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The following products presented in this data sheet are being withdrawn.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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SAW 2in1 filter 1900.0 / 2017.5 MHz

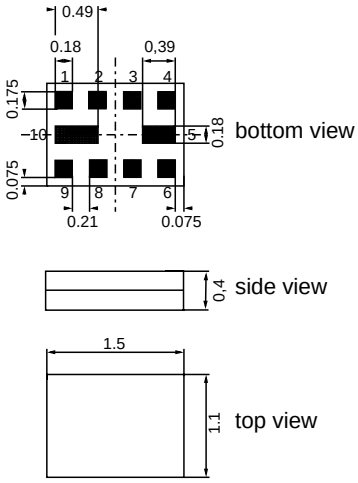
Data sheet SMD

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

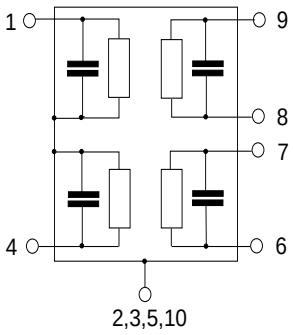
Features

- Package size 1.5 x1.1 x 0.4 mm^3
- Moisture Sensitive Level 3
- RoHS compatible
- Approx. weight 0.003g.
- Package for **S**urface **M**ount **T**echology (**SMT**)
- Ni, gold-plated terminals
- **E**lectrostatic **S**ensitive **D**evice (**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



Characteristics of Filter 1 (TD-SCDMA 1900)

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

		B9815			
		min.	**typ. @ 25 ˚C**	**max.**	
Center frequency	f_C	—	1900.0	—	MHz
Maximum insertion attenuation	α_{max}				
1880.0 ... 1920.0MHz		—	1.6	2.0	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
1880.0 ... 1920.0MHz		—	0.5	1.0	dB
Input VSWR					
1880.0 ... 1920.0MHz		—	1.6	2.0	
Output VSWR					
1880.0 ... 1920.0MHz		—	1.7	2.0	
Group delay ripple (p-p)					
1880.0 ... 1920.0MHz		—	8	18	ns
Common mode rejection ratio					
1880.0 ... 1920.0MHz		20[1)]	27	—	dB
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

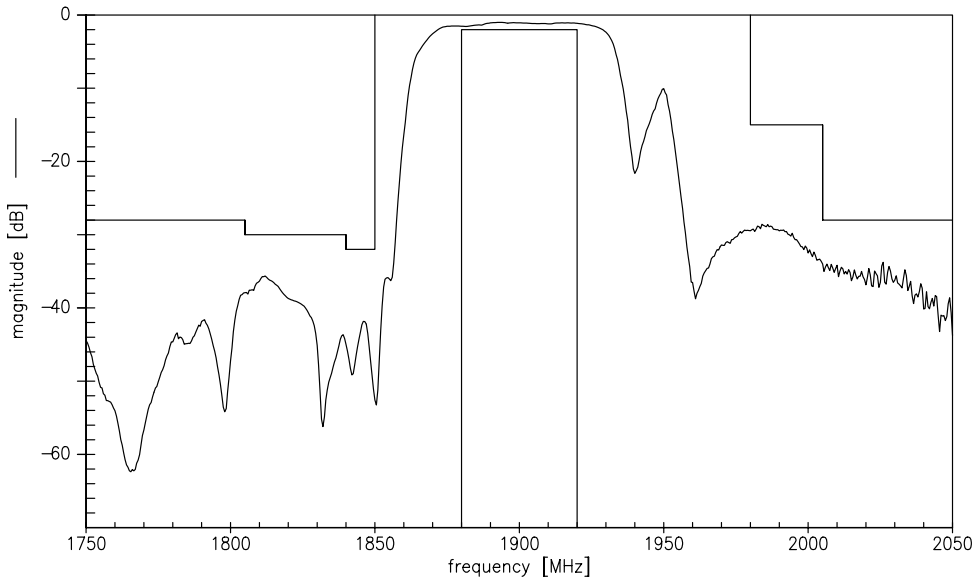
1) A CMRR of 19.6dB corresponds to a phase balance of 10˚ together with an amplitude balance of 1.0dB

Maximum ratings of Filter 1 (TD-SCDMA 1900)

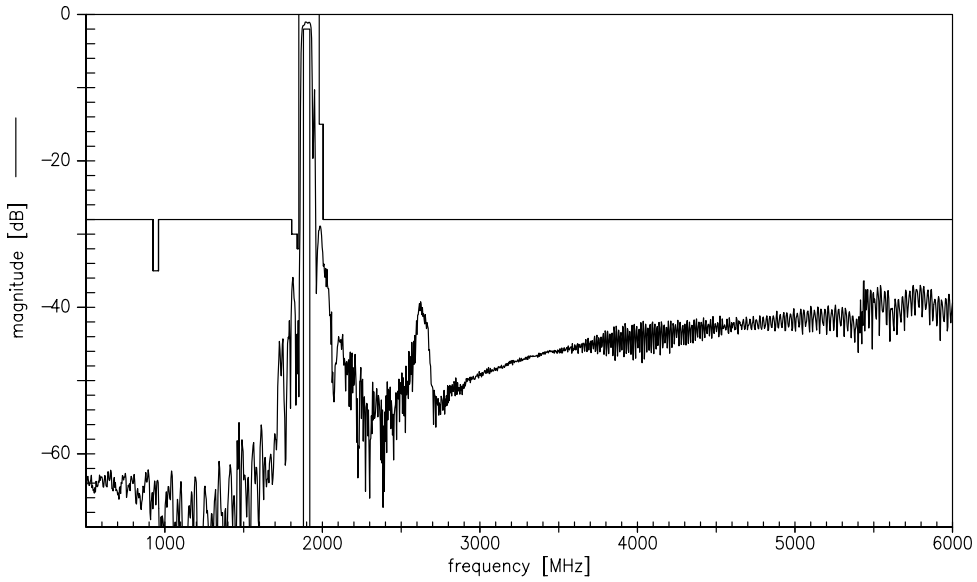
Operable temperature range	T	–40/+85	˚C	
Storage temperature range	T_{stg}	–40/+85	˚C	
DC voltage	V_{DC}	5	V	
ESD voltage	V_{ESD}	50[1)]	V	machine model, 1 pulse
Input power at				
1880.0 ... 1920.0 MHz	P_{IN}	10	dBm	effective power in the on-state,
2010.0 ... 2025.0 MHz	P_{IN}	10	dBm	duty cycle 4:8, 2000hours

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

Transfer function Filter 1 (TD-SCDMA 1900)

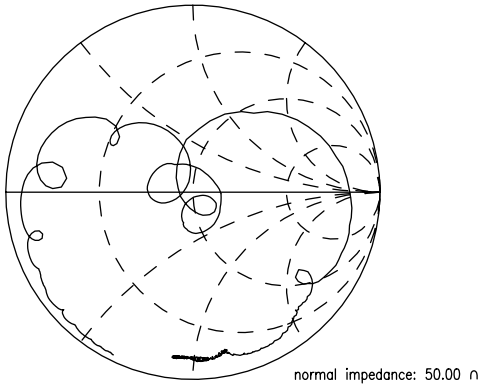


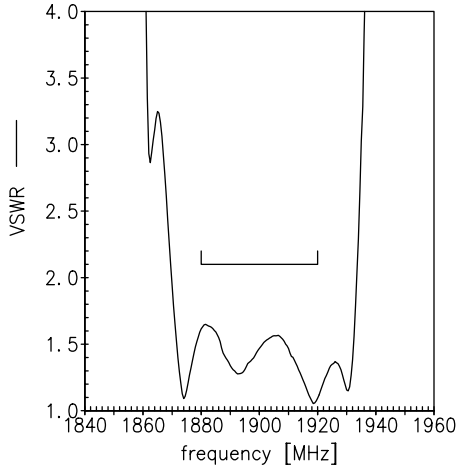
Transfer function Filter 1 (TD-SCDMA 1900) - Wideband



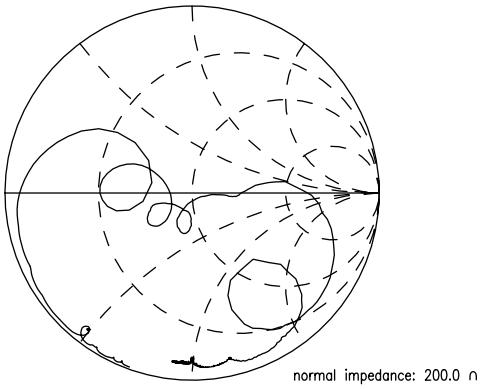
Smith charts Filter 1 (TD-SCDMA 1900)

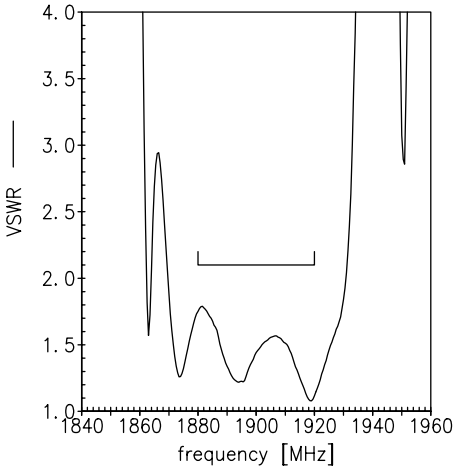
S_{11} function





S_{22} function





Characteristics of Filter 2 (TD-SCDMA 2100)

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

		B9815			
		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		—	0.5	1.2	dB
Input VSWR					
2010.0 ... 2025.0 MHz		—	1.5	2.0	
Output VSWR					
2010.0 ... 2025.0 MHz		—	1.4	2.0	
Group delay ripple (p-p)					
2010.0 ... 2025.0 MHz		—	8	20	ns
Common mode rejection ratio					
2010.0 ... 2025.0 MHz		18[1)]	22	—	dB
Attenuation	α				
0 ... 1840.0 MHz		45	50	—	dB
1840.0 ... 1935.0 MHz		25	34	—	dB
1935.0 ... 1970.0 MHz		22	25	—	dB
1970.0 ... 1980.0 MHz		14	25	—	dB
1980.0 ... 1990.0 MHz		6	12	—	dB
2045.0 ... 2085.0 MHz		3	12	—	dB
2085.0 ... 2120.0 MHz		22	25	—	dB
2120.0 ... 2160.0 MHz		27	30	—	dB
2160.0 ... 2300.0 MHz		35	37	—	dB
2300.0 ... 2700.0 MHz		30	37	—	dB
2700.0 ... 2900.0 MHz		30	35	—	dB
2900.0 ... 6000.0 MHz		30	38	—	dB

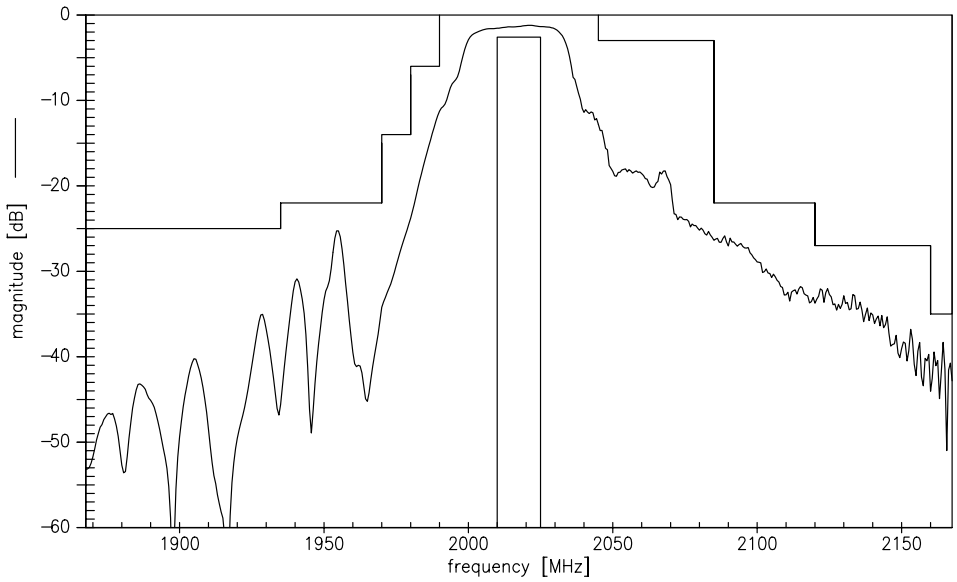
1) A CMRR of 18.0dB corresponds to a phase balance of 12˚ together with an amplitude balance of 1.2dB

Maximum ratings of Filter 2 (TD-SCDMA 2100)

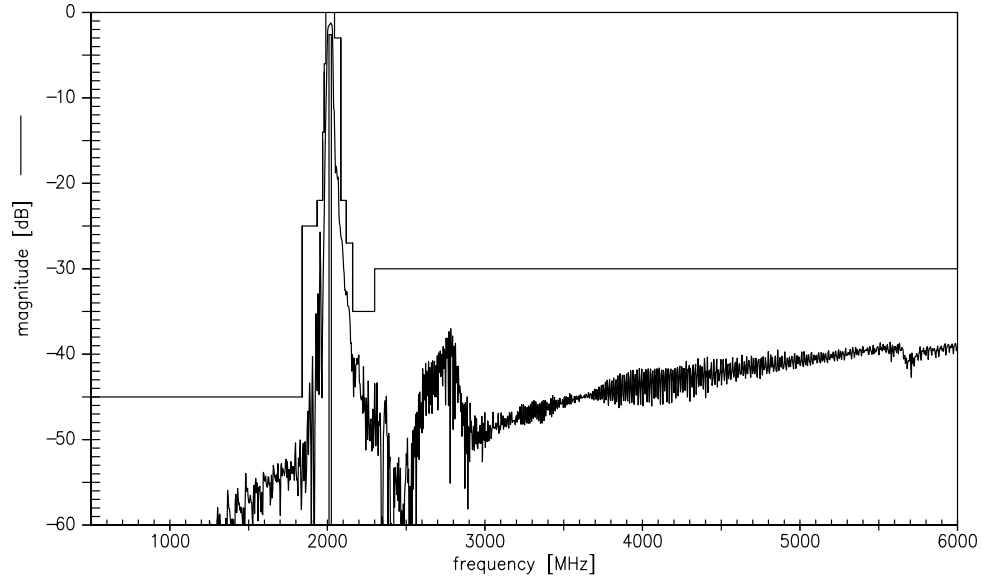
Operable temperature range	T	–40/+85	˚C	
Storage temperature range	T_{stg}	–40/+85	˚C	
DC voltage	V_{DC}	5	V	
ESD voltage	V_{ESD}	50[1)]	V	machine model, 1 pulse
Input power at				
1880.0 ... 1920.0 MHz	P_{IN}	10	dBm	effective power in the on-state,
2010.0 ... 2025.0 MHz	P_{IN}	10	dBm	duty cycle 4:8, 2000hours

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

Transfer function Filter 1 (TD-SCDMA 2100)

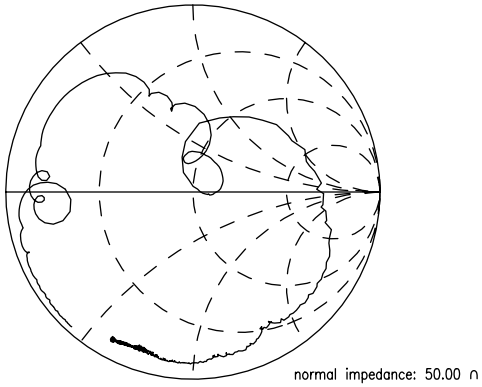


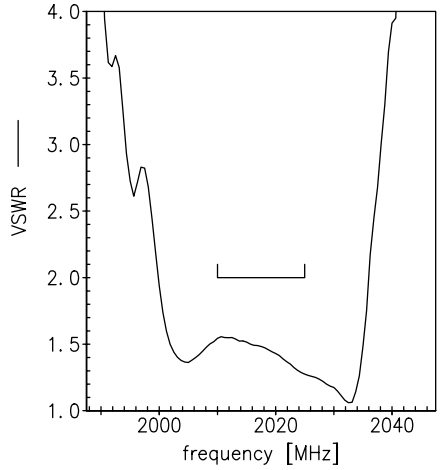
Transfer function Filter 1 (TD-SCDMA 2100) - Wideband



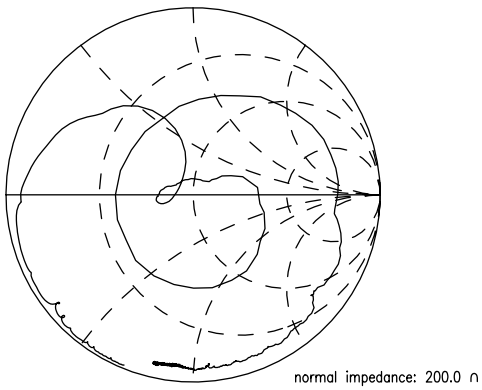
Smith charts Filter 1 (TD-SCDMA 2100)

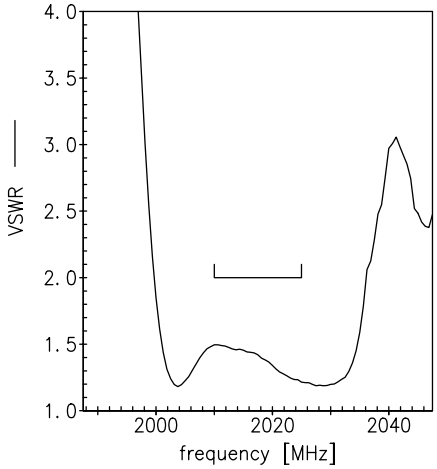
S_{11} function





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."
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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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