



SAW Components

SAW Rx 2in1 input diplex filter
GSM 850 / GSM 900

Series/type:	B9512
Ordering code:	B39941B9512P810
Date:	June 04, 2010
Version:	2.0



Data sheet



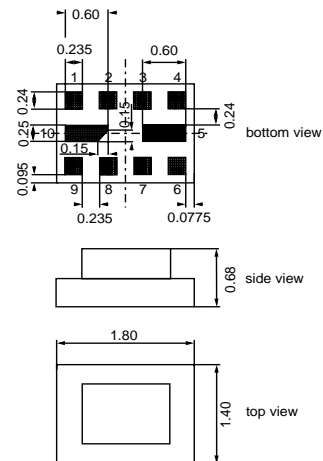
Application

- Low-loss 2in1 RF filter for mobile telephone GSM 900 and GSM 850 systems, receive path (Rx)
- Usable passband:
 Filter 1 (GSM 900): 35 MHz
 Filter 2 (GSM 850): 25 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



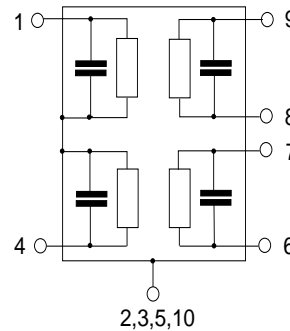
Features

- Package size 1.8 x 1.4 x 0.68 mm³
- RoHS compatible
- Approx. weight 0.006 g
- Package for Surface Mount Technology (SMT)
- Ni, gold-plated terminals
- Electrostatic Sensitive Device (ESD)
- Moisture Sensitive Level 3



Pin configuration

- 1 Input [Diplex]
- 8,9 Output, balanced [Filter 1]
- 6,7 Output, balanced [Filter 2]
- 4 To be grounded
- 2,3,5,10 Case-ground





Data sheet



Characteristics of filter 1 (GSM 900)

Temperature range for specification: $T = -30\text{ °C to }+85\text{ °C}$
 Terminating source impedance: $Z_S = 50\ \Omega \parallel 10\text{ nH (unbalanced)}$
 Terminating load impedance: $Z_L = 150\ \Omega \parallel 40\text{ nH (balanced)}$

		min.	typ. @ 25 °C	max.	
Center frequency	f_C	—	942.5	—	MHz
Maximum insertion attenuation	α_{max}	—	1.9 ¹⁾	3.1	dB
925.0 ... 960.0 MHz					
Amplitude ripple (p-p)	$\Delta\alpha$	—	0.8	1.8	dB
925.0 ... 960.0 MHz					
Input VSWR		—	1.7	2.1	
925.0 ... 960.0 MHz					
Output VSWR		—	1.8	2.1	
925.0 ... 960.0 MHz					
Common mode rejection ratio		23	28	—	dB
925.0 ... 960.0 MHz					
Attenuation	α				
10.0 ... 480.0 MHz		45	55	—	dB
480.0 ... 825.0 MHz		39	44	—	dB
825.0 ... 905.0 MHz		25	30	—	dB
905.0 ... 915.0 MHz		15	20	—	dB
980.0 ... 1000.0 MHz		23	27	—	dB
1000.0 ... 1850.0 MHz		26	28	—	dB
1850.0 ... 1920.0 MHz		40	48	—	dB
1920.0 ... 5000.0 MHz		35	42	—	dB
5000.0 ... 6000.0 MHz		30	36	—	dB

¹⁾ Typical value excluding PCB losses.



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SAW Rx 2in1 input duplex filter

881.5 / 942.5 MHz

Data sheet



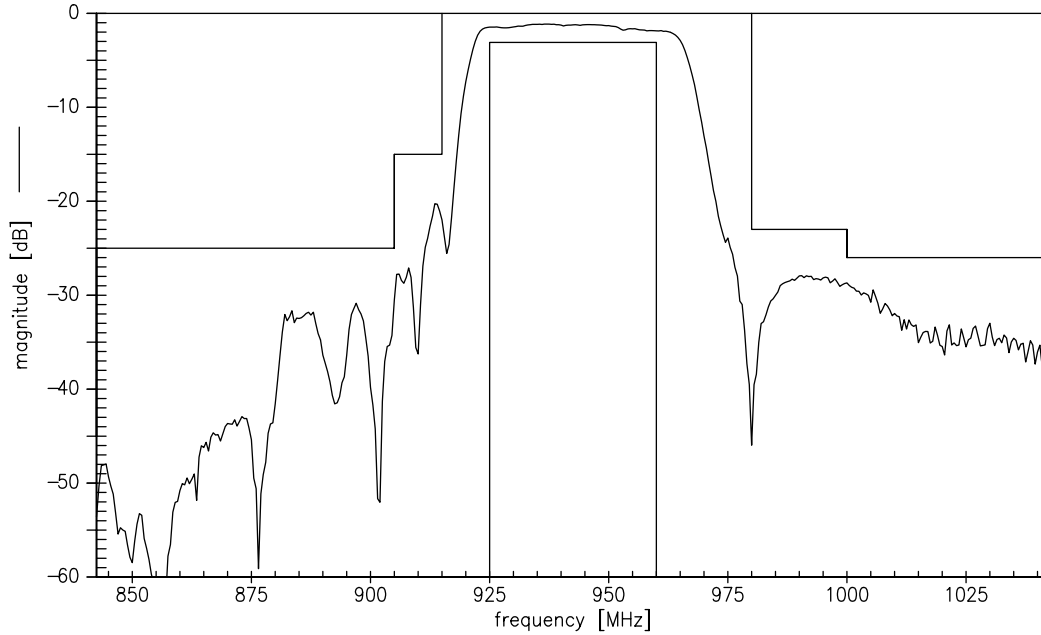
Maximum ratings of filter 1

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}	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				

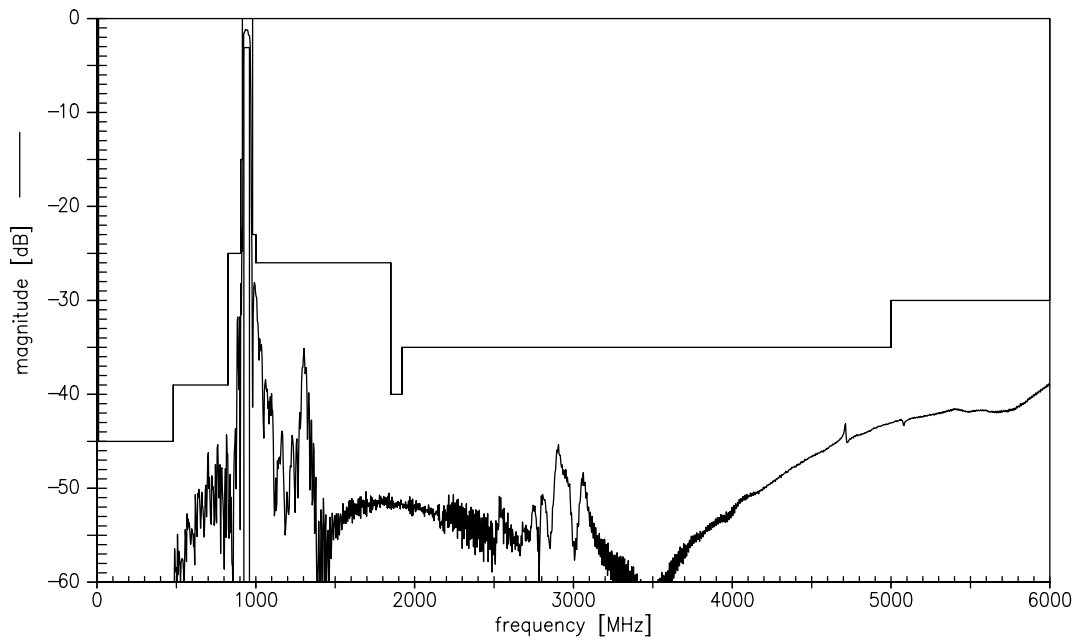
¹⁾ acc. to JESD22-A115A (machine model), 1 negative & 1 positive pulse.



Transfer function of filter 1



Transfer function of filter 1 - wideband

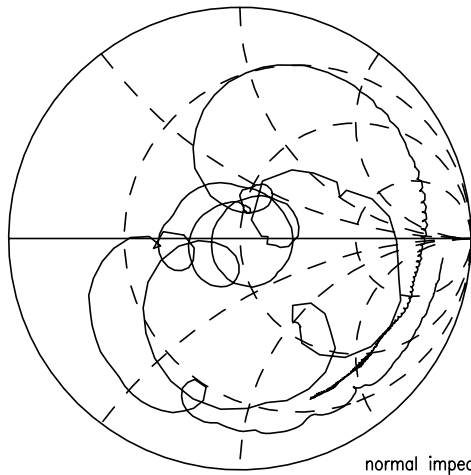


Data sheet

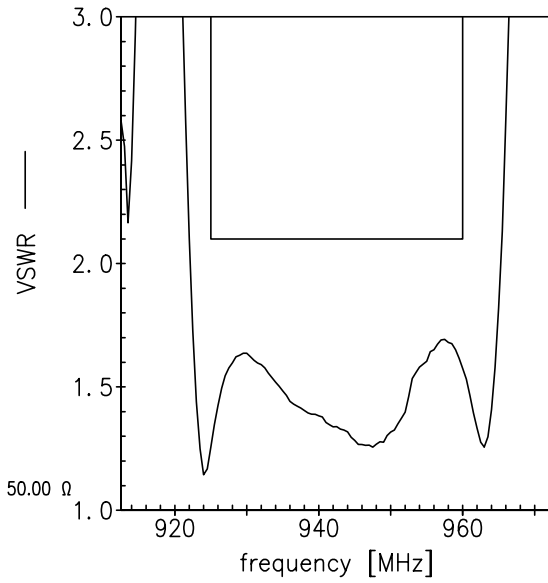


Smith Charts filter 1

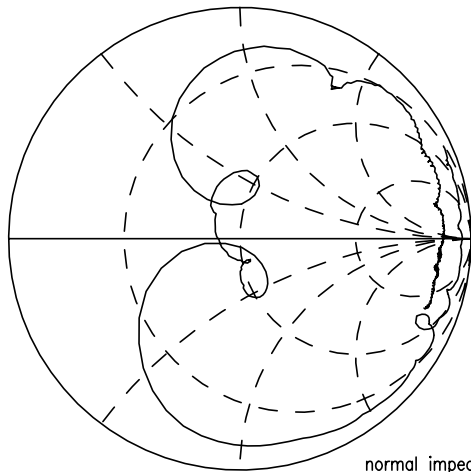
S_{11} function



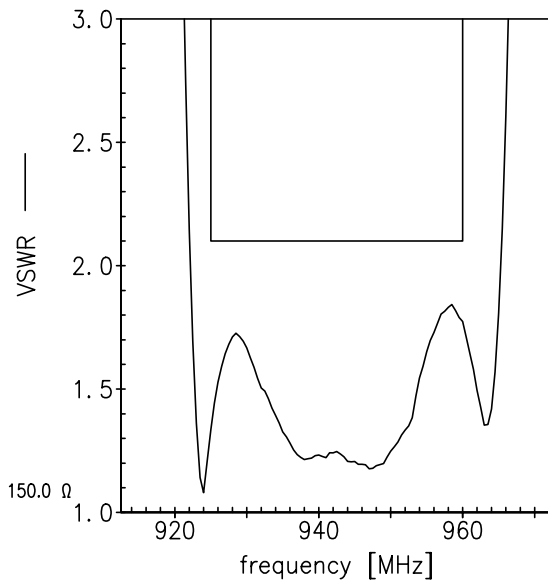
normal impedance: 50.00 Ω



S_{22} function



normal impedance: 150.0 Ω





Data sheet



Characteristics of filter 2 (GSM 850)

Temperature range for specification: $T = -30\text{ °C to }+85\text{ °C}$
 Terminating source impedance: $Z_S = 50\ \Omega \parallel 10\text{ nH (unbalanced)}$
 Terminating load impedance: $Z_L = 150\ \Omega \parallel 56\text{ nH (balanced)}$

		min.	typ. @ 25 °C	max.	
Center frequency	f_C	—	881.5	—	MHz
Maximum insertion attenuation 869.0 ... 894.0 MHz	α_{max}	—	1.7 ¹⁾	2.3	dB
Amplitude ripple (p-p) 869.0 ... 894.0 MHz	$\Delta\alpha$	—	0.7	1.3	dB
Input VSWR 869.0 ... 894.0 MHz		—	1.5	2.0	
Output VSWR 869.0 ... 894.0 MHz		—	1.6	2.0	
Common mode rejection ratio 869.0 ... 894.0 MHz		20	24	—	dB
Attenuation	α				
10.0 ... 447.0 MHz		45	50	—	dB
447.0 ... 849.0 MHz		30	32	—	dB
914.0 ... 1000.0 MHz		24	28	—	dB
1000.0 ... 1850.0 MHz		28	31	—	dB
1850.0 ... 1920.0 MHz		37	43	—	dB
1920.0 ... 5000.0 MHz		33	40	—	dB
5000.0 ... 6000.0 MHz		30	34	—	dB

1) Typical value excluding PCB losses.



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SAW Rx 2in1 input duplex filter

881.5 / 942.5 MHz

Data sheet



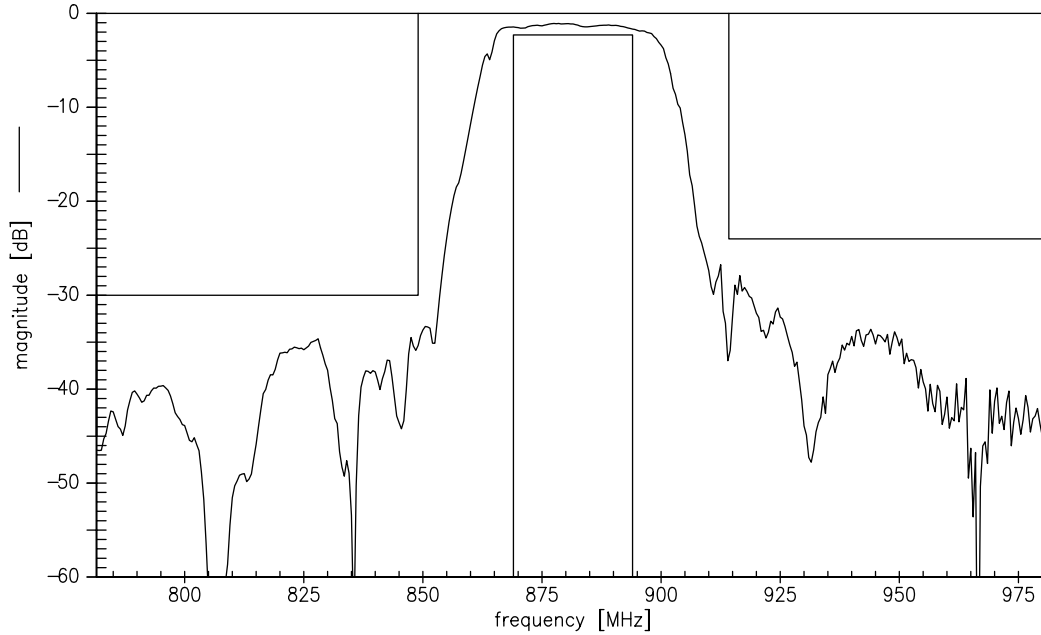
Maximum ratings of filter 2

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, 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				

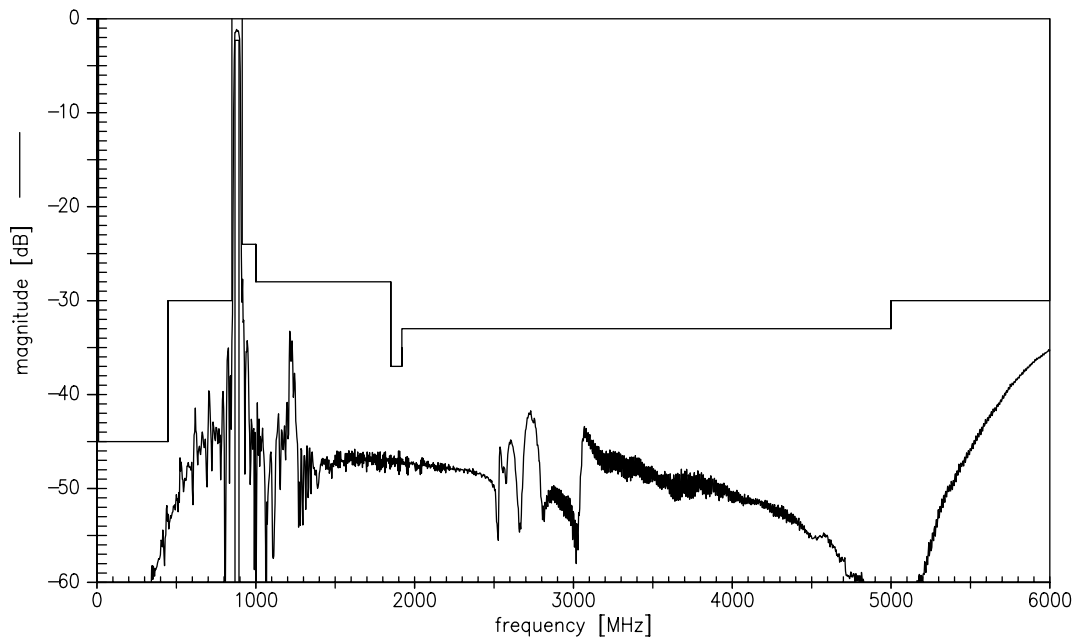
¹⁾ acc. to JESD22-A115A (machine model), 1 negative & 1 positive pulse.



Transfer function of filter 2



Transfer function of filter 2 - wideband

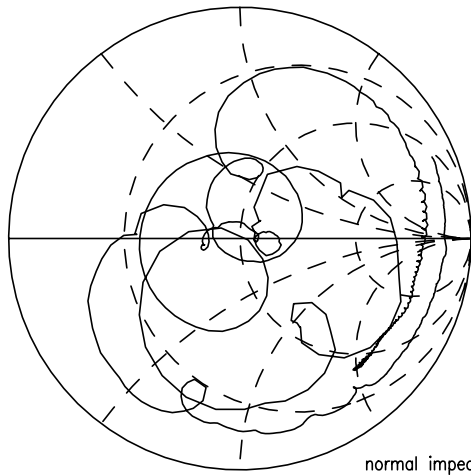


Data sheet

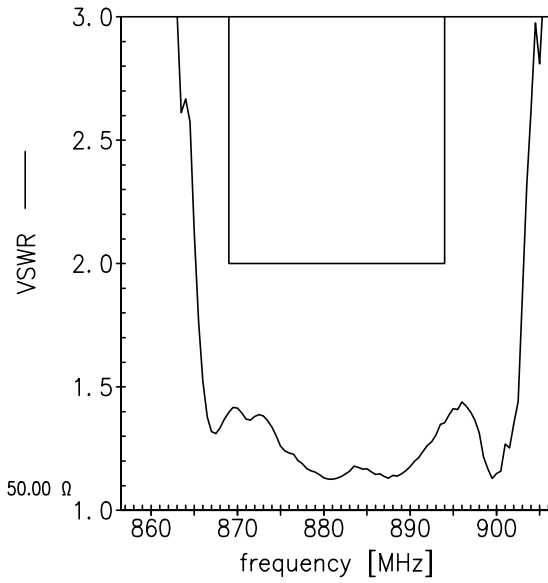


Smith Charts filter 2

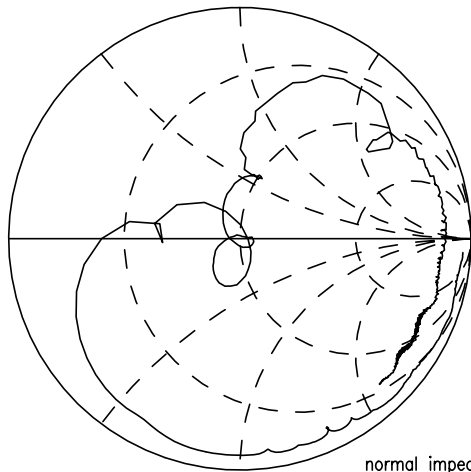
S_{11} function



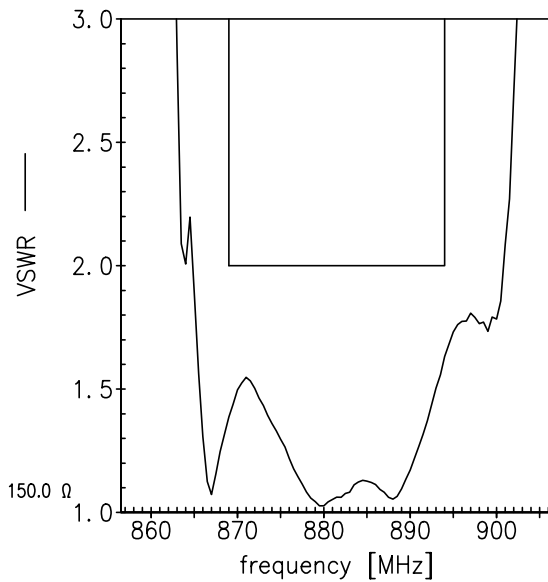
normal impedance: 50.00 Ω



S_{22} function



normal impedance: 150.0 Ω





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References

Type	B9512
Ordering code	B39941B9512P810
Marking and package	C61157-A7-A152
Packaging	F61074-V8226-Z000
Date codes	L_1126
S-parameters	B9512_LB_NB.s3p B9512_LB_WB.s3p B9512_UB_NB.s3p B9512_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.

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