SAW Components

SAW Rx Filter

WCDMA Band I / Band IV / Band X

Series/Type:	**B9451**
Ordering code:	**B39212B9451P810**
Date:	April 07, 2010
Version:	2.0

EPCOS AG is a TDK Group Company.

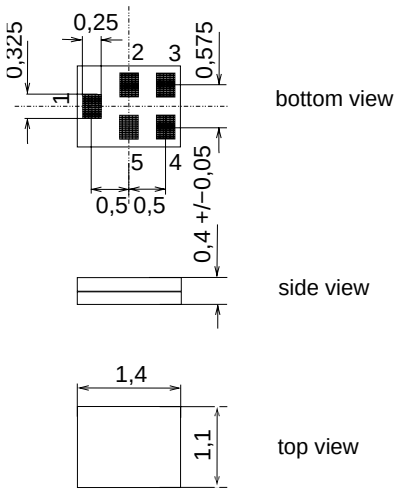
Data sheet SMD

Application

- Low-loss RF filter for mobile telephone WCDMA systems, receive path (RX)
- Useable for antenna diversity systems for WCDMA band I, IV, X
- Impedance 50 Ω
- Unbalanced to unbalanced operation
- Very low insertion attenuation
- Very low amplitude ripple
- Very low Error Vector Magnitude (EVM)
- Very high Tx suppression for WCDMA band I, II, IV, V, X
- Usable passband 60 MHz

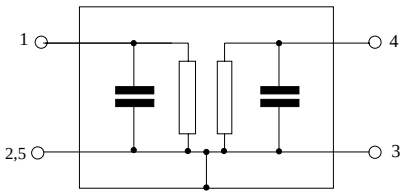
Features

- Package size 1.4 x 1.1 x 0.4 mm^3
- Approx. weight 0.003 g
- RoHS compatible
- 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
- 4 Output, unbalanced
- 2,3,5 To be grounded



Data sheet SMD

Characteristics

Operating temperature range: T = –30 ˚C to +85 ˚C
Terminating source impedance: Z_S = 50 Ω +2.7nH (unbalanced)
Terminating load impedance: Z_L = 50 Ω +1.9nH (unbalanced)

		min.	typ. @ 25 ˚C	max.	
Center frequency	f_C	—	2140.0	—	MHz
Maximum insertion attenuation					
2110.0 ... 2155.0MHz	α_{max}	—	1.9	2.7	dB
2110.0 ... 2170.0MHz	α_{max}	—	1.9	2.7	dB
@$f_{Carrier}$ 2112.4 ... 2167.6MHz	α_{WCDMA} [1]	—	2.1	2.7	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
2110.0 ... 2155.0MHz		—	0.5	1.2	dB
2110.0 ... 2170.0MHz		—	0.5	1.2	dB
Error Vector Magnitude					
@$f_{Carrier}$ 2112.4 ... 2167.6MHz	EVM [2]	—	1.1	1.9	%
Input VSWR					
2110.0 ... 2155.0MHz		—	1.6	2.0	
2110.0 ... 2170.0MHz		—	1.6	2.0	
Output VSWR					
2110.0 ... 2155.0MHz		—	1.6	2.0	
2110.0 ... 2170.0MHz		—	1.6	2.0	
Attenuation	α				
0.0 ... 810.0MHz		35	50	—	dB
810.0 ... 849.0MHz		46	50	—	dB
849.0 ... 898.0MHz		35	49	—	dB
898.0 ... 925.0MHz		46	49	—	dB
925.0 ... 1710.0MHz		35	48	—	dB
1710.0 ... 1770.0MHz		50	54	—	dB
1770.0 ... 1850.0MHz		35	57	—	dB
1850.0 ... 1980.0MHz		44	48	—	dB
2400.0 ... 2484.0MHz		30	50	—	dB
2484.0 ... 4220.0MHz		10	36	—	dB
4220.0 ... 4340.0MHz		15	36	—	dB
4340.0 ... 6000.0MHz		10	34	—	dB

[1] Attenuation of WCDMA signal (“Powertransferfunction”). Please refer to annotation below.
[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 UMTS-Passband, $f_{Carrier}$ ranges from 2112.4 MHz (lowest Rx channel) to 2167.6 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:

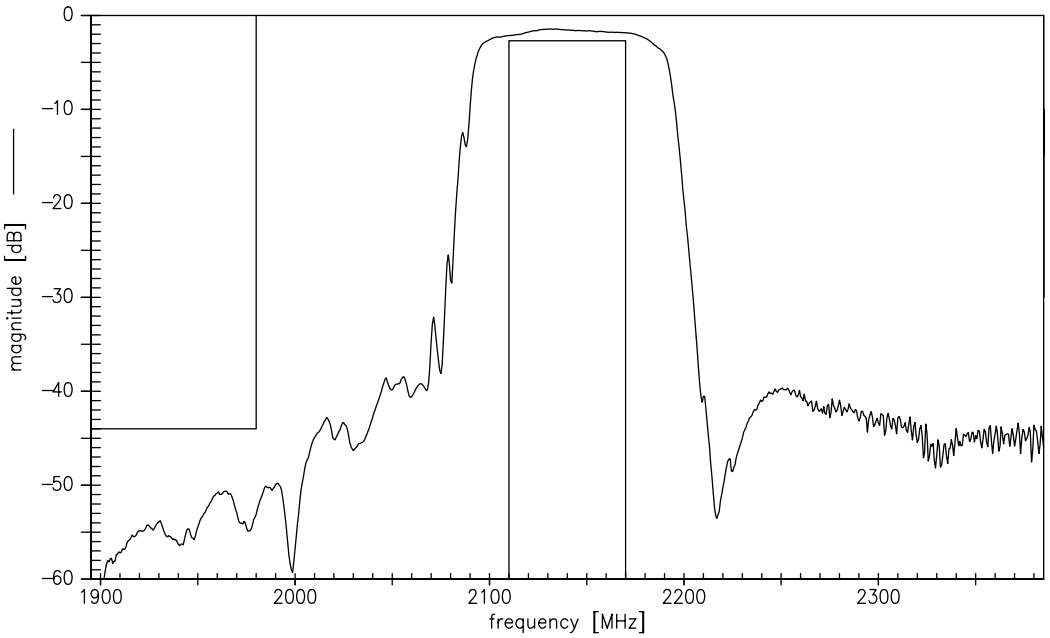
$$\int_{-\infty}^{\infty} \left| H_{RRC}(f) \right|^2 df = 1$$

Maximum ratings

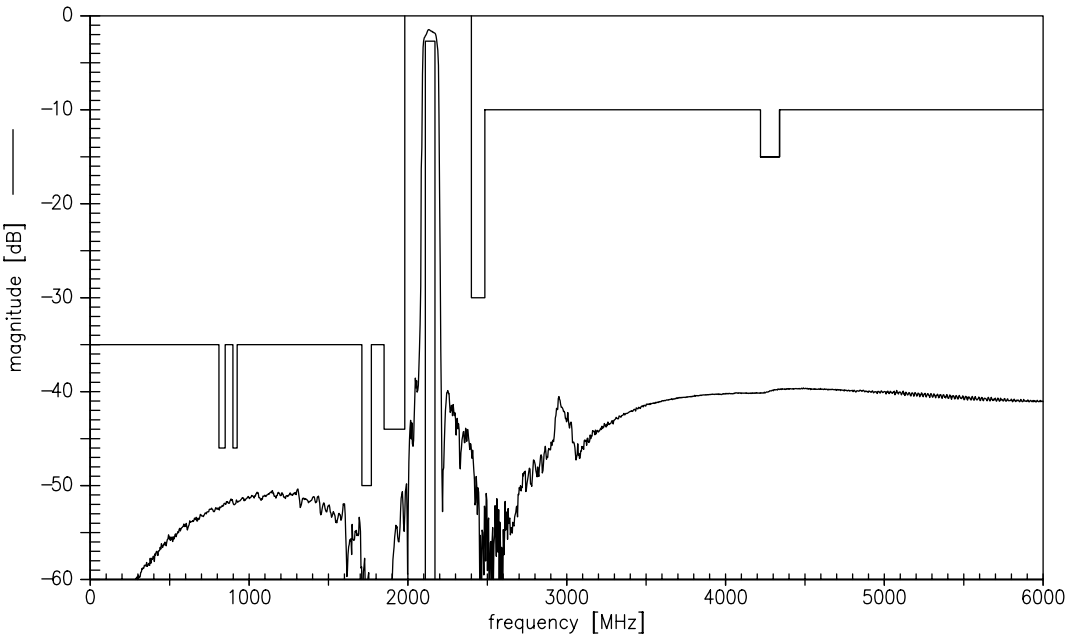
Operable temperature range	T	–30/+85	˚C	
Storage temperature range	T_{stg}	–40/+85	˚C	
DC voltage	V_{DC}	5	V	
ESD voltage	V_{ESD}	100[1)]	V	machine model, 1 pulse
Source Power	P_S	15	dBm	cw signal @ 50˚C

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

Transfer function

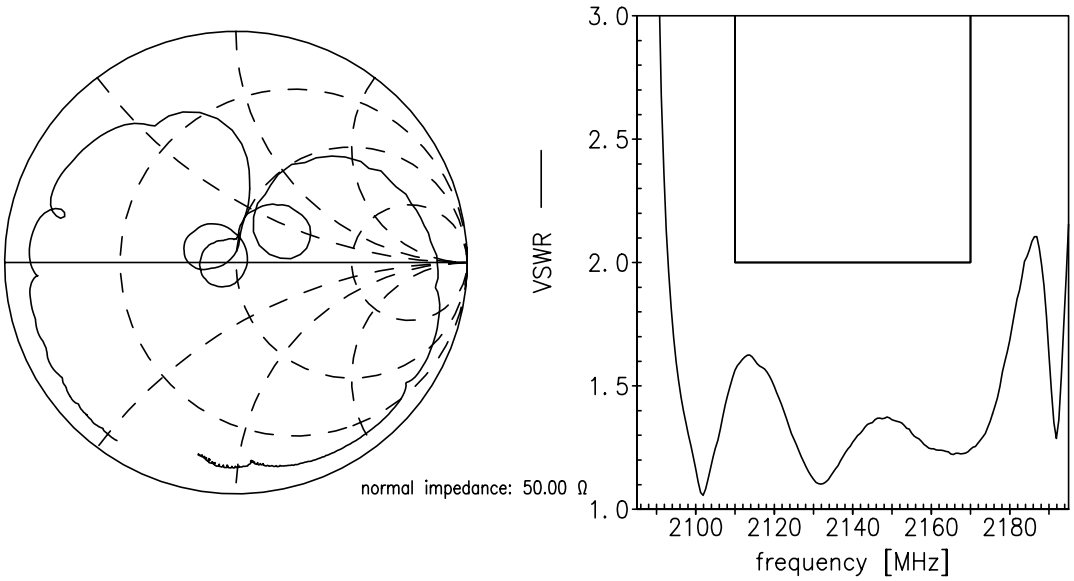


Transfer function (wideband)

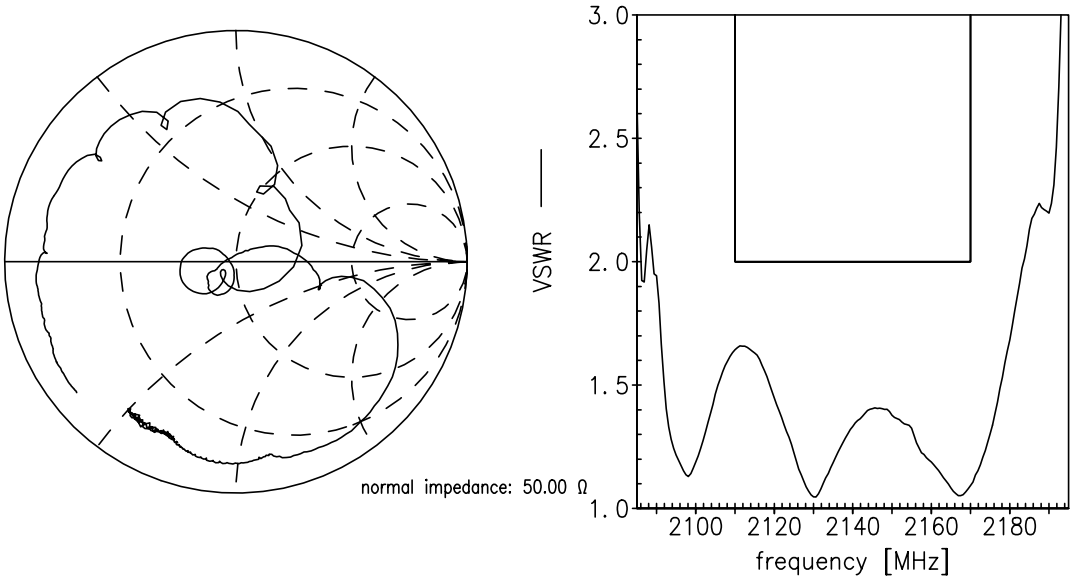


Smith chart

S_{11} function



S_{22} function



References

Type	B9451
Ordering code	B39212B9451P810
Marking and Package	C61157-A8-A14
Packaging	F61074-V8237-Z000
Date Codes	L_1126
S-Parameters	B9451_NB.s2p B9451_WB.s2p 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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