

SAW Components

SAW Rx 2in1 filter

GSM 850 / GSM 1900

Series/type:	B9808
Ordering code:	B39202B9808P810
Date:	September 17, 2010
Version:	2.1

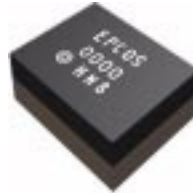
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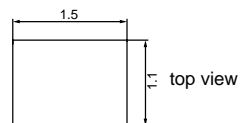
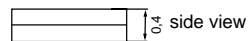
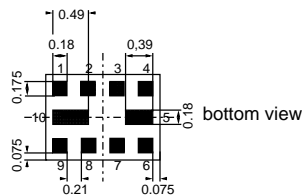
Data sheet


Application

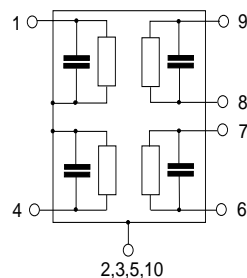
- Low-loss 2in1 RF filter for mobile telephone GSM 1900 and GSM 850 systems, receive path (Rx)
- Usable passband:
Filter 1 (GSM 850): 25 MHz
Filter 2 (GSM 1900): 60 MHz
- Unbalanced to balanced operation for all filters
- Impedance transformation from 50 Ω to 150 Ω for both filters
- Low amplitude ripple
- Suitable for GPRS class 1 to 12


Features

- Package size 1.5 x 1.1 x 0.4 mm³
- Approx. weight 0.003g
- Package for **Surface Mount Technology (SMT)**
- Ni, gold-plated terminals
- **RoHS compatible**
- **Electrostatic Sensitive Device (ESD)**
- Moisture Sensitive Level 3


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



Data sheet


Characteristics of Filter 1 (GSM 850)

Temperature range for specification:

$$T = -20\text{ °C to }+75\text{ °C}$$

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	—	881.5	—	MHz
Maximum insertion attenuation	α_{max}	—	1.3 ¹⁾	2.0 ²⁾	dB
869.0 ... 894.0 MHz					
Amplitude ripple (p-p)	$\Delta\alpha$	—	0.5	1.2 ³⁾	dB
869.0 ... 894.0 MHz					
Input VSWR		—	1.5	2.0	
869.0 ... 894.0 MHz					
Output VSWR		—	1.5	2.0	
869.0 ... 894.0 MHz					
Output amplitude balance (S_{31}/S_{21})		—1.5	-1.1/+1.1	1.5	dB
869.0 ... 894.0 MHz					
Output phase balance ($\phi(S_{31})-\phi(S_{21})+180^\circ$)		—13	-8/+8	13	°
869.0 ... 894.0 MHz					
Attenuation	α				
10.0 ... 447.0 MHz		43	47	—	dB
447.0 ... 849.0 MHz		30	36	—	
914.0 ... 954.0 MHz		21	25	—	dB
954.0 ... 1738.0 MHz		28	35	—	
1738.0 ... 1788.0 MHz		40	55	—	dB
1788.0 ... 3476.0 MHz		35	41	—	
3476.0 ... 6000.0 MHz		26	33	—	dB

¹⁾ Typical value excluding PCB losses.

²⁾ 1.7 dB at 25 °C

³⁾ 0.9 dB at 25 °C


Maximum ratings of filter 1

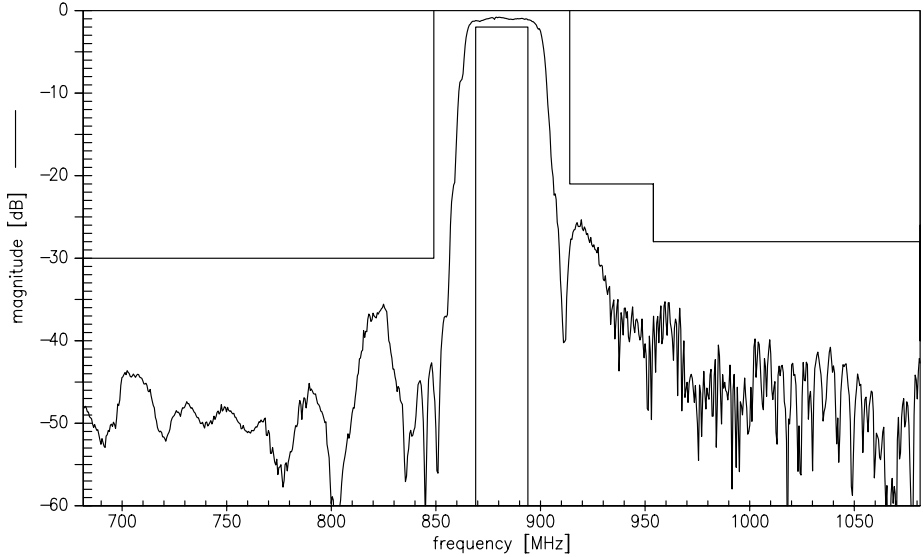
Operable temperature range	T	-40/+85	°C	
Storage temperature range	T _{stg}	-40/+85	°C	
DC voltage	V _{DC}	5	V	
ESD voltage	V _{ESD}	100 ¹⁾	V	machine model, 1 pulse
Input power at				
GSM 850, GSM 900	P _{IN}	15	dBm	effective power in the on-state, duty cycle 4:8
GSM 1800, GSM 1900	P _{IN}	15	dBm	
Tx bands				

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

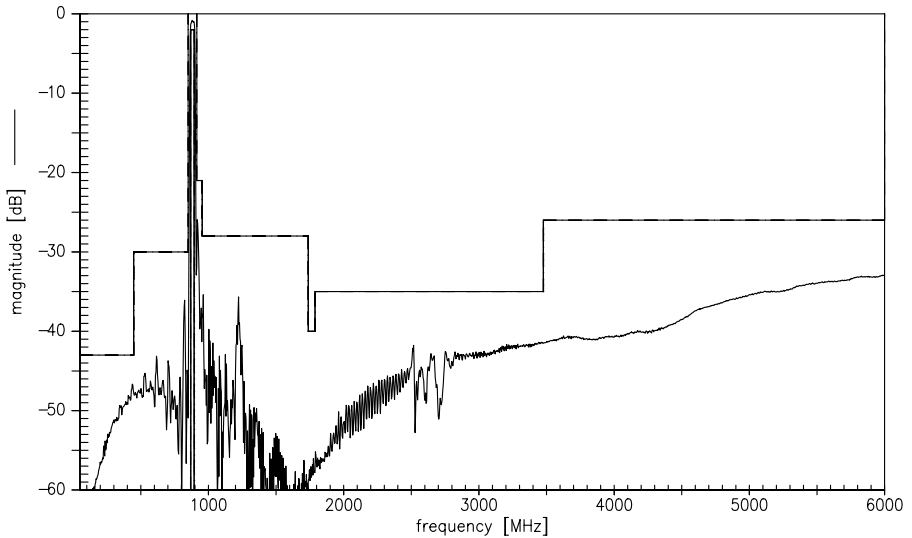
Data sheet



Transfer function of filter 1



Transfer function of filter 1 - wideband

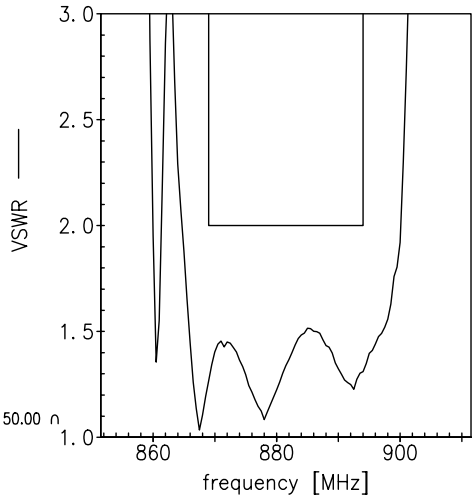
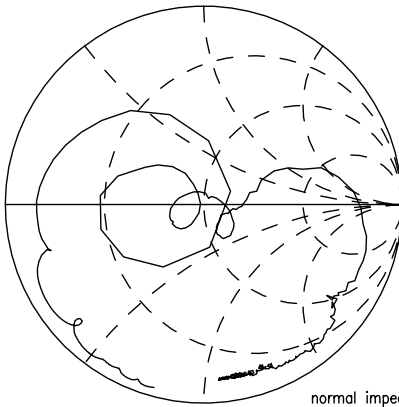


Data sheet

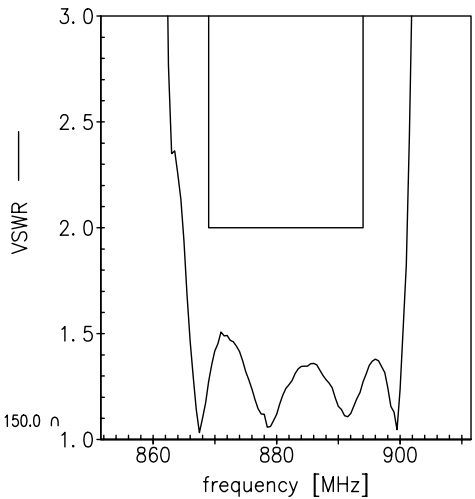
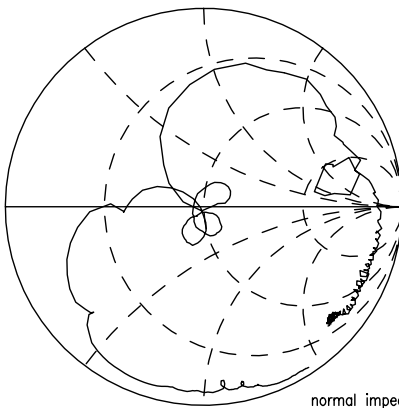


Smith Charts filter 1

S₁₁ function



S₂₂ function



Data sheet


Characteristics of filter 2 (GSM 1900)

Temperature range for specification: $T = -20\text{ °C to }+75\text{ °C}$
 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			—	1960.0	—	MHz
Maximum insertion attenuation	α_{\max}			—	1.3	2.5	dB
1930.0 ... 1990.0	MHz						
Amplitude ripple (p-p)	$\Delta\alpha$			—	0.5	1.6	dB
1930.0 ... 1990.0	MHz						
Input VSWR				—	1.6	2.0	
1930.0 ... 1990.0	MHz						
Output VSWR				—	1.6	2.0	
1930.0 ... 1990.0	MHz						
Output amplitude balance (S_{31}/S_{21})				-1.5	-0.7/0.2	1.5	dB
1930.0 ... 1990.0	MHz						
Output phase balance ($\phi(S_{31})-\phi(S_{21})+180^\circ$)				-12	-6/+5	12	°
1930.0 ... 1990.0	MHz						
Attenuation	α						
10.0 ... 1510.0	MHz			40	46	—	dB
1510.0 ... 1830.0	MHz			29	34	—	dB
1830.0 ... 1850.0	MHz			23	31	—	dB
1850.0 ... 1890.0	MHz			21	24	—	dB
1890.0 ... 1910.0	MHz			12	16	—	dB
2010.0 ... 2070.0	MHz			12	16	—	dB
2070.0 ... 2400.0	MHz			19	22	—	dB
2400.0 ... 2500.0	MHz			35	42	—	dB
2500.0 ... 3860.0	MHz			28	32	—	dB
3860.0 ... 3980.0	MHz			36	42	—	dB
3980.0 ... 5790.0	MHz			30	37	—	dB
5790.0 ... 6000.0	MHz			32	38	—	dB


Maximum ratings of filter 2

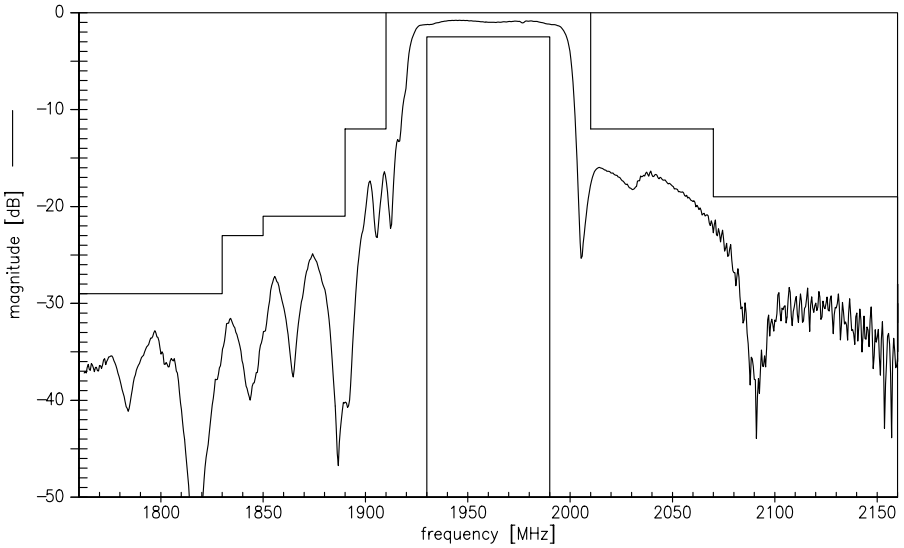
Operable temperature range	T	-40/+85	°C	
Storage temperature range	T _{stg}	-40/+85	°C	
DC voltage	V _{DC}	5	V	
ESD voltage	V _{ESD}	100 ¹⁾	V	machine model, 1 pulse
Input power at				
GSM 850, GSM 900	P _{IN}	15	dBm	effective power in the on-state, duty cycle 4:8
GSM 1800, GSM 1900	P _{IN}	15	dBm	
Tx bands				

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

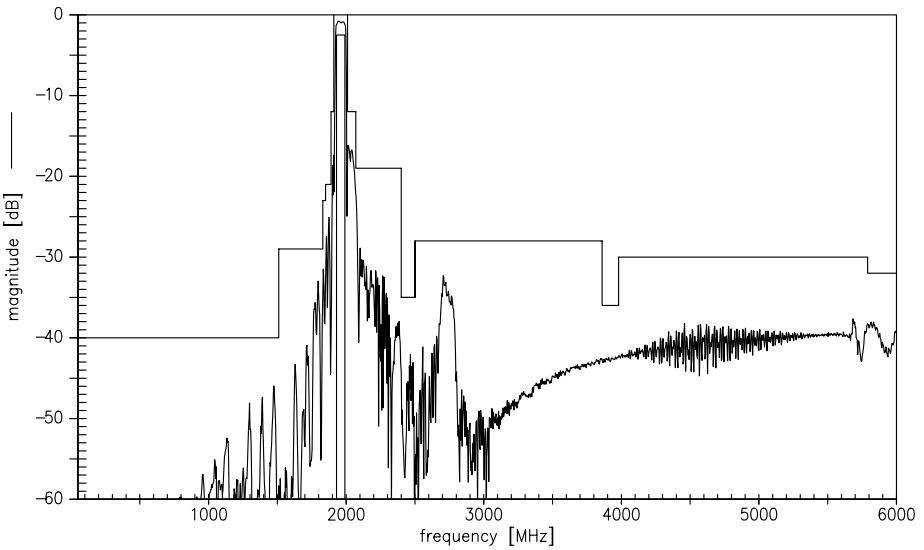
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Transfer function of filter 2



Transfer function of filter 2 - wideband

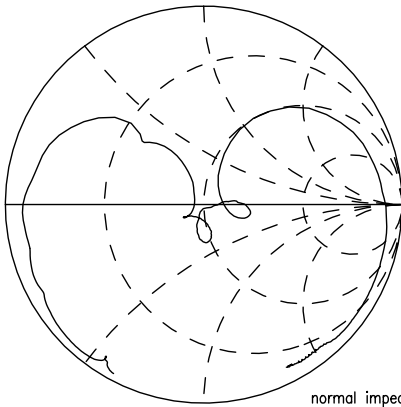


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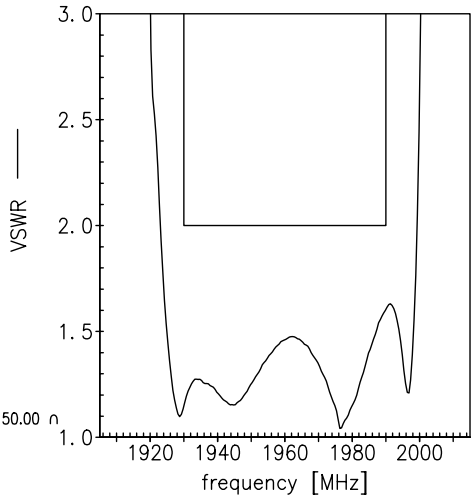


Smith Charts filter 2

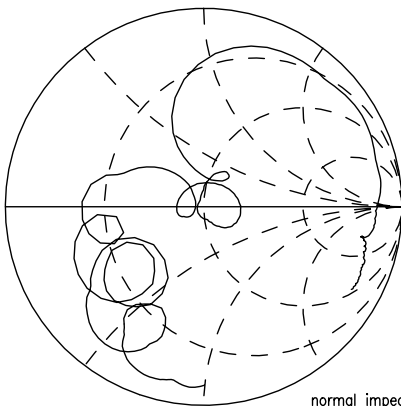
S_{11} function



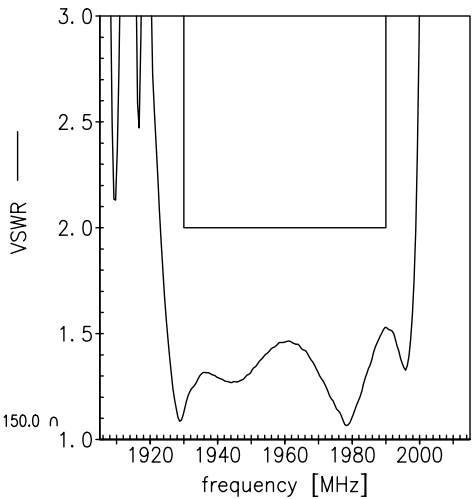
normal impedance: 50.00 Ω



S_{22} function



normal impedance: 150.0 Ω



SAW Components	B9808
SAW Rx 2in1 filter	881.5 / 1960.0 MHz

Data sheet



References

Type	B9808
Ordering code	B39202B9808P810
Marking and package	C61157-A8-A18
Packaging	F61074-V8227-Z000
Date codes	L_1126
S-parameters	B9808_LB_NB.s3p, B9808_LB_WB.s3p B9808_UB_NB.s3p, B9808_UB_WB.s3p see file header for port/pin assignment table
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."
Moldability	Before using in overmolding environment, please contact your EPCOS sales office.
Matching coils	See http://www.tdk.co.jp/tefe02/coil.htm#aname1 http://www.tdk.co.jp/etvcl/index.htm for a large variety of matching coils.

For further information please contact your local EPCOS sales office or visit our webpage at www.epcos.com .

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