



## **SAW Components**

### **SAW Duplexer**

WCDMA/E-UTRA Band VII

<b>Series/type:</b>	<b>B7966</b>
<b>Ordering code:</b>	<b>B39272B7966P810</b>
<b>Date:</b>	January 17, 2012
<b>Version:</b>	2.3



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B7966

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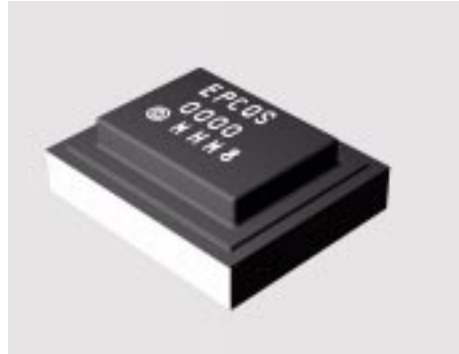
2535.0 / 2655.0 MHz

### Data Sheet



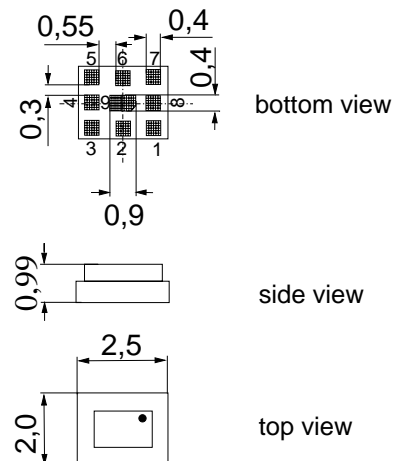
### Application

- Low-loss SAW duplexer for mobile telephone WCDMA/E-UTRA Band VII systems
- Low insertion attenuation
- Low amplitude ripple
- Usable passband 70 MHz
- Single ended to balanced transformation in Antenna - Rx path
- Impedance transformation 50Ω to 100Ω in Antenna - Rx path



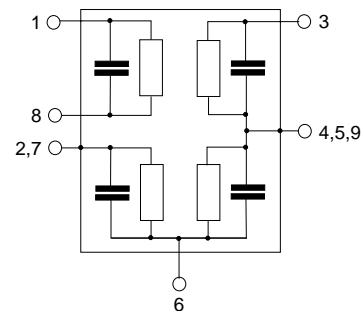
### Features

- Package size 2.5 x 2.0 x 0.99 mm<sup>3</sup>,
- RoHS compatible
- Approx. weight 0.018 g
- Package for **Surface Mount Technology (SMT)**
- Ni, gold-plated terminals
- **Electrostatic Sensitive Device (ESD)**
- **Moisture Sensitivity Level 3**



### Pin configuration

- 3 TX Input
- 1, 8 RX Output (balanced)
- 6 Antenna
- 4, 5, 9 To be grounded
- 2, 7 To be grounded





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#### Characteristics

Temperature range for specification:	T = -20 °C to +85 °C
Antenna terminating impedance:	Z <sub>ANT</sub> = 50 Ω
RX terminating impedance:	Z <sub>RX</sub> = 100 Ω    8.2nH (balanced)
TX terminating impedance:	Z <sub>TX</sub> = 50 Ω

Characteristics TX - ANT	min.	typ. @ 25 °C	max.	
<b>Center frequency</b> f <sub>C</sub>	—	2535.0	—	MHz
<b>Maximum insertion attenuation</b> 2500.0 ... 2570.0 MHz α	—	1.6	2.1	dB
<b>Amplitude ripple (p-p)</b> 2500.0 ... 2570.0 MHz Δα	—	0.4	0.8	dB
<b>Error Vector Magnitude</b> 2502.4 ... 2567.6 MHz EVM <sup>1)</sup>	—	0.9	2.0	%
<b>Input VSWR (TX port)</b> 2500.0 ... 2570.0 MHz	—	1.6	2.2	
<b>Output VSWR (ANT port)</b> 2500.0 ... 2570.0 MHz	—	1.55	1.9	

<sup>1)</sup> Error Vector Magnitude (EMV) based on definition given in 3GPP TS 25.141.



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#### Characteristics

Temperature range for specification:

$T = -20\text{ °C to }+85\text{ °C}$

Antenna terminating impedance:

$Z_{ANT} = 50\Omega$

RX terminating impedance:

$Z_{RX} = 100\Omega \parallel 8.2\text{nH (balanced)}$

TX terminating impedance:

$Z_{TX} = 50\Omega$

Characteristics TX - ANT				min.	typ. @ 25 °C	max.	
<b>Attenuation</b>							
			$\alpha$				
10.0	...	1565.42	MHz	30	40	—	dB
1565.42	...	1573.374	MHz	40	52	—	dB
1573.374	...	1577.466	MHz	43	51	—	dB
1577.466	...	1585.42	MHz	40	50	—	dB
1597.5515	...	1605.886	MHz	41	49	—	dB
1605.886	...	1680.0	MHz	25	45	—	dB
1805.0	...	1880.0	MHz	30	39	—	dB
1900.0	...	1920.0	MHz	30	38	—	dB
2010.0	...	2025.0	MHz	30	36	—	dB
2110.0	...	2170.0	MHz	30	35	—	dB
2400.0	...	2440.0	MHz	35	44	—	dB
2440.0	...	2460.0	MHz	20	30	—	dB
2460.0	...	2473.0	MHz	7	16	—	dB
2473.0	...	2474.0	MHz	6	12	—	dB
@ $f_{Carrier}$	2412.0	...	2457.0 MHz $\alpha_{WLAN}^{1)}$	20	30	—	dB
@ $f_{Carrier}$			2462.0 MHz $\alpha_{WLAN}^{1)}$	15	24	—	dB
@ $f_{Carrier}$			2467.0 MHz $\alpha_{WLAN}^{1)}$	10	19	—	dB
2474.0	...	2500.0	MHz	1	1.5	—	dB
2590.0	...	2620.0	MHz	1.5	3.5	—	dB
2620.0	...	2690.0	MHz	45	50	—	dB
5000.0	...	5140.0	MHz	24	30	—	dB
5150.0	...	5850.0	MHz	15	23	—	dB

<sup>1)</sup> Average over 18MHz at center of WLAN channel (according to IEEE 802-11).



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RX terminating impedance:	Z <sub>RX</sub> = 100 Ω    8.2nH (balanced)
TX terminating impedance:	Z <sub>TX</sub> = 50 Ω

Characteristics ANT - RX				min.	typ. @ 25 °C	max.	
<b>Center frequency</b>	f <sub>C</sub>			—	2655.0	—	MHz
<b>Maximum insertion attenuation</b>							
2620.0 ... 2690.0 MHz	α			—	2.7	3.2	dB
<b>Amplitude ripple (p-p)</b>							
2620.0 ... 2690.0 MHz	Δα			—	0.8	1.3	dB
<b>Error Vector Magnitude</b>	EVM <sup>1)</sup>						
2622.4 ... 2687.6 MHz				—	1.1	2.0	%
<b>Common mode rejection ratio</b>	CMRR						
2620.0 ... 2690.0 MHz				22 <sup>2)</sup>	24.5	—	dB
<b>Input VSWR (ANT port)</b>							
2620.0 ... 2690.0 MHz				—	1.6	1.9	
<b>Output VSWR (RX port)</b>							
2620.0 ... 2690.0 MHz				—	1.7	2.1	
<b>IMD Product Level Limits<sup>3)</sup></b>							
<b>at f<sub>TX</sub>=2535MHz, f<sub>RX</sub>=2655MHz</b>							
Blocker 1	120.0 MHz			—	-107	-100	dBm
Blocker 2	2415.0 MHz			—	-105	-100	dBm
Blocker 3	5190.0 MHz			—	-113	-105	dBm

<sup>1)</sup> Error Vector Magnitude (EMV) based on definition given in 3GPP TS 25.141.

<sup>2)</sup> A combination of 10° phase balance and 1 dB amplitude balance corresponds to 19.6 dB CMRR

<sup>3)</sup> Power levels: 21 dBm Tx signal, -15dBm blocker at antenna port.



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Temperature range for specification:

T = -20 °C to +85 °C

Antenna terminating impedance:

Z<sub>ANT</sub> = 50 Ω

RX terminating impedance:

Z<sub>RX</sub> = 100 Ω || 8.2nH (balanced)

TX terminating impedance:

Z<sub>TX</sub> = 50 Ω

Characteristics ANT - RX				min.	typ. @ 25 °C	max.	
<b>Attenuation</b> α							
1.0	...	2380.0	MHz	35	54	—	dB
2380.0	...	2450.0	MHz	40	60	—	dB
2450.0	...	2484.0	MHz	30	58	—	dB
2500.0	...	2570.0	MHz	53	59	—	dB
2570.0	...	2605.0	MHz	3	6	—	dB
2775.0	...	5120.0	MHz	20	43	—	dB
5120.0	...	5260.0	MHz	40	65	—	dB
5260.0	...	6000.0	MHz	30	59	—	dB
<b>Characteristics TX - RX</b>				min.	typ. @ 25 °C	max.	
<b>Differential Mode Isolation</b> α							
1574.0	...	1577.0	MHz	30	61	—	dB
2500.0	...	2570.0	MHz	53	59	—	dB
2620.0	...	2690.0	MHz	49	53	—	dB
5000.0	...	5140.0	MHz	30	59	—	dB
<b>Common Mode Isolation</b> α							
2500.0	...	2570.0	MHz	47	50	—	dB

### Maximum ratings

Operable temperature range <sup>1)</sup> T	-25/+85	°C	
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Please read *cautions and warnings* and *important notes* at the end of this document.



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### Maximum ratings

Storage temperature range	$T_{\text{stg}}$	-40/+85	°C	
DC voltage	$V_{\text{DC}}$	5	V	
ESD voltage	$V_{\text{ESD}}$	50	V	machine model <sup>2)</sup>
	$V_{\text{ESD}}$	250	V	charge device model <sup>3)</sup>
Input power at	$P_{\text{IN}}$			source and load impedance 50 $\Omega$
2500.0 ... 2570.0 MHz		28	dBm	} continuous wave $T = 55^\circ\text{C}$ , 10.000 h
elsewhere		10	dBm	

1) Defines the temperature range in which the SAW device keeps its typical characteristics, however the specification values are not guaranteed.

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

3) acc. to JESD22-C101C (charge device model), 3 negative & 3 positive pulses.



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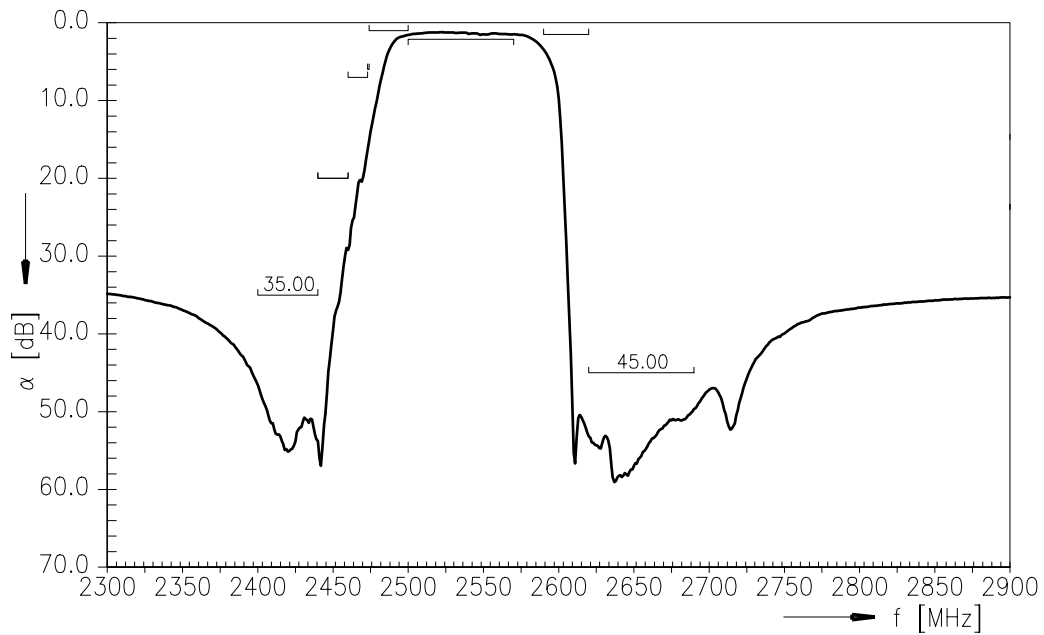
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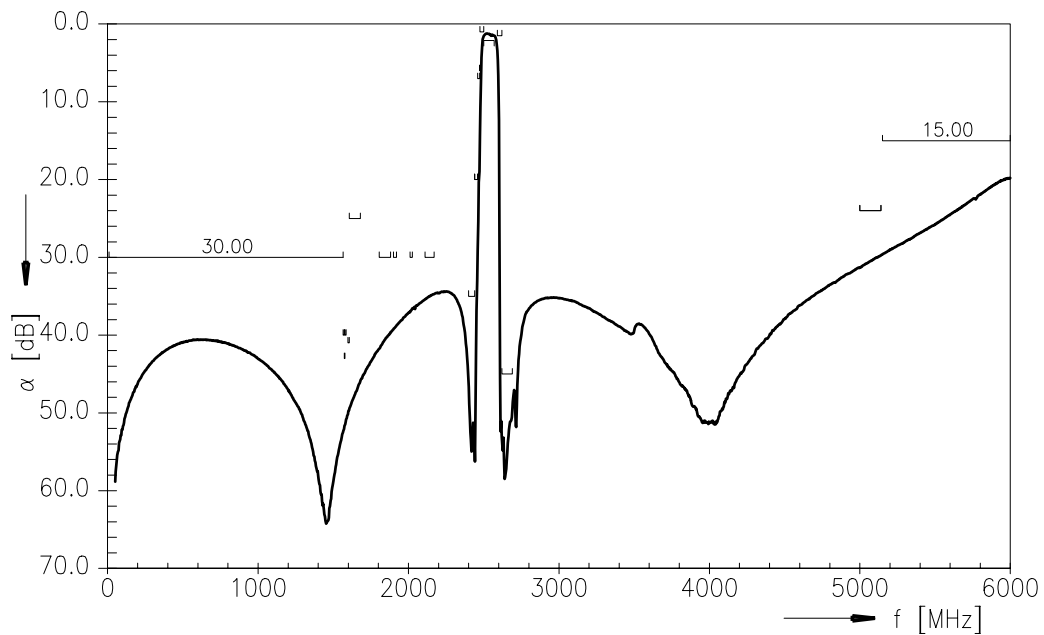
Data Sheet



### Frequency Response TX-ANT



### Frequency Response TX-ANT (wideband)



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





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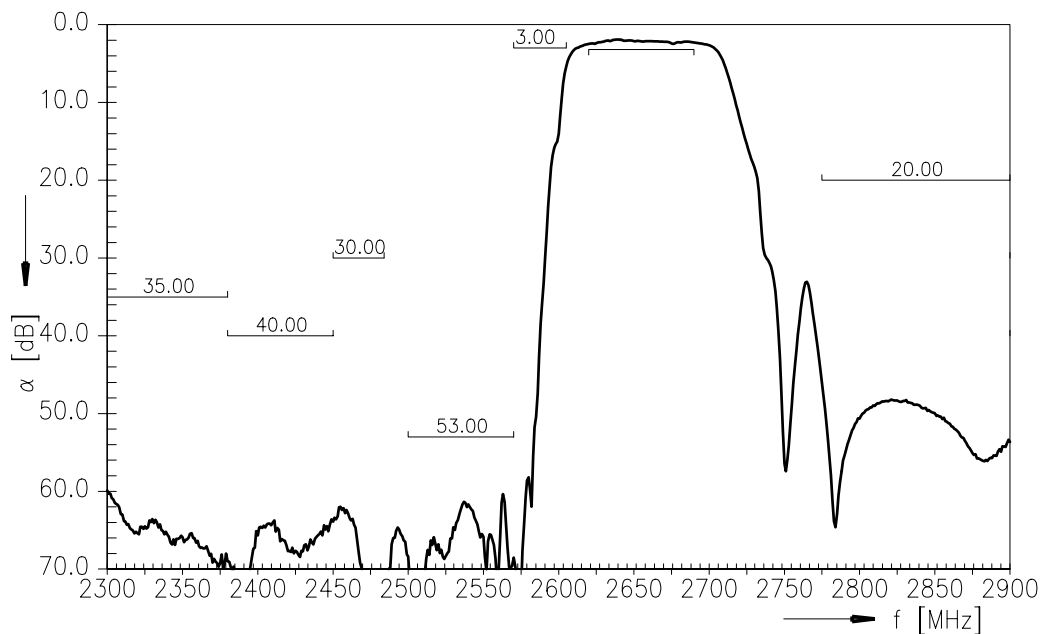
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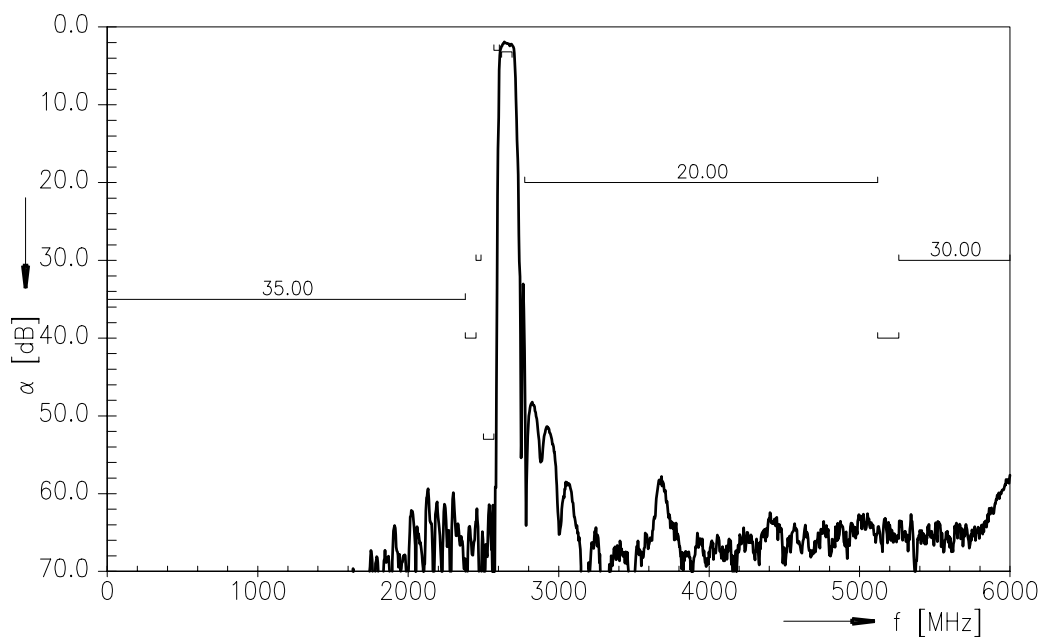
Data Sheet



### Frequency Response RX-ANT



### Frequency Response RX-ANT (wideband)



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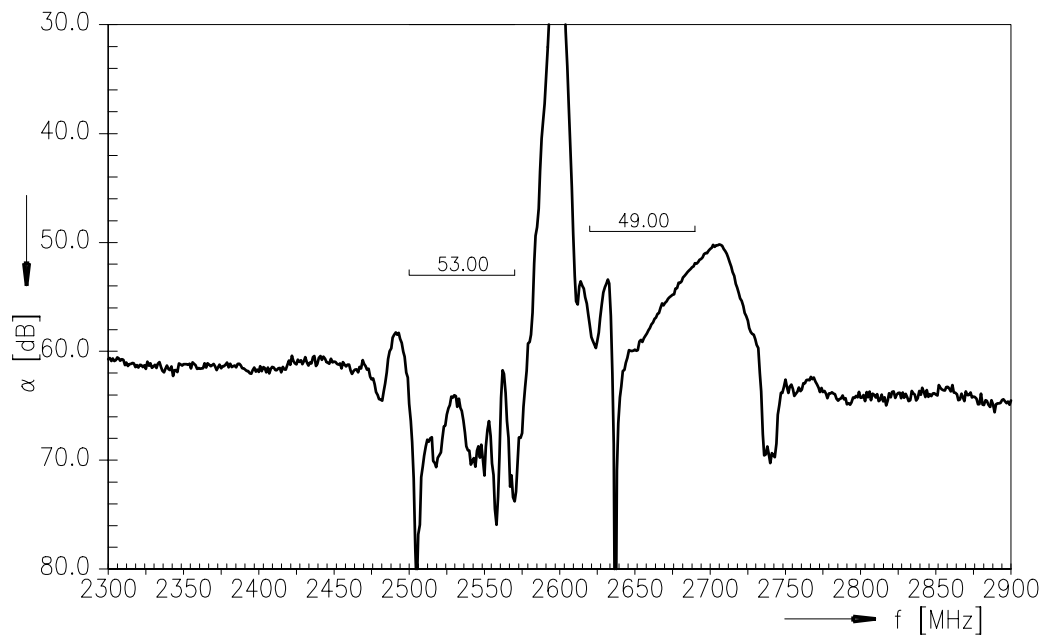
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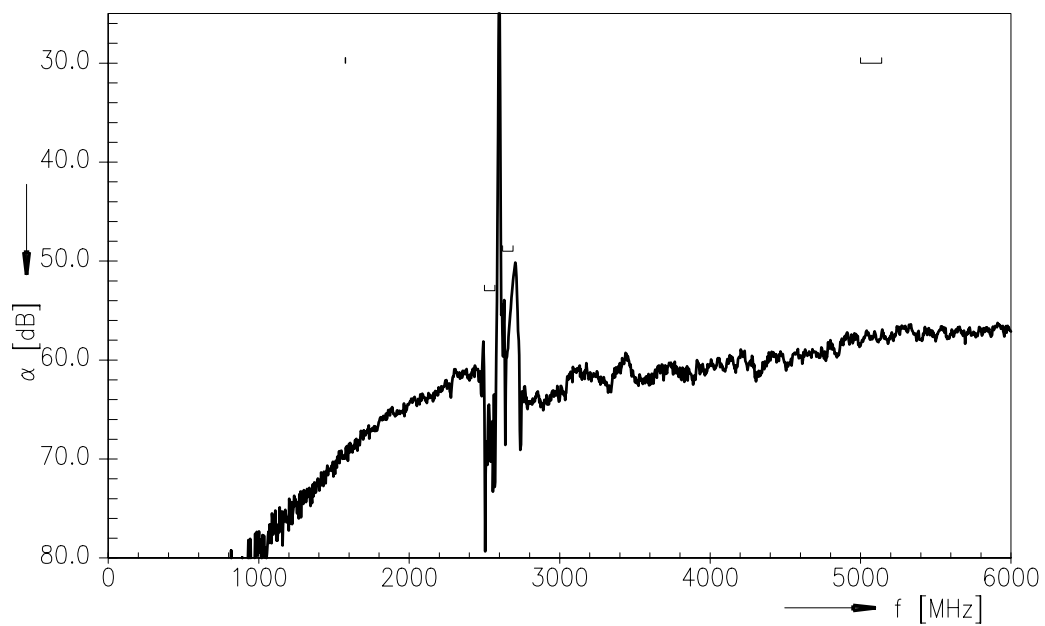
Data Sheet



### Frequency Response TX-RX



### Frequency Response TX-RX (wideband)



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<b>Type</b>	B7966
<b>Ordering code</b>	B39272B7966P810
<b>Marking and package</b>	C61157-A3-A81
<b>Packaging</b>	F61074-V8225-Z000
<b>Date codes</b>	L_1126
<b>S-parameters</b>	B7966_NB.s4p, B7966_WB.s4p See file header for pin/port assignment.
<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 maxi- mum concentration values for certain hazardous substances in electrical and electronic equipment."
<b>Matching coils</b>	See Inductor pdf-catalog <a href="http://www.tdk.co.jp/tefe02/coil.htm#aname1">http://www.tdk.co.jp/tefe02/coil.htm#aname1</a> and Data Library for circuit simulation <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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**11** January 17, 2012



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