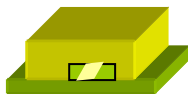


Voltage Controlled Oscillators (VCO)

Oscillators generate oscillating microwave energy. They convert electrical energy into wave energy. They are used as local oscillators for up and down converters in VSATS, point to point radio systems and other telecommunications products. They are used as signal generators, for test equipment, for example. They are also used as modem oscillators, multipliers, virtually **all wireless** systems, and for cellular/PCS systems. Plus many others.



Raditek supplies both connectorized VCO's in an aluminum housing (to >25GHz) and a family of surface mount types (SMT) VCO's (to >3 GHz) .

The RADITEK surface mount VCO's are typically in a 0.3. or 0.5 inch surface mount square footprint units. They are available in an SM or MS package (see below)

They are all designed for **reflow solder** as well as standard soldering mounting, as all are constructed with high temperature industrial grade solder (245°C).

All VCO's are 100% tested before and after the cover is installed

VCO's can be also supplied on **tape and reel**, if requested at the time of ordering.

All of the Surface Mount (SMT) RADITEK VCO's share the following specifications:

- ④ -40 to +85°C typical operating temperature
- ④ Custom designs (usually at no extra cost for SMT types)
- ④ Shielded or hermetic packaging. (T08 type packaging)
- ④ Very low phase noise (subject to the tuning bandwidth, modulation sensitivity range and frequency)
- ④ Fully tested, monotonic tuning characteristics

The four connections for a VCO are:

1. **The Vcc** (the supply voltage, can be 3V, 5V, 8V, 12V or more depending on model and output power)
2. **The RF output**: this will give an RF signal out, which can be changed in frequency with the:
3. **Vt port**, the tuning voltage port , which will change the VCO frequency with changing voltage. The input capacitance is simply that of the Varactor diode in the VCO, typically from a few pF to <50pF.
4. **Ground**. Due to the recommended solder-reflow mounting, the ground will be taken care of through the base plate. If manual assembly is used, care must be taken to add solder to the total non-masked footprint.

Specification considerations:

The main specifications that must be considered for most applications are:

	Some trade-off's in specifications may be needed.
Package	MS (offset connection), SM (central connection) 0.5" square section is the most common.
Output power (V_{cc})	Depends on the other specifications, lower for broader band & lower voltages, typically
DC power	For VCO's below 3 GHz, can be 3 to 15 Volts typically, with 10V or more Vcc.
Tuning Voltage (V_t)	0V often gives problems due to low varactor Q (0.5 to 5V or more preferred). Modulation tuning sensitivity MHz/V is usually a key parameter for phase locking.
Phase noise	$1/f$ noise reduction with deviation from the F_{center} . Usually expressed in dBc/Hz at some offset frequency from the F_{center} . This also varies with the V_{tune} ; V_{cc} ; operating frequency and bandwidth.

Also consider Harmonic level, Spurious, Pushing(MHz/V), Pulling (due to mismatch), Output VSWR