SAW Components

SAW Diversity Rx Filter

WCDMA Band II

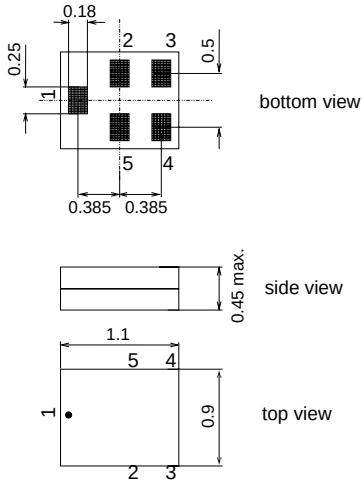
Series/type:	**B9860**
Ordering code:	**B39202B9860P810**
Date:	August 07, 2012
Version:	2.1

Application

- Low-loss RF filter for mobile telephone WCDMA Band II systems (diversity) receive path (Rx)
- Usable for diversity application
- Unbalanced to balanced operation
- Low amplitude ripple
- Usable passband: 60 MHz
- Impedance transformation from 50 Ω to 100 Ω
- Suitable for GPRS class 1 to 12

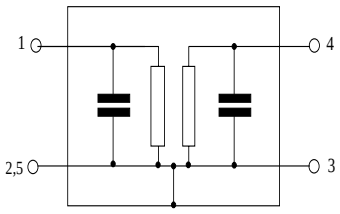
Features

- Package size 1.1 x 0.9 mm²
- max. Package height 0.45 mm
- RoHS compatible
- Approx. weight 0.001g
- Package for **S**urface **M**ount **T**echnology (**SMT**)
- Ni, gold-plated terminals
- **E**lectrostatic **S**ensitive **D**evice (**ESD**)
- **M**oisture **S**ensitive **L**evel 3



Pin configuration

- 1 Input, unbalanced
- 3,4 Output, balanced
- 2,5 Case-ground



Data sheet SMD

Characteristics

Temperature range for specification: T = –20 ˚C to +85 ˚C
Terminating source impedance: Z_S = 50 Ω
Terminating load impedance: Z_L = 100 Ω || 33 nH

		min.	typ. @ 25˚C	max.	
Center frequency	f_C	—	1960.0	—	MHz
Maximum insertion attenuation	α_{max}				
1930.0 ... 1990.0MHz		—	2.5	3.3	dB
@$f_{carrier}$ 1932.4 ... 1987.6MHz	α_{WCDMA} [1]	—	2.2	3.0	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
1930.0 ... 1990.0MHz		—	1.1	1.9	dB
Error Vector Magnitude	EVM [2]				
@$f_{carrier}$ 1932.4 ... 1987.6MHz		—	2.6	4.5	%
Input VSWR					
1930.0 ... 1990.0MHz		—	1.9	2.3	
Output VSWR					
1930.0 ... 1990.0MHz		—	2.0	2.4	
CMRR ($\lvert S_{21}-S_{31}\rvert$ / $\lvert S_{21}+S_{31}\rvert$)					
1930.0 ... 1990.0MHz		20	26	—	dB
Attenuation	α				
10.0 ... 810.0MHz		50	73	—	dB
810.0 ... 849.0MHz		60	71	—	dB
849.0 ... 898.0MHz		60	72	—	dB
898.0 ... 925.0MHz		60	71	—	dB
925.0 ... 1850.0MHz		40	50	—	dB
1850.0 ... 1910.0MHz		40	47	—	dB
@$f_{carrier}$ 1852.4 ... 1907.6MHz	α_{WCDMA} [3]	42	52	—	dB
2400.0 ... 2484.0MHz		45	60	—	dB
2484.0 ... 6000.0MHz		40	46	—	dB

[1] Attenuation of WCDMA signal (“Powertransferfunction“).Please refer to annotation on following page.
[2] Error Vector Magnitude (EVM) based on definition given in 3GPP TS 25.141.

Annotation for characteristics section

Attenuation of WCDMA signal ("Powertransferfunction", α_{WCDMA}) is determined by

$$\int_{-\infty}^{\infty} \left| S_{ds21}(f) H_{RRC}(f - f_{Carrier}) \right|^2 df$$

$f_{Carrier}$ according to 3GPP TS 25.101 (e.g. for Passband, $f_{Carrier}$ ranges from 1932.4 MHz (lowest Rx channel) to 1987.6 MHz (highest Rx channel)). $H_{RRC}(f)$ is the transfer function of the root-raised cosine transmit pulse shaping filter according to 3GPP TS 25.101 with the following normalization:

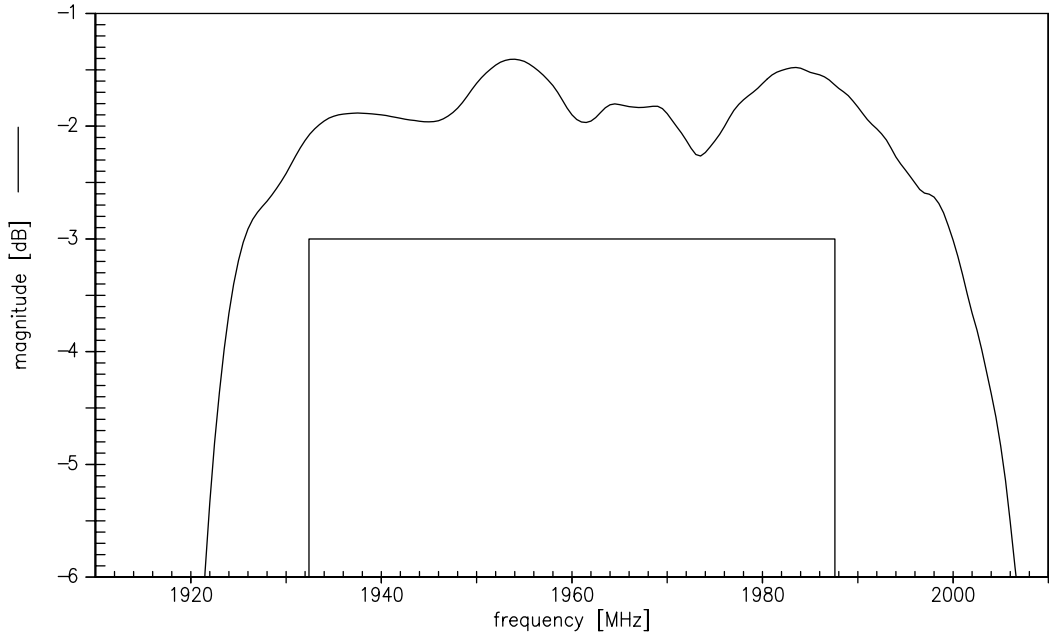
$$\int_{-\infty}^{\infty} \left| H_{RRC}(f) \right|^2 df = 1$$

Maximum ratings

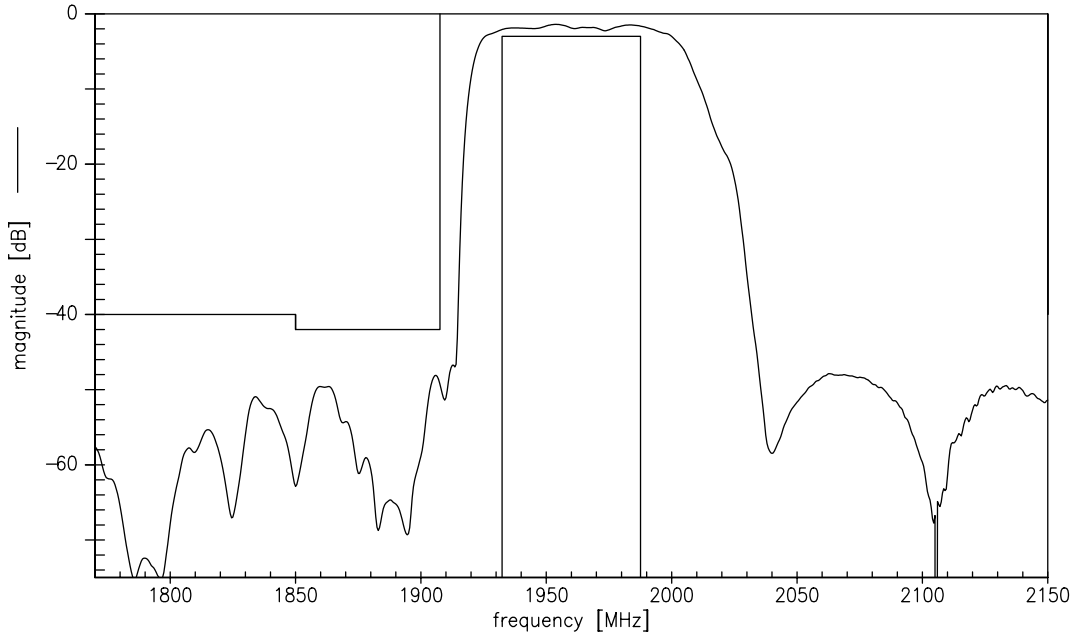
Operable temperature range	T	–40/+85	˚C	
Storage temperature range	T_{stg}	–40/+85	˚C	
DC voltage	V_{DC}	5	V	
ESD voltage	V_{ESD}	50[1)]	V	machine model, 10 pulses
Input Power at 1850.0 ... 1910.0MHz	P_{IN}	21	dBm	CW signal for 2000h at T = 55 ˚C

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

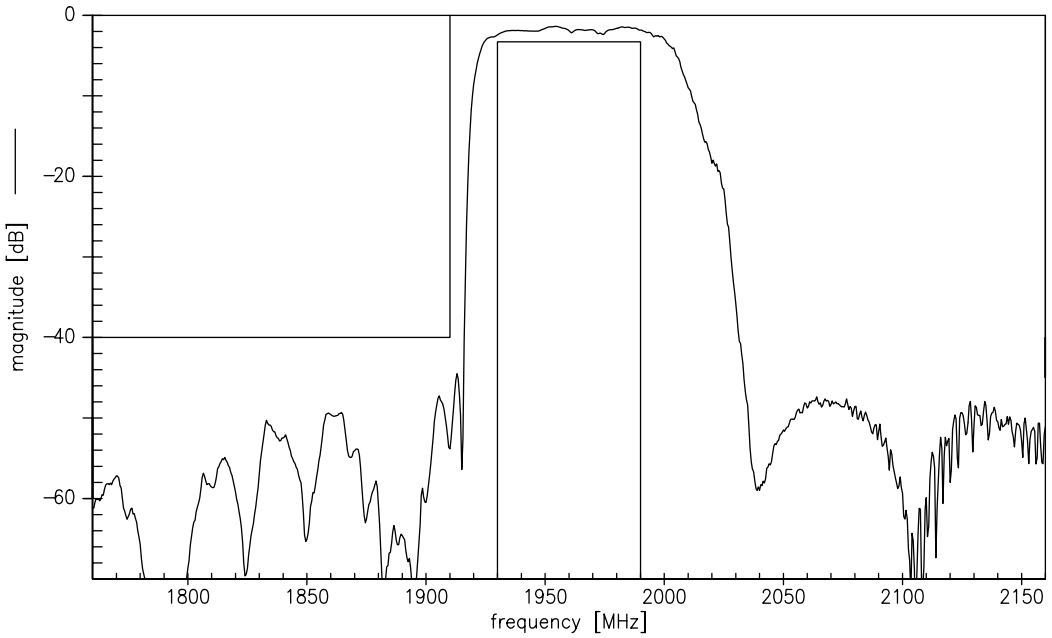
Transfer function for WCDMA signals (Power transfer function passband)



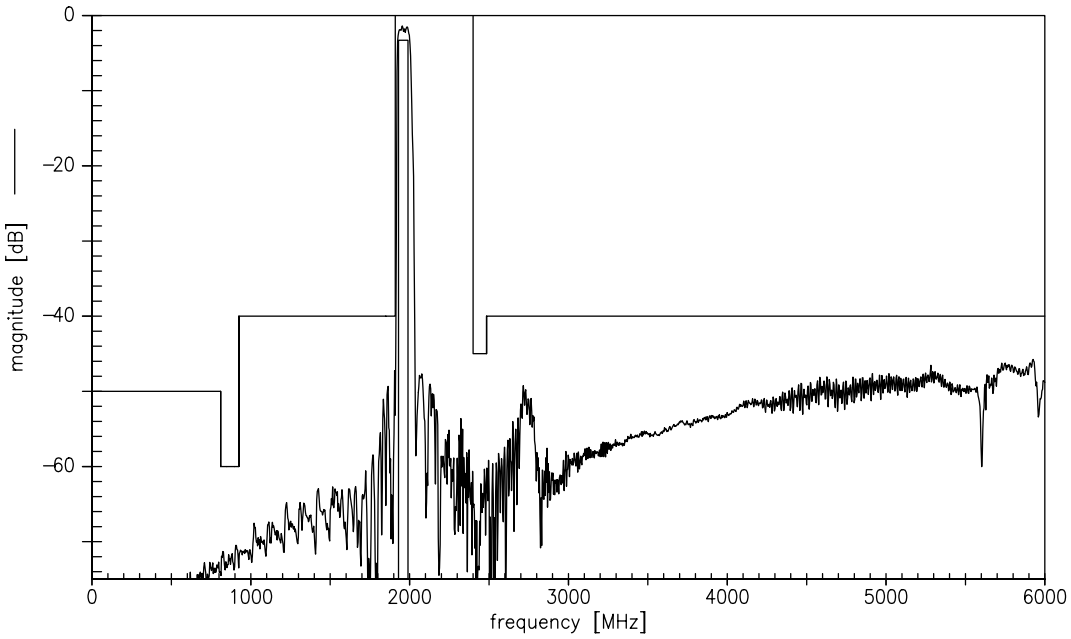
Transfer function for WCDMA signals (Power transfer function narrowband)



Transfer function (narrowband)

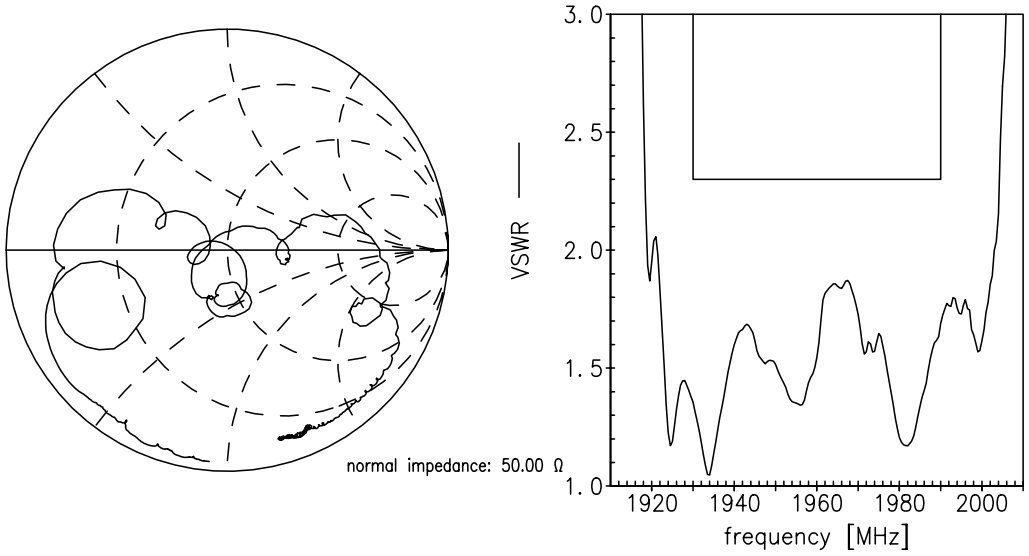


Transfer function (wideband)

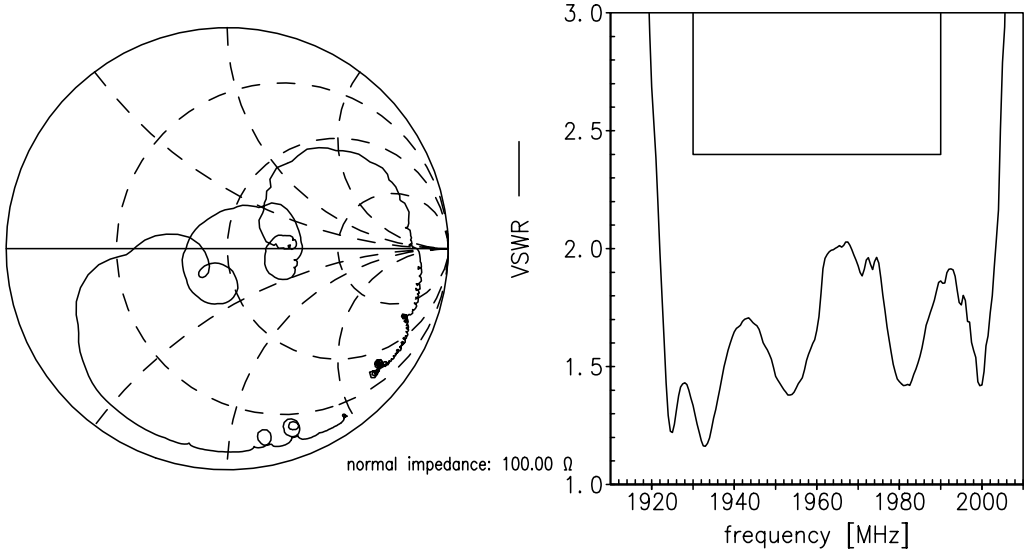


Smith Charts

S_{11} function



S_{22} function



References

Type	B9860
Ordering code	B39202B9860P810
Marking and package	C61175-A8-A3
Packaging	F61074-V8237-Z000
Date codes	L_1126
S-parameters	B9860_NB_UN.s3p, B9860_WB_UN.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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