



SAW Components

SAW Rx 2in1 filter

GSM 900 / GSM 1800

Series/type: **B9308**

Ordering code: **B39182B9308G110**

Date: **August 15, 2006**

Version: **2.1**

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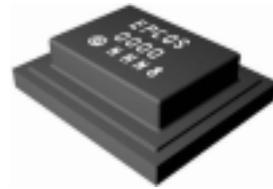
942.5 / 1842.5 MHz

Data sheet



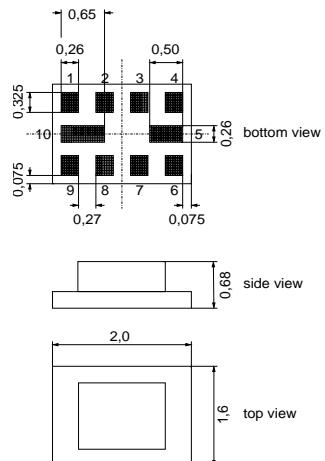
Application

- Low-loss 2in1 RF filter for mobile telephone GSM 900 and GSM 1800 systems, receive path (Rx)
- Usable passband:
 - Filter 1 (GSM 1800): 75 MHz
 - Filter 2 (GSM 900): 35 MHz
- Unbalanced to balanced operation for both filters
- Very low insertion attenuation
- Low amplitude ripple
- Impedance transformation from 50Ω to 150Ω for both filters
- Suitable for GPRS class 1 to 12



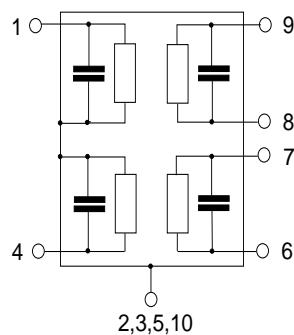
Features

- Package size $2.0 \times 1.6 \times 0.68 \text{ mm}^3$
- Package code QCS10H
- RoHS compatible
- Approx. weight 0.008 g
- Package for **Surface Mount Technology (SMT)**
- Ni, gold-plated terminals
- **Electrostatic Sensitive Device (ESD)**



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



Please read *cautions and warnings and important notes* at the end of this document.

**SAW Components****B9308****SAW Rx 2in1 filter****942.5 / 1842.5 MHz****Data sheet****Characteristics of Filter 1 (GSM 1800)**Temperature range for specification: $T = -20^{\circ}\text{C}$ to $+85^{\circ}\text{C}$ Terminating source impedance: $Z_S = 50 \Omega$ Terminating load impedance: $Z_L = 150 \Omega \parallel 15 \text{ nH}$ (balanced)

			min.	typ. @25°C	max.	
Center frequency	f_C		—	1842.5	—	MHz
Maximum insertion attenuation	α_{max}					
1805.0 ... 1880.0 MHz			—	1.6 ¹⁾	2.3 ²⁾	dB
Amplitude ripple (p-p)	$\Delta\alpha$					
1805.0 ... 1880.0 MHz			—	0.7	1.3 ³⁾	dB
Input VSWR						
1805.0 ... 1880.0 MHz			—	1.8	2.2	
Output VSWR						
1805.0 ... 1880.0 MHz			—	1.7	2.2	
Output amplitude balance (S₃₁/S₂₁)						
1805.0 ... 1880.0 MHz			-1.0	-0.5/0.7	1.0	dB
Output phase balance ($\phi(S_{31}) - \phi(S_{21}) + 180^{\circ}$)						
1805.0 ... 1880.0 MHz			-10	-3/+3	10	°
Attenuation	α					
10.0 ... 902.0 MHz			45	52	—	dB
902.0 ... 940.0 MHz			45	52	—	dB
940.0 ... 1705.0 MHz			28	36	—	dB
1705.0 ... 1785.0 MHz			12 ⁴⁾	18	—	dB
1920.0 ... 1980.0 MHz			17	22	—	dB
1980.0 ... 2030.0 MHz			25	30	—	dB
2030.0 ... 2400.0 MHz			28	34	—	dB
2400.0 ... 2500.0 MHz			32	38	—	dB
2500.0 ... 2775.0 MHz			28	32	—	dB
2775.0 ... 2880.0 MHz			38	58	—	dB
2880.0 ... 3610.0 MHz			28	54	—	dB
3610.0 ... 3760.0 MHz			38	56	—	dB
3760.0 ... 5415.0 MHz			28	48	—	dB
5415.0 ... 5640.0 MHz			35	48	—	dB
5640.0 ... 6000.0 MHz			28	48	—	dB

¹⁾ Typical value excluding PCB losses of 0.27 dB.²⁾ 2.1 dB at 25 °C.³⁾ 1.0 dB at 25 °C.⁴⁾ 14 dB at 25 °C.

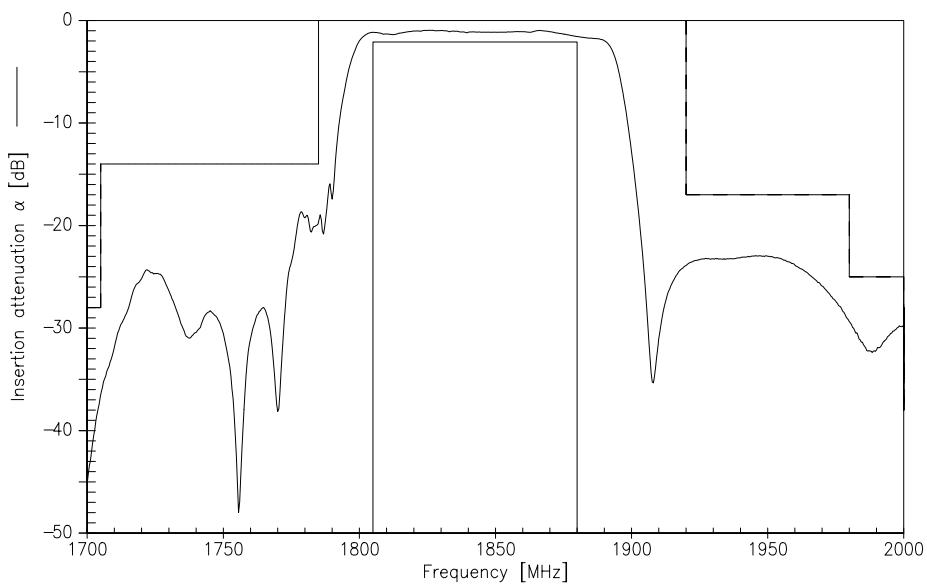
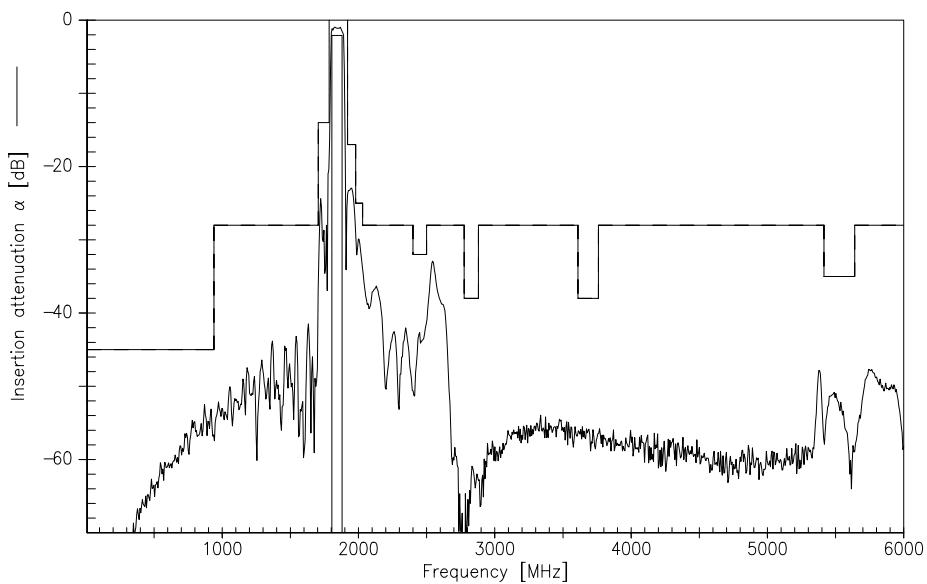
**SAW Components****B9308****SAW Rx 2in1 filter****942.5 / 1842.5 MHz**

Data sheet

**Maximum ratings of Filter 1**

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 ¹⁾	V	machine model, 10 pulses
Input power at GSM 850, GSM 900 GSM 1800, GSM 1900	P _{IN}	15	dBm	effective power in the on-state, duty cycle 4:8
Tx bands	P _{IN}	15	dBm	

¹⁾ acc. to JESD22-A115A (machine model), 10 negative & 10 positive pulses.

Transfer function of Filter 1

Transfer function of Filter 1 (wideband)


**SAW Components****B9308****SAW Rx 2in1 filter****942.5 / 1842.5 MHz****Data sheet****Characteristics of Filter 2 (GSM 900)**Temperature range for specification: $T = -20^{\circ}\text{C}$ to $+85^{\circ}\text{C}$ Terminating source impedance: $Z_S = 50\Omega$ Terminating load impedance: $Z_L = 150\Omega \parallel 82\text{ nH}$ (balanced)

			min.	typ. @25°C	max.	
Center frequency		f_C	—	942.5	—	MHz
Maximum insertion attenuation		α_{\max}	—	1.4 ¹⁾	2.1 ²⁾	dB
925.0 ... 960.0	MHz					
Amplitude ripple (p-p)		$\Delta\alpha$	—	0.7	1.3 ³⁾	dB
925.0 ... 960.0	MHz					
Input VSWR			—	1.8	2.1	
925.0 ... 960.0	MHz					
Output VSWR			—	1.9	2.2	
925.0 ... 960.0	MHz					
Output amplitude balance (S_{31}/S_{21})			—1.0	-0.5/0.5	1.0	dB
925.0 ... 960.0	MHz					
Output phase balance ($\phi(S_{31}) - \phi(S_{21}) + 180^{\circ}$)			-10	-1/+2	10	°
925.0 ... 960.0	MHz					
Attenuation		α				
10.0 ... 480.0	MHz		45	52	—	dB
480.0 ... 905.0	MHz		30	33	—	dB
905.0 ... 915.0	MHz		20	26	—	dB
980.0 ... 1000.0	MHz		26	28	—	dB
1000.0 ... 1850.0	MHz		28	33	—	dB
1850.0 ... 1920.0	MHz		40	56	—	dB
1920.0 ... 3700.0	MHz		35	46	—	dB
3700.0 ... 6000.0	MHz		40	50	—	dB

¹⁾ Typical value excluding PCB losses of 0.16 dB.²⁾ 1.9 dB at 25 °C.³⁾ 1.2 dB at 25 °C.

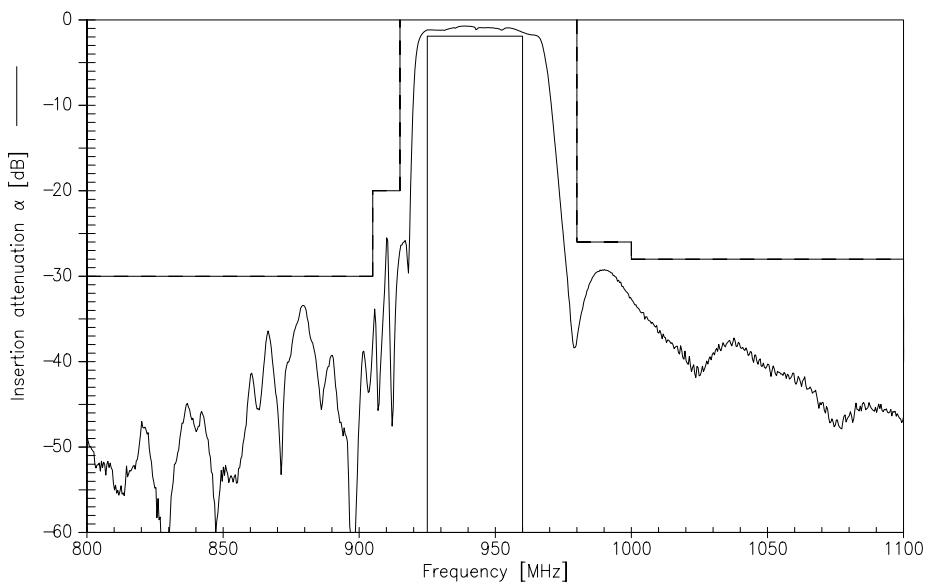
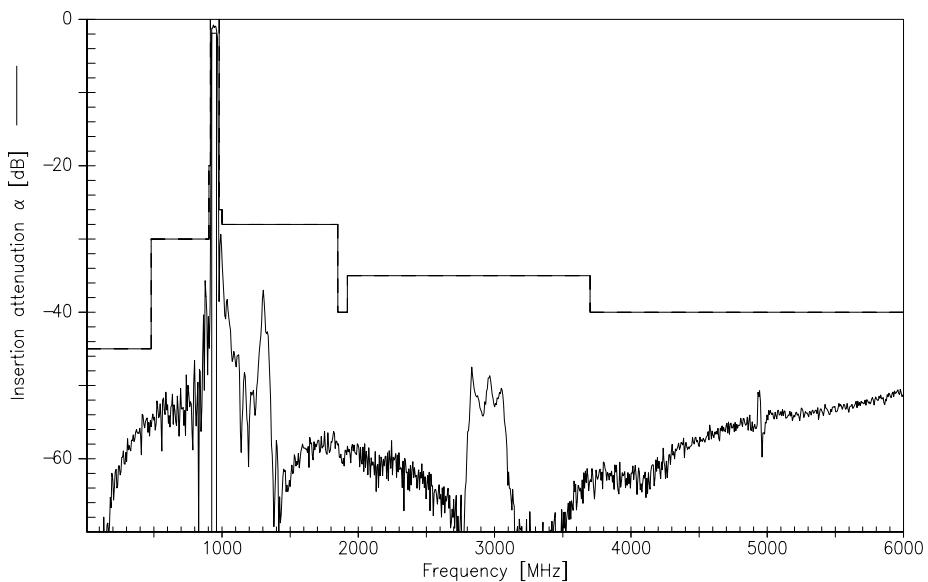
**SAW Components****B9308****SAW Rx 2in1 filter****942.5 / 1842.5 MHz**

Data sheet

**Maximum ratings of Filter 2**

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}	100 ¹⁾	V	machine model, 10 pulses
Input power at GSM 850, GSM 900 GSM 1800, GSM 1900	P _{IN}	15	dBm	effective power in the on-state, duty cycle 4:8
Tx bands	P _{IN}	15	dBm	

¹⁾ acc. to JESD22-A115A (machine model), 10 negative & 10 positive pulses.

Transfer function of Filter 2

Transfer function of Filter 2 (wideband)


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**References**

Type	B9308
Ordering code	B39182B9308G110
Marking and package	C61157-A7-A141
Packaging	F61074-V8152-Z000
Date code	L_1126
S-parameters	B9308_LB_NB.s3p B9308_LB_WB.s3p B9308_UB_NB.s3p B9308_UB_WB.s3p
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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