SAW Components

SAW GPS Extractor Filter

GPS Extractor

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

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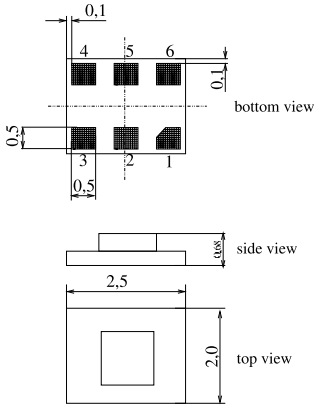
Application

- 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)

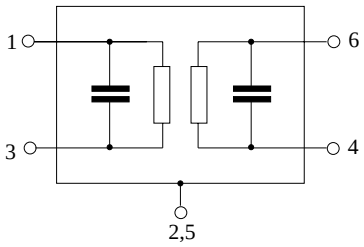
Features

- Package size 2.5 x 2.0 x 0.68 mm^3
- Package code DCS6N
- RoHS compatible
- Approximate weight 0.015 g
- Package for **S**urface **M**ount **T**echnology (**SMT**)
- Ni, gold-plated terminals
- **E**lectrostatic **S**ensitive **D**evice (**ESD**)



Pin configuration

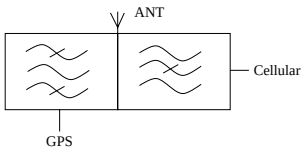
- 1 Input antenna
- 3 Output GPS band
- 6 Output Non-GPS band (Cellular or K-PCS or PCS or Bluetooth band depending on external matching)
- 4 To be grounded
- 2,5 Ground



Characteristics

CELLULAR (859 MHz) + GPS (1575.42 MHz)

Temperature range for specification: T = -30 ˚C to +85 ˚
Terminating input antenna impedance: Z_{ANT} = 50 Ω || 12 nH
Terminating GPS impedance: Z_{GPS} = 50 Ω
Terminating non GPS impedance: Z_{nGPS} = 50 Ω || 27 nH



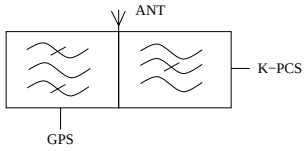
				B7742			
				min.	typ.[1] @ 25 ˚C	max.[1]	
Nominal frequency 1 (GPS)			f_{N1}	—	1575.42	—	MHz
Nominal frequency 2 (Cellular)			f_{N2}	—	859.0	—	MHz
Maximum insertion attenuation			α_{max}				
Antenna-GPS	1574.42	... 1576.42 MHz		—	1.1	1.6[2]	dB
Antenna-Cellular	824.0	... 894.0 MHz		—	0.35	0.6	dB
Attenuation			α				
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			α				
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

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 Ω || 10 nH
Terminating GPS impedance: Z_{GPS} = 50 Ω
Terminating non GPS impedance: Z_{nGPS} = 50 Ω || 3.9 nH



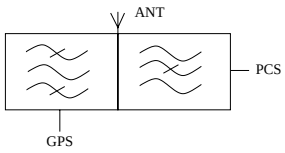
				B7742			
				min.	typ.[1] @ 25 ˚C	max.[1]	
Nominal frequency 1 (GPS)			f_{N1}	—	1575.42	—	MHz
Nominal frequency 3 (K-PCS)			f_{N3}	—	1810.0	—	MHz
Maximum insertion attenuation			α_{max}				
Antenna-GPS	1574.42	... 1576.42 MHz		—	1.2	1.65[2]	dB
Antenna-K-PCS	1750.0	... 1870.0 MHz		—	0.6	0.9	dB
Attenuation			α				
Antenna-GPS	824.0	... 894.0 MHz		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			α				
Cellular band	824.0	... 894.0 MHz		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

Characteristics

PCS (1920 MHz) + GPS (1575.42 MHz)

Temperature range for specification: T = -30 ˚C to +85 ˚
Terminating input antenna impedance: Z_{ANT} = 50 Ω || 10 nH
Terminating GPS impedance: Z_{GPS} = 50 Ω
Terminating non GPS impedance: Z_{nGPS} = 50 Ω || 3.3 nH



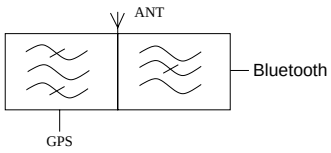
				B7742			
				min.	**typ.[1] @ 25 ˚C**	**max.[1]**	
Nominal frequency 1 (GPS)			f_{N1}	—	1575.42	—	MHz
Nominal frequency 4 (PCS)			f_{N4}	—	1920.0	—	MHz
Maximum insertion attenuation			α_{max}				
Antenna-GPS	1574.42	... 1576.42 MHz		—	1.2	1.65[2]	dB
Antenna-PCS	1850.0	... 1990.0 MHz		—	0.6	0.9	dB
Attenuation			α				
Antenna-GPS	824.0	... 894.0 MHz		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			α				
Cellular band	824.0	... 894.0 MHz		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

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 Ω || 10 nH
Terminating GPS impedance: Z_{GPS} = 50 Ω
Terminating non GPS impedance: Z_{nGPS} = 50 Ω || 2.2 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			α_{max}				
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			α				
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			α				
Bluetooth band	2400.0	... 2483.5 MHz		36	40	—	dB

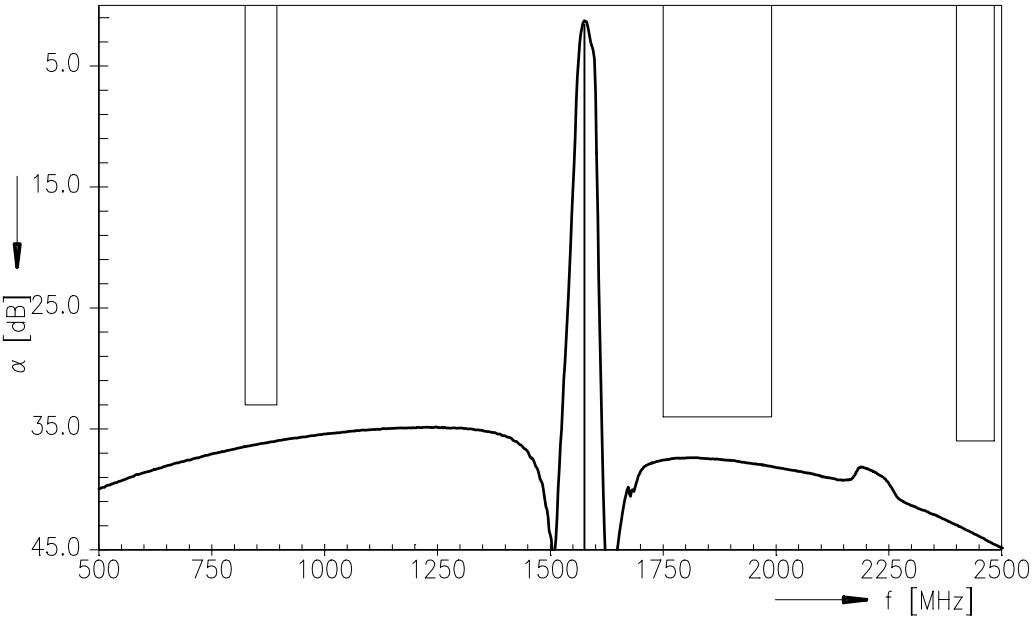
1) PCB loss de-embedded
2) 1.4 dB max. at 25 ˚C

Maximum ratings

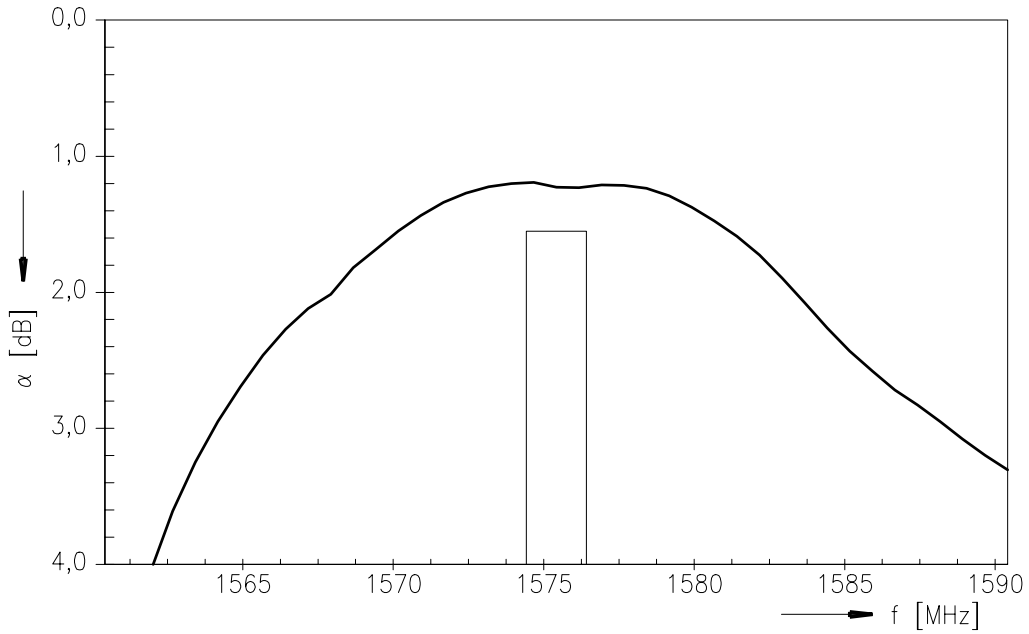
Operable temperature range	T	–30/+85	˚C	
Storage temperature range	T_{stg}	–40/+85	˚C	
DC voltage	V_{DC}	5	V	
ESD voltage	V_{ESD}	50[1)]	V	machine model, 10 pulses
Input power at				
824 ... 894 MHz	P_{IN}	31	dBm	
1750 ... 1870 MHz	P_{IN}	31	dBm	effective power in the on-state
1850 ... 1990 MHz	P_{IN}	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.

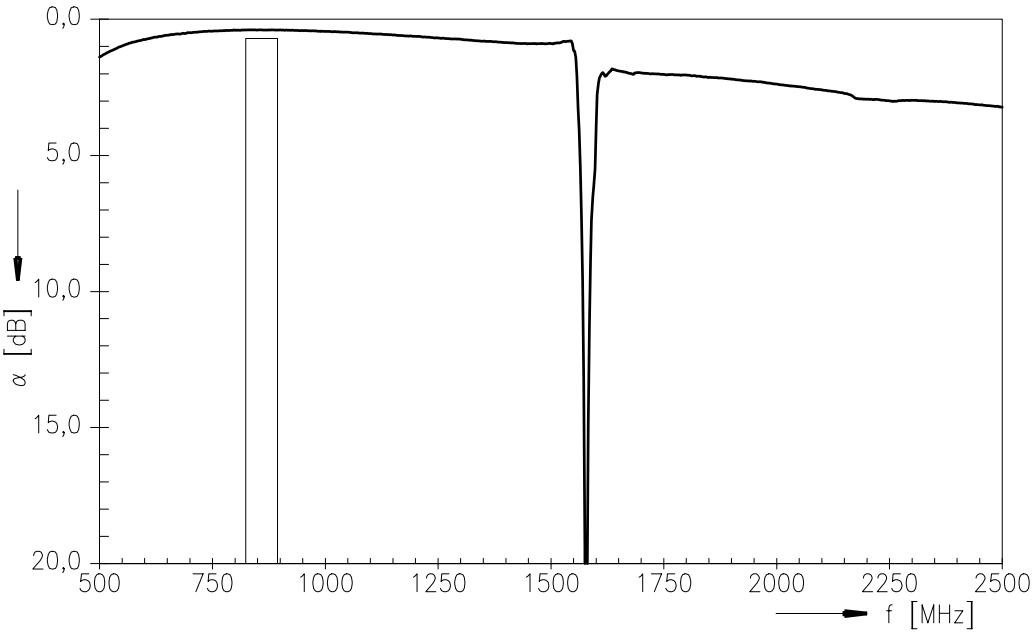
Antenna - GPS (transfer function):



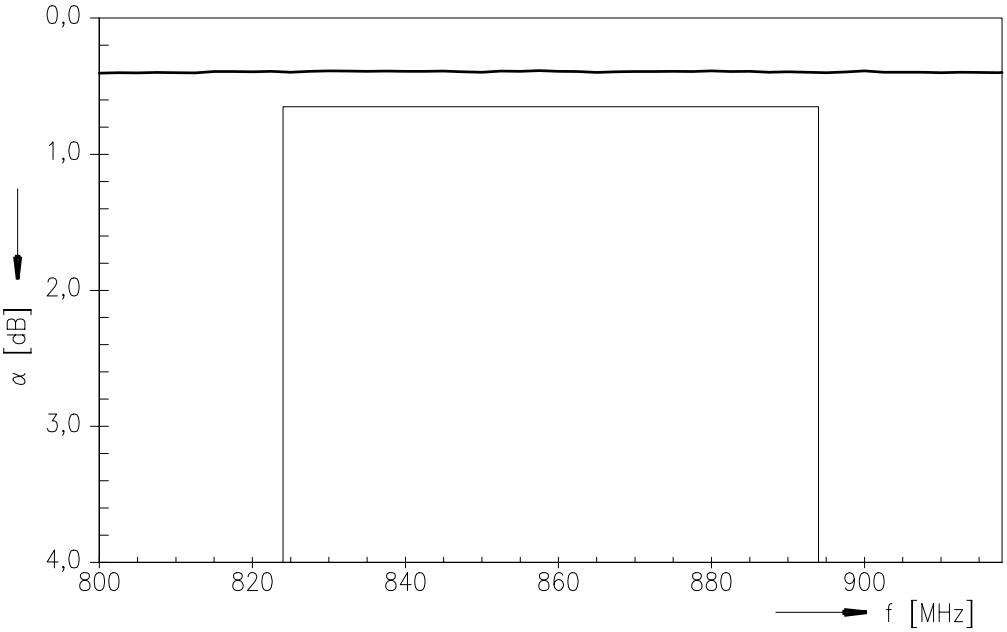
Antenna - GPS (transfer function passband, including PCB loss**):**



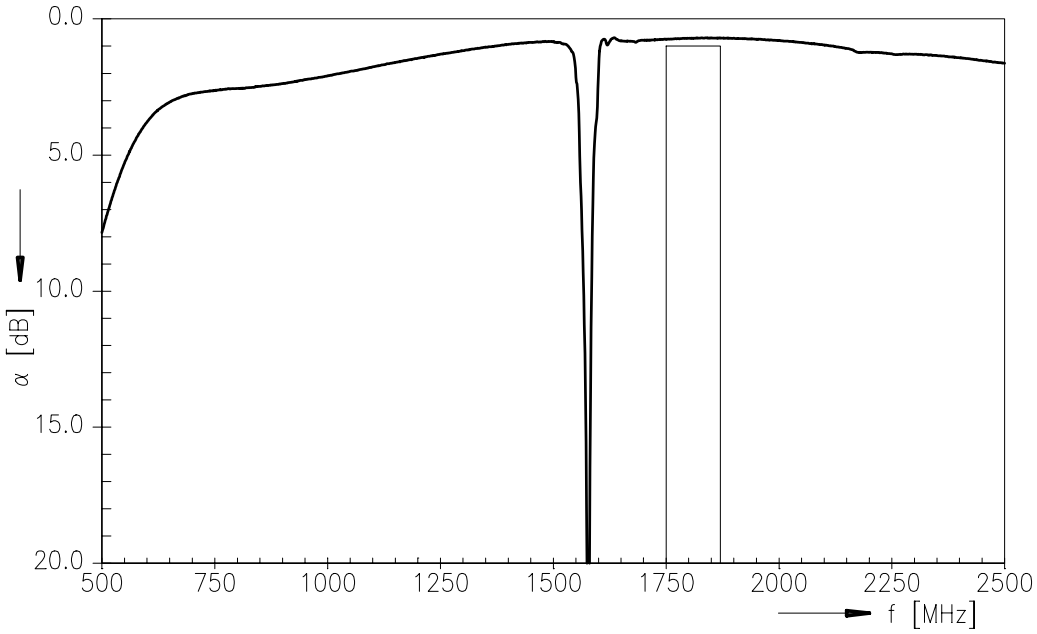
Antenna - Cellular (transfer function, matching for Cellular, incl. PCB loss**):**



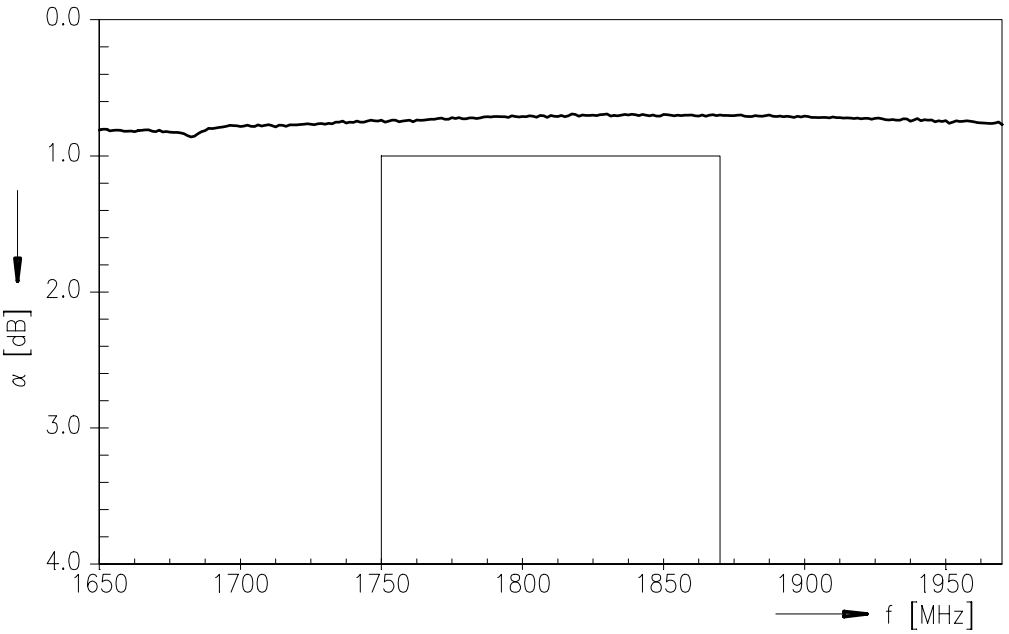
Antenna - Cellular (transfer function passband, matching for Cellular, incl. PCB loss**):**



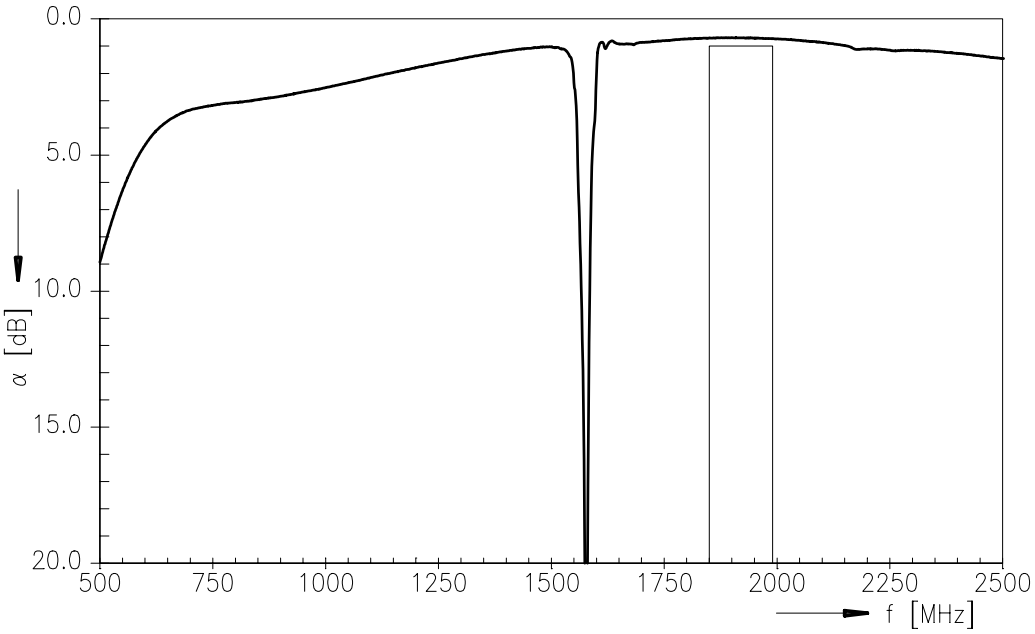
Antenna - K-PCS (transfer function, matching for K-PCS, incl. PCB loss**):**



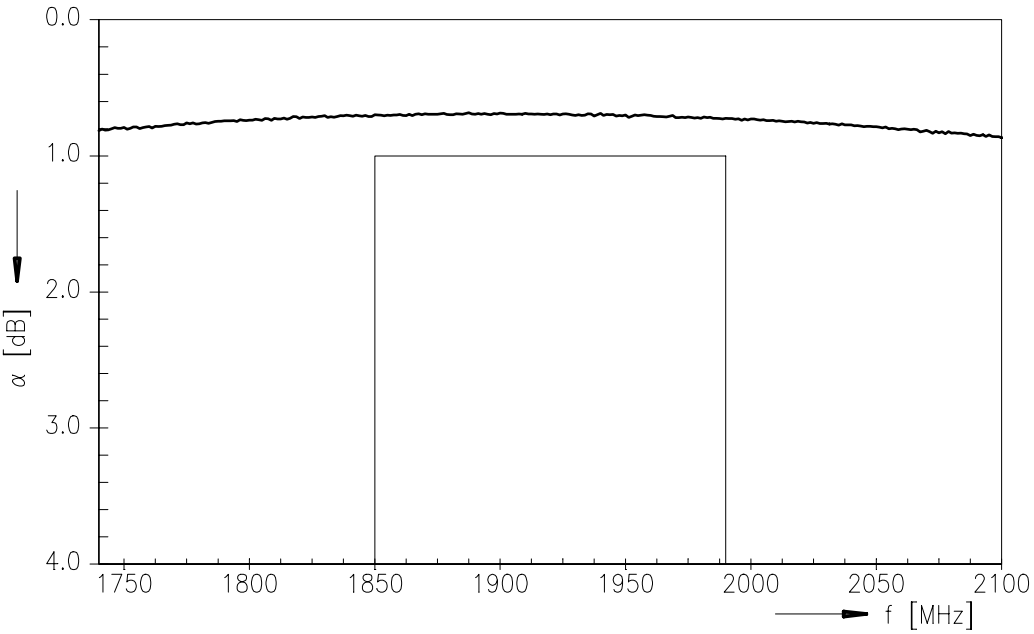
Antenna - K-PCS (transfer function passband, matching for K-PCS, incl. PCB loss**):**



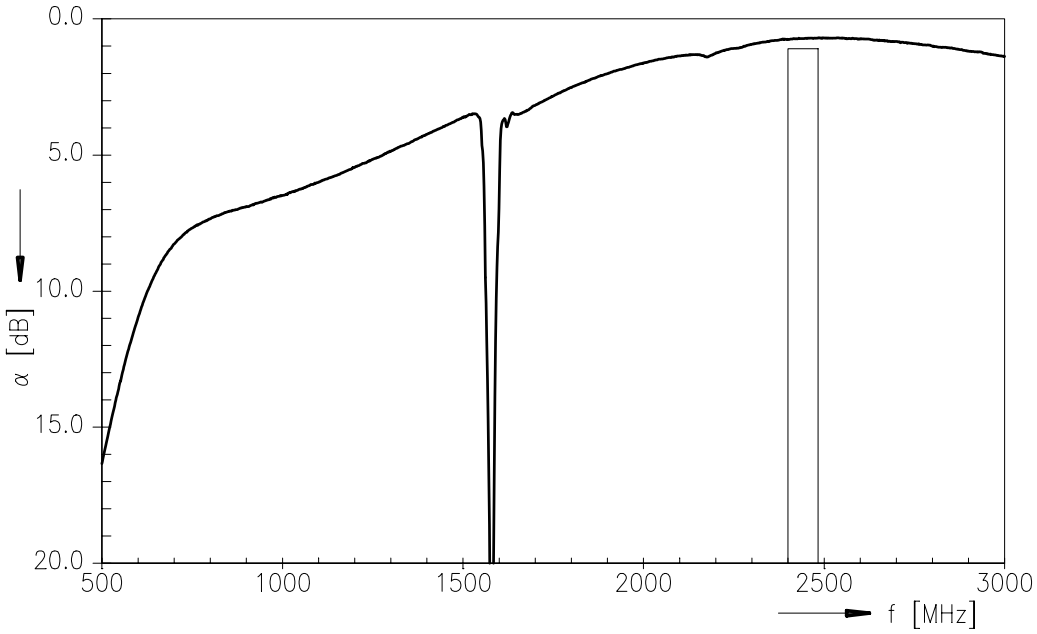
Antenna - PCS (transfer function, matching for PCS, incl. PCB loss**):**



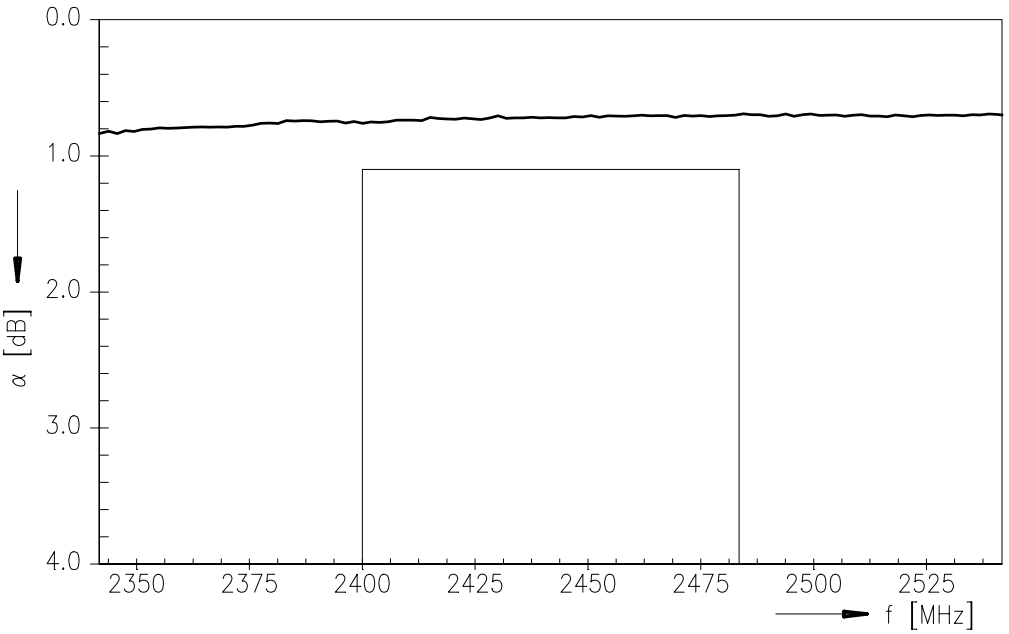
Antenna - PCS (transfer function passband, matching for PCS, incl. PCB loss**):**



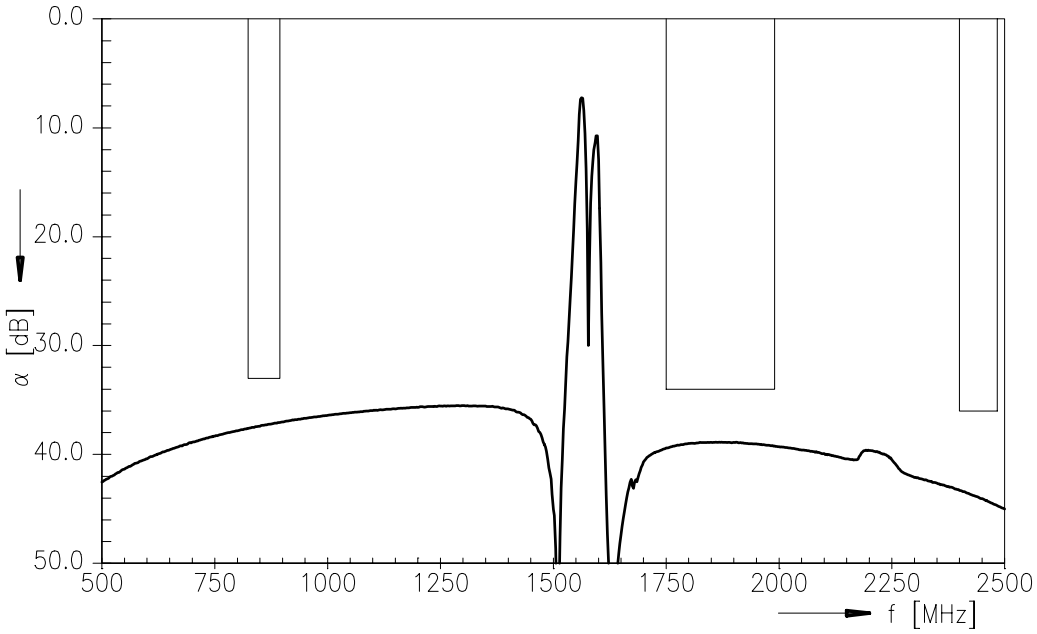
Antenna - Bluetooth (transfer function, matching for Bluetooth, incl. PCB loss**):**



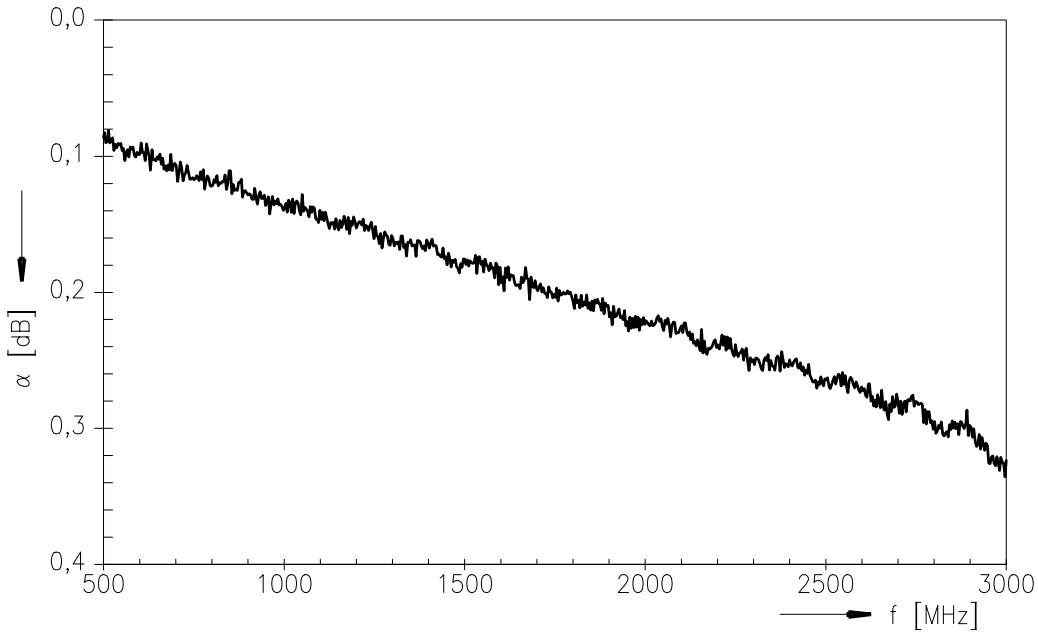
Antenna - Bluetooth (transfer function passband, matching for Bluetooth, incl. PCB loss**):**



Non GPS - GPS (Isolation, transfer function):

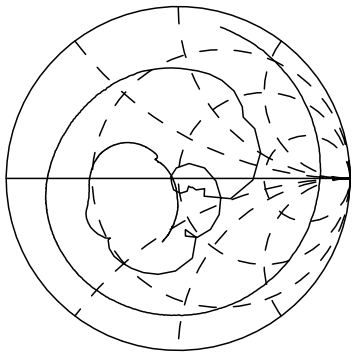


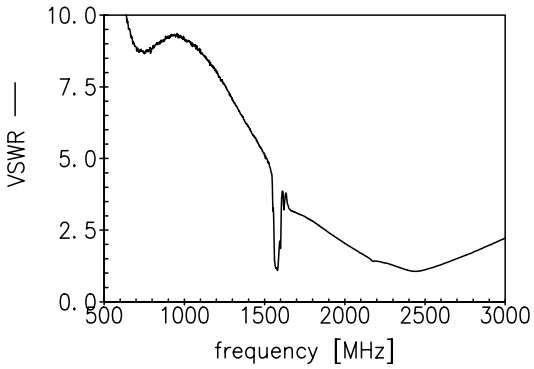
PCB loss (de-embedding curve)



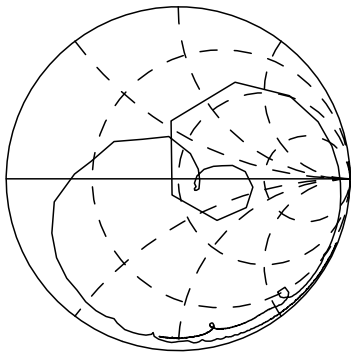
Smith charts / VSWR (example for Bluetooth matching)

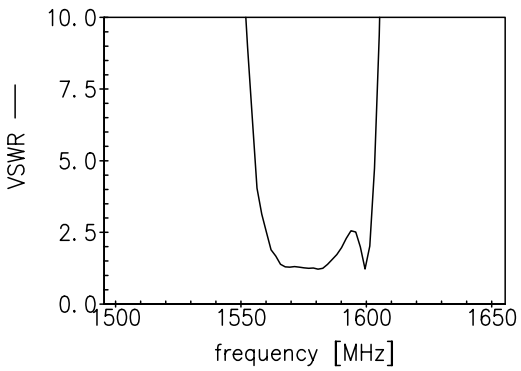
S_{11} Antenna



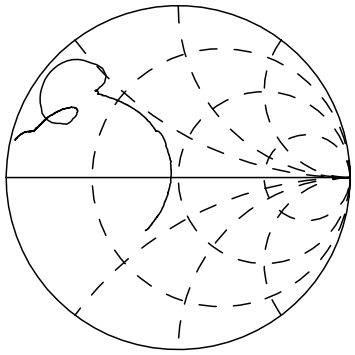


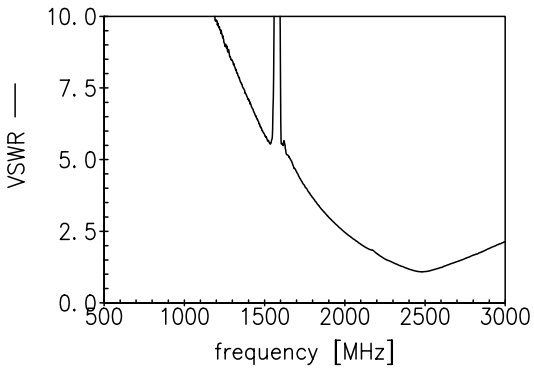
S_{22} GPS





S_{33} Non-GPS





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.

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