

# Voltage Controlled Oscillator

ROS-4415-119R+

50Ω 4214 to 4415 MHz

## The Big Deal:

- Good Harmonic Suppression
- Low Phase Noise
- Robust design and construction
- Small size .500" x .500" x .180"



CASE STYLE: CK605

## Product Overview:

The ROS-4415-119R+ is a Voltage Controlled Oscillator, designed to operate from 4214 to 4415 MHz for WiMAX applications. The ROS-4415-119R+ is packaged in a metal case (size of .500" x .500" x .180") to shield against unwanted signals and noise.

## Key Features

Feature	Advantages
Linear Tuning Sensitivity Ratio: 1.1:1 typ.	Optimal for loop filter design.
Good Harmonic Suppression, -27 dBc typ.	Provides clear signals suitable for systems requiring high spectral purity.
Low Phase Noise: -95 dBc/Hz typ at 10kHz offset	Low phase noise improves system EVM (Error Vector Magnitude).
Good Pulling, 2.5 MHz typ.	Improves immunity against changes in output load.
Good Pushing, 4.5 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-4415-119R+ 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 .180"	The small size enables the ROS-4415-119R+ to be used in compact designs.

Linear Tuning 4214 to 4415 MHz

### Features

- low phase noise, -95 dBc/Hz typ. @ 10kHz offset
- linear tuning characteristics
- low pulling, 2.5 MHz typ.
- low pushing, 4.5 MHz/V typ.
- aqueous washable

### Applications

- wireless communications
- WiMAX



CASE STYLE: CK605

### +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)		HARMONICS (dBc)		PULLING pk-pk @12 dB (MHz)	PUSHING (MHz/V)	DC OPERATING POWER		
	Min.	Max.		Typ.	1	10	100	1000	VOLTAGE RANGE (V)		SENSI- TIVITY (MHz/V)	PORT CAP (pF)	3 dB MODULATION BANDWIDTH (MHz)	Typ.	Typ.	Typ.			Max.	Vcc	Current (mA)
									Min.	Max.											
ROS-4415-119R+	4214	4415	+5	-69	-95	-118	-138	1	10	52 - 57	10	150	-90	-27	-15	2.5	4.5	5	45		

### 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)	12V
All specifications	50 ohm system

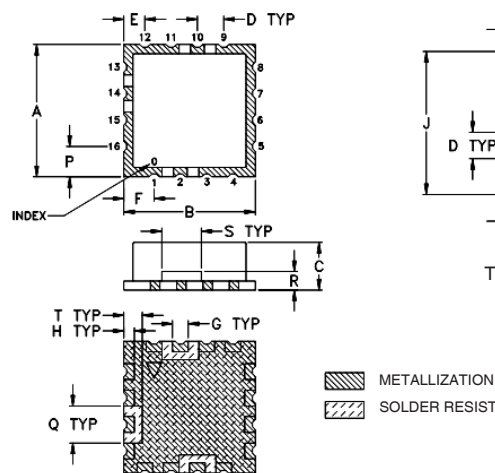
Permanent damage may occur if any of these limits are exceeded.

### Tape & Reel: F37

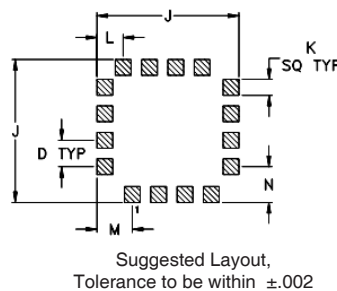
7" Reels with 10, 20, 50, 100 devices  
13" Reels with 200, 500 devices

### Environmental Ratings: ENV65

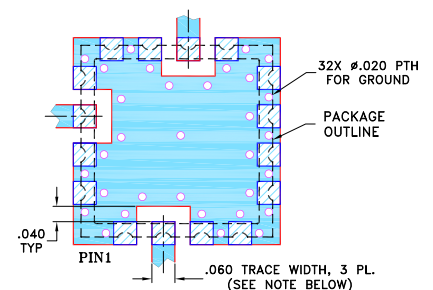
### Outline Drawing



### PCB Land Pattern



### 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.
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### Outline Dimensions (inch/mm)

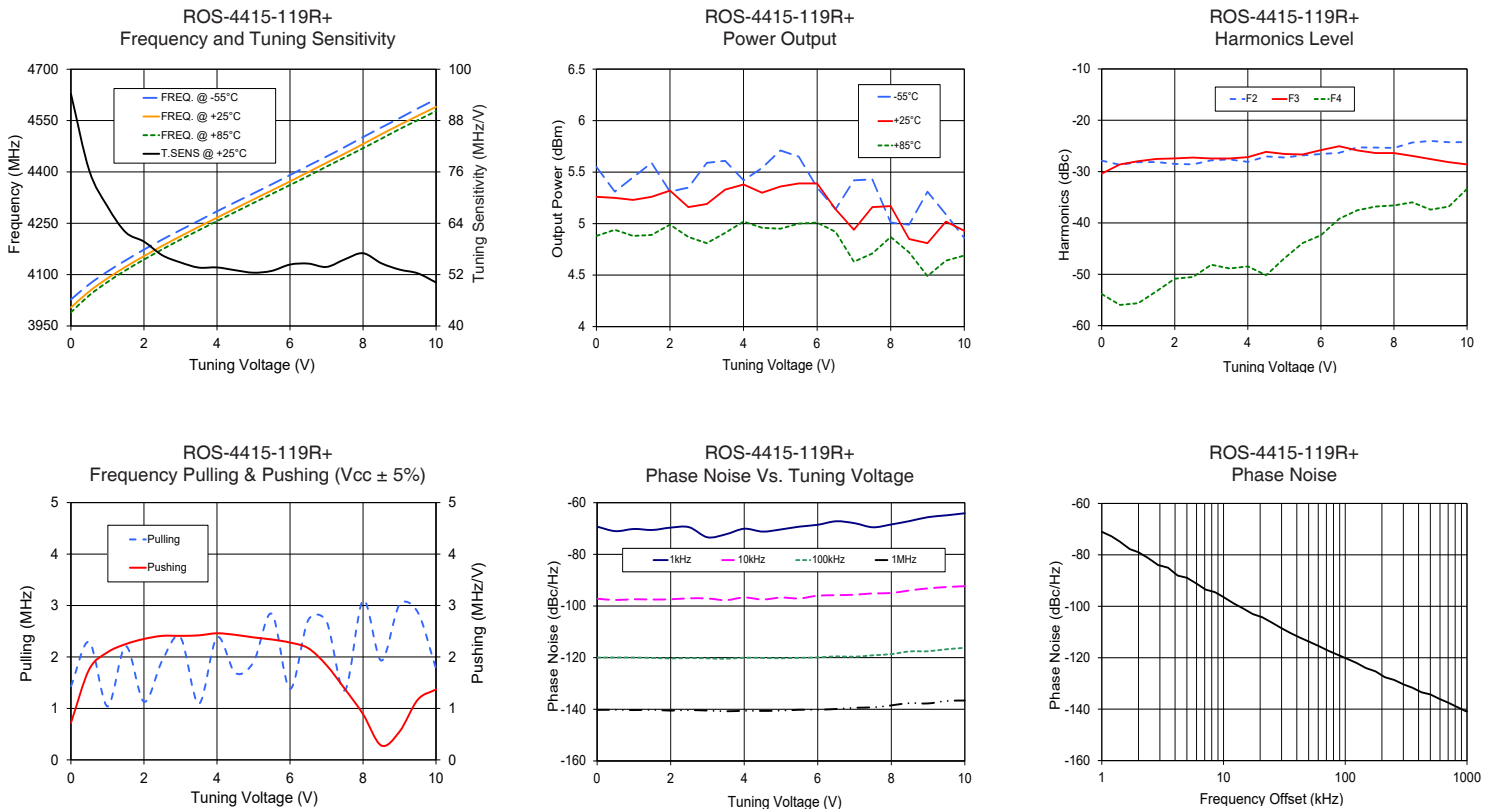
A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	wt.
.500	.500	.180	.100	.080	.115	.060	.040	.540	.060	.100	.135	.135	.115	.140	.070	.150	.070	grams
12.70	12.70	4.57	2.54	2.03	2.92	1.52	1.02	13.72	1.52	2.54	3.43	3.43	2.92	3.56	1.78	3.81	1.78	1.0

# Performance Data & Curves\*

# ROS-4415-119R+

V TUNE	TUNE SENS (MHz/V)	FREQUENCY (MHz)			POWER OUTPUT (dBm)			I <sub>cc</sub> (mA)	HARMONICS (dBc)			FREQ. PUSH (MHz/V)	FREQ. PULL (MHz)	PHASE NOISE (dBc/Hz) at offsets				FREQ OFFSET (kHz)	PHASE NOISE at 4315 MHz (dBc/Hz)
		-55°C	+25°C	+85°C	-55°C	+25°C	+85°C		F2	F3	F4			1kHz	10kHz	100kHz	1MHz		
0.00	94.24	4027.3	4003.7	3989.8	5.55	5.26	4.88	36.14	-27.9	-30.4	-53.8	0.72	1.43	-69.29	-97.2	-120.0	-140.2	1.0	-71.05
1.00	67.93	4108.9	4089.0	4078.3	5.45	5.23	4.88	36.38	-28.2	-28.0	-55.6	2.09	1.04	-70.18	-97.4	-120.0	-140.3	2.0	-78.98
1.50	61.87	4141.7	4123.0	4112.6	5.59	5.26	4.89	36.49	-28.1	-27.5	-53.3	2.25	2.21	-70.57	-97.5	-120.1	-140.2	3.5	-84.98
2.00	59.71	4173.0	4153.9	4143.9	5.31	5.32	4.99	36.58	-28.5	-27.4	-50.9	2.35	1.13	-69.66	-97.4	-120.3	-140.5	6.0	-91.16
2.50	56.52	4202.4	4183.8	4173.7	5.35	5.16	4.87	36.66	-28.6	-27.3	-50.5	2.41	1.93	-69.50	-97.0	-120.1	-140.3	8.5	-94.51
3.00	54.84	4230.2	4212.0	4202.2	5.59	5.19	4.81	36.77	-27.8	-27.4	-48.1	2.41	2.38	-73.40	-97.1	-120.3	-140.5	10.0	-96.40
3.50	53.63	4257.5	4239.4	4229.5	5.61	5.33	4.91	36.85	-27.6	-27.4	-48.9	2.42	1.09	-72.24	-97.7	-120.4	-140.8	20.8	-104.25
4.00	53.67	4284.8	4266.3	4256.3	5.42	5.38	5.02	36.92	-28.1	-27.2	-48.5	2.46	2.38	-70.09	-96.7	-120.0	-140.6	35.5	-110.41
4.50	53.02	4311.4	4293.1	4282.9	5.54	5.30	4.96	37.00	-27.1	-26.2	-50.2	2.43	1.69	-71.20	-97.5	-120.1	-140.6	60.7	-115.47
5.00	52.44	4337.4	4319.6	4309.4	5.71	5.36	4.95	37.09	-27.3	-26.6	-46.9	2.38	1.90	-70.36	-96.8	-120.2	-140.5	86.7	-118.84
5.50	52.86	4363.8	4345.8	4335.6	5.65	5.39	5.00	37.16	-26.9	-26.7	-43.9	2.34	2.84	-69.28	-97.1	-120.1	-140.2	100.0	-120.11
6.00	54.34	4391.0	4372.3	4361.7	5.35	5.39	5.01	37.21	-26.6	-25.8	-42.4	2.28	1.38	-68.56	-96.0	-119.9	-140.2	148.1	-124.03
6.50	54.57	4418.2	4399.4	4388.2	5.14	5.14	4.92	37.26	-26.4	-25.1	-39.2	2.17	2.72	-67.21	-95.8	-119.5	-139.9	177.0	-125.30
7.00	53.79	4444.9	4426.7	4415.5	5.42	4.94	4.63	37.35	-25.3	-25.9	-37.5	1.84	2.69	-67.95	-95.6	-119.6	-139.4	211.6	-127.58
7.50	55.56	4472.8	4453.6	4442.3	5.43	5.16	4.71	37.39	-25.3	-26.4	-36.8	1.38	1.35	-69.53	-95.1	-119.1	-139.2	302.4	-130.42
8.00	56.99	4501.7	4481.4	4469.3	5.01	5.17	4.87	37.39	-25.4	-26.4	-36.6	0.89	3.10	-68.43	-95.0	-118.6	-138.5	355.1	-131.64
8.50	54.65	4529.8	4509.9	4497.0	4.99	4.85	4.72	37.42	-24.3	-26.9	-36.0	0.28	1.93	-67.12	-94.0	-117.6	-137.6	498.5	-134.25
9.00	53.17	4557.1	4537.2	4525.1	5.31	4.81	4.49	37.47	-24.0	-27.6	-37.4	0.55	3.02	-65.61	-93.2	-117.5	-137.7	595.9	-136.05
9.50	52.29	4585.4	4563.8	4551.3	5.09	5.02	4.64	37.42	-24.3	-28.2	-36.8	1.17	2.87	-64.91	-92.7	-116.7	-136.8	982.3	-140.86
10.00	50.15	4612.3	4589.9	4577.7	4.86	4.93	4.69	37.37	-24.3	-28.6	-33.4	1.37	1.77	-64.11	-92.3	-116.2	-136.6	1000.0	-140.83

\*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.
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