



SAW Components

SAW IF filter

GPS

Series/type:	B5068
Ordering code:	B39171-B5068-H810
Date:	Jul 18, 2007
Version:	2.0

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173.8 MHz

Data sheet



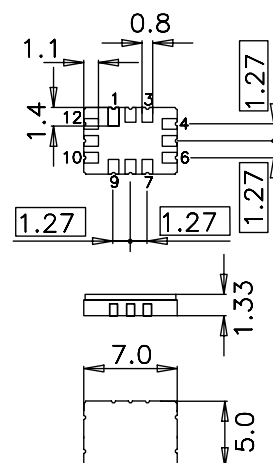
Application

- Low-loss IF filter for GPS applications
- Usable passband 20.2 MHz
- Balanced or unbalanced operation possible



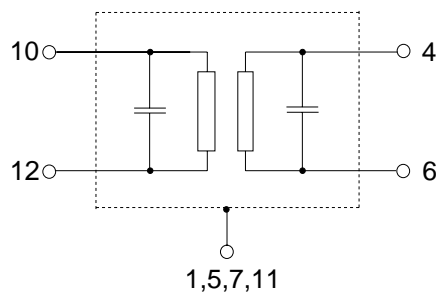
Features

- Package size 7.0 x 5.0 x 1.33 mm³
- Package code QCC12E
- RoHS compatible
- Approx. weight 0.25 g
- Ceramic package for **Surface Mount Technology (SMT)**
- Ni, gold-plated terminals
- **Electrostatic Sensitive Device (ESD)**
- Filter surface passivated



Pin configuration

- 10 Input
- 12 Input ground or input balance
- 4 Output
- 6 Output ground or output balance
- 2, 3, 8, 9 To be grounded
- 1, 5, 7, 11 Case ground



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Characteristics

Operating temperature range: $T = 25\text{ }^{\circ}\text{C}$
 Terminating source impedance: $Z_S = 50\text{ }\Omega$ and matching network
 Terminating load impedance: $Z_L = 50\text{ }\Omega$ and matching network

		min.	typ. @ 25 °C	max.	
Nominal frequency	f_N	—	173.8	—	MHz
Minimum insertion attenuation (including matching network)	α_{\min}	—	9.3	11.0	dB
Passband width					
	$\alpha_{\text{rel}} \leq 1.5\text{ dB}$	$B_{1.5\text{dB}}$	20.3	22.9	— MHz
	$\alpha_{\text{rel}} \leq 3.0\text{ dB}$	$B_{3.0\text{dB}}$	22.0	24.0	— MHz
	$\alpha_{\text{rel}} \leq 35\text{ dB}$	$B_{35\text{dB}}$	—	28.6	31.0 MHz
	$\alpha_{\text{rel}} \leq 40\text{ dB}$	$B_{40\text{dB}}$	—	29.2	41.0 MHz
Amplitude ripple (p-p)	$\Delta\alpha$				
	$f_N \pm 11.0\text{ MHz}$	—	1.0	1.5	dB
Phase ripple (p-p)	$\Delta\phi$				
	$f_N \pm 11.0\text{ MHz}$	—	12	15	deg
Group delay ripple (p-p)	$\Delta\tau$				
	$f_N \pm 11.0\text{ MHz}$	—	60	100	ns
Absolute group delay (at f_N)	τ	—	640	—	ns
Relative attenuation (relative to α_{\min})	α_{rel}				
	80.0 MHz ... $f_N - 19.1\text{ MHz}$	42	48	—	dB
	$f_N - 19.1\text{ MHz}$... $f_N - 14.6\text{ MHz}$	35	38	—	dB
	$f_N + 14.6\text{ MHz}$... $f_N + 19.1\text{ MHz}$	35	38	—	dB
	$f_N + 19.1\text{ MHz}$... $f_N + 26.1\text{ MHz}$	39	42	—	dB
	$f_N + 26.1\text{ MHz}$... 1 GHz	42	48	—	dB
Temperature coefficient of frequency	TC_f	—	-87	—	ppm/K

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Characteristics

Operating temperature range: $T = -40$ to $85\text{ }^{\circ}\text{C}$
 Terminating source impedance: $Z_S = 50\ \Omega$ and matching network
 Terminating load impedance: $Z_L = 50\ \Omega$ and matching network

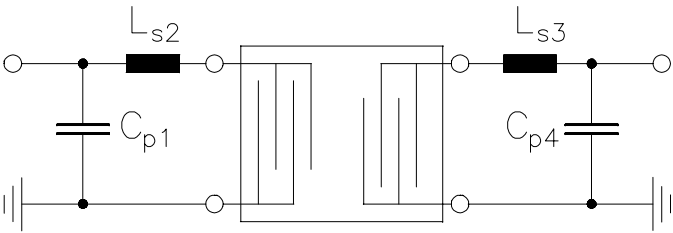
		min.	typ. @ 25 °C	max.	
Nominal frequency	f_N	—	173.8	—	MHz
Minimum insertion attenuation (including matching network)	α_{\min}	—	9.3	11.0	dB
Passband width					
	$\alpha_{\text{rel}} \leq 1.5\text{ dB}$	$B_{1.5\text{dB}}$	20.3	22.9	— MHz
	$\alpha_{\text{rel}} \leq 3.0\text{ dB}$	$B_{3.0\text{dB}}$	22.0	24.0	— MHz
	$\alpha_{\text{rel}} \leq 35\text{ dB}$	$B_{35\text{dB}}$	—	28.6	31.0 MHz
	$\alpha_{\text{rel}} \leq 40\text{ dB}$	$B_{40\text{dB}}$	—	29.2	41.0 MHz
Amplitude ripple (p-p)	$\Delta\alpha$				
	$f_N \pm 10.1\text{ MHz}$	—	0.8	1.5	dB
Phase ripple (p-p)	$\Delta\phi$				
	$f_N \pm 10.1\text{ MHz}$	—	9	15	deg
Group delay ripple (p-p)	$\Delta\tau$				
	$f_N \pm 10.1\text{ MHz}$	—	40	100	ns
Absolute group delay (at f_N)	τ	—	640	—	ns
Relative attenuation (relative to α_{\min})	α_{rel}				
	80.0 MHz ... $f_N - 20.0\text{ MHz}$	42	48	—	dB
	$f_N - 20.0\text{ MHz}$... $f_N - 15.5\text{ MHz}$	35	45	—	dB
	$f_N + 15.5\text{ MHz}$... $f_N + 20.0\text{ MHz}$	35	39	—	dB
	$f_N + 20.0\text{ MHz}$... $f_N + 27.0\text{ MHz}$	39	45	—	dB
	$f_N + 27.0\text{ MHz}$... 1 GHz	42	48	—	dB
Temperature coefficient of frequency	TC_f	—	-87	—	ppm/K

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Matching network to 50 Ω unbalanced



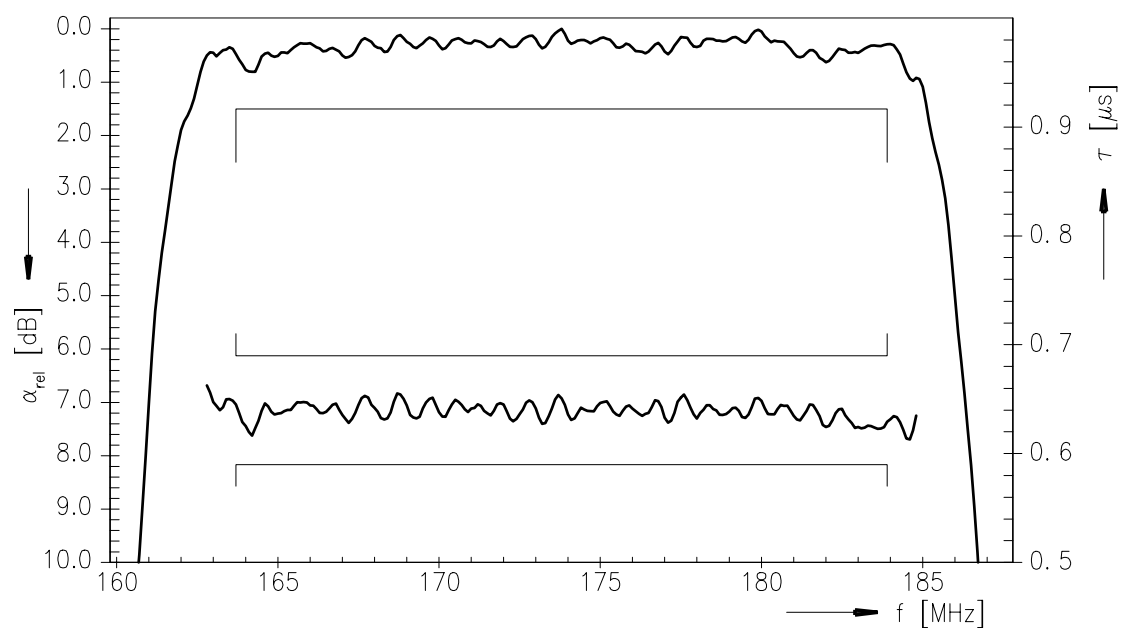
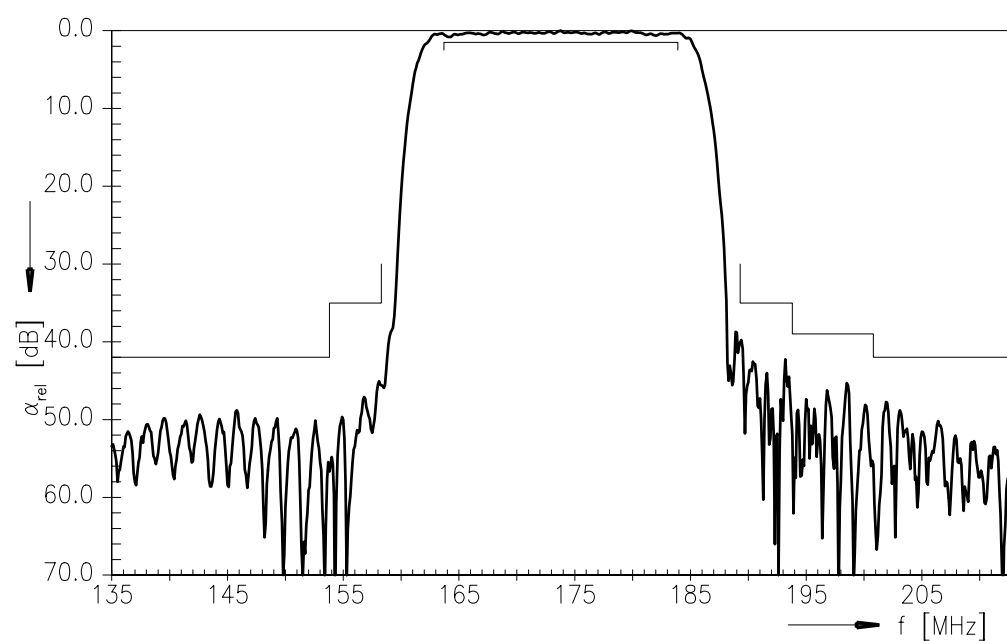
$C_{p1} = 47 \text{ pF}$
 $L_{s2} = 12 \text{ nH}$
 $L_{s3} = 18 \text{ nH}$
 $C_{p4} = 47 \text{ pF}$

Element values depend upon PCB layout.

Maximum ratings

Operable temperature range	T	-40/+85	°C	machine model, 1 pulse
Storage temperature range	T _{stg}	-40/+85	°C	
DC voltage	V _{DC}	0	V	
ESD voltage	V _{ESD}	100 ¹⁾	V	
Input power	P _{IN}	10	dBm	

¹⁾ acc. to J-STD22A-0115A (machine model, 1 pulse +/-).

Transfer function

Transfer function (wideband)


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References

Type	B5068
Ordering code	B39171-B5068-H810
Marking and package	C61157-A7-A103
Packaging	F61074-V8170-Z000
Date codes	L_1126
S-parameters	
Soldering profile	S_6001
RoHS compatible	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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