

Microchip**Diplexer specification****TDX1209B****1/5****Measurement condition**

Ambient temperature T_A : 23 °C
 Input power level: 0 dBm
 Terminating impedance: 50 Ω (all ports)

Characteristics

Remark:

The maximum attenuation in the pass band is defined as the insertion loss a_e . The values of absolute attenuation a_{abs} are guaranteed over the whole operating temperature range. The frequency shift of the filter within the operating temperature range is included in the production tolerance scheme.

D a t a				typ. value		tolerance / limit		
Insertion loss RX1				$a_{e,RX1}$	3.9	dB	max.	5.0 dB
Insertion loss RX2				$a_{e,RX2}$	3.5	dB	max.	5.0 dB
Nominal frequency RX1				$f_{N,RX1}$	-			1209.5 MHz
Nominal frequency RX2				$f_{N,RX2}$	-			1584.5 MHz
Passband RX1				PB_{RX1}	-		$f_{N,RX1}$	$\pm$ 45.5 MHz
Passband variation				PBV_{RX1}	1.5	dB	max.	3 dB
Return loss				RL_{RX1}	9.5	dB	min.	8 dB
Group delay variation				GDV_{RX1}				
1164 MHz	...	1187 MHz			9	ns	max.	15 ns
1187 MHz	...	1237 MHz			15	ns	max.	20 ns
1237 MHz	...	1255 MHz			4	ns	max.	10 ns
Group delay variation (unit to unit)				$GDV_{RX1,u-u}^{*)}$	$\pm$ 4	ns	max.	$\pm$ 7 ns
Passband RX2				PB_{RX2}	-		$f_{N,RX2}$	$\pm$ 25.5 MHz
Passband variation				PBV_{RX2}	1.8	dB	max.	3 dB
Return loss				RL_{RX2}	7	dB	min.	6 dB
Group delay variation within PB				GDV_{RX2}	15	ns	max.	30 ns
Group delay variation (unit to unit)				$GDV_{RX2,u-u}^{**})$	$\pm$ 8	ns	max.	$\pm$ 10 ns
Absolute attenuation RX1				$a_{abs,RX1}$				
600 MHz	...	1114 MHz			31	dB	min.	28 dB
1305 MHz	...	1315 MHz			21	dB	min.	15 dB
1315 MHz	...	1610 MHz			33	dB	min.	30 dB
1610 MHz	...	1800 MHz			31	dB	min.	28 dB
1800 MHz	...	2400 MHz			33	dB	min.	30 dB
Absolute attenuation RX2				$a_{abs,RX2}$				
600 MHz	...	1164 MHz			27	dB	min.	25 dB
1164 MHz	...	1255 MHz			29	dB	min.	25 dB
1255 MHz	...	1509 MHz			26	dB	min.	25 dB
1660 MHz	...	2400 MHz			36	dB	min.	25 dB
Input power level in passbands					-		max.	25 dBm
Operating temperature range				OTR	-			-40 °C ... +85 °C
Storage temperature range					-			-55 °C ... +125 °C
Temperature coefficient of frequency RX1				$TC_{f,RX1}^{***})$	-73	ppm/K		-
Temperature coefficient of frequency RX2				$TC_{f,RX2}^{***})$	-40	ppm/K		-

*) measured at: $f_{N,RX1}$, $f_{N,RX1} + 45.5$ MHz, $f_{N,RX1} - 45.5$ MHz

**) measured at: $f_{N,RX2}$, $f_{N,RX2} + 25.5$ MHz, $f_{N,RX2} - 25.5$ MHz

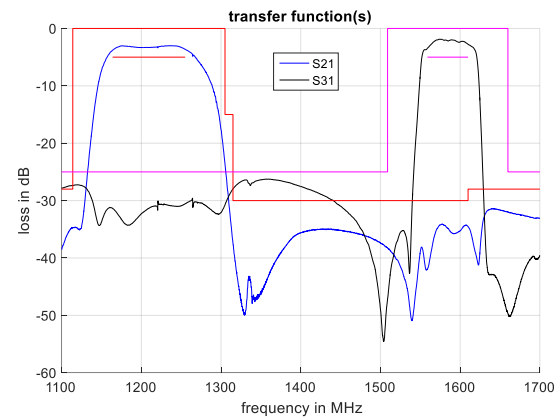
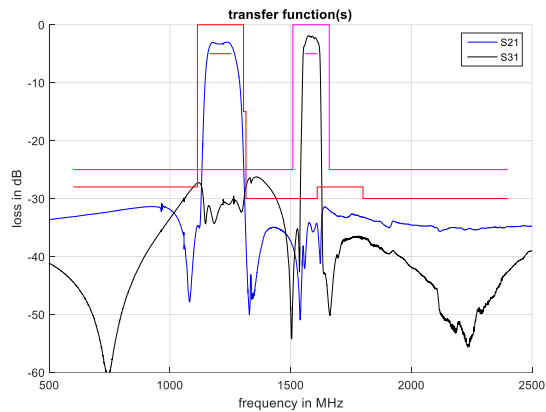
***) $\Delta f = TC_f (T - T_A) f_N$

Generated:**Checked / Approved:**

Microchip Frequency Technology GmbH
 Potsdamer Straße 18
 D 14 513 TELTOW / Germany
 Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30

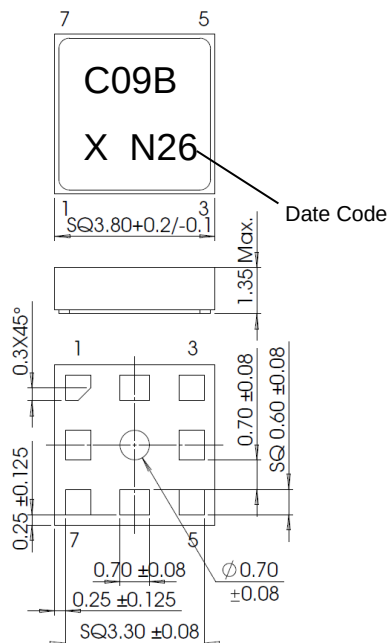
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Duplexer characteristic



Construction and pin connection

(All dimensions in mm)



- | | |
|---|------------|
| 1 | Output RX2 |
| 2 | Ground |
| 3 | Output RX1 |
| 4 | Ground |
| 5 | Ground |
| 6 | Input |
| 7 | Ground |
| 8 | Ground |
| 9 | Ground |

Date code: Year + week

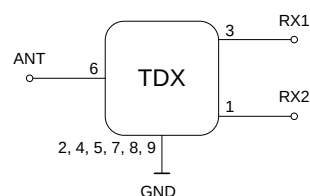
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50 Ω Test circuit



Microchip Frequency Technology GmbH

Potsdamer Straße 18

D 14 513 TELTOW / Germany

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Stability characteristics, reliability

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

- Shock: 1500 g, 0.5 μ s, half sine wave, 3 shocks each plane;
Mil-STD-883, method 2002
- 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
- Change of temperature: -55 °C to 125 °C / 15 min. each / 100 cycles
Mil-STD-883, method 1010
- Resistance to solder heat (reflow): reflow possible: three times max.;
for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4;
- 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;

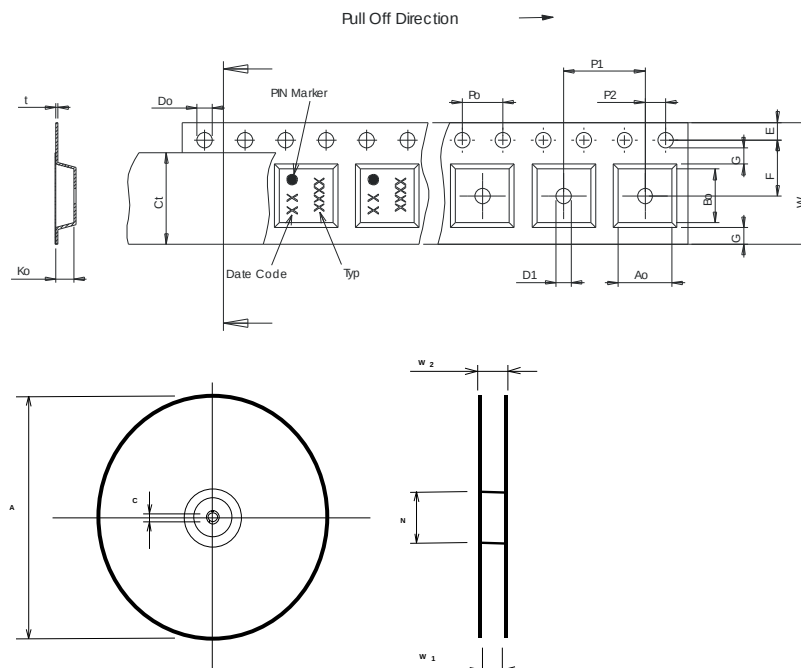
reel of empty components at start:	min. 300 mm
reel of empty components at start including leader:	min. 500 mm
trailer:	min. 300 mm

Tape (all dimensions in mm)

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

Reel (all dimensions in mm)

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



The minimum bending radius is 45 mm.

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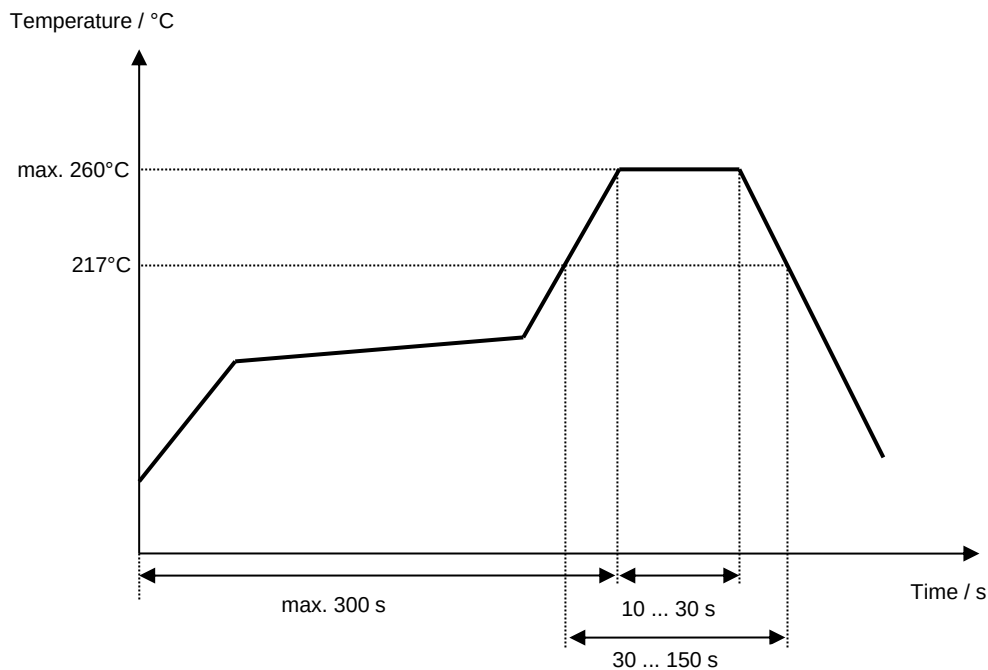
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Air reflow temperature conditions

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**Diplexer specification****TDX1209B****5/5****History**

Version	Reason of Changes	Name	Date
1.0	- Generation of development specification based on TDX1209b_ver6cic	P. Jaster	31.07.2020
1.1	- Reformatted data table - Updated stability characteristics	P. Jaster	31.07.2020
2.0	- Change data table - Add typical values and Diplexer characteristic	C. Noack	24.06.2021