SAW Components

SAW 2in1 filter

TD-SCDMA 2100 / TD-SCDMA 1900

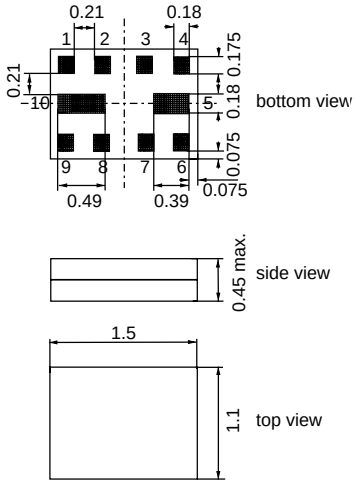
Series/type:	**B9816**
Ordering code:	**B39202B9816P810**
Date:	March 22, 2011
Version:	2.0

Application

- Low-loss 2in1 RF filter for mobile telephone TD-SCDMA 2100 and TD-SCDMA 1900 systems
- Usable passband:
  Filter 1 (TD-SCDMA 2100): 15 MHz
  Filter 2 (TD-SCDMA 1900): 40 MHz
- Unbalanced to unbalanced operation for both filters
- Low amplitude ripple
- No matching network required for operation at 50Ω

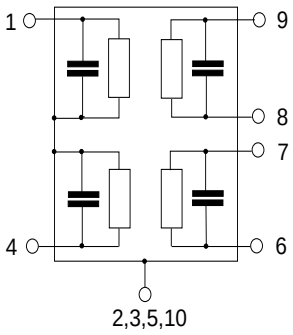
Features

- Package size 1.5 x1.1 x 0.4 mm^3
- RoHS compatible
- Approx. weight 0.003g
- 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 [Filter 1]
■	4	Input [Filter 2]
■	6	Output [Filter 2]
■	9	Output [Filter 1]
■	7,8	To be grounded
■	2,3,5,10	Case-ground



Characteristics of Filter 1 (TD-SCDMA 2100)

Temperature range for specification: T = -30 ˚C to +85 ˚C
Terminating source impedance: Z_S = 50 Ω
Terminating load impedance: Z_L = 50 Ω

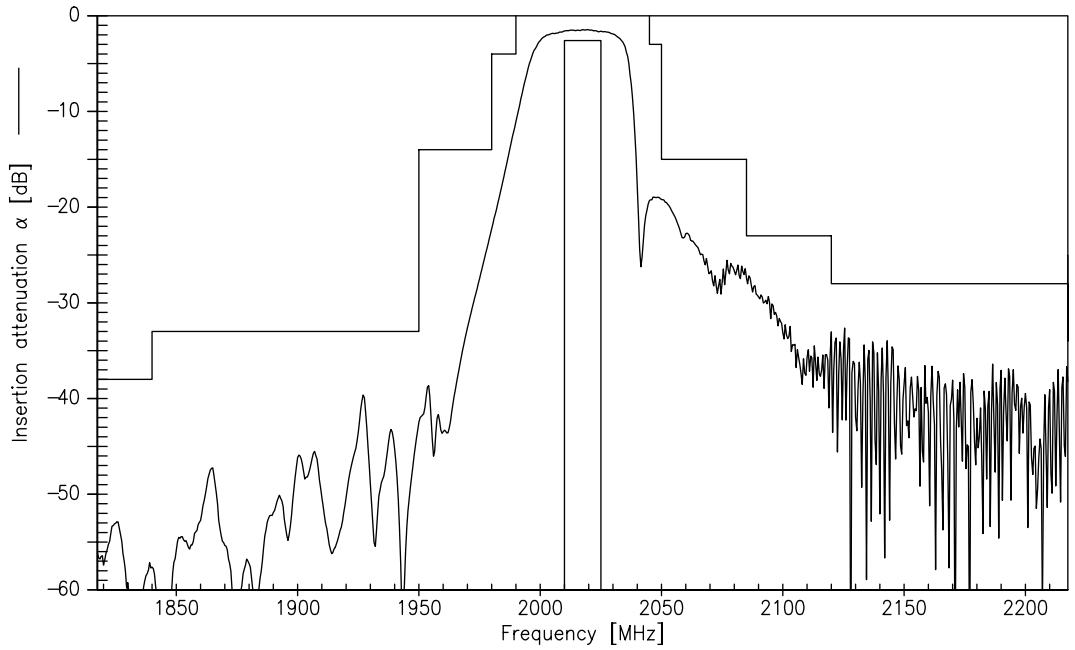
		min.	typ. @ 25˚C	max.	
Center frequency	f_C	—	2017.5	—	MHz
Maximum insertion attenuation	α_{max}				
2010.0 ... 2025.0 MHz		—	1.7	2.6	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
2010.0 ... 2025.0 MHz		—	0.2	1.0	dB
Input VSWR					
2010.0 ... 2025.0 MHz		—	1.3	2.0	
Output VSWR					
2010.0 ... 2025.0 MHz		—	1.3	2.0	
Group delay ripple (p-p)					
2010.0 ... 2025.0 MHz		—	4	20	ns
Attenuation	α				
0 ... 1840.0 MHz		38	44	—	dB
1840.0 ... 1950.0 MHz		33	39	—	dB
1950.0 ... 1980.0 MHz		14	22	—	dB
1980.0 ... 1990.0 MHz		4	11	—	dB
2045.0 ... 2050.0 MHz		3	18	—	dB
2050.0 ... 2085.0 MHz		15	19	—	dB
2085.0 ... 2120.0 MHz		23	27	—	dB
2120.0 ... 2160.0 MHz		28	32	—	dB
2160.0 ... 2500.0 MHz		28	36	—	dB
2500.0 ... 4000.0 MHz		34	40	—	dB
4000.0 ... 6000.0 MHz		25	37	—	dB

Maximum ratings of Filter 1

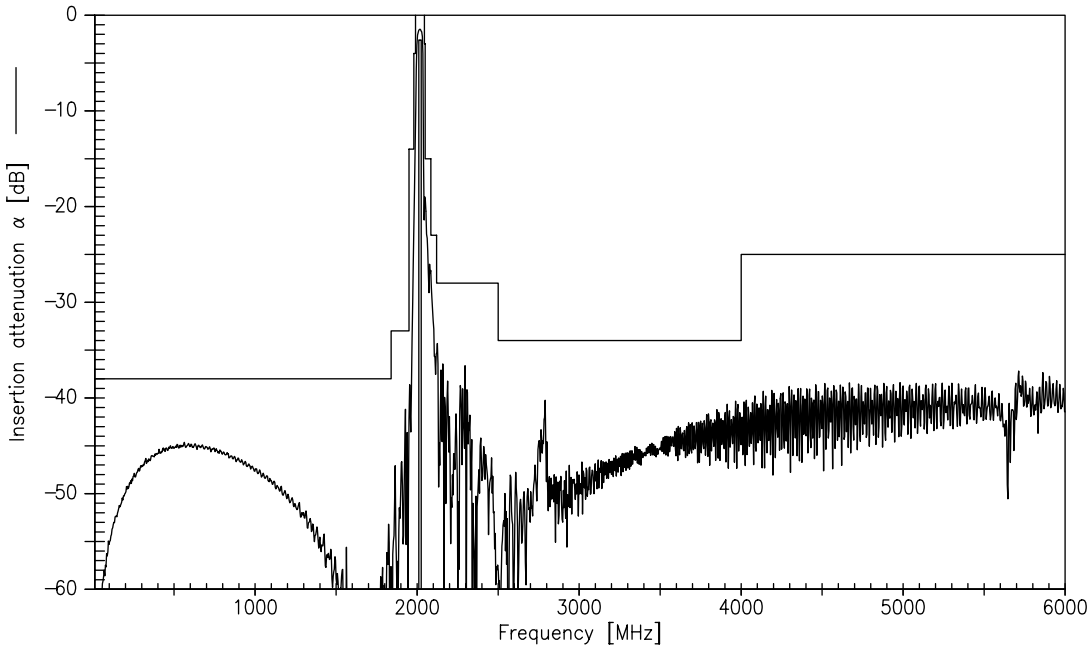
Operable temperature range	T	–40/+85	˚C	
Storage temperature range	T_{stg}	–40/+85	˚C	
DC voltage	V_{DC}	3	V	
ESD voltage	V_{ESD}	50[1)]	V	machine model, 1 pulse
Input Power at 2010.0...2025.0MHz	P_{IN}	6	dBm	continuous wave

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

Transfer function Filter 1 (TD-SCDMA 2100)

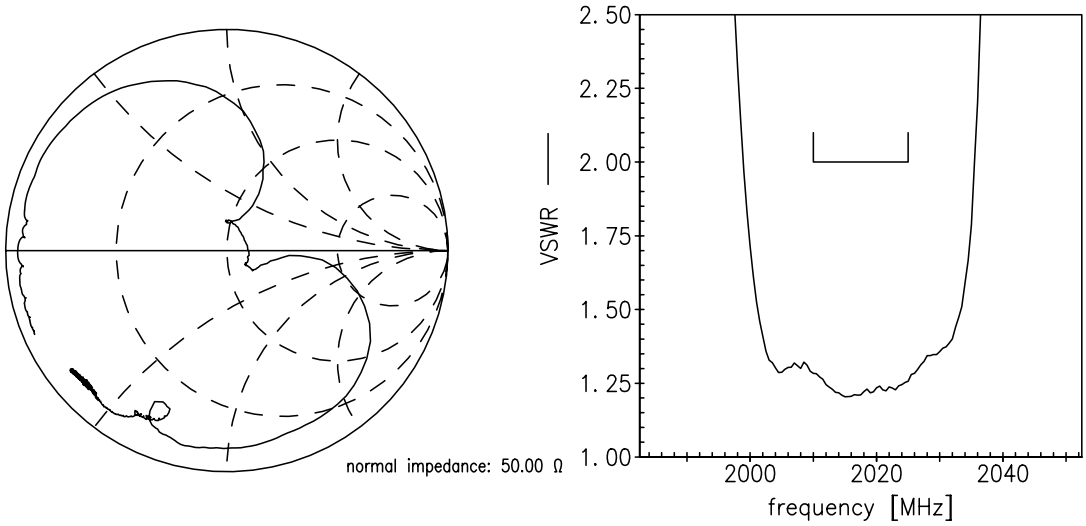


Transfer function Filter 1 (TD-SCDMA 2100) - Wideband

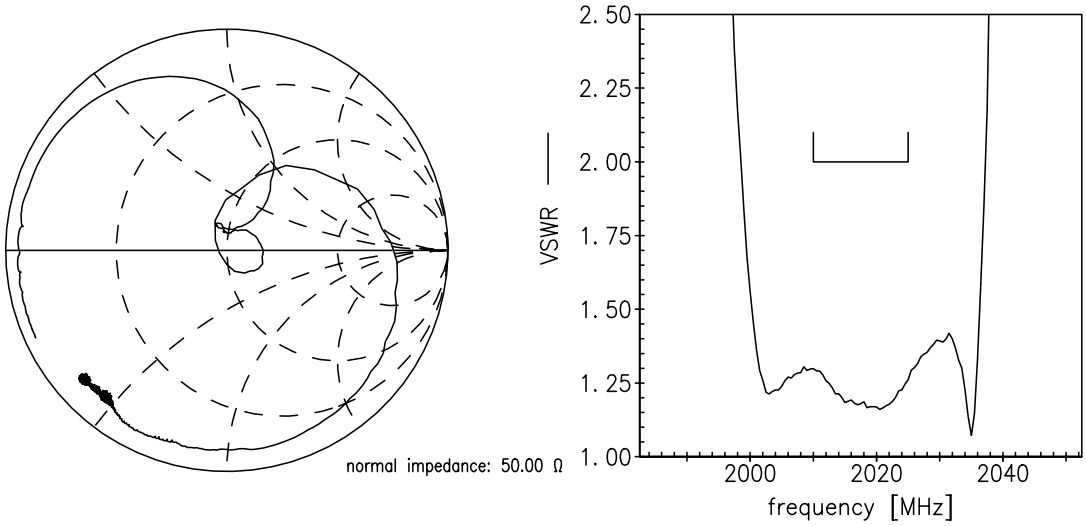


Smith charts of Filter 1

S_{11} function



S_{22} function



Characteristics of Filter 2 (TD-SCDMA 1900)

Temperature range for specification: T = -30 ˚C to +85 ˚C
Terminating source impedance: Z_S = 50Ω
Terminating load impedance: Z_L = 50Ω

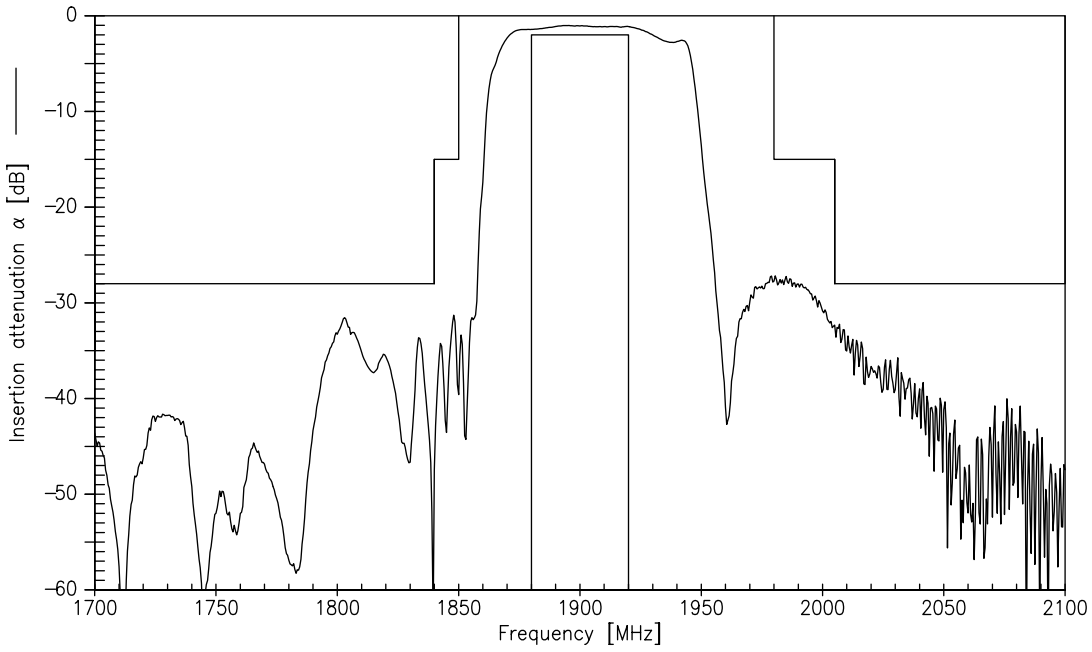
		min.	typ. @ 25˚C	max.	
Center frequency	f_C	—	1900.0	—	MHz
Maximum insertion attenuation	α_{max}				
1880.0 ... 1920.0 MHz		—	1.4	2.0	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
1880.0 ... 1920.0 MHz		—	0.4	0.8	dB
Input VSWR					
1880.0 ... 1920.0 MHz		—	1.5	2.0	
Output VSWR					
1880.0 ... 1920.0 MHz		—	1.5	2.0	
Group delay ripple (p-p)					
1880.0 ... 1920.0 MHz		—	6	14.0	ns
Attenuation	α				
0.0 ... 925.0 MHz		28	42	—	dB
925.0 ... 960.0 MHz		35	42	—	dB
960.0 ... 1805.0 MHz		28	31	—	dB
1805.0 ... 1840.0 MHz		28	33	—	dB
1840.0 ... 1850.0 MHz		15	31	—	dB
1980.0 ... 2005.0 MHz		15	27	—	dB
2005.0 ... 5000.0 MHz		28	32	—	dB
5000.0 ... 6000.0 MHz		25	30	—	dB

Maximum ratings of Filter 2

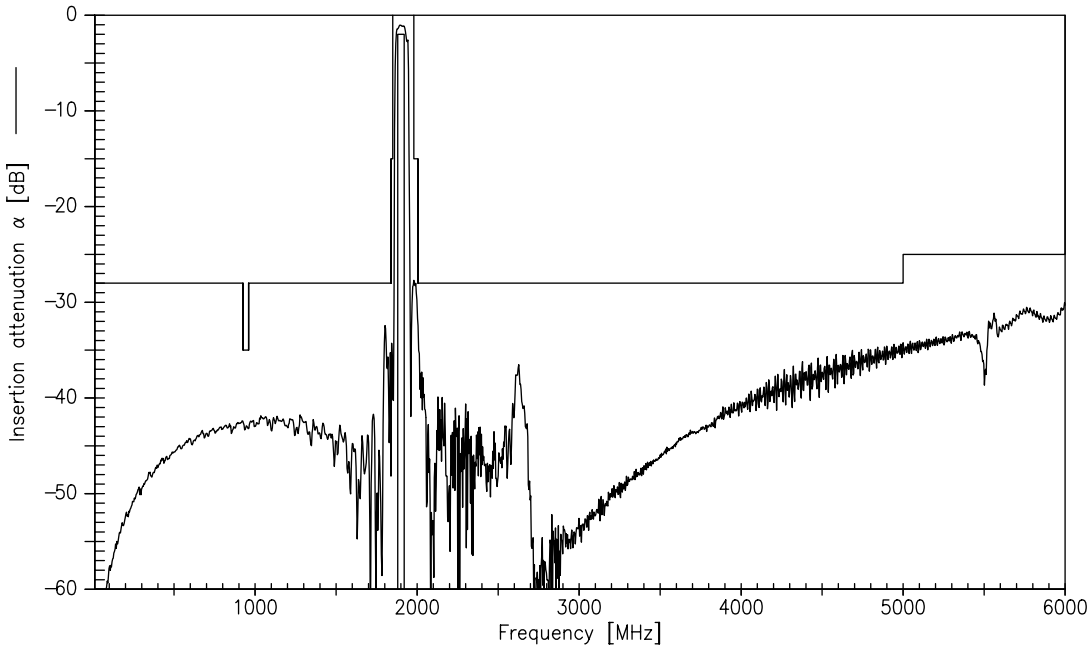
Operable temperature range	T	–40/+85	˚C	
Storage temperature range	T_{stg}	–40/+85	˚C	
DC voltage	V_{DC}	3	V	
ESD voltage	V_{ESD}	50[1)]	V	machine model, 1 pulse
Input Power at 1880.0 ... 1920.0 MHz Tx bands	P_{IN}	5	dBm	continuous wave

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

Transfer function Filter 2 (TD-SCDMA 1900)

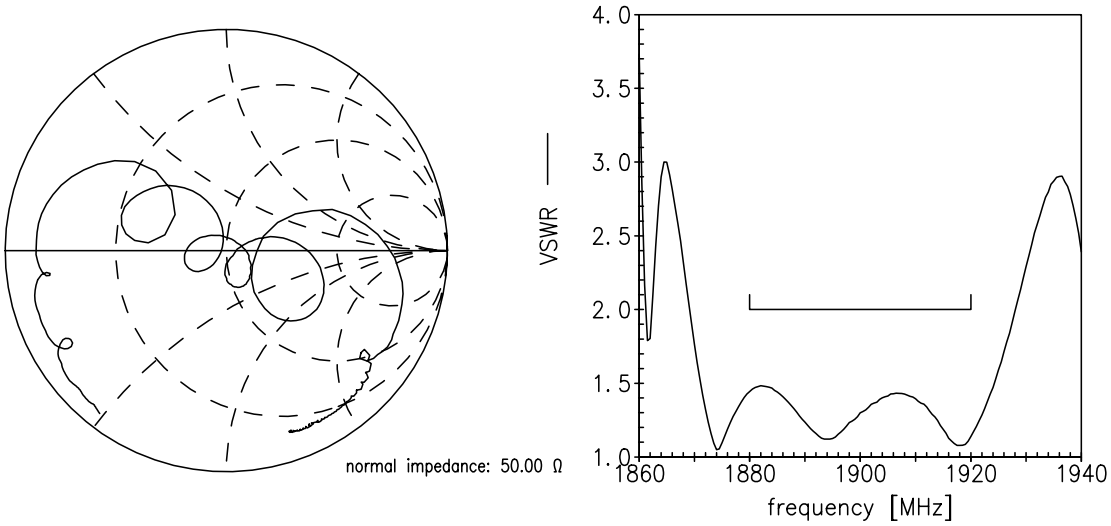


Transfer function Filter 2 (TD-SCDMA 1900) - Wideband

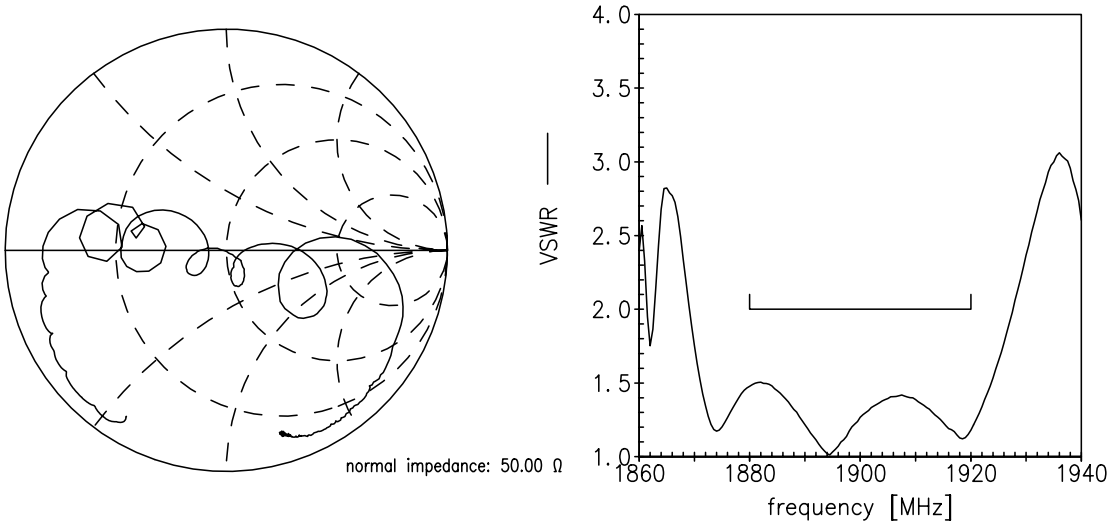


Smith charts of Filter 2

S_{11} function



S_{22} function



References

Type	B9816
Ordering code	B39202B9816P810
Marking and package	C61157-A8-A18
Packaging	F61074-V8227-Z000
Date codes	L_1126
S-parameters	B9816_UB_NB.s2p, B9816_UB_WB.s2p B9816_LB_NB.s2p, B9816_LB_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."
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