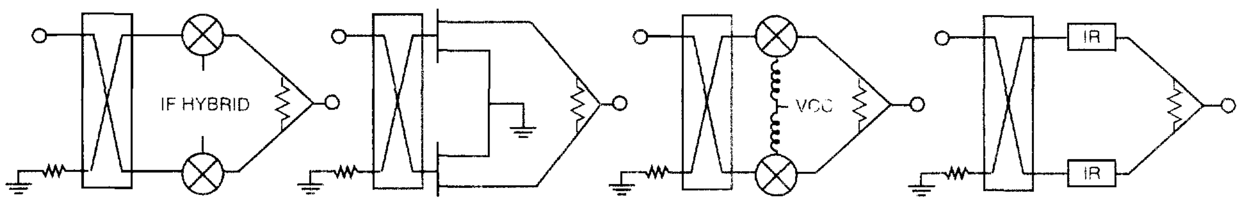
IMAGE REJECTION MIXERS AND I/Q DEMODULATORS



IR Image Rejection	IRF MESFET Image Rejection	IRB Biasable Image Rejection	IRE Enhanced Image Rejection

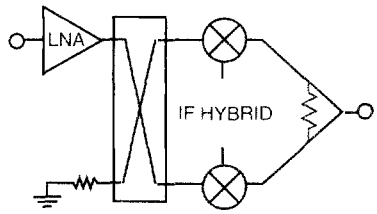
MODEL NUMBER	FREQUENCY RANGE RF AND LO (GHz)	FREQUENCY RANGE IF (GHz) (Note 1)	NOMINAL LO POWER (dBm) (Note 2)	CONVERSION LOSS (dB) (Max.)	IMAGE REJECTION (dB) (Typ./Min.)	LO-RF ISOLATION (dB) (Typ./Min.)	INPUT IP3 (dBm, Typ.) (Note 2)	OUTLINES	NOTES
OCTAVE BANDWIDTHS									
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	23 / 18	[illegible]	[illegible]	[illegible]	[illegible]
IR0204LC2	2 – 4	DC – 0.5	10 – 13	7.5	25 / 18	30 / 20	16	12	3, 4
IR0408LC2	4 – 8	DC – 0.5	10 – 13	8	23 / 18	30 / 20	16	12	3, 4
IR0812LC2	8 – 12	DC – 0.5	10 – 13	8	23 / 18	30 / 20	16	12	3, 4
IR1218LC2	12 – 18	DC – 0.5	10 – 13	9.5	20 / 15	23 / 20	16	12	3, 4
IR1826LC3	18 – 26	DC – 0.5	10 – 13	12	20 / 15	23 / 20	16	14	3, 4
IR2640LC2	26 – 40	DC – 0.5	10 – 13	12.5	20 / 15	20 / 15	14	12	3, 4
MULTIOCTAVE BANDWIDTHS									
IR0502LC1	0.5 – 2	DC – 0.5	10 – 13	9.5	18 / 15	20 / 18	16	6	3, 4
IR0104LC1	1 – 4	DC – 0.5	10 – 13	9.5	20 / 18	20 / 18	16	6	3, 4
IR0208LC2	2 – 8	DC – 0.5	10 – 13	9	20 / 18	20 / 18	18	12	3, 4
IRE0208LI1	2 – 8	DC – 0.5	10 – 13	9.5	30 / 25	30 / 24	18	19	3, 4, 5, 8
IR0218LC1	2 – 18	DC – 0.5	10 – 13	11	20 / 18	20 / 18	18	4	3, 4
IR0618LC2	6 – 18	DC – 0.5	10 – 13	10	20 / 18	20 / 18	16	12	3, 4
IRE0618LI1	6 – 18	DC – 0.5	13 – 15	10.5	35 / 25	30 / 24	18	19	3, 4, 8
IR0226LC1	2 – 26	DC – 0.5	10 – 13	14.5	18 / 15	18 / 15	18	4	3, 4
SPECIAL FEATURE UNITS									
IR0327HA1	3 – 2.7	0.3 – 0.5	17	3.5	15 / 12	40 / 30	23	1	4, image recovery
IRB0218LC1	2 – 18	.01 – 0.5	-10 – 13	12.5	20 / 18	18 / 15	0	5	4, biasable
IRF0306HI2	3 – 6	DC – 0.5	13 – 26	7.5	20 / 18	30 / 20	33	23	4, MESFET, 8
IRF0612HI2	6 – 12	0.5 – 1	13 – 26	8	20 / 18	30 / 20	33	23	4, MESFET, 8
IR0118LC1	1 – 18	DC – 0.5	10 – 13	11	20 / 15	20 / 18	16	7	4
IRA0226LC1	2 – 26	DC – 0.5	10 – 13	20 (gain/min.)	20 / 15	35 / 20	15	5	4, with IF amp
IRBA0226LC1	2 – 26	.01 – 0.5	-10 – 13	25 (gain/min.)	20 / 15	25 / 20	0	5	4. biasable. IF amp

GENERAL

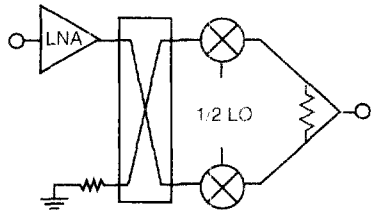
The image rejection mixers and LNA/image rejection mixers in this section represent the most popular models of many different specialized units. They all employ state-of-the-art designs from our mixer group, as well as amplifiers from other MITEQ departments. The symbols above each section are descriptive of the mixer model number prefixes used.

The output power capability of mixers (with and without LNAs) is chiefly determined by the LO power used. The specifications shown are mostly mixers using low-level Schottky diodes, but in all cases higher level H diodes are available requiring 10 dB more LO power and yielding a proportional increase in IF output capability. For extremely high dynamic range, with limited LO power, MESFET mixers with DC bias can be used. Conversely, for applications requiring smallest LO power (-10 dBm), where high IF output power is not required, DC biased Schottky diode designs (IRB) are cost effective.

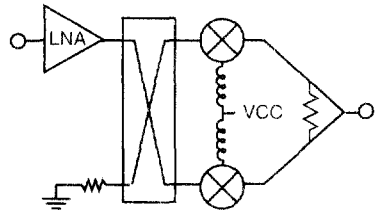
LOW-NOISE IMAGE REJECTION DOWNCONVERTER ASSEMBLIES AND I/Q DEMODULATORS



AR
Low-Noise Image Rejection Mixer Assembly



ARE
Even-Harmonic Low-Noise Image Rejection Mixer Assembly



ARB
Biasable Low-Noise Image Rejection Mixer Assembly

MODEL NUMBER	FREQUENCY RANGE RF AND LO (GHz)	FREQUENCY RANGE IF (GHz) (Note 1)	NOMINAL LO POWER (dBm) (Note 2)	RF-IF GAIN (dB) Typ./Min.	NOISE FIGURE (dB) (Max.)	IMAGE REJECTION (dB) (Min.)	OUTPUT IP³ (dBm, Typ.) (Note 2)	OUTLINES	NOTES
OCTAVE BANDWIDTHS AND SPECIAL FEATURE UNITS									
AR0204LC2	2 – 4	DC – 0.5	10 – 13	30 / 27	1.5	20	16	40	
AR0408LC2	4 – 8	DC – 0.5	10 – 13	32 / 30	2	20	16	40	
ARS308LC7	9.0 – 9.3	.05 – .07	16 – 18	17 / 15	5	15	20	47	9
AR0812LC2	8 – 12	DC – 0.5	10 – 13	30 / 29	2.5	20	16	40	
AR1218LC2	12 – 18	DC – 0.5	10 – 13	28 / 27	3.5	17	18	40	
AR1826LC1	18 – 26	DC – 0.5	10 – 13	35 / 30	5	15	18	43	
MULTIOCTAVE BANDWIDTHS AND SPECIAL FEATURE UNITS									
AR0104LC1	1 – 4	DC – 0.5	-3 – +3	35 / 25	2.5	18	10	43	Biasable LO
ARE0208LC1	2 – 8	DC – 0.2	13 – 16	29 / 26	2.5	27	10	42	8
AR0618LC2	6 – 18	DC – 0.5	10 – 13	24 / 22	4	18	10	40	
AR0118LC1	1 – 18	DC – 0.5	10 – 13	30 / 25	4	15	10	41	
AR2026LC1	20 – 26	DC – 0.5	10 – 13	25 / 23	5	15	10	43	
ARE3436LC1	35 – 36 / 15.5 – 16.5	2.7 – 3.3	10	25	4.5	17	10	46	LO = 1/2 RF
LNB-2640-40	26 – 40	2 – 16	0 for 10 MHz ref.	40	4	20	10	48	

SECTION 2 NOTES

Note 1: To specify the IF frequency, select from the following standard options, or contact MITEQ:
Suffix A: 20–40 MHz, Suffix B: 40–80 MHz, Suffix C: 100–200 MHz, Suffix D: 500–1000 MHz, Suffix Q: I/Q outputs

Note 2: IP^3 measured at midband RF/LO/IF and maximum LO power. Input mixer 1 dB RF compression power is approximately equal to LO power for MESFET designs and -5 dB lower for Schottky designs.

Note 3: Standard units are aligned for LO < RF. For LO > RF, add suffix L to the end of the part number.

Note 4: For LO < RF and LO > RF add suffix B to the end of the part number (image rejection degrades by 2 dB)

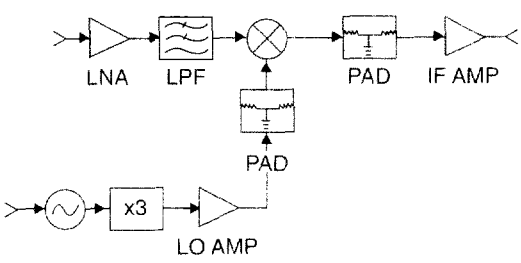
Note 5: LO-RF isolation is typically 60 dB for all low-noise downconverter models.

Note 6: All units are available in phase and amplitude matched sets, contact MITEQ.

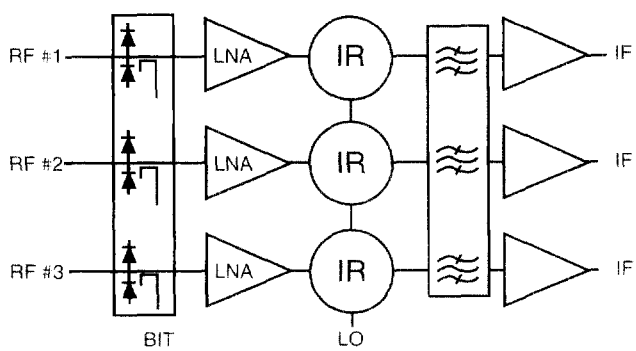
Note 7: Limiter protection for RF low-noise amplifier is available, contact MITEQ.

Note 8: Hermetically sealed housing.

Note 9: 3-channel LNA phase amplitude matched unit with limiter protection and internal bit and LO distribution. Also contains IF filter and fixed gain preamplifier.



LNB
Low-Noise Block Conversion Assembly



ARS
Multichannel, Phase/Amplitude Tracking (with Input Limiter)

SECTION 2