SAW Components

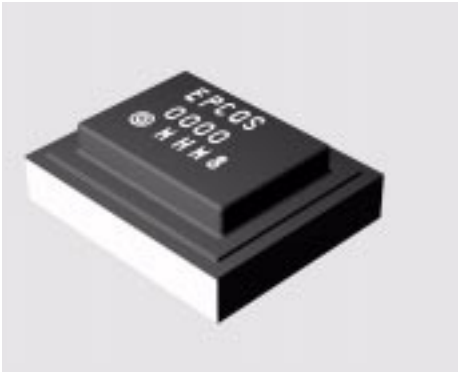
SAW duplexer

Band VIII

Series/type:	**B7681**
Ordering code:	**B39901B7681L310**
Date:	January 11, 2008
Version:	2.0

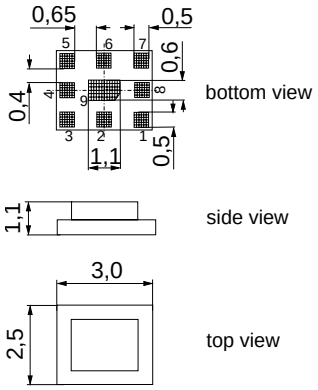
Application

- Low-loss SAW duplexer for mobile telephone Band VIII systems
- Low insertion attenuation
- Low amplitude ripple
- Usable passband 35 MHz
- Single ended to balanced transformation in Antenna - Rx path
- Impedance transformation 50Ω to 100Ω in Antenna - Rx path



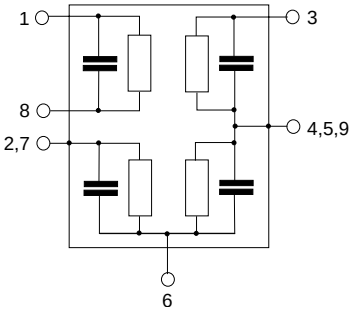
Features

- Package size 3.0 x 2.5 x 1.1 mm^3
- RoHS compatible
- Approximate weight 0.035 g
- Package for **S**urface **M**ount **T**echnology (**SMT**)
- Ni, gold-plated terminals
- Fully matched by integrated matching network
- Balanced Rx port, single ended Tx port
- Impedance transformation 50 Ω to 100 Ω in Rx path



Pin configuration

3	TX input, single ended
1,8	RX output, balanced
6	Antenna
2,4,5,7,9	Ground



Data sheet SMD

Characteristics

Temperature range for specification: T = –15 ˚C to +80 ˚C
ANT terminating impedance: Z_{ANT} = 50 Ω
RX terminating impedance: Z_{RX} = 100 Ω (balanced)
TX terminating impedance: Z_{TX} = 50 Ω

Characteristics TX-ANT						min.	typ. @ 25˚C	max.	
Center frequency					f_C	—	897.50	—	MHz
Maximum insertion attenuation					α_{max}				
@$f_{Carrier}$	882.4	...	912.6	MHz	α_{WCDMA} 1)	—	1.7	2.5	dB
Amplitude ripple (p-p)									
@$f_{Carrier}$	882.4	...	912.6	MHz	Δ_{WCDMA} 1)	—	0.7	1.4	dB
Error Vector Magnitude									
@$f_{Carrier}$	882.4	...	912.6	MHz	EVM 2)	—	2.7	4.5	%
@$f_{Carrier}$	882.4	...	912.6	MHz	EVM 2)	—	2.7	3.5	% 3)
@$f_{Carrier}$	882.4	...	911.6	MHz	EVM 2)	—	2.7	3.5	%
VSWR									
TX port	880.0	...	915.0	MHz		—	1.7	2.0	
ANT port	880.0	...	915.0	MHz		—	1.6	2.0	
Attenuation					α				
	0.3	...	840.0	MHz		25	35	—	dB
	840.0	...	865.0	MHz		20	39	—	dB
@$f_{Carrier}$	927.4	...	957.6	MHz	α_{WCDMA} 1)	40	46	—	dB
	960.0	...	1472.0	MHz		25	34	—	dB
	1472.0	...	1477.0	MHz		25	39	—	dB
	1550.0	...	1600.0	MHz		35	41	—	dB
	1760.0	...	1830.0	MHz		25	50	—	dB
	1830.0	...	2500.0	MHz		25	39	—	dB
	2500.0	...	2745.0	MHz		15	19	—	dB
	2745.0	...	4000.0	MHz		15	23	—	dB
	4000.0	...	5825.0	MHz		2	5	—	dB

1) Attenuation of WCDMA signal (“Powertransferfunction”). Please refer to annotation on page (6).
2) Error Vector Magnitude (EVM) based on definition given in 3GPP TS 25.141.
3) T=-15˚C to +55˚C

Data sheet SMD

Characteristics

Temperature range for specification: T = –15 ˚C to +80 ˚C
ANT terminating impedance: Z_{ANT} = 50 Ω
RX terminating impedance: Z_{RX} = 100 Ω (balanced)
TX terminating impedance: Z_{TX} = 50 Ω

Characteristics ANT-RX						min.	typ. @ 25˚C	max.	
Center frequency					f_C	—	942.5	—	MHz
Maximum insertion attenuation					α_{max}				
	925.0	...	960.0	MHz		—	2.3	3.5	dB
@$f_{Carrier}$	927.4	...	957.6	MHz	α_{WCDMA} 1)	—	2.0	2.7	dB
Amplitude ripple (p-p)									
@$f_{Carrier}$	927.4	...	957.6	MHz	Δ_{WCDMA} 1)	—	0.6	1.2	dB
Error Vector Magnitude									
@$f_{Carrier}$	927.4	...	957.6	MHz	EVM 2)	—	2.4	4.0	%
Common mode suppression					S_{cs21}				
	925.0	...	960.0	MHz		25	28	—	dB
VSWR									
RX port	925.0	...	960.0	MHz		—	1.9	2.2	
ANT port	925.0	...	960.0	MHz		—	1.8	2.1	

1) Attenuation of WCDMA signal (“Powertransferfunction”). Please refer to annotation on page (6).
2) Error Vector Magnitude (EVM) based on definition given in 3GPP TS 25.141.

Characteristics

Temperature range for specification: T = –15 ˚C to +80 ˚C
ANT terminating impedance: Z_{ANT} = 50 Ω
RX terminating impedance: Z_{RX} = 100 Ω (balanced)
TX terminating impedance: Z_{TX} = 50 Ω

Characteristics ANT-RX					min.	typ. @ 25˚C	max.	
Attenuation				α				
0.3	...	835.0	MHz		40	50	—	dB
835.0	...	880.0	MHz		40	51	—	dB
880.0	...	905.0	MHz		23	50	—	dB
905.0	...	915.0	MHz		18	48	—	dB
@$f_{Carrier}$ 882.4	...	912.6	MHz	α_{WCDMA} [1)]	42	50	—	dB
980.0	...	1805.0	MHz		23	36	—	dB
1805.0	...	1920.0	MHz		30	68	—	dB
1920.0	...	2400.0	MHz		30	52	—	dB
2400.0	...	2500.0	MHz		30	46	—	dB
2500.0	...	2880.0	MHz		30	46	—	dB
2880.0	...	4000.0	MHz		30	48	—	dB
4000.0	...	5150.0	MHz		30	47	—	dB
5150.0	...	5825.0	MHz		30	49	—	dB
5825.0	...	6000.0	MHz		30	50	—	dB

[1)] Attenuation of WCDMA signal (“Powertransferfunction”). Please refer to annotation on page (6).

Characteristics TX-RX					min.	typ. @ 25˚C	max.	
Isolation between RX and TX				α				
@$f_{Carrier}$ 882.4	...	912.6	MHz	α_{WCDMA} [1)]	50	52	—	dB
@$f_{Carrier}$ 927.4	...	957.6	MHz	α_{WCDMA} [1)]	45	50	—	dB

[1)] Attenuation of WCDMA signal (“Powertransferfunction”). Please refer to annotation on page (6).

Maximum ratings

Temperature range for specification[1)]	T	–15 / +80	˚C	
Operable temperature range[2)]	T	–25 / +85	˚C	
Storage temperature range	T_{stg}	–40 / +85	˚C	
DC voltage	V_{DC}	5	V	
ESD voltage	V_{ESD}	100[3)]	V	machine model, 10 pulses
Input Power at	P_{IN}			
880.0 ... 915.0 MHz		30	dBm	} continuous wave, 55 ˚C, 10000 h
elsewhere		10	dBm	

1) Defines the temperature range in which the specification values are guaranteed.

2) Defines the temperature range in which the SAW device keeps its typical characteristics, however the specification values are not guaranteed.

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

Annotation for characteristics section

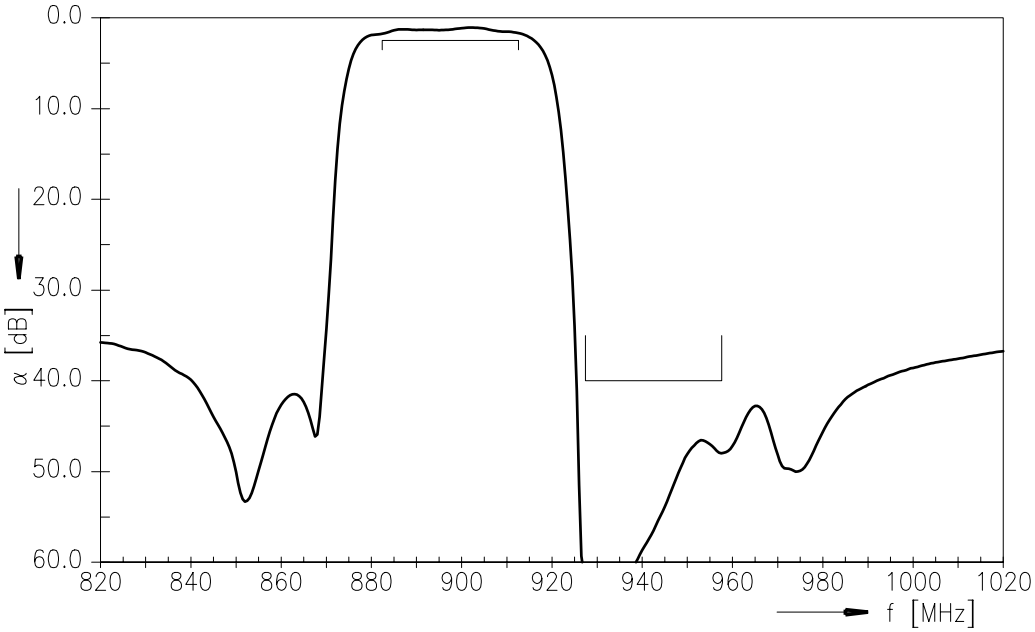
Attenuation of WCDMA signal ("Powertransferfunction", α_{WCDMA}) is determined by

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

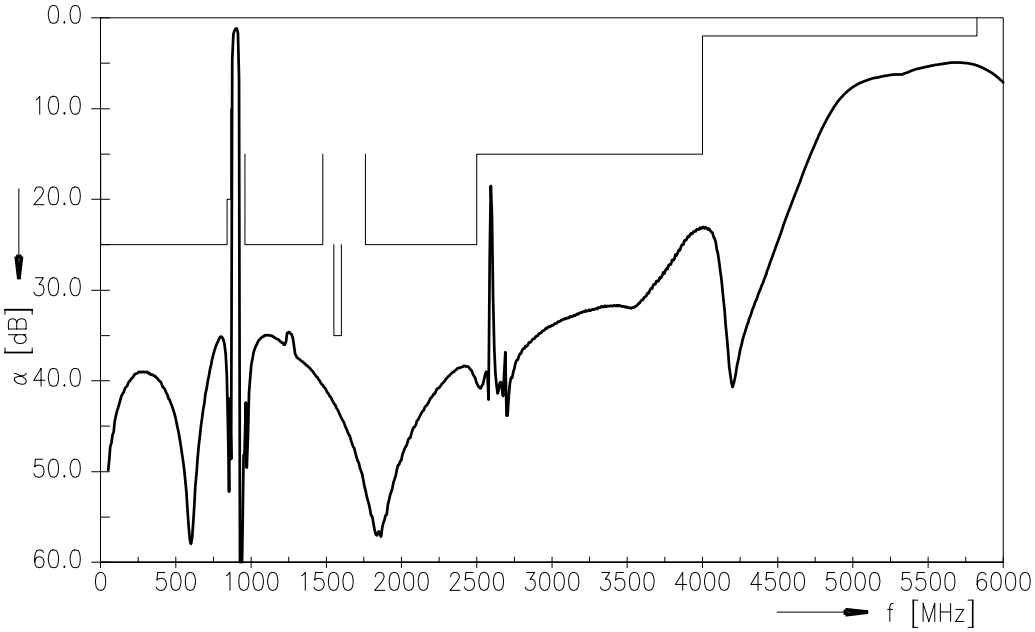
$f_{Carrier}$ according to 3GPP TS 25.101 (e.g. for UMTS-Passband, $f_{Carrier}$ ranges from 882.4 MHz (lowest Tx channel) to 912.6 MHz (highest Tx channel)). $H_{RRC}(f)$ is the transfer function of the root-raised cosine transmit pulse shaping filter according to 3GPP TS 25.101 with the following normalization:

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

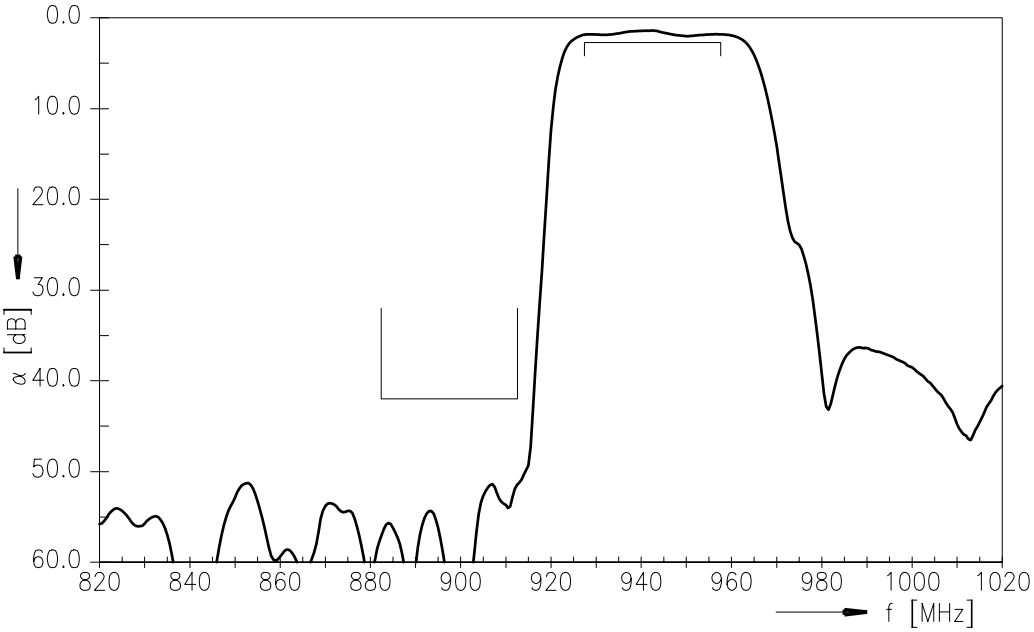
Frequency Response TX-ANT (Powertransferfunction)



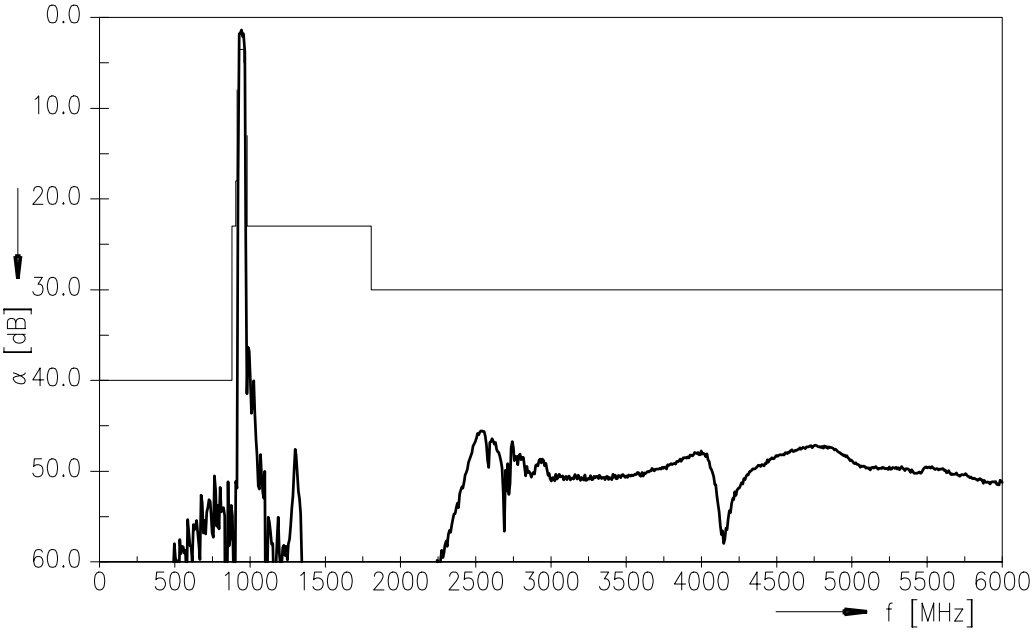
Frequency Response TX-ANT (wideband)



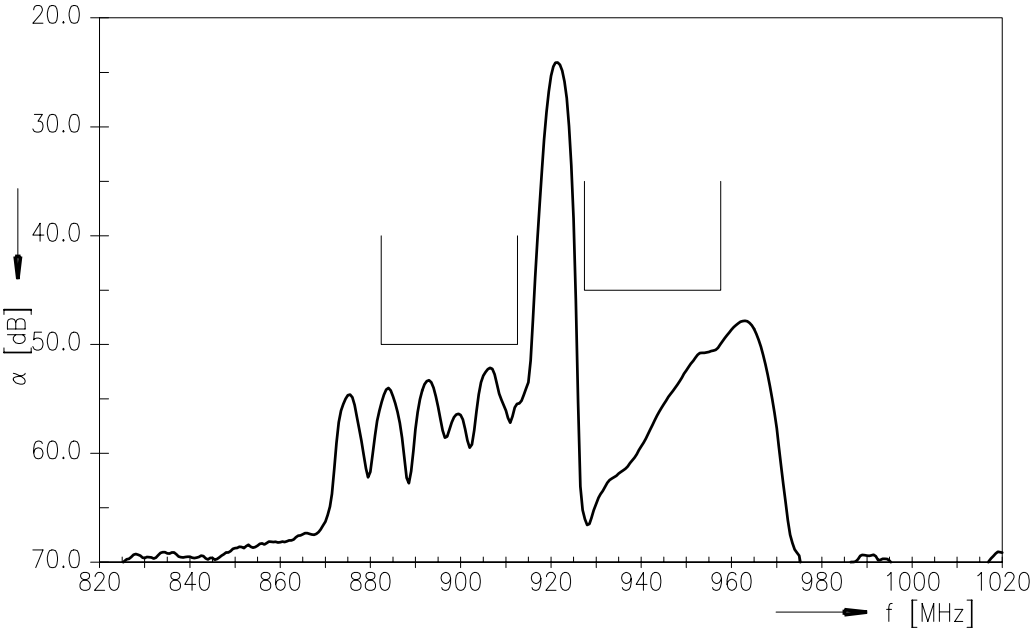
Frequency Response RX-ANT (Powertransferfunction)



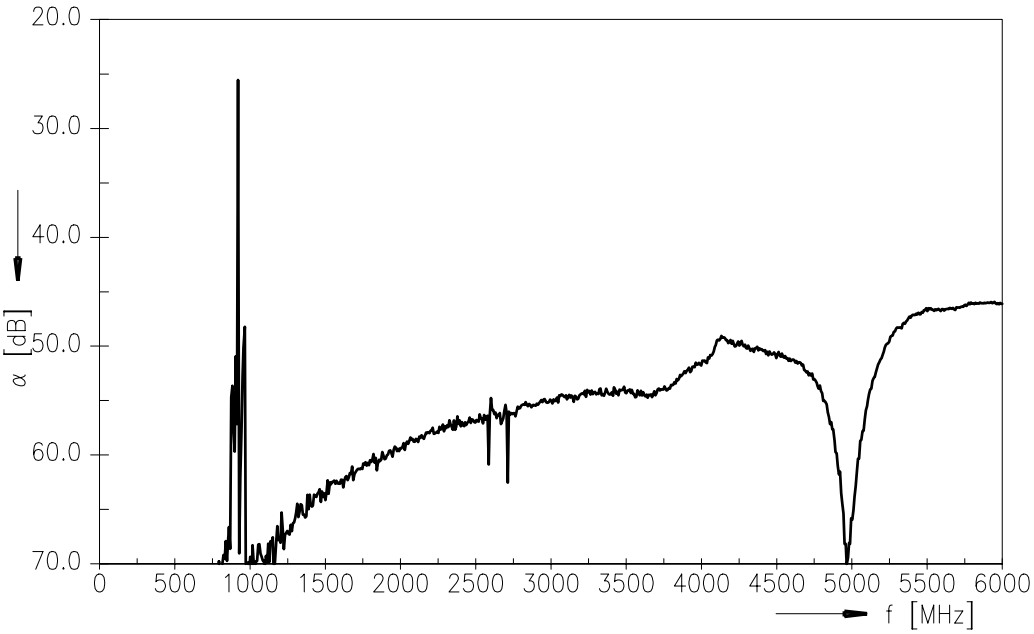
Frequency Response RX-ANT (wideband)



Frequency Response TX-RX (Powertransferfunction)



Frequency Response TX-RX (wideband)



References

Type	B7681
Ordering code	B39901B7681L310
Marking and Package	C61157-Z3-C23
Packaging	F61074-V8211-Z000
Date Codes	L_1126
S-Parameters	B7681_NB.s3p B7681_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."

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