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# SAW Components

Data Sheet B9300





<b>SAW Components</b>	<b>B9300</b>
<b>Low-Loss Dual Band Filter for Mobile Communication</b>	<b>1842,5 &amp; 1960,0 MHz</b>

Data Sheet



Chip Sized Saw Package **QCS10H**

**Features**

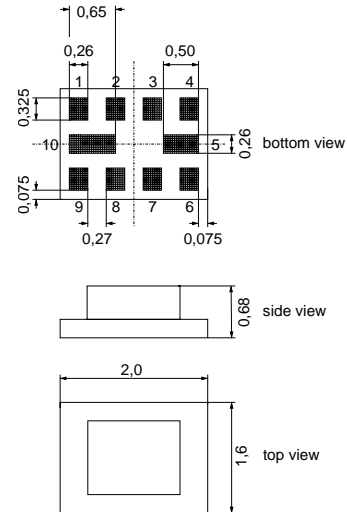
- Low-loss 2-in-1 RF filter for mobile telephone GSM1800 and GSM1900 systems, receive path
- Usable passband:  
Filter 1 (GSM 1900): 60 MHz  
Filter 2 (GSM 1800): 75 MHz
- Unbalanced to balanced operation for both filters
- Impedance transformation from 50 Ω to 150 Ω for both filters
- Suitable for GPRS class 1 to 12
- Package for **Surface Mounted Technology (SMT)**
- Pb-free

**Terminals**

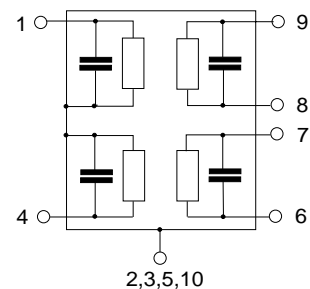
- Ni, gold-plated

**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                 |



Dimensions in mm, approx. weight t.b.d.



Type	Ordering code	Marking and Package according to	Packing according to
B9300	B39202-B9300-G110	C61157-A7-A141	F61074-V8152-Z000

Electrostatic Sensitive Device (ESD)

**Maximum ratings**

Operable temperature range	$T$	- 40 /+ 85	°C	
Storage temperature range	$T_{stg}$	- 40 /+ 85	°C	
DC voltage	$V_{DC}$	5	V	
ESD voltage	$V_{ESD}$	50	V	
Input power at GSM850, GSM900, GSM1800, GSM1900 TX bands	$P_{IN}$	15	dBm	

machine model, 10 pulses<sup>1)</sup>  
effective power in the on-state, duty cycle 4:8

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



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**Characteristics of Filter 1 (GSM 1900)**

Operating temperature range:  $T = 25\text{ °C}$   
 Terminating source impedance:  $Z_S = 50\ \Omega$   
 Terminating load impedance:  $Z_L = 150\ \Omega \parallel 18\text{nH}$  (balanced)

		min.	typ.	max.	
<b>Center frequency</b>	$f_c$	—	1960,0	—	MHz
<b>Maximum insertion attenuation</b>	$\alpha_{\max}$	—	1,6	2,1	dB
	1930,0 ... 1990,0MHz				
<b>Amplitude ripple (p-p)</b>	$\Delta\alpha$	—	0,5	1,0	dB
	1930,0 ... 1990,0MHz				
<b>Input VSWR</b>		—	1,7	2,0	
	1930,0 ... 1990,0MHz				
<b>Output VSWR</b>		—	1,7	2,0	
	1930,0 ... 1990,0MHz				
<b>Output phase balance (<math>\Phi(S_{31}) - \Phi(S_{21}) + 180^\circ</math>)</b>		-10	-2/+4	+10	degree
	1930,0 ... 1990,0MHz				
<b>Output amplitude balance (<math> S_{31}/S_{21} </math>)</b>		-1,2	-0,6/+0,6	+1,2	dB
	1930,0 ... 1990,0MHz				
<b>Attenuation</b>	$\alpha_{\min}$				
	10,0 ... 1510,0MHz	40,0	43	—	dB
	1510,0 ... 1830,0MHz	30,0	36	—	dB
	1830,0 ... 1850,0MHz	26,0	32	—	dB
	1850,0 ... 1890,0MHz	23,0	28	—	dB
	1890,0 ... 1910,0MHz	13,0	18	—	dB
	2010,0 ... 2070,0MHz	13,0	15	—	dB
	2070,0 ... 2400,0MHz	22,0	26	—	dB
	2400,0 ... 6000,0MHz	30,0	34	—	dB



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Data Sheet



**Characteristics of Filter 1 (GSM 1900)**

Operating temperature range:  $T = -20$  to  $+75$  °C  
 Terminating source impedance:  $Z_S = 50 \Omega$   
 Terminating load impedance:  $Z_L = 150 \Omega \parallel 18nH$  (balanced)

		min.	typ.	max.	
<b>Center frequency</b>	$f_c$	—	1960,0	—	MHz
<b>Maximum insertion attenuation</b>	$\alpha_{max}$	—	1,7	2,3	dB
	1930,0 ... 1990,0MHz				
<b>Amplitude ripple (p-p)</b>	$\Delta\alpha$	—	0,6	1,3	dB
	1930,0 ... 1990,0MHz				
<b>Input VSWR</b>		—	1,7	2,0	
	1930,0 ... 1990,0MHz				
<b>Output VSWR</b>		—	1,7	2,0	
	1930,0 ... 1990,0MHz				
<b>Output phase balance (<math>\Phi(S_{31}) - \Phi(S_{21}) + 180^\circ</math>)</b>		-10	-3/+5	+10	degree
	1930,0 ... 1990,0MHz				
<b>Output amplitude balance (<math> S_{31}/S_{21} </math>)</b>		-1,2	-0,7/+0,7	+1,2	dB
	1930,0 ... 1990,0MHz				
<b>Attenuation</b>	$\alpha_{min}$				
	10,0 ... 1510,0MHz	40,0	43	—	dB
	1510,0 ... 1830,0MHz	30,0	35	—	dB
	1830,0 ... 1850,0MHz	26,0	32	—	dB
	1850,0 ... 1890,0MHz	23,0	27	—	dB
	1890,0 ... 1910,0MHz	12,0	16	—	dB
	2010,0 ... 2070,0MHz	12,0	15	—	dB
	2070,0 ... 2400,0MHz	21,0	24	—	dB
	2400,0 ... 6000,0MHz	30,0	34	—	dB



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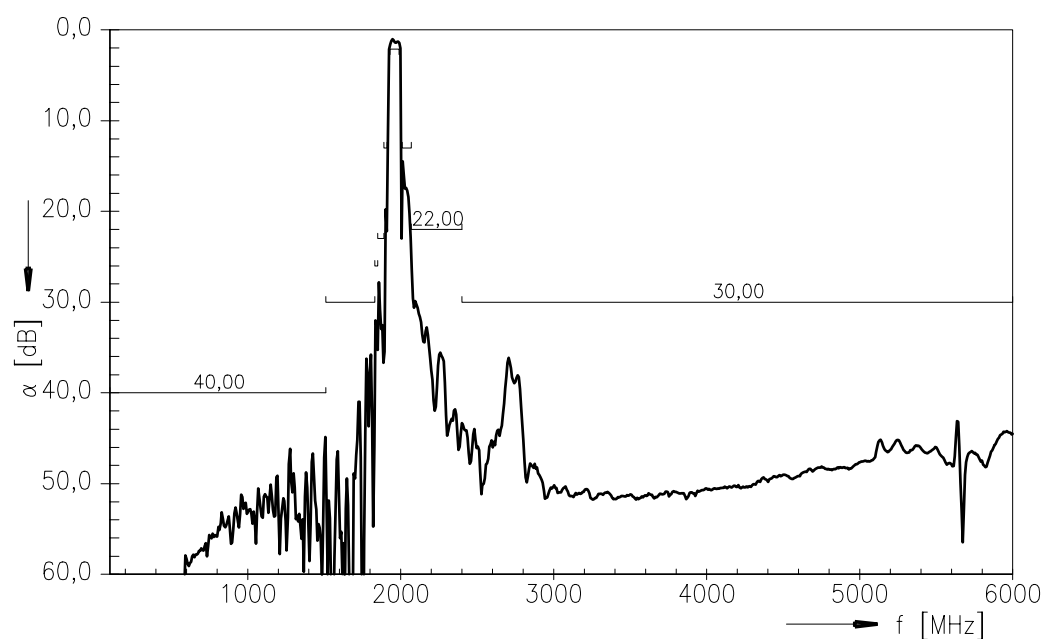
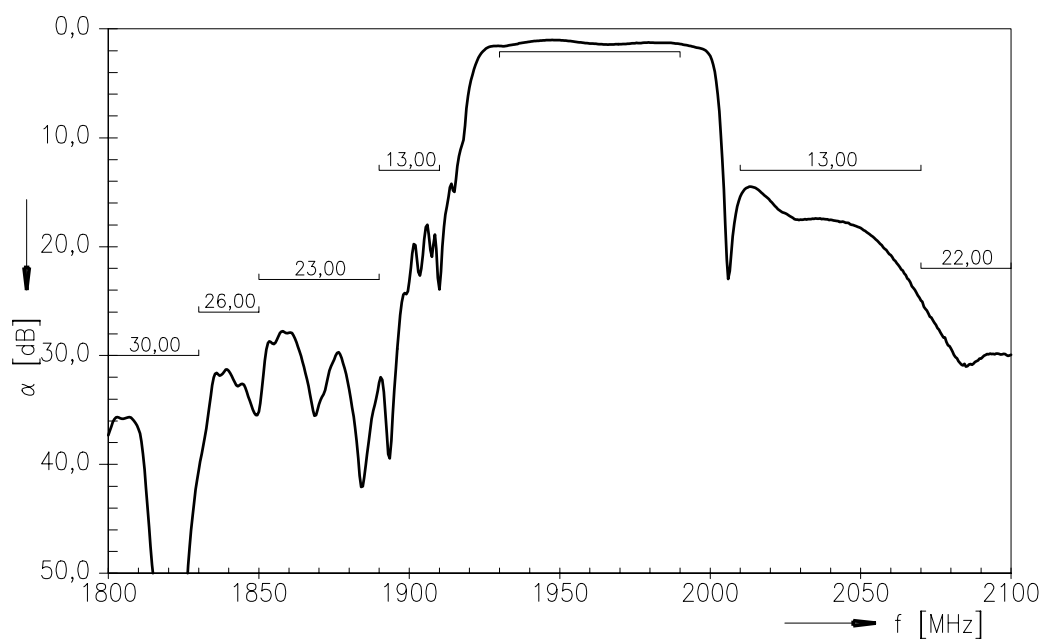
Low-Loss Dual Band Filter for Mobile Communication

1842,5 & 1960,0 MHz

Data Sheet



Transfer Function of Filter 1 (GSM 1900)





<b>SAW Components</b>	<b>B9300</b>
<b>Low-Loss Dual Band Filter for Mobile Communication</b>	<b>1842,5 &amp; 1960,0 MHz</b>
<b>Data Sheet</b>	<b>SMD</b>

**Characteristics of Filter 2 (GSM1800)**

Operating temperature range:  $T = 25\text{ °C}$   
 Terminating source impedance:  $Z_S = 50\ \Omega$   
 Terminating load impedance:  $Z_L = 150\ \Omega \parallel 15\text{nH}$  (balanced)

		<b>min.</b>	<b>typ.</b>	<b>max.</b>	
<b>Center frequency</b>	$f_c$	—	1842,5	—	MHz
<b>Maximum insertion attenuation</b>	$\alpha_{\max}$				
1805,0 ... 1880,0MHz		—	1,6	2,1	dB
<b>Amplitude ripple</b>	$\Delta\alpha$				
1805,0 ... 1880,0MHz		—	0,5	1,0	dB
<b>Input VSWR</b>					
1805,0 ... 1880,0MHz		—	1,8	2,2	
<b>Output VSWR</b>					
1805,0 ... 1880,0MHz		—	1,7	2,2	
<b>Output phase balance (<math>\Phi(S_{31}) - \Phi(S_{21}) + 180^\circ</math>)</b>					
1805,0 ... 1880,0MHz		- 10	-3/+3	+10	degree
<b>Output amplitude balance (<math> S_{31}/S_{21} </math>)</b>					
1805,0 ... 1880,0MHz		-1,0	-0,6/+0,4	+1,0	dB
<b>Attenuation</b>	$\alpha_{\min}$				
10,0 ... 902,0MHz		30,0	52	—	dB
902,0 ... 940,0MHz		45,0	52	—	dB
940,0 ... 1705,0MHz		28,0	42	—	dB
1705,0 ... 1785,0MHz		13,0	18	—	dB
1920,0 ... 1980,0MHz		17,0	23	—	dB
1980,0 ... 2030,0MHz		24,0	28	—	dB
2030,0 ... 2400,0MHz		28,0	34	—	dB
2400,0 ... 6000,0MHz		28,0	32	—	dB



<b>SAW Components</b>	<b>B9300</b>
<b>Low-Loss Dual Band Filter for Mobile Communication</b>	<b>1842,5 &amp; 1960,0 MHz</b>

Data Sheet



**Characteristics of Filter 2 (GSM1800)**

Operating temperature range:  $T = -20$  to  $+75$  °C  
 Terminating source impedance:  $Z_S = 50 \Omega$   
 Terminating load impedance:  $Z_L = 150 \Omega \parallel 15nH$  (balanced)

		min.	typ.	max.	
<b>Center frequency</b>	$f_c$	—	1842,5	—	MHz
<b>Maximum insertion attenuation</b>	$\alpha_{max}$	—	1,8	2,3	dB
	1805,0 ... 1880,0MHz				
<b>Amplitude ripple</b>	$\Delta\alpha$	—	0,7	1,3	dB
	1805,0 ... 1880,0MHz				
<b>Input VSWR</b>		—	1,8	2,2	
	1805,0 ... 1880,0MHz				
<b>Output VSWR</b>		—	1,7	2,2	
	1805,0 ... 1880,0MHz				
<b>Output phase balance (<math>\Phi(S_{31}) - \Phi(S_{21}) + 180^\circ</math>)</b>		- 10	-3/+3	+10	degree
	1805,0 ... 1880,0MHz				
<b>Output amplitude balance (<math> S_{31}/S_{21} </math>)</b>		-1,0	-0,7/+0,5	+1,0	dB
	1805,0 ... 1880,0MHz				
<b>Attenuation</b>	$\alpha_{min}$				
	10,0 ... 902,0MHz	30,0	52	—	dB
	902,0 ... 940,0MHz	45,0	52	—	dB
	940,0 ... 1705,0MHz	28,0	42	—	dB
	1705,0 ... 1785,0MHz	12,0	15	—	dB
	1920,0 ... 1980,0MHz	17,0	23	—	dB
	1980,0 ... 2030,0MHz	24,0	28	—	dB
	2030,0 ... 2400,0MHz	28,0	34	—	dB
	2400,0 ... 6000,0MHz	28,0	32	—	dB



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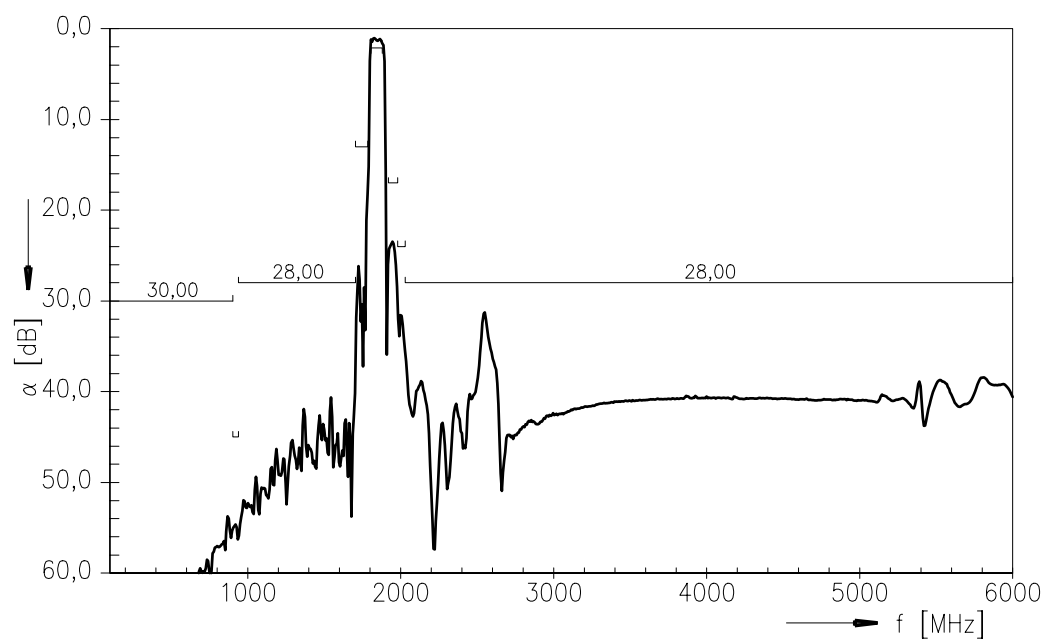
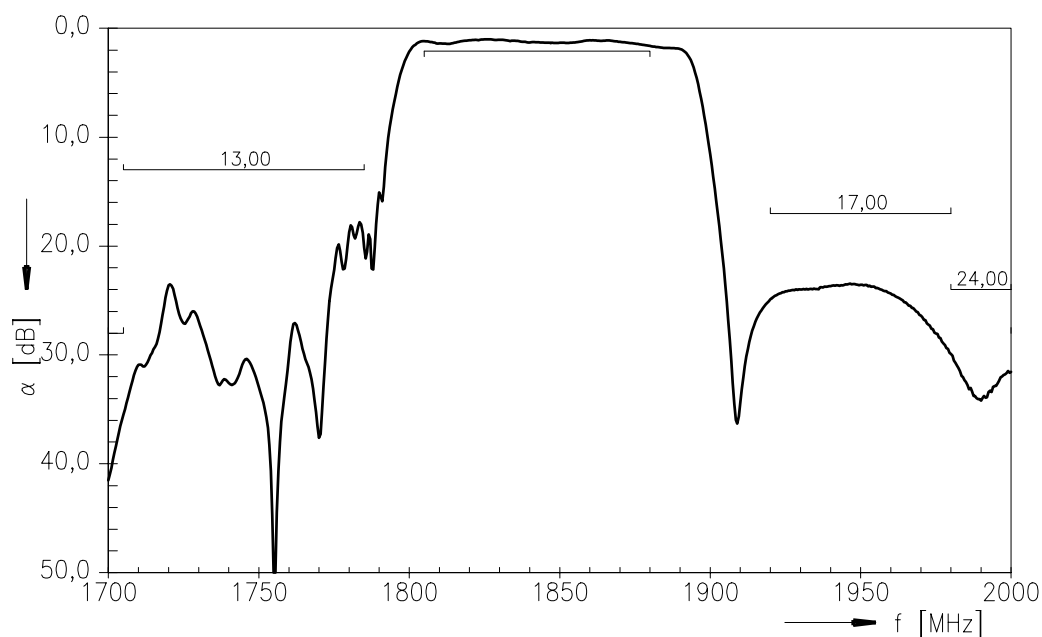
Low-Loss Dual Band Filter for Mobile Communication

1842,5 & 1960,0 MHz

Data Sheet



Transfer Function of Filter 2 (GSM 1800)







<b>SAW Components</b>	<b>B9300</b>
<b>Low-Loss Dual Band Filter for Mobile Communication</b>	<b>1842,5 &amp; 1960,0 MHz</b>
Data Sheet	The SMD logo is a stylized, bold, sans-serif font with a horizontal line through the middle of the letters, giving it a modern, industrial appearance.

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