

Frequency Mixer

UNCL-R1+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)			RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)			RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=-10dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
		+4	+7	+10			+4	+7	+10			+4	+7	+10
10.1	40.1	2.61	4.47	4.17	10.1	40.1	3.25	3.89	3.54	10.1	40.1	1.62	1.82	1.40
49.8	79.8	3.69	3.88	4.04	49.8	79.8	3.02	2.79	2.70	49.8	79.8	1.43	1.30	1.36
89.6	119.6	3.78	4.09	4.21	89.6	119.6	2.99	2.87	2.80	89.6	119.6	1.56	1.44	1.36
129.3	159.3	3.55	3.80	3.92	129.3	159.3	2.87	2.84	2.66	129.3	159.3	1.59	1.49	1.42
169.0	199.0	3.70	3.94	4.10	169.0	199.0	2.58	2.76	2.73	169.0	199.0	1.58	1.49	1.39
208.8	238.8	3.65	3.92	4.00	208.8	238.8	2.83	2.76	2.42	208.8	238.8	1.61	1.51	1.43
248.5	278.5	3.65	3.88	4.04	248.5	278.5	2.80	2.82	2.51	248.5	278.5	1.66	1.50	1.44
288.2	318.2	3.72	3.96	4.04	288.2	318.2	2.77	2.56	2.49	288.2	318.2	1.57	1.45	1.45
328.0	358.0	3.61	3.83	3.91	328.0	358.0	2.28	2.11	2.14	328.0	358.0	1.65	1.52	1.48
367.7	397.7	3.65	3.87	4.01	367.7	397.7	1.86	2.11	2.31	367.7	397.7	1.60	1.50	1.44
407.4	437.4	3.54	3.77	3.93	407.4	437.4	2.53	2.43	2.41	407.4	437.4	1.67	1.57	1.53
447.2	477.2	3.49	3.73	3.90	447.2	477.2	2.79	2.54	2.49	447.2	477.2	1.64	1.54	1.49
486.9	516.9	3.39	3.69	3.87	486.9	516.9	2.56	2.25	2.27	486.9	516.9	1.74	1.62	1.55
526.6	556.6	3.31	3.57	3.74	526.6	556.6	1.98	2.00	1.94	526.6	556.6	1.62	1.51	1.47
566.4	596.4	3.31	3.55	3.71	566.4	596.4	0.81	1.37	1.81	566.4	596.4	1.71	1.59	1.52
606.1	636.1	3.19	3.42	3.57	606.1	636.1	-0.18	0.88	1.64	606.1	636.1	1.75	1.59	1.55
645.8	675.8	3.09	3.36	3.54	645.8	675.8	-0.19	0.79	1.69	645.8	675.8	1.83	1.68	1.62
685.6	715.6	2.94	3.28	3.47	685.6	715.6	0.99	2.00	2.55	685.6	715.6	1.88	1.76	1.70
725.3	755.3	2.81	3.23	3.46	725.3	755.3	1.98	2.87	3.00	725.3	755.3	1.91	1.81	1.75
765.0	795.0	2.60	3.15	3.47	765.0	795.0	2.05	2.98	2.63	765.0	795.0	1.95	1.89	1.83
804.8	834.8	2.32	2.97	3.36	804.8	834.8	1.54	3.85	2.24	804.8	834.8	1.86	1.87	1.86
844.5	874.5	1.94	2.68	3.22	844.5	874.5	-0.83	8.17	2.62	844.5	874.5	1.72	1.82	1.84
884.2	914.2	1.75	2.49	3.01	884.2	914.2	-0.31	8.74	2.92	884.2	914.2	1.61	1.70	1.74
924.0	954.0	1.71	2.39	2.89	924.0	954.0	-0.29	4.29	3.54	924.0	954.0	1.51	1.60	1.63
963.7	993.7	1.76	2.45	2.96	963.7	993.7	-1.88	0.77	1.68	963.7	993.7	1.53	1.61	1.63
1003.4	1033.4	1.86	2.51	3.01	1003.4	1033.4	-3.13	-1.13	0.34	1003.4	1033.4	1.48	1.51	1.52
1043.2	1073.2	1.90	2.50	2.98	1043.2	1073.2	-3.95	-2.32	-0.58	1043.2	1073.2	1.58	1.54	1.52
1082.9	1112.9	2.01	2.56	2.99	1082.9	1112.9	-3.98	-2.46	-0.65	1082.9	1112.9	1.63	1.54	1.49
1122.6	1152.6	2.03	2.57	2.96	1122.6	1152.6	-3.87	-2.53	-0.74	1122.6	1152.6	1.79	1.65	1.55
1162.4	1192.4	2.01	2.56	2.92	1162.4	1192.4	-3.33	-1.89	-0.31	1162.4	1192.4	1.83	1.66	1.53
1202.1	1232.1	2.00	2.50	2.82	1202.1	1232.1	-2.09	-0.76	0.26	1202.1	1232.1	1.83	1.63	1.47
1241.8	1271.8	1.87	2.31	2.59	1241.8	1271.8	-0.83	0.31	0.81	1241.8	1271.8	1.85	1.62	1.47
1281.6	1311.6	1.81	2.19	2.41	1281.6	1311.6	0.21	1.26	1.80	1281.6	1311.6	1.78	1.57	1.41
1321.3	1351.3	1.59	1.95	2.14	1321.3	1351.3	0.87	1.80	2.63	1321.3	1351.3	1.69	1.52	1.38
1361.0	1391.0	1.36	1.67	1.86	1361.0	1391.0	1.14	1.97	3.10	1361.0	1391.0	1.59	1.43	1.32
1380.9	1410.9	1.16	1.46	1.65	1380.9	1410.9	1.06	1.75	2.69	1380.9	1410.9	1.58	1.41	1.29
1420.6	1450.6	0.73	1.01	1.19	1420.6	1450.6	0.99	1.88	2.94	1420.6	1450.6	1.49	1.33	1.26
1440.5	1470.5	0.59	0.87	1.06	1440.5	1470.5	1.27	2.28	3.78	1440.5	1470.5	1.41	1.29	1.22
1480.2	1510.2	0.26	0.54	0.74	1480.2	1510.2	2.12	2.50	4.19	1480.2	1510.2	1.31	1.18	1.13
1500.1	1530.1	0.11	0.35	0.54	1500.1	1530.1	2.95	3.05	4.81	1500.1	1530.1	1.30	1.17	1.12

REV. X3

UNCL-R1+

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Frequency Mixer

UNCL-R1+

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=260.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=10.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=510.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+7			+7			+7
250.0	10.1	3.87	10.0	20.1	3.92	500.0	10.1	3.61
243.8	16.3	3.80	70.6	80.7	4.76	487.4	22.7	3.60
237.7	22.4	3.84	131.2	141.3	5.62	474.9	35.2	3.65
231.5	28.6	3.83	191.7	201.8	5.23	462.3	47.8	3.69
225.4	34.7	3.88	252.3	262.4	3.62	449.7	60.4	3.65
219.2	40.9	3.97	312.9	323.0	4.78	437.2	72.9	3.65
213.1	47.0	3.91	373.5	383.6	3.38	424.6	85.5	3.75
206.9	53.2	3.94	434.1	444.2	5.12	412.1	98.0	3.76
200.8	59.3	3.90	494.7	504.8	3.93	399.5	110.6	3.73
194.6	65.5	3.91	555.2	565.3	4.56	386.9	123.2	3.77
188.5	71.6	3.85	615.8	625.9	4.27	374.4	135.7	3.81
182.3	77.8	3.93	676.4	686.5	3.14	361.8	148.3	3.74
176.2	83.9	3.93	716.8	726.9	3.96	349.2	160.9	3.75
170.0	90.1	3.93	777.4	787.5	2.58	336.7	173.4	3.77
163.8	96.3	3.95	817.8	827.9	4.22	324.1	186.0	3.75
157.7	102.4	3.93	878.3	888.4	4.11	311.5	198.6	3.73
151.5	108.6	3.94	918.7	928.8	3.95	299.0	211.1	3.75
145.4	114.7	3.93	979.3	989.4	4.49	286.4	223.7	3.78
139.2	120.9	3.95	1019.7	1029.8	3.59	273.8	236.3	3.73
133.1	127.0	3.98	1080.3	1090.4	3.04	261.3	248.8	3.76
126.9	133.2	4.03	1120.7	1130.8	3.58	248.7	261.4	3.78
120.8	139.3	4.00	1181.3	1191.4	4.11	236.2	273.9	3.74
114.6	145.5	3.97	1221.7	1231.8	5.32	223.6	286.5	3.69
108.5	151.6	3.94	1282.2	1292.3	4.41	211.0	299.1	3.72
102.3	157.8	3.94	1322.6	1332.7	3.80	198.5	311.6	3.75
96.2	163.9	3.93	1383.2	1393.3	3.78	185.9	324.2	3.72
90.0	170.1	3.96	1423.6	1433.7	2.02	173.3	336.8	3.71
83.8	176.3	3.96	1484.2	1494.3	2.83	160.8	349.3	3.73
77.7	182.4	3.97	1524.6	1534.7	1.37	148.2	361.9	3.72
71.5	188.6	3.96	1585.1	1595.2	1.21	135.6	374.5	3.69
65.4	194.7	3.95	1625.5	1635.6	-0.61	123.1	387.0	3.65
59.2	200.9	3.95	1686.1	1696.2	-0.01	110.5	399.6	3.70
53.1	207.0	3.91	1726.5	1736.6	-1.09	97.9	412.2	3.68
46.9	213.2	3.95	1787.1	1797.2	-2.10	85.4	424.7	3.66
40.8	219.3	3.96	1827.5	1837.6	-2.86	72.8	437.3	3.71
34.6	225.5	3.98	1888.1	1898.2	-4.94	60.3	449.8	3.75
28.5	231.6	3.96	1928.4	1938.5	-4.59	47.7	462.4	3.65
22.3	237.8	3.90	1989.0	1999.1	-7.27	35.1	475.0	3.60
16.2	243.9	3.92	2029.4	2039.5	-8.09	22.6	487.5	3.65
10.0	250.1	3.66	2090.0	2100.1	-12.55	10.0	500.1	3.45

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Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+4	+7	+10	+4	+7	+10
40.1	84.37	77.44	81.83	50.80	49.50	48.26
79.8	75.96	80.36	89.53	45.30	43.96	42.98
119.6	74.43	81.67	81.93	42.27	41.10	40.20
159.3	72.39	75.71	78.02	40.42	39.30	38.22
199.0	71.49	74.18	75.62	38.99	37.85	36.75
238.8	66.80	67.76	68.89	37.33	36.25	35.20
278.5	69.30	71.17	72.78	35.67	34.79	33.81
318.2	65.53	66.90	67.69	34.31	33.65	32.71
358.0	63.82	64.42	65.11	33.07	32.65	31.84
397.7	62.84	63.99	64.76	31.57	31.53	31.10
437.4	62.57	63.38	63.94	30.27	30.57	30.38
477.2	61.75	63.02	63.49	29.07	29.65	29.77
516.9	60.24	61.02	61.50	28.02	28.79	29.04
556.6	59.04	60.00	60.60	27.48	28.30	28.72
596.4	56.71	57.80	58.72	27.05	27.93	28.31
636.1	54.75	56.05	57.16	26.57	27.64	28.10
675.8	54.74	56.38	57.92	25.79	27.20	27.95
715.6	54.70	56.67	58.65	24.92	26.59	27.66
755.3	54.76	56.89	59.13	23.58	25.39	26.87
795.0	53.62	55.54	57.48	22.33	23.92	25.57
834.8	53.19	55.00	56.84	21.51	22.95	24.52
874.5	52.80	54.53	56.44	20.90	22.19	23.70
914.2	51.70	53.21	54.88	20.60	21.97	23.53
954.0	51.31	52.77	54.38	20.03	21.48	23.08
993.7	50.08	51.35	52.70	20.13	21.75	23.49
1033.4	49.47	50.72	52.03	19.94	21.72	23.62
1073.2	48.47	49.65	50.86	19.72	21.74	23.92
1112.9	47.52	48.65	49.80	19.65	21.81	24.16
1152.6	46.99	48.13	49.29	19.09	21.24	23.53
1192.4	46.54	47.59	48.70	18.83	20.81	22.90
1232.1	45.92	46.96	48.08	18.44	20.23	22.10
1271.8	45.47	46.49	47.54	18.35	19.99	21.64
1311.6	45.44	46.46	47.45	18.76	20.26	21.62
1351.3	45.28	46.18	47.00	18.93	20.18	21.16
1391.0	45.63	46.40	47.01	19.57	20.48	21.00
1410.9	45.62	46.24	46.71	19.62	20.39	20.79
1450.6	45.87	46.22	46.37	20.11	20.43	20.39
1470.5	46.04	46.22	46.20	20.43	20.40	20.07
1510.2	46.67	46.47	46.11	21.16	20.57	19.84
1530.1	46.82	46.36	45.80	21.32	20.45	19.55

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+4	+7	+10
10.1	40.1	44.76	43.38	44.75
49.8	79.8	30.24	30.83	30.97
89.6	119.6	25.44	25.87	26.33
129.3	159.3	22.83	23.21	23.45
169.0	199.0	21.07	21.49	21.84
208.8	238.8	19.85	20.43	20.72
248.5	278.5	19.20	19.79	20.21
288.2	318.2	18.94	19.57	20.05
328.0	358.0	18.91	19.79	20.44
367.7	397.7	18.98	20.06	21.03
407.4	437.4	19.05	20.13	21.03
447.2	477.2	18.61	20.02	21.31
486.9	516.9	18.35	19.89	21.51
526.6	556.6	18.08	19.62	21.09
566.4	596.4	17.30	18.35	19.16
606.1	636.1	16.10	16.60	16.90
645.8	675.8	14.69	14.90	14.97
685.6	715.6	13.32	13.33	13.25
725.3	755.3	12.19	12.08	11.96
765.0	795.0	11.89	11.80	11.76
804.8	834.8	11.90	11.94	11.99
844.5	874.5	12.26	12.25	12.30
884.2	914.2	12.82	12.82	12.75
924.0	954.0	13.75	13.60	13.34
963.7	993.7	14.61	14.33	13.75
1003.4	1033.4	14.98	14.38	13.61
1043.2	1073.2	14.37	13.73	12.78
1082.9	1112.9	13.04	12.20	11.30
1122.6	1152.6	11.43	10.67	9.91
1162.4	1192.4	9.80	9.08	8.54
1202.1	1232.1	8.18	7.48	7.04
1241.8	1271.8	6.72	6.03	5.63
1281.6	1311.6	5.32	4.71	4.35
1321.3	1351.3	4.09	3.53	3.13
1361.0	1391.0	3.03	2.53	2.18
1380.9	1410.9	2.76	2.20	1.83
1420.6	1450.6	2.01	1.42	1.08
1440.5	1470.5	1.62	1.07	0.73
1480.2	1510.2	1.19	0.59	0.24
1500.1	1530.1	0.88	0.30	0.04

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=500MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+4	+7	+10		+4	+7	+10		+4	+7	+10
10.1	40.1	1.69	1.76	2.20	40.1	1.35	2.36	4.21	10.0	1.28	1.13	1.04
49.8	79.8	1.54	1.63	1.54	79.8	2.41	3.93	6.68	22.3	1.28	1.14	1.04
89.6	119.6	1.53	1.54	1.60	119.6	1.98	2.99	4.47	34.6	1.25	1.11	1.03
129.3	159.3	1.57	1.60	1.63	159.3	1.70	2.48	3.50	46.9	1.26	1.12	1.02
169.0	199.0	1.53	1.56	1.58	199.0	2.26	3.42	5.07	59.2	1.28	1.13	1.04
208.8	238.8	1.57	1.61	1.62	238.8	1.82	2.63	3.67	71.5	1.27	1.13	1.04
248.5	278.5	1.60	1.62	1.64	278.5	2.09	3.02	4.27	83.8	1.29	1.14	1.05
288.2	318.2	1.59	1.62	1.62	318.2	2.10	3.03	4.26	96.2	1.30	1.16	1.07
328.0	358.0	1.64	1.66	1.65	358.0	1.87	2.61	3.56	108.5	1.27	1.13	1.05
367.7	397.7	1.59	1.60	1.62	397.7	2.14	2.97	4.05	120.8	1.28	1.14	1.05
407.4	437.4	1.65	1.66	1.67	437.4	2.13	3.00	4.21	133.1	1.29	1.15	1.06
447.2	477.2	1.64	1.64	1.64	477.2	2.24	3.11	4.26	145.4	1.28	1.14	1.06
486.9	516.9	1.63	1.63	1.63	516.9	2.42	3.35	4.56	157.7	1.30	1.15	1.06
526.6	556.6	1.67	1.66	1.66	556.6	2.33	3.20	4.32	170.0	1.31	1.17	1.08
566.4	596.4	1.60	1.59	1.58	596.4	2.64	3.68	5.07	182.3	1.30	1.16	1.08
606.1	636.1	1.67	1.66	1.65	636.1	2.43	3.30	4.43	194.6	1.31	1.17	1.08
645.8	675.8	1.62	1.61	1.59	675.8	2.63	3.58	4.88	206.9	1.33	1.18	1.10
685.6	715.6	1.67	1.66	1.64	715.6	2.48	3.23	4.26	219.2	1.31	1.17	1.09
725.3	755.3	1.72	1.70	1.69	755.3	2.48	3.20	4.18	231.5	1.33	1.18	1.09
765.0	795.0	1.71	1.69	1.67	795.0	2.73	3.47	4.45	243.8	1.34	1.19	1.11
804.8	834.8	1.87	1.84	1.81	834.8	2.48	3.13	3.95	256.2	1.33	1.19	1.10
844.5	874.5	1.80	1.76	1.73	874.5	3.03	3.95	5.16	268.5	1.35	1.20	1.11
884.2	914.2	1.92	1.88	1.84	914.2	2.76	3.48	4.40	280.8	1.38	1.23	1.14
924.0	954.0	1.86	1.82	1.78	954.0	2.89	3.76	4.88	293.1	1.36	1.22	1.13
963.7	993.7	1.82	1.78	1.75	993.7	3.03	3.85	4.91	305.4	1.38	1.23	1.13
1003.4	1033.4	1.85	1.81	1.77	1033.4	2.52	3.14	3.92	317.7	1.40	1.24	1.15
1043.2	1073.2	1.65	1.62	1.59	1073.2	2.95	3.69	4.68	330.0	1.38	1.23	1.14
1082.9	1112.9	1.71	1.67	1.64	1112.9	2.57	3.06	3.73	342.3	1.40	1.24	1.15
1122.6	1152.6	1.49	1.47	1.44	1152.6	2.68	3.28	4.10	354.6	1.43	1.27	1.17
1162.4	1192.4	1.48	1.45	1.43	1192.4	2.99	3.56	4.38	366.9	1.42	1.27	1.17
1202.1	1232.1	1.40	1.38	1.37	1232.1	2.52	2.98	3.60	379.2	1.44	1.28	1.18
1241.8	1271.8	1.25	1.24	1.23	1271.8	3.09	3.72	4.56	391.5	1.46	1.30	1.20
1281.6	1311.6	1.31	1.30	1.30	1311.6	2.85	3.29	3.89	403.8	1.45	1.28	1.19
1321.3	1351.3	1.17	1.17	1.18	1351.3	2.99	3.48	4.15	416.2	1.46	1.30	1.19
1361.0	1391.0	1.19	1.19	1.20	1391.0	3.47	3.88	4.53	428.5	1.49	1.32	1.21
1380.9	1410.9	1.25	1.26	1.27	1410.9	3.31	3.64	4.18	440.8	1.48	1.31	1.21
1420.6	1450.6	1.21	1.22	1.23	1450.6	3.69	4.12	4.80	453.1	1.50	1.33	1.22
1440.5	1470.5	1.16	1.18	1.19	1470.5	4.07	4.38	5.00	465.4	1.53	1.36	1.25
1480.2	1510.2	1.31	1.33	1.34	1510.2	3.89	4.01	4.42	477.7	1.51	1.35	1.24
1500.1	1530.1	1.35	1.37	1.38	1530.1	3.88	4.11	4.61	490.0	1.54	1.37	1.26

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	3	16	7	39	10	26	20	32	26	36
1	-	23	+0	34	12	41	21	36	29	39	44	41
2	>90	57	39	>67	44	>67	44	>67	46	61	61	>67
3	>90	>67	64	>67	>67	>67	>67	>67	65	>67	>67	>67
4	>90	>67	>67	>67	>67	>67	>67	>67	>67	>67	>67	>67
5	>90	>67	>67	>67	>67	>67	>67	>67	>67	>67	>67	>67
6	>90	>67	>67	>67	>67	>67	>67	>67	>67	>67	>67	>67
7	>90	>67	>67	>67	>67	>67	>67	>67	>67	>67	>67	>67
8	>90	>67	>67	>67	>67	>67	>67	>67	>67	>67	>67	>67
9	>90	>67	>67	>67	>67	>67	>67	>67	>67	>67	>67	>67
10	>90	>67	>67	>67	>67	>67	>67	>67	>67	>67	>67	>67
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

LO HARMONICS ORDER

Test conditions: RF IN: 250 MHz; -25.00 dBm.
LO IN: 280 MHz; +7.00 dBm
IF OUT: 30 MHz; -22.64 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	13	26	19	49	21	36	31	44	39	50
1	-	23	+0	34	12	43	21	38	29	42	43	45
2	>90	48	28	62	36	58	37	61	40	54	53	64
3	>90	54	43	59	57	63	65	58	51	57	65	61
4	>90	71	59	75	59	>77	57	>77	57	>77	58	72
5	>90	>77	>77	>77	69	>77	65	>77	64	>77	61	>77
6	>90	>77	75	>77	73	>77	73	>77	73	>77	72	>77
7	>90	>77	>77	>77	>77	>77	>77	>77	>77	>77	>77	>77
8	>90	>77	>77	>77	>77	>77	>77	>77	>77	>77	>77	>77
9	>90	>77	>77	>77	>77	>77	>77	>77	>77	>77	>77	>77
10	>90	>77	>77	>77	>77	>77	>77	>77	>77	>77	>77	>77
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

LO HARMONICS ORDER

Test conditions: RF IN: 250 MHz; -15.00 dBm.
LO IN: 280 MHz; +7.00 dBm
IF OUT: 30 MHz; -12.69 dBm

- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.