



## **SAW Components**

### **SAW GPS Extractor Filter**

GPS Extractor

<b>Series/type:</b>	<b>B7742</b>
<b>Ordering code:</b>	<b>B39162B7742E310</b>
<b>Date:</b>	<b>May 24, 2006</b>
<b>Version:</b>	<b>2.1</b>



## SAW Components

B7742

### SAW GPS Extractor Filter

1575.42 / 859.0 / 1810.0 / 1920.0 / 2441.75 MHz

#### Data Sheet



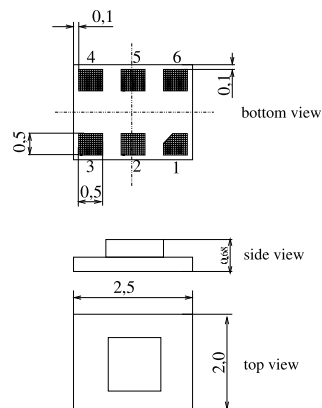
#### Application

- Low loss RF GPS Extractor filter for mobile phones using common antenna for GPS and Cellular or PCS or/and K-PCS or Bluetooth band
- Placed between antenna, GPS band and Cellular/PCS/K-PCS/Bluetooth band
- No switches and control lines required
- Integrated low loss GPS filter with single ended output 50  $\Omega$
- Very low insertion attenuation in GPS and Non-GPS band
- High selectivity of GPS filter
- Low amplitude ripple in all bands
- Usable passbands 2 MHz (GPS), 70 MHz (Cellular), 120 MHz (K-PCS), 140 MHz (PCS), 83.5 MHz (Bluetooth)



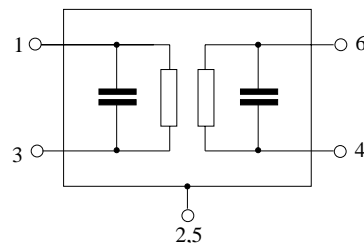
#### Features

- Package size 2.5 x 2.0 x 0.68 mm<sup>3</sup>
- Package code DCS6N
- RoHS compatible
- Approximate weight 0.015 g
- Package for **Surface Mount Technology (SMT)**
- Ni, gold-plated terminals
- **Electrostatic Sensitive Device (ESD)**



#### Pin configuration

- 1 Input antenna
- 3 Output GPS band
- 6 Output Non-GPS band (Cellular or K-PCS or PCS or Bluetooth band depending on external matching)
- 4 To be grounded
- 2,5 Ground



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



<b>SAW Components</b>	<b>B7742</b>
<b>SAW GPS Extractor Filter</b>	<b>1575.42 / 859.0 / 1810.0 / 1920.0 / 2441.75 MHz</b>

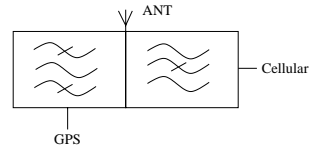
Data Sheet



**Characteristics**

**CELLULAR (859 MHz) + GPS (1575.42 MHz)**

Temperature range for specification: T = -30 °C to +85 °  
 Terminating input antenna impedance:  $Z_{ANT} = 50 \Omega \parallel 12 \text{ nH}$   
 Terminating GPS impedance:  $Z_{GPS} = 50 \Omega$   
 Terminating non GPS impedance:  $Z_{nGPS} = 50 \Omega \parallel 27 \text{ nH}$



		<b>B7742</b>			
		<b>min.</b>	<b>typ.<sup>1)</sup> @ 25 °C</b>	<b>max.<sup>1)</sup></b>	
<b>Nominal frequency 1 (GPS)</b>	$f_{N1}$	—	1575.42	—	MHz
<b>Nominal frequency 2 (Cellular)</b>	$f_{N2}$	—	859.0	—	MHz
<b>Maximum insertion attenuation</b>					
Antenna-GPS	1574.42 ... 1576.42 MHz	—	1.1	1.6 <sup>2)</sup>	dB
Antenna-Cellular	824.0 ... 894.0 MHz	—	0.35	0.6	dB
<b>Attenuation</b>					
Antenna-GPS	824.0 ... 894.0 MHz	33	36	—	dB
Antenna-GPS	1750.0 ... 1990.0 MHz	34	38	—	dB
<b>VSWR (Antenna)</b>					
Cellular band	824.0 ... 894.0 MHz	—	1.2	1.5	
GPS band	1574.42 ... 1576.42 MHz	—	1.4	1.7	
<b>VSWR (GPS)</b>					
GPS band	1574.42 ... 1576.42 MHz	—	1.3	1.7	
<b>VSWR (Non-GPS)</b>					
Cellular band	824.0 ... 894.0 MHz	—	1.3	1.6	
<b>Isolation between Non GPS and GPS path</b>					
Cellular band	824.0 ... 894.0 MHz	33	37	—	dB
K-PCS + PCS band	1750.0 ... 1990.0 MHz	34	39	—	dB

<sup>1)</sup> PCB loss de-embedded

<sup>2)</sup> 1.4 dB max. at 25 °C



<b>SAW Components</b>	<b>B7742</b>
<b>SAW GPS Extractor Filter</b>	<b>1575.42 / 859.0 / 1810.0 / 1920.0 / 2441.75 MHz</b>

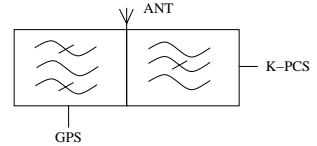
Data Sheet



**Characteristics**

**K-PCS (1810 MHz) + GPS (1575.42 MHz)**

Temperature range for specification: T = -30 °C to +85 °  
 Terminating input antenna impedance:  $Z_{ANT} = 50 \Omega \parallel 10 \text{ nH}$   
 Terminating GPS impedance:  $Z_{GPS} = 50 \Omega$   
 Terminating non GPS impedance:  $Z_{nGPS} = 50 \Omega \parallel 3.9 \text{ nH}$



		<b>B7742</b>			
		<b>min.</b>	<b>typ.<sup>1)</sup> @ 25 °C</b>	<b>max.<sup>1)</sup></b>	
<b>Nominal frequency 1 (GPS)</b>	$f_{N1}$	—	1575.42	—	MHz
<b>Nominal frequency 3 (K-PCS)</b>	$f_{N3}$	—	1810.0	—	MHz
<b>Maximum insertion attenuation</b>					
Antenna-GPS	1574.42 ... 1576.42 MHz	—	1.2	1.65 <sup>2)</sup>	dB
Antenna-K-PCS	1750.0 ... 1870.0 MHz	—	0.6	0.9	dB
<b>Attenuation</b>					
Antenna-GPS	824.0 ... 894.0 MHz	37	42	—	dB
Antenna-GPS	1750.0 ... 1990.0 MHz	33	37	—	dB
<b>VSWR (Antenna)</b>					
K-PCS band	1750.0 ... 1870.0 MHz	—	1.3	1.6	
GPS band	1574.42 ... 1576.42 MHz	—	1.5	1.9	
<b>VSWR (GPS)</b>					
GPS band	1574.42 ... 1576.42 MHz	—	1.5	1.8	
<b>VSWR (Non-GPS)</b>					
K-PCS band	1750.0 ... 1870.0 MHz	—	1.2	1.5	
<b>Isolation between Non GPS and GPS path</b>					
Cellular band	824.0 ... 894.0 MHz	35	40	—	dB
K-PCS + PCS band	1750.0 ... 1990.0 MHz	33	38	—	dB

<sup>1)</sup> PCB loss de-embedded

<sup>2)</sup> 1.5 dB max. at 25 °C



<b>SAW Components</b>	<b>B7742</b>
<b>SAW GPS Extractor Filter</b>	<b>1575.42 / 859.0 / 1810.0 / 1920.0 / 2441.75 MHz</b>

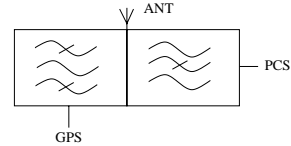
Data Sheet



**Characteristics**

**PCS (1920 MHz) + GPS (1575.42 MHz)**

Temperature range for specification:  $T = -30\text{ °C to }+85\text{ °C}$   
 Terminating input antenna impedance:  $Z_{ANT} = 50\ \Omega \parallel 10\text{ nH}$   
 Terminating GPS impedance:  $Z_{GPS} = 50\ \Omega$   
 Terminating non GPS impedance:  $Z_{nGPS} = 50\ \Omega \parallel 3.3\text{ nH}$



		<b>B7742</b>			
		<b>min.</b>	<b>typ.<sup>1)</sup> @ 25 °C</b>	<b>max.<sup>1)</sup></b>	
<b>Nominal frequency 1 (GPS)</b>	$f_{N1}$	—	1575.42	—	MHz
<b>Nominal frequency 4 (PCS)</b>	$f_{N4}$	—	1920.0	—	MHz
<b>Maximum insertion attenuation</b>					
Antenna-GPS	1574.42 ... 1576.42 MHz	—	1.2	1.65 <sup>2)</sup>	dB
Antenna-PCS	1850.0 ... 1990.0 MHz	—	0.6	0.9	dB
<b>Attenuation</b>					
Antenna-GPS	824.0 ... 894.0 MHz	37	42	—	dB
Antenna-GPS	1750.0 ... 1990.0 MHz	33	37	—	dB
<b>VSWR (Antenna)</b>					
PCS band	1850.0 ... 1990.0 MHz	—	1.3	1.6	
GPS band	1574.42 ... 1576.42 MHz	—	1.6	1.9	
<b>VSWR (GPS)</b>					
GPS band	1574.42 ... 1576.42 MHz	—	1.5	1.8	
<b>VSWR (Non-GPS)</b>					
PCS band	1850.0 ... 1990.0 MHz	—	1.2	1.5	
<b>Isolation between Non GPS and GPS path</b>					
Cellular band	824.0 ... 894.0 MHz	35	40	—	dB
K-PCS + PCS band	1750.0 ... 1990.0 MHz	33	38	—	dB

<sup>1)</sup> PCB loss de-embedded

<sup>2)</sup> 1.5 dB max. at 25 °C



<b>SAW Components</b>	<b>B7742</b>
<b>SAW GPS Extractor Filter</b>	<b>1575.42 / 859.0 / 1810.0 / 1920.0 / 2441.75 MHz</b>

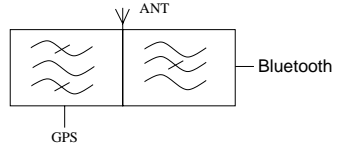
Data Sheet



**Characteristics**

**Bluetooth (2441.75 MHz) + GPS (1575.42 MHz)**

Temperature range for specification: T = -30 °C to +85 °  
 Terminating input antenna impedance:  $Z_{ANT} = 50 \Omega \parallel 10 \text{ nH}$   
 Terminating GPS impedance:  $Z_{GPS} = 50 \Omega$   
 Terminating non GPS impedance:  $Z_{nGPS} = 50 \Omega \parallel 2.2 \text{ nH}$



		<b>B7742</b>			
		<b>min.</b>	<b>typ.<sup>1)</sup> @ 25 °C</b>	<b>max.<sup>1)</sup></b>	
<b>Nominal frequency 1 (GPS)</b>	$f_{N1}$	—	1575.42	—	MHz
<b>Nominal frequency 5 (Bluetooth)</b>	$f_{N5}$	—	2441.75	—	MHz
<b>Maximum insertion attenuation</b>					
Antenna-GPS	1574.42 ... 1576.42 MHz	—	1.1	1.6 <sup>2)</sup>	dB
Antenna-Bluetooth	2400.0 ... 2483.5 MHz	—	0.7	1.0	dB
<b>Attenuation</b>					
Antenna-GPS	824.0 ... 894.0 MHz	34	38	—	dB
Antenna-GPS	1750.0 ... 1990.0 MHz	34	39	—	dB
Antenna-GPS	2400.0 ... 2483.5 MHz	36	40	—	dB
<b>VSWR (Antenna)</b>					
Bluetooth band	2400.0 ... 2483.5 MHz	—	1.2	1.6	
GPS band	1574.42 ... 1576.42 MHz	—	1.4	1.8	
<b>VSWR (GPS)</b>					
GPS band	1574.42 ... 1576.42 MHz	—	1.4	1.8	
<b>VSWR (Non-GPS)</b>					
Bluetooth band	2400.0 ... 2483.5 MHz	—	1.2	1.5	
<b>Isolation between Non GPS and GPS path</b>					
Bluetooth band	2400.0 ... 2483.5 MHz	36	40	—	dB

1) PCB loss de-embedded

2) 1.4 dB max. at 25 °C



**SAW Components** **B7742**

**SAW GPS Extractor Filter** **1575.42 / 859.0 / 1810.0 / 1920.0 / 2441.75 MHz**

Data Sheet



**Maximum ratings**

Operable temperature range	T	-30/+85	°C	
Storage temperature range	T <sub>stg</sub>	-40/+85	°C	
DC voltage	V <sub>DC</sub>	5	V	
ESD voltage	V <sub>ESD</sub>	50 <sup>1)</sup>	V	machine model, 10 pulses
Input power at				
824 ... 894 MHz	P <sub>IN</sub>	31	dBm	
1750 ... 1870 MHz	P <sub>IN</sub>	31	dBm	effective power in the on-state
1850 ... 1990 MHz	P <sub>IN</sub>	31	dBm	continuous wave signal
2400 ... 2483.5 MHz	P <sub>IN</sub>	31	dBm	

<sup>1)</sup> acc. to JESD22-A115A (machine model), 10 negative & 10 positive pulses.



SAW Components

B7742

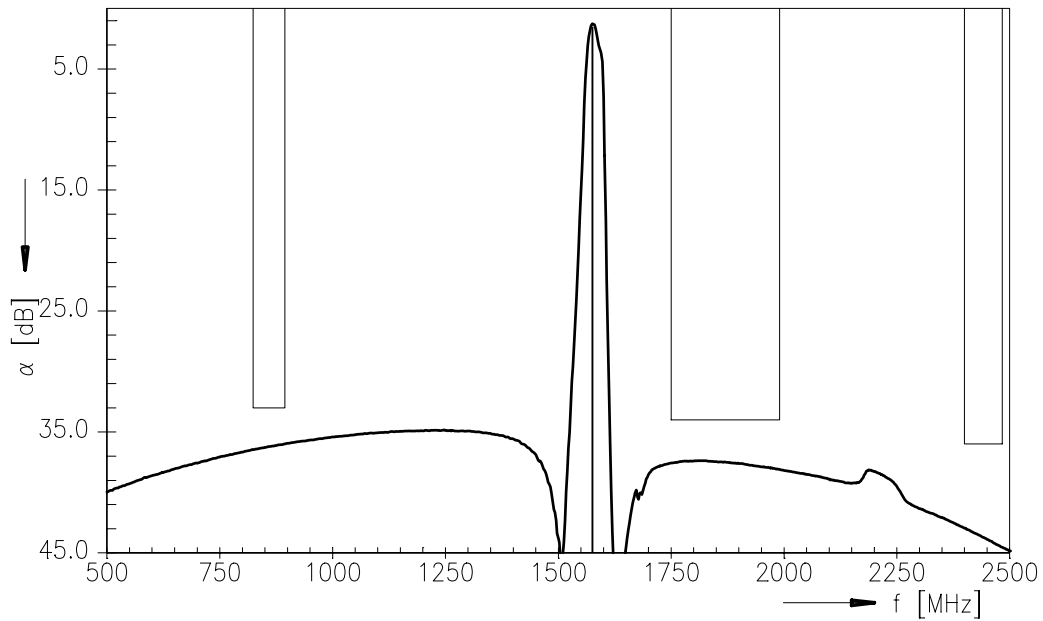
SAW GPS Extractor Filter

1575.42 / 859.0 / 1810.0 / 1920.0 / 2441.75 MHz

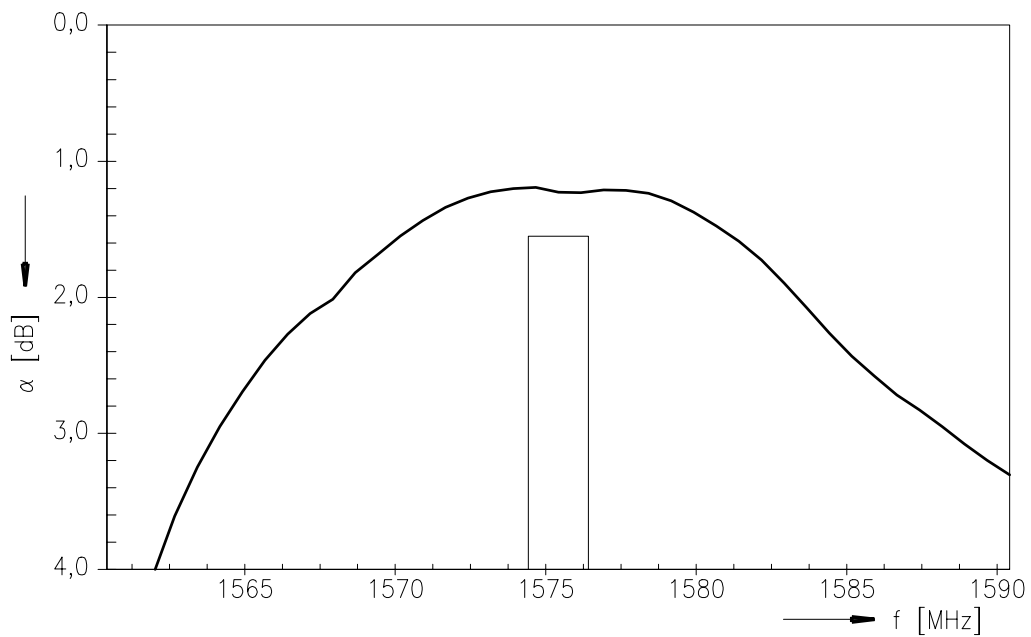
Data Sheet



Antenna - GPS (transfer function):



Antenna - GPS (transfer function passband, including PCB loss):



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





SAW Components

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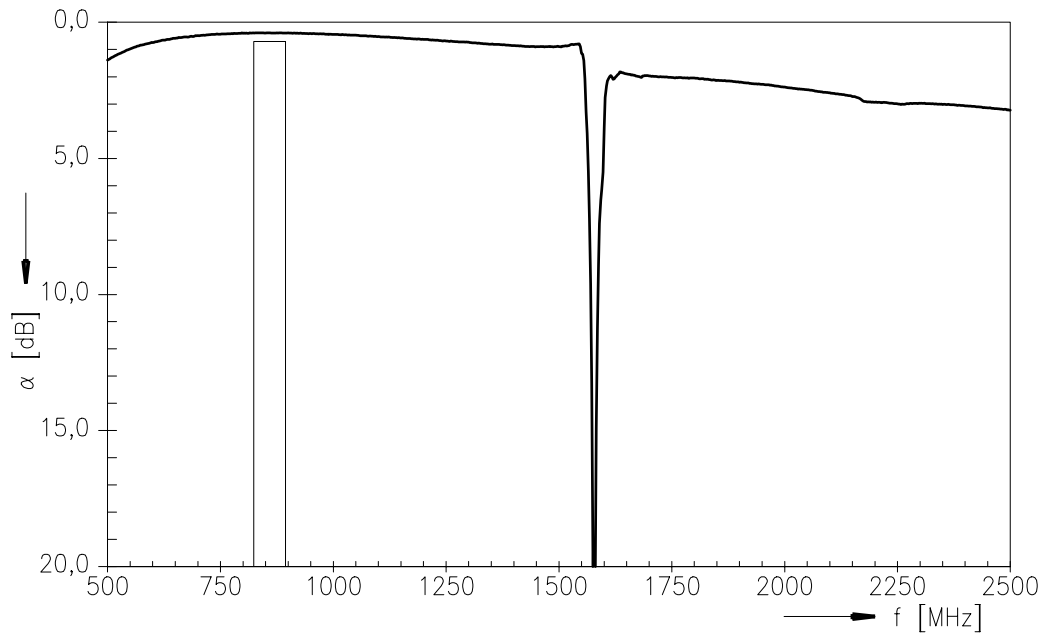
SAW GPS Extractor Filter

1575.42 / 859.0 / 1810.0 / 1920.0 / 2441.75 MHz

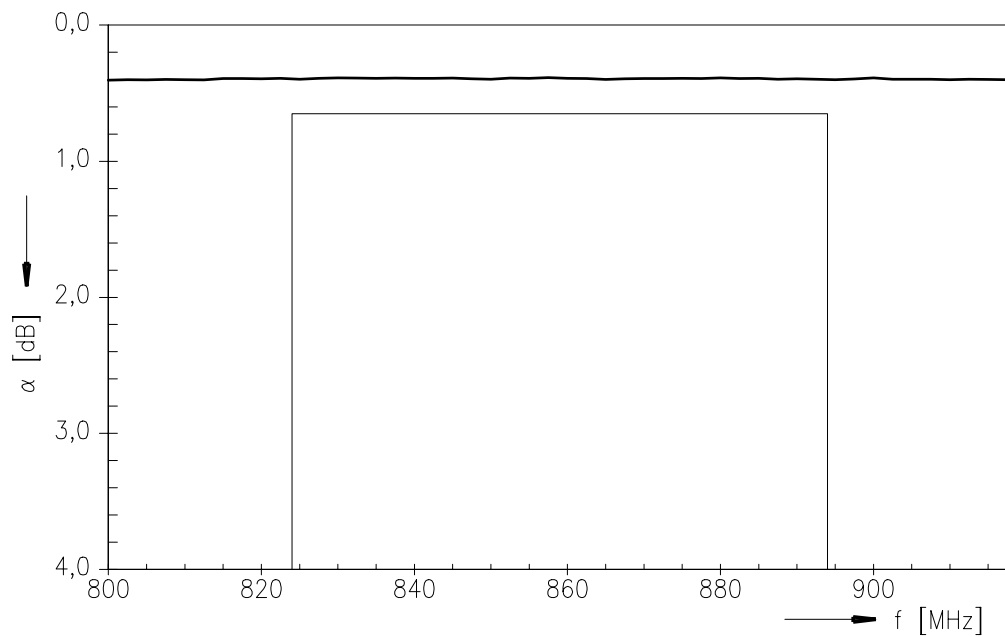
Data Sheet



Antenna - Cellular (transfer function, matching for Cellular, incl. PCB loss):



Antenna - Cellular (transfer function passband, matching for Cellular, incl. PCB loss):



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



SAW Components

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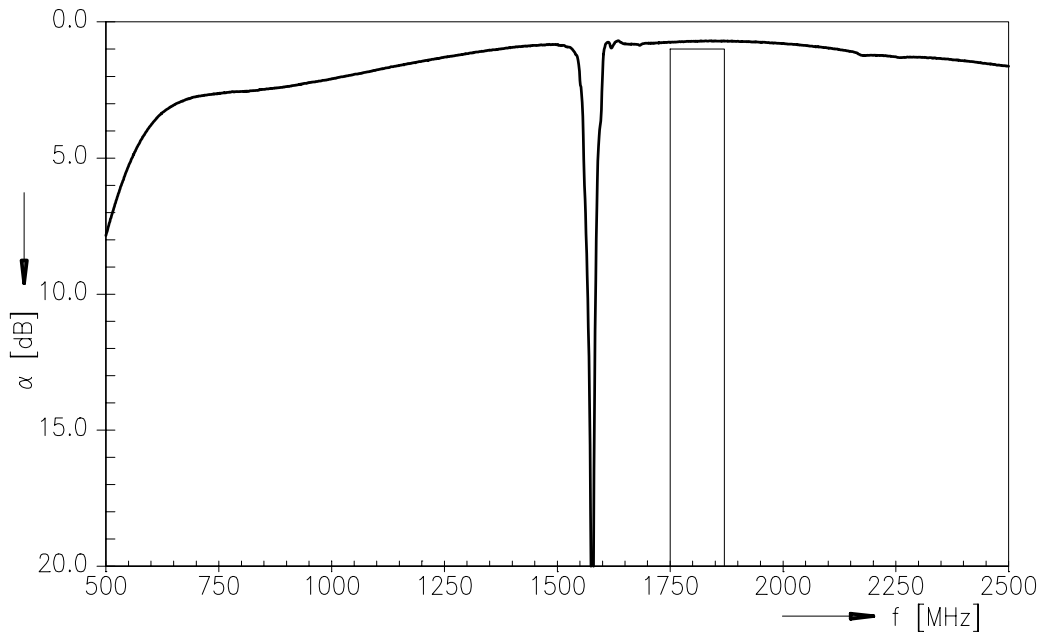
SAW GPS Extractor Filter

1575.42 / 859.0 / 1810.0 / 1920.0 / 2441.75 MHz

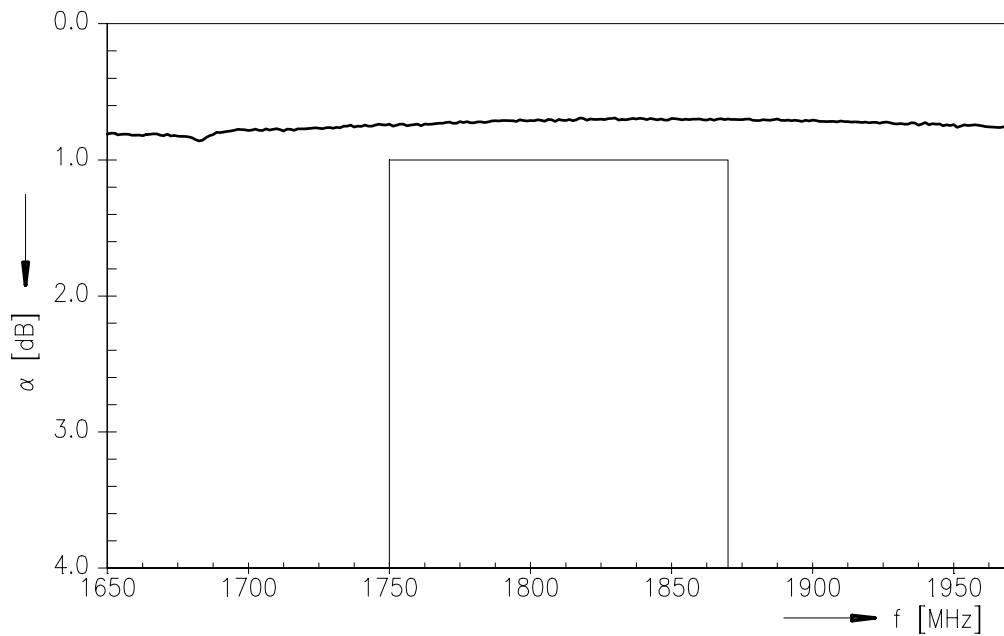
Data Sheet



Antenna - K-PCS (transfer function, matching for K-PCS, incl. PCB loss):



Antenna - K-PCS (transfer function passband, matching for K-PCS, incl. PCB loss):



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



SAW Components

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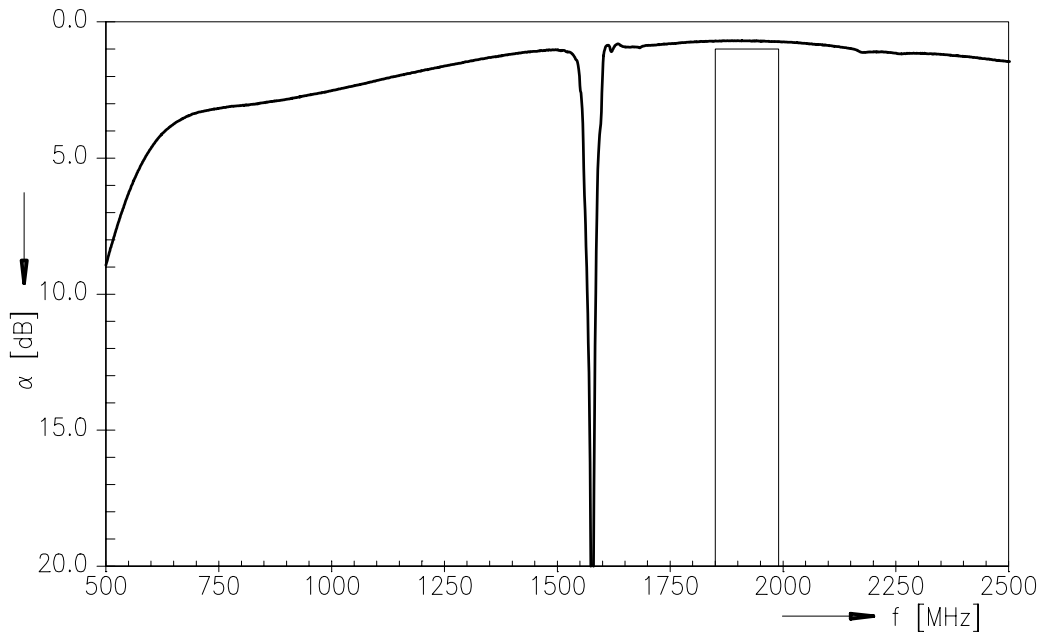
SAW GPS Extractor Filter

1575.42 / 859.0 / 1810.0 / 1920.0 / 2441.75 MHz

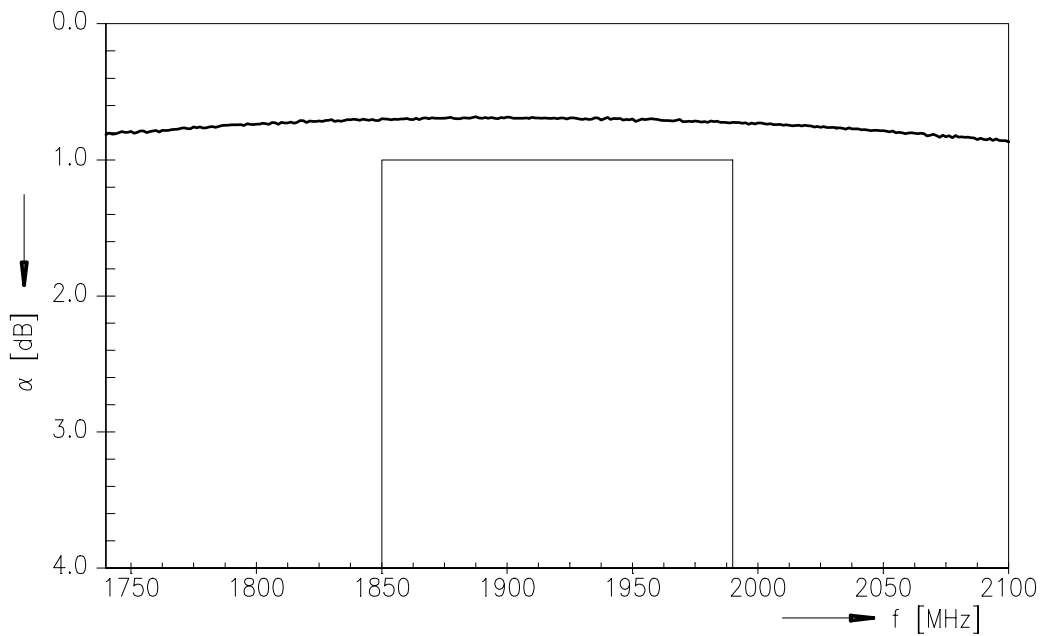
Data Sheet



Antenna - PCS (transfer function, matching for PCS, incl. PCB loss):



Antenna - PCS (transfer function passband, matching for PCS, incl. PCB loss):



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



SAW Components

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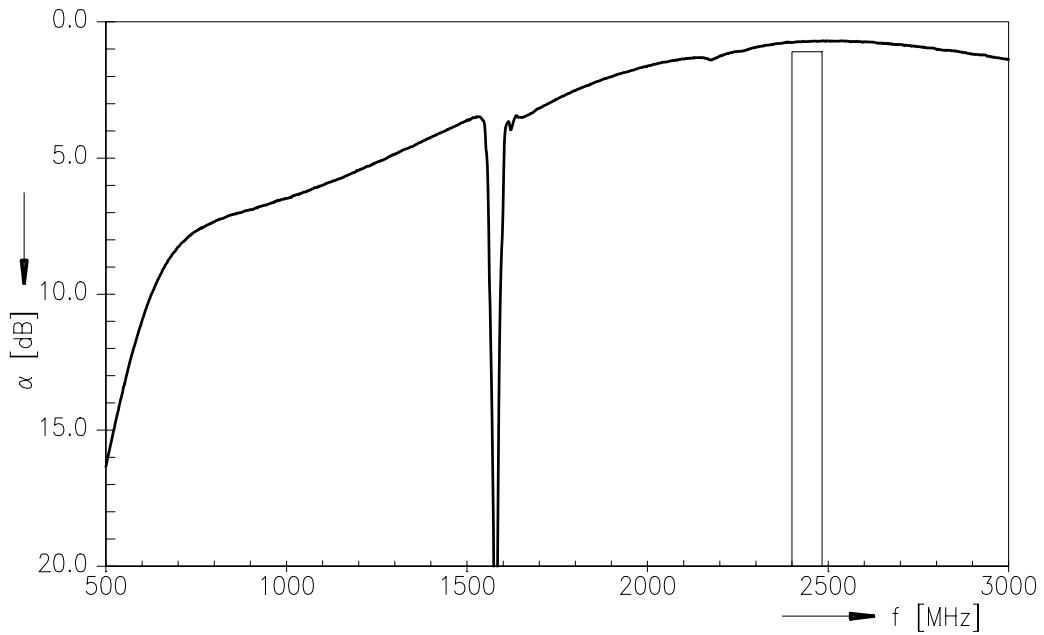
SAW GPS Extractor Filter

1575.42 / 859.0 / 1810.0 / 1920.0 / 2441.75 MHz

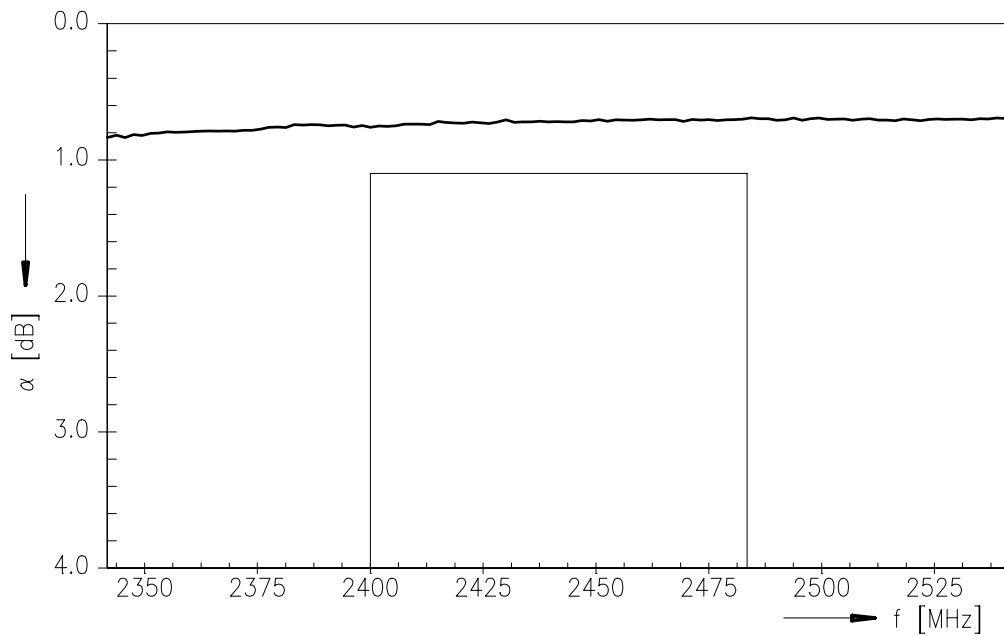
Data Sheet



Antenna - Bluetooth (transfer function, matching for Bluetooth, incl. PCB loss):



Antenna - Bluetooth (transfer function passband, matching for Bluetooth, incl. PCB loss):



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



SAW Components

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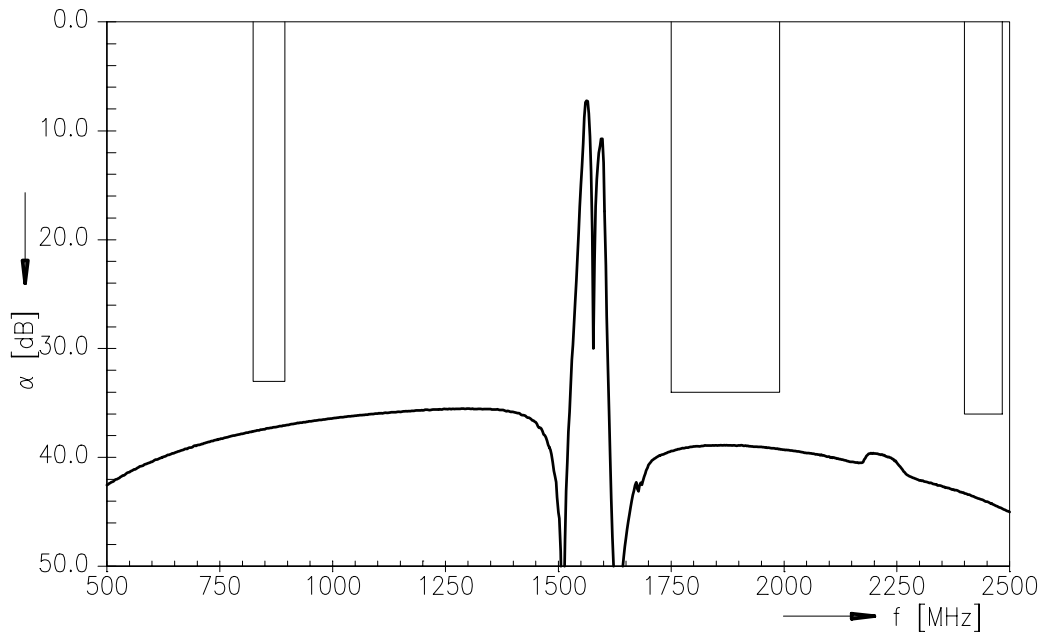
SAW GPS Extractor Filter

1575.42 / 859.0 / 1810.0 / 1920.0 / 2441.75 MHz

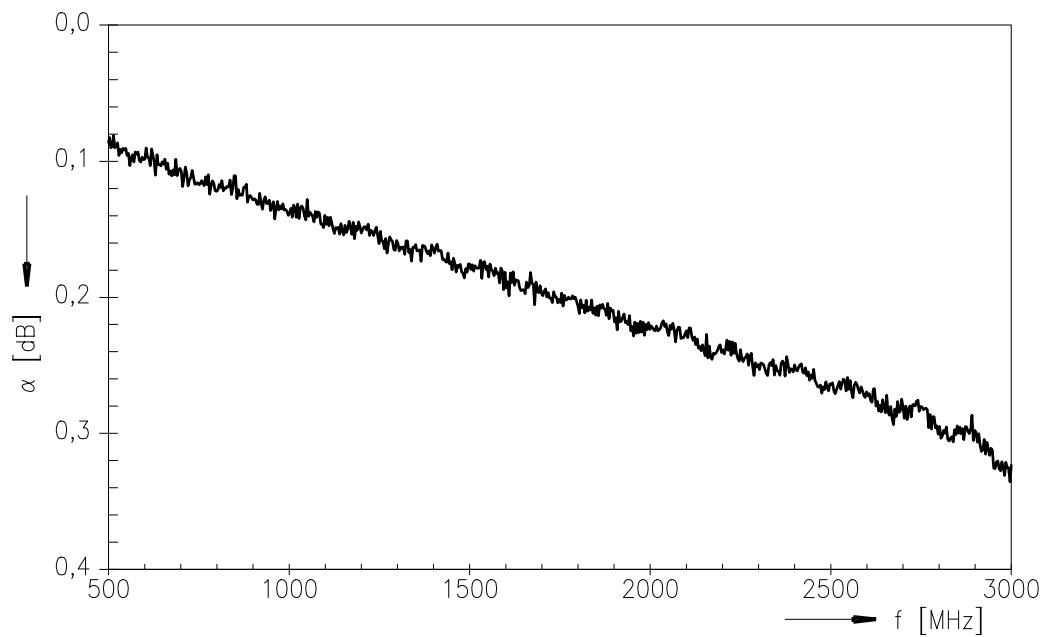
Data Sheet



Non GPS - GPS (Isolation, transfer function):



PCB loss (de-embedding curve)



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



SAW Components

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SAW GPS Extractor Filter

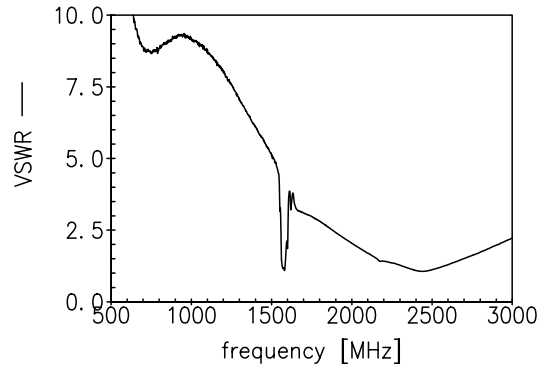
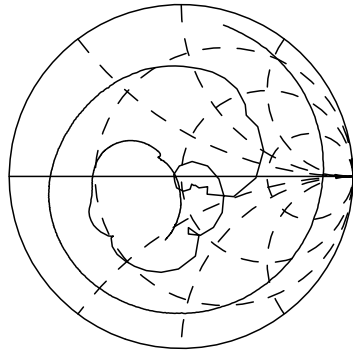
1575.42 / 859.0 / 1810.0 / 1920.0 / 2441.75 MHz

Data Sheet

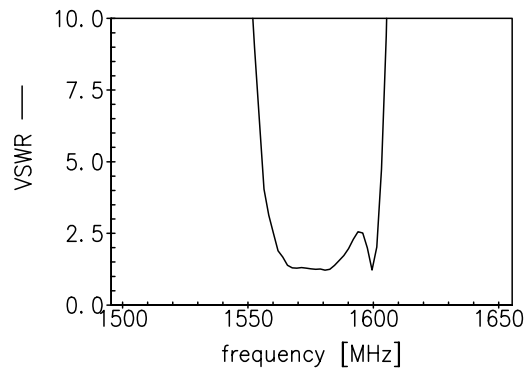
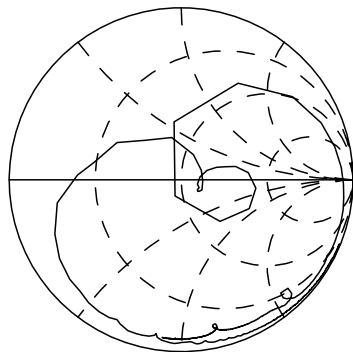


Smith charts / VSWR (example for Bluetooth matching)

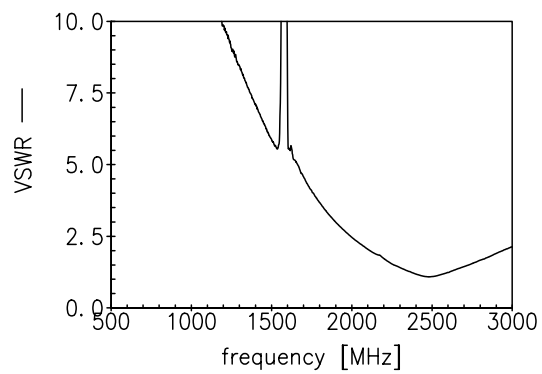
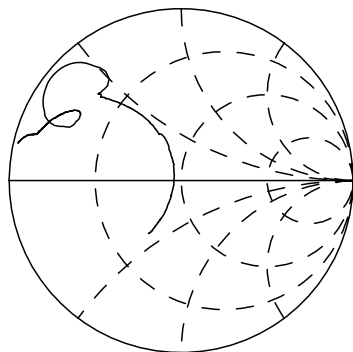
**S<sub>11</sub> Antenna**



**S<sub>22</sub> GPS**



**S<sub>33</sub> Non-GPS**



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

**SAW Components****B7742****SAW GPS Extractor Filter****1575.42 / 859.0 / 1810.0 / 1920.0 / 2441.75 MHz**

Data Sheet

**References**

<b>Type</b>	B7742
<b>Ordering code</b>	B39162B7742E310
<b>Marking and package</b>	C61157-A7-A116
<b>Packaging</b>	F61074-V8153-Z000
<b>Date codes</b>	L_1126
<b>S-parameters (unmatched)</b>	B7742_NB.s3p B7742_WB.s3p
<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.

**For further information please contact your local EPCOS sales office or visit our webpage at [www.epcos.com](http://www.epcos.com) .**

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