

Microchip**Filter specification****TFS1280****1/5****Measurement condition**

Ambient temperature T_A :	23	°C
Input power level:	0	dBm
Terminating impedance: *)		
Source:	50	Ω
Load:	50	Ω
Input:	39.6 Ω	$\parallel$ -0.78 pF
Output:	39.6 Ω	$\parallel$ -0.78 pF

Characteristics

Remark:

The reference level for the relative attenuation a_{rel} of the TFS1280 is the minimum of the passband attenuation a_{min} . The minimum of the passband 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 1280 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	a_e	4	dB	max.	6	dB
Nominal frequency	f_N	-			1280	MHz
Centre frequency	f_c	1280	MHz			
Passband		-		$f_N \pm$	37.5	kHz
Passband ripple	p-p	0.5	dB	max.	2	dB
Relative attenuation	a_{rel}					
$f_N \pm 1.5$ MHz ... $f_N \pm 5$ MHz		10	dB	min.	3.5	dB
$f_N \pm 5$ MHz ... $f_N \pm 20$ MHz		30	dB	min.	12	dB
$f_N + 20$ MHz ... $f_N + 25$ MHz		30	dB	min.	28	dB
$f_N + 25$ MHz ... $f_N + 180$ MHz		36	dB	min.	30	dB
$f_N - 20$ MHz ... $f_N - 1150$ MHz		38	dB	min.	30	dB
Group delay ripple within PB		60	ns	max.	150	ns
Input power level		-		max.	15	dBm
Operating temperature range	OTR	-			-40 °C ... +91 °C	
Storage temperature range		-			-55 °C ... +125 °C	
Frequency inversion temperature	T_0	40	°C		-	
Temperature coefficient of frequency	TC_f **)	-0.05	ppm/K ²		-	

*) 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.

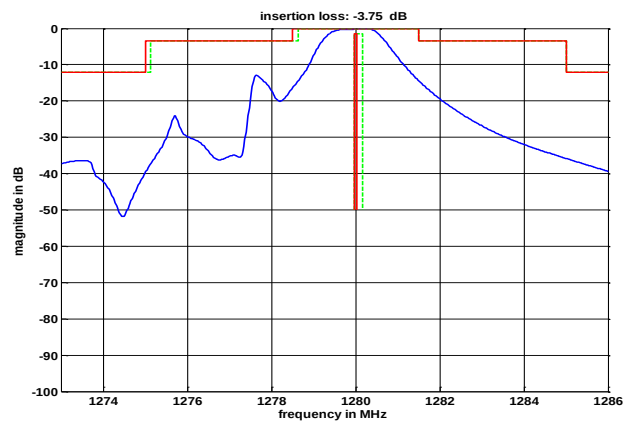
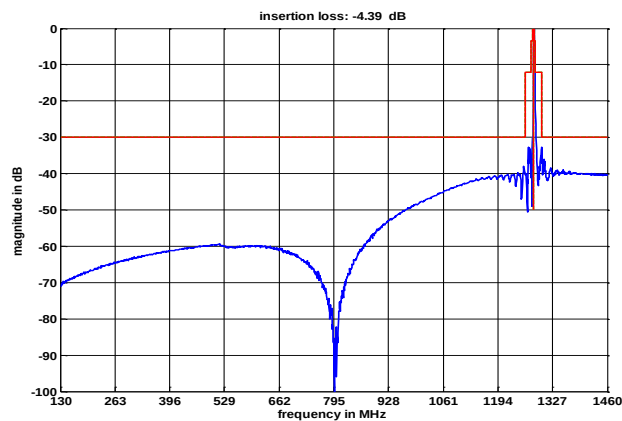
**) $\Delta f = TC_f (T - T_0)^2 f_N$

Generated:**Checked / Approved:**

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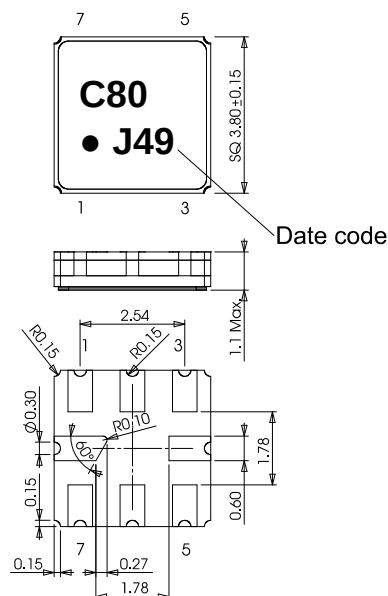
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Filter characteristic



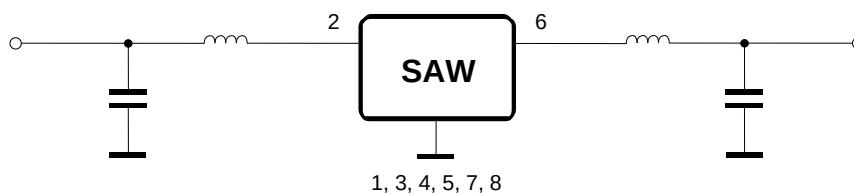
Construction and pin connection

(All dimensions in mm)



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

Date code: Year + week
 J 2017
 K 2018
 L 2019
 ...

50 Ω Test circuit

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Stability characteristics, reliability

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

1. Shock: 500g, 1 ms, half sine wave, 3 shocks each plane;
DIN IEC 68 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 68 T2 - 6
3. Change of temperature: -55 °C to 125°C / 15 min. each / 100 cycles
DIN IEC 68 part 2 – 14 Test N
4. Resistance to solder heat (reflow): reflow possible: three times max.;
for temperature conditions, see page 4: "Air reflow temperature conditions"

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

ESD SIMULATION MODEL	CLASSIFICATION LEVEL	CRITERIA
Human Body Model (HBM) acc. to ANSI/ESDA/JEDEC JS-001-2014	Class 1A	1 positive + 1 negative pulse 125 ... 250 Volts

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;

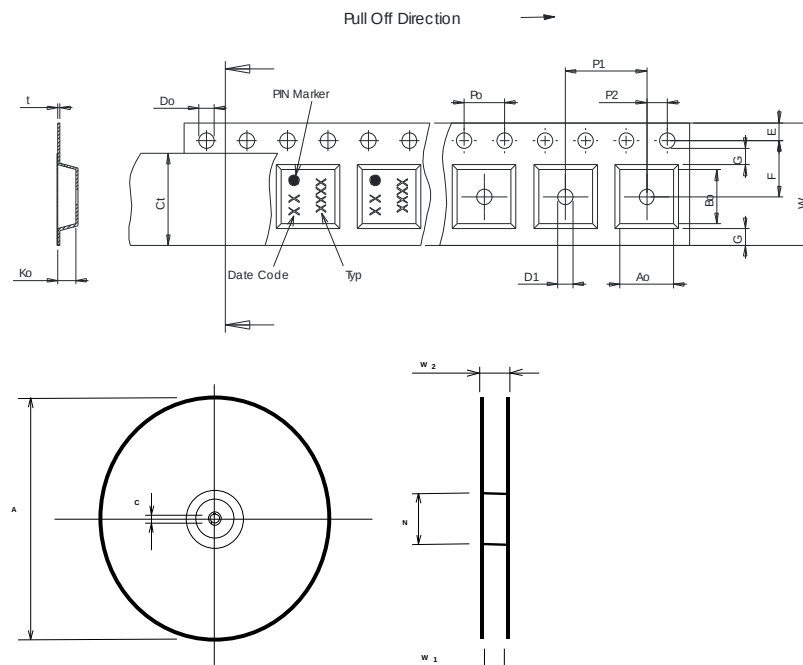
reel of empty components at start: min. 300 mm
reel of empty components at start including leader: min. 500 mm
trailer: min. 300 mm

Tape (all dimensions in mm)

W	: 12.00 ±0.3
Po	: 4.00 ±0.1
Do	: 1.50 +0.1/-0
E	: 1.75 ±0.1
F	: 5.50 ±0.05
G(min)	: 0.75
P2	: 2.00 ±0.05
P1	: 8.00 ±0.1
D1(min)	: 1.50
Ao	: 4.30 ±0.1
Bo	: 4.30 ±0.1
Ct	: 9.2 ±0.1
Ko	: 1.80 ±0.1
t	: 0.30 ±0.05

Reel (all dimensions in mm)

A	: 330 or 180
W1	: 12.4 +2/-0
W2(max)	: 18.40
N(min)	: 50.00
C	: 13.0 +0.5/-0.2



The minimum bending radius is 45 mm.

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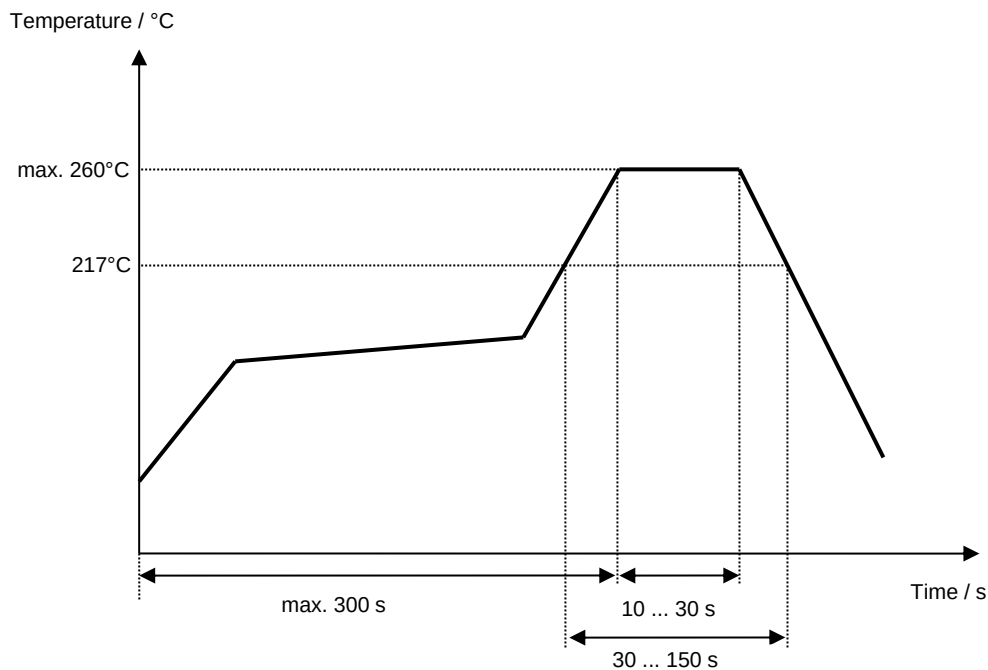
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Air reflow temperature conditions

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

Microchip**Filter specification****TFS1280****5/5****History**

Version	Reason of Changes	Name	Date
1.0	- Generation of development specification	S. Channaa	29.05.2009
1.1	- Change input power level, passband ripple, attenuation and OTR	S. Channaa	03.06.2009
1.2	- Change input power level, add typical values and filter characteristic - Generation of filter specification	S. Channaa	21.12.2010
2.0	- Orientation of tape and reel corrected - Typos corrected	A. Molke	28.10.2013
3.0	- Operating temperature range extended - Storage temperature range extended - Limits for passband ripple and group delay ripple relaxed - Update of typical values - Update of stability characteristics - Terminating impedances and test circuit corrected	A. Molke	13.10.2015
3.1	- Update of maximum input power	A. Molke	25.01.2016
3.2	- Update storage temperature range - Update construction	P. Jaster	21.09.2017
4.0	- changed operating temperature range	P. Jaster	23.10.2017
5.0	- changed data table	P. Jaster	05.11.2017

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