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# SAW Components

Data Sheet B3881

Data Sheet

EP



## SAW Components

B3881

### Low-Loss Filter

168,96 MHz

#### Data Sheet

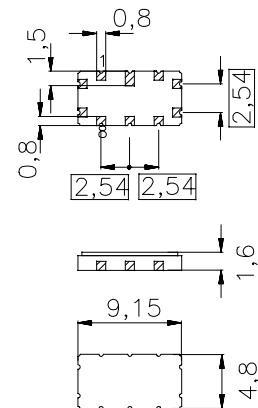
Ceramic package QCC10B

#### Features

- High performance IF bandpass filter
- Multichannel W-CDMA and CDMA capable
- Hermetically sealed ceramic package
- unbalanced to unbalanced and unbalanced to balanced operation possible

#### Terminals

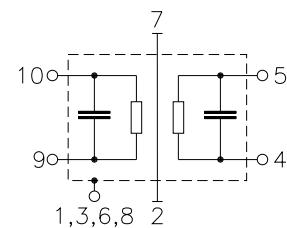
- Gold plated



Dimensions in mm, approx. weight 0,23 g

#### Pin configuration

9	Input
10	Input ground
4	Output
5	Output ground or balanced output
2, 7	Ground
1, 3, 6, 8	To be grounded



Type	Ordering code	Marking and Package according to	Packing according to
B3881	B39171-B3881-Z710	C61157-A7-A49	F61074-V8172-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	
Source power	$P_s$	10	dBm	



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### Characteristics

Operating temperature:	$T = +35 \dots +85^\circ\text{C}$			
Terminating source impedance:	$Z_S = 50 \Omega$ single ended and matching network			
Terminating load impedance:	$Z_S = 50 \Omega$ single ended and matching network			

		min.	typ.	max.	
<b>Nominal frequency</b>	$f_N$	—	168,96	—	MHz
<b>Minimum insertion attenuation</b> (including matching network)	$\alpha_{\min}$	—	18,5	20,5	dB
<b>Passband width</b>					
$\alpha_{\text{rel}} \leq 1 \text{ dB}$	$B_{1\text{dB}}$	—	14,1	—	MHz
$\alpha_{\text{rel}} \leq 2 \text{ dB}$	$B_{2\text{dB}}$	—	14,5	—	MHz
$\alpha_{\text{rel}} \leq 40 \text{ dB}$	$B_{40\text{dB}}$	—	17,1	—	MHz
<b>Amplitude ripple (p-p)</b>	$\Delta\alpha$				
$f_N \pm 6,67 \text{ MHz}$		—	0,6	0,9	dB
<b>Group delay ripple (p-p)</b>	$\Delta\tau$				
$f_N \pm 6,67 \text{ MHz}$		—	80	120	ns
<b>Phase Linearity<sup>1)</sup> (rms)</b>	$\Delta\phi$				
$f_N \pm 1,92 \text{ MHz}$		—	0,5	1,0	°
$f_N - 5,0 \text{ MHz} \pm 1,92 \text{ MHz}$		—	1,5	2,0	°
$f_N + 5,0 \text{ MHz} \pm 1,92 \text{ MHz}$		—	0,9	1,5	°
$f_N + k^*1,25 \text{ MHz} \pm 0,6144 \text{ MHz}$		—	0,7	1,3	°
<b>Average Error Vector Magnitude 1)</b>	$EVM$				
$f_N \pm 1,92 \text{ MHz}$		—	1,3	3,0	%
$f_N - 5,0 \text{ MHz} \pm 1,92 \text{ MHz}$		—	3,0	4,0	%
$f_N + 5,0 \text{ MHz} \pm 1,92 \text{ MHz}$		—	2,5	4,0	%
$f_N + k^*1,25 \text{ MHz} \pm 0,6144 \text{ MHz}$		—	1,8	4,0	%
<b>Relative attenuation</b> (relative to $\alpha_{\min}$ )	$\alpha_{\text{rel}}$				
$f_N \pm 7,5 \text{ MHz} \dots f_N \pm 17,5 \text{ MHz}$		2	4	—	dB
$f_N \pm 17,5 \text{ MHz} \dots f_N \pm 21,5 \text{ MHz}$		41	45	—	dB
$f_N \pm 21,5 \text{ MHz} \dots f_N \pm 25,5 \text{ MHz}$		43	48	—	dB
$f_N \pm 25,5 \text{ MHz} \dots f_N \pm 66,0 \text{ MHz}$		45	50	—	dB
$f_N \pm 66,0 \text{ MHz} \dots f_N \pm 111,0 \text{ MHz}$		40	45	—	dB
<b>Temperature coefficient of frequency</b>	$TC_f$	—	-18	—	ppm/K

1) Phase Linearity/Average Error Vector Magnitude:where  $k = (-5, -4 \dots +5)$



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Characteristics							
Operating temperature:		$T = 0 \dots +85^\circ\text{C}$					
Terminating source impedance:		$Z_S = 50 \Omega$ single ended and matching network					
Terminating load impedance:		$Z_S = 50 \Omega$ single ended and matching network					
<b>Nominal frequency</b>	$f_N$	—	168,96	— MHz			
<b>Minimum insertion attenuation</b> (including matching network)	$\alpha_{\min}$	—	18,5	20,5 dB			
<b>Passband width</b>							
$\alpha_{\text{rel}} \leq 1 \text{ dB}$	$B_{1\text{dB}}$	—	14,1	— MHz			
$\alpha_{\text{rel}} \leq 2 \text{ dB}$	$B_{2\text{dB}}$	—	14,5	— MHz			
$\alpha_{\text{rel}} \leq 40 \text{ dB}$	$B_{40\text{dB}}$	—	17,1	— MHz			
<b>Amplitude ripple</b> (p-p)	$\Delta\alpha$						
$f_N \pm 6,67 \text{ MHz}$		—	0,6	0,9 dB			
<b>Group delay ripple</b> (p-p)	$\Delta\tau$						
$f_N \pm 6,67 \text{ MHz}$		—	80	120 ns			
<b>Phase Linearity<sup>1)</sup></b> (rms)	$\Delta\phi$						
$f_N \pm 1,92 \text{ MHz}$		—	0,5	1,0 °			
$f_N - 5,0 \text{ MHz} \pm 1,92 \text{ MHz}$		—	1,5	2,5 °			
$f_N + 5,0 \text{ MHz} \pm 1,92 \text{ MHz}$		—	0,9	1,5 °			
$f_N + k^*1,25 \text{ MHz} \pm 0,6144 \text{ MHz}$		—	0,7	1,3 °			
<b>Average Error Vector Magnitude 1)</b>	$EVM$						
$f_N \pm 1,92 \text{ MHz}$		—	1,3	3,0 %			
$f_N - 5,0 \text{ MHz} \pm 1,92 \text{ MHz}$		—	3,0	4,5 %			
$f_N + 5,0 \text{ MHz} \pm 1,92 \text{ MHz}$		—	2,5	4,0 %			
$f_N + k^*1,25 \text{ MHz} \pm 0,6144 \text{ MHz}$		—	1,8	4,0 %			
<b>Relative attenuation</b> (relative to $\alpha_{\min}$ )	$\alpha_{\text{rel}}$						
$f_N - 7,5 \text{ MHz} \dots f_N - 17,5 \text{ MHz}$		2	4	— dB			
$f_N + 7,5 \text{ MHz} \dots f_N + 17,5 \text{ MHz}$		1,5	4	— dB			
$f_N \pm 17,5 \text{ MHz} \dots f_N \pm 21,5 \text{ MHz}$		41	45	— dB			
$f_N \pm 21,5 \text{ MHz} \dots f_N \pm 25,5 \text{ MHz}$		43	48	— dB			
$f_N \pm 25,5 \text{ MHz} \dots f_N \pm 66,0 \text{ MHz}$		45	50	— dB			
$f_N \pm 66,0 \text{ MHz} \dots f_N \pm 111,0 \text{ MHz}$		40	45	— dB			
<b>Temperature coefficient of frequency</b>	$TC_f$	—	-18	— ppm/K			

1) Phase Linearity/Average Error Vector Magnitude:where  $k = (-5, -4 \dots +5)$



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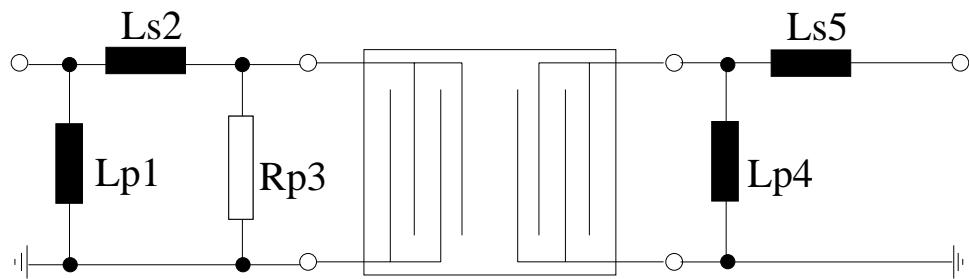
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**Matching network to 50 Ohm:**

(Element values depend upon PCB layout)



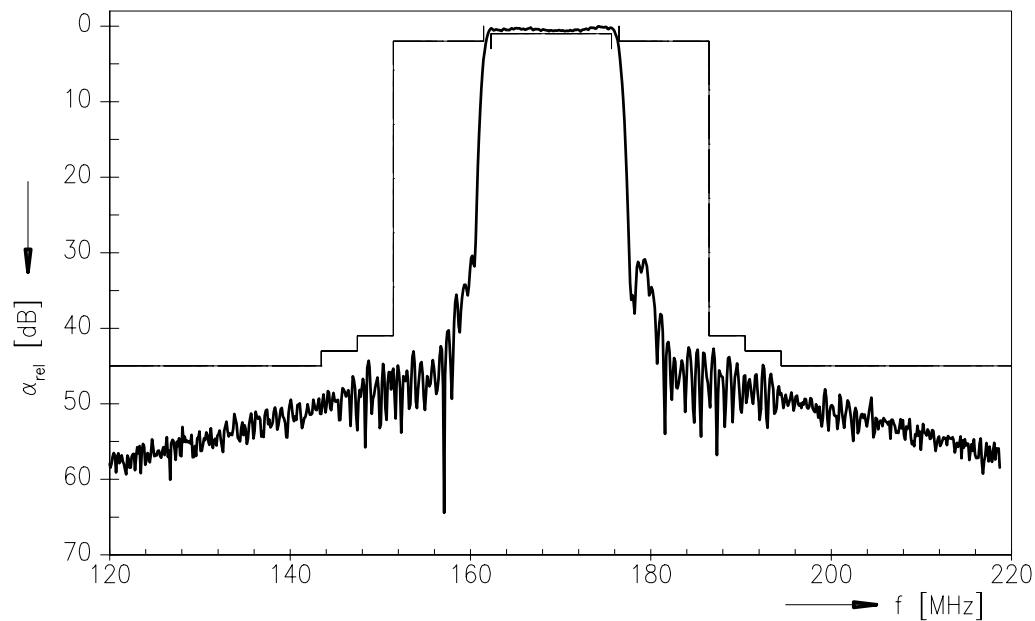
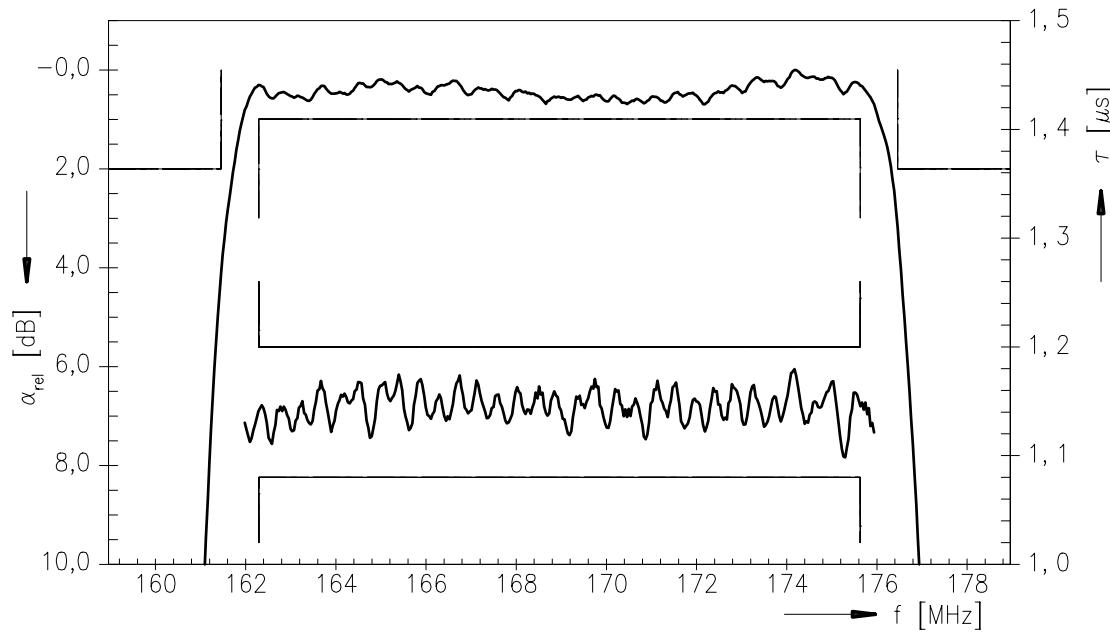
$$L_{p1} = 47 \text{ nH}$$

$$L_{s2} = 100 \text{ nH}$$

$$R_{p3} = 1,8 \text{ k}\Omega$$

$$L_{p4} = 220 \text{ nH}$$

$$L_{s5} = 82 \text{ nH}$$

**Normalized frequency response, matching network** (single ended to single ended)

**Normalized frequency response (pass band), matching network**




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**Published by EPCOS AG**

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

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

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