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

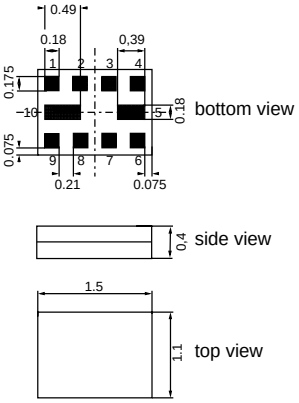
Application

- 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



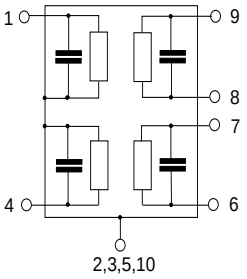
Features

- Package size 1.5 x1.1 x 0.4 mm³
- Approx. weight 0.003g
- Package for **S**urface **M**ount **T**echnology (**SMT**)
- Ni, gold-plated terminals
- **RoHS compatible**
- **E**lectrostatic **S**ensitive **D**evice (**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



Characteristics of Filter 1 (GSM 850)

Temperature range for specification: T = -20 ˚C to +75 ˚C
Terminating source impedance: Z_S = 50 Ω
Terminating load impedance: Z_L = 150 Ω || 82 nH (balanced)

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

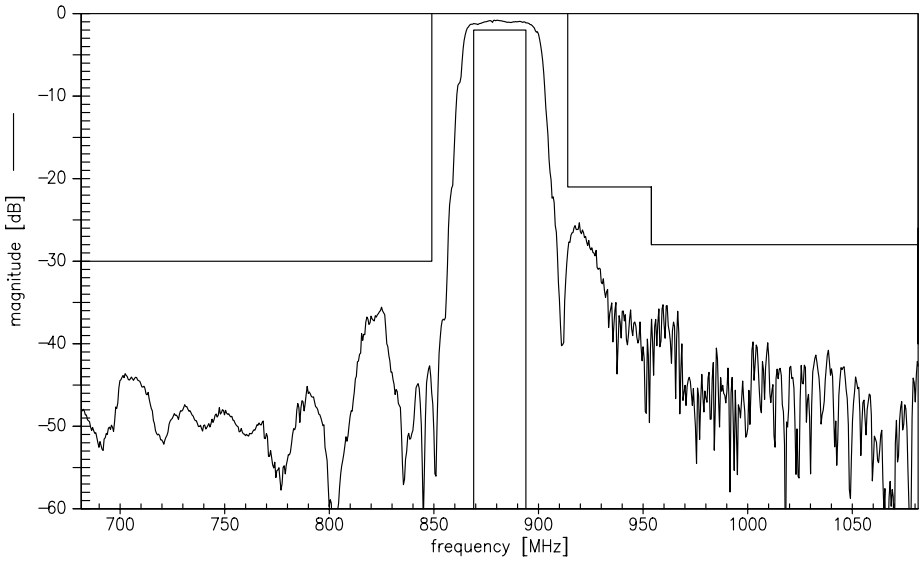
[1] Typical value excluding PCB losses.
[2] 1.7 dB at 25˚C
[3] 0.9 dB at 25˚C

Maximum ratings of filter 1

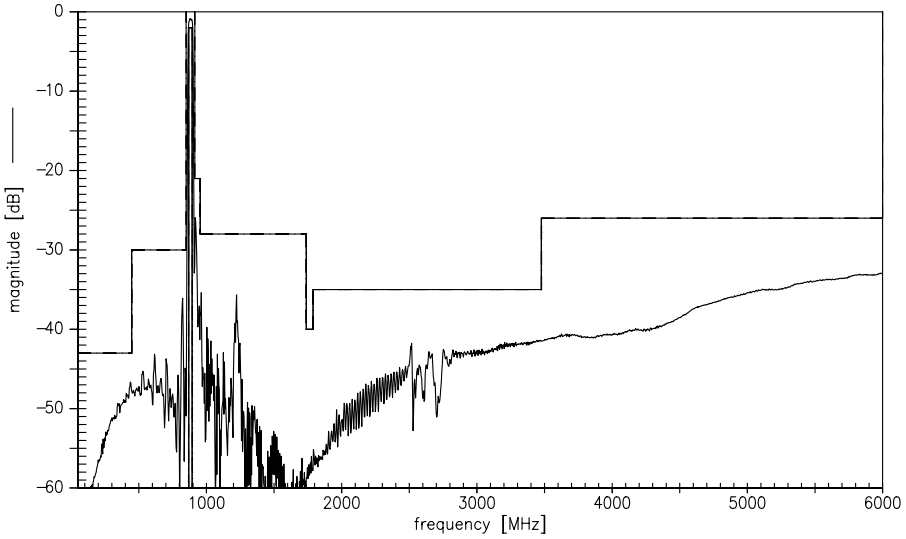
Operable temperature range	T	–40/+85	˚C	
Storage temperature range	T_{stg}	–40/+85	˚C	
DC voltage	V_{DC}	5	V	
ESD voltage	V_{ESD}	100[1)]	V	machine model, 1 pulse
Input power at				
GSM 850, GSM 900	P_{IN}	15	dBm	effective power in the on-state,
GSM 1800, GSM 1900	P_{IN}	15	dBm	duty cycle 4:8
Tx bands				

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

Transfer function of filter 1

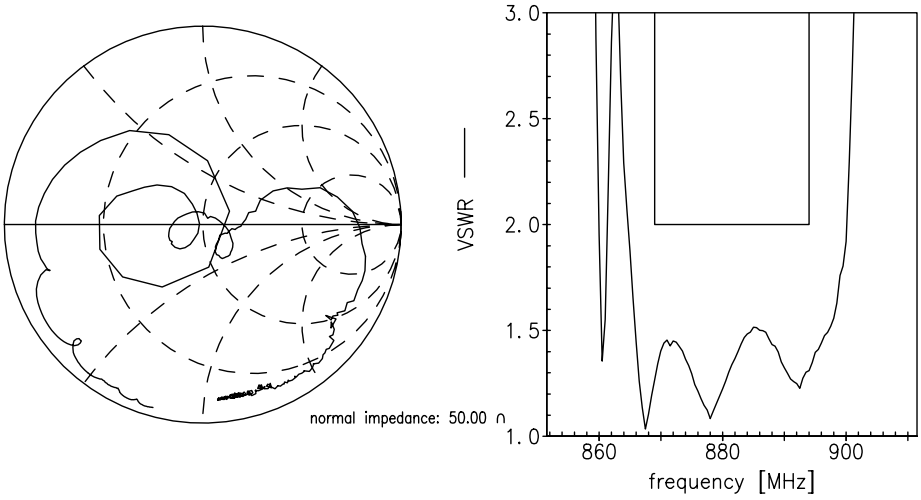


Transfer function of filter 1 - wideband

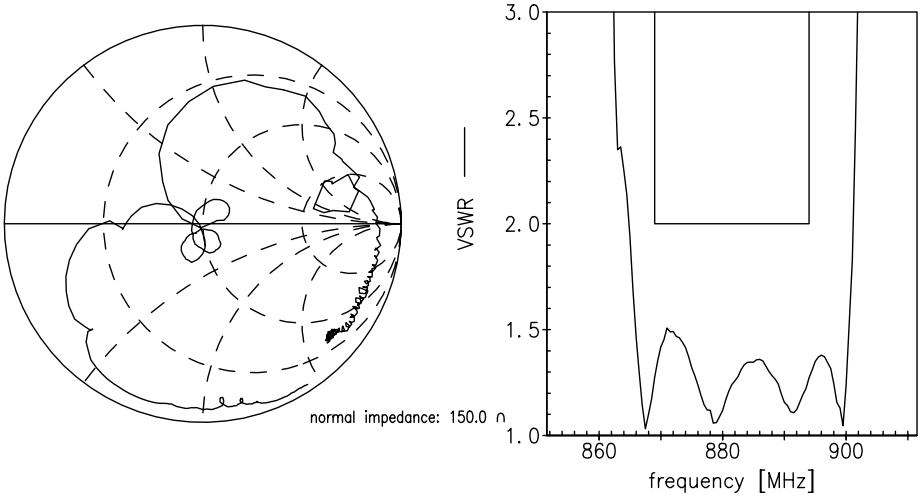


Smith Charts filter 1

S_{11} function



S_{22} function



Characteristics of filter 2 (GSM 1900)

Temperature range for specification: T = -20 ˚C to +75 ˚C
Terminating source impedance: Z_S = 50 Ω
Terminating load impedance: Z_L = 150 Ω || 15 nH (balanced)

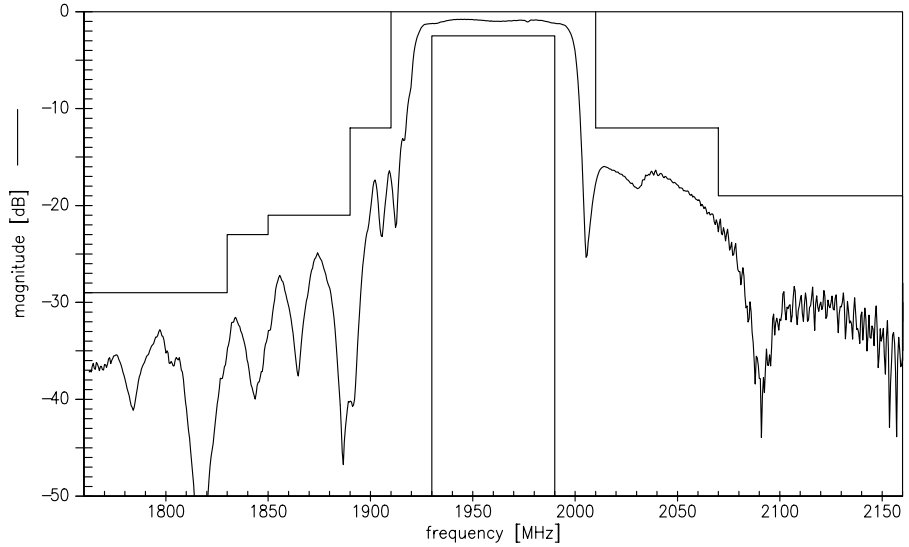
		min.	typ. @25˚C	max.	
Center frequency	f_C	—	1960.0	—	MHz
Maximum insertion attenuation	α_{max}				
1930.0 ... 1990.0 MHz		—	1.3	2.5	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
1930.0 ... 1990.0 MHz		—	0.5	1.6	dB
Input VSWR					
1930.0 ... 1990.0 MHz		—	1.6	2.0	
Output VSWR					
1930.0 ... 1990.0 MHz		—	1.6	2.0	
Output amplitude balance ($\|S_{31}/S_{21}\|$)					
1930.0 ... 1990.0 MHz		–1.5	-0.7/0.2	1.5	dB
Output phase balance ($\phi(S_{31})-\phi(S_{21})+180^\circ$)					
1930.0 ... 1990.0 MHz		–12	-6/+5	12	˚
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

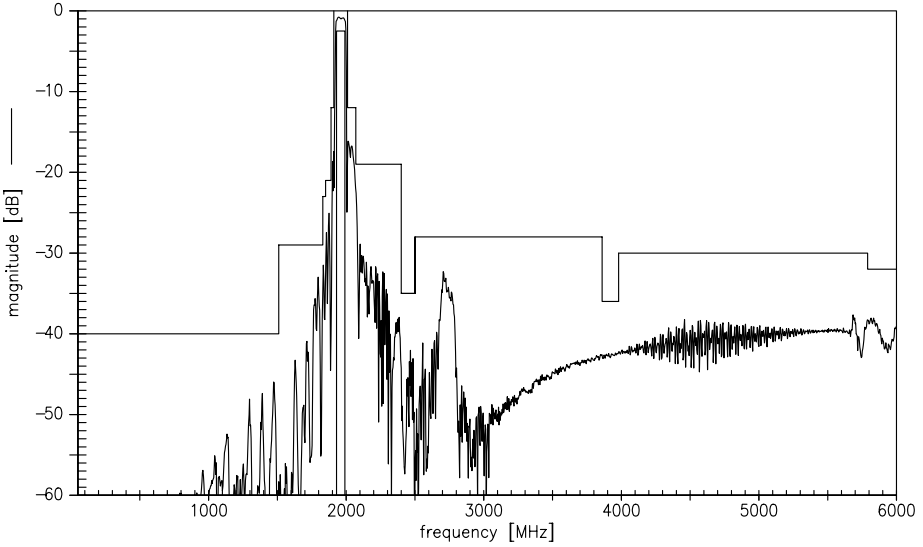
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Storage temperature range	T_{stg}	–40/+85	˚C	
DC voltage	V_{DC}	5	V	
ESD voltage	V_{ESD}	100[1)]	V	machine model, 1 pulse
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GSM 850, GSM 900	P_{IN}	15	dBm	effective power in the on-state,
GSM 1800, GSM 1900	P_{IN}	15	dBm	duty cycle 4:8
Tx bands				

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

Transfer function of filter 2

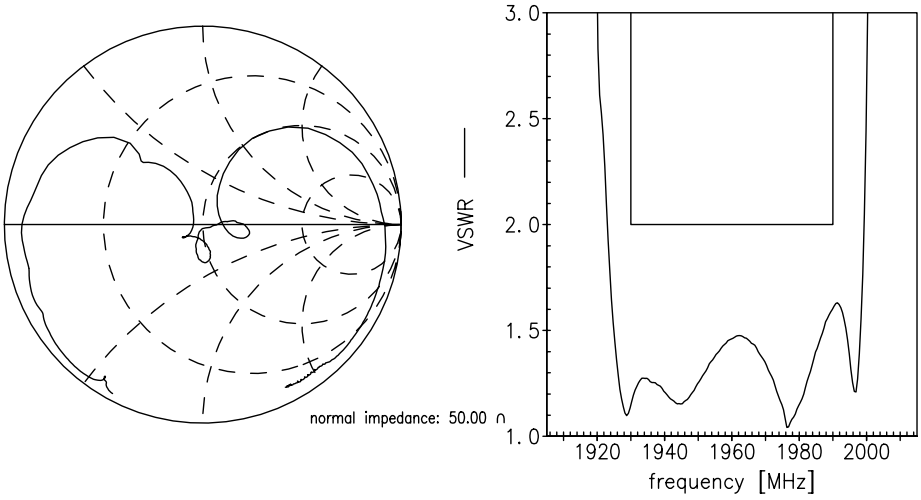


Transfer function of filter 2 - wideband

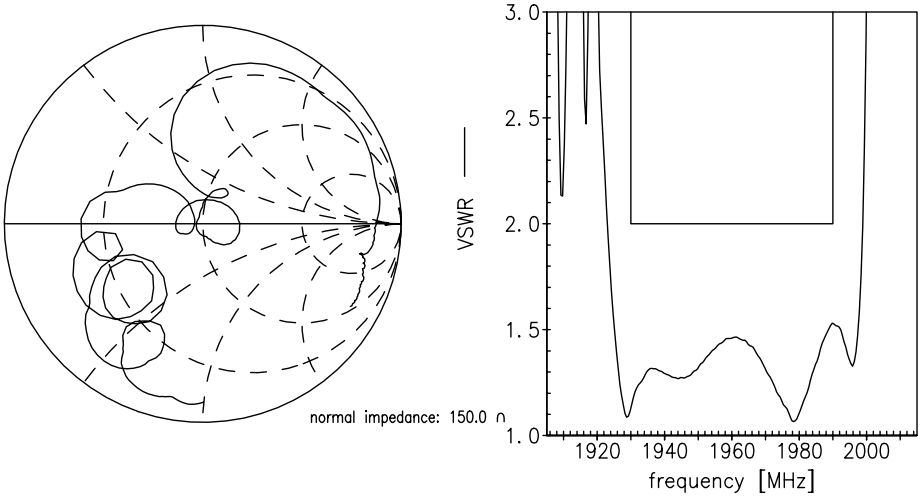


Smith Charts filter 2

S_{11} function



S_{22} function



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.

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