Measurement condition

Ambient temperature T_A: 25 °C
Input power level: 0 dBm
Terminating impedance: *
Input: 469.96 Ω || -28.72 pF
Output: 956.93 Ω || -10.11 pF

Characteristics

Remark:
The reference level for the relative attenuation a_{rel} of the TFS 35G 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 3 dB filter attenuation level relative to the insertion loss a_e. The nominal frequency f_N is fixed at 35.42 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	12.9	dB	max.	17	dB
Nominal frequency	f_N				35.42	MHz
Centre frequency	f_C	35.42	MHz		-	
Passband (1)	PB1	-			f_C ± 0.80	MHz
Passband (2)	PB2	-			f_C ± 1.023	MHz
Pass band ripple in PB1		0.7	dB	max.	1.6	dB
Bandwidth	BW					
1.6 dB		2.29	MHz	min.	1.7	MHz
3 dB		2.61	MHz	min.	2.046	MHz
Relative attenuation	a_{rel}					
34.620 MHz … 36.220 MHz		0.7	dB	max.	1.6	dB
34.397 MHz … 36.443 MHz		0.9	dB	max.	3.0	dB
0.420 MHz … 32.397 MHz		40	dB	min.	25	dB
38.443 MHz … 62.000 MHz		32	dB	min.	25	dB
62.000 MHz … 70.420 MHz		22	dB	min.	15	dB
Group delay	mean value in PB1	1.2	µs	max.	1.7	µs
Group delay ripple within PB1		190	ns	max.	350	ns
Deviation from linear phase within PB1		4	°	max.	7	°
Input/Output return loss within PB1		4	dB	min.	2	dB
Input power level		-		max.	0	dBm
Operating temperature range	OTR	-		- 40 °C ... + 85°C		
Storage temperature range		-		- 55 °C ... + 125°C		
Temperature coefficient of frequency	TC_f **	-18	ppm/K		-	

*) 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.
**) $\Delta f = TC_f(T - T_A)f_N$

Generated:

Checked / Approved:

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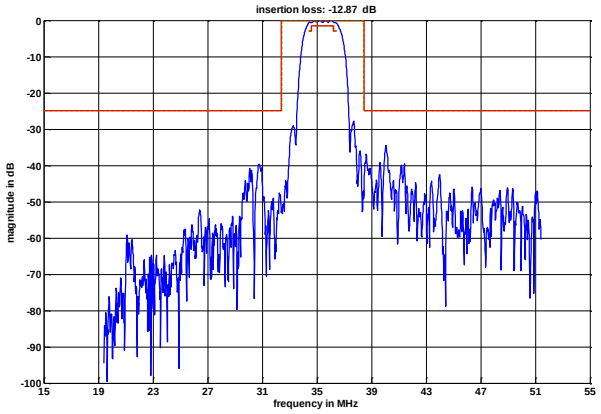
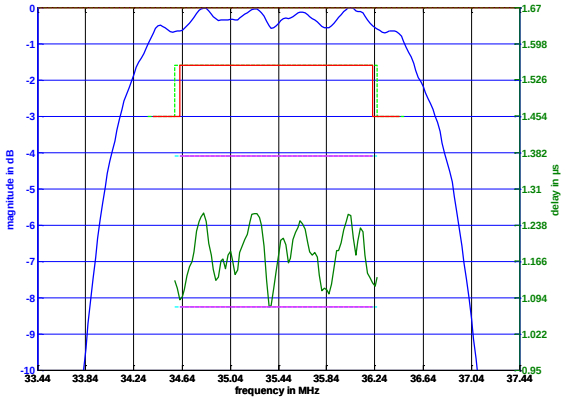
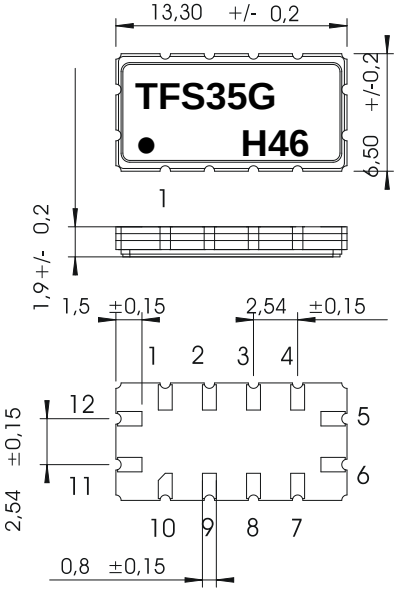
Filter characteristic





Construction and pin connection

(All dimensions in mm)



Unbalanced :

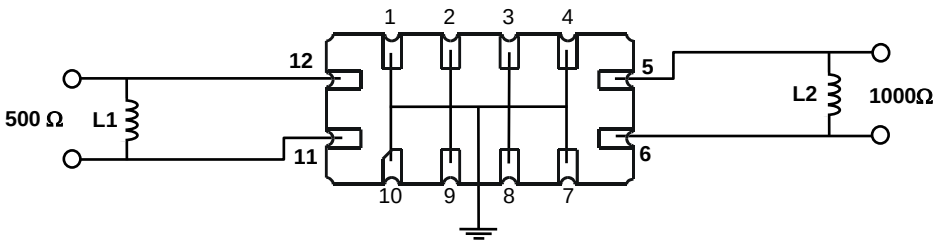
Pin **11**	**Input**
Pin 12	Input RF Return
Pin **5**	**Output**
Pin 6	Output RF Return
Pin 1-4, 7-10	Package Ground

Balanced :

Pin **11**	**Input**
Pin **12**	**Input**
Pin **5**	**Output**
Pin **6**	**Output**
Pin 1-4, 7-10	Package Ground

Date code:	Year + week
H	2016
J	2017
K	2018
...	

500 Ω x 1000 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;

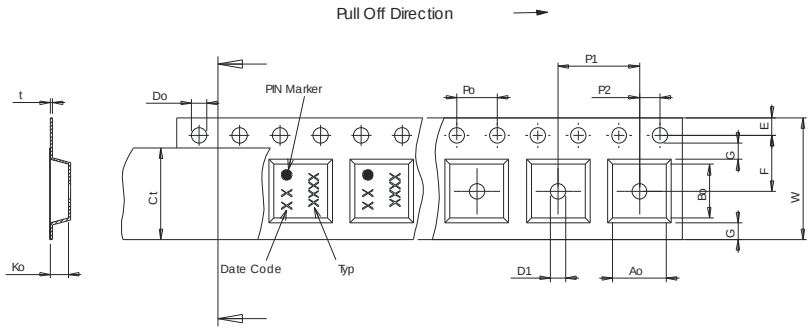
5. SAW devices are Electrostatic Discharge (ESD) sensitive devices.

This filter is RoHS compliant (2011/65/EU)

Packing

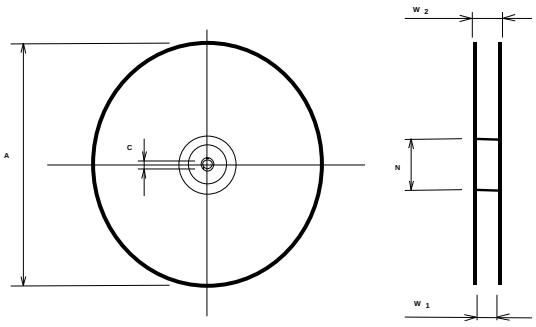
Tape & Reel: IEC 286 – 3, with exception of value for N and minimum bending radius;
tape type II, embossed carrier tape with top cover tape on the upper side;

max. pieces of filters per reel:	1700
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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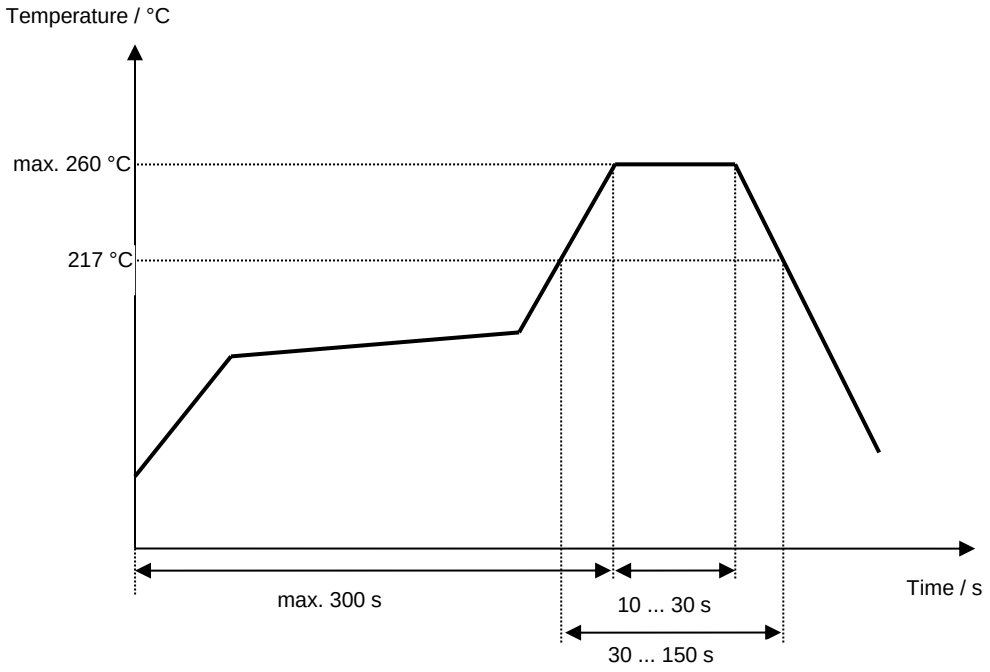
Air reflow temperature conditions

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 (based on TFS35GS01)	TCUK	06.02.2012
1.1	- Add typ value, add plots and move from dev to filter spec. - Typo, change 1dB bw to 1.6dB to complement PB1.	TCUK	08.08.2012
2.0	- Changed 'Group delay ripple within PB1' from 300 to 350ns as per customer agreement - (see email from customer 10/10/2012 :15:03pm)	TCUK	11.10.2012
3.0	- Change tape & reel dimensions - Update header and footer sections - Update data section - Update storage temperature range - Update stability characteristics, reliability	Bonnen	09.11.2016

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