

RF360 Europe GmbH

A Qualcomm – TDK Joint Venture

## SAW Components

### SAW 2in1 filter

TD-SCDMA 2100 / TD-SCDMA 1900

Series/type: B9816  
Ordering code: B39202B9816P810

Date: March 22, 2011  
Version: 2.0

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## SAW 2in1 filter

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## SAW Components

B9816

### SAW 2in1 filter

2017.5/ 1900.0 MHz

#### Data Sheet



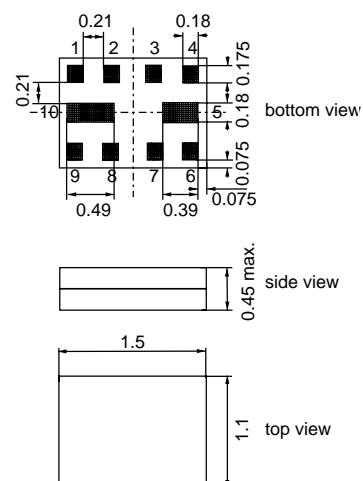
#### Application

- 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  $50\Omega$



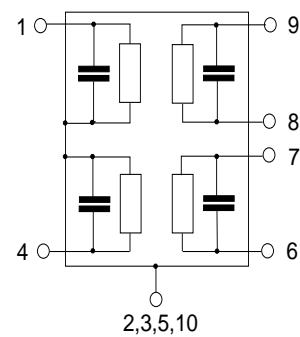
#### Features

- Package size  $1.5 \times 1.1 \times 0.4 \text{ mm}^3$
- RoHS compatible
- Approx. weight 0.003g
- Package for **Surface Mount Technology (SMT)**
- Ni, gold-plated terminals
- **Electrostatic Sensitive Device (ESD)**
- **Moisture Sensitive Level 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



Please read *cautions and warnings and important notes* at the end of this document.

**SAW Components**
**B9816**
**SAW 2in1 filter**
**2017.5/ 1900.0 MHz**
**Data Sheet**

**Characteristics of Filter 1 (TD-SCDMA 2100)**

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

 Terminating source impedance:  $Z_S = 50\Omega$ 

 Terminating load impedance:  $Z_L = 50\Omega$ 

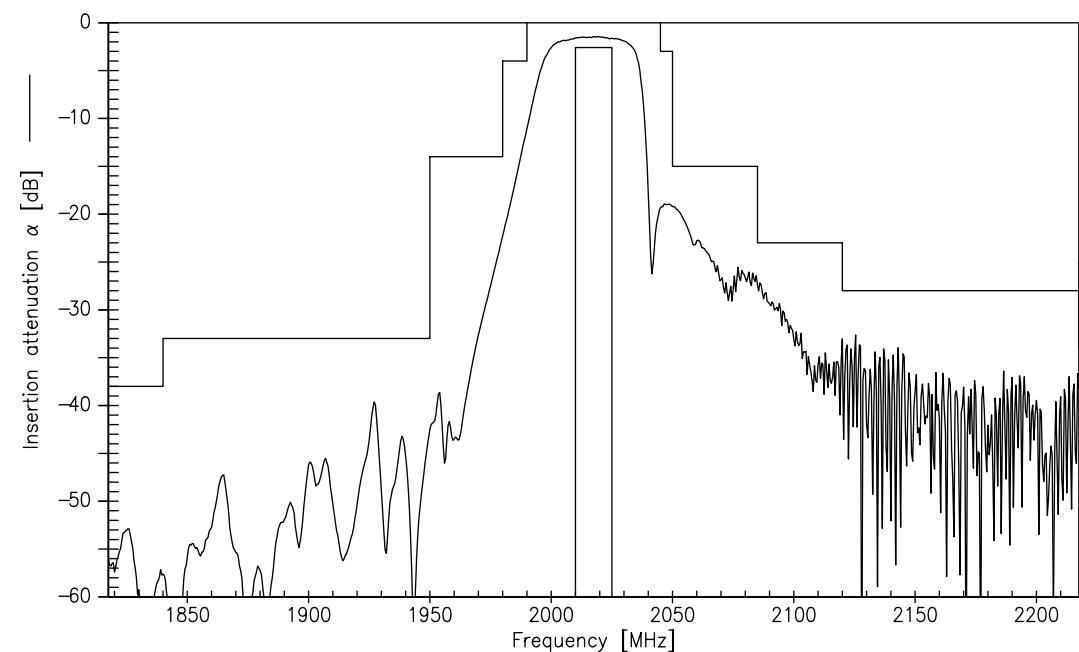
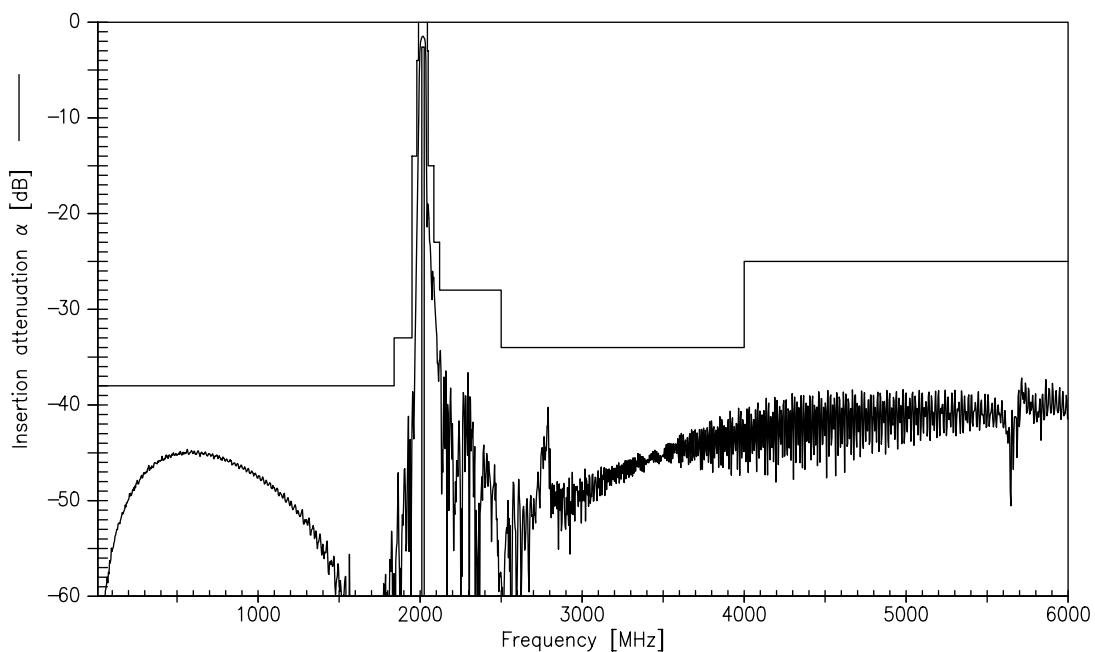
			min.	typ. @ 25°C	max.	
<b>Center frequency</b>		$f_C$	—	2017.5	—	MHz
<b>Maximum insertion attenuation</b>		$\alpha_{\max}$	—	1.7	2.6	dB
	2010.0 ... 2025.0	MHz				
<b>Amplitude ripple (p-p)</b>		$\Delta\alpha$	—	0.2	1.0	dB
	2010.0 ... 2025.0	MHz				
<b>Input VSWR</b>			—	1.3	2.0	
	2010.0 ... 2025.0	MHz				
<b>Output VSWR</b>			—	1.3	2.0	
	2010.0 ... 2025.0	MHz				
<b>Group delay ripple (p-p)</b>			—	4	20	ns
	2010.0 ... 2025.0	MHz				
<b>Attenuation</b>		$\alpha$				
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 <sub>stg</sub>	–40/+85	°C	
DC voltage	V <sub>DC</sub>	3	V	
ESD voltage	V <sub>ESD</sub>	50 <sup>1)</sup>	V	machine model, 1 pulse
Input Power at 2010.0...2025.0MHz	P <sub>IN</sub>	6	dBm	continuous wave

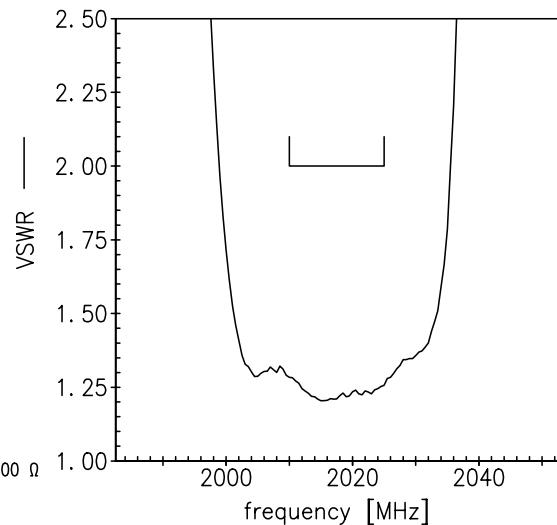
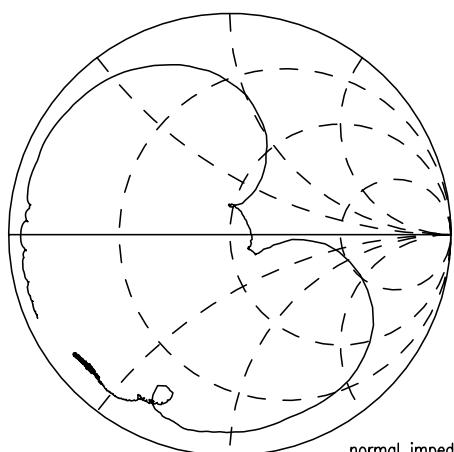
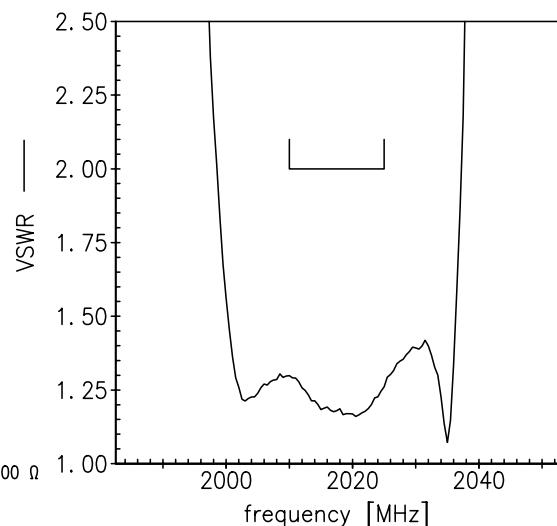
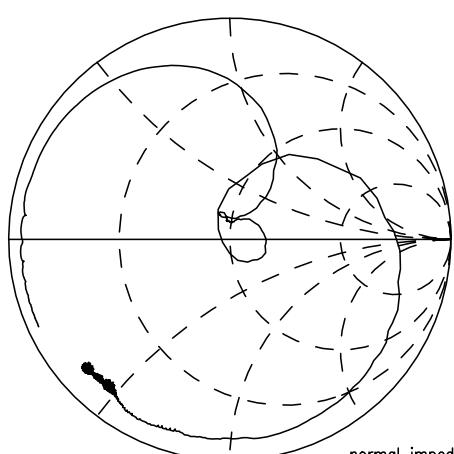
<sup>1)</sup> acc. to JESD22-A115A (machine model), 1 negative & 1 positive pulse.

**SAW Components**
**B9816**
**SAW 2in1 filter**
**2017.5/ 1900.0 MHz**
**Data Sheet**

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

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


Please read *cautions and warnings and important notes* at the end of this document.

**SAW Components**
**B9816**
**SAW 2in1 filter**
**2017.5/ 1900.0 MHz**
**Data Sheet**

**Smith charts of Filter 1**
 **$S_{11}$  function**

 **$S_{22}$  function**


Please read *cautions and warnings and important notes* at the end of this document.

**SAW Components**
**B9816**
**SAW 2in1 filter**
**2017.5/ 1900.0 MHz**
**Data Sheet**

**Characteristics of Filter 2 (TD-SCDMA 1900)**

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

 Terminating source impedance:  $Z_S = 50\Omega$ 

 Terminating load impedance:  $Z_L = 50\Omega$ 

			min.	typ. @ 25°C	max.	
<b>Center frequency</b>		$f_C$	—	1900.0	—	MHz
<b>Maximum insertion attenuation</b>		$\alpha_{\text{max}}$	—	1.4	2.0	dB
	1880.0 ... 1920.0	MHz				
<b>Amplitude ripple (p-p)</b>		$\Delta\alpha$	—	0.4	0.8	dB
	1880.0 ... 1920.0	MHz				
<b>Input VSWR</b>			—	1.5	2.0	
	1880.0 ... 1920.0	MHz				
<b>Output VSWR</b>			—	1.5	2.0	
	1880.0 ... 1920.0	MHz				
<b>Group delay ripple (p-p)</b>			—	6	14.0	ns
	1880.0 ... 1920.0	MHz				
<b>Attenuation</b>		$\alpha$				
	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

SAW Components

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SAW 2in1 filter

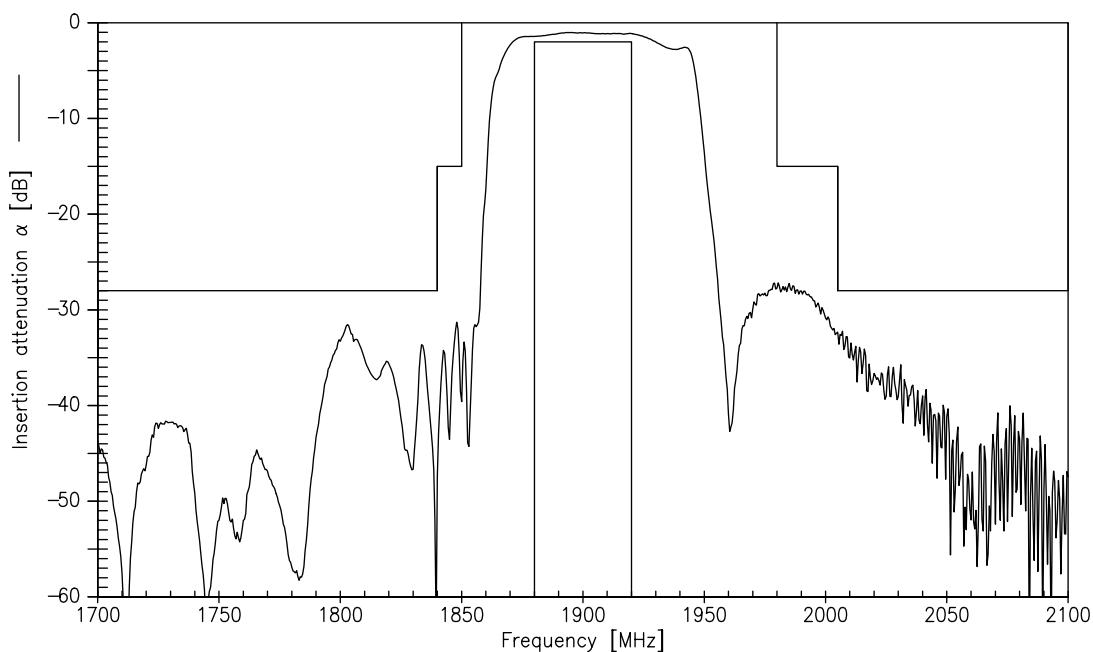
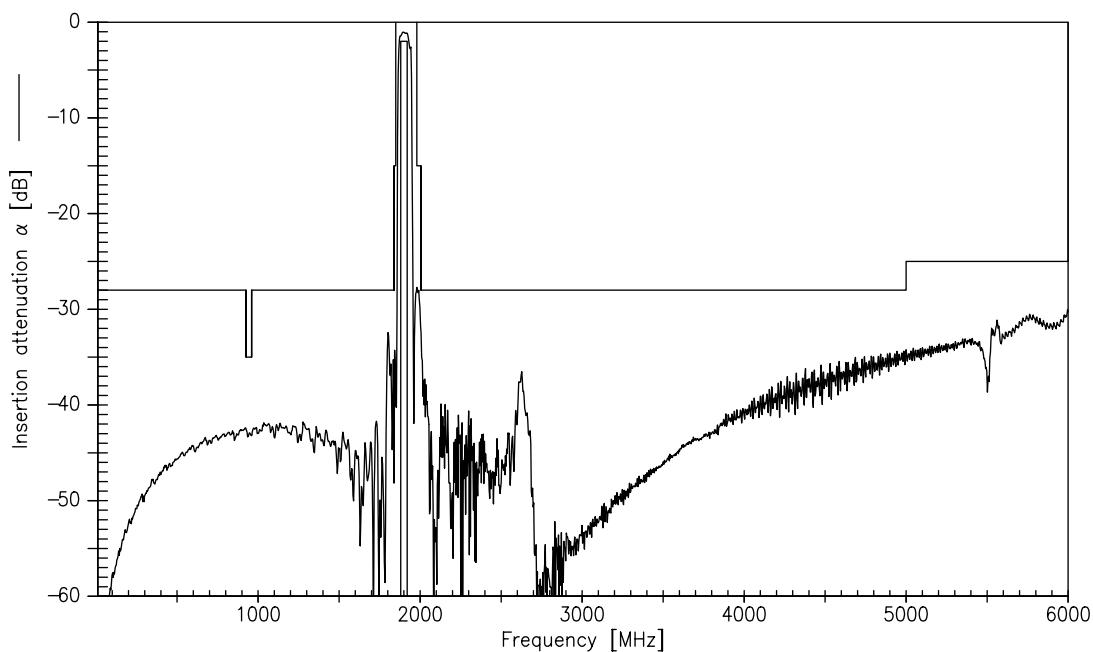
2017.5/ 1900.0 MHz

Data Sheet

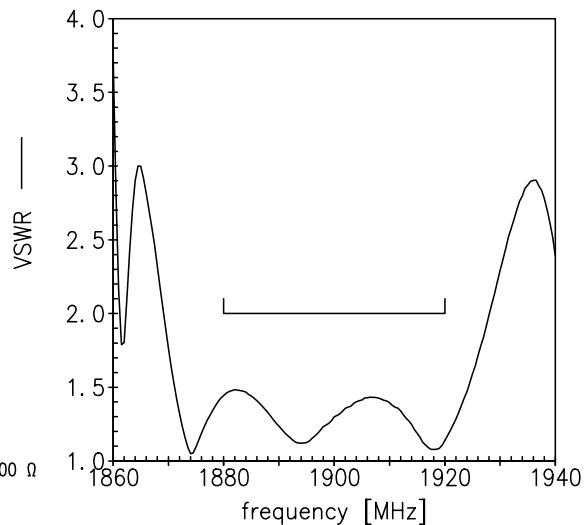
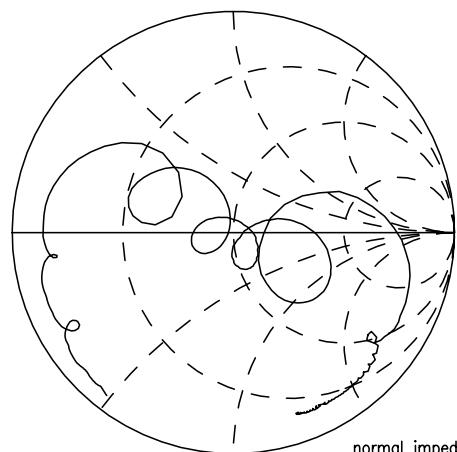
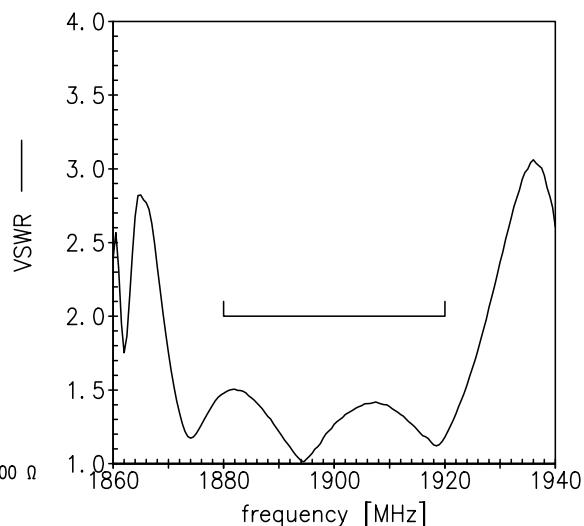
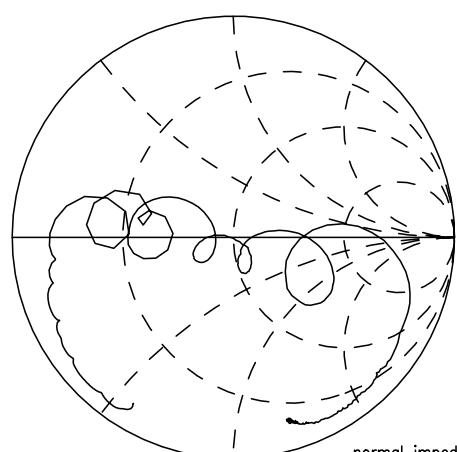
**Maximum ratings of Filter 2**

Operable temperature range	T	–40/+85	°C	
Storage temperature range	T <sub>stg</sub>	–40/+85	°C	
DC voltage	V <sub>DC</sub>	3	V	
ESD voltage	V <sub>ESD</sub>	50 <sup>1)</sup>	V	machine model, 1 pulse
Input Power at 1880.0 ... 1920.0 MHz	P <sub>IN</sub>	5	dBm	continuous wave
Tx bands				

<sup>1)</sup> 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**


**SAW Components**
**B9816**
**SAW 2in1 filter**
**2017.5/ 1900.0 MHz**
**Data Sheet**

**Smith charts of Filter 2**
 **$S_{11}$  function**

 **$S_{22}$  function**


Please read *cautions and warnings* and  
*important notes* at the end of this document.

**SAW Components**
**B9816**
**SAW 2in1 filter**
**2017.5/ 1900.0 MHz**
**Data Sheet**

**References**

<b>Type</b>	B9816
<b>Ordering code</b>	B39202B9816P810
<b>Marking and package</b>	C61157-A8-A18
<b>Packaging</b>	F61074-V8227-Z000
<b>Date codes</b>	L_1126
<b>S-parameters</b>	B9816_UB_NB.s2p, B9816_UB_WB.s2p B9816_LB_NB.s2p, B9816_LB_WB.s2p see file header for port/pin assignment table
<b>Soldering profile</b>	S_6001
<b>RoHS compatible</b>	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."
<b>Moldability</b>	Before using in overmolding environment, please contact your EPCOS sales office.
<b>Matching coils</b>	See <a href="http://www.tdk.co.jp/tefe02/coil.htm#aname1">http://www.tdk.co.jp/tefe02/coil.htm#aname1</a> <a href="http://www.tdk.co.jp/etvcl/index.htm">http://www.tdk.co.jp/etvcl/index.htm</a> for a large variety of matching coils.

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