

## **Excellent Integrated System Limited**

Stocking Distributor

Click to view price, real time Inventory, Delivery & Lifecycle Information:

EPCOS (TDK) B39351B3559U310

For any questions, you can email us directly: <u>sales@integrated-circuit.com</u>





# SAW Components

### Data Sheet B3559





#### Distributor of EPCOS (TDK): Excellent Integrated System Limited Datasheet of B39351B3559U310 - FILTER SAW 345.03 MHZ REMOTE SMD

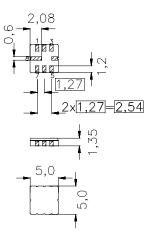


SAW Components	B3559
Low-loss Filter	345,00 MHz

**Data Sheet** 

#### Features

- RF low-loss filter for remote control receivers
- Package for Surface Mounted Technology (SMT)
- Balanced and unbalanced operation possible



Ceramic package QCC8C

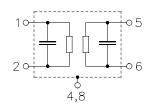
#### Terminals

Ni, gold plated

typ. dimensions in mm, approx. weight 0,1 g

#### **Pin configuration**

- 1 Input Ground
- 2 Input
- 5 Output
- 6 Output Ground
- 4,8 Case Ground
- 3,7 to be grounded



Туре	Ordering code	Marking and package according to	Packing according to
B3559	B39351-B3559-U310	C61157-A7-A56	F61074-V8070-Z000

Electrostactic Sensitive Device (ESD)

#### **Maximum ratings**

Operable temperature range	T <sub>A</sub>	-45/+90	°C	
Storage temperature range	T <sub>stg</sub>	-45/+90	°C	
DC voltage	V <sub>DC</sub>	0	V	
Source power	Ps	0	dBm	source impedance 50 $\Omega$



## Distributor of EPCOS (TDK): Excellent Integrated System Limited Datasheet of B39351B3559U310 - FILTER SAW 345.03 MHZ REMOTE SMD



SAW Components					B3559
Low-loss Filter				345,	00 MHz
Data Sheet					
Characteristics					
Reference temperature: $T_{\Delta}$	= 25 °(	C			
			ning network	í.	
Terminating load impedance: $Z_{L}$	= 50 Ω	and match	ning network	(	
		min.	typ.	max.	
Center frequency	f <sub>C</sub>	_	345,03	_	MHz
(center frequency between 3 dB points)					
Minimum insertion attenuation	$\alpha_{min}$				
344,90 345,10 MHz	<u> </u>		2,0	3,0	dB
<b>Pass band</b> (relative to $\alpha_{min}$ )					
344,94 345,13 MH	<u>z</u>	_	0,8	2,0	dB
344,90 345,17 MH		_	1,0	3,0	dB
344,87 345,20 MH:	z	_	1,5	6,0	dB
Relative attenuation (relative to $\alpha_{min}$ )	$\alpha_{rel}$				
10,00 300,00 MHz		45	50	_	dB
300,00 341,00 MH	Z	40	45	_	dB
341,00 344,00 MHz	Z	15	20	_	dB
346,10 347,00 MH	z	10	15	—	dB
347,00 350,00 MH	<u>z</u>	20	25	—	dB
350,00 450,00 MH	<u>z</u>	35	40	—	dB
450,00 1000,00 MH	Z	45	50		dB
Impedance for pass band matching					
Input: $Z_{IN} = R_{IN}    C_{IN}$		_	350    2,80	—	$\Omega \parallel pF$
Output: $Z_{OUT} = R_{OUT} \parallel C_{OUT}$		—	350    2,80	—	Ω    pF
Temperature coefficient of frequency <sup>1)</sup>	TC <sub>f</sub>	—	-0,03	_	ppm/K <sup>2</sup>
Frequency inversion point	$T_0$	10	-	30	°C

<sup>1)</sup>Temperature dependence of  $f_C$ :  $f_C(T_A) = f_C(T_0) (1 + TC_f(T_A - T_0)^2)$ 



#### Distributor of EPCOS (TDK): Excellent Integrated System Limited Datasheet of B39351B3559U310 - FILTER SAW 345.03 MHZ REMOTE SMD



$\begin{array}{c c c} \hline \mathbf{C} & C$	SAW Components					B3559
	Low-loss Filter				345,	00 MHz
Reference temperature: $T_A = -45 \dots 90$ °C         Terminating source impedance: $Z_S = 50 \Omega$ and matching network         Z_L = 50 Ω and matching network       max.         Center frequency $f_C$ $ 345,00$ $-$ M         Minimum insertion attenuation $\alpha_{min}$ $\alpha_{min}$ $ 2,0$ $3,5$ dl         Pass band (relative to $\alpha_{min}$ ) $344,90 \dots 345,10$ MHz $ 0,8$ $2,0$ dl         Relative attenuation (relative to $\alpha_{min}$ ) $\alpha_{rel}$ $ 1,0$ $3,0$ dl         Relative attenuation (relative to $\alpha_{min}$ ) $\alpha_{rel}$ $ 1,5$ $6,0$ dl $344,90 \dots 345,10$ MHz $ 1,5$ $6,0$ dl $344,90 \dots 345,10$ MHz $ 1,0$ $3,0$ $dl$ Relative attenuation (relative to $\alpha_{min}$ ) $\alpha_{rel}$ $\alpha_{rel}$ $45$ $50$ $ dl$ $344,00 \dots 343,93$ MHz $15$ $20$ $ dl$ $344,90$ $\alpha_{rel}$ $\alpha_{rel}$ $\alpha_{rel}$ $\alpha_{rel}$ $\alpha_{rel}$ $\alpha_{rel}$ $\alpha_{rel}$ $\alpha_{rel}$ $\alpha_{rel}$ $\alpha$	Data Sheet					
Terminating source impedance: $Z_S^2 = 50 \ \Omega$ and matching network         Terminating load impedance: $Z_L^2 = 50 \ \Omega$ and matching network         Center frequency $f_C$ —       345,00       —       M         Center frequency between 3 dB points) $\alpha_{min}$ —       2,0       3,5       dI         Minimum insertion attenuation $\alpha_{min}$ —       2,0       3,5       dI         Pass band (relative to $\alpha_{min}$ ) $344,94 \ \ 345,10 \ MHz$ —       0,8       2,0       dI         Pass band (relative to $\alpha_{min}$ ) $344,94 \ \ 345,10 \ MHz$ —       0,8       2,0       dI         Relative attenuation (relative to $\alpha_{min}$ ) $\alpha_{rel}$ —       1,0       3,0       dI $300,00 \ \ 345,13 \ MHz$ —       1,5       6,0       dI $300,00 \ \ 341,00 \ MHz$ 45       —       dI $344,00 \ \ 343,93 \ MHz$ 15       20       —       dI $344,00 \ \ 350,00 \ MHz$ 20       25       —       dI $300,00 \ \ 345,00 \ MHz$ 40       45       —       dI $300,00 \ \ 343,93 \ MHz$ 15       20       — <t< td=""><td>Characteristics</td><td></td><td></td><td></td><td></td><td></td></t<>	Characteristics					
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Terminating source impedance: Z <sub>S</sub>	= 50 Ω	and matcl			
$\begin{array}{c c} \hline \textbf{C} \ \textbf{C} $			min.	typ.	max.	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		f <sub>C</sub>		345,00	—	MHz
Pass band (relative to $\alpha_{min}$ )       344,94 345,06 MHz        0,8       2,0       dl         344,90 345,10 MHz        1,0       3,0       dl         344,87 345,13 MHz        1,5       6,0       dl         Relative attenuation (relative to $\alpha_{min}$ ) $\alpha_{rel}$ 10,00 300,00 MHz       45       50        dl         300,00 341,00 MHz       40       45        dl         346,10 347,00 MHz       10       15        dl         346,00 350,00 MHz       20       25        dl         350,00 450,00 MHz       35       40        dl         345,00 1000,00 MHz       45       50        dl	Ainimum insertion attenuation	$\alpha_{min}$				
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	344,90 345,10 MHz		—	2,0	3,5	dB
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Pass band (relative to $\alpha_{min}$ )					
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	344,94 345,06 MHz		_	0,8	2,0	dB
Relative attenuation (relative to $\alpha_{min}$ ) $\alpha_{rel}$ 45       50        df         300,00        341,00       MHz       40       45        df         341,00        343,93       MHz       15       20        df         346,10        347,00       MHz       10       15        df         347,00        350,00       MHz       20       25        df         350,00        450,00       MHz       35       40        df         450,00        1000,00       MHz       35       50        df	344,90 345,10 MHz		—	1,0	3,0	dB
10,00 300,00 MHz       45       50        difference         300,00 341,00 MHz       40       45        difference         341,00 343,93 MHz       15       20        difference         346,10 347,00 MHz       10       15        difference         347,00 350,00 MHz       20       25        difference         350,00 450,00 MHz       35       40        difference         450,00 1000,00 MHz       45       50        difference	344,87 345,13 MHz		—	1,5	6,0	dB
10,00 300,00 MHz       45       50        difference         300,00 341,00 MHz       40       45        difference         341,00 343,93 MHz       15       20        difference         346,10 347,00 MHz       10       15        difference         347,00 350,00 MHz       20       25        difference         350,00 450,00 MHz       35       40        difference         450,00 1000,00 MHz       45       50        difference	Relative attenuation (relative to $\alpha_{min}$ )	$\alpha_{rel}$				
341,00 343,93 MHz       15       20       —       di         346,10 347,00 MHz       10       15       —       di         347,00 350,00 MHz       20       25       —       di         350,00 450,00 MHz       35       40       —       di         450,00 1000,00 MHz       45       50       —       di		101	45	50	—	dB
346,10        347,00       MHz       10       15       —       df         347,00        350,00       MHz       20       25       —       df         350,00        450,00       MHz       35       40       —       df         450,00        1000,00       MHz       45       50       —       df	300,00 341,00 MHz		40	45	—	dB
347,00 350,00 MHz       20       25       —       di         350,00 450,00 MHz       35       40       —       di         450,00 1000,00 MHz       45       50       —       di	341,00 343,93 MHz		15	20	_	dB
350,00 450,00 MHz 35 40 — di 450,00 1000,00 MHz 45 50 — di	346,10 347,00 MHz		10	15	_	dB
450,00 1000,00 MHz 45 50 — dl	347,00 350,00 MHz		20	25	_	dB
	350,00 450,00 MHz		35	40	_	dB
Impedance for page band matching	450,00 1000,00 MHz		45	50	—	dB
Indedance for dass dand matching	mpedance for pass band matching					
			_	350    2.80	_	Ω    pF
			_		_	Ω    pF

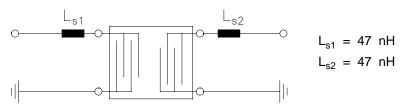




SAW Components	B3559
Low-loss Filter	345,00 MHz

Data Sheet

Matching network to 50  $\Omega$  (element values depend on pcb layout and equivalent circuit)



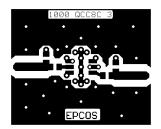
#### Minimising the crosstalk

For a good ultimate rejection a low crosstalk is necessary. Low crosstalk can be realised with a good RF layout. The major crosstalk mechanism is caused by the "ground-loop" problem.

Grounding loops are created if input-and output transducer GND are connected on the top-side of the PCB and fed to the system grounding plane by a common via hole. To avoid the common ground path, the ground pin of the input- and output transducer are fed to the system ground plane (bottom PCB plane) by their own via hole. The transducers' grounding pins should be isolated from the upper grounding plane.

A common GND inductivity of 0.5nH degrades the ultimate rejection (crosstalk) by 20dB.

The optimised PCB layout, including matching network for transformation to 50 Ohm, is shown here. In this PCB layout the grounding loops are minimised to realise good ultimate rejection.



Optimised PCB layout for SAW filters in QCC8C package, pinning 2,5 (top side, scale 1:1)

The bottom side is a copper plane (system ground area). The input and output grounding pins are isolated and connected to the common ground by separated via holes.

For good contact of the upper grounding area with the lower side it is necessary to place enough via holes.

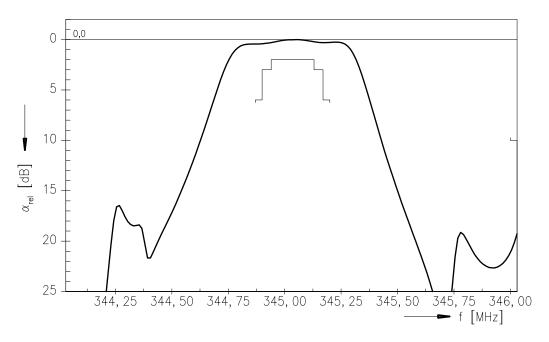




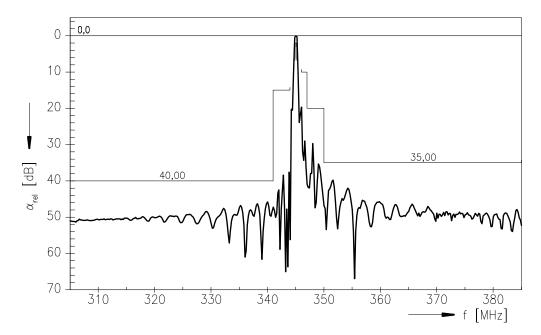
SAW Components	B3559
Low-loss Filter	345,00 MHz

Data Sheet

Normalized frequency response



#### Normalized frequency response (wideband)







SAW Components

Low-loss Filter Data Sheet B3559 345,00 MHz

#### Published by EPCOS AG Surface Acoustic Wave Components Division, SAW CE AE PD P.O. Box 80 17 09, D-81617 München

© EPCOS AG 2001. All Rights Reserved.

As far as patents or other rights of third parties are concerned, liability is only assumed for components per se, not for applications, processes and circuits implemented within components or assemblies.

The information describes the type of component and shall not be considered as assured characteristics.

Terms of delivery and rights to change design reserved.

For questions on technology, prices and delivery please contact the sales offices of EPCOS AG or the international representatives.

Due to technical requirements components may contain dangerous substances. For information on the type in question please also contact one of our sales offices.