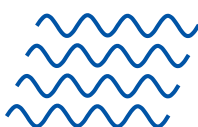
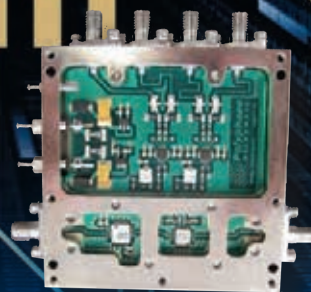
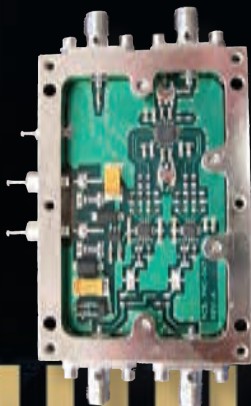


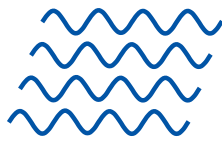
Polyphase Microwave Inc.

PRODUCT SELECTION GUIDE



Polyphase
MICROWAVE

A Technology Service Corporation Company



Polyphase
M I C R O W A V E

A Technology Service Corporation Company

**Polyphase Microwave, Inc.
is a wholly-owned subsidiary of
Technology Service Corporation**

Technology Service Corporation (TSC) is an employee-owned, high-technology company primarily engaged in providing engineering services to the US Government. These services involve support of systems throughout their life cycles from advanced concept development through operational support. TSC has supported Federal Government, commercial, and international customers for over 40 years. Our Government customers include the US Military Services, Defense Agencies, and the Federal Aviation Administration.

Polyphase Microwave, Inc.

Polyphase Microwave designs and manufactures high-performance specialty mixer components, electronic assemblies, custom circuit boards, and instrumentation for demanding RF/microwave applications. Our products are critical elements in wireless communications systems, radar/EW systems, test instrumentation, and scientific R&D.

In-Stock and Custom Products

We stock a complete line of specialty mixer components including image-reject mixers, quadrature (I/Q) modulators, quadrature (I/Q) demodulators, and single-sideband modulators. Our standard products are often just the starting point for a customized solution. Our experienced engineering staff is ready to discuss your application requirements and find the best solution for your system.

Facility

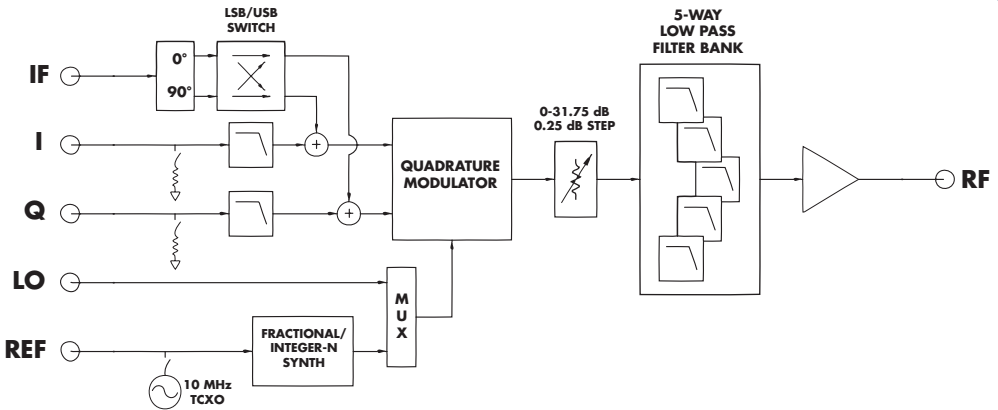
We design, build and test all of our products at our manufacturing facility located in Bloomington, Indiana, USA.

Quality Assurance

Polyphase Microwave is committed to customer satisfaction through our Quality Management System (QMS). All of our employees are trained in the QMS requirements and are responsible for its application to the manufacturing process. Our QA manager regularly reviews the QMS while ensuring compliance and continuous improvements.

protoTx UPCONVERTER

The protoTx is a 0.3GHz to 5.0 GHz user-programmable RF upconverter and IF to RF upconverter with internal LO synthesizer.

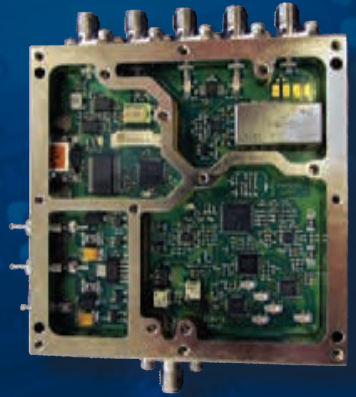


Models:

- PTX-0350 (IF: 10MHz – 50MHz)
- PTX-0350-001 (IF: 30MHz – 100MHz)
- PTX-0350-002 (IF: 100MHz – 200MHz)

4 Programmable Operating Modes:

- I/Q upconverter
- RF = LO + IF upconverter
- RF = LO - IF upconverter
- Synthesizer



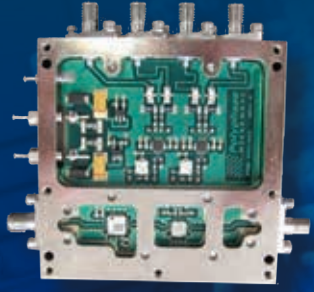
Features:

- USB 2.0 interface
- Internal LO synthesizer or external LO input
- 1 Hz step size
- LO nulling control
- 5-way switched RF filter bank
- RF attenuator, 0 to 31.75 dB in 0.25 dB steps
- +22 dBm RF output power
- API available for custom software integration
- Non-volatile memory for setting recall
- Compact size: 3"x3"x0.6"



QUADRATURE MODULATORS

Quadrature modulators generate any bandpass RF modulation including QPSK, QAM, OFDM, FM, PM, AM, and pulsed Doppler. I and Q baseband inputs directly modulate the LO input to generate a modulated RF output. AM series modulators use active designs with superior linearity and have integrated LO amplifiers. QM series modulators are passive for the lowest output noise.



Device	LO/RF Frequency (GHz)	I/Q Bandwidth (MHz)	Conversion Loss (dB)	LO-RF Leakage (dBm)	Sideband Suppression (dBc)	Supply Voltage (V)
AM0350A	0.3 - 5.0	DC - 300	3.0	-35	-40	±5
QM0511A	0.55 - 1.1	DC - 275	8.5	-52	-35	Passive
QM0622A	0.6 - 2.2	DC - 275	7.5	-55	-35	Passive
QM1214A	1.2 - 1.4	DC - 275	7.0	-50	-42	Passive
QM1220A	1.2 - 2.0	DC - 275	7.0	-50	-40	Passive
QM1422A	1.4 - 2.2	DC - 275	7.0	-52	-40	Passive
QM2040A	2.0 - 4.0	DC - 275	8.0	-42	-34	Passive
QM2326A	2.3 - 2.6	DC - 275	8.5	-50	-45	Passive
AM3570A	3.5 - 7.0	DC - 300	6.5	-35	-31	±5
QM4075A	4.0 - 7.5	DC - 275	6.5	-25	-34	Passive
AM4080A	4.0 - 8.0	DC - 300	7.0	-35	-38	±5
AM70100A	7.0 - 10.0	DC - 300	7.0	-45	-40	±5
AM90120A	9.0 - 12.0	DC - 300	8.0	-45	-40	±5
AM110140A	11.0 - 14.0	DC - 300	8.5	-40	-32	±5
AM150175A	15.0 - 17.5	DC - 300	10.0	-45	-30	±5

Values listed are typical. See datasheet for full performance specifications.

SINGLE SIDEBAND MIXER

Upconvert an IF signal to the desired RF sideband while suppressing the unwanted RF sideband. The SSB series features enhanced sideband suppression, linearity, and ultra-low LO leakage.

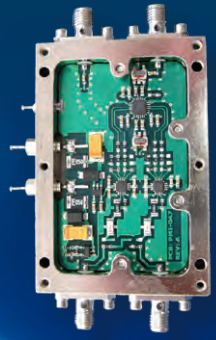


Device	LO/RF Frequency (GHz)	LO Power (dBm)	Conversion Loss (dB)	Carrier Suppression (dBm)	Sideband Suppression (dBc)	Supply Voltage (V)
SSB0550A	0.5 - 5.0	5	4.0	-35	-40	±5
SSB0511A	0.55 - 1.1	14	8.5	-50	-35	Passive
SSB0622A	0.6 - 2.2	14	8.0	-45	-38	Passive
SSB1214A	1.2 - 1.4	14	8.0	-48	-40	Passive
SSB2040A	2.0 - 4.0	15	8.0	-37	-33	Passive
SSB3040A	3.0 - 4.0	15	7.5	-38	-35	Passive
SSB3570A	3.5 - 7.0	15	7.0	-32	-34	Passive
SSB4080A	4.0 - 8.0	15	6.5	-35	-37	Passive
SSB70100A	7.0 - 10.0	15	6.0	-40	-37	Passive
SSB80120A	8.0 - 12.0	15	7.0	-37	-35	Passive
SSB110150A	11.0 - 15.0	15	7.5	-32	-34	Passive
SSB140180A	14.0 - 18.0	15	8.0	-33	-33	Passive

Values listed are typical. See datasheet for full performance specifications.

QUADRATURE DEMODULATORS

Quadrature demodulators directly convert RF signals to I and Q baseband outputs. Internally matched lowpass filters provide anti-aliasing for easy interfacing with digitizers or ADCs. AD series demodulators are active designs with the best overall performance. QD series demodulators use passive mixers for the lowest possible output noise.



Device	LO/RF Frequency (GHz)	I/Q Bandwidth (MHz)	Conversion Loss (dB)	Amplitude Imbalance (dB)	Quadrature Phase Error (Deg)	Supply Voltage (V)
AD0105B	0.1 - 0.5	DC - 100	7.5	±0.1	±1.5	±5
AD0540B	0.5 - 4.0	DC - 275	0.0	±0.05	±0.5	±5
QD0511B	0.55 - 1.1	DC - 275	8.5	±0.1	±1.6	Passive
QD0622B	0.6 - 2.2	DC - 275	7.5	±0.1	±1.4	Passive
QD1214B	1.2 - 1.4	DC - 275	7.0	±0.1	±1.1	Passive
QD1220B	1.2 - 2.0	DC - 275	7.0	±0.1	±1.2	Passive
QD1422B	1.4 - 2.2	DC - 275	6.5	±0.1	±1.5	Passive
QD2040B	2.0 - 4.0	DC - 275	8.0	±0.2	±2.5	Passive
AD2060B	2.0 - 6.0	DC - 275	2.0	±0.05	±0.5	±5
QD2326B	2.3 - 2.6	DC - 275	8.5	±0.05	±0.5	Passive
QD3040B	3.0 - 4.0	DC - 275	7.0	±0.1	±1.6	Passive
QD4070B	4.0 - 7.0	DC - 275	7.0	±0.2	±2.0	Passive
AD4080B	4.0 - 8.0	DC - 275	8.0	±0.1	±2.0	±5
AD60100B	6.0 - 10.0	DC - 275	7.0	±0.1	-2.0	±5
AD90120B	9.0 - 12.0	DC - 275	8.0	±0.1	-1.0	±5
AD110140B	11.0 - 14.0	DC - 275	9.0	±0.2	±2.0	±5
AD155180B	15.5 - 18.0	DC - 275	11.0	±0.3	±1.0	±5

Values listed are typical. See datasheet for full performance specifications.

IMAGE REJECT MIXERS

The desired RF sideband is downconverted to an IF output while the unwanted RF image is rejected. The IRM series features enhanced image rejection, linearity, and LO-RF isolation making them ideal for high-performance microwave downconverters and receivers.



Device	LO/RF Frequency (GHz)	LO Power (dBm)	Conversion Loss (dB)	Noise Figure (dB)	Image Rejection (dB)	Supply Voltage (V)
IRM0511B	0.55 - 1.1	14	8.5	9	37	Passive
IRM0622B	0.6 - 2.2	14	8.5	9	35	Passive
IRM1214B	1.2 - 1.4	14	8.0	8.5	40	Passive
IRM2040B	2.0 - 4.0	15	9.5	10	35	Passive
IRM3040B	3.0 - 4.0	15	7.5	8	37	Passive
IRM3570B	3.5 - 7.0	15	8.0	8.5	30	Passive
IRM4080B	4.0 - 8.0	15	7.5	8	35	Passive
IRM50100B	5.0 - 10.0	15	7.5	8	32	Passive
IRM70100B	7.0 - 10.0	15	7.5	8	40	Passive
IRM80120B	8.0 - 12.0	15	7.5	8	33	Passive
IRM110150B	11.0 - 15.0	15	8.5	9	30	Passive
IRM140180B	14.0 - 18.0	15	8.5	9	32	Passive

Values listed are typical. See datasheet for full performance specifications.