



SAW Components

SAW GPS Extractor Filter

GPS Extractor

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



SAW Components

B7742

SAW GPS Extractor Filter

1575.42 / 859.0 / 1810.0 / 1920.0 / 2441.75 MHz

Data Sheet



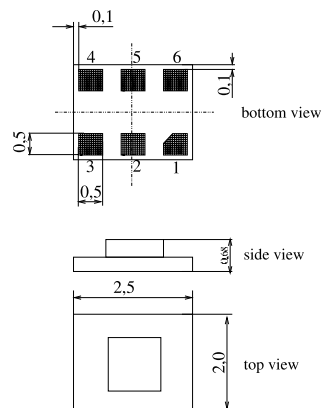
Application

- 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 Ω
- 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)



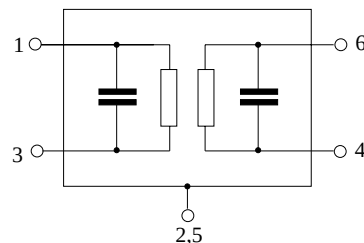
Features

- Package size 2.5 x 2.0 x 0.68 mm³
- 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





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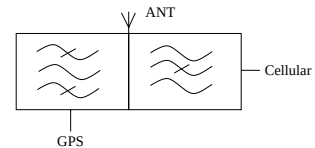
Data Sheet



Characteristics

CELLULAR (859 MHz) + GPS (1575.42 MHz)

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



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

¹⁾ PCB loss de-embedded

²⁾ 1.4 dB max. at 25 °C



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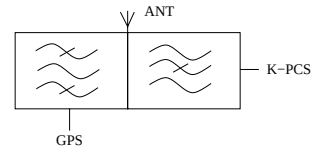
Data Sheet



Characteristics

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

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



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

¹⁾ PCB loss de-embedded

²⁾ 1.5 dB max. at 25 °C



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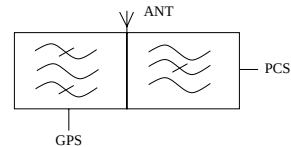
Data Sheet



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: $Z_{nGPS} = 50\ \Omega \parallel 3.3\text{ nH}$



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

¹⁾ PCB loss de-embedded

²⁾ 1.5 dB max. at 25 °C



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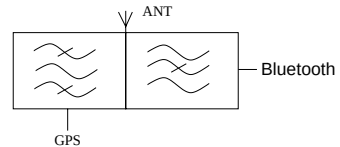
Data Sheet



Characteristics

Bluetooth (2441.75 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: $Z_{nGPS} = 50\ \Omega \parallel 2.2\text{ nH}$



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

¹⁾ PCB loss de-embedded

²⁾ 1.4 dB max. at 25 °C



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1575.42 / 859.0 / 1810.0 / 1920.0 / 2441.75 MHz

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Maximum ratings

Operable temperature range	T	−30/+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, 10 pulses
Input power at				
824 ... 894 MHz	P _{IN}	31	dBm	
1750 ... 1870 MHz	P _{IN}	31	dBm	effective power in the on-state
1850 ... 1990 MHz	P _{IN}	31	dBm	continuous wave signal
2400 ... 2483.5 MHz	P _{IN}	31	dBm	

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



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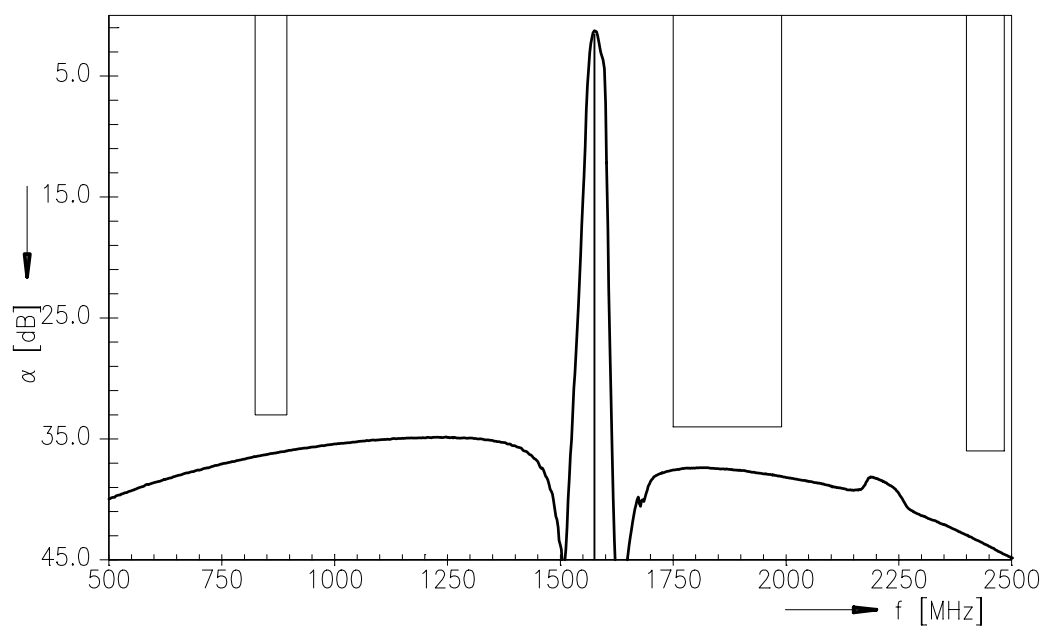
SAW GPS Extractor Filter

1575.42 / 859.0 / 1810.0 / 1920.0 / 2441.75 MHz

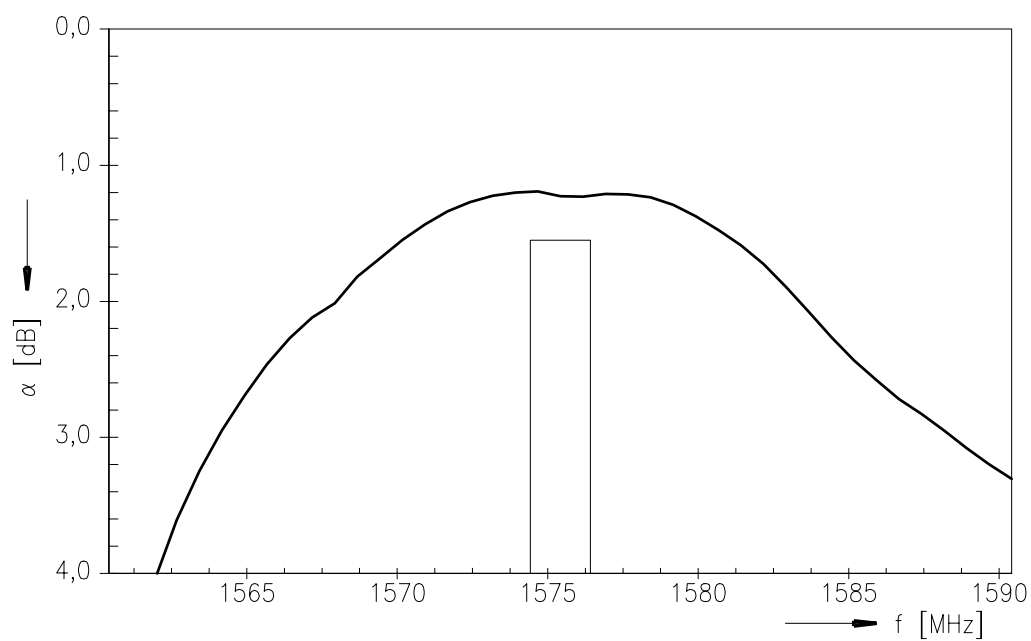
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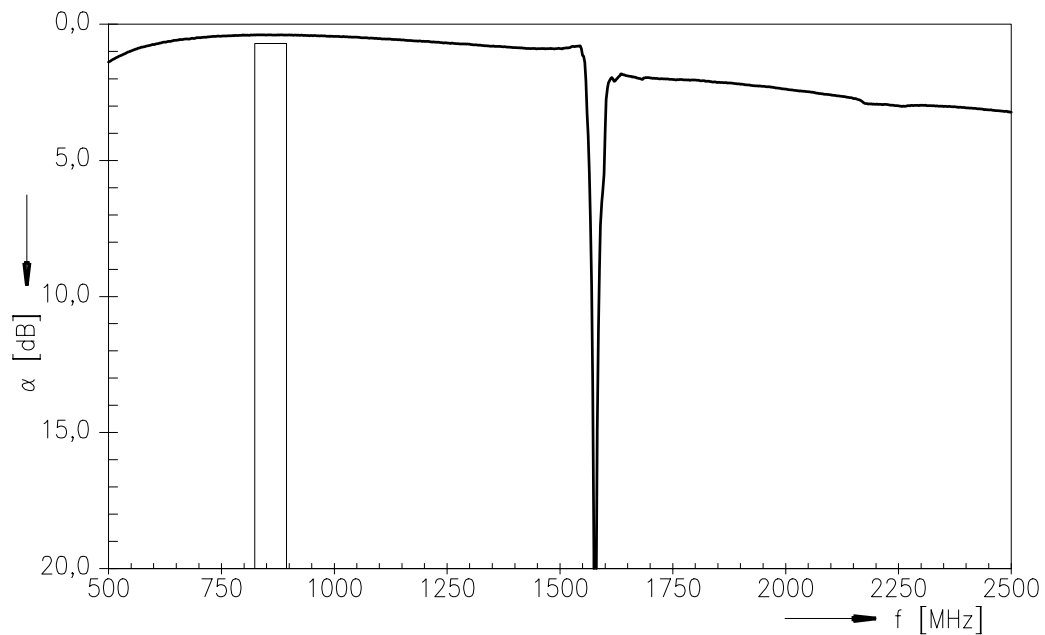
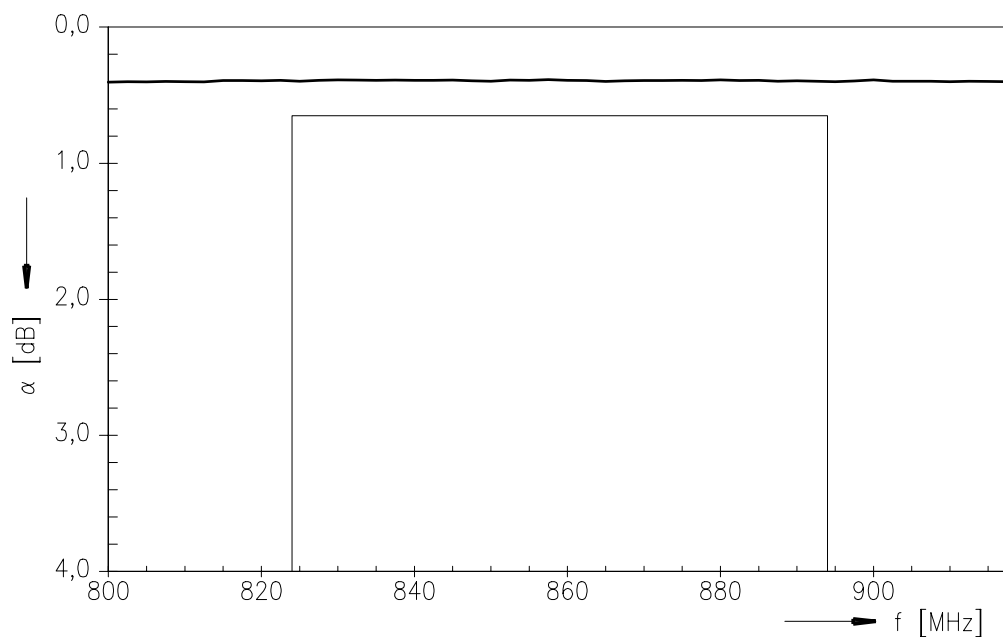
Antenna - GPS (transfer function):



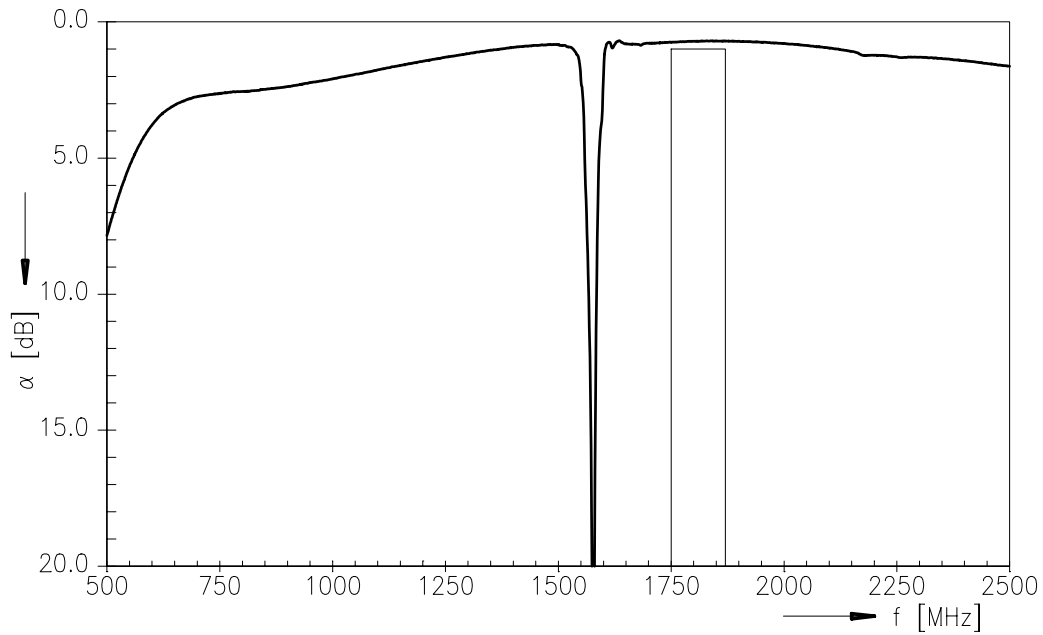
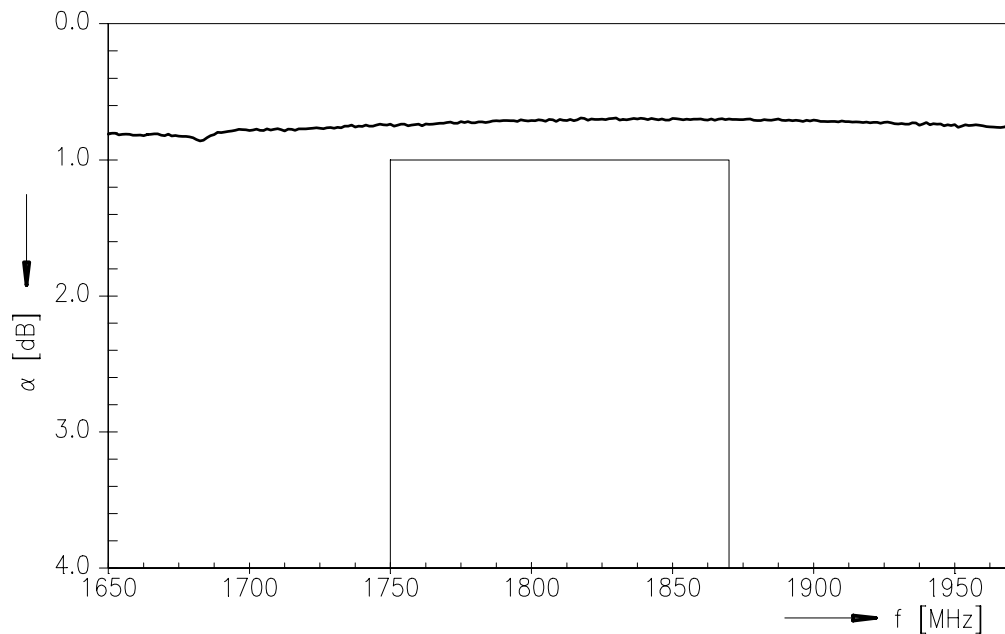
Antenna - GPS (transfer function passband, including PCB loss):

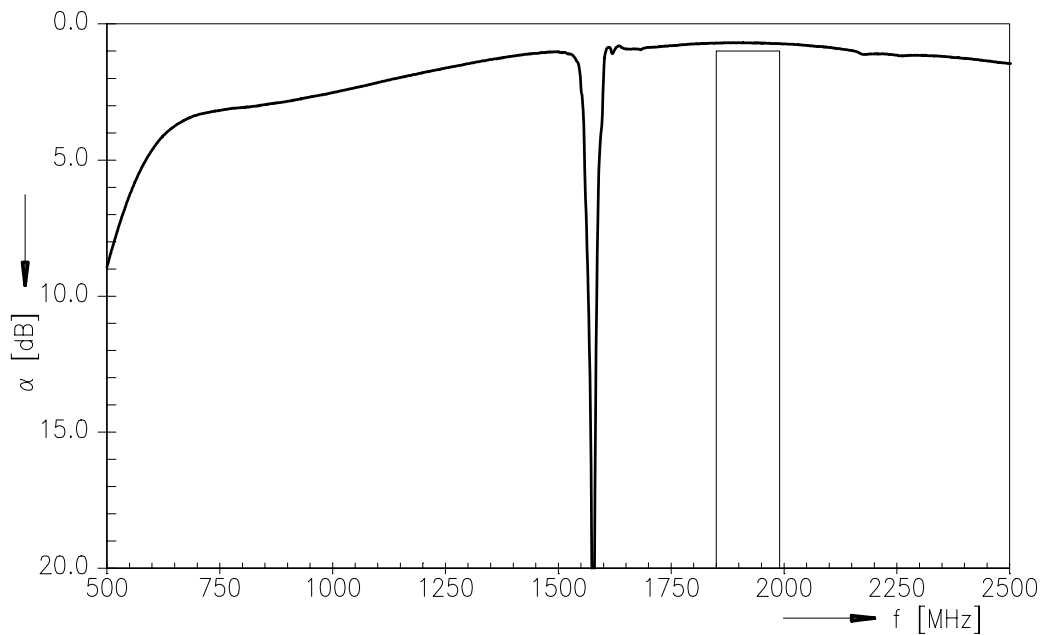
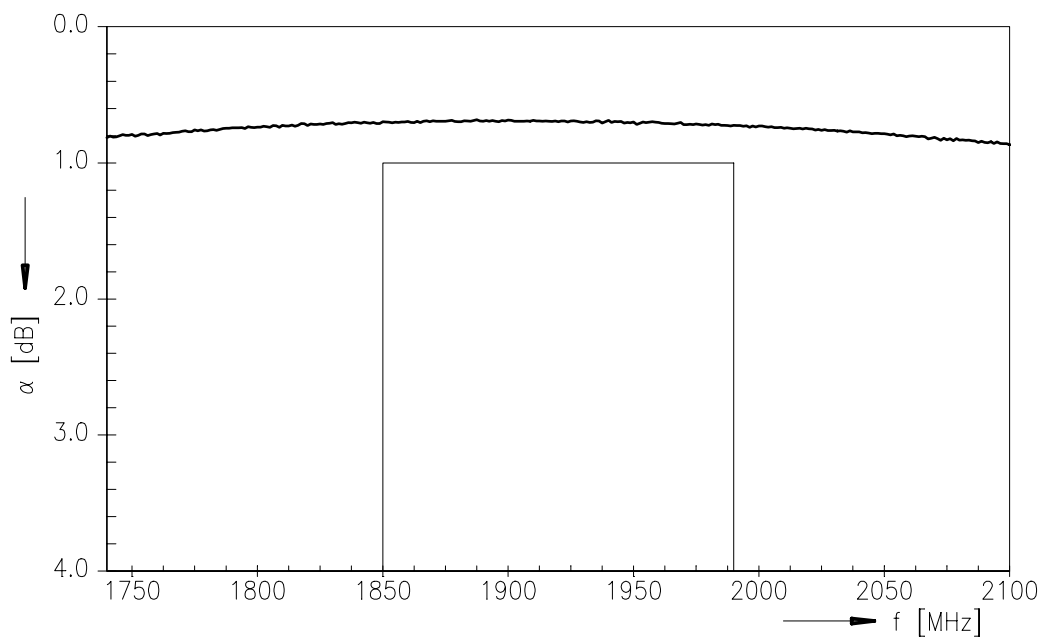


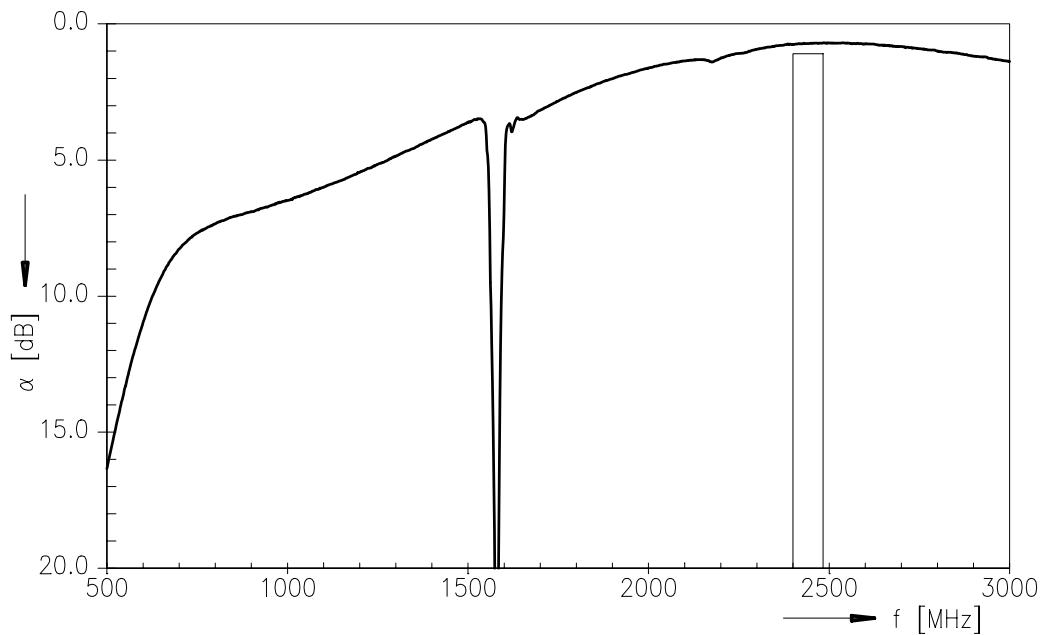
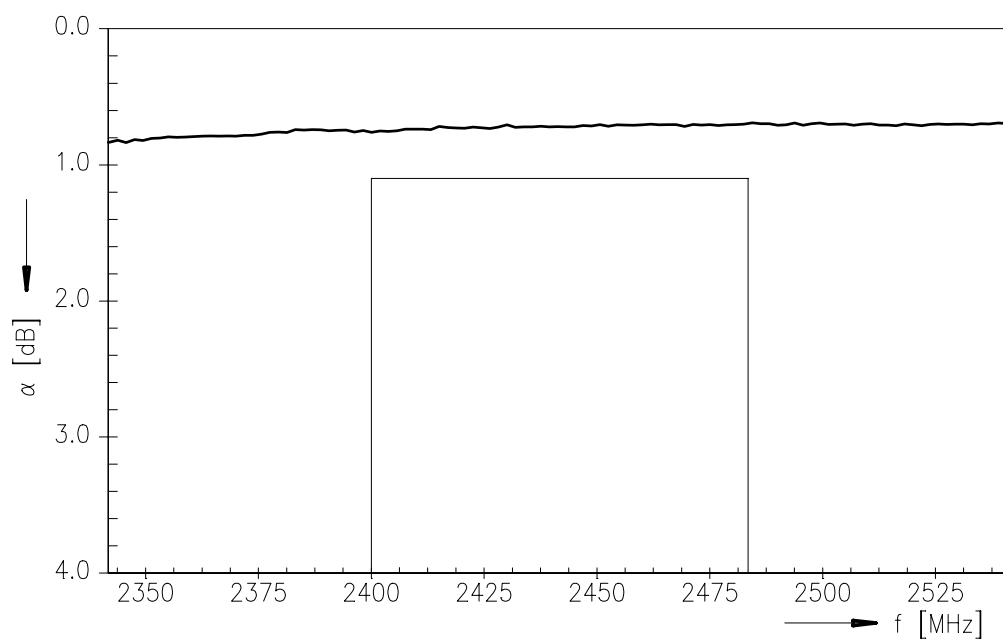
Please read *cautions and warnings and important notes* at the end of this document.

**SAW Components****B7742****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):**

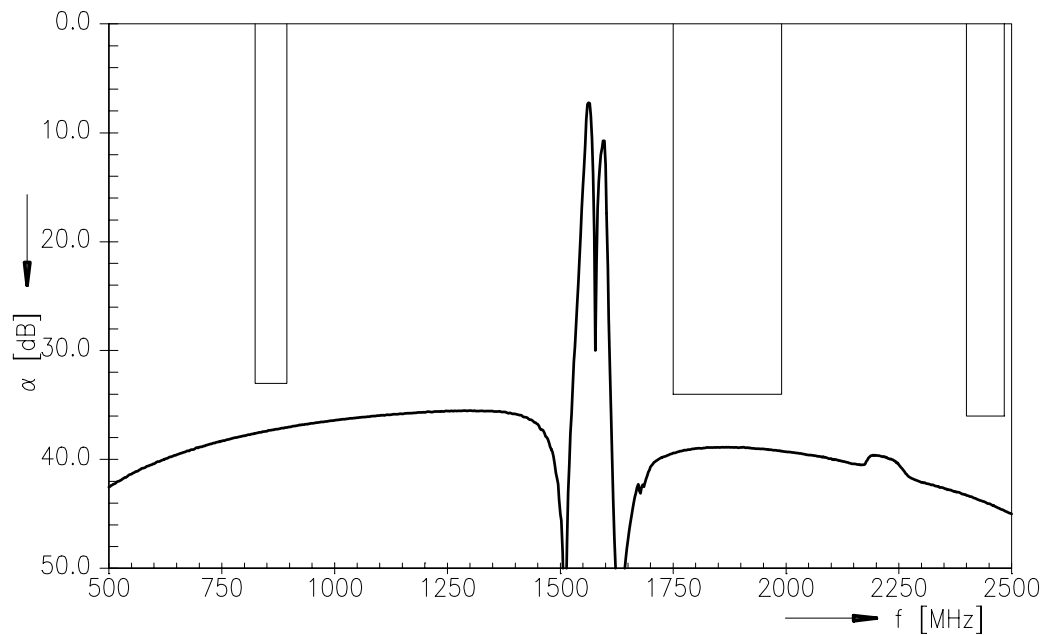
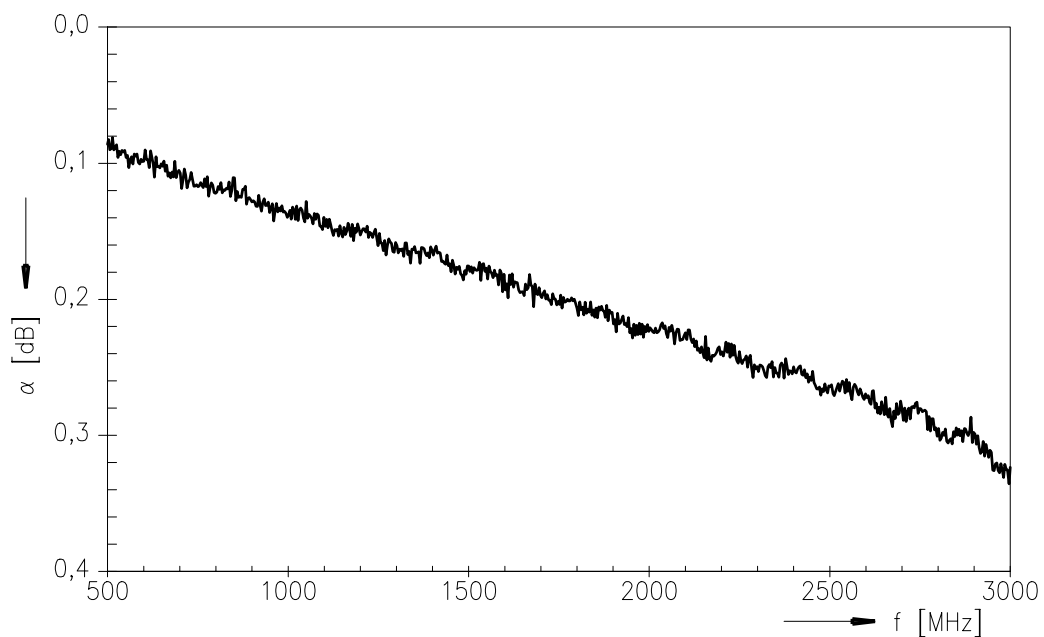
Please read *cautions and warnings and important notes* at the end of this document.

**SAW Components****B7742****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):**

**SAW Components****B7742****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):**

**SAW Components****B7742****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****B7742****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)**



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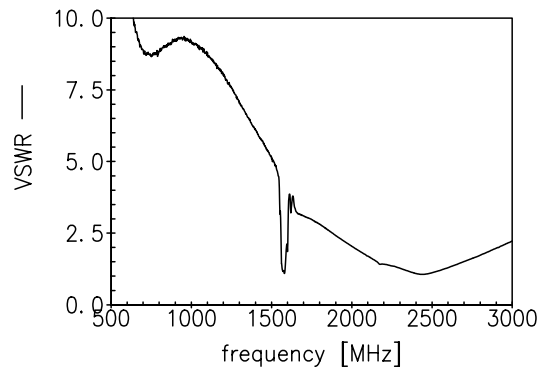
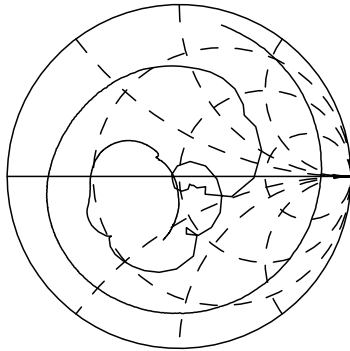
1575.42 / 859.0 / 1810.0 / 1920.0 / 2441.75 MHz

Data Sheet

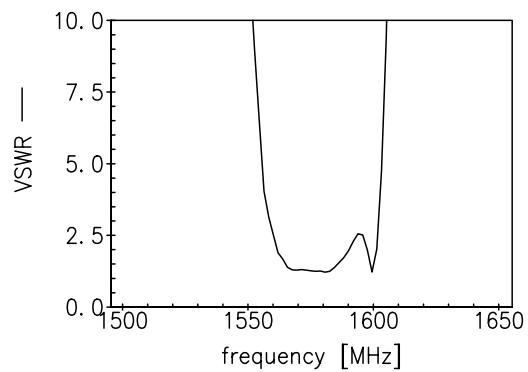
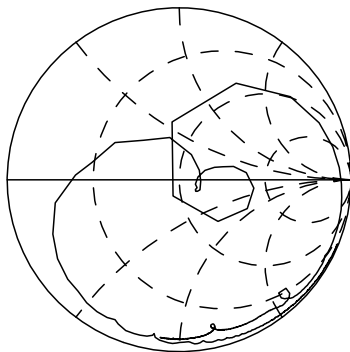


Smith charts / VSWR (example for Bluetooth matching)

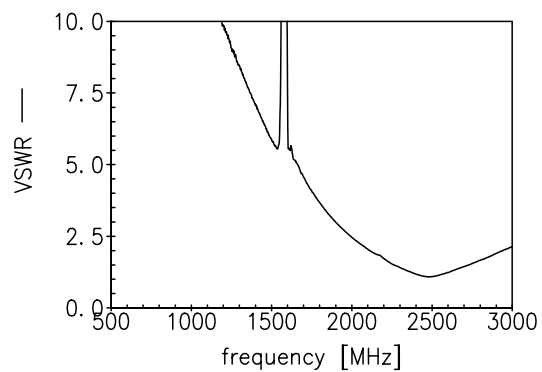
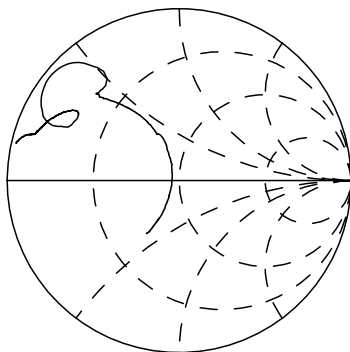
S₁₁ Antenna



S₂₂ GPS



S₃₃ 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**

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

For further information please contact your local EPCOS sales office or visit our webpage at www.epcos.com.

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Surface Acoustic Wave Components Division

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