

# Voltage Controlled Oscillator

ROS-2310-7+

50Ω 2290 to 2310 MHz

## The Big Deal:

- Good Harmonic Suppression
- Low Phase Noise
- Robust design and construction
- Small size .500" x .500" x .220"



CASE STYLE: CK1113

## Product Overview:

The ROS-2310-7+ is a Voltage Controlled Oscillator, designed to operate from 2290 to 2310 MHz for military applications. The ROS-2310-7+ is packaged in a metal case (size of .500" x .500" x .220") to shield against unwanted signals and noise.

## Key Features

Feature	Advantages
Low Phase Noise: -114 dBc/Hz typ at 10kHz offset	Low phase noise improves system EVM (Error Vector Magnitude).
High Power Output, +7.5 dBm typ.	Reduces amplification requirements and improves immunity to external noise sources.
Good Pulling, 1 MHz typ.	Improves immunity against changes in output load.
Good Pushing, 0.3 MHz/V typ.	Provides increased immunity against noisy DC lines and improves output frequency stability vs. variations in supply voltage.
Robust design and construction	Each internal component of the ROS-2310-7+ is bonded to the substrate, providing better immunity to microphonics, reduced phase hit, and decreased tombstoning risk during subsequent reflow operations.
Small size, .500" x .500" x .220"	The small size enables the ROS-2310-7+ to be used in compact designs.

# Voltage Controlled Oscillator

## ROS-2310-7+

Linear Tuning 2290 to 2310 MHz

### Features

- very low phase noise
- low pushing
- low pulling
- aqueous washable

### Applications

- military
- wireless communication
- outdoor terminal



CASE STYLE: CK1113

**+RoHS Compliant**  
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

### Electrical Specifications

MODEL NO.	FREQ. (MHz)		POWER OUTPUT (dBm)	PHASE NOISE dBc/Hz SSB at offset frequencies, kHz					TUNING			NON HARMONIC SPURIOUS (dBc)	2nd HARMONIC (dBc)	PULLING pk-pk @ 12 dB (MHz)	PUSHING (MHz/V)	DC OPERATING POWER			
	Min.	Max.		1	10	100	1000	10000	VOLTAGE RANGE (V)	SENSITIVITY (MHz/V)	PORT CAP (pF)					3 dB MODULATION BANDWIDTH (MHz)	Vcc (volt)	Current (mA)	
ROS-2310-7+	2290	2310	TYP	+7.5	-88	-114	-135	-155	-168	-	6-10	14	120	-90	-22	1.0	0.3	5	29
			MIN	+5.5	-	-	-	-	-	0.5	4	-	-	-	-	-	-	4.75	-
			MAX	+9.5	-80	-109	-130	-149	-160	5.0	14	-	-	-	-12	-	-	5.25	35

### Pin Connections

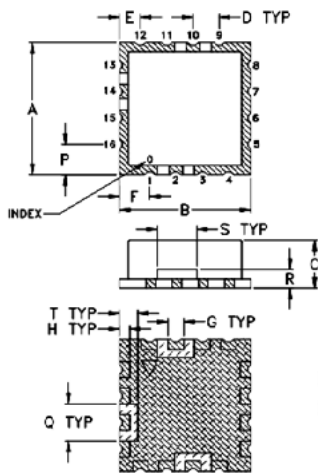
RF OUT	10
VCC	14
V-TUNE	2
GROUND	1,3,4,5,6,7,8,9,11,12,13,15,16

### Maximum Ratings

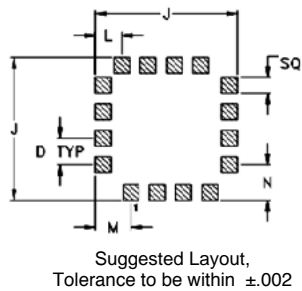
Operating Temperature	-55°C to 85°C
Storage Temperature	-55°C to 100°C
Absolute Max. Supply Voltage (Vcc)	6.5V
Absolute Max. Tuning Voltage (Vtune)	7.0V
All specifications	50 ohm system

- Permanent damage may occur if any of these limits are exceeded.
- Model meets Mini-Circuits ENV65 environmental spec.

### Outline Drawing

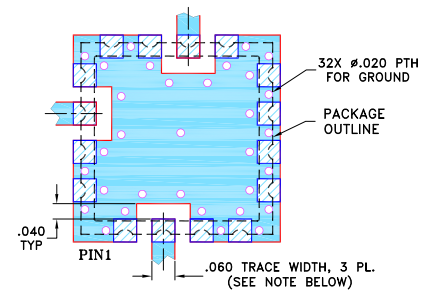


### PCB Land Pattern



METALLIZATION  
 SOLDER RESIST

### Demo Board MCL P/N: TB-10 Suggested PCB Layout (PL-012)



#### NOTES:

1. TRACE WIDTH IS SHOWN FOR FR4 WITH DIELECTRIC THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE BOTTOM IS CONTINUOUS GROUND PLANE.

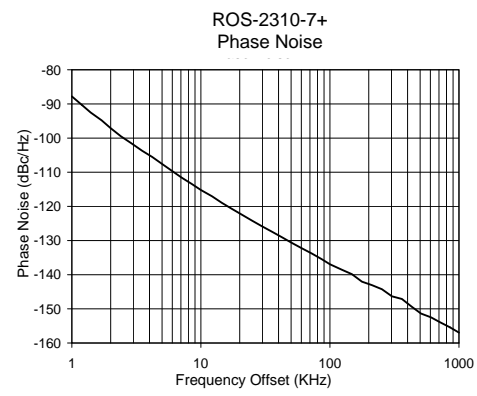
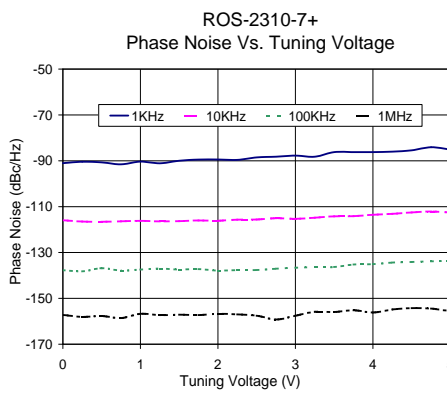
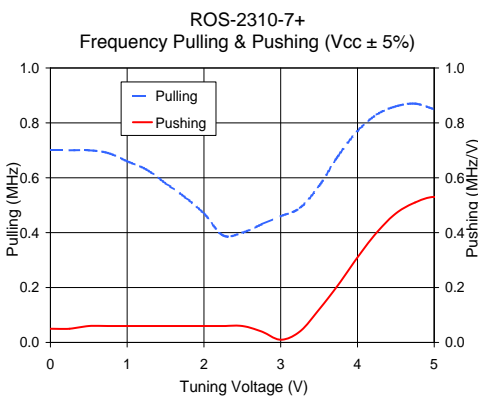
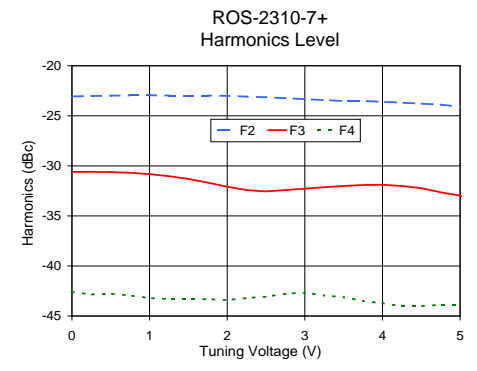
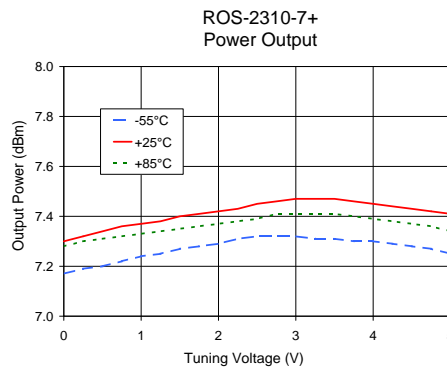
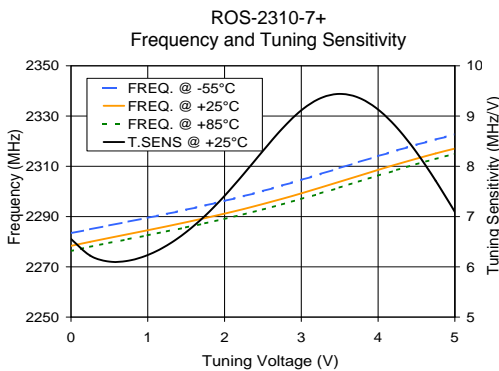
DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)  
 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

### Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	wt.
.500	.500	.220	.100	.080	.115	.060	.040	.540	.060	.100	.135	.135	.115	.140	.070	.150	.070	grams
12.70	12.70	5.59	2.54	2.03	2.92	1.52	1.02	13.72	1.52	2.54	3.43	3.43	2.92	3.56	1.78	3.81	1.78	1.2

V TUNE	TUNE SENS (MHz/V)	FREQUENCY (MHz)			POWER OUTPUT (dBm)			Icc (mA)	HARMONICS (dBc)			FREQ. PUSH (MHz/V)	FREQ. PULL (MHz)	PHASE NOISE (dBc/Hz) at offsets				FREQ OFFSET (KHz)	PHASE NOISE at 2300 MHz (dBc/Hz)
		-55°C	+25°C	+85°C	-55°C	+25°C	+85°C		F2	F3	F4			1kHz	10kHz	100kHz	1MHz		
0.00	6.55	2283.4	2278.3	2276.3	7.17	7.30	7.26	28.68	-23.1	-30.6	-42.6	0.05	0.70	-91.03	-115.9	-137.7	-157.2	1.0	-87.80
0.50	6.10	2286.5	2281.5	2279.5	7.20	7.34	7.30	28.69	-23.0	-30.6	-42.8	0.06	0.70	-90.69	-116.6	-136.8	-157.7	2.0	-97.10
0.75	6.12	2288.0	2283.0	2281.1	7.22	7.36	7.31	28.69	-23.0	-30.7	-43.0	0.06	0.69	-91.54	-116.4	-137.9	-158.6	3.5	-103.70
1.00	6.23	2289.5	2284.6	2282.6	7.24	7.37	7.32	28.69	-23.0	-30.8	-43.2	0.06	0.66	-90.34	-116.2	-137.5	-156.7	6.0	-109.66
1.25	6.43	2291.1	2286.1	2284.1	7.25	7.38	7.33	28.68	-23.0	-31.0	-43.3	0.06	0.63	-91.08	-116.4	-137.0	-157.3	8.5	-113.43
1.50	6.69	2292.7	2287.7	2285.7	7.27	7.40	7.34	28.68	-23.0	-31.3	-43.3	0.06	0.58	-89.99	-116.3	-137.4	-157.1	10.0	-115.20
1.75	7.02	2294.4	2289.4	2287.3	7.28	7.41	7.35	28.67	-23.0	-31.7	-43.3	0.06	0.53	-89.47	-116.0	-137.3	-157.3	20.8	-122.45
2.00	7.41	2296.2	2291.2	2289.1	7.29	7.42	7.36	28.65	-23.0	-32.1	-43.4	0.06	0.47	-89.44	-116.1	-137.9	-156.7	35.5	-127.41
2.25	7.85	2298.2	2293.0	2290.9	7.31	7.43	7.37	28.64	-23.1	-32.4	-43.2	0.06	0.39	-89.60	-115.7	-137.7	-157.0	60.7	-132.29
2.50	8.31	2300.2	2295.0	2292.8	7.32	7.45	7.38	28.61	-23.2	-32.6	-43.1	0.06	0.40	-88.53	-115.6	-137.7	-157.6	86.7	-135.49
2.75	8.75	2302.3	2297.1	2294.8	7.32	7.46	7.39	28.58	-23.2	-32.4	-42.8	0.04	0.43	-88.20	-115.1	-137.1	-159.2	100.0	-136.95
3.00	9.11	2304.6	2299.3	2297.0	7.32	7.47	7.41	28.55	-23.3	-32.3	-42.7	0.01	0.46	-87.73	-115.3	-136.6	-157.6	148.1	-139.85
3.25	9.36	2306.9	2301.5	2299.2	7.31	7.47	7.41	28.51	-23.4	-32.1	-43.0	0.04	0.49	-88.22	-114.8	-136.4	-155.9	177.0	-142.04
3.50	9.44	2309.3	2303.9	2301.6	7.31	7.47	7.41	28.46	-23.5	-32.0	-43.1	0.12	0.57	-86.23	-114.2	-136.3	-156.0	211.6	-143.06
3.75	9.36	2311.7	2306.2	2303.9	7.30	7.46	7.41	28.42	-23.5	-31.9	-43.5	0.21	0.68	-86.20	-114.2	-135.2	-155.2	302.4	-146.32
4.00	9.13	2314.1	2308.6	2306.3	7.30	7.45	7.40	28.36	-23.6	-31.9	-43.7	0.31	0.77	-86.21	-113.5	-135.1	-156.2	361.5	-147.11
4.25	8.76	2316.4	2310.9	2308.6	7.29	7.44	7.39	28.31	-23.7	-32.0	-44.0	0.40	0.83	-86.00	-113.2	-134.4	-154.8	507.5	-151.38
4.50	8.28	2318.6	2313.0	2310.8	7.28	7.43	7.38	28.25	-23.8	-32.2	-44.0	0.47	0.86	-85.44	-112.5	-134.1	-154.3	606.7	-152.48
4.75	7.71	2320.7	2315.1	2312.9	7.27	7.42	7.37	28.20	-23.9	-32.6	-43.9	0.51	0.87	-84.09	-112.1	-133.9	-154.4	851.6	-155.42
5.00	7.10	2322.7	2317.0	2314.9	7.25	7.41	7.36	28.15	-24.1	-33.0	-43.9	0.53	0.85	-85.06	-112.5	-133.6	-155.4	1000.0	-156.96

\*at 25°C unless mentioned otherwise



### Additional 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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