

EPCOS Product Brief 2015

Surface Acoustic Wave Components for Telematics

Key components in telematics applications

Miniaturized EPCOS SAW filters are key components that ensure excellent RF signal quality in an ever wider spectrum of demanding automotive telematics applications. These include satellite-based navigation such as GPS, Galileo and Glonass, traffic guidance systems, and emergency call systems such as eCall. Automotive SAW filters qualified to AEC-Q200 also enable the reliable function of vehicle fleet management, toll systems and car-to-X communications as well as WLAN, SDARS and DAB systems.

Benefits

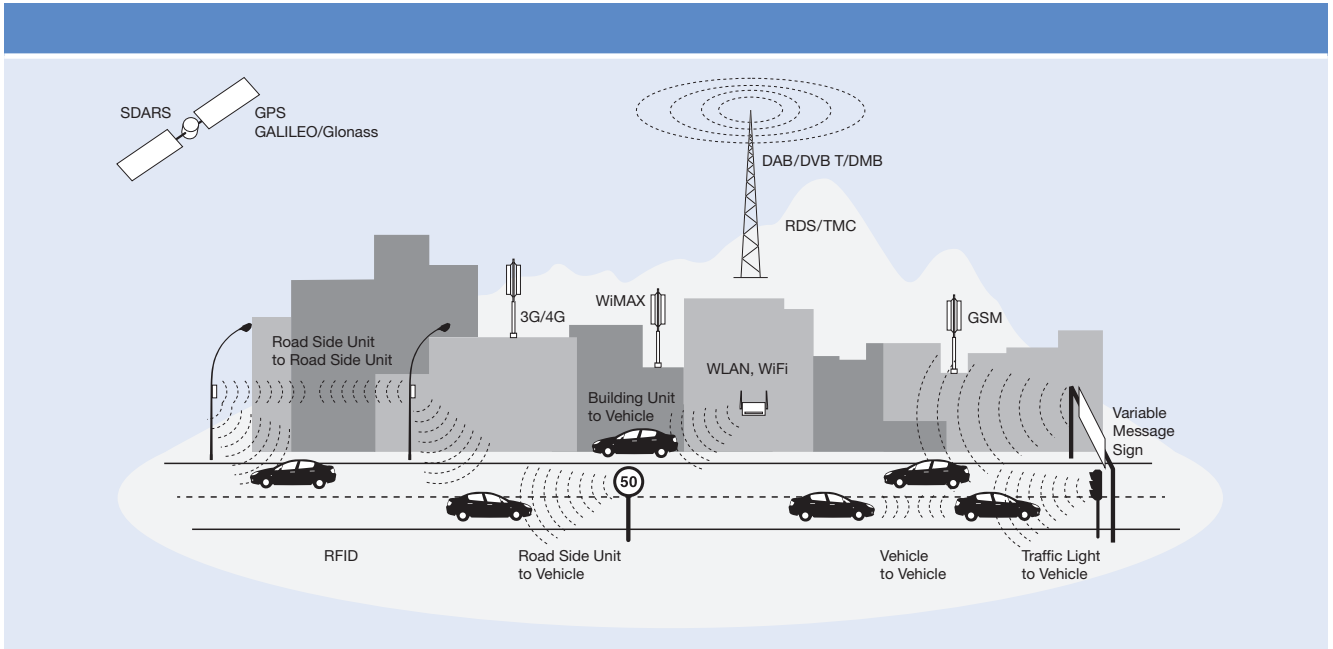
- SAW components in SMD ceramic and automotive CSSP™ packages

- Long product life cycles according to automotive requirements
- 100% final testing
- Operating temperature range from -40 °C up to +125 °C
- Patented passivation technologies for enhanced reliability
- Component qualification according to AEC-Q200
- Full support for level 3 PPAP
- Unique production know-how and economies of scale from the world market leader in SAW components
- ROHS-compatible
- Lead-free soldering

TDK is responding to the requirements of the automotive industry with a steadily growing portfolio of cutting-edge RF components. Challenge us with the specifications for your application!



SAW AE Filters for Global Navigation Satellite Systems



Single filters

Application	f_c MHz	Usable bandwidth MHz	Insertion attenuation dB	Type	Configuration		
Package size: 1.4 × 1.1 mm²							
GPS/Galileo	1575.42	6.0	1.2	B4300	50 Ω se / 50 Ω se		
		2.0	1.3	B4308	50 Ω se / 100 Ω bal		
GPS/Galileo/Glonass	1588.655	34.47	1.5	B4310	50 Ω se / 50 Ω se		
		34.47	1.6	B4313	50 Ω se / 100 Ω bal		
GPS/Galileo/Glonass/BeiDou	1582.4	31.24	1.0 ... 1.4	B4327	50 Ω se / 50 Ω se		
Package size: 3.0 × 3.0 mm²							
GPS/Galileo	1575.42	6.0	1.3	B3923	50 Ω se / 50 Ω se	pre-LNA; low IA	
		2.0	3.2	B3521	50 Ω se / 50 Ω se	post-LNA; high selectivity	
		2.0	1.6	B3522	50 Ω se / 50 Ω se	pre-LNA	
		6.0	2.8	B3525	50 Ω se / 100 Ω bal	high selectivity	
		2.4	3.3	B4050	50 Ω se / 50 Ω bal	high selectivity	
		2.4	1.3	B4060	50 Ω se / 50 Ω se	low I _A	
		2.0	1.2	B3528	50 Ω se / 100 Ω bal	low I _A	
		2.0	2.0	B3400	50 Ω se / 50 Ω se	high nearby rejection	
GPS/Galileo/Glonass	1585.50	41	1.9	B3519	50 Ω se / 50 Ω se		
		1586.00	42	1.9	B3517	50 Ω se / 100 Ω bal	
		1588.42	56	2.0	B3913	50 Ω se / 50 Ω se	
GPS/Galileo/Glonass/BeiDou	1588.00	56	1.8	B3412	50 Ω se / 50 Ω se		

SAW AE Filters for Global Navigation Satellite Systems



Special single filters

Application	f _c MHz	Usable bandwidth MHz	Insertion attenuation dB	Type	Package size mm ²	Configuration	
GPS/Galileo	1575.42	6.0	1.4	B3524	2.5 × 2.0	50 Ω se / 50 Ω se	low I _A
GPS/Glonass	1588.65	34.47	1.2	B3401	2.5 × 2.0	50 Ω se / 50 Ω se	
Glonass	1601.50	17	2.5	B3529	3.0 × 3.0	50 Ω se / 50 Ω se	
GPS	1228.00	20	3.0	B4057	3.0 × 3.0	50 Ω se / 50 Ω se	post-LNA; high selectivity

Diplexers

Application	f _c MHz	Usable bandwidth MHz	Insertion attenuation dB	Type	Package size mm ²	Configuration	
GPS/Galileo/ Glonass	1575.42	10	3.8	B3518	3.0 × 2.5	50 Ω se / 50 Ω se	
	1601.50	10	3.6				
GPS/SDARS	1575.42	2.048	1.8	B3526	3.0 × 3.0	50 Ω se / 50 Ω se	
	2326.25	12.5	1.6				
	1575.42	6	1.2	B3920	3.0 × 3.0	50 Ω se / 50 Ω se	
	2332.50	25	1.4				
GPS/Glonass/ SDARS	1592.21	37.58	1.3	B3927	3.0 × 3.0	50 Ω se / 50 Ω se	
	2332.50	25	1.6				

Band-stop filters

Application	f _c MHz	Insertion attenuation dB	Type	Package size mm ²	Configuration	
GPS	1575.42	0.65 ... 1.9	B3470	3.0 × 2.5	50 Ω se / 50 Ω se	SDARS notch (2320 to 2345 MHz) + WLAN high pass (2400 to 2485 and 4850 to 5925)
SDARS	2332.5	0.9 ... 2.0	B3471	3.0 × 2.5	50 Ω se / 50 Ω se	
SDARS	2332.5	2.0 ... 2.2	B3472	3.0 × 2.5	50 Ω se / 50 Ω se	
DVB-T	725.5	2.5 ... 5.5	B3473	3.0 × 2.5	50 Ω se / 50 Ω se	

GPS/Glonass/BeiDou extractors

Application	f _c MHz	Insertion attenuation passband dB	Type	Package size mm ²	Configuration	
GNSS/mobile communications	GPS/ Glonass	1.6 ... 1.8	B4322	2.0 × 1.6	GPS/Glonass output bal / Non-GPS/Glonass output unbal	
GNSS/mobile communications	GPS/ Glonass	1.9 ... 3.4	B3405	3.0 × 2.5	GPS/Glonass output unbal / Non-GPS/Glonass output unbal	
GNSS/mobile communications	GPS/ Glonass	1.6 ... 2.4	B4340	2.0 × 1.6	GPS/Glonass output unbal / Non-GPS/Glonass output unbal	

SAW AE Filters for WLAN and Digital Radio



WLAN						
f_c MHz	Usable bandwidth MHz	Insertion attenuation dB	Type	Package size mm ²	Configuration	
2448.5	97	1.7	B3912	3.0 × 3.0	50 Ω se / 50 Ω se	
2441.75	83.5	1.9	B3918	3.0 × 3.0	50 Ω se / 50 Ω se	high suppression SDARS

DAB (Digital audio broadcasting)						
f_c MHz	Usable bandwidth MHz	Insertion attenuation dB	Type	Package size mm ²	Configuration	
1472.0	40	1.6	B1664	3.0 × 3.0	50 Ω se / 50 Ω se	
1472.0	40	3.0	B1647	3.0 × 3.0	50 Ω se / 100 Ω bal	
1472.0	40	1.5	B4325	1.4 × 1.1	50 Ω se / 50 Ω se	
1472.0	40	2.2	B4326	1.4 × 1.1	50 Ω se / 100 Ω bal	

Satellite radio							
Application	f_c MHz	Usable bandwidth MHz	Insertion attenuation dB	Type	Package size mm ²	Configuration	
Sirius	2326.25	12.5	2.5	B1646	3.0 × 3.0	50 Ω se / 50 Ω se	
XM	2338.755	12.5	2.4	B1644	3.0 × 3.0	50 Ω se / 100 Ω bal	
XM	2338.755	12.5	2.7	B1643	3.0 × 3.0	50 Ω se / 50 Ω se	
Sirius/XM	2332.5	25	2.4	B1669	3.0 × 3.0	50 Ω se / 50 Ω se	
Sirius/XM	2332.5	25	1.5	B3595	3.0 × 3.0	50 Ω se / 50 Ω se	Pre-LNA $P_s = 15$ dBm
Sirius/XM	2332.5	25	0.8	B3404	3.0 × 3.0	50 Ω se / 50 Ω se	Pre-LNA $P_s = 18$ dBm
Sirius/XM	2332.5	25	4.5	B3442	3.0 × 3.0	50 Ω se / 50 Ω se	Post-LNA $P_s = 18$ dBm Extreme nearby out-of-band attenuation Meets new specification from SXM (2014)

Telematics Duplexers (se/bal) and Filters

3G/4G



Band	Function	Type	Package size mm ²	Configuration	
B1	duplexer	B4400	2.0 × 1.6	50 Ω se ANT / 100 Ω Rx bal	
	(D)Rx	B4302	1.4 × 1.1	50 Ω se / 150 Ω bal	
	Tx	B4309		50 Ω se / 50 Ω se	
B2	duplexer	B4480	2.0 × 1.6	50 Ω se ANT / 100 Ω Rx bal	
	(D)Rx	B4335	1.4 × 1.1	50 Ω se / 100 Ω bal	
	Tx	B4315		50 Ω se / 50 Ω se	
B3	duplexer	B4406	2.0 × 1.6	50 Ω se ANT / 100 Ω Rx bal	
	(D)Rx	B4328	1.4 × 1.1	50 Ω se / 100 Ω bal	
	Tx	B4331		50 Ω se / 50 Ω se	
B4	duplexer	B4403	2.0 × 1.6	50 Ω se ANT / 100 Ω Rx bal	
	(D)Rx	B4302	1.4 × 1.1	50 Ω se / 150 Ω bal	
	Tx	B4307		50 Ω se / 50 Ω se	
B5/BC10 (incl. B6)	duplexer	B4405	2.0 × 1.6	50 Ω se ANT / 100 Ω Rx bal	
	(D)Rx	B4324	1.4 × 1.1	50 Ω se / 100 Ω bal	
	Tx	B4311		50 Ω se / 50 Ω se	
B7	duplexer	development	2.0 × 1.6	50 Ω se ANT / 100 Ω Rx bal	
	(D)Rx	B4329	1.4 × 1.1	50 Ω se / 100 Ω bal	
	Tx	B4332		50 Ω se / 50 Ω se	
B8	duplexer	B4401	2.0 × 1.6	50 Ω se ANT / 100 Ω Rx bal	
	(D)Rx	B4323	1.4 × 1.1	50 Ω se / 100 Ω bal	
	Tx	B4330		50 Ω se / 50 Ω se	
B9	duplexer	development	2.0 × 1.6	50 Ω se ANT / 100 Ω Rx bal	
	Tx	development	1.4 × 1.1	50 Ω se / 50 Ω se	
B12 (incl. B17)	duplexer	development	2.0 × 1.6	50 Ω se ANT / 100 Ω Rx bal	
	Rx	B4339	1.4 × 1.1	50 Ω se / 50 Ω se	
	(D)Rx	development		50 Ω se / 100 Ω bal	
B13	duplexer	B4402	2.0 × 1.6	50 Ω se ANT / 100 Ω Rx bal	
	(D)Rx	B4318	1.4 × 1.1	50 Ω se / 100 Ω bal	
	Tx	B4319		50 Ω se / 50 Ω se	
B13 + B14	Rx	development	1.4 × 1.1	50 Ω se / 50 Ω se	
	Tx	B4341		50 Ω se / 50 Ω se	
B17	duplexer	B4407	2.0 × 1.6	50 Ω se ANT / 100 Ω Rx bal	
	(D)Rx	B4333	1.4 × 1.1	50 Ω se / 100 Ω bal	
	Tx	B4334		50 Ω se / 50 Ω se	
B20	duplexer	B4404	2.0 × 1.6	50 Ω se ANT / 100 Ω Rx bal	
	(D)Rx	B4321	1.4 × 1.1	50 Ω se / 100 Ω bal	
	Tx	B4320		50 Ω se / 50 Ω se	
B38	Rx	B4342	1.4 × 1.1	50 Ω se / 100 Ω bal, pre-PA	
	Tx	B4343		50 Ω se / 50 Ω se, post-PA	
B39	Rx	B4338	1.4 × 1.1	50 Ω se / 100 Ω bal, pre-PA	
B33/39 + B34	2 in 1	B4382	1.5 × 1.1	50 Ω se / 100 Ω bal, pre-PA	

SAW AE Filters for Mobile Communication Based Systems

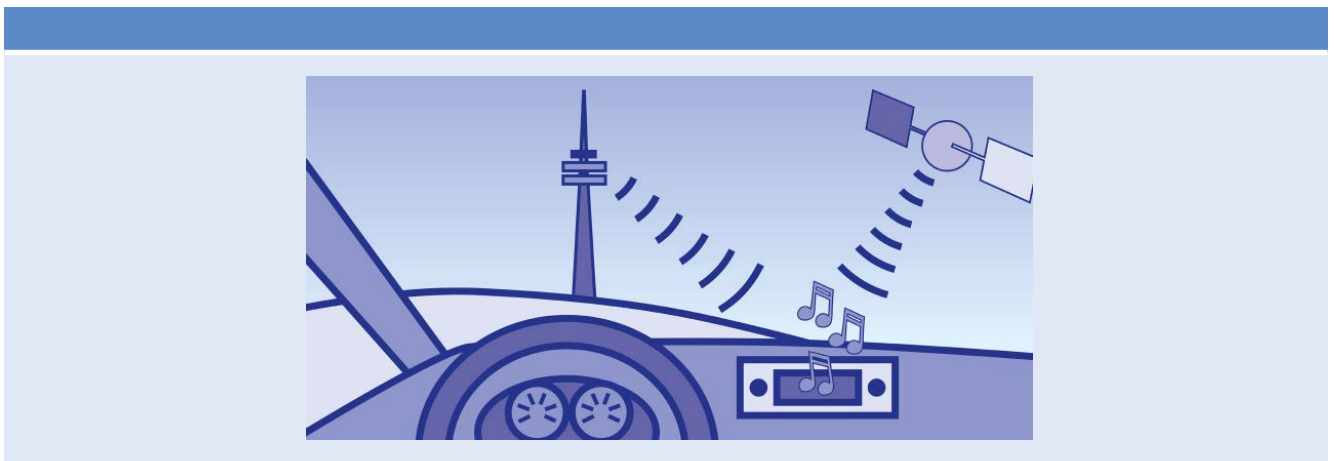
2G



Single filters				
Band	Function	Type	Configuration	
Package size: 1.4 × 1.1 mm²				
GSM850 / Band 5	Rx	B4303	50 Ω se / 150 Ω bal	
GSM900 / Band 8	Rx	B4304	50 Ω se / 150 Ω bal	
GSM1800 / Band 3	Rx	B4306	50 Ω se / 150 Ω bal	
GSM1900 / Band 2	Rx	B4305	50 Ω se / 150 Ω bal	
DCS / Band 3	Rx	B4306	50 Ω se / 150 Ω bal	

2 in 1 filters				
Band	Function	Type	Configuration	
Package size: 1.5 × 1.1 mm²				
GSM1800 / Band 3	Rx	B4381	both: 50 Ω se / 150 Ω bal	
GSM1900 / Band 2	Rx			
GSM850 / Band 5	Rx	B4380	both: 50 Ω se / 150 Ω bal	
GSM900 / Band 8	Rx			

2 in 1 filters with diplexed output				
Band	Function	Type	Configuration	
Package size: 1.5 × 1.1 mm²				
GSM1800 / Band 3	Rx	B4383	50 Ω se / 150 Ω bal	
GSM1900 / Band 2	Rx			



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