Mixers

All Mixers | Microlithic & MMIC Chip/Module (Recommended) | Microlithic & MMIC Surface Mount (Recommended) | High Linearity (T3) to 40 GHz (Recommended) | Double Balanced to 65 GHz (Legacy) | Triple Balanced to 50 GHz (Legacy) | Special Function (IQ • IR • SSB)

Marki Microwave has an extensive line of mixers to cover any frequency band to 65 GHz, all built on a legacy of providing the best mixer performance in the world for over 20 years.

For a given mixer requirement, we recommend starting with the mixer search engine to determine which mixers will cover your frequency band of interest. Based on this information you can select from each of our mixer lines. Most mixer lines are available in connectorized, carrier, or surface mount (below 26 GHz) packages. Keep in mind that the 'best' mixer is the one most suitable for your application, and this can only be decided by careful consideration of the datasheet and possibly experimenting with the different mixers.

- **Microlithic Mixers** represent the most advanced mixer technology platform available from anywhere, including Marki. These mixers are fabricated using a patent-pending material system to provide a 14x size reduction over comparable hybrid mixers. They are computer optimized to offer superior isolation, spurious, and phase characteristics. They offer overlapping IF and LO bands, and broad flat conversion loss at RF/LO frequencies above 2 GHz.
- **T3 Mixers (and T3A Mixers with Integrated LO Amplifier)** are the most sophisticated mixer circuit available. For applications where intermodulation distortion (IP3 or two tone) and input power compression (1-dB compression) are system limitations. When provided with a square wave LO drive (generated by the integrated LO amplifier in T3A units) they provide the highest possible IP3, 1-dB compression, and spurious product prevention, particularly at frequencies below 10 GHz.
- **Double Balanced Mixers** are good general purpose mixers for most applications. Different product lines offer different tradeoffs primarily between bandwidth, isolations, and package options.
- **Triple Balanced Mixers** offer overlapping IF and LO/RF bands. Depending on the application they may also offer superior spurious suppression and linearity.
- **Special Function Mixers** use integrated in-phase power dividers and quadrature couplers to enable IQ modulation and image/sideband suppression.

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Microlithic & MMIC Chip/Module

		RF [GHz]		LO [GHz]		IF [GHz]					
Model	Datasheet	Low	High	Low	High	Low	High	Conversion Loss [dB]	Isolations L-R [dB]	Isolations L-I [dB]	Surface Mount Option
ML1-0113		1.5	13	1.5	13	DC	1.5	7	40	20	N
ML1-0220		2	20	2	20	DC	4	7	40	20	N
MM1-0312H		3	12	3	12	DC	4.5	8	52	27	N
MM1-0312S		3	12	3	12	DC	4.5	8	52	27	N
MM1-0320H		3.5	20	3.5	20	DC	4	8	52	27	N
MM1-0424S		4.5	24	4.5	24	DC	4	8	49	29	N
MM1-0626H		6	26.5	6	26.5	DC	9	8	53	30	N
MM1-0626S		6	26.5	6	26.5	DC	9	8	53	30	N
ML1-0732		7	32	7	32	DC	8	8	42	25	N
ML1-0936		9	36	9	36	DC	12	7	33	28	N
ML1-1040		10	40	10	40	DC	16	8	43	20	N
ML1-1050		10	50	10	50	DC	16	8	43	20	N
MM1-1140H		11	40	11	40	DC	12	7	47	25	N
ML1-1644		16	44	16	44	DC	21	7	40	25	N
ML1-1850		18	50	18	50	DC	24	8	37	23	N
MM1-1850H		18	50	18	50	DC	20	8	43	34	N
MM1-1850S		18	50	18	50	DC	20	8.5	43	34	N
MM1-1857H		18	57	18	57	DC	21	7.5	45	30	N
MM1-2567LS		25	67	25	67	DC	30	9	33	23	N

Microlithic and MMIC Surface Mount

		RF [GHz]		LO [GHz]		IF [GHz]					
Model	Datasheet	Low	High	Low	High	Low	High	Conversion Loss [dB]	Isolations L-R [dB]	Isolations L-I [dB]	Surface Mount Option
ML1-0110SM		1.5	10	1.5	10	DC	2	7	38	17	Y
ML1-0218SM		2	18	2	18	DC	4	7	40	20	Y
MM1-0312HSM		3	12	3	12	DC	4.5	7	49	29	Y
MM1-0312SSM		3	12	3	12	DC	4.5	7	49	29	Y
MM1-0320HSM		3.5	20	3.5	20	DC	4	8	49	29	Y
MM1-0424SSM		4.5	24	4.5	24	DC	4	8	48	30	Y
MM1-0626HSM		6	26.5	6	26.5	DC	9	7	45	30	Y
MM1-0626SSM		6	26.5	6	26.5	DC	9	8	45	30	Y
MM1-0726HSM		7	26.5	7	26.5	DC	9	7.5	27	26	Y
ML1-0832SM		8	32	8	32	DC	10	7	36	27	Y
MM1-1130HSM		11	30	11	30	DC	12	7	40	28	Y

T3 Series Mixers - High Intercept and Broadband (Triple-Balanced) - View All

		RF [MHz]		LO [MHz]		IF [MHz]					
Model	Datasheet	Low	High	Low	High	Low	High	Conversion Loss [dB]	Isolations L-R [dB]	Isolations L-I [dB]	Surface Mount Option
T3-03		1	3400	1	3400	1	3400	7	30	30	Y
T3-04		1	4000	1	4000	1	4000	7	30	28	Y
T3-05		1	5000	1	5000	1	4000	7	30	28	Y
T3-06		1	6000	1	6000	1	4000	7	30	27	Y
T3-07		1	7000	1	7000	1	4000	7.5	24	27	Y
T3-08		10	8000	10	8000	1	4000	7.5	24	27	Y
T3-10		10	10000	10	10000	1	4000	7.5	24	27	Y
T3-12		10	12000	10	12000	1	4000	7.5	24	27	Y
T3-18		10	18000	10	18000	1	10000	7.5	25	40	Y
T3H-18		10	18000	10	18000	10	18000	8.5	30	33	Y
T3-20		10	20000	10	20000	1	10000	7.5	24	37	Y
T3H-20		10	20000	10	20000	10	18000	8.5	30	33	Y
T3-0218		2000	18000	2000	18000	1	6000	7	25	28	Y
T3-0316		3000	16000	3000	16000	1	4000	7.5	25	25	Y
T3-0838		8000	38000	8000	38000	10	10000	8.0	28	40	N
T3-1040		10000	40000	10000	40000	1000	18000	8.0	28	30	N

T3A Series Mixers - High Intercept (Triple-Balanced) with Integrated Amplifier - View All

		RF [MHz]		LO [MHz]		IF [MHz]					
Model	Datasheet	Low	High	Low	High	Low	High	Conversion Loss [dB]	DC Voltage [V]	DC Current [mA]	Surface Mount Option
T3A-07SMG		10	7000	10	7000	1	4000	6.5	+/-5	160	Y
T3A-07PA		10	7000	10	7000	1	4000	6.5	+7	250	N

M1 Series Mixers - General Purpose (Double-Balanced) - View All

		RF [GHz]		LO [GHz]		IF [GHz]					
Model	Datasheet	Low	High	Low	High	Low	High	Conversion Loss [dB]	Isolations L-R [dB]	Isolations L-I [dB]	Surface Mount Option

		RF [GHz]		LO [GHz]		IF [GHz]					
Model	Datasheet	Low	High	Low	High	Low	High	Conversion Loss [dB]	Isolations L-R [dB]	Isolations L-I [dB]	Surface Mount Option
M1-0008		.01	8	.01	8	DC	2	7.5	40	25	Y
M1-0012		.01	12	.01	12	DC	2	7.5	35	25	Y
M1-0204		2	4	2	4	DC	2	5	38	20	Y
M1-0208		2	8	2	8	DC	2	6	38	20	Y
M1-0212		2	12	2	12	DC	2	6	35	20	Y
M1-0218		2	18	2	18	DC	2	7	35	25	N
M1-0220		2	20	2	20	DC	2	7	35	25	N
M1-0310		3	10	3	10	DC	3	6	40	40	Y
M1-0408		4	8	4	8	DC	4	5.5	35	25	Y
M1-0412		4	12	4	12	DC	4	5	40	30	Y
M1-0420		4	20	4	20	DC	4	6	35	30	Y
M1-0616		6	16	6	16	DC	4	5.5	35	30	Y
M1B-0618		6	18	6	18	DC	4	5.5	33	30	Y
M1-0620		6	20	6	20	DC	6	5.5	40	20	Y
M1R-0726		7	26.5	7	26.5	DC	8	6	38	25	N
M1-0818		8	18	8	18	DC	4	6	35	30	Y
M1-1020		10	20	10	20	DC	4	6	35	30	Y

M2 Series Mixers - Broadband (Triple-Balanced) - View All

		RF [GHz]		LO [GHz]		IF [GHz]					
Model	Datasheet	Low	High	Low	High	Low	High	Conversion Loss [dB]	Isolations L-R [dB]	Isolations L-I [dB]	Surface Mount Option
M2-0020		1	20	.5	20	.001	6	7.5	24	25	N
M2-0026		.01	26	.01	26	.001	6	8	20	20	N
M2-0208		2	8	2	8	.001	6	7	20	30	Y
M2-0218		2	18	2	18	.001	6	7.5	25	27	Y
M2B-0218		2	18	2	18	1	12	7.5	30	23	N
M2-0219		2	19	2	19	.001	6	7	25	25	N
M2-0220		2	20	2	20	.001	6	7.5	25	27	Y
M2H-0220		2	20	2	20	1	10	7	27	27	Y
M2-0226		2	26.5	2	26.5	.001	6	7.5	25	28	N
M2B-0226LA		2	26	2	26	1	15	8	15	15	N
M2H-0226		2	26.5	2	26.5	1	10	8.5	23	25	N
M2-0240		2	40	2	40	.001	6	9	30	30	N
M2-0243LPV		2	43	2	43	.4	43	10	30	25	N
M2-0250LNVT		2	50	2	50	.4	50	10	25	25	N
M2-0440		4	40	4	40	.5	20	10	25	25	N

M4 Series Mixers - Ultra Wideband (Double-Balanced) - View All

		RF [GHz]		LO [GHz]		IF [MHz]					
Model	Datasheet	Low	High	Low	High	Low	High	Conversion Loss [dB]	Isolations L-R [dB]	Isolations L-I [dB]	Surface Mount Option
M4-0040		.5	40	.5	40	DC	400	8	28	30	N

		RF [GHz]		LO [GHz]		IF [MHz]					
Model	Datasheet	Low	High	Low	High	Low	High	Conversion Loss [dB]	Isolations L-R [dB]	Isolations L-I [dB]	Surface Mount Option
M4-0050		.5	50	.5	50	DC	300	9	27	27	N
M4-0126		1	26.5	1	26.5	DC	700	8.5	30	30	N
M4-0140		1	40	1	40	DC	700	8.5	30	27	N
M4-0150		1	50	1	50	DC	400	9	27	27	N
M4-0165		1	65	1	65	DC	400	9.5	27	27	N

M8 Series Mixers - High Performance, High Isolation (Double-Balanced) - View All

		RF [GHz]		LO [GHz]		IF [GHz]				
Model	Datasheet	Low	High	Low	High	Low	High	Conversion Loss [dB]	Isolations L-R [dB]	Isolations L-I [dB]
M8-0326		3	26.5	3	26.5	DC	2	5.5	35	25
M8-0412		4	12	4	12	DC	2	5	40	25
M8-0420		4	20	4	20	DC	2	5.5	40	30

M9 Series Mixers - Millimeter Wave (Double-Balanced) - View All

		RF [GHz]		LO [GHz]		IF [GHz]				
Model	Datasheet	Low	High	Low	High	Low	High	Conversion Loss [dB]	Isolations L-R [dB]	Isolations L-I [dB]
M9-0444		4	44	4	44	DC	3	7.5	25	25
M9-0465		4	65	4	65	DC	3	9	25	25
M9-0540		5	40	5	40	DC	3	7.5	25	25
M9-0750		7	50	7	50	DC	10	7.5	25	25
M9-0942		9	42	9	42	1	22	9	25	25
M9-0950		9	50	9	50	1	22	10	25	25
M9D-2065		20	65	5	30	1	22	12	30	30

IQ Mixers - View All

		RF [GHz]		LO [GHz]		IF [MHz]							
Model	Datasheet	Low	High	Low	High	Low	High	Conversion Loss [dB]	Image Rejection [dB]	Amplitude Deviation [dB]	Phase Deviation [Degrees]	Isolations L-R [dB]	Isolations L-I [dB]
MLIQ-0218		2	18	2	18	DC	3500	8.5	29	0.21	5	45	25
MLIQ-0218SM		2	18	2	18	DC	3500	8.5	29	0.21	5	45	25
MLIQ-0416		4	16	4	16	DC	3500	8.5	32	0.13	3.5	45	25
MLIQ-1845		18	45	18	45	DC	20000	8	31	0.11	5	37	29
IQ-1545		1.5	4.5	1.5	4.5	DC	500	5.5	25	0.3	3	43	30
IQ-0255		2	5.5	2	5.5	DC	500	5.5	23	0.3	3	42	30
IQ-0307		3	7	3	7	DC	500	5.8	23	0.3	3	30	20
IQ-4509		4.5	9	4.5	9	DC	500	5.5	23	0.3	4	30	20
IQ-0618		6	18	6	18	DC	500	7.5	23	0.4	3	35	20
IQB-0618		6	18	6	18	DC	5000	11.0	23	0.5	5	20	20

Image Reject and Single Sideband Mixers - View All

		RF [GHz]		LO [GHz]							
Model	Datasheet	Low	High	Low	High	IF [MHz]	IF [MHz]	Conversion Loss [dB]	Image Rejection [dB]	Isolations L-R [dB]	Isolations L-I [dB]

		RF [GHz]		LO [GHz]							
Model	Datasheet	Low	High	Low	High	IF [MHz]	IF [MHz]	Conversion Loss [dB]	Image Rejection [dB]	Isolations L-R [dB]	Isolations L-I [dB]
IR-4509		4.5	9	4.5	9	50	90	5.5	23	30	25
IRW-0618		6	18	6	18	4	210	7.5	23	35	25
SSB-0618		6	18	6	18	4	210	7.5	23	35	25

Amplifiers

All Amplifiers | Surface Mount LO Driver Amplifiers | LO Driver Amplifier Modules | Millimeter Wave Amplifier Modules | Data Amplifier Modules | Legacy Amplifiers

Marki Microwave specializes in LO buffer driver amplifiers suitable for driving all Marki Microwave mixers with LO signals up to 50 GHz, including the following series:

- The ADM series surface mount amplifiers are efficient GaAs pHEMT distributed amplifiers. Each model is optimized for a different application, including driving of T3 series mixers with various bias current, size, and performance tradeoffs. In addition to use as LO buffer amplifiers, each of these amplifiers can be used effectively as clock distribution and general purpose signal chain amplifiers as well.
- The ADM series packaged amplifiers use the same optimized pHEMT distributed amplifier MMICs combined with low loss, low resonance bias tees in a connectorized module. They can be used for driving all Marki mixers up to I level diodes, across a broad frequency range.
- The Millimeter wave series amplifiers offer high saturated output power across K-Ka band frequencies, suitable for driving higher frequency mixers.
- The AMZ-40 amplifier is a wideband, 100 kHz to 40 GHz amplifier intended for use in broadband microwave and high data rate systems

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Surface Mount LO Driver Amplifiers

			Frequency Band [GHz]						
Model	Datasheet	Application	Low	High	Typical Current [mA]	Saturated Output Power [dBm]	Gain [dB]	Size	Bias
ADM-0026-5929SM		Best T3 Driver	DC	26.5	165	20	13.5	4mm + bias tee	External
ADM-0126-5835SM		Better T3 Driver	1	26.5	75	17	11	4mm	Internal
ADM-0012-5931SM		Low Freq T3 Driver/T3A Pre-amp	DC	12	85	15	11	3mm + blocking caps	Either
ADM-0026-5931SM		T3 Driver/T3A Pre-amp	DC	26.5	75	16	10.5	4mm	Either
ADM-0026-5915SM		MM1/ML1 Mixer Driver	DC	26.5	125	17	13.5	4mm + blocking caps	Either
ADM-0126-5928SM		ML1/MM1 Mixer Driver	0.3	26.5	125	17	13.5	4mm	Internal

LO Driver Amplifier Modules

		Frequency Band [GHz]		Input Power for Saturation [dBm]					
Model	Datasheet	Low	High	Low	High	Saturated Output Power [dBm]	Small Signal Gain [dB]	S-Params	Surface Mount Option
ADM1-0026PA		.005	26.5	+5	+15	20	12	ADM1-0026PA	N

Millimeter Wave Amplifier Modules

		Frequency Band [GHz]		Input Power for Saturation [dBm]					
Model	Datasheet	Low	High	Low	High	Saturated Output Power [dBm]	Small Signal Gain [dB]	S-Params	Surface Mount Option
A-1844		18	44	0	+5	18	17	-	N
A-2050		20	50	0	+5	21	23	-	N

Data Amplifier Modules

Model	Datasheet	Max Data Rate [Gb/s]	Saturated Output [Vpp]	Additive Jitter [fs]	Rise/Fall Time [ps]	DC Power Dissipation [W]
AMZ-40		43	9	750	10	1.6

Legacy Amplifiers

		Frequency Band [GHz]		Input Power for Saturation [dBm]					
Model	Datasheet	Low	High	Low	High	Saturated Output Power [dBm]	Small Signal Gain [dB]	S-Params	Surface Mount Option
A-0010		.005	10	+5	+10	23	N/A	A-0010	Y
A-0015		.005	15	+5	+10	23	N/A	A-0015	Y
A-0020		.005	20	+5	+10	22	N/A	A-0020	Y
A-0030		.005	30	+5	+10	21	N/A	A-0030	Y
A-0110		1	10	0	+5	21	26	A-0110	Y
A-0115		1	15	0	+5	21	26	A-0115	Y
A-0120		1	20	0	+5	21	26	A-0120	Y
A-0126		1	26	0	+5	21	26	A-0126	Y
AP-0010		.020	10	+5	+17	24	22		Y
AP-0015		.020	15	+5	+17	23	21		Y
AP-0020		.020	20	+5	+17	23	21		Y
AP-0025		.020	25	+5	+17	23	20		Y
AP-0110		1	10	0	+18	22	30	AP-0110	Y
AP-0115		1	15	0	+18	22	30	AP-0115	Y
AP-0120		1	20	0	+18	21	30	AP-0120	Y
AP-0125		1	25	0	+18	22	27	AP-0125	Y

Baluns / Inverters

All Baluns / Inverters | Test and Measurement Baluns | Surface Mount Baluns and Transformers | Pulse Inverters

For a complete introduction to baluns and transformers, please see the Marki Microwave Balun Basics Primer.

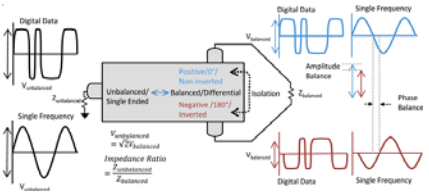
Marki Microwave specializes in broadband, microwave frequency baluns and balun transformers for test and measurement and high speed analog to digital interface applications. Our balun line consists of 3 different types of baluns, two of which are available as surface mount or connectorized:

Our transmission line transformer baluns are based on a traditional transmission line assisted with magnetic material to make broadband operation (200 kHz to 10 GHz connectorized, 500 kHz to 9 GHz surface mount) achievable with excellent amplitude balance, phase balance, and common mode rejection. These baluns are ideally suited to applications involving baseband data, analog to digital interfaces, and other test and measurement applications.

The basis for all these products is a 1:1 transmission line transformer. In some products (BALH-0003, BALH-0003SMG, BALH-0006, BALH-0006SMG, BALH-0009SMG) this transformer is sold by itself. In other products (BAL-0003, BAL-0003SMG, BAL-0006, BAL-0006SMG, BAL-0010, BAL- 0009SMG) the transformer is resistively matched on the differential ports to 50 ohms. The major difference is an improved common port return loss at the expense of ~2dB of insertion loss.

The second type of baluns is the power divider-inverter type of balun. This consists of a Wilkinson power divider, providing minimal loss and isolation, along with a high frequency inverter that allows data operation to over 50 Gb/s. These baluns are only available in connectorized fashion as the BAL-0026, BAL-0036, BAL-0050, and BAL-0067. These baluns maintain flat amplitude response to 36 GHz, and superior common mode rejection to very high frequencies.

The final type of balun is the capacitively coupled balun. BAL-0106, BAL-0212, and BAL-0520 are banded, capacitively coupled transmission line baluns. They have low insertion loss and extremely high levels of balance, at the expense of a reduced low end capability. They can handle significantly more power because they have no resistors to burn up and no ferrite to saturate.



For more information, please see Marki Microwave Baluns, Transformers, and Pulse Inverters.

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All Baluns / Inverters - View All

Test and Measurement Baluns - View All

		Frequency							
Model	Datasheet	Low	High	Amplitude Balance [dB]	Phase Balance [Degrees]	Total Insertion Loss [dB]	Common Mode Rejection (dB)	S-Parameters	Surface Mount Option
BAL-0003		200 kHz	3 GHz	±0.05	±1	7	45	BAL-0003	N
BALH-0003		200 kHz	3 GHz	±0.1	±1	4.5	45	BALH-0003	N
BAL-0006		200 kHz	6 GHz	±0.05	±1	7.5	40	BAL-0006	N
BALH-0006		200 kHz	6 GHz	±0.1	±1	5.5	40	BALH-0006	N
BAL-0010		200 kHz	10 GHz	±0.2	±2	8	35	BAL-0010	N
BALH-0010		200 kHz	10 GHz	±0.2	±2	5.5	35	BALH-0010	N
BAL-0106		1.2 GHz	6 GHz	±0.1	±2	3.6	38	BAL-0106	N
BAL-0212		2.6 GHz	12 GHz	±0.1	±2	4	35	BAL-0212	N
BAL-0520		5 GHz	20 GHz	±0.2	±3	4.5	30	BAL-0520	N
BAL-0026		300 kHz	26.5 GHz	±0.5	±3	5.5	30	BAL-0026	N
BAL-0036		300 kHz	36 GHz	±0.5	±3	6	30	BAL-0036	N
BAL-0050		300 kHz	50 GHz	±0.7	±4	6	28	BAL-0050	N
BAL-0067		300 kHz	67 GHz	±0.7	±4	6	27	BAL-0067	N

Surface Mount Baluns and Transformers - View All

		Frequency						

Model	Datasheet	Low	High	Amplitude Balance [dB]	Phase Balance [Degrees]	Total Insertion Loss [dB]	Common Mode Rejection (dB)	S-Parameters	Surface Mount Option
BAL-0003SMG		500 kHz	3 GHz	±0.3	±3	6.8	35	BAL-0003SMG	Y
BALH-0003SMG		500 kHz	3 GHz	±0.2	±2	5	35	BALH-0003SMG	Y
BAL-0006SMG		500 kHz	6 GHz	±0.4	±3	7	30	BAL-0006SMG	Y
BALH-0006SMG		500 kHz	6 GHz	±0.2	±3	5	30	BALH-0006SMG	Y
BAL-0009SMG		500 kHz	9 GHz	±0.6	±5	7.5	26	BAL-0009SMG	Y
BALH-0009SMG		500 kHz	9 GHz	±0.8	±5	5.5	25	BALH-0009SMG	Y
BAL-0208SMG		2 GHz	8 GHz	±0.3	±1	5.5	34	BAL-0208SMG	Y
BAL-0416SMG		4 GHz	16 GHz	±0.4	±1	6.3	35	BAL-0416SMG	Y
BAL-0620SMG		6 GHz	20 GHz	±0.2	±1	5.6	34	BAL-0620SMG	Y

Pulse Inverters - View All

		Frequency				
Model	Datasheet	Low	High	Insertion Loss [dB]	Rise/Fall Time [ps]	S-Parameters
INV-0026		200 kHz	26.5 GHz	2	13	INV-0026
INV-0040		200 kHz	40 GHz	2.5	13	INV-0040
INV-0065		200 kHz	65 GHz	5	12	INV-0065

Bias Tees / DC Blocks

All Bias Tees / DC Blocks | Surface Mount, Lead-Free / RoHS Compliant Bias | Surface Mount, Leaded Bias Tees | Connectorized Bias Tees | High Power Bias Tees | Coaxial Microwave DC Blocks

Bias Tees and DC blocks are actually specific forms of very low frequency filters. Specifically, a Bias Tee is a diplexer with an extremely low crossover frequency, while a DC block is a high pass filter with a very low cutoff frequency. All Marki Microwave bias tees and DC blocks offer low, flat insertion loss up to high frequencies.

Marki offers two basic designs for surface mount bias tees. The design used only in the BT-0030SM/G, includes a bypass capacitor on the DC input line, making it immune to external disturbances on the bias line, but it also cannot be improved with additional external components. The performance of the BT-0030SM/G does not change with the current load on the DC bias line. The design used in the BT-0014SM/G, BT-0024SM/G, and BT-0034SM/G does not include an internal bypass capacitor directly on the DC blocking line. The low frequency on these bias tees is lower (500 kHz instead of 10 MHz), but is dependent on the bias conditions. It can be extended lower and made more insensitive to current with an external coil (down to 4 kHz). An external bypass capacitor can also be added to make it more immune to bias line disturbances.

All bias tees are constructed using a custom-made, resonance-free conical inductor to achieve extremely broadband performance. These bias tees offer superior performance, reliability, and ease-of-use when compared to cumbersome bias tees employing off-the-shelf conical inductors.

Marki DC blocks use a proprietary coaxial construction to offer extremely high frequency operation with low, flat insertion loss.

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Bias-Tees - Surface Mount, Lead-Free - View All

		Frequency							
Model	Datasheet	Low	High	Insertion Loss [dB]	DC Current [A]	DC Port Isolation [dB]	DC Voltage [V]	S-Parameters	Surface Mount Option
BT-0014SMG		500 kHz	14 GHz	0.5	0.5	40	30	BT-0014SMG	Y
BT-0024SMG		500 kHz	24 GHz	1	0.5	40	30	BT-0024SMG	Y
BT-0030SMG		20 MHz	30 GHz	1	0.5	40	30	BT-0030SMG	Y
BT-0034SMG		500 kHz	34 GHz	1	0.5	40	30	BT-0034SMG	Y

Bias-Tees - Surface Mount, Leaded - View All

		Frequency							
Model	Datasheet	Low	High	Insertion Loss [dB]	DC Current [A]	DC Port Isolation [dB]	DC Voltage [V]	S-Parameters	Surface Mount Option
BT-0014SM		500 kHz	14 GHz	0.5	0.5	40	30	BT-0014SM	Y
BT-0024SM		500 kHz	24 GHz	1	0.5	40	30	BT-0024SM	Y
BT-0030SM		20 MHz	30 GHz	1.0	0.5	40	30	BT-0030SM	Y
BT-0034SM		500 kHz	34 GHz	1.0	0.5	40	30	BT-0034SM	Y

Bias-Tees - Connectorized - View All

		Frequency							
Model	Datasheet	Low	High	Insertion Loss [dB]	DC Current [A]	DC Port Isolation [dB]	DC Voltage [V]	S-Parameters	Surface Mount Option
BT-0018		40 kHz	18 GHz	0.6	0.5	35	30	BT-0018	N
BT-0025		40 kHz	25 GHz	0.8	0.5	35	30	BT-0025	N
BT-0026		10 MHz	26.5 GHz	0.8	0.5	30	30	BT-0026	N
BT-0040		4 kHz	40 GHz	1.5	0.5	30	30	BT-0040	N
BTN-0040		40 kHz	40 GHz	1.5	0.5	30	30	BTN-0040	N
BT-0050		4 kHz	50 GHz	1.8	0.5	30	30	BT-0050	N
BTN-0050		40 kHz	50 GHz	1.8	0.5	30	30	BTN-0050	N
BT-0065		4 kHz	65 GHz	1.8	0.5	30	30	BT-0065	N
BTN-0065		40 kHz	65 GHz	2.0	0.5	25	30	BTN-0065	N

High Power Bias Tees - View All

		Frequency							
Model	Datasheet	Low	High	Insertion Loss [dB]	DC Current [A]	DC Port Isolation [dB]	DC Voltage [V]	S-Parameters	Surface Mount Option
BTN1-0018		500 kHz	18 GHz	0.7	1	30	50	BTN1-0018	N
BTN2-0018		3 MHz	18 GHz	0.7	2	30	50	BTN2-0018	N
BT1-0026		50 kHz	26.5 GHz	1	1	30	50	BT1-0026	N
BTN1-0026		500 kHz	26.5 GHz	1	1	30	50	BTN1-0026	N
BT2-0026		100 kHz	26.5 GHz	1	2	30	50	BT2-0026	N
BTN2-0026		3 MHz	26.5 GHz	1	2	30	50	BTN2-0026	N
BT1-0040		50 kHz	40 GHz	1.5	1	30	50	BT1-0040	N
BTN1-0040		500 kHz	40 GHz	1.5	1	30	50	BTN1-0040	N
BT2-0040		100 kHz	40 GHz	1.5	2	30	50	BT2-0040	N
BTN2-0040		3 MHz	40 GHz	1.5	2	30	50	BTN2-0040	N
BT1-0050		50 kHz	50 GHz	1.5	1	30	50	BT1-0050	N
BT2-0050		100 kHz	50 GHz	1.5	2	30	50	BT2-0050	N
BTN1-0050		500 kHz	50 GHz	1.5	1	30	50	BTN1-0050	N
BTN2-0050		3 MHz	50 GHz	1.5	2	30	50	BTN2-0050	N

DC Blocks - View All

		Frequency						
Model	Datasheet	Low	High	Insertion Loss [dB]	Rise Time [ps]	Group Delay [ps]	DC Voltage [V]	S-Parameters
DCZ(M-F)29(M-F)29		4 kHz	40 GHz	0.7	6	75	16	-
DCZ(M-F)24(M-F)24		4 kHz	65 GHz	0.7	6	75	16	-

Directional Couplers/Pick-Off Tees

All Directional Couplers | 3 dB Quadrature (90 degree) Hybrids | High Directivity Bridge Couplers | Stripline Directional Couplers | Low Loss High Power Directional Couplers | Dual Directional Couplers | Pick-Off Tees

For in-depth information regarding all couplers, please refer to the Microwave Power Dividers and Couplers Primer and the Directivity and VSWR Measurements App Note .

Marki Microwave coupler offerings include:

Quadrature Hybrid Couplers that offer an equal splitting ratio and 90 degree phase shift between outputs.

High Directivity Bridge Couplers with a 16 dB coupling ratio and the highest directivity commercially available from 200 kHz to 12 GHz.

Stripline Directional Couplers with excellent directivity, flat coupling, and low insertion loss to 65 GHz.

Low Loss Airline Couplers suitable for high power applications.

Dual Directional (stripline) Couplers with excellent directivity for both forward and reflected coupled measurements.

Pick Off Tees for very broadband, non-directional signal coupling.

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3 dB Quadrature (90 degree) Hybrids View All

		Frequency Band [GHz]						
Model	Datasheet	Low	High	Coupling [dB]	Amplitude Balance [dB]	Phase Balance [Degrees]	Isolation [dB]	S-Parameters
QH-0R71R3		0.65	1.3	3	±0.3	±3	16	QH-0R71R3
QH-0R714		0.7	14.5	3	±0.2	±2	22	QH-0R714
QH-0516		5	16	3	±0.25	±2	24	-
QH-0226		2	26.5	3	±0.25	±2	22	QH-0226
QH-0440		4	40	3	±0.40	±5	18	QH-0440
QH-0550		5	50	3	±0.6	±5	22	QH-0550
QH-0867		8	67	3	±0.6	±6	18	QH-0867

High Directivity Bridge Couplers View All

		Frequency Band					
Model	Datasheet	Low	High	VSWR	Mean Coupling [dB]	Directivity [dB]	S-Parameters
CBR16-0003		200 kHz	3 GHz	1.1	16	40	CBR16-0003
CBR16-0006		200 kHz	6 GHz	1.15	16	38	CBR16-0006
CBR16-0012		200 kHz	12 GHz	1.25	16	32	CBR16-0012

Directional Couplers (Stripline) View All

		Frequency Band [GHz]						
Model	Datasheet	Low	High	VSWR	Mean Coupling [dB]	Amplitude Flatness [dB]	Directivity [dB]	S-Parameters
C09-0R412		0.45	12	1.15	9	±0.7	22	C09-0R412
C09-0R418		0.45	18	1.15	9	±0.7	22	C09-0R418
C09-0R426		0.45	26.5	1.15	9	±0.7	22	C09-0R426
C20-0R612		0.6	12	1.2	20	±0.6	22	C20-0R612
C10-0116		1	16	1.15	10	±0.5	20	C10-0116
C20-0116		1	16	1.15	20	±0.6	20	C20-0116
C20-0R518		0.5	18	1.2	20	±0.75	22	C20-0R518
C20-0R520		0.5	20	1.2	20	±0.75	22	C20-0R520

		Frequency Band [GHz]						
Model	Datasheet	Low	High	VSWR	Mean Coupling [dB]	Amplitude Flatness [dB]	Directivity [dB]	S-Parameters
C13-0126		1	26.5	1.15	13	±0.6	20	C13-0126
C10-0226		2	26.5	1.15	10	±0.6	22	C10-0226
C20-0226		2	26.5	1.25	20	±0.75	22	C20-0226
C13-0140		1	40	1.2	13	±1	16	C13-0140
C20-0240		2	40	1.3	20	±0.75	17	C20-0240
C13-0150		1	50	1.2	13	±0.75	16	C13-0150
C10-0450		4	50	1.35	10	±0.5	15	C10-0450
C10-0667		6	67	1.2	10	±0.8	17	C10-0667
C16-0667		6	67	1.25	16	±0.9	17	C16-0667
C20-0667		6	67	1.25	20	±0.8	17	C20-0667

Directional Couplers (Low Loss) View All

		Frequency Band [GHz]							
Model	Datasheet	Low	High	VSWR	Insertion Loss [dB]	Mean Coupling [dB]	Directivity [dB]	Average Power [W]	S-Parameters
C17-0R506		0.5	6	1.2	0.4	17	20	120	C17-0R506
C17-0R512		0.5	12	1.2	0.65	17	20	80	C17-0R512
C17-0R518		0.5	18	1.2	1	17	20	60	C17-0R506
CA-18		Up	18	1.2	0.35	See Datasheet	22	200	CA-18
CA-26		Up	26.5	1.1	0.35	See Datasheet	24	50	CA-26
CA-40		Up	40	1.1	0.5	See Datasheet	24	20	CA-40
CA-50		Up	50	1.1	0.5	See Datasheet	24	15	CA-50
C-0250		2	50	1.25	0.7	15	12	-	C-0250
C-0265		2	65	1.25	0.7	15	12	-	C-0265

Dual Directional Couplers View All

		Frequency Band [GHz]						
Model	Datasheet	Low	High	VSWR	Mean Coupling [dB]	Amplitude Flatness [dB]	Directivity [dB]	S-Parameters
CD10-0106		0.7	6.3	1.14	10	±0.6	25	-
CD10-0114		0.7	14.7	1.17	10	±0.6	23	-

Pick-Off Tees View All

		Frequency Band [GHz]				
Model	Datasheet	Low	High	Insertion Loss [dB]	Pick-Off Loss [dB]	S-Parameters
PT-0020		DC	20	2	16	-
PT-0030		DC	30	2	16	-

Filters / Diplexers

All Filters / Diplexers | Lowpass Filters | Surface Mount Band Pass Filters | Connectorized Band Pass Filters | High Pass Filters | Diplexer | Equalizers

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Lowpass Filters - View All

Model	Datasheet	3 dB Cutoff Frequency [GHz]	Passband Insertion Loss [dB]	Passband Return Loss [dB]	Frequency @ 50 dB Suppression [GHz]	S-Parameters
FLP-0490		4.9	0.6	30	9.3	FLP-0490
FLP-0750		7.5	0.9	30	12.5	FLP-0750
FLP-0960		9.6	0.6	25	17.25	FLP-0960
FLP-1250		12.5	0.6	20	19.5	FLP-1250
FLP-1460		14.6	0.6	20	25.5	FLP-1460
FLP-1740		17.4	0.9	20	23	FLP-1740
FLP-1800		18	1.2	20	21.5	FLP-1800
FLP-1940		19.4	0.9	20	33.75	FLP-1940
FLP-2000		20	1.2	20	24	FLP-2000
FLP-2150		21.5	1.2	18	32	FLP-2150
FLP-2360		23.6	1.3	18	33	FLP-2360
FLP-2650		26.5	1.5	15	36.5	FLP-2650
FLP-3200		32	1.8	15	41.5	FLP-3200
FLP-3660		36.6	1.8	15	46	FLP-3660
FLP-4300		43	2	15	52.5	FLP-4300
FLP-5000		50	2	15	62	FLP-5000

Surface Mount Band Pass Filters - View All

Model	Datasheet	Center Frequency [GHz]	Low Frequency 1 dB Cutoff [GHz]	High Frequency 1 dB Cutoff [GHz]	S-Parameters	Surface Mount Option
FB-0785SM		7.85	7.25	8.45	FB-0785SM	Y
FB-0850SM		8.5	7.85	9.2	FB-0850SM	Y
FB-0900SM		9.0	8.4	9.6	FB-0900SM	Y
FB-0955SM		9.55	8.9	10.2	FB-0955SM	Y
FB-1050SM		10.5	9.6	11.4	FB-1050SM	Y
FB-1140SM		11.4	10.45	12.35	FB-1140SM	Y
FB-1215SM		12.15	11.35	12.95	FB-1215SM	Y
FB-1300SM		13.0	12.0	14.0	FB-1300SM	Y
FB-1445SM		14.45	13.2	15.7	FB-1445SM	Y
FB-1575SM		15.75	14.6	16.9	FB-1575SM	Y

Connectorized Band Pass Filters - View All

Model	Datasheet	Center Frequency [GHz]	Low Frequency 1 dBc Cutoff [GHz]	High Frequency 1 dBc Cutoff [GHz]	S-Parameters

Model	Datasheet	Center Frequency [GHz]	Low Frequency 1 dBc Cutoff [GHz]	High Frequency 1 dBc Cutoff [GHz]	S-Parameters
FB-0785		7.85	7.25	8.45	FB-0785
FB-0860		8.60	7.95	9.25	FB-0860
FB-0905		9.05	8.45	9.65	FB-0905
FB-0955		9.55	8.9	10.2	FB-0955
FB-1050		10.5	9.75	11.25	FB-1050
FB-1145		11.45	10.6	12.3	FB-1145
FB-1215		12.15	11.3	13	FB-1215
FB-1310		13.1	12.2	14	FB-1310
FB-1385		13.85	11.5	16.2	FB-1385
FB-1390		13.9	13.48	14.32	FB-1390
FB-1445		14.45	13.3	15.6	FB-1445
FB-1450		14.50	11.1	17.9	FB-1450
FB-1500		15	12	18	FB-1500
FB-1575		15.75	14.5	17	FB-1575
FB-1655		16.55	15.8	17.3	FB-1655
FB-1690		16.9	15.7	18.1	FB-1690
FB-1725		17.25	15.8	18.7	FB-1725
FB-1800		18.00	15.85	20.15	FB-1800
FB-1840		18.4	16.65	20.15	FB-1840
FB-2000		20.00	18.6	21.4	FB-2000
FB-2020		20.2	17.2	23.2	FB-2020
FB-2060		20.60	18.95	22.25	FB-2060
FB-2250		22.5	18	27	FB-2250
FB-2400		24.00	22.40	25.60	FB-2400
FB-2430		24.30	21.25	27.35	FB-2430
FB-2480		24.8	21.1	28.5	FB-2480
FB-2500		25	18	32	FB-2500
FB-2770		27.7	23.55	31.85	FB-2770
FB-3270		32.70	28.75	36.65	FB-3270
FB-3700		37.00	32.55	41.45	FB-3700
FB-4000		40.00	34.4	45.6	FB-4000

High Pass Filters - View All

Model	Datasheet	Cutoff Frequency [GHz]	30 dB Rejection Frequency [GHz]	50 dB Rejection Frequency [GHz]	80 dB Rejection Frequency [GHz]	S-Parameters
FH-1700		17.00	14.00	11.50	6.00	FH-1700
FH-1800		18.00	15.00	12.00	6.50	FH-1800
FH-2600		26.00	21.50	18.00	11.00	FH-2600
FH-4000		40.00	36.60	33.00	25.00	FH-4000
FH-5500		55.00	51.00	45.00	35.00	FH-5500

Diplexer / Duplexers - View All

		Pass Band Low [GHz]	Pass Band High [GHz]			

Model	Datasheet	Low	High	Low	High	Isolation [dB]	S-Parameters	Surface Mount Option
DPX-M50		DC	0.035	0.07	10	24	DPX-M50	Y
DPX-0R5		DC	0.36	0.7	8	24	DPX-0R5	Y
DPX-1		DC	0.85	1.4	5	24	DPX-1	Y
DPX-2		DC	1.5	2.7	7	25	DPX-2	Y
DPX-3		DC	2.3	4.2	8	25	DPX-3	Y
DPX-4		DC	2.8	5.5	12	30	DPX-4	Y
DPX-0508		DC	5	8	18	45	DPX-0508	N
DPX-9516		DC	9.5	16	32	40	DPX-9516	N
DPX-1114		DC	11	14	30	50	DPX-1114	N
DPX-1721		DC	17	21.5	40	50	DPX-1721	N

Equalizers

		Frequency Low (GHz)						
Model	Datasheet	Low	High	Insertion Loss (dB)	Input VSWR (dB)	Output VSWR (dB)	Rise/Fall Time (ps)	S-Parameters
EQ3-26		DC	26.5	1.2	1.2	1.2	14	EQ3-26
EQ3-40		DC	40	1.2	1.3	1.3	11	EQ3-40
EQ6-26		DC	26.5	2	1.4	1.2	15	EQ6-26
EQ6-40		DC	40	2	1.3	1.3	11	EQ6-40

Multipliers

All Multipliers | Doublers | Amplified Doublers | Amplified Quadruplers

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Doublers - View All

		Input [GHz]		Output [GHz]					
Model	Datasheet	Low	High	Low	High	Conversion Loss [dB]	Suppression F	Suppression 3F	Surface Mount Option
MLD-0416SM		2.0	8.0	4.0	16.0	12	40	40	Y
MLD-0632		3.0	16.0	6.0	32.0	12	40	42	N
MMD-1030H		5	15	10	30	12	41	51	N
MMD-1030HSM		5	15	10	30	12	34	46	Y
MLD-1640		8.0	20.0	16.0	40.0	11	34	34	N
D-0250		1	25	2	50	12	15	-	N
D-0265		1	32.5	2	65	13	15	-	N
D-1505		1.5	5	3	10	10	25	30	Y
D-0365		1.5	32.5	3	65	12.5	15	-	N
D-0308		3	8	6	16	9	25	30	Y
D-0840		4	20	8	40	10	15	25	N
D-0515		5	15	10	30	10	20	30	N
D-1550		7.5	25	15	50	12	20	20	N

Amplified Doublers - View All

		Input [GHz]		Output [GHz]		Input Level [dBm]					
Model	Datasheet	Low	High	Low	High	Low	High	Output Level [dBm]	Suppression F	Suppression 3F	Bias [V/mA]
ADA-0410		4	10	8	20	+5	+8	14	20	20	5V@100mA
ADA-0512		5	12	10	24	+6	+8	14	20	25	5V@120mA
AD-1020		10	20	20	40	+5	+10	7	13	15	5V@100mA
ADA-1020		10	20	20	40	+5	+10	20	35	15	5V@500mA
ADA-2050		10	25	20	50	0	+5	17	35	20	5V@500mA

Amplified Quadruplers - View All

		Input [GHz]		Output [GHz]		Input Level [dBm]						
Model	Datasheet	Low	High	Low	High	Low	High	Output Level [dBm]	Suppressions F	Suppressions 2F	Suppressions 3F	Bias [V/mA]
AQA-1933		1.9	3.3	7.6	13.2	+2	+5	12	20	10	10	5V@150mA
AQA-2040		5	10	20	40	+5	+8	19	45	30	25	5V@400mA
AQA-2050		5	12.5	20	50	+5	+8	18	40	20	20	5V@400mA

Power Dividers

All Power Dividers | 2-way Resistive | 2-way High Isolation | 2-way Wilkinson | 3-way Wilkinson | 4-way Wilkinson

Marki Microwave produces three types of power dividers:

- Resistive Power Dividers have an intrinsic loss of 6 dB and no isolation between ports (loss from any port to any other port is 6 dB). They work across broad bandwidths.
- Wilkinson Power Dividers have less loss (3 dB for the power split) and isolation between output ports. They will also work over broad bandwidths, but only have isolation across the specified band.
- High Isolation Power Combiners are specially designed products with the highest possible isolation between output ports. They work to very low frequencies, and have an intrinsic loss of 6 dB.

For information see the Microwave Power Divider and Coupler Primer .

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Resistive Power Dividers (2-way)

				Frequency Band [GHz]						
Model	Datasheet	Price	Stock	Low	High	Insertion Loss [dB]	Amplitude Balance [dB]	Phase Balance [Degrees]	S-Parameters	Surface Mount Option
PD-0010		$275.00	11	DC	10	0.25	±0.1	±1	PD-0010	N
PD-0020		$350.00	17	DC	20	0.5	±0.2	±2	PD-0020	N
PD-0030		$450.00	3	DC	30	0.5	±0.25	±2	PD-0030	N
PD-0030SM		$40.00	166	DC	30	1.0	±0.25	±3	PD-0030SM	Y
PD-0040		$495.00	0	DC	40	0.75	±0.25	±2	PD-0040	N

Wilkinson Power Dividers (2-way)

				Frequency Band [GHz]							
Model	Datasheet	Price	Stock	Low	High	Insertion Loss [dB]	Amplitude Balance [dB]	Phase Balance [Degrees]	Isolation [dB]	S-Parameters	Surface Mount Option
PD-0R413		$525.00	4	0.4	13.2	1.0	±0.05	±1	24	PD-0R413	N
PD-0R426		$875.00	2	0.4	26	2.0	±0.05	±2	24	PD-0R426	N
PD-0R510		$375.00	5	0.5	10	0.90	±0.1	±1	22	PD-0R510	N
PD-0R618		$525.00	0	0.6	18	1.0	±0.05	±1	22	PD-0R618	N
PD-0R636		$1,050.00	0	0.6	36	2.0	±0.1	±3	22	PD-0R636	N
PD-0109		$325.00	7	1	9	0.75	±0.1	±1	22	PD-0109	N
PD-0126		$525.00	17	1	26.5	1.0	±0.1	±3	20	PD-0126	N
PD-0140		$875.00	14	1	40	1.5	±0.2	±2	20	PD-0140	N
PD-0150		$1,100.00	6	1	50	2.0	±0.25	±3	20	PD-0150	N
PD-0165		$1,566.00	10	1	65	2.0	±0.25	±3	20	PD-0165	N
PD-0218		$350.00	2	2	18	1.0	±0.2	±2	22	PD-0218	N
PD-0220		$350.00	0	2	20	1.0	±0.2	±2	22	PD-0220	N
PD-0434SM		$60.00	12	4	34	1.5	±0.25	±3	20	PD-0434SM	Y
PD-0426		$475.00	4	4	26.5	0.8	±0.2	±2	18	PD-0426	N
PD-0440		$785.00	2	4	40	1.0	±0.2	±3	18	PD-0440	N
PD-0450		$980.00	7	4	50	1.2	±0.5	±5	18	PD-0450	N
PD-0465		$1,350.00	9	4	65	2	±0.5	±5	18	PD-0465	N
PD-0530SMG		$67.00	110	5	30	1.5	±0.1	±2	25	PD-0530SMG	Y
PD-0535SM		$70.00	3	5	35	1.5	±0.25	±3	18	PD-0535SM	Y

High Isolation Power Combiners (2-way)

				Frequency						
Model	Datasheet	Price	Stock	Low	High	Insertion Loss [dB]	Amplitude Balance [dB]	Isolation [dB]	S-Parameters	Surface Mount Option
PBR-0003		$595.00	1	300 kHz	3 GHz	1.25	±0.4	45	PBR-0003	N
PBR-0003SMG		$104.00	1	10 MHz	3 GHz	1.5	±0.8	40	PBR-0003SMG	Y
PBR-0006		$695.00	0	300 kHz	6 GHz	1.5	±0.5	40	PBR-0006	N
PBR-0006SMG		$114.00	48	10 MHz	6 GHz	1.7	±0.8	35	PBR-0006SMG	Y
PBR-0012		$895.00	17	300 kHz	12 GHz	1.5	±0.6	35	PBR-0012	N

Wilkinson Power Dividers (3-way)

				Frequency Band [GHz]							
Model	Datasheet	Price	Stock	Low	High	Insertion Loss [dB]	Amplitude Balance [dB]	Phase Balance [Degrees]	Isolation [dB]	S-Parameters	Surface Mount Option
PD3-0R412		$875.00	6	0.4	12	1.5	±0.1	±2	See Datasheet	PD3-0R412	N
PD3-0R616		$945.00	0	0.6	16	1.5	±0.1	±2	See Datasheet	PD3-0R616	N
PD3-0126		$1,195.00	11	1.5	26.5	1.5	±0.3	±4	See Datasheet	PD3-0126	N

Wilkinson Power Dividers (4-way)

				Frequency Band [GHz]							
Model	Datasheet	Price	Stock	Low	High	Insertion Loss [dB]	Amplitude Balance [dB]	Phase Balance [Degrees]	Isolation [dB]	S-Parameters	Surface Mount Option
PD4-0R518		$1,450.00	12	0.5	18	1.5	±0.25	±3	See Datasheet	PD4-0R518	N
PD4-0R526		$1,750.00	7	0.5	26.5	2.5	±0.25	±3	See Datasheet	PD4-0R526	N
PD4-0R532		$2,150.00	1	0.5	32	2.5	±0.3	±4	See Datasheet	PD4-0R532	N
PD4-0120		$1,250.00	4	1	20	1.5	±0.25	±3	See Datasheet	PD4-0120	N
PD4-0126		$1,550.00	0	1	26.5	1.5	±0.3	±3	See Datasheet	PD4-0126	N
PD4-0140		$2,250.00	1	1	40	2.5	±0.4	±4	See Datasheet	PD4-0140	N
PD4-0150		$2,950.00	2	1	50	4	±0.5	±5	See Datasheet	-	N
PD4-0218		$1,050.00	0	2	18	1.2	±0.2	±2	See Datasheet	PD4-0218	N

Surface Mount

T3 Series Mixers - High Intercept and Broadband (Triple-Balanced)

		RF [MHz]		LO [MHz]		IF [MHz]					
Model	Datasheet	Low	High	Low	High	Low	High	Conversion Loss [dB]	Isolations L-R [dB]	Isolations L-I [dB]	Surface Mount Option
T3-03		1	3400	1	3400	1	3400	7	30	30	Y
T3-04		1	4000	1	4000	1	4000	7	30	28	Y
T3-05		1	5000	1	5000	1	4000	7	30	28	Y
T3-06		1	6000	1	6000	1	4000	7	30	27	Y
T3-07		1	7000	1	7000	1	4000	7.5	24	27	Y
T3-08		10	8000	10	8000	1	4000	7.5	24	27	Y
T3-10		10	10000	10	10000	1	4000	7.5	24	27	Y
T3-12		10	12000	10	12000	1	4000	7.5	24	27	Y
T3-18		10	18000	10	18000	1	10000	7.5	25	40	Y
T3H-18		10	18000	10	18000	10	18000	8.5	30	33	Y
T3-20		10	20000	10	20000	1	10000	7.5	24	37	Y
T3H-20		10	20000	10	20000	10	18000	8.5	30	33	Y
T3-0218		2000	18000	2000	18000	1	6000	7	25	28	Y
T3-0316		3000	16000	3000	16000	1	4000	7.5	25	25	Y

T3A Series Mixers - High Intercept (Triple-Balanced) with Integrated Amplifier

		RF [MHz]		LO [MHz]		IF [MHz]					
Model	Datasheet	Low	High	Low	High	Low	High	Conversion Loss [dB]	DC Voltage [V]	DC Current [mA]	Surface Mount Option
T3A-07SMG		10	7000	10	7000	1	4000	6.5	+/-5	160	Y

M1 Series Mixers - General Purpose (Double-Balanced)

		RF [GHz]		LO [GHz]		IF [GHz]					
Model	Datasheet	Low	High	Low	High	Low	High	Conversion Loss [dB]	Isolations L-R [dB]	Isolations L-I [dB]	Surface Mount Option
M1-0008		.01	8	.01	8	DC	2	7.5	40	25	Y
M1-0012		.01	12	.01	12	DC	2	7.5	35	25	Y
M1-0204		2	4	2	4	DC	2	5	38	20	Y
M1-0208		2	8	2	8	DC	2	6	38	20	Y
M1-0212		2	12	2	12	DC	2	6	35	20	Y
M1-0310		3	10	3	10	DC	3	6	40	40	Y
M1-0408		4	8	4	8	DC	4	5.5	35	25	Y
M1-0412		4	12	4	12	DC	4	5	40	30	Y
M1-0420		4	20	4	20	DC	4	6	35	30	Y
M1-0616		6	16	6	16	DC	4	5.5	35	30	Y
M1B-0618		6	18	6	18	DC	4	5.5	33	30	Y
M1-0620		6	20	6	20	DC	6	5.5	40	20	Y
M1-0818		8	18	8	18	DC	4	6	35	30	Y
M1-1020		10	20	10	20	DC	4	6	35	30	Y

M2 Series Mixers - Broadband (Triple-Balanced)

		RF [GHz]		LO [GHz]		IF [GHz]					

Model	Datasheet	Low	High	Low	High	Low	High	Conversion Loss [dB]	Isolations L-R [dB]	Isolations L-I [dB]	Surface Mount Option
M2-0208		2	8	2	8	.001	6	7	20	30	Y
M2-0218		2	18	2	18	.001	6	7.5	25	27	Y
M2-0220		2	20	2	20	.001	6	7.5	25	27	Y
M2H-0220		2	20	2	20	1	10	7	27	27	Y

Doublers

		Input [GHz]		Output [GHz]					
Model	Datasheet	Low	High	Low	High	Conversion Loss [dB]	Suppression F	Suppression 3F	Surface Mount Option
MLD-0416SM		2.0	8.0	4.0	16.0	12	40	40	Y
MMD-1030HSM		5	15	10	30	12	34	46	Y
D-1505		1.5	5	3	10	10	25	30	Y
D-0308		3	8	6	16	9	25	30	Y

Surface Mount, Lead-Free / RoHS Compliant Bias Tees

		Frequency							
Model	Datasheet	Low	High	Insertion Loss [dB]	DC Current [A]	DC Port Isolation [dB]	DC Voltage [V]	S-Parameters	Surface Mount Option
BT-0014SMG		500 kHz	14 GHz	0.5	0.5	40	30	BT-0014SMG	Y
BT-0024SMG		500 kHz	24 GHz	1	0.5	40	30	BT-0024SMG	Y
BT-0030SMG		20 MHz	30 GHz	1	0.5	40	30	BT-0030SMG	Y
BT-0034SMG		500 kHz	34 GHz	1	0.5	40	30	BT-0034SMG	Y

Surface Mount, Leaded Bias Tees

		Frequency							
Model	Datasheet	Low	High	Insertion Loss [dB]	DC Current [A]	DC Port Isolation [dB]	DC Voltage [V]	S-Parameters	Surface Mount Option
BT-0014SM		500 kHz	14 GHz	0.5	0.5	40	30	BT-0014SM	Y
BT-0024SM		500 kHz	24 GHz	1	0.5	40	30	BT-0024SM	Y
BT-0030SM		20 MHz	30 GHz	1.0	0.5	40	30	BT-0030SM	Y
BT-0034SM		500 kHz	34 GHz	1.0	0.5	40	30	BT-0034SM	Y

Legacy Amplifiers

		Frequency Band [GHz]		Input Power for Saturation [dBm]					
Model	Datasheet	Low	High	Low	High	Saturated Output Power [dBm]	Small Signal Gain [dB]	S-Params	Surface Mount Option
A-0010		.005	10	+5	+10	23	N/A	A-0010	Y
A-0015		.005	15	+5	+10	23	N/A	A-0015	Y
A-0020		.005	20	+5	+10	22	N/A	A-0020	Y
A-0030		.005	30	+5	+10	21	N/A	A-0030	Y
A-0110		1	10	0	+5	21	26	A-0110	Y
A-0115		1	15	0	+5	21	26	A-0115	Y
A-0120		1	20	0	+5	21	26	A-0120	Y
A-0126		1	26	0	+5	21	26	A-0126	Y
AP-0010		.020	10	+5	+17	24	22		Y
AP-0015		.020	15	+5	+17	23	21		Y
AP-0020		.020	20	+5	+17	23	21		Y

		Frequency Band [GHz]		Input Power for Saturation [dBm]					
Model	Datasheet	Low	High	Low	High	Saturated Output Power [dBm]	Small Signal Gain [dB]	S-Params	Surface Mount Option
AP-0025		.020	25	+5	+17	23	20		Y
AP-0110		1	10	0	+18	22	30	AP-0110	Y
AP-0115		1	15	0	+18	22	30	AP-0115	Y
AP-0120		1	20	0	+18	21	30	AP-0120	Y
AP-0125		1	25	0	+18	22	27	AP-0125	Y

Surface Mount Band Pass Filters

Model	Datasheet	Center Frequency [GHz]	Low Frequency 1 dB Cutoff [GHz]	High Frequency 1 dB Cutoff [GHz]	S-Parameters	Surface Mount Option
FB-0785SM		7.85	7.25	8.45	FB-0785SM	Y
FB-0850SM		8.5	7.85	9.2	FB-0850SM	Y
FB-0900SM		9.0	8.4	9.6	FB-0900SM	Y
FB-0955SM		9.55	8.9	10.2	FB-0955SM	Y
FB-1050SM		10.5	9.6	11.4	FB-1050SM	Y
FB-1140SM		11.4	10.45	12.35	FB-1140SM	Y
FB-1215SM		12.15	11.35	12.95	FB-1215SM	Y
FB-1300SM		13.0	12.0	14.0	FB-1300SM	Y
FB-1445SM		14.45	13.2	15.7	FB-1445SM	Y
FB-1575SM		15.75	14.6	16.9	FB-1575SM	Y

Diplexer

		Pass Band Low [GHz]		Pass Band High [GHz]				
Model	Datasheet	Low	High	Low	High	Isolation [dB]	S-Parameters	Surface Mount Option
DPX-M50		DC	0.035	0.07	10	24	DPX-M50	Y
DPX-0R5		DC	0.36	0.7	8	24	DPX-0R5	Y
DPX-1		DC	0.85	1.4	5	24	DPX-1	Y
DPX-2		DC	1.5	2.7	7	25	DPX-2	Y
DPX-3		DC	2.3	4.2	8	25	DPX-3	Y
DPX-4		DC	2.8	5.5	12	30	DPX-4	Y

2-way Resistive

				Frequency Band [GHz]						
Model	Datasheet	Low	High	Insertion Loss [dB]	Amplitude Balance [dB]	Phase Balance [Degrees]	S-Parameters	Surface Mount Option		
PD-0030SM		$40.00	166	DC	30	1.0	±0.25	±3	PD-0030SM	Y

2-way Wilkinson

				Frequency Band [GHz]							
Model	Datasheet	Low	High	Insertion Loss [dB]	Amplitude Balance [dB]	Phase Balance [Degrees]	Isolation [dB]	S-Parameters	Surface Mount Option		
PD-0434SM		$60.00	12	4	34	1.5	±0.25	±3	20	PD-0434SM	Y
PD-0530SMG		$67.00	110	5	30	1.5	±0.1	±2	25	PD-0530SMG	Y
PD-0535SM		$70.00	3	5	35	1.5	±0.25	±3	18	PD-0535SM	Y

2-way High Isolation

				Frequency					

Model	Datasheet	Low	High	Insertion Loss [dB]	Amplitude Balance [dB]	Isolation [dB]	S-Parameters	Surface Mount Option		
PBR-0003SMG		$104.00	1	10 MHz	3 GHz	1.5	±0.8	40	PBR-0003SMG	Y
PBR-0006SMG		$114.00	48	10 MHz	6 GHz	1.7	±0.8	35	PBR-0006SMG	Y

Legacy Amplifiers

		Frequency Band [GHz]		Input Power for Saturation [dBm]					
Model	Datasheet	Low	High	Low	High	Saturated Output Power [dBm]	Small Signal Gain [dB]	S-Params	Surface Mount Option
A-0010		.005	10	+5	+10	23	N/A	A-0010	Y
A-0015		.005	15	+5	+10	23	N/A	A-0015	Y
A-0020		.005	20	+5	+10	22	N/A	A-0020	Y
A-0030		.005	30	+5	+10	21	N/A	A-0030	Y
A-0110		1	10	0	+5	21	26	A-0110	Y
A-0115		1	15	0	+5	21	26	A-0115	Y
A-0120		1	20	0	+5	21	26	A-0120	Y
A-0126		1	26	0	+5	21	26	A-0126	Y
AP-0010		.020	10	+5	+17	24	22		Y
AP-0015		.020	15	+5	+17	23	21		Y
AP-0020		.020	20	+5	+17	23	21		Y
AP-0025		.020	25	+5	+17	23	20		Y
AP-0110		1	10	0	+18	22	30	AP-0110	Y
AP-0115		1	15	0	+18	22	30	AP-0115	Y
AP-0120		1	20	0	+18	21	30	AP-0120	Y
AP-0125		1	25	0	+18	22	27	AP-0125	Y

Resistive Power Dividers (2-way)

				Frequency Band [GHz]						
Model	Datasheet	Low	High	Insertion Loss [dB]	Amplitude Balance [dB]	Phase Balance [Degrees]	S-Parameters	Surface Mount Option		
PD-0030SM		$40.00	166	DC	30	1.0	±0.25	±3	PD-0030SM	Y

Wilkinson Power Dividers (2-way)

				Frequency Band [GHz]							
Model	Datasheet	Low	High	Insertion Loss [dB]	Amplitude Balance [dB]	Phase Balance [Degrees]	Isolation [dB]	S-Parameters	Surface Mount Option		
PD-0434SM		$60.00	12	4	34	1.5	±0.25	±3	20	PD-0434SM	Y
PD-0530SMG		$67.00	110	5	30	1.5	±0.1	±2	25	PD-0530SMG	Y
PD-0535SM		$70.00	3	5	35	1.5	±0.25	±3	18	PD-0535SM	Y

High Isolation Power Combiners (2-way)

				Frequency						
Model	Datasheet	Low	High	Insertion Loss [dB]	Amplitude Balance [dB]	Isolation [dB]	S-Parameters	Surface Mount Option		
PBR-0003SMG		$104.00	1	10 MHz	3 GHz	1.5	±0.8	40	PBR-0003SMG	Y
PBR-0006SMG		$114.00	48	10 MHz	6 GHz	1.7	±0.8	35	PBR-0006SMG	Y

Surface Mount Baluns and Transformers

		Frequency						

Model	Datasheet	Low	High	Amplitude Balance [dB]	Phase Balance [Degrees]	Total Insertion Loss [dB]	Common Mode Rejection (dB)	S-Parameters	Surface Mount Option
BAL-0003SMG		500 kHz	3 GHz	±0.3	±3	6.8	35	BAL-0003SMG	Y
BALH-0003SMG		500 kHz	3 GHz	±0.2	±2	5	35	BALH-0003SMG	Y
BAL-0006SMG		500 kHz	6 GHz	±0.4	±3	7	30	BAL-0006SMG	Y
BALH-0006SMG		500 kHz	6 GHz	±0.2	±3	5	30	BALH-0006SMG	Y
BAL-0009SMG		500 kHz	9 GHz	±0.6	±5	7.5	26	BAL-0009SMG	Y
BALH-0009SMG		500 kHz	9 GHz	±0.8	±5	5.5	25	BALH-0009SMG	Y
BAL-0208SMG		2 GHz	8 GHz	±0.3	±1	5.5	34	BAL-0208SMG	Y
BAL-0416SMG		4 GHz	16 GHz	±0.4	±1	6.3	35	BAL-0416SMG	Y
BAL-0620SMG		6 GHz	20 GHz	±0.2	±1	5.6	34	BAL-0620SMG	Y

Lead-Free / RoHS Compliant Bias Tees

		Frequency							
Model	Datasheet	Low	High	Insertion Loss [dB]	DC Current [A]	DC Port Isolation [dB]	DC Voltage [V]	S-Parameters	Surface Mount Option
BT-0014SMG		500 kHz	14 GHz	0.5	0.5	40	30	BT-0014SMG	Y
BT-0024SMG		500 kHz	24 GHz	1	0.5	40	30	BT-0024SMG	Y
BT-0030SMG		20 MHz	30 GHz	1	0.5	40	30	BT-0030SMG	Y
BT-0034SMG		500 kHz	34 GHz	1	0.5	40	30	BT-0034SMG	Y

Leaded Bias Tees

		Frequency							
Model	Datasheet	Low	High	Insertion Loss [dB]	DC Current [A]	DC Port Isolation [dB]	DC Voltage [V]	S-Parameters	Surface Mount Option
BT-0014SM		500 kHz	14 GHz	0.5	0.5	40	30	BT-0014SM	Y
BT-0024SM		500 kHz	24 GHz	1	0.5	40	30	BT-0024SM	Y
BT-0030SM		20 MHz	30 GHz	1.0	0.5	40	30	BT-0030SM	Y
BT-0034SM		500 kHz	34 GHz	1.0	0.5	40	30	BT-0034SM	Y

Microlithic and MMIC Surface Mount

		RF [GHz]		LO [GHz]		IF [GHz]					
Model	Datasheet	Low	High	Low	High	Low	High	Conversion Loss [dB]	Isolations L-R [dB]	Isolations L-I [dB]	Surface Mount Option
ML1-0110SM		1.5	10	1.5	10	DC	2	7	38	17	Y
ML1-0218SM		2	18	2	18	DC	4	7	40	20	Y
MM1-0312HSM		3	12	3	12	DC	4.5	7	49	29	Y
MM1-0312SSM		3	12	3	12	DC	4.5	7	49	29	Y
MM1-0320HSM		3.5	20	3.5	20	DC	4	8	49	29	Y
MM1-0424SSM		4.5	24	4.5	24	DC	4	8	48	30	Y
MM1-0626HSM		6	26.5	6	26.5	DC	9	7	45	30	Y
MM1-0626SSM		6	26.5	6	26.5	DC	9	8	45	30	Y
MM1-0726HSM		7	26.5	7	26.5	DC	9	7.5	27	26	Y
ML1-0832SM		8	32	8	32	DC	10	7	36	27	Y
MM1-1130HSM		11	30	11	30	DC	12	7	40	28	Y

Microlithic & MMIC Surface Mount (Recommended)

		RF [GHz]		LO [GHz]		IF [GHz]					

Model	Datasheet	Low	High	Low	High	Low	High	Conversion Loss [dB]	Isolations L-R [dB]	Isolations L-I [dB]	Surface Mount Option
ML1-0110SM		1.5	10	1.5	10	DC	2	7	38	17	Y
ML1-0218SM		2	18	2	18	DC	4	7	40	20	Y
MM1-0312HSM		3	12	3	12	DC	4.5	7	49	29	Y
MM1-0312SSM		3	12	3	12	DC	4.5	7	49	29	Y
MM1-0320HSM		3.5	20	3.5	20	DC	4	8	49	29	Y
MM1-0424SSM		4.5	24	4.5	24	DC	4	8	48	30	Y
MM1-0626HSM		6	26.5	6	26.5	DC	9	7	45	30	Y
MM1-0626SSM		6	26.5	6	26.5	DC	9	8	45	30	Y
MM1-0726HSM		7	26.5	7	26.5	DC	9	7.5	27	26	Y
ML1-0832SM		8	32	8	32	DC	10	7	36	27	Y
MM1-1130HSM		11	30	11	30	DC	12	7	40	28	Y