SAW Components

SAW GPS + GLONASS filter

Series/type:	**B8401**
Ordering code:	**B39162-B8401-P810**
Date:	December 23, 2010
Version:	2.0

Revision history: Changes compared to previous iteration issue

ISSUE	ORIGINATOR	DETAIL SPEC CHANGES	DATE
LU46A_v1.0	M. Schmachtl	initial release	29.05.2009
LU46B_v1.1	M. Schmachtl	initial release of LU46B, only typical values	14.10.2009
LU46B_v1.2	M. Schmachtl	limits defined	30.10.2009
LU46B_v1.3	M. Schmachtl	package height and ESD values defined, attenuation @ 5825-8976 MHz and linearities IIP2, IIP3 added	30.11.2009
LU46B_v1.4	M. Schmachtl	CDM ESD values and IIP2&IIP3 limits added	22.12.2009
LU46B_v1.5	M. Schmachtl	introduction of new frequency ranges 1625-1660 MHz and 1660-1710 MHz, relaxation of attenuation @ 776-824 MHz from 47 dB to 46 dB and @ 915-1427 MHz from 45 dB to 44 dB	25.02.2010
B8401_v2.0	M. Schmachtl	improvement of insertion attenuation @1573.42-1577.42 MHz from 1.5dB to 1.4dB max. and from 1.1dB to 0.9dB typ., @1571.42 - 1605.89 MHz from 1.3dB to 1.0dB typ., relaxation of ampitude ripple @1573.42-1577.42 MHz from 0.6dB to 0.7dB max. and @1571.42 - 1605.89 MHz from 0.8dB to 1.0dB max., relaxation of attenuation @ 1625-1660 MHz from 1.5dB to 1.0dB	23.12.2010

Preliminary Data

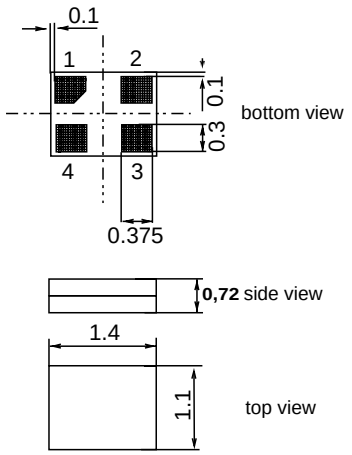
SMD

Application

- ESD robust low-loss RF GPS + GLONASS filter with ESD protection at the Input
- Usable passbands: up to 8.0 MHz for GPS and 8.34 MHz for GLONASS
- Very low insertion attenuation
- Unbalanced to unbalanced operation
- No matching network required for operation at 50 Ω

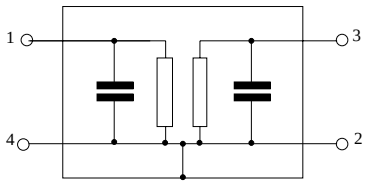
Features

- Package size 1.4 x 1.1 x 0.72 mm^3
- Package code DCS4R
- RoHS compatible
- Approximate weight 0.003 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
- 3 Output
- 2,4 Case ground



Preliminary Data

SMD

Characteristics of Filter

Temperature range for specification: T = –30 ˚C to +85˚C
Terminating source impedance: Z_S = 50 Ω
Terminating load impedance: Z_L = 50 Ω

		LU46C[1]			DGL[2]	
		min.	**typ. @ 25 ˚C**	**max.**	**min./ max.**	
Center frequency	f_C	—	1588.65			MHz
Maximum insertion attenuation	α_{max}					
1573.42 ... 1577.42 MHz		—	0.9	1.4		dB
1571.42 ... 1605.89 MHz		—	1.0	1.7		dB
Amplitude ripple (p-p)	$\Delta\alpha$					
1573.42 ... 1577.42 MHz		—	0.2	0.7		dB
1571.42 ... 1605.89 MHz		—	0.3	1.0		dB
VSWR Input						
1573.42 ... 1577.42 MHz		—	1.4	1.8		
1597.55 ... 1605.89 MHz		—	1.3	1.8		
VSWR Output						
1573.42 ... 1577.42 MHz		—	1.4	1.8		
1597.55 ... 1605.89 MHz		—	1.2	1.8		
Group delay ripple[3] (p-p)	$\Delta\tau$					
1573.42 ... 1577.42 MHz		—	2	8		ns
1597.55 ... 1605.89 MHz			3	8		ns
Deviation within GLONASS band relative to L1 1575.42 MHz		-9	-3	9		ns
Attenuation	α					
0.1 ... 698.0 MHz		40	51	—		dB
698.0 ... 716.0 MHz		40	51	—		dB
716.0 ... 776.0 MHz		45	50	—		dB
776.0 ... 787.0 MHz		46	50	—		dB
787.0 ... 824.0 MHz		46	50	—		dB
824.0 ... 849.0 MHz		45	49	—		dB
849.0 ... 880.0 MHz		45	49	—		dB
880.0 ... 915.0 MHz		45	49	—		dB
915.0 ... 1427.0 MHz		44	48	—		dB
1427.0 ... 1452.0 MHz		42	47	—		dB
1452.0 ... 1525.0 MHz		30	38	—		dB
1625.0 ... 1660.0 MHz		1.0	2.7	—		dB
1660.0 ... 1710.0 MHz		30	44	—		dB

		LU46C[1]			DGL[2]	
		min.	typ. @ 25 °C	max.	min./ max.	
1710.0 ... 1785.0 MHz		47	51	—		dB
1785.0 ... 1850.0 MHz		45	57	—		dB
1850.0 ... 1920.0 MHz		45	56	—		dB
1920.0 ... 1980.0 MHz		45	55	—		dB
1980.0 ... 2010.0 MHz		40	54	—		dB
2010.0 ... 2025.0 MHz		40	53	—		dB
2025.0 ... 2305.0 MHz		40	48	—		dB
2305.0 ... 2360.0 MHz		40	48			dB
2360.0 ... 2402.0 MHz		40	47	—		dB
2402.0 ... 2480.0 MHz		40	46	—		dB
2480.0 ... 2496.0 MHz		40	46	—		dB
2496.0 ... 2570.0 MHz		40	45	—		dB
2570.0 ... 2690.0 MHz		30	44	—		dB
2690.0 ... 3168.0 MHz		30	42	—		dB
3168.0 ... 4224.0 MHz		15	31	—		dB
4224.0 ... 4752.0 MHz		10	15	—		dB
4752.0 ... 4900.0 MHz		10	18	—		dB
4900.0 ... 5825.0 MHz		5	9	—		dB
5825.0 ... 6336.0 MHz		5[4]	11	—		dB
6336.0 ... 8976.0 MHz		7[4]	12	—		dB
IIP2 (2nd order Input Intercept Point)						
2 tone (cw) method:						
P1@10 ... 14dBm @F1=824MHz..915MHz						
P2 @-4 ...0dBm @F2=F1+1575.42MHz		100[4]	116	—		dBm
P1@10 ... 14dBm @F1=824MHz..915MHz						
P2 @6dBm @F2=F1+1575.42MHz		100[4]	116	—		dBm
IIP3 (3rd order Input Intercept Point)						
2 tone (cw) method:						
P1@10dBm @F1=1710MHz..1980MHz						
P2 @5dBm @F2=2*F1+1575.42MHz		105[4]	120	—		dBm
P1@14dBm @F1=1710MHz..1980MHz						
P2 @5dBm @F2=2*F1+1575.42MHz		105[4]	120	—		dBm

1) Values in columns min, typ and max indicate the development status of the current version.
2) Values in column DesignGoal (DGL) indicate the target performance.
3) Averaged over 1 MHz
4) Measurement under mass-production conditions not possible.

Preliminary Data

SMD

Maximum ratings of Filter

Operable temperature range	T	–30/+85	˚C	
Storage temperature range	T_{stg}	–40/+85	˚C	
DC voltage	V_{DC}	5	V	
ESD voltage @ Input				
Contact Discharge	V_{ESD}	± 8 [1)]	kV	at input pin 1
Air Discharge	V_{ESD}	± 15[2)]	kV	at input pin 1
Machine Model	V_{ESD}	± 1000 [3)]	V	at input pin 1
Machine Model	V_{ESD}	± 100 [3)]	V	at output pin 3
Charge Device Model	V_{ESD}	± 750 [4)]	V	at input and output (pin 1 and 3)
Human Body Model	V_{ESD}	± 1000[5)]	V	at input pin 1
Human Body Model	V_{ESD}	± 400[5)]	V	at output pin 3

1) acc. to IEC61000-4-2 (Contact discharge, Rs = 330 R, Cs = 150 pF), 10 negative & 10 positive pulses

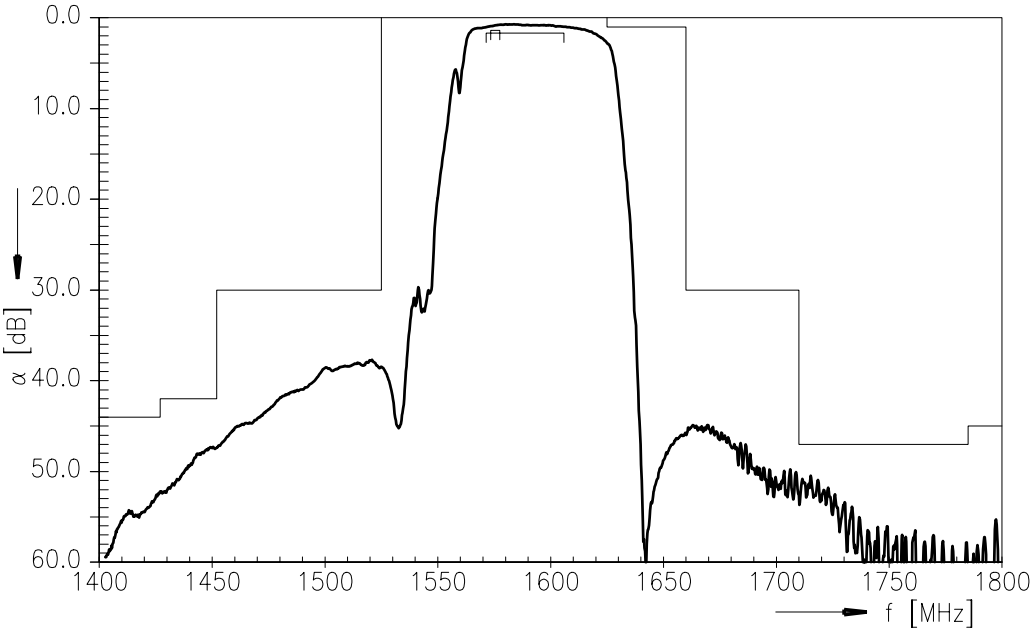
2) acc. to IEC61000-4-2 (Air discharge, Rs = 330 R, Cs = 150 pF), 10 negative & 10 positive pulses.

3) acc. to JESD22-A115A (machine model, Rs = 0 R, Cs = 200 pF), 1 negative & 1 positive pulse.

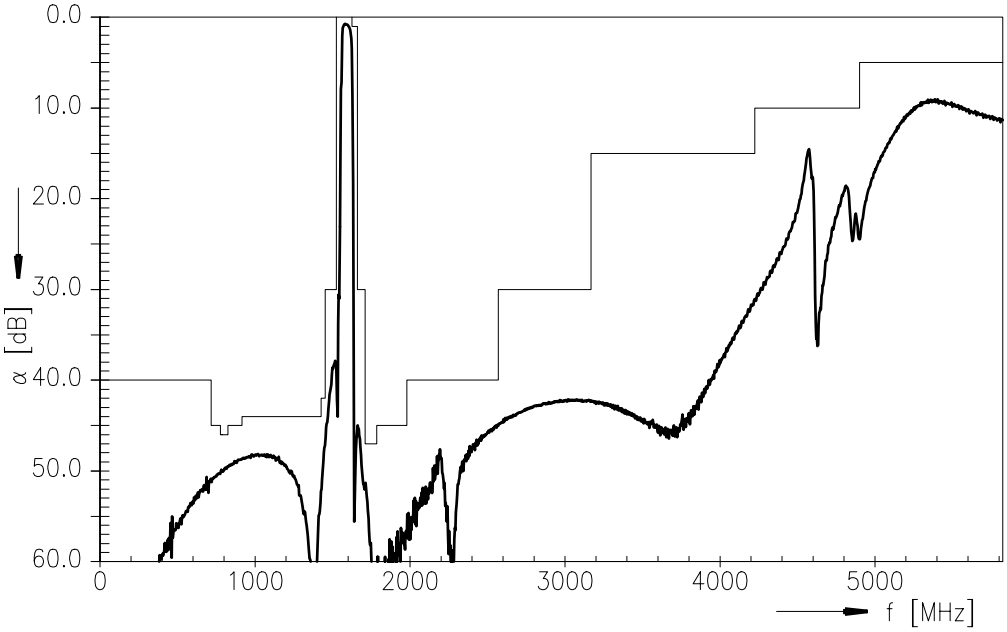
4) acc. to JESD22-C101 (charge device model), 3 negative & 3 positive pulses.

5) acc. to JESD22-A114 (Human body model, Rs = 1500 R, Cs = 100 pF), 1 negative & 1 positive pulse.

Transfer function (passband)

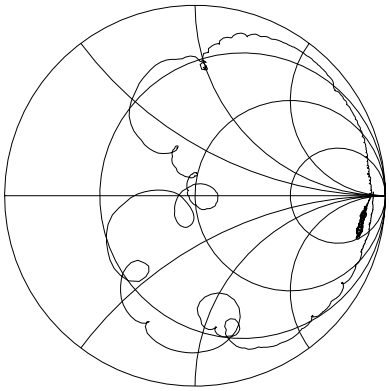


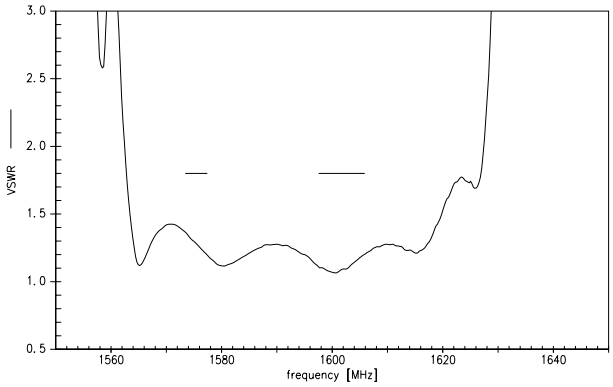
Transfer function



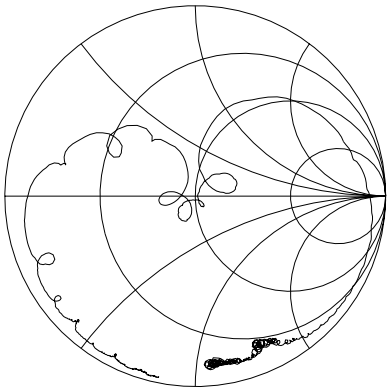
Smith chart / VSWR

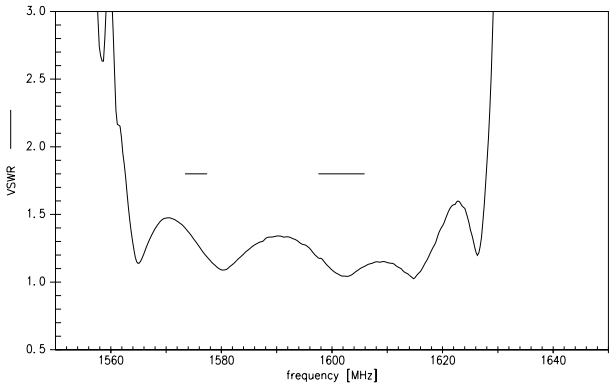
S_{11} function





S_{22} function





Type	B8401
Ordering code	B39162-B8401-P810
Marking and package	C61157-A8-A31
Packaging	F61074-V8249-Z000
Date codes	L_1126
S-parameters	B8401_NB.s3p, B8401_WB.s3p see file header for port/pin assignment table
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."
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