating source impedance:  $Z_S = 50 \Omega$   
 Terminating load impedance:  $Z_L = 200 \Omega$

		min.	typ.	max.	
<b>Center frequency</b>	$f_C$	—	942,5	—	MHz
<b>Maximum insertion attenuation</b>	$\alpha_{max}$	—	1,9	2,7	dB
925,0 ... 960,0 MHz					
<b>Amplitude ripple (p-p)</b>	$\Delta\alpha$	—	0,8	1,8	dB
925,0 ... 960,0 MHz					
<b>Input VSWR</b>		—	1,8	2,3	
925,0 ... 960,0 MHz					
<b>Output VSWR</b>		—	1,8	2,3	
925,0 ... 960,0 MHz					
<b>Output phase balance</b> $\phi(S_{31})-\phi(S_{21})$		-5	0	5	degree
925,0 ... 960,0 MHz					
<b>Output amplitude balance</b> $( S_{31}/S_{21} )$		-0,5	0	0,5	dB
925,0 ... 960,0 MHz					
<b>Attenuation</b>	$\alpha$				
0,0 ... 880,0 MHz		50	65	—	dB
880,0 ... 905,0 MHz		30	38	—	dB
905,0 ... 915,0 MHz		20	26	—	dB
980,0 ... 1050,0 MHz		26	28	—	dB
1050,0 ... 2775,0 MHz		50	64	—	dB
2775,0 ... 2880,0 MHz		54	62	—	dB
2880,0 ... 6000,0 MHz		50	60	—	dB





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**Characteristics**

Operating temperature range:  $T = -20$  to  $+85$  °C  
 Terminating source impedance:  $Z_S = 50 \Omega$   
 Terminating load impedance:  $Z_L = 200 \Omega \parallel 100$  nH

		min.	typ.	max.	
<b>Center frequency</b>	$f_C$	—	942,5	—	MHz
<b>Maximum insertion attenuation</b>	$\alpha_{max}$	—	2,1	3,1	dB
925,0 ... 960,0 MHz					
<b>Amplitude ripple (p-p)</b>	$\Delta\alpha$	—	1,1	2,2	dB
925,0 ... 960,0 MHz					
<b>Input VSWR</b>		—	1,8	2,3	
925,0 ... 960,0 MHz					
<b>Output VSWR</b>		—	1,8	2,3	
925,0 ... 960,0 MHz					
<b>Output phase balance</b> $\phi(S_{31})-\phi(S_{21})$		-5	0	5	degree
925,0 ... 960,0 MHz					
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925,0 ... 960,0 MHz					
<b>Attenuation</b>	$\alpha$				
0,0 ... 880,0 MHz		50	65	—	dB
880,0 ... 905,0 MHz		30	38	—	dB
905,0 ... 915,0 MHz		20	26	—	dB
980,0 ... 1050,0 MHz		25	28	—	dB
1050,0 ... 2775,0 MHz		50	64	—	dB
2775,0 ... 2880,0 MHz		54	62	—	dB
2880,0 ... 6000,0 MHz		50	60	—	dB



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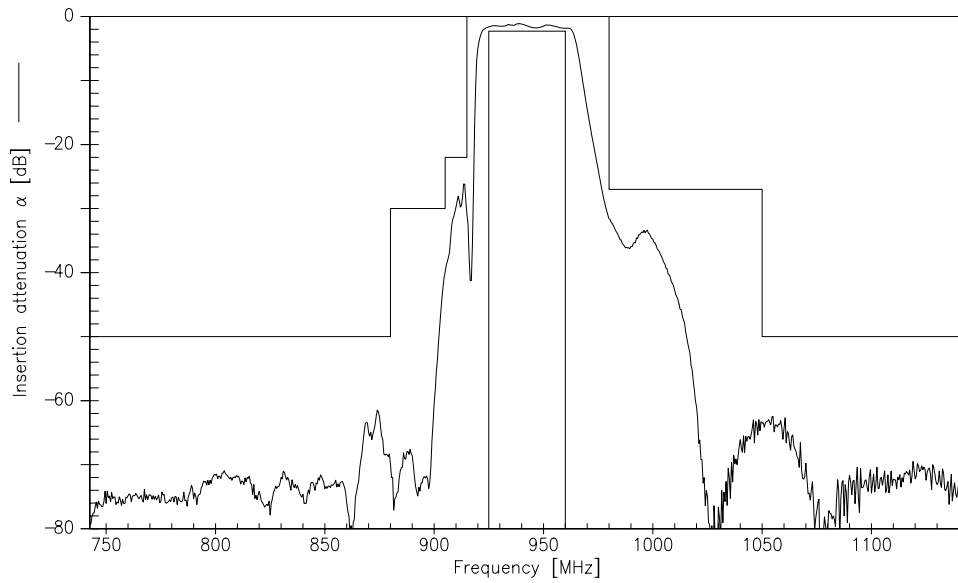
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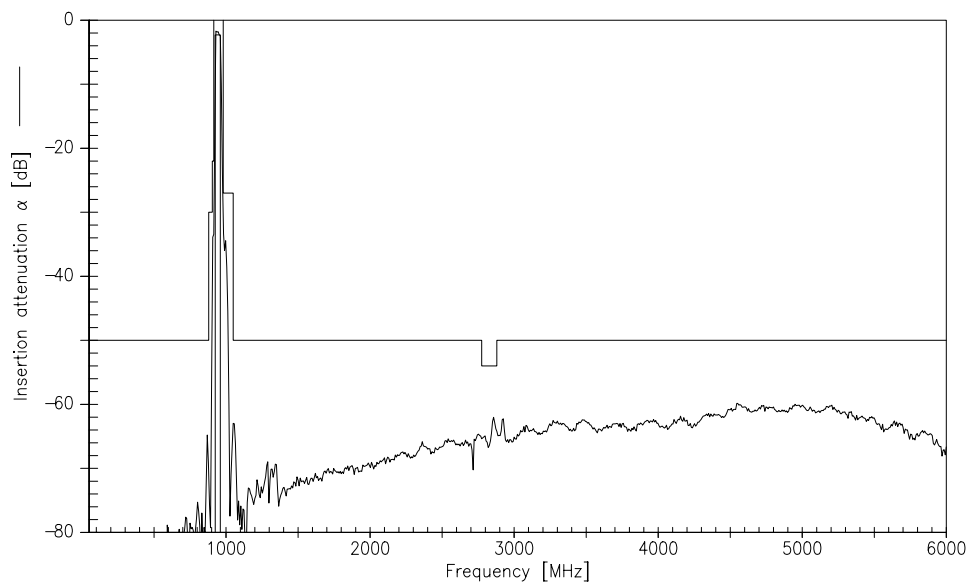
Data Sheet



### Transfer function

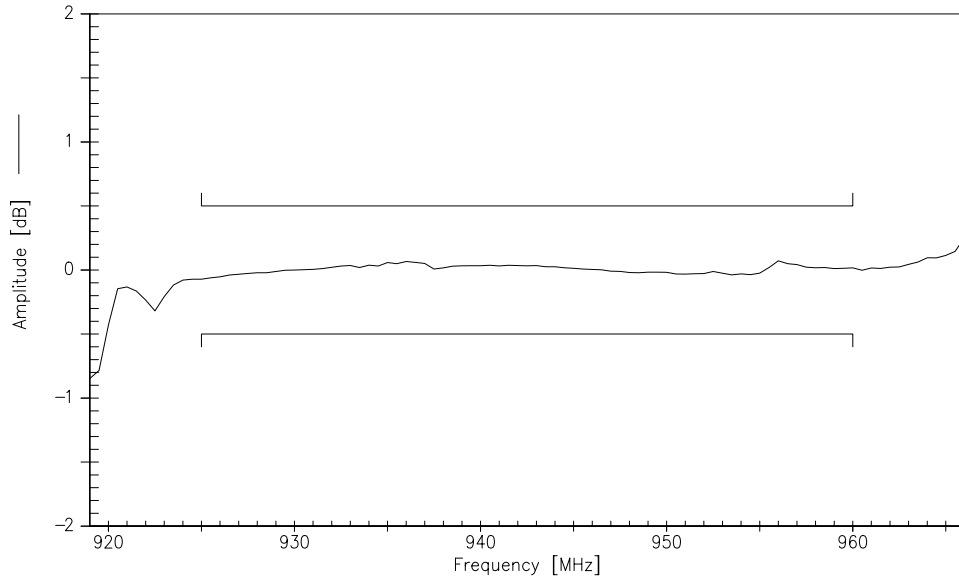


### Transfer function (wideband)

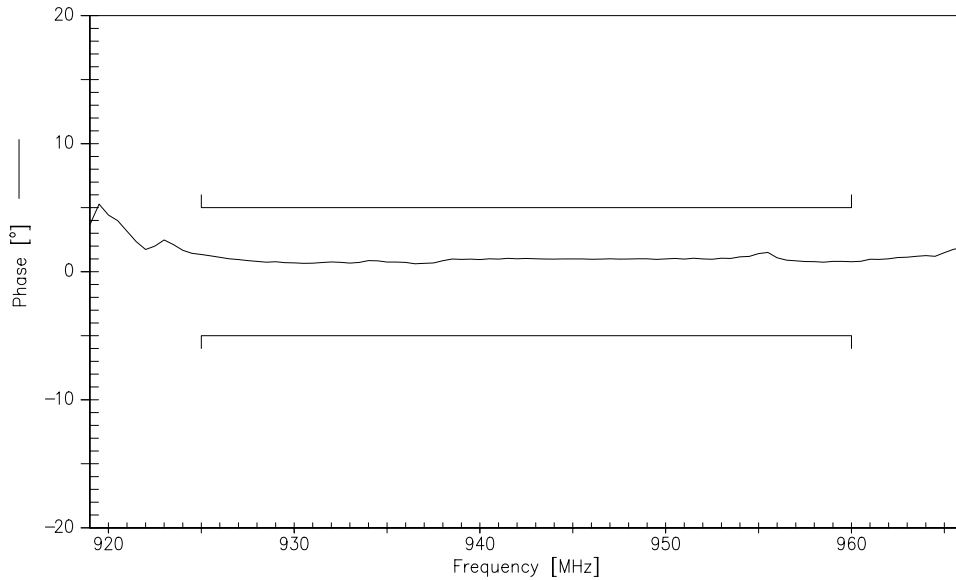




Output amplitude balance ( $|S_{31}|/|S_{21}|$ )



Output phase balance ( $\phi(S_{31}) - \phi(S_{21}) + 180^\circ$ )





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**Published by EPCOS AG**

**Surface Acoustic Wave Components Division, SAW MC WT**

**P.O. Box 80 17 09, 81617 Munich, GERMANY**

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