

Coaxial Frequency Mixer

NON-CATALOG

ZMX-7GLHR

Level 10 (LO Power +10 dBm) 3700 to 7000 MHz

Maximum Ratings

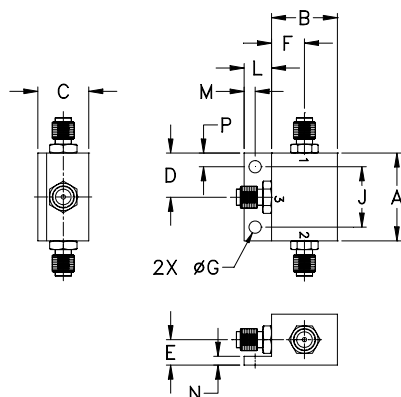
Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power	50mW
IF Current	40mA

Permanent damage may occur if any of these limits are exceeded.

Coaxial Connections

LO	2
RF	1
IF	3

Outline Drawing



Outline Dimensions (inch)

A	B	C	D	E	F	G	H
1.00	.75	.58	.50	.29	.38	.140	--
25.40	19.05	14.73	12.70	7.37	9.65	3.56	--
J	K	L	M	N	P		wt
.687	--	.32	.13	.10	.16		grams
17.45	--	8.13	3.30	2.54	4.06		25.0

Features

- wide frequency range, 3700 to 7000 MHz
- low conversion loss, 5.4 dB typ.
- high L-I isolation, 35 dB typ.

Applications

- SATCOM
- instrumentation
- defense & federal communications
- SHF



CASE STYLE: BU413

Connectors	Model
SMA	ZMX-7GLHR

Electrical Specifications

FREQUENCY (MHz)		CONVERSION LOSS* (dB)			LO-RF ISOLATION (dB)		LO-IF ISOLATION (dB)	
LO/RF	IF							
f_L - f_U		$\overline{X}$	σ	Total Range Max.	Typ.	Min.	Typ.	Min.
3700-7000	DC-1500	5.4	0.30	8.5	33	20	35	20

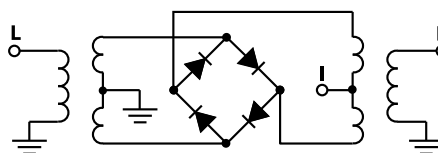
1 dB COMP: +5 dBm typ.

* Above 750 MHz IF, conversion loss increases up to 9.8 dB max.

Typical Performance Data

Frequency (MHz)		Conversion Loss (dB)	Isolation L-R (dB)	Isolation L-I (dB)	VSWR RF Port (:1)	VSWR LO Port (:1)
RF	LO	LO +10dBm	LO +10dBm	LO +10dBm	LO +10dBm	LO +10dBm
3700.00	3730.00	3.99	32.98	27.03	1.50	1.14
3886.79	3916.79	3.98	31.80	28.45	1.27	1.16
4000.00	4030.00	3.92	32.48	28.87	1.51	1.19
4198.11	4228.11	4.06	34.29	30.39	2.05	1.23
4384.91	4414.91	4.31	35.39	30.87	2.33	1.23
4571.70	4601.70	4.33	34.22	31.36	2.22	1.31
4758.49	4788.49	4.75	32.35	31.67	2.02	1.26
5000.00	4970.00	4.61	33.65	33.33	2.15	1.25
5194.34	5164.34	4.63	33.47	34.18	2.27	1.23
5381.13	5351.13	4.74	31.77	34.40	2.30	1.18
5567.92	5537.92	4.92	31.07	34.26	2.39	1.18
5754.72	5724.72	4.88	32.53	34.46	2.75	1.13
5941.51	5911.51	5.30	32.98	34.47	3.27	1.07
6000.00	5970.00	5.39	33.39	34.42	3.38	1.15
6190.57	6160.57	5.57	33.62	34.18	3.79	1.20
6377.36	6347.36	5.82	34.18	33.86	3.91	1.15
6564.15	6534.15	5.93	35.55	33.39	3.98	1.14
6750.94	6720.94	5.72	35.04	32.76	3.86	1.18
6937.74	6907.74	5.62	34.39	32.13	3.74	1.08
7000.00	6970.00	5.62	34.32	32.02	3.64	1.21

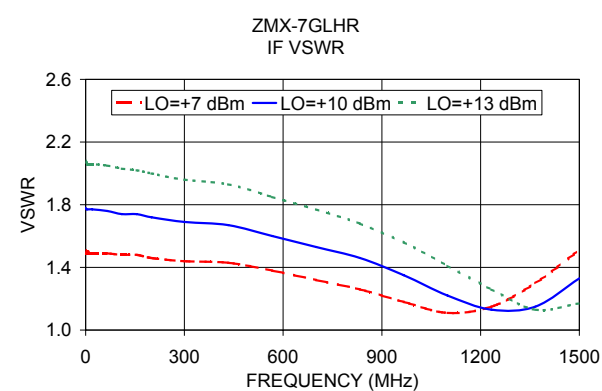
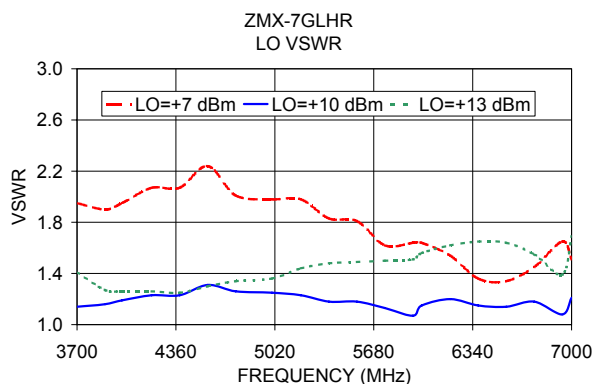
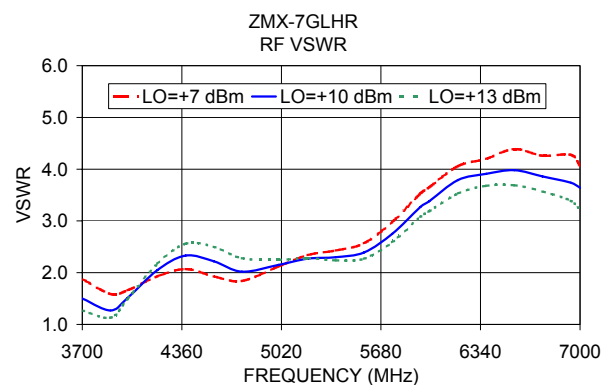
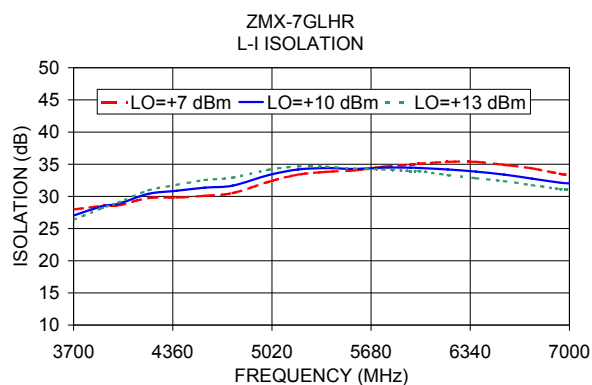
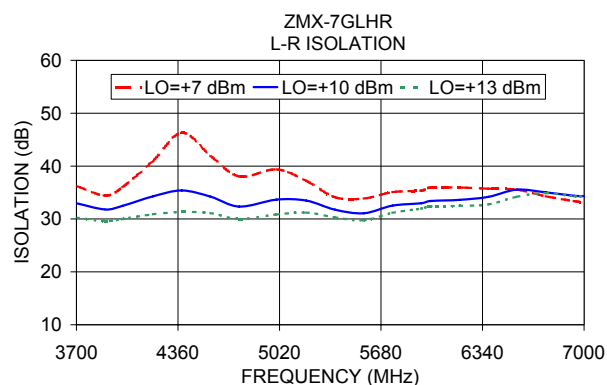
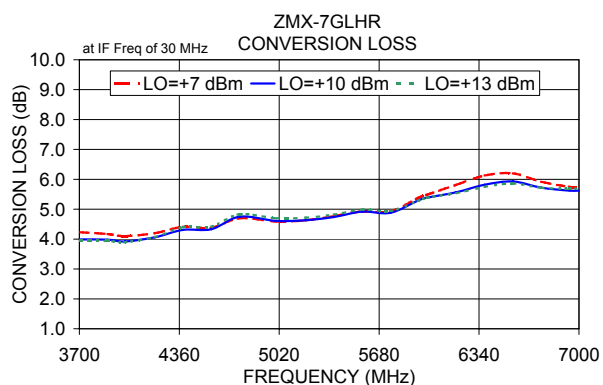
Electrical Schematic



Notes

- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
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Frequency Mixer

ZMX-7GLHR

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)		
		@LO (dBm)		
		+7	+10	+13
1500.1	1530.1	16.05	12.48	11.38
1717.6	1747.6	10.59	9.69	9.32
1935.1	1965.1	8.76	8.33	8.22
2152.6	2182.6	7.58	7.31	7.25
2370.1	2400.1	6.71	6.54	6.53
2587.6	2617.6	6.31	6.13	6.04
2805.1	2835.1	5.80	5.54	5.45
3022.6	3052.6	5.36	5.18	5.12
3240.1	3270.1	4.87	4.78	4.76
3457.6	3487.6	4.71	4.59	4.56
3675.1	3705.1	4.70	4.55	4.51
3892.6	3922.6	4.61	4.52	4.53
4110.1	4140.1	4.79	4.70	4.73
4327.6	4357.6	5.19	5.16	5.30
4545.1	4575.1	5.20	5.36	5.66
4762.6	4792.6	5.29	5.43	5.74
4980.1	5010.1	5.35	5.44	5.71
5197.6	5227.6	5.25	5.35	5.54
5415.1	5445.1	5.91	5.67	5.57
5632.6	5662.6	7.42	6.68	6.33
5850.1	5880.1	7.31	6.81	6.64
6089.4	6119.4	7.26	6.94	6.87
6306.8	6336.8	7.23	6.93	6.92
6546.1	6576.1	7.06	6.82	6.90
6763.6	6793.6	7.00	6.76	6.86
7002.8	7032.8	7.15	6.85	6.94
7220.4	7250.4	7.23	6.93	7.09
7459.6	7489.6	8.23	7.68	7.52
7677.1	7707.1	8.35	7.72	7.46
7916.4	7946.4	7.30	6.89	6.85
8133.9	8163.9	6.80	6.49	6.52
8373.1	8403.1	6.37	6.17	6.27
8590.6	8620.6	6.02	5.87	6.11
8829.8	8859.8	5.64	5.56	5.97
9047.4	9077.4	5.64	5.62	6.33
9286.6	9316.6	6.18	6.43	7.77
9504.1	9534.1	6.67	6.98	9.12
9743.3	9773.3	7.39	7.97	10.56
9960.9	9990.9	8.67	9.39	12.78
10200.1	10230.1	9.63	10.67	13.90

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+7	+10	+13
1500.1	1530.1	10.61	23.76	23.43
1717.6	1747.6	16.01	17.71	15.76
1935.1	1965.1	12.12	13.34	11.98
2152.6	2182.6	14.11	14.22	12.77
2370.1	2400.1	10.89	14.94	17.96
2587.6	2617.6	8.97	12.44	15.25
2805.1	2835.1	11.59	13.34	14.06
3022.6	3052.6	10.36	11.23	12.10
3240.1	3270.1	10.43	11.57	12.63
3457.6	3487.6	11.73	13.03	14.05
3675.1	3705.1	16.07	16.83	15.76
3892.6	3922.6	14.47	14.85	15.02
4110.1	4140.1	13.51	14.78	15.19
4327.6	4357.6	12.95	12.52	11.84
4545.1	4575.1	11.47	13.57	14.81
4762.6	4792.6	15.87	18.72	17.72
4980.1	5010.1	15.14	19.44	22.44
5197.6	5227.6	11.31	15.54	20.31
5415.1	5445.1	8.00	13.42	19.53
5632.6	5662.6	17.61	18.63	16.98
5850.1	5880.1	19.38	18.04	15.76
6089.4	6119.4	19.51	19.47	16.69
6306.8	6336.8	19.78	19.58	17.35
6546.1	6576.1	18.67	17.86	17.03
6763.6	6793.6	17.43	17.11	17.47
7002.8	7032.8	15.64	18.84	19.09
7220.4	7250.4	14.30	17.39	18.76
7459.6	7489.6	14.70	17.84	18.04
7677.1	7707.1	18.32	16.57	13.29
7916.4	7946.4	13.40	12.30	10.99
8133.9	8163.9	12.23	11.33	9.93
8373.1	8403.1	10.41	9.70	8.53
8590.6	8620.6	9.59	8.72	8.04
8829.8	8859.8	8.65	8.02	7.86
9047.4	9077.4	10.17	8.83	9.05
9286.6	9316.6	11.23	9.46	10.28
9504.1	9534.1	13.10	10.41	11.67
9743.3	9773.3	13.79	11.57	12.88
9960.9	9990.9	14.52	13.93	16.76
10200.1	10230.1	15.22	15.81	23.05

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+5dBm (dB)		
		@LO (dBm)		
		+7	+10	+13
1500.1	1530.1	-1.49	-0.05	0.08
1717.6	1747.6	0.39	0.49	0.51
1935.1	1965.1	1.08	0.73	0.52
2152.6	2182.6	1.40	0.97	0.75
2370.1	2400.1	1.80	1.30	0.92
2587.6	2617.6	2.03	1.77	1.48
2805.1	2835.1	1.86	1.63	1.42
3022.6	3052.6	1.60	1.30	1.12
3240.1	3270.1	1.56	1.21	1.00
3457.6	3487.6	1.30	0.97	0.77
3675.1	3705.1	1.15	0.86	0.67
3892.6	3922.6	1.08	0.81	0.68
4110.1	4140.1	1.15	0.89	0.80
4327.6	4357.6	1.03	0.83	0.73
4545.1	4575.1	1.07	0.63	0.34
4762.6	4792.6	0.97	0.53	0.27
4980.1	5010.1	0.95	0.56	0.33
5197.6	5227.6	1.59	1.15	0.83
5415.1	5445.1	2.92	2.25	1.66
5632.6	5662.6	1.56	1.39	1.08
5850.1	5880.1	0.92	0.84	0.71
6089.4	6119.4	0.57	0.49	0.44
6306.8	6336.8	0.54	0.42	0.40
6546.1	6576.1	0.54	0.37	0.36
6763.6	6793.6	0.52	0.37	0.33
7002.8	7032.8	0.50	0.38	0.27
7220.4	7250.4	0.62	0.51	0.31
7459.6	7489.6	0.39	0.43	0.43
7677.1	7707.1	0.39	0.53	0.70
7916.4	7946.4	0.85	0.90	1.02
8133.9	8163.9	1.10	1.06	1.15
8373.1	8403.1	1.38	1.36	1.50
8590.6	8620.6	1.63	1.62	1.86
8829.8	8859.8	2.05	2.04	2.24
9047.4	9077.4	1.89	1.97	2.13
9286.6	9316.6	1.71	1.77	1.75
9504.1	9534.1	1.40	1.61	1.36
9743.3	9773.3	1.18	1.24	0.96
9960.9	9990.9	0.81	0.83	0.36
10200.1	10230.1	0.61	0.55	0.07

Frequency Mixer

ZMX-7GLHR

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=5350MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=3690MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=7010.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+10			+10			+10
1649.9	3700.1	6.81	10.1	3700.1	4.77	2710.0	4300.1	13.13
1569.9	3780.1	6.93	90.1	3780.1	4.53	2650.0	4360.1	12.30
1489.9	3860.1	6.96	170.1	3860.1	4.48	2590.0	4420.1	11.45
1409.9	3940.1	6.88	250.1	3940.1	4.49	2530.0	4480.1	10.66
1329.9	4020.1	6.83	330.1	4020.1	4.54	2450.0	4560.1	9.78
1249.9	4100.1	6.79	410.1	4100.1	4.55	2390.0	4620.1	9.22
1169.9	4180.1	6.72	490.1	4180.1	4.68	2310.0	4700.1	8.69
1089.9	4260.1	6.46	570.1	4260.1	4.85	2250.0	4760.1	8.58
1009.9	4340.1	6.46	650.1	4340.1	5.08	2170.0	4840.1	8.59
929.9	4420.1	6.70	730.1	4420.1	5.41	2110.0	4900.1	8.47
849.9	4500.1	6.56	810.1	4500.1	5.56	2030.0	4980.1	8.52
770.0	4580.0	6.14	890.1	4580.1	5.50	1970.0	5040.1	8.47
690.0	4660.0	5.93	970.1	4660.1	5.59	1890.0	5120.1	8.44
610.0	4740.0	5.73	1050.1	4740.1	5.77	1830.0	5180.1	8.43
530.0	4820.0	5.52	1130.1	4820.1	5.65	1750.0	5260.1	8.39
450.0	4900.0	5.34	1210.1	4900.1	5.33	1690.0	5320.1	8.28
370.0	4980.0	5.22	1290.1	4980.1	5.25	1610.0	5400.1	8.23
290.0	5060.0	5.11	1370.1	5060.1	5.45	1550.0	5460.1	8.11
210.0	5140.0	5.06	1450.1	5140.1	5.70	1470.0	5540.1	8.09
130.0	5220.0	5.15	1510.1	5200.1	5.67	1410.0	5600.1	7.89
50.0	5300.0	5.36	1590.1	5280.1	5.94	1330.0	5680.1	7.87
30.0	5380.0	5.33	1650.1	5340.1	5.95	1270.0	5740.1	7.78
110.0	5460.0	5.30	1730.1	5420.1	6.02	1190.0	5820.1	7.72
210.0	5560.0	5.39	1790.1	5480.1	6.09	1130.0	5880.1	7.88
290.0	5640.0	5.62	1870.1	5560.1	6.25	1050.0	5960.1	7.65
390.0	5740.0	5.97	1930.1	5620.1	6.20	990.0	6020.1	7.54
470.0	5820.0	6.18	2010.1	5700.1	6.54	910.0	6100.1	7.25
570.0	5920.0	6.39	2070.1	5760.1	6.89	850.0	6160.1	7.30
650.0	6000.0	6.54	2150.1	5840.1	7.23	770.0	6240.1	7.07
750.0	6100.0	6.66	2210.1	5900.1	7.49	710.0	6300.1	7.22
830.0	6180.0	6.75	2290.1	5980.1	7.86	630.0	6380.1	7.21
930.1	6280.1	6.72	2350.1	6040.1	7.91	570.0	6440.1	7.06
1010.1	6360.1	6.76	2430.1	6120.1	8.18	490.0	6520.1	7.09
1110.1	6460.1	6.69	2490.1	6180.1	8.56	430.0	6580.1	6.94
1190.1	6540.1	6.68	2570.1	6260.1	9.06	350.0	6660.1	7.00
1290.1	6640.1	6.62	2630.1	6320.1	9.43	290.0	6720.1	6.88
1370.1	6720.1	6.60	2710.1	6400.1	9.72	210.0	6800.1	6.91
1470.1	6820.1	6.70	2770.1	6460.1	9.93	150.0	6860.1	6.93
1550.1	6900.1	6.90	2850.1	6540.1	9.79	70.0	6940.1	6.87
1650.1	7000.1	7.41	2910.1	6600.1	9.94	10.0	7000.1	7.04

REV. X3

ZMX-7GLHR

101011

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Frequency Mixer

ZMX-7GLHR

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+7	+10	+13	+7	+10	+13
1530.1	35.85	37.78	30.82	14.16	14.28	14.74
1747.6	40.95	38.83	38.50	14.83	15.05	15.06
1965.1	33.62	31.41	31.99	15.33	15.39	15.36
2182.6	32.11	29.15	27.64	16.47	16.51	16.29
2400.1	29.84	27.76	26.69	16.73	16.41	16.12
2617.6	28.74	26.78	25.30	17.21	16.50	15.84
2835.1	30.43	27.79	26.63	19.83	18.44	17.97
3052.6	31.86	29.13	27.72	22.57	21.43	20.77
3270.1	33.68	30.33	28.38	23.57	23.10	22.68
3487.6	35.43	31.18	28.96	24.58	24.71	24.70
3705.1	34.98	32.16	30.20	25.04	26.06	26.64
3922.6	34.54	31.06	29.45	25.49	26.64	27.69
4140.1	37.59	32.46	30.13	26.31	27.56	28.70
4357.6	38.20	32.62	29.77	27.04	28.13	29.20
4575.1	36.36	33.32	30.23	27.87	28.96	29.79
4792.6	33.59	32.86	31.29	28.99	30.00	30.84
5010.1	32.02	32.69	32.19	30.09	31.01	31.47
5227.6	31.12	31.63	32.22	30.85	31.49	31.83
5445.1	31.28	30.65	29.91	31.46	31.79	31.52
5662.6	31.79	30.73	29.24	32.29	31.89	31.05
5880.1	31.46	31.43	29.96	33.11	32.26	31.05
6119.3	31.17	32.11	31.03	33.70	32.29	30.90
6336.9	30.24	31.49	31.65	33.99	32.01	30.68
6576.1	30.52	31.87	31.69	33.73	31.66	30.10
6793.6	30.12	32.51	33.00	33.28	31.14	29.63
7032.9	29.19	32.32	35.09	32.42	30.81	29.01
7250.4	27.53	29.53	32.46	31.39	29.97	28.46
7489.6	27.89	29.40	30.98	29.99	28.88	27.74
7707.1	28.92	30.67	31.90	28.85	27.90	26.82
7946.4	29.86	31.83	33.13	27.63	27.21	26.30
8163.9	31.55	33.10	33.89	27.24	26.72	26.42
8403.1	34.22	35.97	35.52	27.41	27.14	26.91
8620.6	37.58	40.86	41.67	28.05	27.89	27.48
8859.8	37.36	39.90	44.03	29.15	28.63	28.10
9077.4	35.20	37.01	39.59	29.82	29.27	27.97
9316.6	32.79	34.47	36.72	30.15	28.92	27.75
9534.1	31.35	32.92	34.45	29.89	28.55	27.01
9773.3	29.85	31.71	33.09	29.54	27.72	26.49
9990.8	28.75	31.08	31.92	28.36	27.09	25.70
10230.1	27.41	29.23	30.37	27.11	25.91	25.52

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+7	+10	+13
1500.1	1530.1	11.70	14.12	15.03
1717.6	1747.6	10.06	10.92	11.64
1935.1	1965.1	8.75	9.28	10.16
2152.6	2182.6	8.43	8.63	8.93
2370.1	2400.1	8.35	8.21	8.27
2587.6	2617.6	8.06	7.84	7.66
2805.1	2835.1	8.06	8.32	8.44
3022.6	3052.6	8.19	8.57	8.79
3240.1	3270.1	9.43	9.71	9.86
3457.6	3487.6	10.71	10.77	10.78
3675.1	3705.1	12.00	11.88	11.71
3892.6	3922.6	12.89	12.68	12.49
4110.1	4140.1	13.45	13.04	12.83
4327.6	4357.6	13.96	13.37	12.96
4545.1	4575.1	14.37	13.62	13.23
4762.6	4792.6	14.75	14.04	13.61
4980.1	5010.1	15.22	14.53	14.09
5197.6	5227.6	16.25	15.73	15.42
5415.1	5445.1	19.37	19.25	19.05
5632.6	5662.6	17.56	17.56	17.58
5850.1	5880.1	16.81	16.77	16.73
6069.4	6119.4	16.93	16.82	16.74
6306.8	6336.8	17.19	17.07	17.06
6546.1	6576.1	17.51	17.45	17.41
6763.6	6793.6	17.90	17.89	17.84
7002.8	7032.8	18.56	18.65	18.83
7220.4	7250.4	19.12	19.45	19.72
7459.6	7489.6	19.40	19.66	19.90
7677.1	7707.1	19.41	19.58	19.86
7916.4	7946.4	19.96	20.11	20.48
8133.9	8163.9	20.72	21.09	21.42
8373.1	8403.1	21.50	21.89	22.45
8590.6	8620.6	22.10	22.69	23.43
8829.8	8859.8	22.93	23.68	24.80
9047.4	9077.4	24.16	25.02	26.47
9286.6	9316.6	26.06	27.10	28.59
9504.1	9534.1	27.82	28.87	30.02
9743.3	9773.3	29.53	30.25	30.67
9960.9	9990.9	31.24	31.14	31.16
10200.1	10230.1	32.35	31.28	30.37

Frequency Mixer

ZMX-7GLHR

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=7000MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+7	+10	+13		+7	+10	+13		+7	+10	+13
1500.1	1530.1	12.99	12.71	12.26	1530.1	3.09	2.14	2.09	10.0	1.55	1.93	2.28
1717.6	1747.6	7.22	6.86	6.66	1747.6	2.52	1.95	2.12	90.3	1.55	1.95	2.33
1935.1	1965.1	4.45	4.23	4.07	1965.1	2.14	1.76	2.03	170.5	1.49	1.87	2.24
2152.6	2182.6	3.22	3.02	2.84	2182.6	1.89	1.65	1.99	250.8	1.46	1.82	2.18
2370.1	2400.1	2.48	2.27	2.12	2400.1	1.67	1.51	1.89	331.1	1.44	1.79	2.15
2587.6	2617.6	1.81	1.65	1.59	2617.6	1.55	1.48	1.88	411.3	1.37	1.70	2.06
2805.1	2835.1	1.38	1.20	1.13	2835.1	1.47	1.46	1.90	491.6	1.38	1.70	2.05
3022.6	3052.6	1.31	1.15	1.08	3052.6	1.38	1.44	1.93	571.9	1.36	1.67	2.02
3240.1	3270.1	1.21	1.09	1.07	3270.1	1.22	1.39	1.96	652.1	1.32	1.62	1.96
3457.6	3487.6	1.10	1.05	1.16	3487.6	1.14	1.39	1.98	732.4	1.20	1.49	1.83
3675.1	3705.1	1.13	1.16	1.22	3705.1	1.16	1.41	2.00	812.7	1.17	1.38	1.73
3892.6	3922.6	1.34	1.40	1.44	3922.6	1.27	1.43	1.96	893.0	1.20	1.37	1.70
4110.1	4140.1	1.47	1.55	1.61	4140.1	1.34	1.45	1.94	973.2	1.18	1.33	1.66
4327.6	4357.6	1.63	1.77	1.86	4357.6	1.38	1.46	1.94	1053.5	1.14	1.24	1.57
4545.1	4575.1	1.80	1.96	2.09	4575.1	1.52	1.53	1.97	1133.8	1.22	1.13	1.42
4762.6	4792.6	1.94	2.04	2.16	4792.6	1.67	1.61	2.00	1214.0	1.31	1.12	1.35
4980.1	5010.1	1.87	1.90	1.97	5010.1	1.81	1.66	1.98	1294.3	1.35	1.15	1.32
5197.6	5227.6	1.56	1.46	1.44	5227.6	1.96	1.73	1.97	1374.6	1.39	1.17	1.26
5415.1	5445.1	2.45	2.25	2.07	5445.1	2.08	1.76	1.92	1454.8	1.54	1.27	1.21
5632.6	5662.6	4.64	4.09	3.66	5662.6	2.19	1.79	1.87	1535.1	1.70	1.40	1.27
5850.1	5880.1	4.75	4.28	3.94	5880.1	2.30	1.80	1.81	1615.4	1.85	1.56	1.41
6089.4	6119.4	4.32	3.87	3.56	6119.3	2.34	1.79	1.76	1695.6	1.94	1.68	1.52
6306.8	6336.8	4.32	3.77	3.46	6336.9	2.42	1.78	1.68	1775.9	2.21	1.91	1.72
6546.1	6576.1	4.11	3.52	3.18	6576.1	2.51	1.75	1.55	1856.2	2.46	2.13	1.90
6763.6	6793.6	3.90	3.22	2.83	6793.6	2.54	1.71	1.44	1936.4	2.75	2.39	2.11
7002.8	7032.8	3.71	3.01	2.48	7032.9	2.61	1.65	1.31	2016.7	2.95	2.58	2.32
7220.4	7250.4	3.77	3.10	2.60	7250.4	2.48	1.56	1.20	2097.0	3.23	2.86	2.57
7459.6	7489.6	4.54	3.98	3.45	7489.6	2.43	1.48	1.05	2157.2	3.34	2.95	2.66
7677.1	7707.1	5.02	4.36	3.64	7707.1	2.36	1.42	1.09	2237.4	3.42	3.02	2.74
7916.4	7946.4	4.01	3.45	2.90	7946.4	2.21	1.41	1.25	2297.7	3.64	3.23	2.93
8133.9	8163.9	3.30	2.81	2.35	8163.9	2.17	1.47	1.42	2377.9	3.74	3.34	3.05
8373.1	8403.1	2.64	2.28	1.94	8403.1	2.11	1.57	1.62	2438.1	3.57	3.22	3.00
8590.6	8620.6	2.07	1.80	1.63	8620.6	2.06	1.66	1.82	2518.4	3.51	3.19	3.03
8829.8	8859.8	1.57	1.53	1.67	8859.8	2.02	1.79	2.04	2578.6	3.53	3.23	3.12
9047.4	9077.4	1.52	1.72	2.19	9077.4	1.96	1.93	2.25	2658.9	3.35	3.17	3.17
9286.6	9316.6	2.14	2.57	3.38	9316.6	1.90	2.11	2.50	2719.1	3.10	3.07	3.18
9504.1	9534.1	2.92	3.50	4.66	9534.1	1.94	2.28	2.66	2799.3	2.80	2.99	3.27
9743.3	9773.3	3.97	4.78	6.15	9773.3	1.99	2.40	2.69	2859.5	2.66	3.02	3.42
9960.9	9990.9	5.56	6.53	8.31	9990.8	2.09	2.53	2.71	2939.8	2.76	3.34	3.89
10200.1	10230.1	7.44	8.39	9.63	10230.1	2.17	2.57	2.76	3000.0	3.05	3.65	4.21

Harmonics Tables

RF HARMONICS ORDER	(-dBm)	(-dBc)										
	0	-	-	6	18	22	33	---	---	---	---	---
	1	-	13	+0	40	23	41	60	---	---	---	---
	2	84	57	62	56	61	64	68	72	---	---	---
	3	>90	>75	73	>75	54	74	64	>75	>75	---	---
	4	>90	>75	>75	>75	>75	>75	>75	>75	>75	>75	---
	5	---	---	>75	>75	>75	>75	>75	>75	>75	>75	---
	6	---	---	---	>75	>75	>75	>75	>75	>75	>75	74
	7	---	---	---	---	>75	>75	>75	>75	>75	>75	>75
	8	---	---	---	---	---	>75	>75	>75	>75	>75	>75
	9	---	---	---	---	---	---	>75	>75	>75	>75	>75
	10	---	---	---	---	---	---	---	>75	>75	>75	>75
RF CAL		0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 5350 MHz; -10.00 dBm.

LO IN: 5380 MHz; +10.00 dBm

IF OUT: 30 MHz; -15.49 dBm

RF HARMONICS ORDER	(-dBm)	(-dBc)										
	0	-	-	15	28	32	43	---	---	---	---	---
	1	-	12	+0	43	24	43	62	---	---	---	---
	2	64	50	48	58	49	67	58	65	---	---	---
	3	89	59	50	51	29	49	45	61	>84	---	---
	4	>90	76	77	67	71	65	68	74	>84	>84	---
	5	---	---	81	>84	73	66	47	68	62	76	>84
	6	---	---	---	>84	>84	71	80	72	84	80	>84
	7	---	---	---	---	>84	>84	73	>84	61	83	77
	8	---	---	---	---	---	>84	>84	82	>84	72	>84
	9	---	---	---	---	---	---	>84	>84	84	>84	64
	10	---	---	---	---	---	---	---	>84	>84	>84	>84
RF CAL		0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 5350 MHz; 0.00 dBm.

LO IN: 5380 MHz; +10.00 dBm

IF OUT: 30 MHz; -5.89 dBm

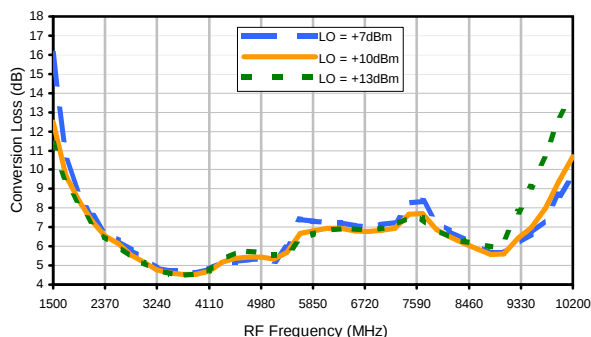
Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.

2. + entry denotes harmonics are in (dBc) above IF OUTPUT.

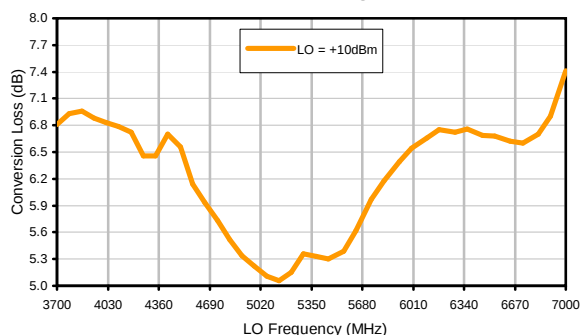
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

Typical Performance Curves

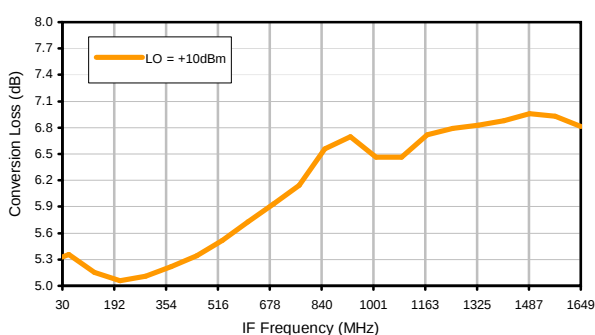
Conversion Loss @ IF=30MHz



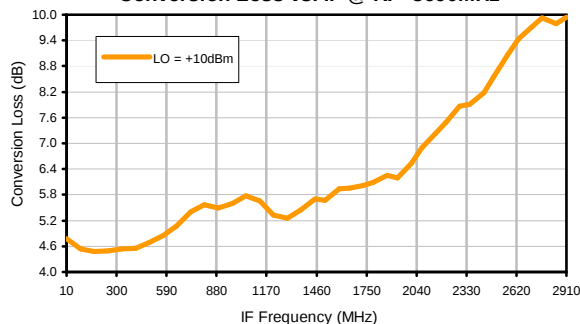
Conversion Loss vs. LO @ RF=5350MHz



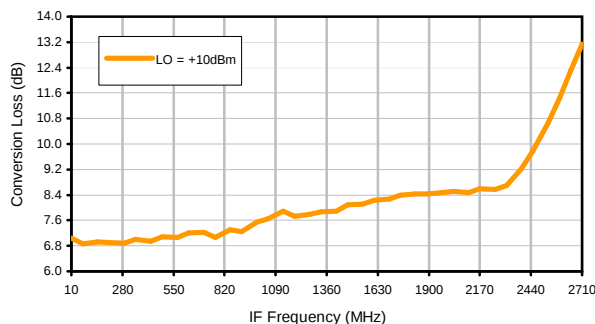
Conversion Loss vs. IF @ RF=5350MHz



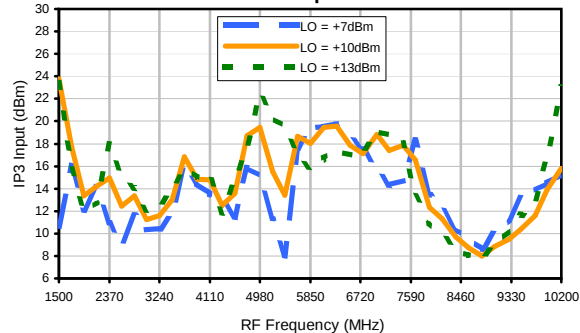
Conversion Loss vs. IF @ RF=3690MHz



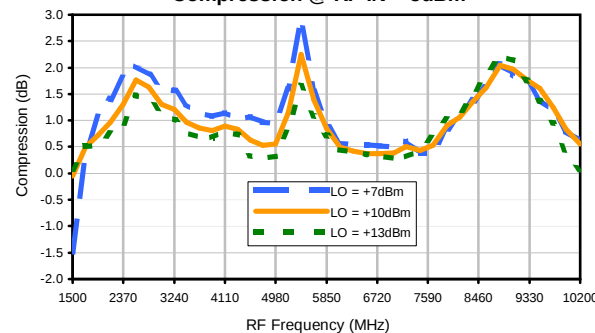
Conversion Loss vs. IF @ RF=7010.1MHz



IP3 Input

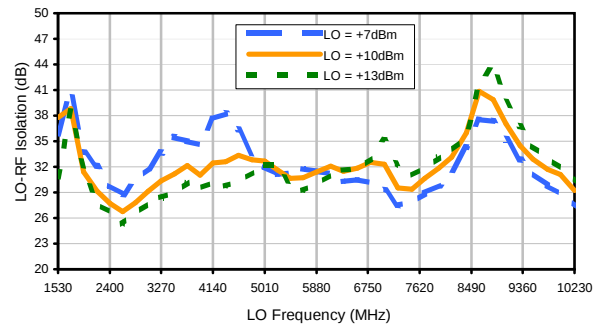


Compression @ RF IN=+5dBm

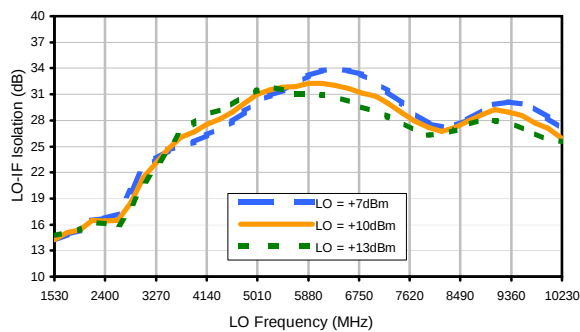


Typical Performance Curves

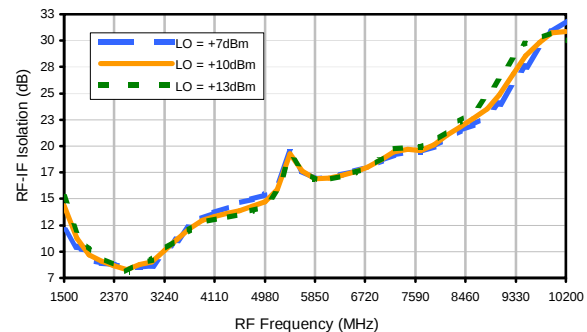
LO-RF Isolation



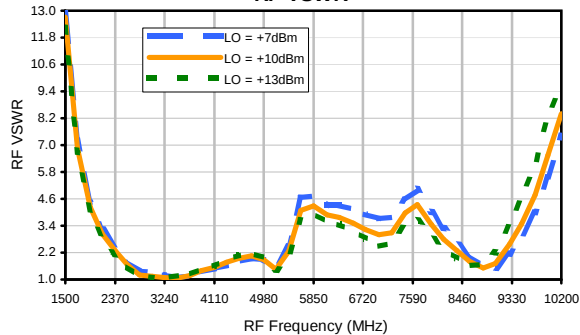
LO-IF Isolation



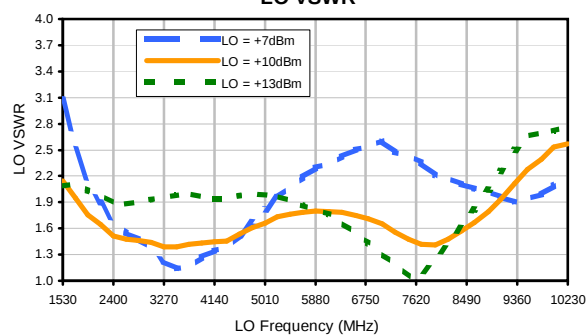
RF-IF Isolation



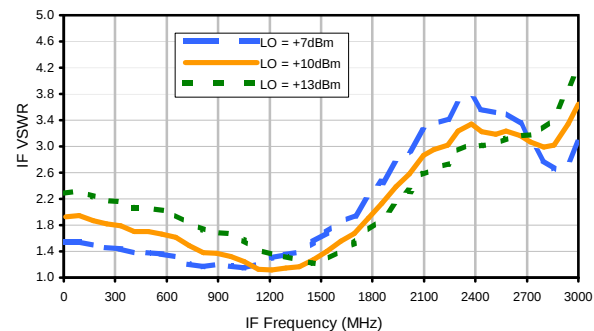
RF VSWR



LO VSWR



IF VSWR



Harmonics Tables

RF HARMONICS ORDER	(-dBm)		(-dBc)									
	0	1	2	3	4	5	6	7	8	9	10	11
	0	-	-	6	18	22	33	---	---	---	---	---
	1	-	13	+0	40	23	41	60	---	---	---	---
	2	84	57	62	56	61	64	68	72	---	---	---
	3	>90	>75	73	>75	54	74	64	>75	>75	---	---
	4	>90	>75	>75	>75	>75	>75	>75	>75	>75	>75	---
	5	---	---	>75	>75	>75	>75	>75	>75	>75	>75	---
	6	---	---	---	>75	>75	>75	>75	>75	>75	>75	74
	7	---	---	---	---	>75	>75	>75	>75	>75	>75	>75
	8	---	---	---	---	---	>75	>75	>75	>75	>75	>75
	9	---	---	---	---	---	---	>75	>75	>75	>75	>75
	10	---	---	---	---	---	---	---	>75	>75	>75	>75
RF CAL		0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 5350 MHz; -10.00 dBm.

LO IN: 5380 MHz; +10.00 dBm

IF OUT: 30 MHz; -15.49 dBm

RF HARMONICS ORDER	(-dBm)		(-dBc)									
	0	1	2	3	4	5	6	7	8	9	10	11
	0	-	-	15	28	32	43	---	---	---	---	---
	1	-	12	+0	43	24	43	62	---	---	---	---
	2	64	50	48	58	49	67	58	65	---	---	---
	3	89	59	50	51	29	49	45	61	>84	---	---
	4	>90	76	77	67	71	65	68	74	>84	>84	---
	5	---	---	81	>84	73	66	47	68	62	76	>84
	6	---	---	---	>84	>84	71	80	72	84	80	>84
	7	---	---	---	---	>84	>84	73	>84	61	83	77
	8	---	---	---	---	---	>84	>84	82	>84	72	>84
	9	---	---	---	---	---	---	>84	>84	84	>84	64
	10	---	---	---	---	---	---	---	>84	>84	>84	>84
RF CAL		0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 5350 MHz; 0.00 dBm.

LO IN: 5380 MHz; +10.00 dBm

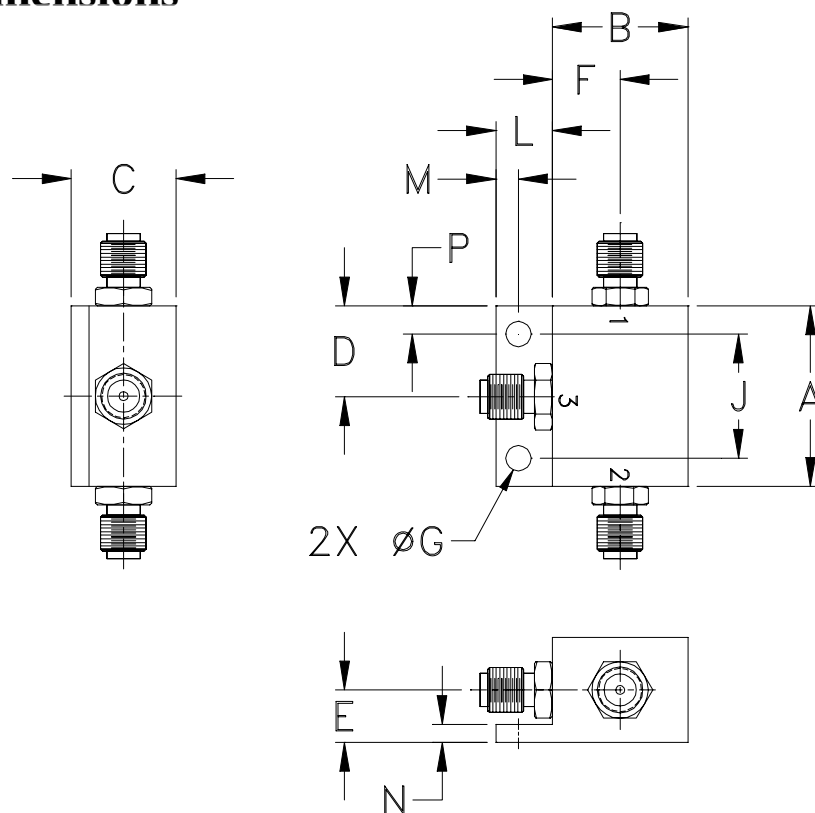
IF OUT: 30 MHz; -5.89 dBm

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.

Outline Dimensions



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N
BU413	1.00 (25.40)	.75 (19.05)	.58 (14.73)	.50 (12.70)	.29 (7.37)	.38 (9.65)	.140 (3.56)	--	.687 (17.45)	--	.32 (8.13)	.13 (3.30)	.10 (2.54)

CASE#	P	WT. GRAMS
BU413	.16 (4.06)	25

Dimensions are in inches (mm). Tolerances: 2 Pl. $\pm .03$; 3 Pl. $\pm .015$

Notes:

- Case material: Aluminum alloy.
- Case finish:
For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.



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All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-55° to 100°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Barometric Pressure	100,000 Feet	MIL-STD-202, Method 105, Condition D
Humidity	90% RH, 65°C Units may require bake-out after humidity to restore full performance.	MIL-STD-202, Method 103
Thermal Shock	-65° to 125°C, 5 cycles	MIL-STD-202, Method 107, Condition B
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18)	MIL-STD-202, Method 213, Condition I