Measurement condition

Ambient temperature T_A: 23 °C
Input power level: 0 dBm
Terminating impedance: *
Input: 655 Ω || -6.1 pF
Output: 521 Ω || -6.9 pF

Characteristics

Remark:
The reference level for the relative attenuation a_{rel} of the TFS 261B is the minimum of the pass band attenuation a_{min}. The minimum of the pass band attenuation a_{min} is defined as the insertion loss a_e. The centre frequency f_c is the arithmetic mean value of the upper and lower frequencies at the 1.5 dB filter attenuation level relative to the insertion loss a_e. The nominal frequency f_N is fixed at 261.0 MHz without any tolerance. The given values for both the relative attenuation a_{rel} and the group delay ripple have to be achieved at the frequencies given below even if the centre frequency f_c is shifted due to the temperature coefficient of frequency TC_f in the operating temperature range and due to a production tolerance for the centre frequency f_c.

D a t a		**typ. value**		**tolerance / limit**		
Insertion loss (reference level)	a_e	7.5		max.	11.0	dB
Nominal frequency	f_N	-			261.0	MHz
Centre frequency	f_C	261.0	MHz		-	
Pass band	PB	-		f_N ±	150.0	kHz
Pass band ripple		0.14	dB	max.	1.0	dB
Pass band variation		1	dB	max.	1.5	dB
Relative attenuation	a_{rel}					
f_N … f_N ± 150.0 kHz		1	dB	max.	1.5	dB
f_N - 260.0 MHz … f_N - 0.8 MHz		46	dB	min.	40	dB
f_N + 0.8 MHz … f_N + 1.8 MHz		38	dB	min.	35	dB
f_N + 1.8 MHz … f_N + 239.0 MHz		46	dB	min.	40	dB
Group delay	at f_N @ 25 °C	1.56	µs	max.	±100	ns
Group delay ripple within PB		144	ns	max.	200	ns
Return loss within f_N ± 100 kHz		22	dB	min.	15	dB
Input power level	**	-		max.	20	dBm
Operable temperature range		-		- 40 °C ... + 105 °C		
Operating temperature range	OTR	-		- 40 °C ... + 85 °C		
Storage temperature range		-		- 62 °C ... + 125 °C		
Frequency inversion temperature		49	°C		-	
Temperature coefficient of frequency	TC_f ***	-0.03	ppm/K²		-	

*) The terminating impedances depend on parasitics and q-values of matching elements and the board used, and are to be understood as reference values only. Should there be additional questions do not hesitate to ask for an application note or contact our design team.
**) for short term operation only, cycle time 1:1000; 15 dBm max for continuous operation
***) $\Delta f = TC_f(T - T_0)^2 f_N$

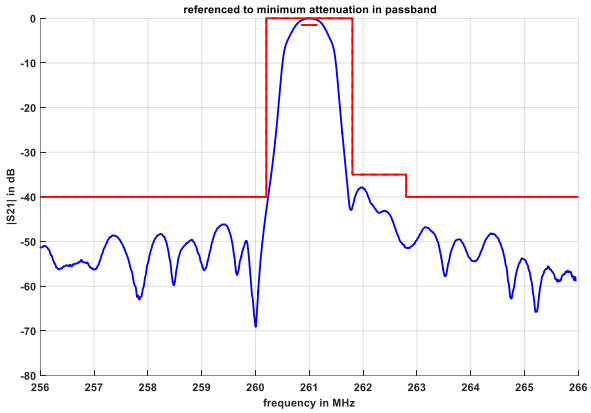
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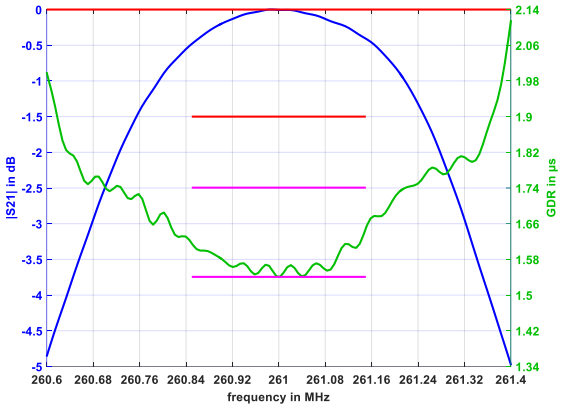
Checked / Approved:

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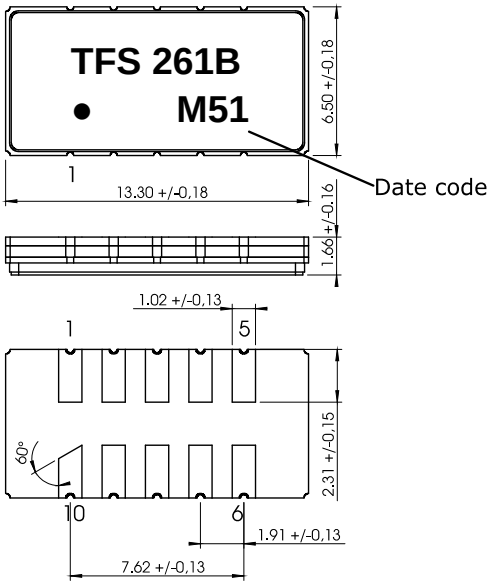
Filter characteristic





Construction and pin connection

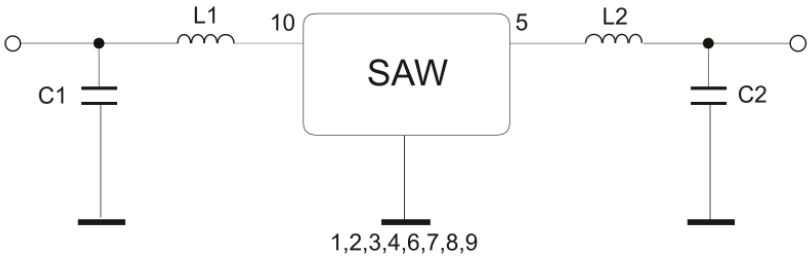
(All dimensions in mm)



1	Ground
2	Ground
3	Ground
4	Ground
5	Output
6	Ground
7	Ground
8	Ground
9	Ground
10	Input

Date code:	Year + week
M	2020
N	2021
P	2022
...	

50 Ω Test circuit



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Stability characteristics, reliability

After the following tests the filter shall meet the whole specification:

1. Shock: 500 g, 1 ms, half sine wave, 3 shocks each plane;
   DIN IEC 60068 T2 - 27

2. Vibration: 10 Hz to 2000 Hz, 0.35 mm or 5 g respectively, 1 octave per min, 10 cycles per plane, 3 planes; DIN IEC 60068 T2 - 6

3. Change of temperature: -55 °C to 125 °C / 15 min. each / 100 cycles
   DIN IEC 60068 part 2 – 14 Test N

4. Resistance to solder heat (reflow): reflow possible: three times max.;
   for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4;

5. SAW devices are Electrostatic Discharge (ESD) sensitive devices.

This filter is RoHS compliant (2011/65/EU+2015/863/EU)

Packing

Tape & Reel: IEC 286 – 3, with exception of value for N and minimum bending radius;
tape type II, embossed carrier tape with top cover tape on the upper side;

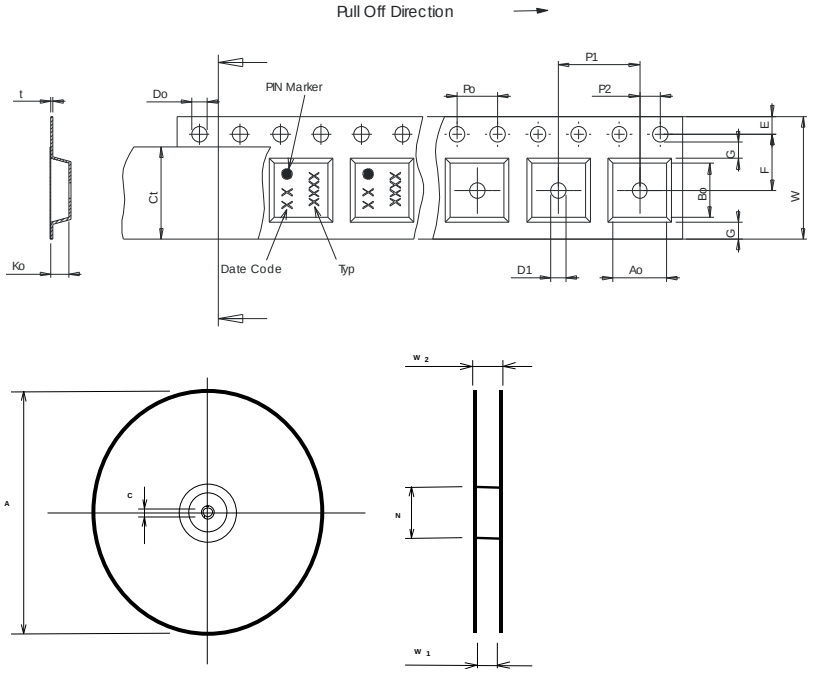
reel of empty components at start:	min. 300 mm
reel of empty components at start including leader:	min. 500 mm
trailer:	min. 300 mm

Tape (all dimensions in mm)

W	:	24.00	+0.30/-0.10
Po	:	4.00	±0.1
Do	:	1.50	+0.1/0
E	:	1.75	±0.10
F	:	11.50	±0.10
G(min)	:	0.60	
P2	:	2.00	±0.1
P1	:	12.00	±0.1
D1(min)	:	1.50	
Ao	:	7.00	±0.10
Bo	:	13.80	±0.10
Ct	:	21.00	±0.1
Ko	:	2.10	±0.10
t	:	0.30	±0.05

Reel (all dimensions in mm)

A	:	330	or 180
W1	:	24.4	+2/-0
W2(max)	:	30.40	
N(min)	:	60.00	
C	:	13.0	+0.5/-0.2



The minimum bending radius is 45 mm.

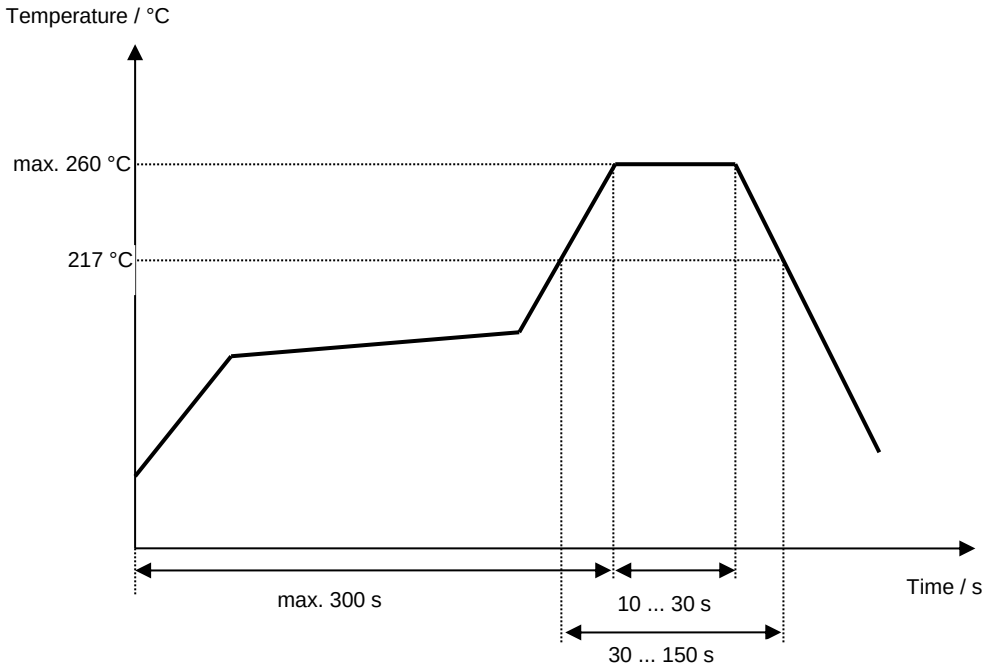
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Air reflow temperature conditions

Conditions	**Exposure**
Average ramp-up rate (30 °C to 217 °C)	less than 3 °C / second
> 100 °C	between 300 and 600 seconds
> 150 °C	between 240 and 500 seconds
> 217 °C	between 30 and 150 seconds
Peak temperature	max. 260 °C
Time within 5 °C of actual peak temperature	between 10 and 30 seconds
Cool-down rate (Peak to 50 °C)	less than 6 °C / second
Time from 30 °C to Peak temperature	no greater than 300 seconds

Chip-mount air reflow profile



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History

Version	Reason of Changes	Name	Date
1.0	- Generation of development specification	Strehl	20.01.2009
1.1	- add of terminating impedances, typical values, filter characteristics and matching configuration - change of time domain parameters	Pfeiffer	19.05.2009
2.0	- back to development status, change of package, change terminating impedance to t.b.d. - remove pulse response requirements	Bonnen	31.08.2020
3.0	- Generation of filter specification with agreed relaxations	Bonnen	16.12.2020

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