

Measurement condition

Ambient temperature T_A : 23 °C
 Input power level: 0 dBm
 Terminating impedance: *
 Input: 492 Ω || -1.5 pF
 Output: 492 Ω || -1.5 pF
 External Coil: 100 nH

Characteristics

Remark:

Reference level for the relative attenuation a_{rel} of the TFS467A 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 467.475 MHz without tolerance. The given values for the relative attenuation a_{rel} and for the group delay ripple have to be reached 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 in OTR	a_e	-	dB	max.	5.5	dB
Insertion loss in ROTR		4.2	dB	max.	5.0	dB

Nominal frequency	f_N	-		467.475	MHz
Centre frequency **	f_c	467.508	MHz	-	

Relative attenuation		a_{rel}							
f_N	...	$f_N \pm 50$	kHz	0.3	dB	max.	1.5	dB***	
$f_N \pm 50$	kHz	$f_N \pm 90$	kHz	0.5	dB	max.	3	dB	
$f_N \pm 500$	kHz	$f_N \pm 850$	kHz	30	dB	min.	25	dB	
$f_N \pm 850$	kHz	$f_N \pm 4.8$	MHz	55	dB	min.	40	dB	
0.3	MHz	$f_N - 4.8$	MHz	60	dB	min.	45	dB	
$f_N + 4.8$	MHz	...	800	MHz	60	dB	min.	45	dB

Group delay ripple							
$f_N \pm 90$	kHz	0.9	µs	max.	2	µs	

Maximum input power level

	modulation type	GMSK	FSK									
		($B_{3dB} \geq 200$ kHz)	(100%)		(50%)		(20%)		(10%)			
ambient temp. / °C	duty cycle (on-time)	100%	100%	f_N	100%	f_N	50%	f_N	20%	f_N	10%	f_N
	exposure frequency	f_N	$f_N - 95$ kHz	f_N	$f_N - 95$ kHz	f_N	$f_N - 95$ kHz	f_N	$f_N - 95$ kHz	f_N	$f_N - 95$ kHz	f_N
50	input power level / dBm	8.8	7.3	8.8	7.9	9.4	8.6	10.1	9.3	10.8		
85		6.6	5.1	6.6	5.7	7.2	6.5	8.0	7.1	8.6		

Operating temperature range	OTR	-		-40°C ... +85 °C
Reduced operating temperature range	ROTR	-		0°C ... +50 °C
Storage temperature range		-		-55°C ... +125 °C
Frequency inversion temperature	T_0 ****	28	°C	-
Temperature coefficient of frequency	TC_f ****	-0.038	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.

**) at T_A : $f_{c,typical} = f_N + (f_N - f_{-40°C})/2$

***) 1 dB in reduced operating temperature range

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

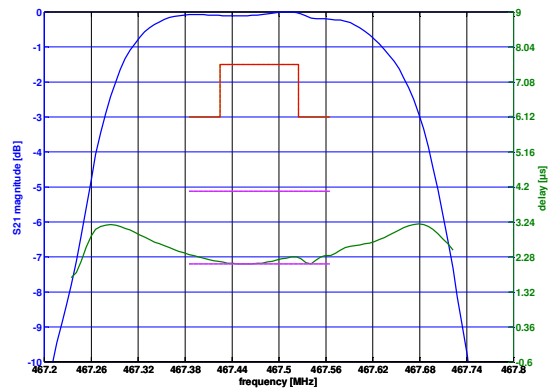
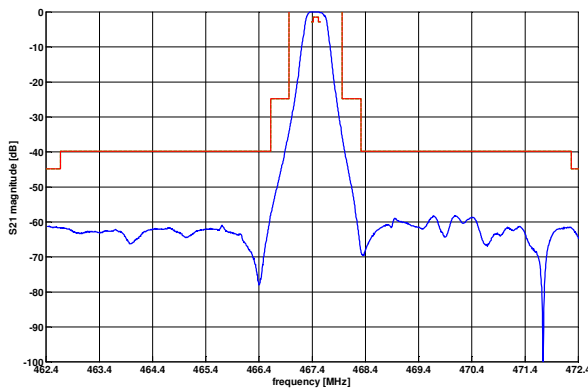
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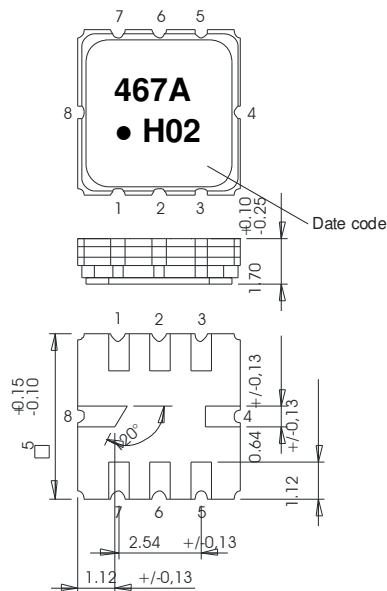
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Filter characteristic



Construction and pin connection

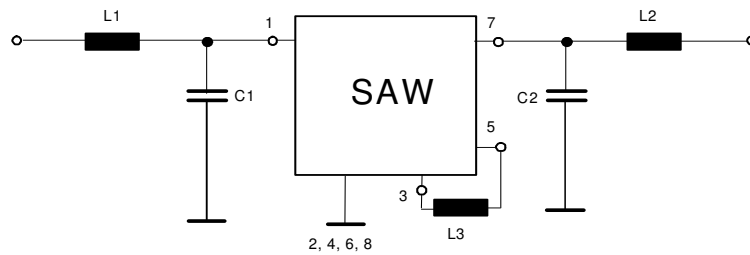
(All dimensions in mm)



- 1 Input
- 2 Input RF Return
- 3 External Coil
- 4 Ground
- 5 External Coil
- 6 Output RF Return
- 7 Output
- 8 Ground

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

50 Ω Test circuit



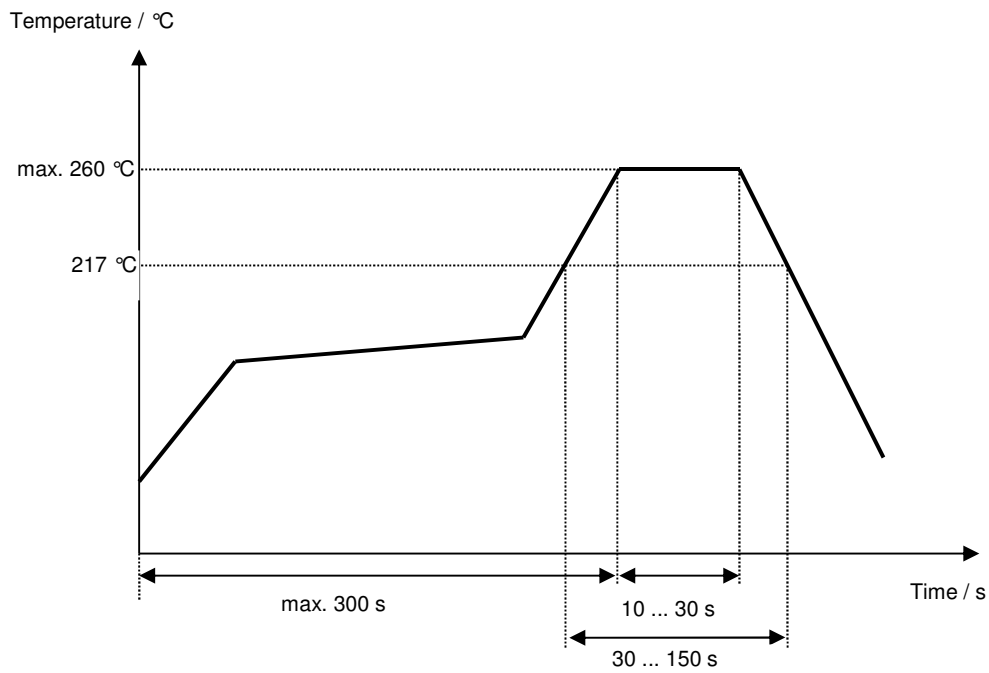
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Air reflow temperature conditions

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	Raura	29.10.2013
2.0	- Centre frequency corrected	Raura	30.10.2013
3.0	- Generation of filter specification	Bonnen	02.07.2015
3.1	- Maximum input power changed	Bonnen	23.10.2015
3.2	- Add table for input power level - Add comment for f_c	Bonnen	08.01.2016
3.3	- Change table for input power level - Changed nominal frequency f_N in the remark section	Bonnen	14.01.2016