

SAW Rx 2in1 filter GSM 850 / GSM 900

Series/type: B9304

Ordering code: B39941B9304G110

Date: April 24, 2006

Version: 2.0

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SAW Rx 2in1 filter

881.5 & 942.5 MHz MHz

Data sheet



Application

- Low-loss 2-in-1 RF filter for mobile telephone GSM850 and GSM900 bands, receive path (RX)
- Impedance transformation from 50 Ω to 100 Ω for both filters
- Unbalanced to balanced operation for both filters
- Very low insertion attenuation
- Low amplitude ripple
- Usable passband:

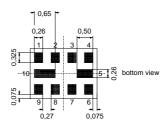
Filter 1 (GSM850): 25 MHz Filter 2 (GSM900): 35 MHz

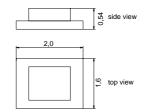
■ Suitable for GPRS class 1 to 12



Features

- Package size 2.0 x1.6 x 0.68 mm³
- Package code QCS10H
- RoHS compatible
- Approximate weight 0.008 g
- Package for Surface Mount Technology (SMT)
- Ni, gold-plated terminals
- Electrostatic Sensitive Device (ESD)



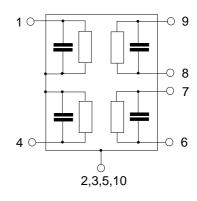


Pin configuration

1 Input [Filter 1]4 Input [Filter 2]

6,7 Output, balanced [Filter 2]8,9 Output, balanced [Filter 1]

■ 2,3,5,10 To be grounded





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 \equiv MD

Characteristics of Filter 1 (GSM850)

Temperature range for specification: $T = -10 \,^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$

Terminating source impedance: $Z_S = 50 \Omega$ Terminating load impedance: $Z_L = 100 \Omega$

	min.	typ. @ 25 °C	max.	
Center frequency f _C	_	881.5	_	MHz
$\textbf{Maximum insertion attenuation} \qquad \qquad \alpha_{\text{max}}$				
869.0 894.0 MHz	_	1.3	2.1 ¹⁾	dB
Amplitude ripple (p-p) $\Delta\alpha$				
869.0 894.0 MHz	_	0.7	1.4	dB
Input VSWR				
869.0 894.0 MHz	_	1.7	2.1	
Output VSWR 869.0 894.0 MHz		4.0	0.0	
009.0 094.0 WINZ	_	1.8	2.2	
Output amplitude balance (S_{31}/S_{21})				
869.0 894.0 MHz	-1.0	-0.5/0.5	1.0	dB
Output phase balance $(\phi(S_{31}) - \phi(S_{21}) + 180^{\circ})$	_	2.0/2.0	_	•
869.0 894.0 MHz	– 5	-2.0/2.0	5	
Common mode suppression S_{cs21}				
869.0 894.0 MHz	20	27	_	dB
824.0 995.0 MHz	20	25	_	dB
1648.0 1990.0 MHz	20	40	_	dB
3296.0 3980.0 MHz	20	33		dB
Inter band isolation α				
Inter band isolation α 925.0 960.0 MHz	35	44	_	dB
Attenuation α				
0.3 480.0 MHz	45	54	_	dB
480.0 824.0 MHz	30	35	_	dB
824.0 849.0 MHz	23	35	_	dB
914.0 1738.0 MHz	23	25	_	dB
1738.0 2400.0 MHz	30	52	_	dB
2400.0 2500.0 MHz	40	50	_	dB
2500.0 6000.0 MHz	30	45	_	dB
6000.0 12750.0 ²⁾ MHz	20	32	_	dB

 $^{^{1)}\,}$ 2.5 dB max at -30 $^{\circ}\text{C}$... -10 $^{\circ}\text{C}$ and 85 $^{\circ}\text{C}$... 95 $^{\circ}\text{C}$

values based on measurement data on PCB layout given in document "Test PWB and electrical verification methods", dated 11.04.2005; they may vary with different PCB layout



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Maximum ratings

Operable temperature range	Т	-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				
GSM850, GSM900	P_{IN}	15	dBm	peak power of GSM signal
GSM1800, GSM1900	P_{IN}	15	dBm	duty cycle 4:8
Tx bands				

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

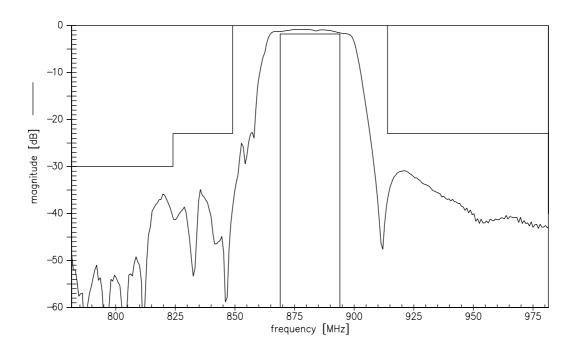


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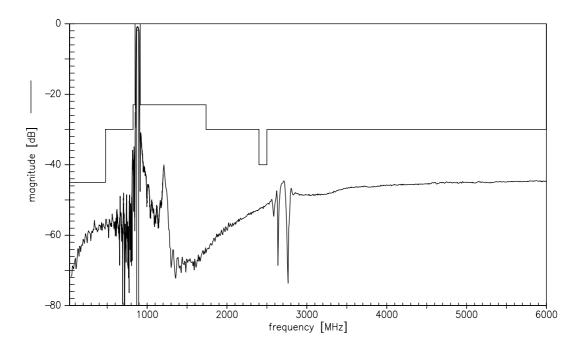
Data sheet



Transfer function



Transfer function (wideband)





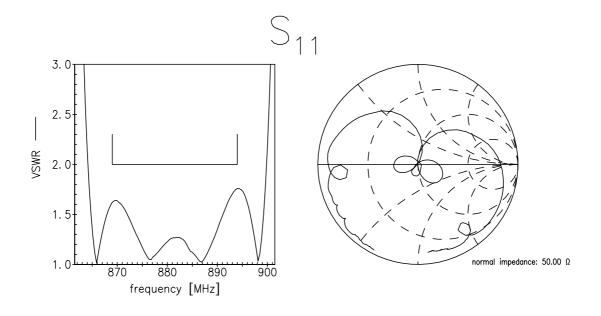
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881.5 & 942.5 MHz MHz

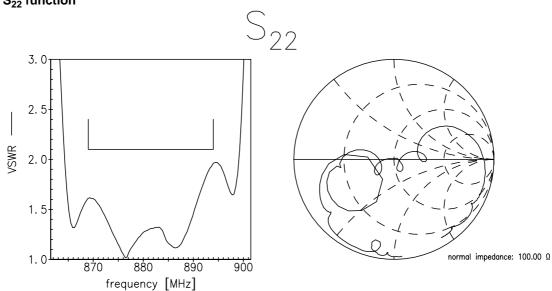
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Smith charts

S₁₁ function









SAW Rx 2in1 filter

881.5 & 942.5 MHz MHz

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 \equiv MD

Characteristics of Filter 2 (GSM900)

Temperature range for specification: $T = -10 \,^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$

Terminating source impedance: $Z_S = 50 \Omega$ Terminating load impedance: $Z_L = 100 \Omega$

	min.	typ.	max.		
Center frequency f _C	_	@ 25 °C 942.5	_	MHz	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		1.8	2.6 ¹⁾	dB	
Amplitude ripple (p-p) $\Delta\alpha$		1.0	2.0 /	GD.	
925.0 960.0 MHz	_	1.1	1.7	dB	
Input VSWR					
925.0 960.0 MHz	_	1.9	2.3		
Output VSWR					
925.0 960.0 MHz	_	2.0	2.4		
Output amplitude balance (S_{31}/S_{21})					
925.0 960.0 MHz	-1.2	-0.7/0.7	1.2	dB	
Output phase balance $(\phi(S_{31}) - \phi(S_{21}) + 180^{\circ})$					
925.0 960.0 MHz	-5	-2.0/2.0	5	۰	
Common mode suppression S _{cs21}					
925.0 960.0 MHz	20	27	_	dB	
824.0 995.0 MHz	20	25	<u> </u>	dB	
1648.0 1990.0 MHz	20	47	_	dB	
3296.0 3980.0 MHz	20	35	<u> </u>	dB	
Inter band isolation α					
869.0 894.0 MHz	35	40	_	dB	
Attenuation α					
0.3 480.0 MHz	45	54	_	dB	
480.0 880.0 MHz	30	33	<u> </u>	dB	
880.0 905.0 MHz	23	32	<u> </u>	dB	
905.0 915.0 MHz	18	20	—	dB	
980.0 1850.0 MHz	23	30	<u> </u>	dB	
1850.0 1920.0 MHz	30	47	_	dB	
1920.0 2400.0 MHz	25	45	_	dB	
2400.0 2500.0 MHz	40	45	-	dB	
2500.0 6000.0 MHz	30	40	—	dB	
6000.012750.0 MHz	20	26		dB	

^{1) 3.3} dB max. at -30 °C ... -10 °C and 85 °C ... 95 °C



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ESD voltage	V_{ESD}	100 ¹⁾	V	machine model, 10 pulses
Input power at				
GSM850, GSM900	P_{IN}	15	dBm	peak power of GSM signal
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Tx bands				

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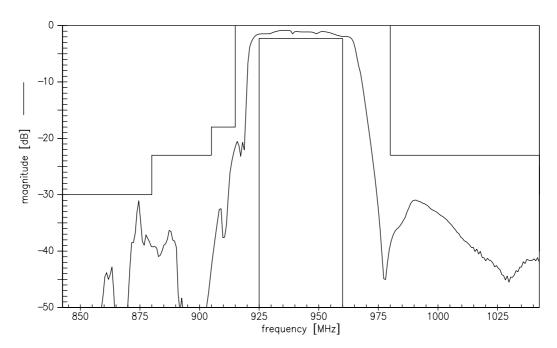


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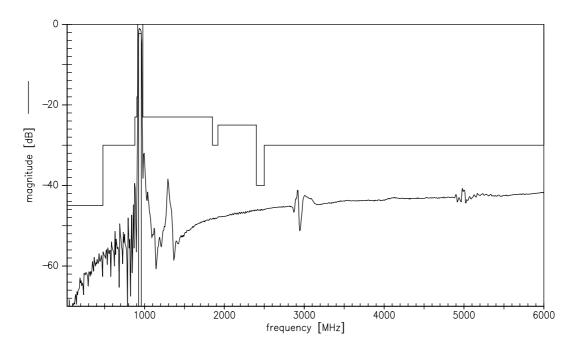
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Transfer function



Transfer function (wideband)





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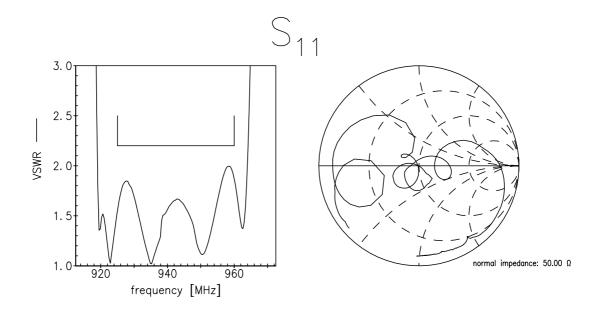
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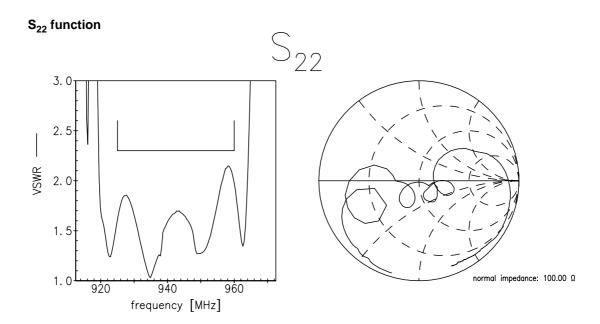
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=MD

Smith charts

S₁₁ function







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References

Туре	B9304
Ordering code	B39941B9304G110
Marking and package	C61157-A7-A1
Packaging	F61074-V8252-Z000
Date codes	L_1126
S-parameters	B9304_LB_NB.s3p B9304_LB_WB.s3p B9304_UB_NB.s3p B9304_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."
Moldability	Before using in overmolding environment, please contact your EPCOS sales office.

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