SAW Components

SAW 2in1 input diplex filter

TDSCDMA 1900 / 2000

Series/type:	**B9821**
Ordering code:	**B39202B9821P810**
Date:	January 04, 2012
Version:	2.0

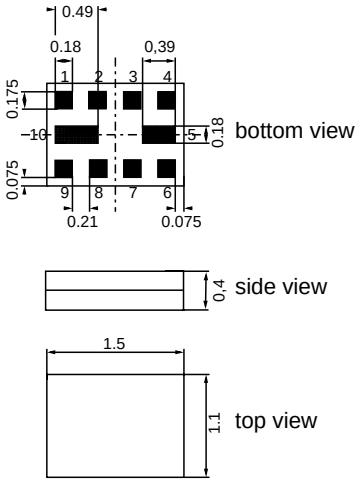
EPCOS AG is a TDK Group Company.

Application

- Low-loss 2in1 input diplex filter for mobile telephone TDSCDMA 1900 and 2000 systems
- Usable passband:
  Filter 1 (TD-SCDMA1900): 40 MHz
  Filter 2 (TD-SCDMA 2000): 15 MHz
- Unbalanced to balanced operation for all filters
- Impedance transformation from 50 Ω to 200 Ω for both filters
- Matching network only at the input

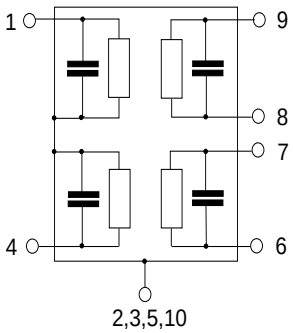
Features

- Package size 1.5 x1.1 x 0.4 mm³
- Approx. weight 0.003g
- Package for **S**urface **M**ount **T**echnology (**SMT**)
- Ni, gold-plated terminals
- RoHS compatible
- **E**lectrostatic **S**ensitive **D**evice (**ESD**)
- **M**oisture **S**ensitive **L**evel 3



Pin configuration

■	1	Input [filter 1 & 2]
■	6,7	Output balanced [filter 2]
■	8,9	Output balanced [filter 1]
■	4	To be grounded
■	2,3,5,10	Case ground



Characteristics of Filter 1 (TD-SCDMA 1900)

Temperature range for specification: T = -30 ˚C to +85 ˚C
Terminating source impedance: Z_S = 50 Ω || 4.0nH
Terminating load impedance: Z_L = 200 Ω

		min.	typ. @ 25 ˚C	max.	
Center frequency	f_C	—	1900.0	—	MHz
Maximum insertion attenuation	α_{max}				
1880.0 ... 1920.0MHz		—	2.3	2.7	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
1880.0 ... 1920.0MHz		—	1.0	1.4	dB
Input VSWR					
1880.0 ... 1920.0MHz		—	1.7	2.1	
Output VSWR					
1880.0 ... 1920.0MHz		—	1.7	2.2	
Group delay ripple (p-p)					
1880.0 ... 1920.0MHz		—	13	25	ns
Common mode rejection ratio					
1880.0 ... 1920.0MHz		17[1)]	20	—	dB
Attenuation	α				
10.0 ... 925.0MHz		29	69	—	dB
925.0 ... 960.0MHz		35	69	—	dB
960.0 ... 1795.0MHz		30	34	—	dB
1795.0 ... 1840.0MHz		30	34	—	dB
1840.0 ... 1850.0MHz		25	39	—	dB
1980.0 ... 2005.0MHz		15	40	—	dB
2005.0 ... 6000.0MHz		28	33	—	dB

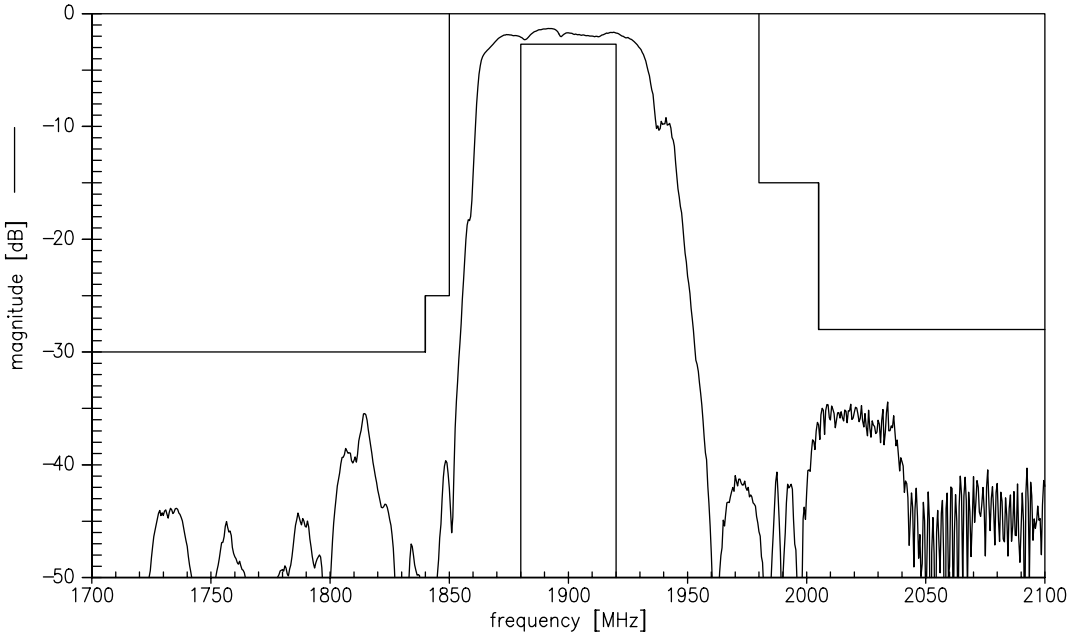
1) A CMRR of 19.6dB corresponds to a phase balance of 10˚ together with an amplitude balance of 1.0dB

Maximum ratings of filter 1

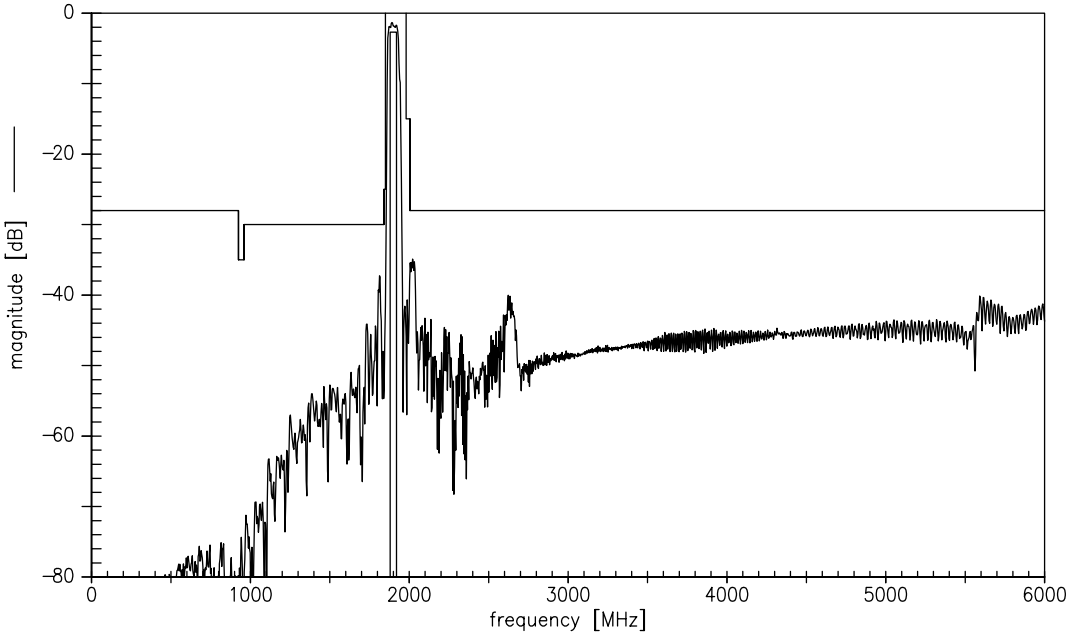
Operable temperature range	T	–40/+85	˚C	
Storage temperature range	T_{stg}	–40/+85	˚C	
DC voltage	V_{DC}	5	V	
ESD voltage	V_{ESD}	50[1)]	V	machine model, 1 pulse
Input power at 1880.0 ... 1920.0 MHz	P_{IN}	10	dBm	continuous wave

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

Transfer function of filter 1 - narrowband

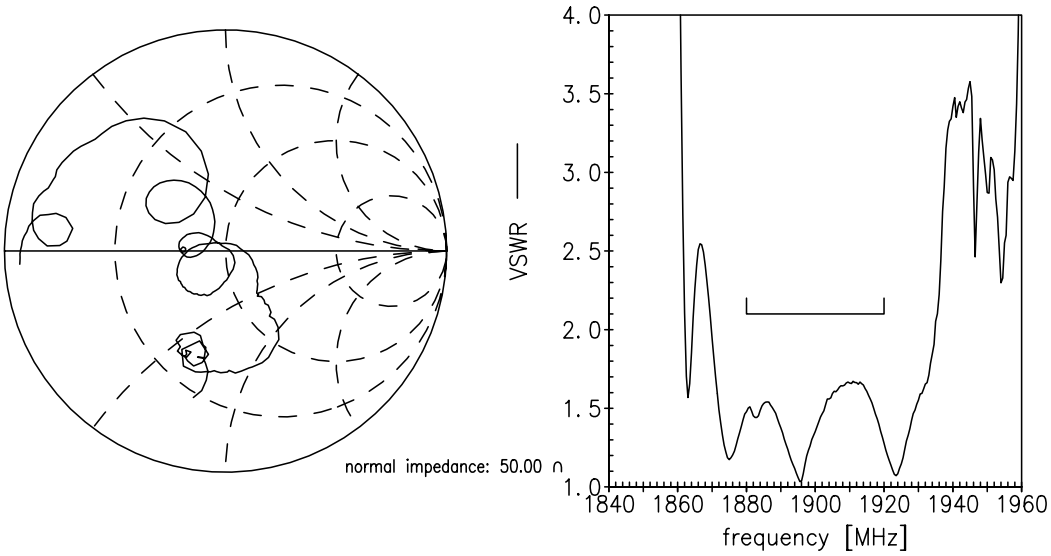


Transfer function of filter 1 - wideband

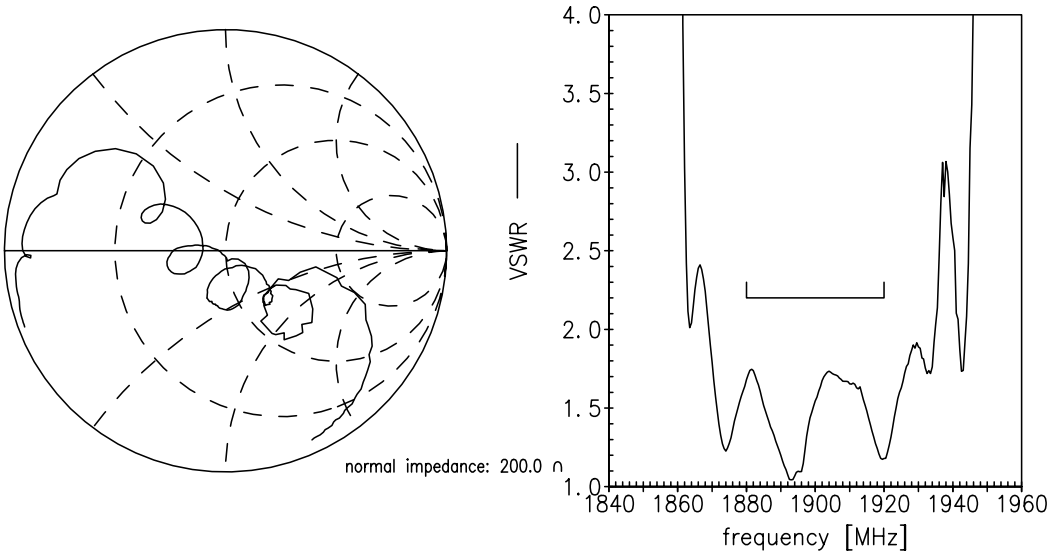


Smith Charts filter 1

S_{11} function



S_{22} function



Characteristics of Filter 2 (TD-SCDMA 2000)

Temperature range for specification: T = -30 ˚C to +85 ˚C
Terminating source impedance: Z_S = 50 Ω || 4.0nH
Terminating load impedance: Z_L = 200 Ω

		min.	typ. @ 25˚C	max.	
Center frequency	f_C	—	2017.5	—	MHz
Maximum insertion attenuation	α_{max}				
2010.0 ... 2025.0 MHz		—	2.3	2.8	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
2010.0 ... 2025.0 MHz		—	0.5	1.2	dB
Input VSWR					
2010.0 ... 2025.0 MHz		—	1.6	2.0	
Output VSWR					
2010.0 ... 2025.0 MHz		—	1.5	2.0	
Group delay ripple (p-p)					
2010.0 ... 2025.0 MHz		—	11	25	ns
Common mode rejection ratio					
2010.0 ... 2025.0 MHz		10[1)]	29	—	dB
Attenuation	α				
10.0 ... 1840.0 MHz		40	50	—	dB
1840.0 ... 1925.0 MHz		30	34	—	dB
1925.0 ... 1970.0 MHz		22	26	—	dB
1970.0 ... 1980.0 MHz		13	20	—	dB
1980.0 ... 1990.0 MHz		3	11	—	dB
2045.0 ... 2085.0 MHz		2	5	—	dB
2085.0 ... 2110.0 MHz		22	26	—	dB
2110.0 ... 2160.0 MHz		29	39	—	dB
2160.0 ... 2300.0 MHz		35	44	—	dB
2300.0 ... 2900.0 MHz		35	42	—	dB
2900.0 ... 6000.0 MHz		32	39	—	dB

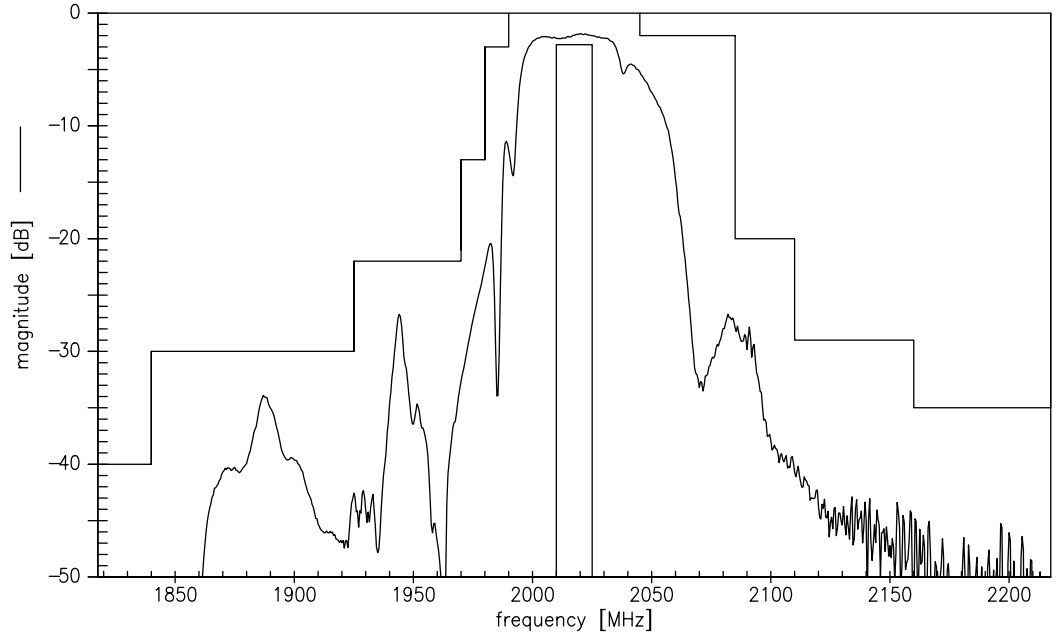
1) A CMRR of 19.6dB corresponds to a phase balance of 10˚ together with an amplitude balance of 1.0dB

Maximum ratings of filter 2

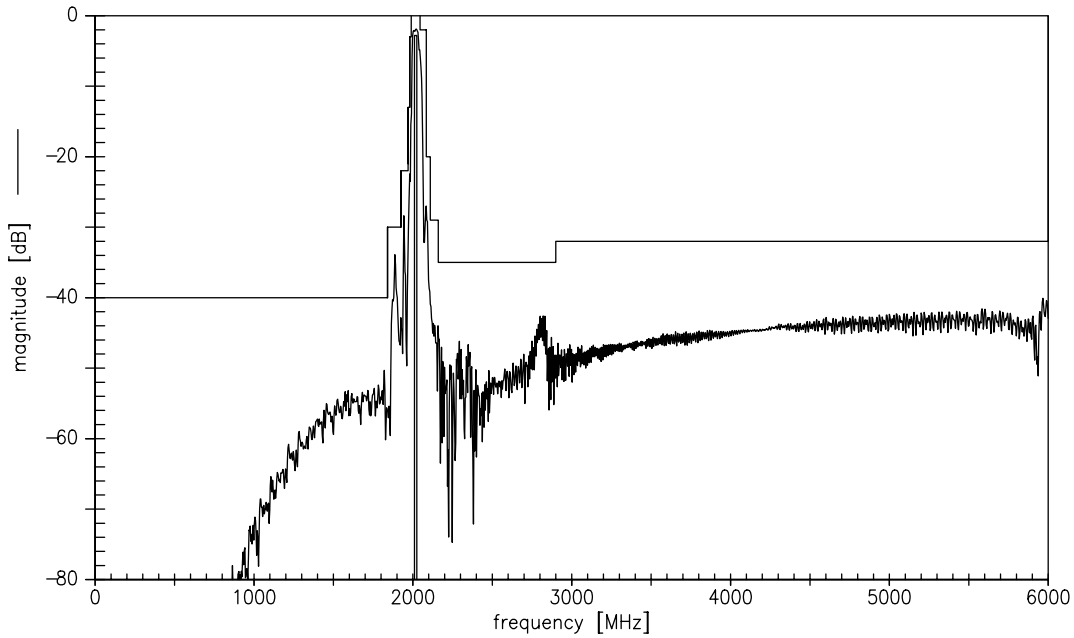
Operable temperature range	T	–40/+85	˚C	
Storage temperature range	T_{stg}	–40/+85	˚C	
DC voltage	V_{DC}	3	V	
ESD voltage	V_{ESD}	50[1)]	V	machine model, 1 pulse
Input power at 2010.0 ... 2025.0 MHz	P_{IN}	10	dBm	continous wave

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

Transfer function of filter 2 - narrowband

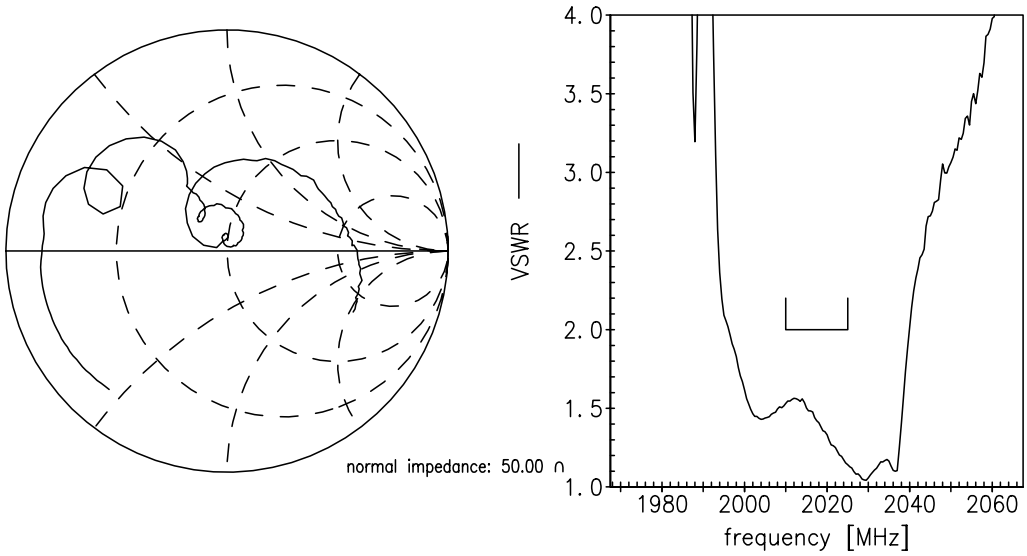


Transfer function of filter 2 - wideband

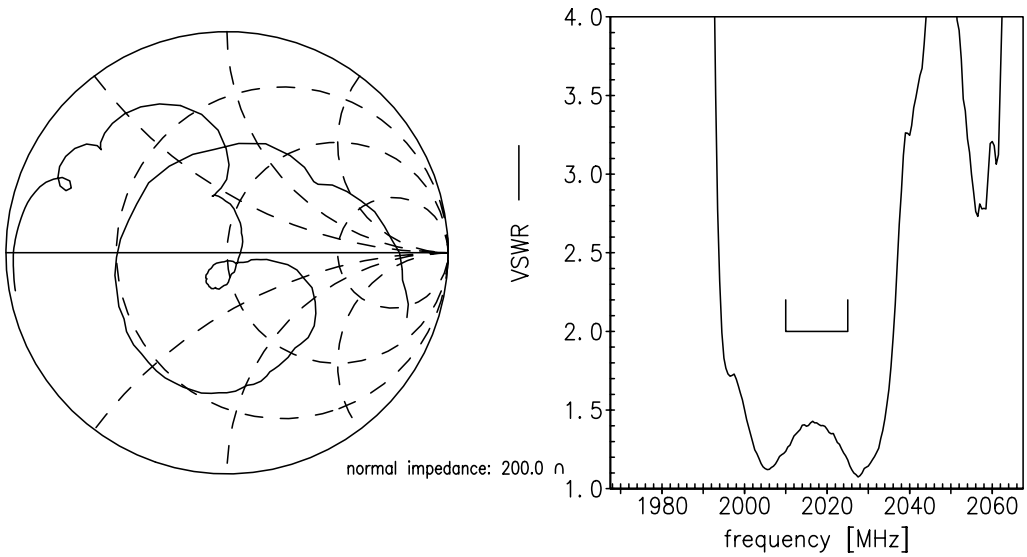


Smith Charts filter 2

S_{11} function



S_{22} function



References

Type	B9821
Ordering code	B39202B9821P810
Marking and package	C61157-A8-A18
Packaging	F61074-V8227-Z000
Date codes	L_1126
S-parameters	B9821_LB_NB.s3p, B9821_LB_WB.s3p B9821_UB_NB.s3p, B9821_UB_WB.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."
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