SAW Components

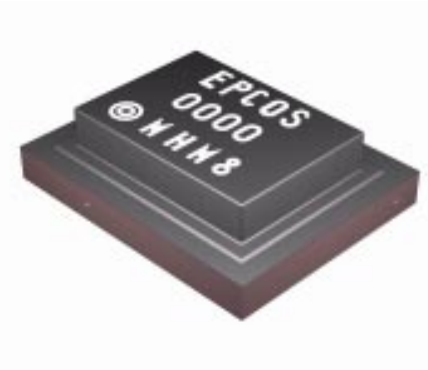
SAW Duplexer

Cellular / WCDMA Band V

Series/type:	**B7671**
Ordering code:	**B39881B7671A710**
Date:	September 23, 2009
Version:	2.0

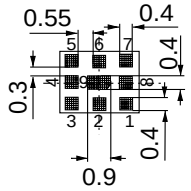
Application

- Multimode SAW duplexer for mobile telephone Cellular / WCDMA Band V systems
- Low insertion attenuation
- Low amplitude ripple
- Single ended to balanced transformation in Antenna - Rx path
- Impedance transformation 50Ω to 100Ω in Antenna - Rx path

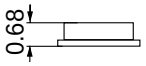


Features

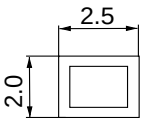
- Package size 2.5 x 2.0 x 0.68 mm³
- RoHS compatible
- Package for **S**urface **M**ount **T**echnology (**SMT**)
- Ni, gold-plated terminals
- **E**lectrostatic **S**ensitive **D**evice (**ESD**)



bottom view



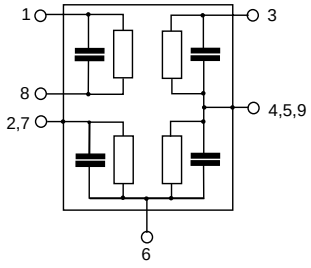
side view



top view

Pin configuration

■	3	TX Input
■	1, 8	RX Output (balanced)
■	6	Antenna
■	2, 4, 5, 7, 9	To be grounded



Characteristics

Temperature range for specification: T = –20 ˚C to +85 ˚C
Antenna terminating impedance: Z_{ANT} = 50 Ω ll 8.2 nH
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		836.5		MHz
Maximum insertion attenuation	α_{max}				
824.0 ... 849.0 MHz			1.7	2.2	dB
@$f_{Carrier}$ 826.4 ... 846.6 MHz	α_{WCDMA} 1)		1.6	2.0	dB
Amplitude ripple	$\Delta\alpha$				
824.0 ... 849.0 MHz			0.5	1.0	dB
@$f_{Carrier}$ 826.4 ... 846.6 MHz	α_{WCDMA} 1)		0.4	0.8	dB
Error Vector Magnitude					
@$f_{Carrier}$ 826.4 ... 846.6 MHz	EVM 2)		1.4	2.5	%
Input VSWR (TX port)					
824.0 ... 849.0 MHz			1.9	2.2	
Output VSWR (ANT port)					
824.0 ... 849.0 MHz			1.7	2.0	

1) Attenuation of WCDMA signal (“Powertransferfunction”). Please refer to annotation on page (8).
2) Error Vector Magnitude (EVM) based on definition given in 3GPP TS 25.141.

Characteristics

Temperature range for specification: T = –20 ˚C to +85 ˚C
Antenna terminating impedance: Z_{ANT} = 50 Ω ll 8.2 nH
RX terminating impedance: Z_{RX} = 100 Ω (balanced)
TX terminating impedance: Z_{TX} = 50 Ω

Characteristics TX - ANT				min.	typ. @ 25 ˚C	max.	
Absolute attenuation			α				
10.0	...	420.0	MHz	30	42		dB
420.0	...	494.0	MHz	35	39		dB
494.0	...	701.0	MHz	30	33		dB
701.0	...	728.0	MHz	30	34		dB
728.0	...	764.0	MHz	30	34		dB
764.0	...	804.0	MHz	30	36		dB
860.0	...	869.0	MHz	4	16		dB
869.0	...	894.0	MHz	44	50		dB
1574.0	...	1577.0	MHz	40	45		dB
1638.0	...	1708.0	MHz	20	48		dB
1844.9	...	1879.9	MHz	30	49		dB
1884.5	...	1919.6	MHz	30	48		dB
1930.0	...	1990.0	MHz	35	45		dB
2110.0	...	2170.0	MHz	33	41		dB
2400.0	...	2557.0	MHz	30	35		dB
3286.0	...	3406.0	MHz	20	28		dB
4110.0	...	4255.0	MHz	20	25		dB
4934.0	...	5350.0	MHz	15	22		dB
5725.0	...	5953.0	MHz	6	10		dB

Characteristics

Temperature range for specification: T = –20 ˚C to +85 ˚C
Antenna terminating impedance: Z_{ANT} = 50 Ω ll 8.2 nH
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		881.5		MHz
Maximum insertion attenuation	α_{max}				
869.0 ... 894.0 MHz			2.2	2.7	dB
@$f_{Carrier}$ 871.4 ... 891.6 MHz	α_{WCDMA} 1)		1.9	2.4	dB
Amplitude ripple	$\Delta\alpha$				
869.0 ... 894.0 MHz			0.8	1.6	dB
@$f_{Carrier}$ 871.4 ... 891.6 MHz	α_{WCDMA} 1)		0.4	1.0	dB
Input VSWR (ANT port)					
869.0 ... 894.0 MHz			1.5	1.8	
Output VSWR (RX port)					
869.0 ... 894.0 MHz			1.7	2.0	
Common mode rejection ratio					
869.0 ... 894.0 MHz	CMRR	23 2)	30		dB

1) Attenuation of WCDMA signal (“Powertransferfunction”). Please refer to annotation on page (8).
2) A combination of 10 ˚ phase balance and 1 dB amplitude balance corresponds to 19.6 dB CMRR

Characteristics

Temperature range for specification: T = –20 ˚C to +85 ˚C
Antenna terminating impedance: Z_{ANT}= 50 Ω ll 8.2 nH
RX terminating impedance: Z_{RX} = 100 Ω (balanced)
TX terminating impedance: Z_{TX} = 50 Ω

Characteristics ANT - RX				min.	typ. @ 25 ˚C	max.	
IMD product level limits[1)]							
at f_{TX} = 836.5 MHz f_{RX} = 881.5 MHz							
Blocker 1		45.0	MHz		-127		dBm
Blocker 2		791.5	MHz		-89		dBm
Blocker 3		1718.0	MHz		-114		dBm
Attenuation			α				
10.0	...	447.0	MHz	45	60		dB
447.0	...	824.0	MHz	35	55		dB
824.0	...	849.0	MHz	45	54		dB
849.0	...	854.0	MHz	10	35		dB
909.0	...	1000.0	MHz	7	10		dB
1000.0	...	1850.0	MHz	28	45		dB
1850.0	...	1920.0	MHz	40	50		dB
1920.0	...	6000.0	MHz	35	40		dB

[1)] IMD product level limits for power levels P_{TX}=21dBm (antenna port output power) and $P_{Blocker}$= -15dBm (antenna port input power)

Characteristics

Temperature range for specification: T = –20 ˚C to +85 ˚C
Antenna terminating impedance: Z_{ANT} = 50 Ω ll 8.2 nH
RX terminating impedance: Z_{RX} = 100 Ω (balanced)
TX terminating impedance: Z_{TX} = 50 Ω

Characteristics TX - RX					min.	typ. @ 25 ˚C	max.	
Isolation								
824.0	...	849.0	MHz		54	56		dB
@$f_{Carrier}$ 826.4	...	846.6	MHz	α_{WCDMA} 1)	55	57		dB
869.0	...	894.0	MHz		48	51		dB
@$f_{Carrier}$ 871.4	...	891.6	MHz	α_{WCDMA} 1)	48	52		dB
1574.0	...	1577.0	MHz		40	67		dB
1638.0	...	1708.0	MHz		20	65		dB
2462.0	...	2557.0	MHz		20	62		dB
Common Mode Isolation								
824.0	...	849.0	MHz		50	54		dB
@$f_{Carrier}$ 826.4	...	846.6	MHz	α_{WCDMA} 1)	50	57		dB

1) Attenuation of WCDMA signal (“Powertransferfunction”). Please refer to annotation on page (8).

Maximum ratings

Operable temperature range[1)]	T	–30/+85	˚C	
Storage temperature range	T_{stg}	–40/+85	˚C	
DC voltage	V_{DC}	5	V	
ESD voltage	V_{ESD}	100[2)]	V	machine model, 10 pulses
Input power at	P_{IN}			source and load impedance 50 Ω
824.0 ... 849.0 MHz		29	dBm	} continuous wave
elsewhere		10	dBm	*T* = 50˚C, 5.000 h

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

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

Annotation for characteristics section

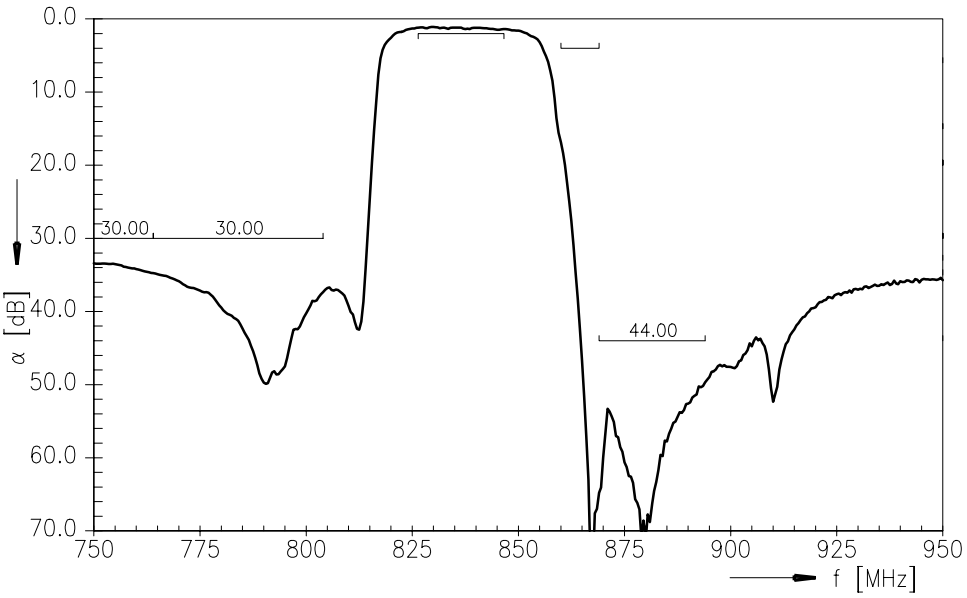
Attenuation of WCDMA signal ("Powertransferfunction", α_{WCDMA}) is determined by

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

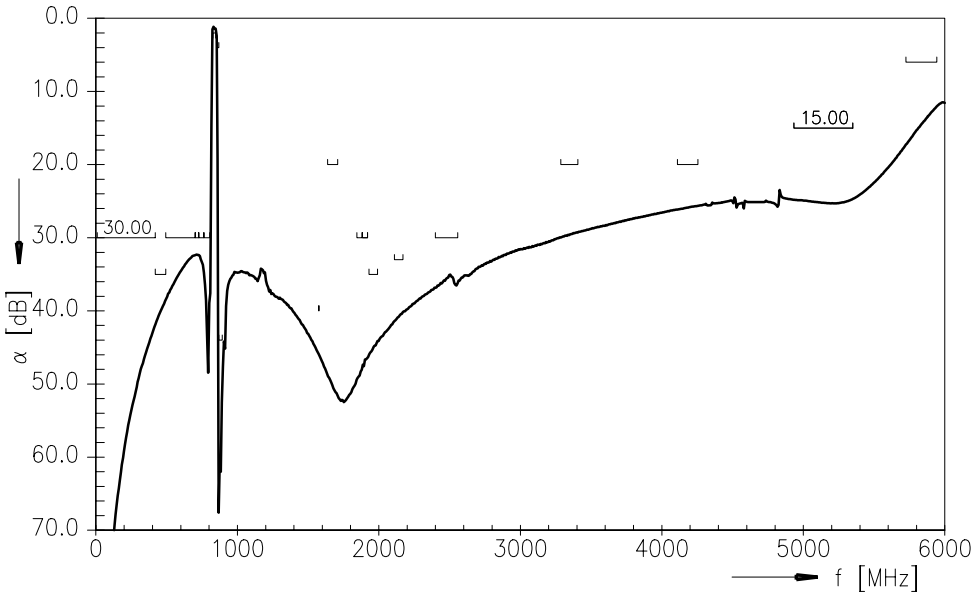
$f_{Carrier}$ according to 3GPP TS 25.101 (e.g. for WCDMA Band 5-Passband, $f_{Carrier}$ ranges from 826.4 MHz (lowest Tx channel) to 846.6 MHz (highest Tx channel)). $H_{RRC}(f)$ is the transfer function of the root-raised cosine transmit pulse shaping filter according to 3GPP TS 25.101 with the following normalization:

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

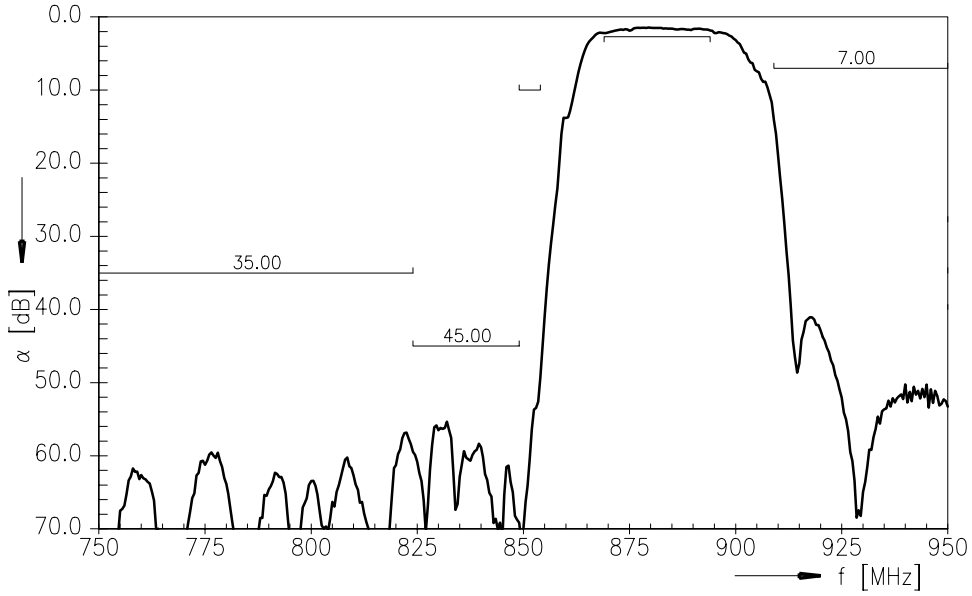
Frequency Response TX-ANT (passband)



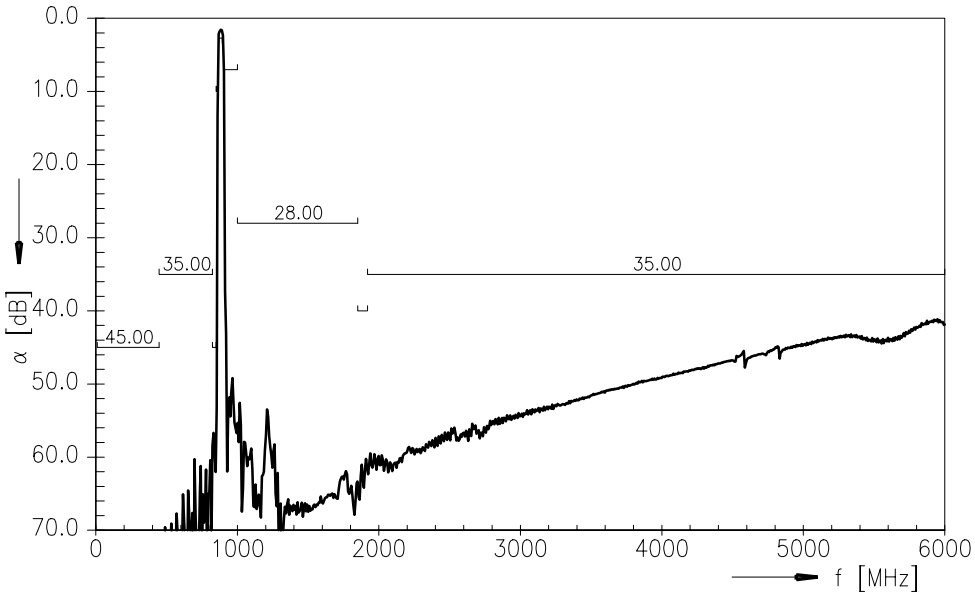
Frequency Response TX-ANT (wideband)



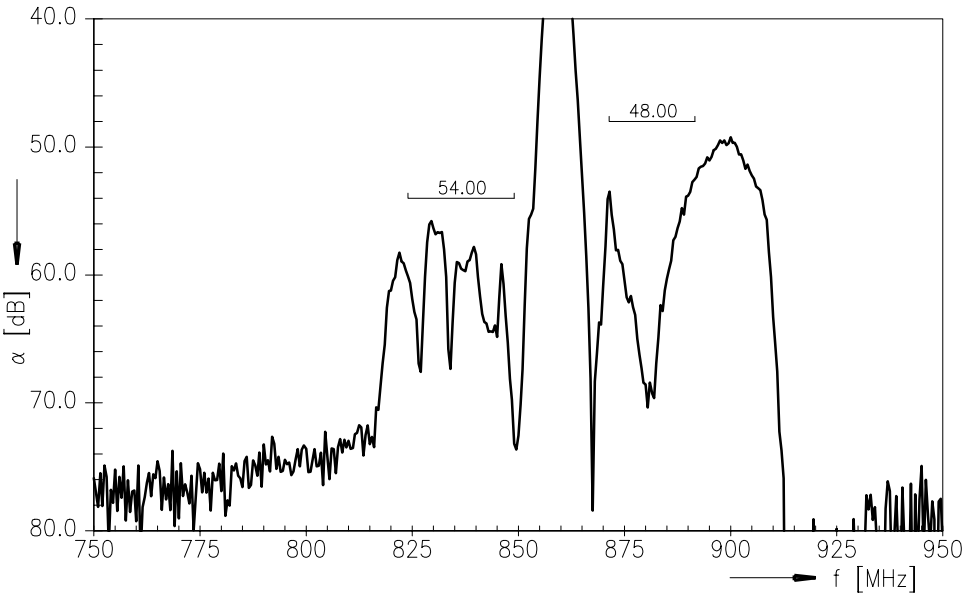
Frequency Response RX-ANT (Passband)



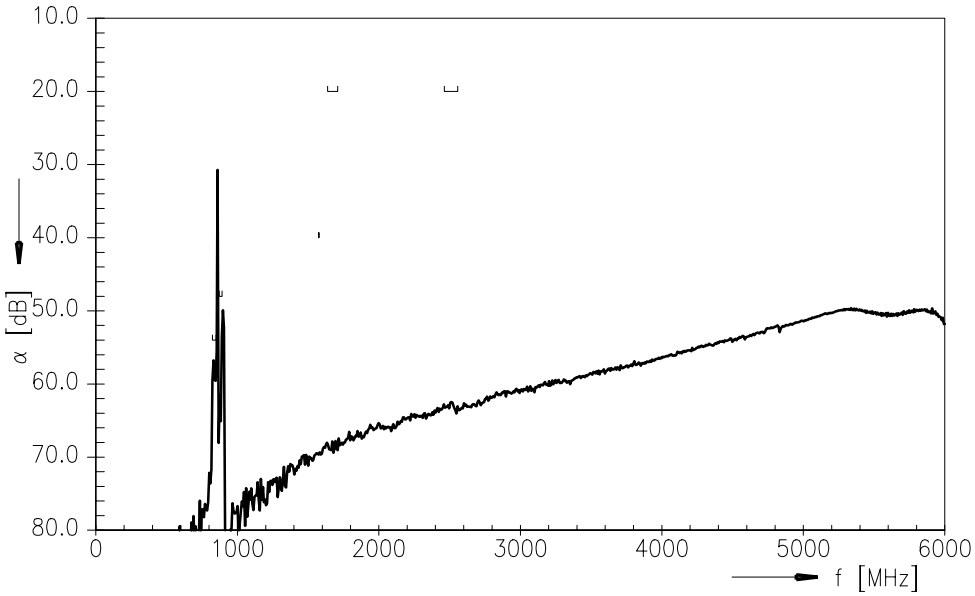
Frequency Response RX-ANT (Wideband)



Frequency Response TX-RX (Isolation)



Frequency Response TX-RX (Wideband)



References

Type	B7671
Ordering code	B39881B7671A710
Marking and package	C61157-A3-A61
Packaging	F71074-V8153-Z000
Date codes	L_1126
S-parameters	B7671_NB.s4p B7671_WB.s4p see file header for pin/port assignments.
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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