

MIXERS, ACTIVE 50 Ω
570 MHz to 6 GHz



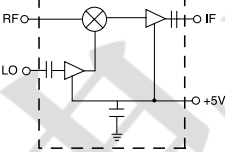
MAX
Case BJ937

HIGH OUTPUT IP3

MODEL PREFIX	FREQUENCY (MHz)			OUTPUT IP3 (dBm)	RF INPUT @ 1 dB compression (dBm)	CONVERSION GAIN (dB)		NOISE FIGURE (dB)	LO-RF ISOLATION (dB)		LO-IF ISOLATION (dB)		DC POWER				
	RF	LO	IF			Typ.	(dBm)		Min.	Max.	Max.	Typ.	Min.	Typ.	Min.	Volt	Current (mA) Max.
LEVEL 0 LO Power 0 dBm up to 8 dBm RF																	
MAX-9H	810-930	570-675	240-260	33	8	8.0	11	11	22	10	2	—	5	165			
MAX-19H	1700-1940	1450-1675	240-260	32	7	7.5	10	11	19	10	6	—	5	165			

ELECTRICAL SCHEMATIC

MAX MIXER/AMPLIFIER



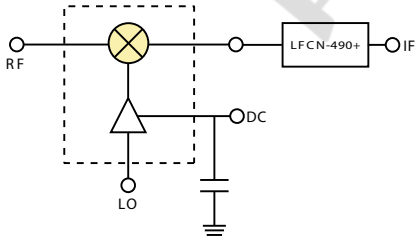
MACA
Case DZ1034

WIDEBAND

MODEL PREFIX	FREQUENCY (MHz)		OUTPUT IP3 (dBm) Typ.	RF INPUT @ 1 dB compression (dBm) Typ.	CONVERSION LOSS (dB)			LO-RF ISOLATION (dB)		LO-IF ISOLATION (dB)		DC POWER	
	RF/LO	IF			Min.	σ	Max.	Typ.	Min.	Typ.	Min.	Volt	Max.
	LEVEL 0 LO Power 0 dBm up to 10 dBm RF												
MACA-63H	2000-6000	DC-1000	20	10	6.9	0.1	8.9	16	10	35	23	5	110
LEVEL -3 LO Power -3 dBm up to 10 dBm RF													
MACA-242H	750-2400	DC-500	18	10	6.1	0.1	9.8	20	4	55	28	5	110

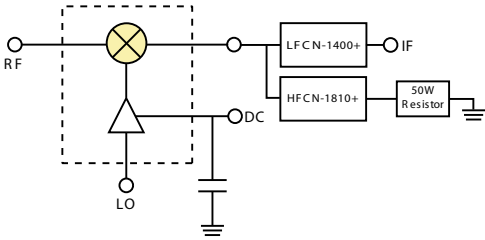
ELECTRICAL SCHEMATICS

MACA -242H



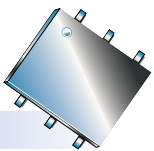
LFCN-490+ is added to improve L-I isolation.

MACA -63H



LFCN-1400+ & HFCN-1810+ is added to improve isolation.





MIXERS, HI-REL 50 Ω

0.15 MHz to 4 GHz Hermetically Sealed Ceramic Quads



MODEL PREFIX	LO LEVEL (dBm)	RF IN @ 1 dB comp. Typ. (dBm)	FREQUENCY (MHz)		CONVERSION LOSS (dB)				LO-RF ISOLATION (dB)						LO-IF ISOLATION (dB)						IP3 (dBm)
			LO/RF	IF	$\bar{x}$	σ	Max.	TOTAL RANGE Max.	L Typ.	M Typ.	U Typ.	L Min.	M Min.	U Min.	L Typ.	M Typ.	U Typ.	L Min.	M Min.	U Min.	

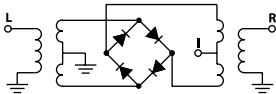
PLASTIC PACKAGE

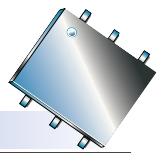
ADE-R1L	+3	0	2-500	DC-500	5.6	0.10	7.2	8.8	68	55	55	42	44	35	60	45	45	32	35	25	14
ADE-R6	+7	+1	0.15-250	DC-200	4.6	0.05	7.0	7.5	70	50	55	40	42	28	65	45	45	27	32	18	10
ADE-R1	+7	+1	1-500	DC-500	5.0	0.10	6.5	7.8	75	55	60	40	45	33	65	45	45	26	30	18	15
ADE-R2ASK	+7	+1	2-1000	DC-1000	5.4	0.10	6.8	9.5	65	50	48	32	36	20	55	40	32	22	22	11	14
ADEX-R10	+7	+1	10-1000	DC-800	6.8	0.10	7.8	8.3	70	55	60	40	47	37	40	26	33	20	26	13	16
ADE-R901	+7	+1	300-1000	DC-200	5.9	0.10	7.5	—	38	25	38	25	38	25	28	20	28	20	28	20	13
ADEX-R11X	+7	+1	10-2000	10-1000	7.5	0.10	8.5	9.8	62	45	36	23	30	20	60	45	42	30	33	22	10
ADEX-R20	+7	+1	1500-2800	DC-500	5.8	0.10	8.0	—	30	22	30	22	30	22	28	15	28	15	28	15	12
ADEX-R30W	+7	+1	300-4000	DC-950	6.8	0.20	9.0	9.8	35	18	35	18	35	18	16	6	16	6	16	6	12
ADE-R1LH	+10	+5	1-500	DC-500	5.2	0.10	6.5	8.2	70	55	60	45	47	32	65	45	45	28	34	20	15
ADE-R2ASKLH	+10	+5	2-1000	DC-1000	5.7	0.10	7.0	9.5	68	45	45	30	36	20	55	40	32	22	22	12	15
ADEX-R10LH	+10	+5	10-1000	DC-800	7.0	0.10	7.8	8.3	70	55	60	40	47	37	60	45	42	30	33	22	16
ADE-R901LH	+10	+5	300-1000	DC-800	6.4	0.10	7.8	—	42	32	42	32	42	32	35	20	35	20	35	20	18
ADE-R5LH	+10	+5	10-1500	DC-1000	7.2	0.10	8.2	9.5	65	50	55	40	42	27	50	37	40	28	30	20	15
ADE-R11XLH	+10	+5	10-2000	10-1000	7.5	0.10	8.6	9.8	55	40	36	23	28	18	65	50	45	30	38	22	11
ADE-R6LH	+10	+5	0.2-250	DC-200	4.9	0.05	7.0	8.4	70	54	50	37	40	28	65	45	45	31	33	20	16
ADE-R20LH	+10	+5	1500-2600	DC-300	6.0	0.10	8.2	—	35	23	35	23	35	23	26	15	26	15	26	15	14
ADE-R3GLH	+10	+4	2000-2700	DC-700	5.2	0.10	7.0	—	35	24	35	24	35	24	23	9	23	9	23	9	14
ADE-R18WLH	+10	+5	1750-3500	DC-700	5.4	0.30	8.9	—	33	22	33	22	33	22	12	7	12	7	12	7	11
ADE-R35LH	+10	+5	1800-3500	DC-1000	6.8	0.50	9.2	—	25	16	25	16	25	16	22	12	22	12	22	12	14
ADE-R30WLH	+10	+5	300-4000	DC-950	7.5	0.20	9.0	9.8	40	24	40	24	40	24	16	6	16	6	16	6	15
ADE-R1MHW	+13	+9	5-600	DC-600	5.2	0.10	6.9	8.0	63	50	53	35	43	27	56	40	44	28	30	20	18
ADE-R12MH	+13	+9	10-1200	DC-1200	6.8	0.10	8.2	9.5	62	48	50	38	40	28	68	40	42	30	30	21	22
ADE-R272MH	+13	+9	1300-2700	DC-600	5.6	0.10	9.5	—	34	24	34	24	34	24	25	11	25	11	25	11	18

SHIELDED METAL CASE

TUF-R3SM	+7	+1	0.25-400	DC-400	5.0	0.06	7.0	8.0	70	55	60	40	55	35	62	45	45	30	38	25	11
TUF-R1SM	+7	+1	5-600	DC-600	5.6	0.2	7.0	8.0	60	45	50	32	42	26	60	43	48	34	40	25	16
TUF-R2SM	+7	+1	50-1000	DC-1000	6.2	0.05	7.5	9.0	60	45	50	38	45	33	52	40	45	25	35	20	16
TUF-R5SM	+7	+1	20-1500	DC-1200	6.5	0.05	9.0	9.0	55	42	48	35	43	32	40	25	30	18	23	10	12
TUF-R3LHSM	+10	+5	0.3-400	DC-400	5.2	0.05	7.0	8.0	62	48	46	30	42	27	62	48	46	30	35	23	15
TUF-R1LHSM	+10	+5	5-600	DC-600	6.2	0.03	7.2	8.5	53	40	48	30	40	24	50	40	45	30	38	21	18
TUF-R2LHSM	+10	+5	50-1000	DC-1000	6.2	0.03	7.5	9.0	55	45	49	38	42	35	52	40	44	30	35	24	17
TUF-R5LHSM	+10	+5	20-1500	DC-650	6.9	0.2	8.8	9.3	55	42	47	35	42	30	40	25	28	16	22	9	13
TUF-R3MHSM	+13	+8	0.3-400	DC-400	5.0	0.03	7.0	8.0	65	50	50	33	43	28	62	48	50	33	38	25	18
TUF-R1MHSM	+13	+9	5-600	DC-600	6.0	0.07	7.0	8.5	55	43	45	33	37	28	55	42	43	32	34	23	20
TUF-R2MHSM	+13	+9	50-1000	DC-1000	6.0	0.1	7.5	9.0	58	40	50	33	42	28	52	38	42	28	32	20	19
TUF-R5MHSM	+13	+9	20-1500	DC-650	7.0	0.1	8.5	9.0	60	45	50	35	46	28	40	27	32	20	22	9	17

ELECTRICAL SCHEMATIC





MIXERS, FREQUENCY 50 Ω

50 kHz to 20 GHz



MODEL PREFIX	FREQUENCY (MHz)		CONVERSION LOSS (dB)				LO-RF ISOLATION (dB)						LO-IF ISOLATION (dB)						IP3@ center- band TYP. (dBm)	S C H E M A T I C
	LO/Rf f _L -f _U	IF	MID-BAND m σ	Max.	TOTAL RANGE Max.		L Typ.	Min.	M Typ.	Min.	U Typ.	Min.	L Typ.	Min.	M Typ.	Min.	U Typ.	Min.		

LEVEL 3 +3 dBm LO up to 0 dBm RF

ADE-1L	2-500	DC-500	5.2	0.10	7.2	8.0	68	50	55	30	44	30	55	40	45	30	35	25	16	1
MBA-15L	800-1000	DC-200	8.0	0.10	—	9.5			20	13					15	8			9	1
RMS-5L	400-1400	DC-800	7.0	0.20	—	9.8			22	14					22	6			9	1

LEVEL 4 +3 dBm LO up to 1 dBm RF

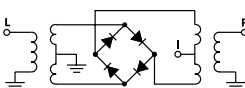
ADEX-10L	10-1000	DC-800	7.2	0.10	8.2	8.8	75	55	60	40	47	37	40	26	33	20	24	13	16	1
MBA-15L	1200-2400	DC-600	6.5	0.10	—	8.5			27	15					20	10			10	1
MBA-25L	2000-3000	DC-600	6.2	0.15	—	8.6			28	18					15	7			10	1
MBA-591L	4950-5900	DC-1000	7.0	0.10	—	9.0			35	25					26	17			15	1
SIM-73L	2400-7000	DC-3000	6.3	0.20	—	8.5			32	17					26	11			12	1
MCA1-85L	2800-8500	DC-1200	6.0	0.30	8.4	—			35	20					38	7			11	1
MCA1-12GL	3800-12000	DC-1500	6.5	0.30	9.2	—			38	17					40	8			9	1

LEVEL 7 +7 dBm LO up to +1 dBm RF

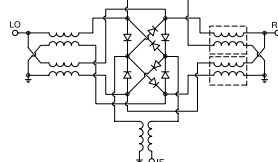
ADE-6	0.05-250	DC-200	4.6	0.05	7.0	8.4	62	49	40	30	40	20	58	44	45	24	25	15	10	1
TUF-3SM	0.15-400	DC-400	4.7	0.02	7.0	8.0	60	50	46	30	35	25	60	40	47	25	35	20	11	1
ADE-1	0.5-500	DC-500	5.0	0.10	6.5	7.8	70	50	55	35	45	30	65	45	40	25	30	20	15	1
ASK-1-KK81	1-600	DC-600	5.58	0.06	7.0	8.5	50	30	35	25	30	20	45	35	30	20	25	15	14	1
ADE-1ASK	2-600	DC-600	5.3	0.10	6.5	7.5	55	45	50	30	40	25	50	40	45	24	35	18	16	1
TUF-1SM	2-600	DC-600	5.85	0.04	7.0	8.0	60	50	42	30	37	25	60	45	47	30	36	22	16	1
ADE-2ASK	1-1000	DC-1000	5.4	0.10	6.8	9.5	55	45	45	30	36	20	50	40	32	22	22	12	12	1
SYM-2	2-1000	DC-1000	5.4	0.10	7.2	9.5	70	45	50	30	40	25	63	40	48	24	37	20	17	1
ADE-2M	5-1000	DC-1000	6.67	0.26	8.0	9.5	60	40	40	20	25	18	55	30	30	20	20	12	17	6,7
ADE-2	5-1000	DC-1000	6.67	0.26	8.0	9.5	65	40	47	25	32	22	62	35	45	25	32	20	20	1
ADEX-10	10-1000	DC-800	6.8	0.10	7.8	8.3	80	55	60	40	47	37	40	26	33	20	24	13	16	1
ADE-12	50-1000	DC-1000	7.0	0.15	8.0	9.0	40	25	—	—	33	22	44	26	—	—	37	20	17	1
TUF-2SM	50-1000	DC-1000	5.85	0.07	7.5	9.0	58	40	47	30	42	25	50	35	44	20	29	18	16	1
ADE-4	200-1000	DC-800	6.8	0.10	—	8.5	60	45	53	40	45	30	45	30	40	22	35	20	15	1
ADE-14	800-1000	DC-200	7.4	0.20	—	8.9			32	22					34	20			17	1
ADE-901	800-1000	DC-200	5.9	0.10	—	7.3			32	22					26	18			13	1
SYM-12	5-1200	DC-1000	6.5	0.30	8.0	9.0	68	45	50	30	37	25	56	40	46	25	29	18	16	1
ADE-5	5-1500	DC-1000	6.6	0.10	7.5	9.3	50	40	40	25	33	23	50	40	30	20	20	10	15	1
TUF-5SM	20-1500	DC-1500	5.7	0.04	9.0	9.0	54	40	42	30	39	25	40	25	32	18	23	8	12	1
ADE-13	50-1600	50-1000	8.1	0.10	9.0	9.8	50	25	40	25	33	20	49	30	35	20	32	20	11	1
JMS-11X	5-1900	5-1000	6.7	0.15	8.2	9.8	58	45	35	20	27	18	56	45	37	20	27	20	9	1
ADE-11X	10-2000	5-1000	7.1	0.10	8.2	9.8	62	45	36	20	27	18	60	45	37	20	38	20	9	1
ADE-20	1500-2000	DC-300	5.4	0.10	—	7.8			31	22					28	20			14	1
MCA1-24	300-2400	DC-700	6.1	0.10	—	8.9			40	25					25	15			10	1
SYM-2500	1-2500	DC-500	6.5	0.10	8.5	9.8	70	50	50	25	36	20	60	45	30	10	16	8	12	1
MBA-12	800-2500	DC-500	7.5	0.10	—	9.0			30	20					15	8			12	1
ADE-3GL	2100-2600	DC-600	6.0	0.25	—	8.8			34	25					20	7			17	1
MBA-26	2200-2700	DC-500	5.7	0.10	—	8.0			40	32					33	18			9	1
ADE-3G	2300-2700	DC-400	5.6	0.10	—	7.0			36	25					26	17			13	1
ADE-30	200-3000	DC-1000	4.5	0.20	9.0	9.8			35	20					20	7			14	1
ADE-35	1600-3500	DC-1500	6.3	0.50	—	9.8			25	16					22	12			11	1
ADE-18W	1750-3500	DC-700	5.4	0.30	—	8.9			33	20					12	7			11	1
ADE-30W	300-4000	DC-950	6.8	0.20	9.0	9.8			35	17					16	7			12	1
SIM-43	750-4200	DC-1500	6.3	0.20	—	8.6			37	25					24	11			12	1
MCA1-42	1000-4200	DC-1500	6.1	0.10	—	8.9			35	23					20	12			10	1
SKY-42	2000-4200	DC-1200	5.0	0.30	—	8.5			31	20					17	12			9	1
MBA-591	2800-5900	DC-1000	6.5	0.10	—	9.0			36	20					26	17			10	1
MCA1-60	1600-6000	DC-2000	6.2	0.30	—	8.5			32	17					18	—			8	1
MBA-671	2400-6700	DC-1000	6.5	0.10	—	9.2			36	20					26	17			10	1
SIM-83	2300-8000	DC-3000	6.0	0.20	—	8.9			32	17					28	7			15	1
MCA1-85	2800-8500	DC-1250	5.5	0.20	—	8.1			40	20					40	9			13	1
SIM-14	3700-10000	DC-4000	6.3	0.20	—	9.5			36	25					16	12			13	1
MCA1-12G	3800-12000	DC-1800	6.2	0.10	—	8.5			38	18					40	8			11	1
SIM-153	3400-15000	DC-4000	8.0	0.40	—	13.2			36	20					30	20			10	1

ELECTRICAL SCHEMATICS

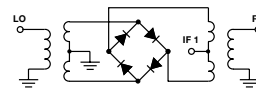
1 DOUBLE BALANCED MIXER



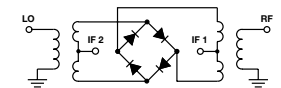
2 TRIPLE BALANCED MIXER

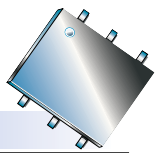


6 ADE-2M MIXER (Config. 1)



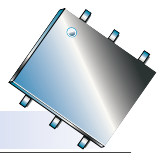
7 ADE-2M Bi-Phase Modulator (Config. 2)





MODEL PREFIX	FREQUENCY (MHz)		CONVERSION LOSS (dB)				LO-RF ISOLATION (dB)						LO-IF ISOLATION (dB)						IP3 @ center- band TYP. (dBm)	S C H E M A T I C
	LO/RF f _L -f _U	IF	MID-BAND m		TOTAL RANGE Max.		L		M		U		L		M		U			
			$\bar{x}$	σ	Max.	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.		
LEVEL 10 +10 dBm LO up to +5 dBm RF																				
ADE-1LH	0.5-500	DC-500	5.0	0.10	6.5	8.2	65	50	55	35	47	26	52	40	45	22	34	20	15	1
JMS-1LH	2-500	DC-500	5.75	0.10	7.0	8.0	55	50	45	30	40	25	55	45	45	25	30	20	16	1
RMS-1LH	2-500	DC-500	5.36	0.08	7.0	8.0	58	45	44	25	30	20	55	40	40	25	28	17	15	1
TUF-1LHSM	2-600	DC-600	6.0	0.17	7.0	8.0	70	50	50	30	42	25	65	45	50	30	41	22	17	1
RMS-2LH	5-1000	DC-1000	6.44	0.10	8.0	9.5	58	40	39	20	22	16	52	30	30	17	18	11	18	1
TUF-5LHSM	20-1500	DC-1000	6.9	0.27	8.5	9.0	53	40	42	30	38	25	40	25	30	18	22	8	14	1
SYM-11LH	1-2000	10-600	7.0	0.10	8.3	9.85	60	40	45	25	37	25	59	40	33	20	25	20	14	2
LRMS-20J	1500-2000	DC-500	5.0	0.15	—	7.5			35	22					26	18			18	1
MCA1-24LH	300-2400	DC-700	6.5	0.10	—	8.9			40	25					22	12			13	1
MBA-15LH	1200-2400	DC-600	5.6	0.10	—	8.5			26	17					22	10			15	1
SYM-25DLHW	40-2500	DC-1000	6.3	0.10	7.5	8.8	48	28	40	25	38	22	36	25	33	25	39	21	22	2
SCM-2500LH	500-2500	DC-500	5.6	0.20	6.8	10.0			36	22					18	10			16	1
LRMS-25J	750-2500	DC-600	5.2	0.15	—	9.5			35	17					20	7			18	1
SYM-30DLHW	5-3000	5-1500	6.5	0.15	8.4	9.2	36	28	37	29	33	23	41	32	45	37	47	31	19	2
MBA-18LH	1600-3200	DC-500	5.8	0.10	—	8.5			30	17					22	10			12	1
MCA-35LH	500-3500	10-1500	6.3	0.10	—	8.9			32	11					30	15			16	2
MBA-25LH	2200-3600	DC-500	7.0	0.10	—	9.2			32	21					20	10			12	1
SIM-43LH	824-4200	DC-1500	6.3	0.10	—	8.6			37	26					24	11			14	1
MCA1-42LH	1000-4200	DC-1500	6.0	0.10	—	8.9			38	23					20	11			12	1
MCA-50LH	1000-5000	10-1500	7.3	0.20	—	9.9			25	11					30	15			17	2
SKY-53LHR	2800-5300	DC-500	6.2	0.20	—	9.5			28	15					12	8			14	1
SYM-63LH	1-6000	DC-1000	7.5	0.15	9.5	10.0	65	45	35	30	29	20	60	40	25	14	19	12	14	1
SIM-63LH	750-6000	DC-1500	6.6	0.20	—	9.3			32	22					22	12			12	1
MCA1-60LH	1700-6000	DC-2000	6.4	0.10	—	8.3			35	20					21	—			13	1
SKY-60LH	2500-6000	DC-1500	6.2	0.20	—	9.7			28	17					14	8			15	1
SIM-83LH	1700-8000	DC-3000	6.0	0.20	—	8.4			31	16					28	8			18	1
MCA1-80LH	2800-8000	DC-1250	5.9	0.20	8.4	—			35	20					40	8			12	1
SIM-153LH	3200-15000	DC-4000	7.5	0.30	—	12.4			36	17					20	9			18	1
SIM-14LH	3700-10000	DC-4000	6.7	0.30	—	8.9			38	21					17	10			19	1
LEVEL 13 +13 dBm LO up to +9 dBm RF																				
TUF-3MHSM	0.15-400	DC-400	5.0	0.33	7.0	8.0	60	50	46	30	35	25	60	40	42	25	35	20	18	1
ADE-1MHW	0.5-600	DC-600	5.2	0.10	6.9	8.0	63	50	53	32	43	20	56	40	44	25	30	20	17	1
ADE-1MH	2-500	DC-500	5.2	0.10	6.5	8.0	60	45	50	35	48	25	55	40	45	30	40	22	17	1
JMS-1MH	2-500	DC-500	5.75	0.10	7.0	8.0	70	55	60	40	44	25	55	42	45	25	35	20	22	1
RMS-1MH	2-500	DC-500	5.65	0.08	7.0	8.0	58	45	44	25	30	20	55	40	36	25	28	17	26	1
ADE-12MH	10-1200	DC-1200	6.3	0.10	8.0	8.5	62	45	45	32	40	26	68	40	42	27	30	20	22	1
TUF-2MHSM	50-1000	DC-1000	6.0	0.25	7.5	9.0	58	40	47	30	37	25	55	35	47	20	32	18	19	1
ADE-10MH	800-1000	10-200	7.0	0.20	—	8.5			34	20					29	20			26	2
JMS-5MH	5-1500	DC-1000	5.7	0.10	8.0	9.5	67	40	57	25	35	20	60	40	35	18	15	8	19	1
RMS-5MH	10-1500	DC-900	5.67	0.09	9.0	9.5	58	40	40	20	26	18	50	30	38	18	17	8	17	1
MCA1-24MH	300-2400	DC-700	6.1	0.10	—	8.9			40	20					25	14			13	1
MBA-15MH	1400-2400	DC-600	5.5	0.10	—	8.5			28	16					16	8			18	1
ADE-25MH	5-2500	5-1500	6.9	0.10	8.5	9.8	47	28	34	23	34	23	34	23	32	20	23	17	18	2
RMS-25MH	5-2500	5-1500	7.0	0.20	8.5	9.8	54	28	32	23	32	20	34	23	32	25	28	17	17	2
SYM-25DMHW	40-2500	DC-1000	6.6	0.10	8.0	9.0	47	32	37	27	35	22	38	28	35	25	38	20	26	2
SYM-30DMHW	5-3000	5-1500	6.5	0.10	8.4	9.3	36	25	39	30	34	23	41	27	42	33	45	30	22	2
MBA-25MH	2000-3000	DC-500	6.5	0.10	—	8.6			36	18					20	7			18	1
ADE-35MH	5-3500	5-2500	6.9	0.10	9.3	10.5	47	28	33	23	38	18	34	23	28	18	23	17	18	2
MCA-35MH	500-3500	10-1500	6.9	0.10	—	8.7			29	11					29	15			20	2
ADE-42MH	5-4200	5-3500	7.5	0.20	9.8	11.8	47	28	29	20	30	15	34	23	26	17	23	17	17	2
RMS-42MH	800-4200	DC-800	5.3	0.20	9.0	10.8	35	25	—	—	28	17	18	10	—	—	15	7	19	1
SIM-43MH	824-4200	DC-1500	6.1	0.10	—	9.8			35	22					23	10			21	1
MCA1-42MH	1000-4200	DC-1500	6.2	0.10	—	8.9			35	20					20	10			16	1
MCA1T-42MH	1000-4200	DC-1500	6.2	0.10	—	8.9			35	20					20	10			16	1
MCA-50MH	1000-5000	10-1500	7.3	0.20	—	9.9			25	11					30	20			19	2
SKY-53MHR	2800-5300	DC-500	5.7	0.20	—	9.5			28	15					12	8			19	1
MCA1-60MH	1600-6000	DC-2000	6.2	0.10	—	8.5			28	18					15	—			15	1
SKY-60MH	2500-6000	DC-1500	6.2	0.20	—	9.5			28	17					14	8			19	1
SIM-722MH	2300-7200	DC-3000	6.5	0.20	—	9.3			26	14					22	10			20	1
MCA1-80MH	2800-8000	DC-1250	5.6	0.20	—	8.7			27	17					25	7			18	1
SIM-852MH	3700-8500	DC-4000	6.9	0.20	—	9.8			36	22					15	7			20	1
SIM-153MH	3200-15000	DC-4000	7.5	0.40	—	11.5			35	21					19	9			17	1
SIM-24MH	7300-20000	DC-7500	5.7	0.30	—	10.9			36	19					18	10			17	1

L = low range (f_L to $10f_L$) M = mid range ($10f_L$ to $f_U/2$) U = upper range ($f_U/2$ to f_U)
m = mid band ($2f_L$ to $f_U/2$)



MIXERS, FREQUENCY 50 Ω 150 kHz to 11 GHz

LTCC

LTCC

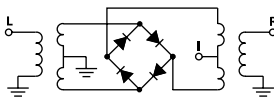


MODEL PREFIX	FREQUENCY (MHz)		CONVERSION LOSS (dB)				LO-RF ISOLATION (dB)						LO-IF ISOLATION (dB)						IP3 @ center- band TYP. (dBm)	S C H E M A T I C
	LO/RF f _L , f _U	IF	MID-BAND		TOTAL RANGE MAX.	L Typ.	Min.	M Typ.	Min.	U Typ.	Min.	L Typ.	Min.	M Typ.	Min.	U Typ.	Min.			
			$\bar{x}$	σ														Max.		
LEVEL 17 +17 dBm LO up to +14 dBm RF																				
TUF-3HSM	0.15-400	DC-400	5.00	0.33	7.0	8.0	60	50	50	35	40	30	60	40	45	25	35	20	22	1
ADE-1H	0.5-500	DC-500	5.30	0.20	6.8	8.0	65	50	52	35	40	26	53	40	42	25	32	20	23	1
JMS-1H	2-500	DC-500	5.90	0.10	7.0	8.5	60	45	50	25	37	22	55	45	50	25	37	22	22	1
RMS-1H	2-500	DC-500	6.25	0.034	7.0	8.5	55	44	44	25	33	20	50	34	45	25	37	22	22	1
LRMS-1HJ	2-500	DC-500	6.25	0.034	7.0	8.5	55	44	44	25	33	20	50	34	45	25	37	22	25	1
TUF-1HSM	2-600	DC-600	5.90	0.18	7.0	8.0	68	50	50	30	43	25	62	45	48	30	33	22	26	1
ADE-1HW	5-750	DC-750	6.00	0.10	7.2	8.8	64	45	48	35	42	28	50	35	40	30	30	18	26	1
RMS-2H	5-1000	DC-900	6.98	0.054	8.5	9.3	55	40	39	22	33	20	52	30	45	22	30	17	23	1
ADEX-10H	10-1000	DC-800	7.00	0.10	8.5	9.5	68	55	55	40	47	31	46	30	32	20	26	13	22	1
JMS-2H	20-1000	DC-1000	7.00	0.15	8.4	9.5	63	40	50	28	35	20	56	30	47	22	37	20	24	1
SYM-10DHW	50-1000	20-800	7.00	—	8.5	9.8	—	—	45	30	—	—	—	—	29	20	—	—	25	2
TUF-2HSM	50-1000	DC-1000	6.20	0.22	7.5	9.0	58	40	47	30	42	25	58	35	44	25	28	18	21	1
ADE-10H	400-1000	DC-500	7.00	0.10	—	8.5	—	—	39	29	—	—	—	—	25	17	—	—	30	1
SYM-10DH	800-1000	20-200	7.60	—	—	9.3	—	—	45	34	—	—	—	—	29	20	—	—	31	2
SIM-14H	3700-1000	DC-4000	7.00	0.30	9.3	—	—	—	38	24	—	—	—	—	16	8	—	—	25	—
ADE-12H	500-1200	DC-250	6.70	0.20	—	8.2	—	—	34	25	—	—	—	—	28	20	—	—	28	1
SYM-14H	100-1370	10-1000	6.50	0.20	7.4	8.9	—	—	36	28	—	—	—	—	30	24	—	—	30	2
JMS-5H	5-1500	DC-1000	5.90	0.10	8.0	9.5	70	50	50	25	35	20	60	40	35	18	20	8	22	1
LRMS-5HJ	10-1500	DC-900	6.36	0.05	8.0	9.8	65	40	36	20	22	15	50	30	30	18	17	7	22	1
RMS-5H	10-1500	DC-900	6.36	0.05	8.0	9.8	65	40	36	20	22	15	50	30	30	18	17	7	24	1
TUF-5HSM	20-1500	DC-1000	7.50	0.17	8.5	9.0	62	55	50	40	38	25	40	25	29	18	20	8	20	1
ADE-17H	100-1700	50-1500	7.20	0.10	8.5	9.5	32	20	—	—	36	22	32	20	—	—	37	22	25	2
SYM-18H	5-1800	10-1500	5.75	0.10	7.6	8.9	50	28	45	35	40	24	39	22	50	30	30	22	30	2
TUF-18DHSIM	100-1800	50-750	7.30	0.15	8.5	9.0	—	—	41	23	—	—	—	—	33	20	—	—	27	2
SYM-20DHW	10-2000	10-1800	6.20	0.10	7.5	8.8	33	20	40	25	37	22	44	30	42	28	34	22	27	2
SYM-20DH	1700-2000	10-300	6.70	0.16	—	8.2	—	—	35	22	—	—	—	—	34	22	—	—	32	2
SYM-22H	1500-2200	DC-200	5.60	0.30	—	8.8	—	—	33	22	—	—	—	—	38	22	—	—	30	1
SYM-24DH	1400-2400	10-250	7.00	0.20	—	9.3	—	—	32	22	—	—	—	—	36	23	—	—	29	2
SYM-25DHW	80-2500	DC-1000	6.40	0.40	8.0	9.0	46	29	37	25	35	20	38	26	33	24	36	20	30	2
JYM-28H	400-2800	4-700	6.30	0.20	8.0	9.0	—	—	40	25	—	—	—	—	30	15	—	—	23	2
JYM-30H	2-3000	4-1400	6.00	0.20	8.9	10.6	40	30	40	25	30	25	40	35	30	20	22	15	24	2
SYM-30DHW	5-3000	5-1500	6.50	0.10	8.3	9.1	36	24	40	30	40	25	42	28	44	36	48	33	29	2
MCA-35H	500-3500	10-1500	6.90	0.10	8.9	—	—	—	30	11	—	—	—	—	27	14	—	—	24	2
SYM-36H	1500-3600	DC-600	6.30	0.40	—	9.0	—	—	30	20	—	—	—	—	34	20	—	—	25	1
SIM-43H	1000-4000	DC-1500	6.50	0.10	8.6	—	—	—	37	28	—	—	—	—	24	9	—	—	22	1
MCA-50H	1000-5000	10-1500	7.30	0.20	10.2	—	—	—	25	12	—	—	—	—	32	18	—	—	23	2
SKY-60H	2500-6000	DC-1500	6.20	0.20	—	9.7	—	—	28	17	—	—	—	—	14	8	—	—	23	1
SIM-762H	2300-7600	DC-3000	6.00	0.10	9.0	—	—	—	35	17	—	—	—	—	21	11	—	—	25	1
MCA1-80H	2800-8000	DC-1250	6.30	0.20	8.9	8.9	—	—	35	21	—	—	—	—	35	8	—	—	24	1
MCA1-113H	3800-11000	DC-1800	6.80	0.20	8.8	8.8	—	—	35	17	—	—	—	—	32	8	—	—	21	1

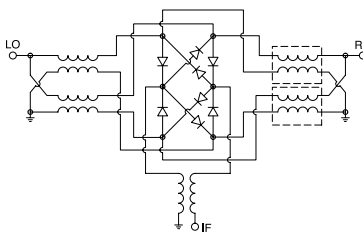
L = low range (f_L to $10f_L$) M = mid range ($10f_L$ to $f_U/2$) U = upper range ($f_U/2$ to f_U)
m = mid band ($2f_L$ to $f_U/2$)

ELECTRICAL SCHEMATICS

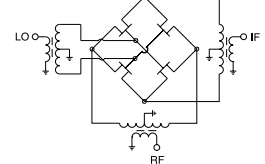
1 DOUBLE BALANCED MIXER



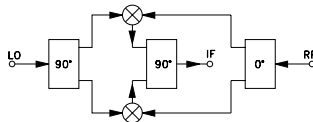
2 TRIPLE BALANCED MIXER



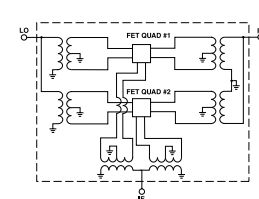
3 HIGH IP3 NARROW BAND MIXER

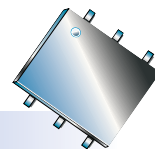


4 IMAGE REJECT MIXER



5 HIGH IP3 BROADBAND MIXER





HIGH IP3

HJK
Case TTT167, TTT881LAVI
Case CK605

MODEL PREFIX	FREQUENCY (MHz)			IP3 (dBm)	RF @1 dB compr. (dBm) Typ.	CONVERSION LOSS (dB)			LO-RF ISOLATION (dB)		LO-IF ISOLATION (dB)		S C H E M A T I C
	RF	LO	IF			Typ.	σ	Max.	Typ.	Min.	Typ.	Min.	
LEVEL 7 +7 dBm LO up to +10 dBm RF													
HJK-9	818-853	753-778	40-100	22	10	7.1	0.3	8.7	36	24	26	20	3
HJK-19	1850-1910	1780-1840	70-130	21	10	8.0	0.2	9.5	30	20	24	16	3
HJK-21	1850-1910	2090-2150	180-300	22	10	7.5	0.3	9.5	28	18	19	13	3

LEVEL 10 +10 dBm LO up to +13 dBm RF

HJK-72LH	450-670	520-740	30-500	22	10	7.3	0.1	8.8	45	32	40	29	3
HJK-9LH	818-853	753-778	40-100	27	13	6.7	0.2	8.0	37	24	27	20	3
HJK-212LH	1800-2100	1660-1960	10-270	24	13	6.8	0.15	9.0	42	30	35	25	3
HJK-19LH	1850-1910	1750-1840	70-130	25	13	7.5	0.2	9.4	30	20	23	15	3
HJK-21LH	1850-1910	2090-2150	180-300	25	13	7.2	0.3	8.9	28	20	19	13	3
MCA-19FLH	1850-1910	1760-1820	70-130	25	10	6.9	—	8.8	40	22	39	20	3
MCA-30FLH	2960-3060	2780-2880	130-230	25	10	7.5	—	8.9	35	20	27	15	3
MCA-36FLH	3500-3600	3500-3170	380-480	25	10	8.4	—	9.4	40	20	28	15	3

LEVEL 13 +13 dBm LO up to +16 dBm RF

HJK-9MH	818-853	753-778	40-100	31	16	6.7	0.2	8.0	37	24	27	20	3
HJK-19MH	1850-1910	1780-1840	70-130	30	16	7.4	0.2	8.9	30	20	23	15	3
HJK-21MH	1850-1910	2090-2150	180-300	29	16	7.2	0.2	8.9	29	20	19	13	3
MCA-19FMH	1850-1910	1760-1820	70-130	30	13	6.9	—	8.4	40	22	39	20	3
MCA-30FMH	2960-3060	2780-2880	130-230	30	13	7.4	—	8.9	35	20	27	15	3
MCA-36FMH	3500-3600	3070-3170	380-480	30	13	8.3	—	9.3	42	20	27	15	3

LEVEL 16 +16 dBm LO up to +19 dBm RF

HJK-3H	140-180	160	0.5-20	37	19	8.0	0.1	9.2	44	35	44	30	3
--------	---------	-----	--------	----	----	-----	-----	-----	----	----	----	----	---

LEVEL 17 +17 dBm LO up to +20 dBm RF

LAVI-252H	200-2500	130-2430	50-2000	25	17	7.8	0.25	10.3	40	25	45	33	5
LAVI-711H	220-710	250-740	10-500	30	20	7.3	0.25	9.0	50	40	40	29	5
HJK-481H	345-480	395-530	30-150	32	20	6.5	0.1	8.0	55	43	38	28	3
HJK-72H	450-670	520-740	30-500	29	17	7.2	0.1	8.8	44	32	40	30	3
HJK-9H	818-853	753-778	40-100	33	20	6.7	0.2	8.0	35	24	31	23	3
HJK-212H	1800-2100	1660-1960	10-270	32	20	6.5	0.15	8.6	42	30	35	25	3
HJK-19H	1850-1910	1780-1840	70-130	32	20	8.0	0.2	8.9	26	20	22	16	3
HJK-21H	1850-1910	2090-2150	180-300	36	20	7.6	0.2	8.9	28	20	25	18	3
MCA-3851FH	1670-3850	1420-3290	250-500	30	17	7.5	—	9.2	40	23	35	20	3
MCA-19FH	1850-1910	1760-1820	70-130	35	17	6.9	—	8.5	40	22	39	20	3
MCA-325	2230-3490	2070-3330	10-330	30	17	7.5	—	9.5	40	25	30	18	3
MCA-2751FH	2430-2750	2780-3100	100-600	31	15	7.6	—	9.1	40	34	32	23	3
MCA-30FH	2960-3060	2780-2880	130-230	34	17	7.4	—	8.9	37	20	27	15	3
MCA-36FH	3500-3600	3070-3170	380-480	33	17	8.3	—	9.2	44	20	29	15	3

LEVEL 19 +19 dBm LO up to +23 dBm RF

LAVI-9VH	820-870	990-1040	120-220	36	23	7.2	0.12	8.5	46	40	46	37	5
----------	---------	----------	---------	----	----	-----	------	-----	----	----	----	----	---

LEVEL 20 +20 dBm LO up to +15 dBm RF

HJK-20VH	1090	1167-1950	77-870	30	15	7.2	0.2	8.5	32	26	34	26	3
LAVI-23VH	1200-2000	1270-2070	50-1000	30	20	8.4	0.25	9.8	58	40	40	30	5
LAVI-252VH	1850-2500	1920-2570	60-750	30	20	7.5	0.3	9.2	45	25	40	25	5

LEVEL 21 +21 dBm LO up to +20 dBm RF Wideband

LAVI-971VH	270-970	340-1040	10-600	33	20	7.5	0.12	9.5	48	32	36	28	5
LAVI-10VH	300-1000	525-1175	60-875	33	20	6.3	0.12	8.0	50	40	45	30	5
LAVI-17VH	470-1730	600-1800	70-1000	32	20	6.8	0.20	8.9	52	38	50	36	5
LAVI-22VH	425-2200	525-2400	100-700	31	20	7.7	0.20	9.6	50	36	45	28	5

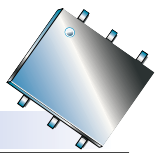
LEVEL 22 +22 dBm LO up to +20 dBm RF

LAVI-362VH	100-3100	1800-3600	500-2500	33	20	7.5	0.1	9.9	40	27	35	22	5
------------	----------	-----------	----------	----	----	-----	-----	-----	----	----	----	----	---

LEVEL 23 +23 dBm LO up to +23 dBm RF Wideband

LAVI-25VH	400-2500	650-2800	70-1500	32	20	7.8	0.25	9.6	50	35	45	30	5
LAVI-2VH	2-1100	2-1100	2-1000	34	23	7.5	0.12	9.5	48	37	47	36	5





MIXERS, FREQUENCY 50 Ω

57 MHz to 2550 MHz

LTCC

SIM
Case HV1195

HJK
Case TTT167, TTT881

LAVI
Case CK605

JCIR
Case BG291

IMAGE REJECT

MODEL PREFIX	FREQUENCY (MHz)			CONVERSION LOSS (dB)			IMAGE REJECTION (dBc)				LO-RF ISOLATION (dB)		LO-IF ISOLATION (dB)		RF-IF ISOLATION (dB)		IP3 @ centerband (dBm)	S C H E M A T I C
	RF f_L - f_U	LO f_L - f_U	IF	$\bar{x}$	σ	Max.	RF>LO	LO>RF	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	
LEVEL 13 +13dBm LO up to +1 dBm RF																		
JCIR-25	2490-2550	2420-2480	57-83	7.0	—	8.5												
LEVEL 15 +15dBm LO up to +1 dBm RF																		
JCIR-4MH	430-930	500-1000	65-75	7.9	0.15	9.0												
LEVEL 18 +18dBm LO up to +11 dBm RF																		
JCIR-152H	1000-1500	1080-1580	68-100	7.5	0.15	9.0												

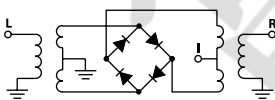
UP CONVERTERS 0.1 to 7400 MHz

MODEL PREFIX	LO LEVEL (dBm)	RF IN @ 1 dB compr. Typ. (dBm)	FREQUENCY (MHz)			CONVERSION LOSS (dB)			LO-IF (IN) ISOLATION (dB)		LO-RF (OUT) ISOLATION (dB)		IP3 @ centerband (dBm)	SCHE MATIC
			IF (IN)	LO	RF (OUT)	Typ.	σ	Max.	Typ.	Min.	Typ.	Min.	Typ.	
SIM-U63	7	+1	1600-2500	3100-5700	3800-6000	6.9	0.3	8.4	16	10	39	29	10	1
SIM-U742MH	13	+9	0.1-3300	2300-7400	2300-7400	8.0	0.4	9.8	17	11	23	13	20	1
SIM-U432H	17	+14	0.1-800	1100-4250	1100-3900	7.5	0.2	9.8	24	13	36	28	26	1
SIM-U712H	17	+14	2600-7100	10-1780	2600-7100	7.3	0.3	9.5	27	14	19	11	27	1
HJK-U151H	17	+17	10-130	140-280	70-150	7.6	0.1	9.2	40	30	55	48	28	3
HJK-U232H	17	+20	850-1850	370-510	1220-2360	6.8	0.1	8.8	35	28	46	40	31	3
LAVI-U182H	19	+15	10-250	1490-1730	1560-1800	8.3	0.15	9.6	40	29	53	42	32	5
LAVI-U252VH	21	+16	10-1300	1800-2800	1500-2500	7.8	0.15	9.5	51	33	45	27	30	5

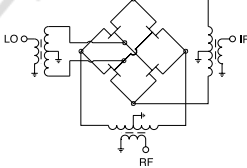
L = low range (f_L to $10f_L$) M = mid range ($10f_L$ to $f_U/2$) U = upper range ($f_U/2$ to f_U)
m = mid band ($2f_L$ to $f_U/2$)

ELECTRICAL SCHEMATICS

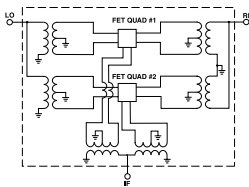
1 DOUBLE BALANCED MIXER



3 HIGH IP3 NARROW BAND MIXER



5 HIGH IP3 BROADBAND MIXER



4 IMAGE REJECT MIXER

