Oki Semiconductor

MBF93xx

Surface Acoustic Wave (SAW) Filters

DESCRIPTION

The new MBF93xx Surface Acoustic Wave (SAW) filters utilize OKI's third generation design and manufacturing technology to achieve a high out of band attenuation, low insertion loss, and low manufacturing cost in an industry standard 6-pin package 1.6 mm thick and 3.8 mm square.

These 50Ω matched bandpass microwave RF filters are designed for the worldwide standard wireless voice and data communications frequencies being utilized by cellular and wireless local-loop service providers. They have achieved design acceptance by leading wireless handset manufacturers in North America, Europe, and Asia.

OKI's lowest insertion loss SAW filters and high performance GaAs devices are used to reduce transmitter complexity. Receiver designs can be simplified by using the higher Tx frequency attenuation SAW filters.

These devices take advantage of OKI's over 15 year RF communications component manufacturing experience and very high volume manufacturing capability to meet true customer demands.

FEATURES

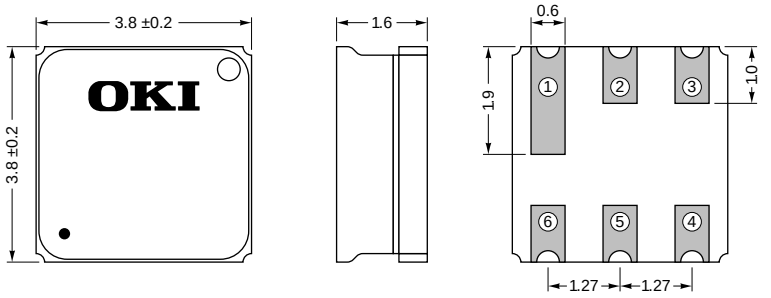
- Low insertion loss
- Small size, light weight
- 50Ω matched
- 6-pin SMD package
- High reliability

SAW Filter Summary [1]

Part Number	Description	Pass Frequency	Insertion Loss	Stop Frequency	Attenuation
MBF9311	CDMA, AMPS, & TDMA Receive filter for North America standards	869-894 MHz	‹ 3.0 dB	824-849 MHz	› 35 dB
MBF9317	CDMA, AMPS, & TDMA Transmit filter for North America standards	824-849 MHz	‹ 3.5 dB	869-894 MHz	› 30 dB
MBF9321	GSM Transmit filter for European standards	890-915 MHz	‹ 3.5 dB	935-980 MHz	› 20 dB
MBF9323	GSM Receive filter for European standards	935-960 MHz	‹ 4.0 dB	890-915 MHz	› 20 dB
MBF9332	ETACS Receive filter for world wide ETACS standard	917-950 MHz	‹ 5.0 dB	872-900 MHz	› 25 dB
MBF9341	PCS, CDMA, & TDMA Transmit filter for North America standards	1850-1910 MHz	‹ 4.0 dB	1930-1990 MHz	› 25 dB
MBF9362	PCS, CDMA, & TDMA Receive filter for North America standards	1930-1990 MHz	‹ 4.0 dB	1850-1910 MHz	› 25 dB

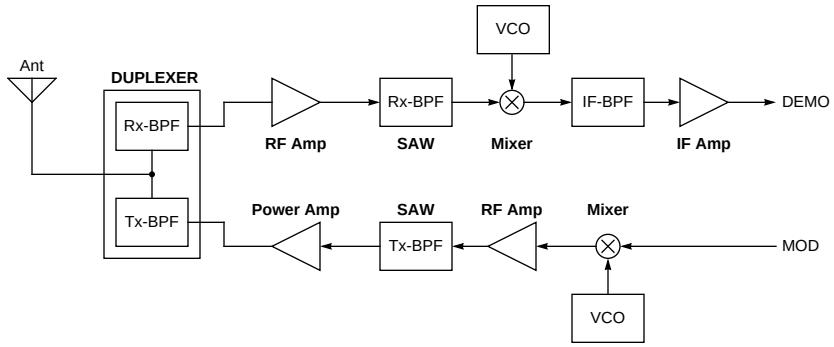
1. All parts in 6-pin ceramic square package (3.8mm x 3.8mm) by 1.6 mm thick with system matched 50Ω I/O

PIN CONFIGURATION



Pin Number	Signal
1, 3, 4, 6	Ground
2	Input
5	Output

BLOCK DIAGRAM



MBF9311 Electrical Characteristics (-30 ~ +85 °C)

Parameter	Frequency (MHz)	Min	Max	Units
Center Frequency (F_C)	Fr 881.5	–	–	MHz
Bandwidth (BW)	Fr ±12.5	–	–	MHz
Insertion Loss across BW	869 ~ 894	–	3.0	dB
Return Loss across BW		10	–	dB
Stop Band Attenuation	0.3 ~ 824	20	–	dB
	824 ~ 849	35	–	dB
	979 ~ 1004	25	–	dB
	1008 ~ 1114	20	–	dB

Terminating Impedance = 50 Ω

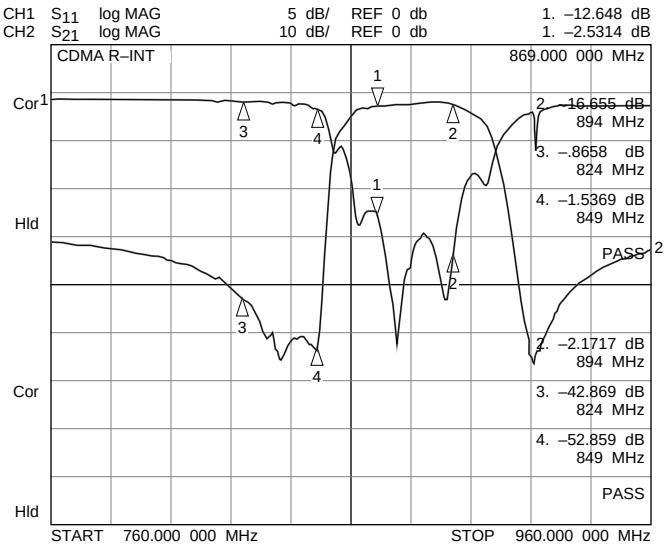


Figure 1. MBF9311 Frequency Response

MBF9317 Electrical Characteristics (-30 ~ +85 °C)

Parameter	Frequency (MHz)	Min	Max	Units
Center Frequency (F_C)	Ft 836.5	–	–	MHz
Bandwidth (BW)	Fr ±12.5	–	–	MHz
Insertion Loss across BW	824 ~ 849	–	3.5	dB
Return Loss across BW		10.0	–	dB
Stop Band Attenuation	0.3 ~ 800	28	–	dB
	869 ~ 1049	30	–	dB
	1049 ~ 2000	25	–	dB

Terminating Impedance = 50 Ω

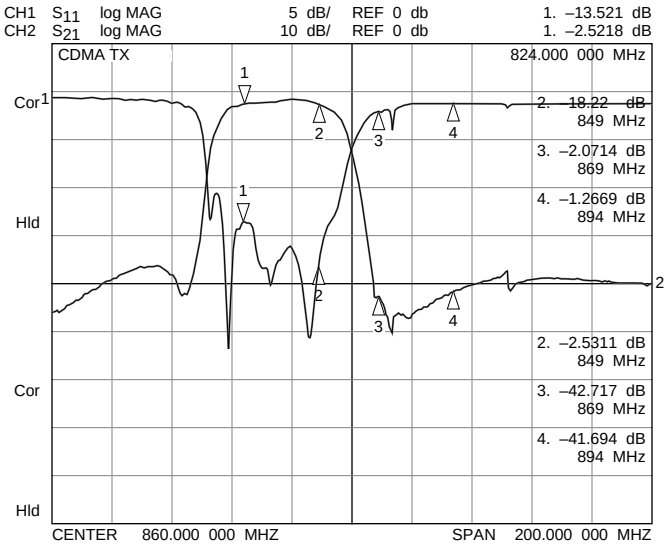


Figure 2. MBF9317 Frequency Response

MBF9321 Electrical Characteristics (-30 ~ +85 °C)

Parameter	Frequency (MHz)	Min	Max	Units
Center Frequency (F_C)	902.5	–	–	MHz
Bandwidth (BW)	Ft ±12.5	–	–	MHz
Insertion Loss across BW	890 ~ 915	–	3.5	dB
Ripple across BW		–	2.0	dB
VSWR across BW		–	2.5	–
Stop Band Attenuation	500 ~ 870	20	–	dB
	935 ~ 980	20	–	dB
	980 ~ 1100	26	–	dB
	1100 ~ 1500	15	–	dB

Terminating Impedance = 50 Ω

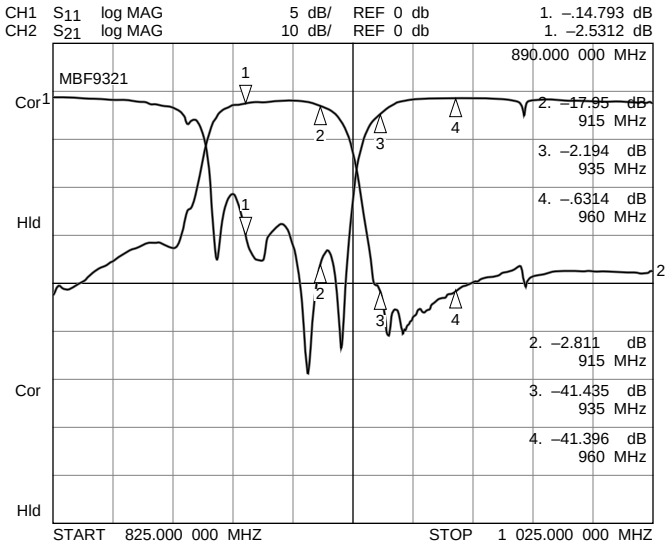


Figure 3. MBF9321 Frequency Response

MBF9323 Electrical Characteristics (-30 ~ +85 °C)

Parameter	Frequency (MHz)	Min	Max	Units
Center Frequency (F_C)	947.5	–	–	MHz
Bandwidth (BW)	Ft ±12.5	–	–	MHz
Insertion Loss across BW	935 ~ 960	–	3.5	dB
Ripple across BW		–	2.0	dB
VSWR across BW		–	2.5	–
Stop Band Attenuation	500 ~ 870	30	–	dB
	890 ~ 915	20	–	dB
	980 ~ 1025	15	–	dB
	1025 ~ 1070	33	–	dB
	1070 ~ 1105	30	–	dB
	1105 ~ 1500	20	–	dB

Terminating Impedance = 50 Ω

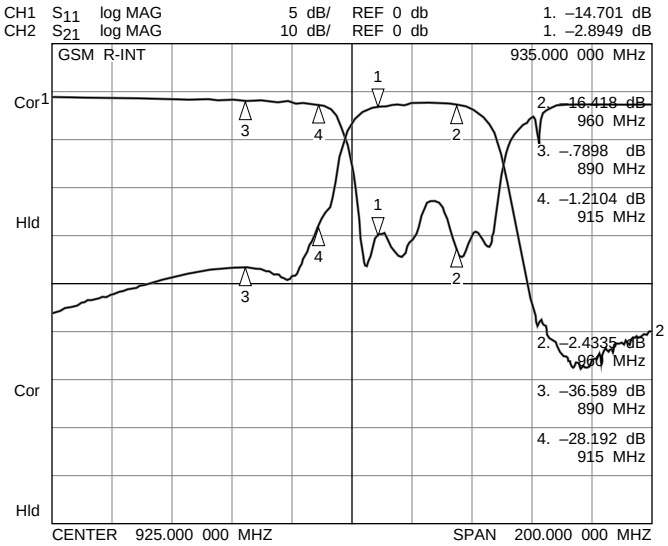


Figure 4. MBF9323 Frequency Response

MBF9332 Electrical Characteristics (-30 ~ +85 °C)

Parameter		Frequency (MHz)	Min	Max	Units
Center Frequency (F_C)		933.5	–	–	MHz
Bandwidth (BW)		Ft ±16.5	–	–	MHz
Insertion Loss across BW		917 ~ 950	–	5.5	dB
VSWR across BW			–	2.0	–
Stop Band Attenuation		0 ~ 872	20	–	dB
		872 ~ 900	25	–	dB
		900 ~ 905	10	–	dB
		1007 ~ 1040	30	–	dB
		1040 ~ 2000	20	–	dB
Output Reflection Coefficient	Mag	1031~1065	0.86		Degrees
	Angle		-155	-125	Degrees

Terminating Impedance = 50 Ω

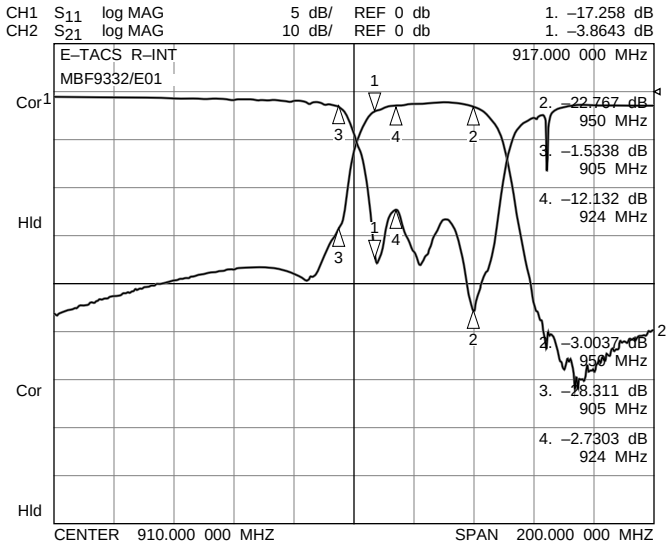


Figure 5. MBF9332 Frequency Response

MBF9341 Electrical Characteristics (-30 ~ +85 °C)

Parameter	Frequency (MHz)	Min	Typ	Max	Units
Center Frequency (F_C)	1880	–	–	–	MHz
Bandwidth (BW)	Ft ±30	–	–	–	MHz
Insertion Loss across BW	1850~1910	–	–	5.0	dB
Ripple across BW		–	2.0	–	dB
VSWR across BW		–	–	2.0	–
Stop Band Attenuation	1590 ~ 1650	18	–	–	dB
	1720 ~ 1780	16	–	–	dB
	1930 ~ 1990	7	14	–	dB

Terminating Impedance = 50 Ω

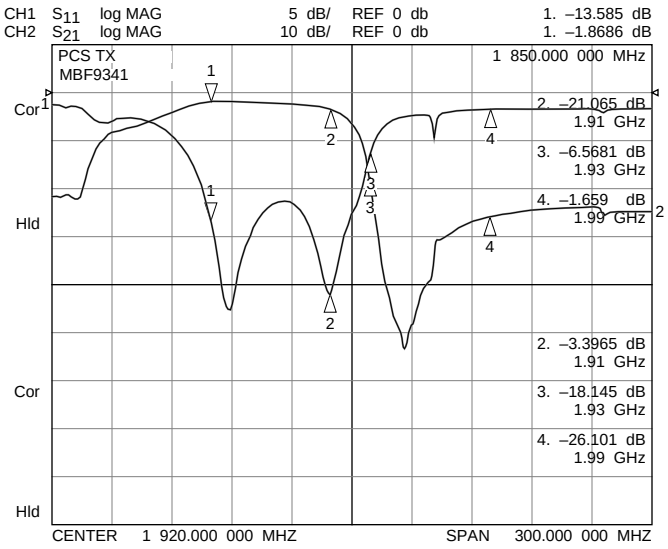


Figure 6. MBF9341 Frequency Response

MBF9362 Electrical Characteristics (-30 ~ +85 °C)

Parameter	Frequency (MHz)	Min	Typ	Max	Units
Center Frequency (F_C)	Fr: 1960				MHz
Bandwidth (BW)	Fr± 30				MHz
Insertion Loss across BW	1930 ~ 1990	–	–	5.0	dB
Ripple across BW		–	2.0	3.0	dB
VSWR across BW		–	–	2.0	–
Stop Band Attenuation	1509 ~1570	20	–	–	dB
	1720 ~ 1780	20	–	–	dB
	1850 ~ 1910	13	26	–	dB

Terminating Impedance = 50 Ω

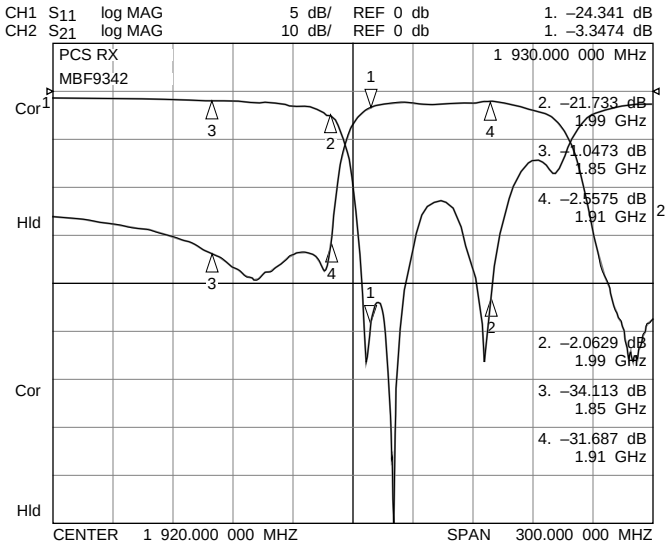


Figure 7. MBF9362 Frequency Response

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