PRODUCT DESCRIPTION

Thin Film Mixers

Avantek's series of Thin-Film Ceramic Mixers features 14 different types of double- and triple-balanced mixers with RF/LO frequency ranges from 0.75 GHz to 26 GHz and IF from DC to 10 GHz.

Thin Film Mixers offer excellent gain and phase matching and tracking from unit-to-unit and lot-to-lot, with no compromise in performance specifications.

Superior stability over temperature is a result of the thin film alumina substrate construction. Conversion loss on these mixers typically varies <0.5 dB from –55° to 100°C.

The planar design and construction can survive high levels of thermal shock, mechanical shock and random vibration. Welding and thermo-compression bonding is used throughout instead of solder for improved performance and reliability.

Thin Film Mixers are supplied in Avanpak stainless steel hermetic cases. All TFX Series Mixers are available with a variety of connector options on all ports.

Included in the Thin Film models are block converters with high microwave IF frequencies and band overlap, wideband mixers with decade plus bandwidth and a .75 to 18 GHz dual channel mixer.

Applications include multi-channel system design due to the excellent amplitude and phase tracking between mixers with little or no matching or selecting required. Thin-Film Mixers are designed so that all units can be dropped into existing sockets with minimal change in system performance.

Avanpak DBX/DBY Mixers

Avantek's DBX/DBY Series covers the frequency range .05 to 18 GHz with various IF response frequencies ranging from DC to 10 GHz.

All DBX/DBY mixers feature high isolation, relatively low conversion loss and a good 50-ohm match (low VSWR) at all ports for ease of integration with other RF components.

The DBX/DBY Series uses precisely matched Schottky-barrier diodes and a "quasi-planar" physical construction for excellent overall symmetry. Construction techniques result in high LO-to-RF isolation, extremely low single-tone intermodulation distortion and very good amplitude and phase match characteristics.

Applications include use in threat warning self protection jammers and wideband heterodyned receivers. This series is also ideal for narrowband low IF frequency requirements.

These mixers are supplied in Avanpak DBX and DBY cases. The DBY is a smaller version of the DBX and is used in compact stripline/microstrip systems. The DBY offers all of the same performance and reliability advantages of the DBX package.

Planarpak™ Surface Mount Mixer

The PPM-2515M is a triple balanced surface mount mixer with a frequency range of .05 to 2.5 GHz and an IF range of .001 to 1.5 GHz.

This PlanarPak mixer uses precisely matched monolithic beam lead Schottky diodes and polyimide insulated baluns to yield excellent performance over more than five octaves of RF and LO bandwidths. With overlapping RF, LO and IF frequency ranges there is still greater than 25 dB of port-to-port isolation. IF bandwidths up to 1500 MHz are obtained with very flat conversion loss. Good 50-ohm match is realized at all ports.

UMX Double Balanced Mixers

Avantek's UMX Series of double balanced mixers covers the frequency range 1 to 5500 MHz with various IF response frequencies ranging from DC to 1300 MHz.

The UMX Series features high isolation and good harmonically-related intermodulation product suppression.

The UMX double balanced mixers have been designed for low cost/high performance applications. They are supplied in the hermetically sealed TO-8 package.

Avanpak Mixer-Preamplifiers

The MXA Series of Avanpak mixer-preamplifiers integrates Avantek's mixer and thin-film amplifier products into a miniature microwave flatpack.

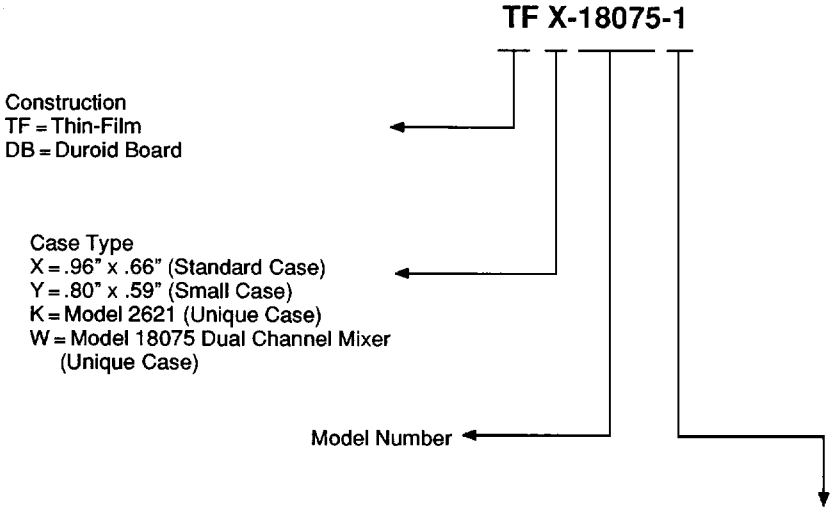
MXA devices cover the frequency range from .05 to 18 GHz on the R and L ports with frequencies up to 2 GHz.

Virtually any combination of selected mixers and amplifiers may be cascaded to meet customer needs. All combinations are packaged in Avanpak MA-X cases which are small size and light weight and can be used for coax, stripline or microstrip applications.

Avantek Doubler

Avantek balanced doubler operates over the frequency range of 75 MHz to 2 GHz.

Mixer Model Number Selection Guide



Connector Configuration Designation

Dash Number	Connectors R Port	I Port	L Port
–1	F	F	F
–2	P	P	P
–3	M	M	M
–4	F	F	M
–5	F	M	M
–6	F	M	F
–7	M	M	F
–8	M	F	F
–9	M	F	M

See the following case drawings for connector options:

DBX/TFX, page 16–10
DBY, page 16–11
TFK page 16–44
TFW, page 16–45

Avantek's Mixer model number selection guide allows the end user to specify either thin-film or duroid board technology, case type, model number and connector configuration.

Contact your nearest Avantek direct sales engineer, manufacturer's representative, and/or distributor for assistance in ordering Avantek Mixer products.

MIXER SELECTION GUIDE

THIN FILM MIXERS*

Typical Specifications at 25°C Case Temperature

Model No.	Frequency Range RF/LO (GHz)	Frequency Range IF (GHz)	Conversion Loss (dB)	Isolation LO to RF (dB)	Isolation LO to IF (dB)	VSWR RF Port	VSWR LO Port	Case Type	Page Number
TFX-72L/M/H	2–7	DC–1.0	6.0	35	35	2.5	2.0	TFX	7–6
TFX824M/H	2–8	.005–4.0	7.5	22	35	2.0	2.0	TFX	7–18
TFX-158L/M	8–15	DC–1.0	6.0	30	30	2.0	2.0	TFX	7–8
TFX-167L/M	7–16	DC–4.0	6.5	30	20	2.5	2.0	TFX	7–10
TFX-184L	4–18	DC–4.0	7.0	25	20	2.5	2.5	TFX	7–12
TFX-185L	5–18	DC–5.0	6.5	25	20	2.0	2.5	TFX	7–14
TFX-186L	6–18	DC–5.5	6.5	30	25	2.5	2.5	TFX	7–16
TFX-18075L/M/H	.75–18	DC–0.5	8.0	25	20	2.7	2.5	TFX	7–24
TFW-18075D	.75–18	DC–0.3	7.0	25	20	2.7	2.5	TFW	7–26
TFX-2021M/H	2–20	DC–0.5	7.5	25	30	2.5	2.0	TFX	7–20
TFK-2621M	2–26	DC–0.5	8.0	35	25	2.5	2.5	TFK	7–22

*Mixers are available for use with low-power (+7 to +13 dBm), medium power (+10 to +17 dBm), and high-power (+17 to +24 dBm) LOs. The TFX-824 has two diode quads and operates with medium (+10 to +17 dBm) and high-power (+13 to +20 dBm) LOs.

DBX/DBY MIXERS

Typical Specifications at 25°C Case Temperature

Model No.	Frequency Range RF/LO (GHz)	Frequency Range IF (GHz)	Conversion Loss (dB)	Isolation LO to RF (dB)	Isolation LO to IF (dB)	VSWR RF Port	VSWR LO Port	Case Type	Page Number
DBX/DBY-3503M/H[3]	.05-3.0[1]	.001-3.0	8.0	30	35	2.0:1	2.0:1	DBX or DBY	7–50
DBX/DBY-72L/M/H	2-7	DC-1.5	6.0	35	25	2.5:1	1.7:1	DBX or DBY	7–28
DBX/DBY-824M/H[3]	2-8	.005-4.0	6.5	25	30	2.0:1	1.5:1	DBX or DBY	7–43
DBX/DBY-1221L/M/H	2-12	DC-1.3	6.0	35	25	2.5:1	2.0:1	DBX or DBY	7–45
DBX/DBY-158L/M/H	8-15	DC-1.0	6.0	30	20	2.0:1	1.5:1	DBX or DBY	7–30
DBX/DBY-167L/M/H	7-16	DC-4.0	6.5	30	20	2.0:1	1.5:1	DBX or DBY	7–32
DBX/DBY-184L/M/H[2]	4-18	DC-4.0	6.5	30	20	2.5:1	2.0:1	DBX or DBY	7–34
DBX/DBY-185L/M/H	5-18	DC-6.0	6.5	30	20	2.0:1	1.5:1	DBX or DBY	7–38
DBX/DBY-186L/M/H	6-18	DC-7.0	7.0	30	20	2.0:1	1.5:1	DBX or DBY	7–40
DBX/DBY-184LS/MS/HS	4-18	DC-1.5	6.5	30	30	2.0:1	2.0:1	DBX or DBY	7–36
DBX/DBY-1824M/H[3]	2-18	.005-4.0	7.0	25	30	2.5:1	2.0:1	DBX or DBY	7–47
DBX/DBY-18212M/H[3]	2-18	0.5-10	7.5	30	20	2.5:1	2.0:1	DBX or DBY	7–52

NOTES. 1. LO = .05-3.5 GHz
2. Also available with LS/MS/HS suffix (page 7–36) with 30 dB typ LO to IF isolation and IF response to 1.5 GHz for swept frequency applications
3. Triple balanced mixer (balanced on all three ports)

SURFACE MOUNT PACKAGE MIXER

Typical Specifications at 25°C Case Temperature

Model	Frequency Range RF & LO (GHz)	Frequency Range IF (GHz)	Conversion Loss (dB)	Isolation LO to RF (dB)	Isolation LO to IF (dB)	VSWR RF Port	VSWR LO Port	Case Type	Page Number
PPM-2515M	.05-2.5	.001-1.5	7.6	35	35	1.5:1	2.5:1	PP-38M	7–55

MIXER SELECTION GUIDE (continued)

UMX MIXERS

Typical Specifications at 25°C Case Temperature

Model	Frequency Range RF & LO (MHz)	Frequency Range IF (MHz)	Conversion Loss (dB)	Isolation LO to RF (dB)	Isolation LO to IF (dB)	VSWR RF Port	VSWR LO Port	Case Type	Page Number
UMX-520	1-500	DC-500	6.0	55	45	1.4	1.5	TO-8M	7–57
UMX-570[1]	1-500	DC-500	5.5	35	45	1.2	1.8	TO-8M	7–59
UMX-2020	10-2000	DC-1000	7.0	40	30	2.0	2.0	TO-8M	7–61
UMX-4220	3700-4200[2]	DC-1300	5.0	35	25	1.5	1.5	TO-8M	7–63

NOTES. 1. +27 dBm LO drive, +32 dBm intercept point
2. LO = 2400 to 5500 MHz

MIXER/PREAMPLIFIERS[1]

Typical Specifications at 25°C Case Temperature

Model	Consisting of the Following Products	Frequency Range f_{RF} (GHz)	Frequency Range f_{LO} (GHz)	Frequency Range f_{IF} (MHz)	RF-IF Gain (dB) Min.	Noise Figure (dB) Typ.	Power Output for 1 dB Gain Compression (dBm) Min.	DC Current (mA) Typ	Case Type	Page Number
MXA-2512	DBX-3503, UTO-440, UTO-210	.5-2.0	.5-2.0	10-200	10	11	6	30	MA-3	7–65
MXA-3012[2]	DBX-3503, UTO-1012, UTO-1013	.05-3.0	.05–3.5	10-1000	20	10.5	7	50	MA–2	7–65
MXA-7202	TFX-72M, UTO-514, UTO-516	2-7	2-7	30-160	22	8.5	9	45	MA-2	7–65
MXA-7203	TFX-72M, UTO-514, UTO-516, UTO-509	2-7	2-7	30-160	33	8.5	20	135	MA-3	7–65
MXA-10911	TFX-186M, UTO-222	9-10	9-10	70	20	9	18	50	MA-1	7–65
MXA-18422	TFX-184M, UTO-2012, UTO-2012	4-18	4-18	500-2000	9	11.5	12	100	MA-2	7–65
MXA-18423	TFX-184M, UTO-2012, UTO-2012, UTO-2013	4-18	4-18	500-2000	18	11.5	19	200	MA-3	7–65

NOTES. 1. Sample Listing of possible Mixer/Amplifier combinations
2. Power out at 1 dB compression is +3 dBm (Min.) from .05 to .6 GHz RF input frequency on MXA-3012

DOUBLERS

Typical Specifications At 25°C Case Temperature

Model	Input Port Frequency Range (MHz)	Output Port Frequency Range (MHz)	Conversion Loss (dB)	VSWR Input	VSWR Output	Case Type	Page Number
DRX-2075	75-2000	150-4000	11	2.0	2.0	DRX	7–67