



SAW Components

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

Series/type:	B9814
Ordering code:	B39941B9814P810
Date:	September 30, 2011
Version:	2.1

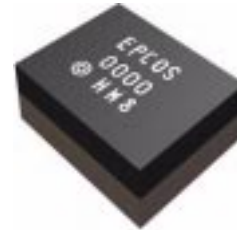
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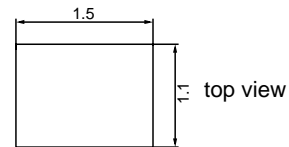
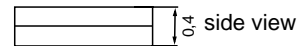
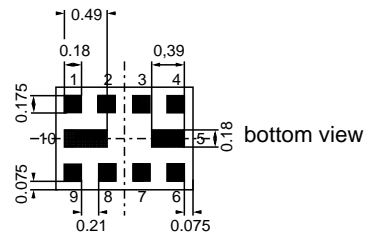
Data sheet


Application

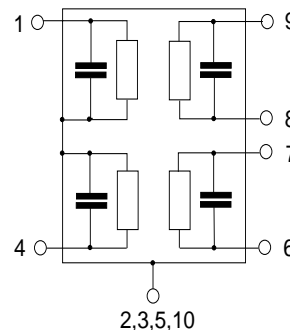
- Low-loss 2in1 RF filter for mobile telephone GSM 900 and GSM 850 systems, receive path (Rx)
- Usable passband:
 Filter 1 (GSM 900): 35 MHz
 Filter 2 (GSM 850): 25 MHz
- Unbalanced to balanced operation for all filters
- Impedance transformation from 50 Ω to 150 Ω for both filters
- Low amplitude ripple
- Suitable for GPRS class 1 to 12


Features

- Package size 1.5 x 1.1 x 0.4 mm³
- RoHS compatible
- Approx. weight 0.003g
- 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⁾	3.0	dB
925.0 ... 960.0 MHz					
Amplitude ripple (p-p)	$\Delta\alpha$	—	0.9	2.1	dB
925.0 ... 960.0 MHz					
Input VSWR		—	1.9	2.3	
925.0 ... 960.0 MHz					
Output VSWR		—	2.0	2.3	
925.0 ... 960.0 MHz					
Common mode rejection ratio		22	27	—	dB
925.0 ... 960.0 MHz					
Attenuation	α				
10.0 ... 480.0 MHz		45	55	—	dB
480.0 ... 825.0 MHz		35	39	—	dB
825.0 ... 905.0 MHz		21	26	—	dB
905.0 ... 915.0 MHz		14	20	—	dB
980.0 ... 1050.0 MHz		21	26	—	dB
1050.0 ... 1850.0 MHz		26	32	—	dB
1850.0 ... 1920.0 MHz		38	39	—	dB
1920.0 ... 5000.0 MHz		30	38	—	dB
5000.0 ... 6000.0 MHz		30	36	—	dB

¹⁾ Typical value excluding PCB losses.

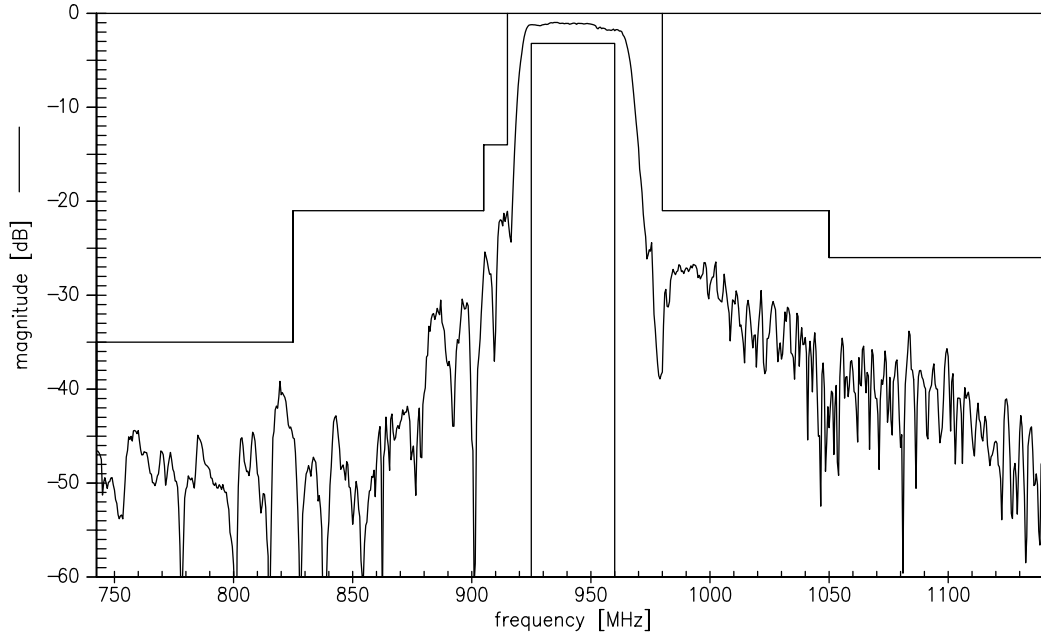

Maximum ratings of filter 1

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				

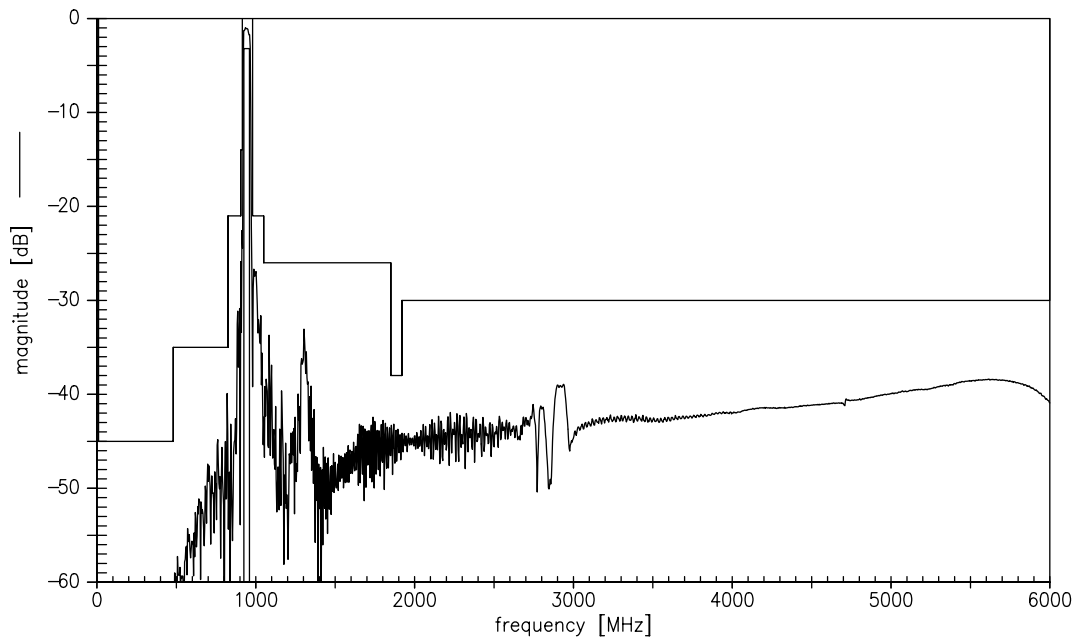
¹⁾ acc. to JESD22-A115A (machine model), 1 negative & 1 positive pulse.



Transfer function of filter 1



Transfer function of filter 1 - wideband

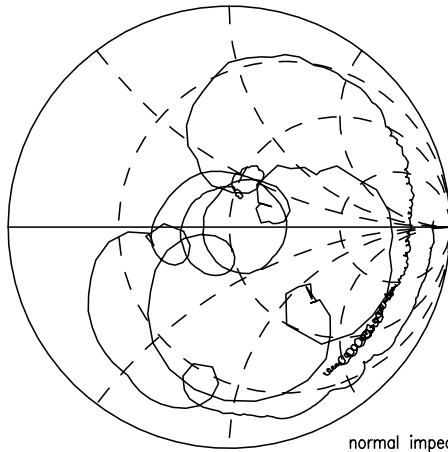


Data sheet

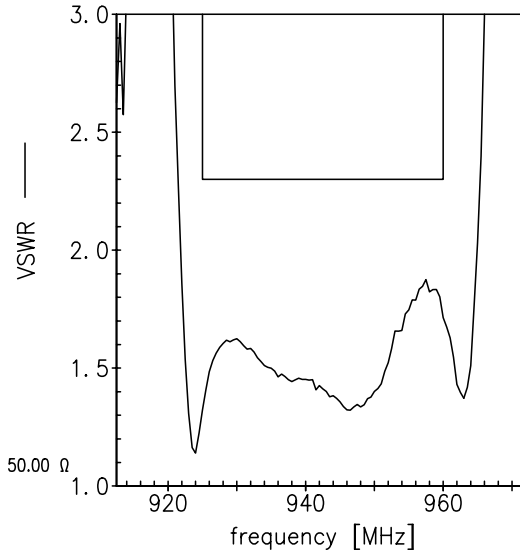


Smith Charts filter 1

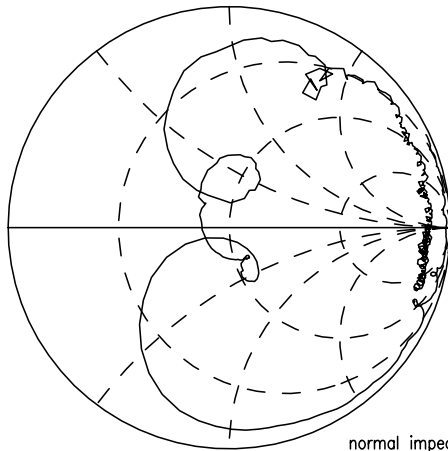
S_{11} function



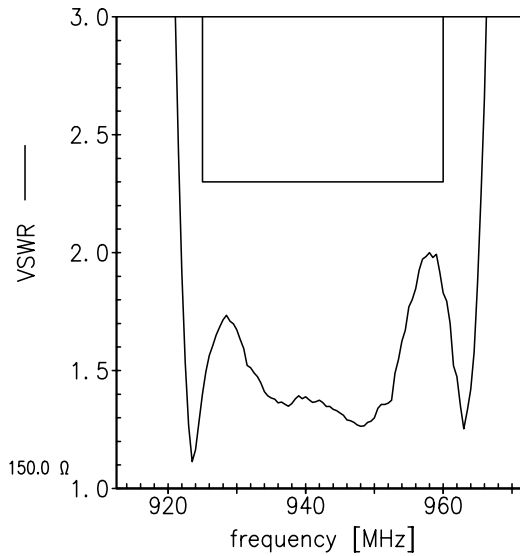
normal impedance: 50.00 Ω



S_{22} function



normal impedance: 150.0 Ω



Data sheet


Characteristics of filter 2 (GSM 850)

Temperature range for specification: $T = -30\text{ }^{\circ}\text{C to }+85\text{ }^{\circ}\text{C}$
 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}	—	1.6 ¹⁾	2.1	dB
Amplitude ripple (p-p) 869.0 ... 894.0 MHz	$\Delta\alpha$	—	0.8	1.6	dB
Input VSWR 869.0 ... 894.0 MHz		—	1.5	2.2	
Output VSWR 869.0 ... 894.0 MHz		—	1.7	2.2	
Common mode rejection ratio 869.0 ... 894.0 MHz		19	24	—	dB
Attenuation	α				
10.0 ... 447.0 MHz		45	50	—	dB
447.0 ... 849.0 MHz		28	33	—	dB
914.0 ... 1000.0 MHz		24	28	—	dB
1000.0 ... 1850.0 MHz		28	32	—	dB
1850.0 ... 1920.0 MHz		37	46	—	dB
1920.0 ... 4000.0 MHz		33	39	—	dB
4000.0 ... 6000.0 MHz		25	32	—	dB

1) Typical value excluding PCB losses.

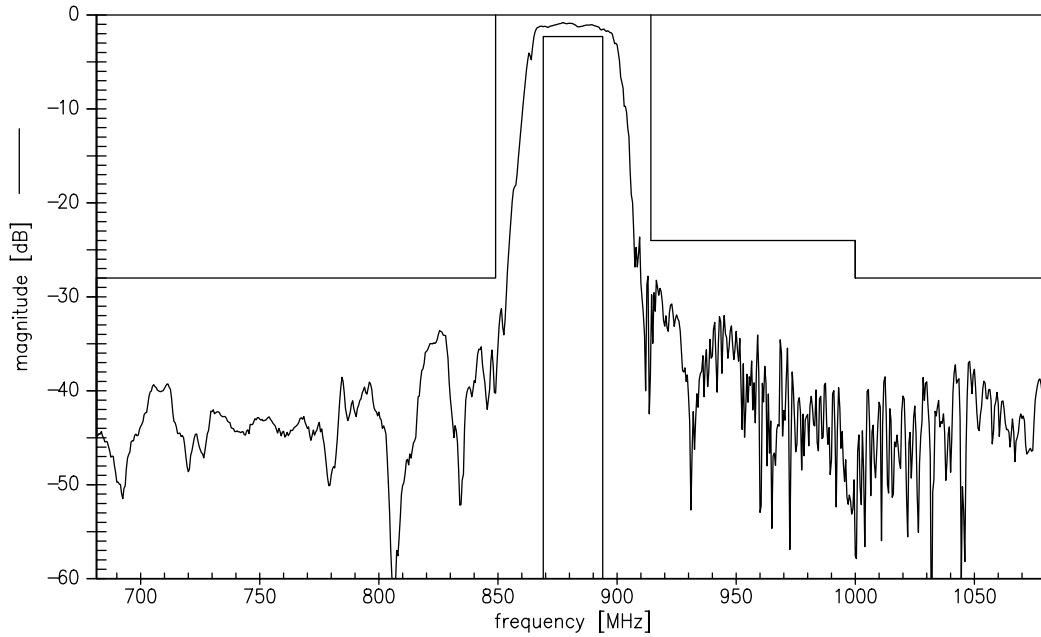

Maximum ratings of filter 2

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				

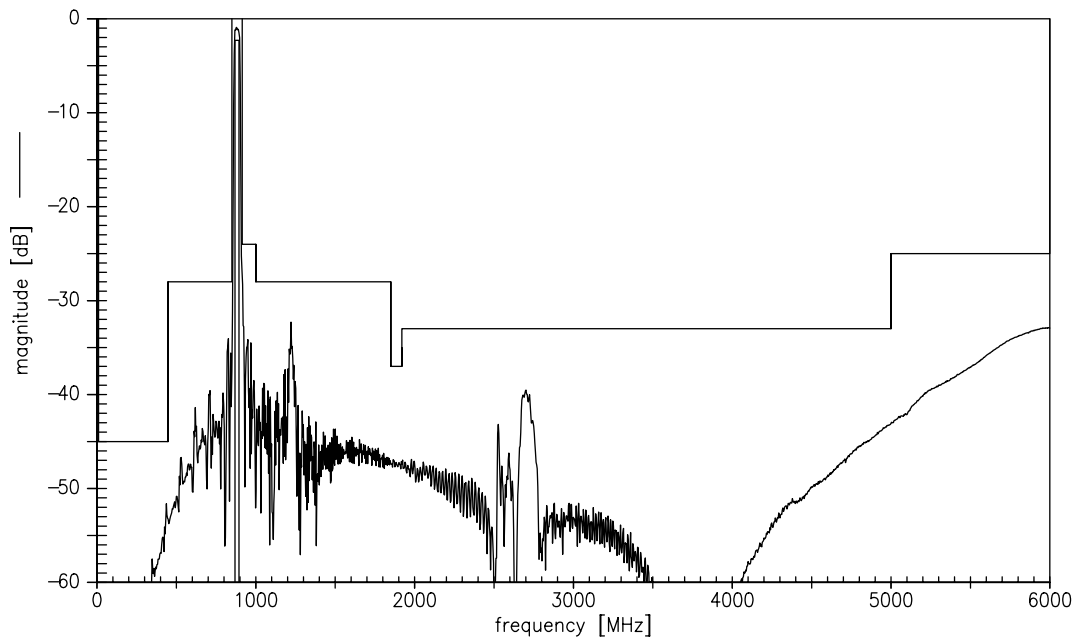
¹⁾ acc. to JESD22-A115A (machine model), 1 negative & 1 positive pulse.



Transfer function of filter 2



Transfer function of filter 2 - wideband

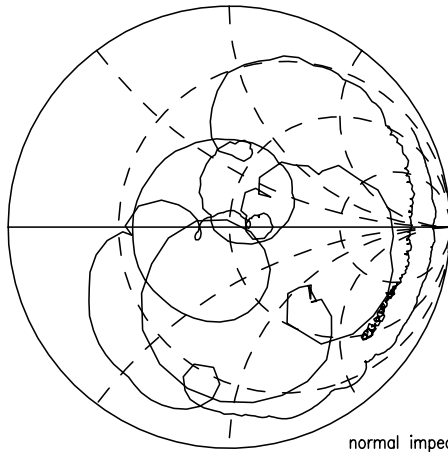


Data sheet

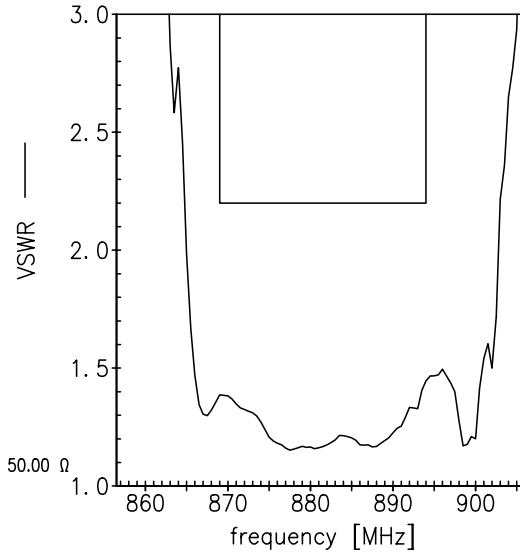


Smith Charts filter 2

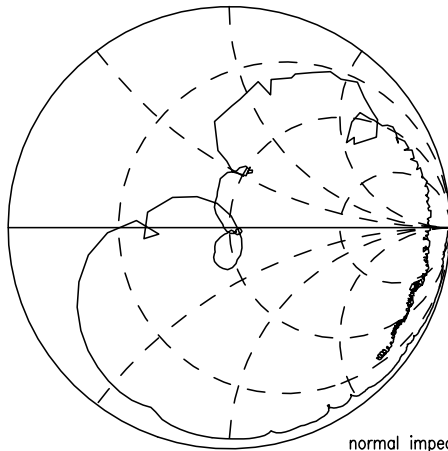
S₁₁ function



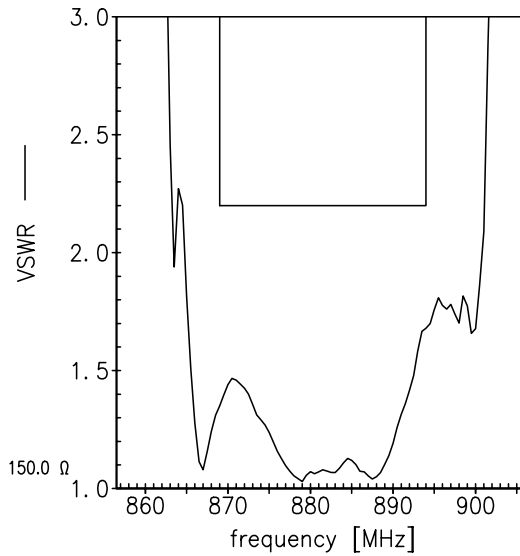
normal impedance: 50.00 Ω



S₂₂ function



normal impedance: 150.0 Ω



SAW Components **B9814**

SAW Rx 2in1 input diplex filter **881.5 / 942.5 MHz**

Data sheet



References

Type	B9814
Ordering code	B39941B9814P810
Marking and package	C61157-Z8-C20
Packaging	F61074-V8227-Z000
Date codes	L_1126
S-parameters	B9814_LB_NB.s3p, B9814_LB_WB.s3p B9814_UB_NB.s3p, B9814_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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