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SAW filters for mobile communications

Series/Type: B9815

The following products presented in this data sheet are being withdrawn.

Ordering Code	Substitute Product	Date of Withdrawal	Deadline Last Orders	Last Shipments
B39202B9815P810	B39202B9825P810	2015-11-20	2016-03-01	2016-06-30

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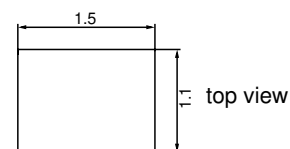
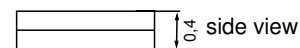
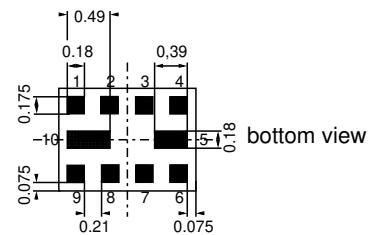
Data sheet


Application

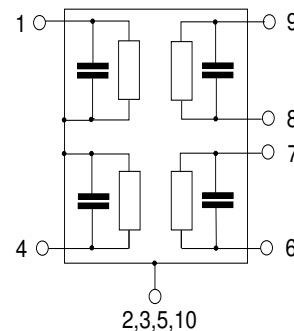
- Low-loss 2in1 RF filter for mobile telephone TD-SCDMA 1900 and TD-SCDMA 2100 systems
- Usable passband:
 - Filter 1 (TD-SCDMA 1900): 40 MHz
 - Filter 2 (TD-SCDMA 2100): 15 MHz
- Unbalanced to balanced operation for both filters
- Impedance transformation from 50 Ω to 200 Ω for both filters
- Low amplitude ripple
- No matching network required


Features

- Package size 1.5 x 1.1 x 0.4 mm³
- Moisture Sensitive Level 3
- RoHS compatible
- Approx. weight 0.003g.
- Package for Surface Mount Technology (SMT)
- Ni, gold-plated terminals
- Electrostatic Sensitive Device (ESD)


Pin configuration

- 1 Input [Filter 1]
- 4 Input [Filter 2]
- 6,7 Output balanced [Filter 2]
- 8,9 Output balanced [Filter 1]
- 2,3,5,10 Case ground



Data sheet


Characteristics of Filter 1 (TD-SCDMA 1900)

Temperature range for specification: $T = -30\text{ °C to }+85\text{ °C}$
 Terminating source impedance: $Z_S = 50\ \Omega$
 Terminating load impedance: $Z_L = 200\ \Omega$

		B9815			
		min.	typ. @ 25 °C	max.	
Center frequency	f_C	—	1900.0	—	MHz
Maximum insertion attenuation	α_{\max}	—	1.6	2.0	dB
1880.0 ... 1920.0MHz					
Amplitude ripple (p-p)	$\Delta\alpha$	—	0.5	1.0	dB
1880.0 ... 1920.0MHz					
Input VSWR		—	1.6	2.0	
1880.0 ... 1920.0MHz					
Output VSWR		—	1.7	2.0	
1880.0 ... 1920.0MHz					
Group delay ripple (p-p)		—	8	18	ns
1880.0 ... 1920.0MHz					
Common mode rejection ratio		20 ¹⁾	27	—	dB
1880.0 ... 1920.0MHz					
Attenuation	α				
0.0 ... 925.0MHz		28	62	—	dB
925.0 ... 960.0MHz		35	63	—	dB
960.0 ... 1805.0MHz		28	41	—	dB
1805.0 ... 1840.0MHz		30	35	—	dB
1840.0 ... 1850.0MHz		32	44	—	dB
1980.0 ... 2005.0MHz		15	29	—	dB
2005.0 ... 6000.0MHz		28	37	—	dB

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

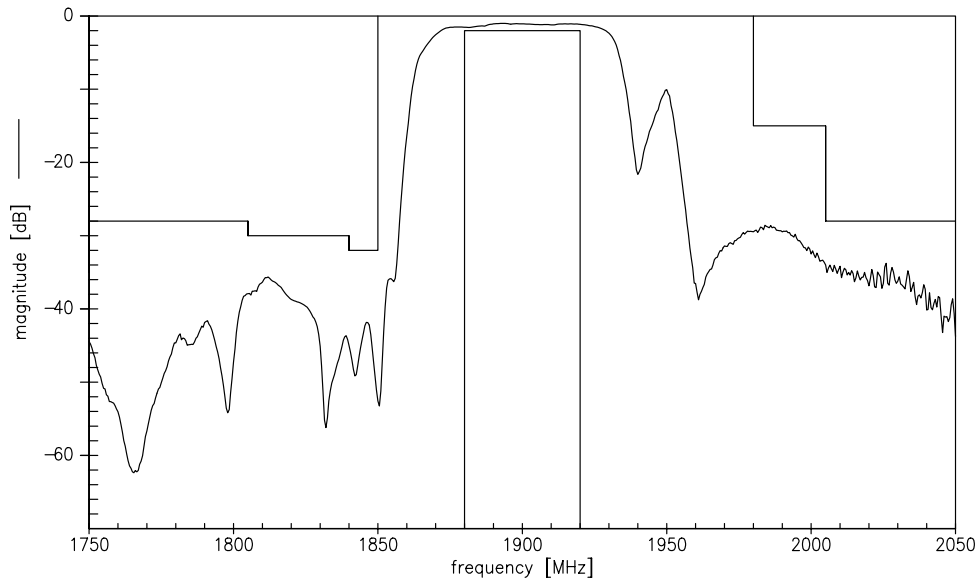

Maximum ratings of Filter 1 (TD-SCDMA 1900)

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	effective power in the on-state, duty cycle 4:8, 2000hours
2010.0 ... 2025.0 MHz	P _{IN}	10	dBm	

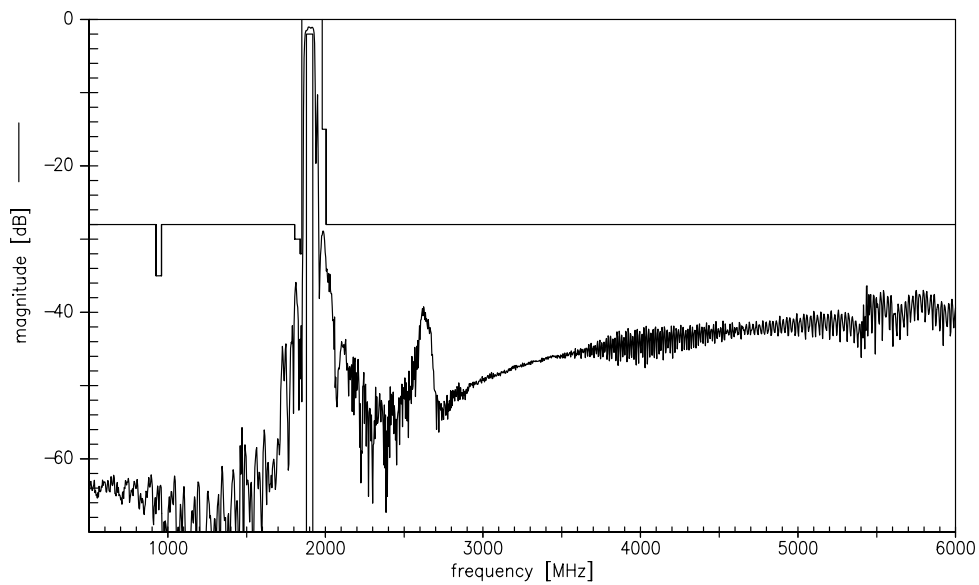
¹⁾ acc. to JESD22-A115A (machine model), 1 negative & 1 positive pulse.



Transfer function Filter 1 (TD-SCDMA 1900)



Transfer function Filter 1 (TD-SCDMA 1900) - Wideband

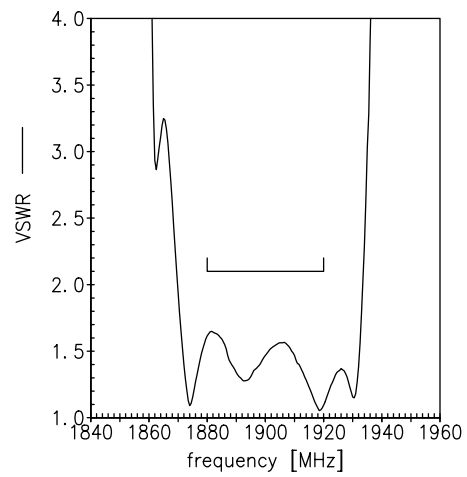
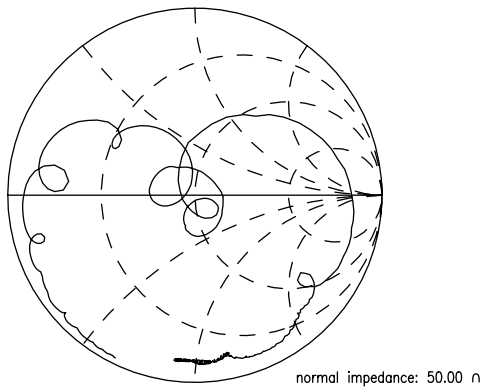


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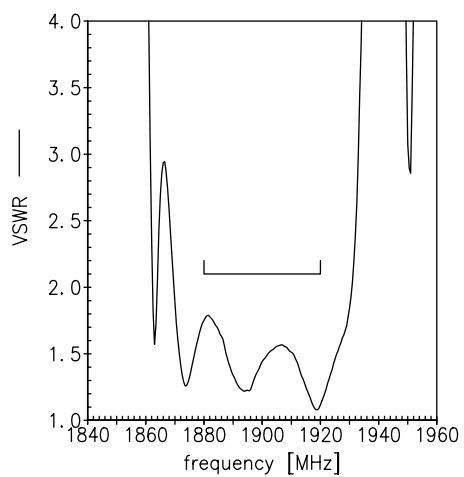
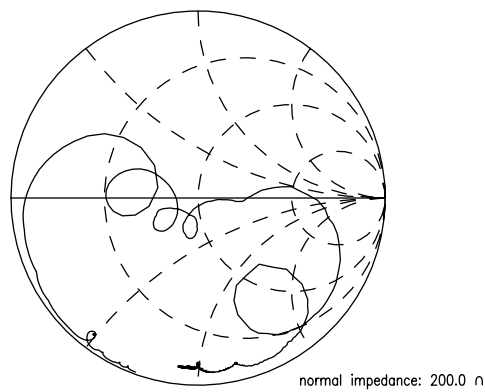


Smith charts Filter 1 (TD-SCDMA 1900)

S_{11} function



S_{22} function




Characteristics of Filter 2 (TD-SCDMA 2100)

 Temperature range for specification: $T = -30\text{ °C to }+85\text{ °C}$

 Terminating source impedance: $Z_S = 50\ \Omega$

 Terminating load impedance: $Z_L = 200\ \Omega$

		B9815			
		min.	typ. @ 25°C	max.	
Center frequency	f_C	—	2017.5	—	MHz
Maximum insertion attenuation	α_{\max}	—	1.7	2.6	dB
2010.0 ... 2025.0	MHz				
Amplitude ripple (p-p)	$\Delta\alpha$	—	0.5	1.2	dB
2010.0 ... 2025.0	MHz				
Input VSWR		—	1.5	2.0	
2010.0 ... 2025.0	MHz				
Output VSWR		—	1.4	2.0	
2010.0 ... 2025.0	MHz				
Group delay ripple (p-p)		—	8	20	ns
2010.0 ... 2025.0	MHz				
Common mode rejection ratio		18 ¹⁾	22	—	dB
2010.0 ... 2025.0	MHz				
Attenuation	α				
0 ... 1840.0	MHz	45	50	—	dB
1840.0 ... 1935.0	MHz	25	34	—	
1935.0 ... 1970.0	MHz	22	25	—	dB
1970.0 ... 1980.0	MHz	14	25	—	
1980.0 ... 1990.0	MHz	6	12	—	dB
2045.0 ... 2085.0	MHz	3	12	—	
2085.0 ... 2120.0	MHz	22	25	—	dB
2120.0 ... 2160.0	MHz	27	30	—	
2160.0 ... 2300.0	MHz	35	37	—	dB
2300.0 ... 2700.0	MHz	30	37	—	
2700.0 ... 2900.0	MHz	30	35	—	dB
2900.0 ... 6000.0	MHz	30	38	—	

¹⁾ A CMRR of 18.0dB corresponds to a phase balance of 12° together with an amplitude balance of 1.2dB

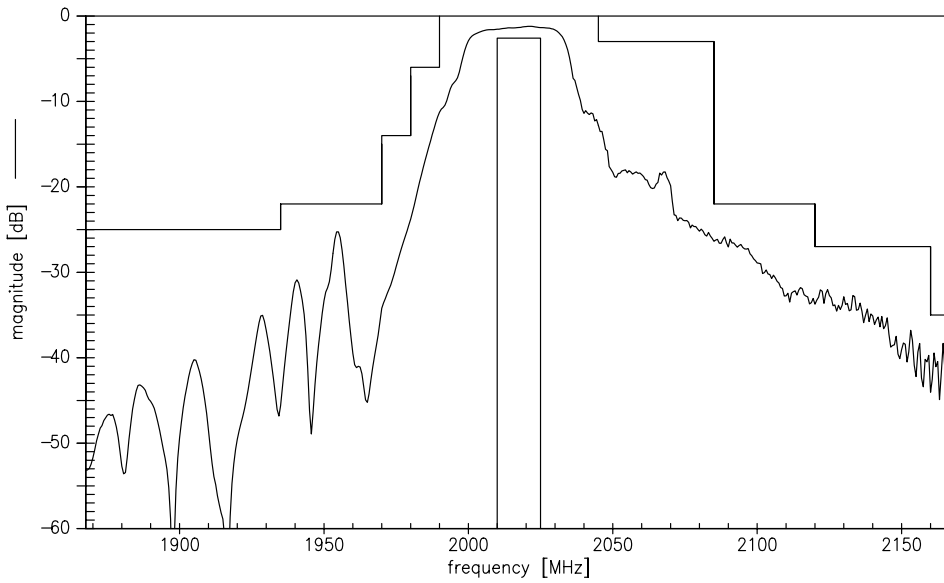

Maximum ratings of Filter 2 (TD-SCDMA 2100)

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	effective power in the on-state, duty cycle 4:8, 2000hours
2010.0 ... 2025.0 MHz	P _{IN}	10	dBm	

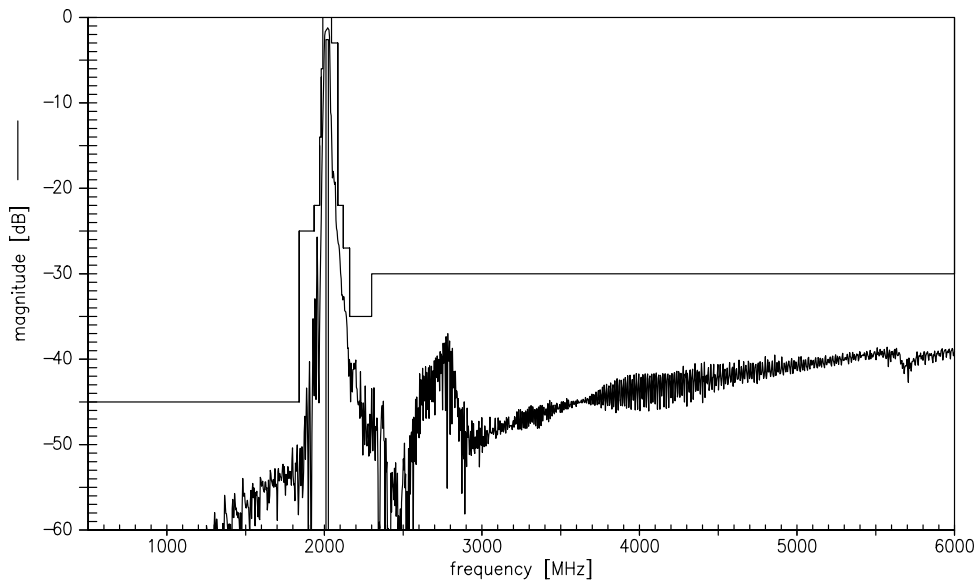
¹⁾ acc. to JESD22-A115A (machine model), 1 negative & 1 positive pulse.



Transfer function Filter 1 (TD-SCDMA 2100)



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

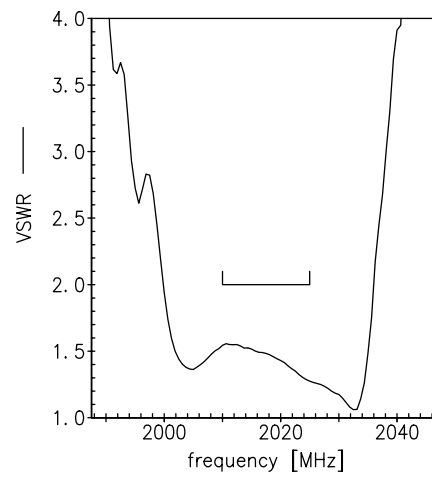
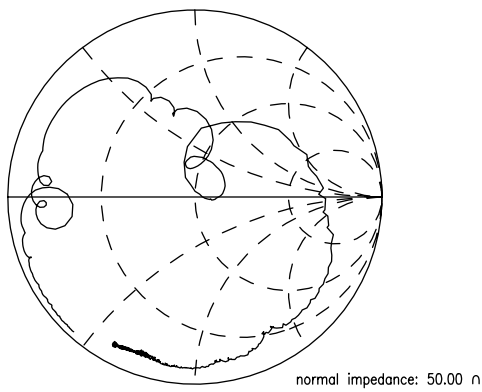


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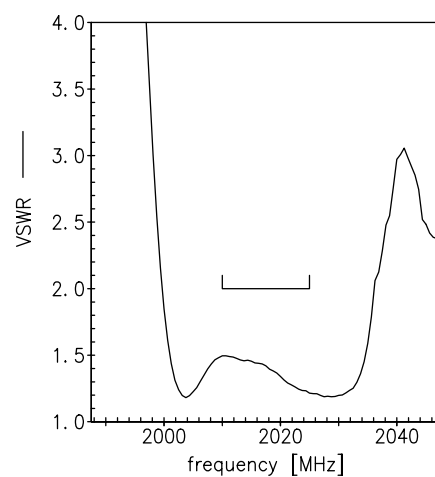
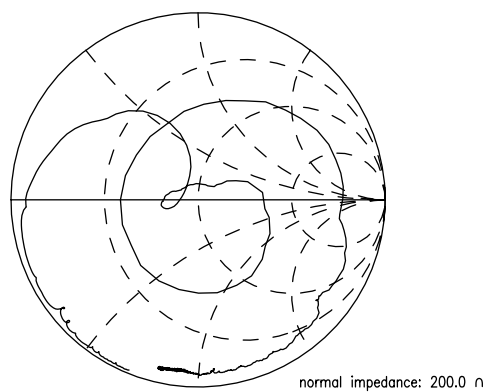


Smith charts Filter 1 (TD-SCDMA 2100)

S_{11} function



S_{22} function




References

Type	B9815
Ordering code	B39202B9815P810
Marking and package	C61157-A8-A19
Packaging	F61074-V8227-Z000
Date codes	L_1126
S-parameters	B9815_LB_NB.s3p, B9815_LB_WB.s3p B9815_UB_NB.s3p, B9815_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."
Moldability	Before using in overmolding environment, please contact your EPCOS sales office.
Matching coils	See Inductor pdf-catalog http://www.tdk.co.jp/tefe02/coil.htm#aname1 and Data Library for circuit simulation http://www.tdk.co.jp/etvcl/index.htm

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