

Module: 3 Connectors, 22.86 mm x 22.86 mm x 13.97 mm

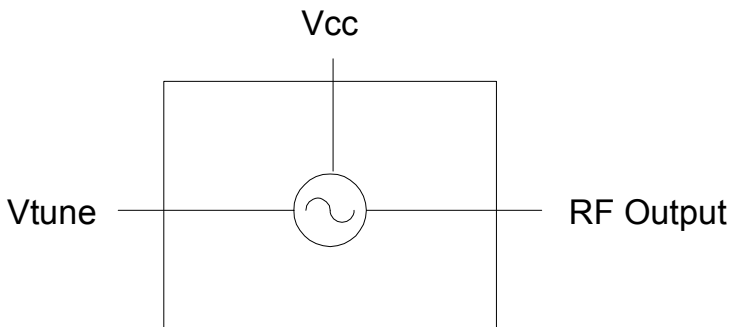


## Features

- 25 MHz to 50 MHz VCO
- 15V Operation
- +12.5 dBm Typical Output Power
- -115 dBc/Hz @ 10 kHz
- -135 dBc/Hz @ 100 kHz
- -160 dBc/Hz @ 1000 kHz

## Applications

- Instrumentation
- Aerospace
- Test Equipment
- Plug and Play



Functional Block Diagram

## Product Description

RFMD's VCO-102S/STC is a hybrid assembled voltage controlled oscillator integrated into a connectorized module. The VCO-102 features an integrated resonator and tuning varactors. The performance over temperature is excellent.

## Ordering Information

VCO-102S/STC      High Reliability Military and Space VCO

## Optimum Technology Matching® Applied

- |                                      |                                      |  |                                    |
|--------------------------------------|--------------------------------------|--|------------------------------------|
| <input type="checkbox"/> GaAs HBT    | <input type="checkbox"/> SiGe BiCMOS | <input type="checkbox"/> GaAs pHEMT        | <input type="checkbox"/> GaN HEMT  |
| <input type="checkbox"/> GaAs MESFET | <input type="checkbox"/> Si BiCMOS   | <input type="checkbox"/> Si CMOS           | <input type="checkbox"/> BiFET HBT |
| <input type="checkbox"/> InGaP HBT   | <input type="checkbox"/> SiGe HBT    | <input checked="" type="checkbox"/> Si BJT | <input type="checkbox"/> LDMOS     |

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## Absolute Maximum Ratings

| Parameter                              | Rating      | Unit |
|--|-------------|------|
| Supply Voltage ( $V_{CC}$ )            | 17          | V    |
| $V_{TUNE}$                             | 0 to 22     | V    |
| Storage Temperature                    | -65 to +150 | °C   |
| Operating Temperature                  | -55 to +100 | °C   |
| ESD JESD22-A114 Human Body Model (HBM) |             | V    |

**Caution!** ESD sensitive device.

Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability. Specified typical performance or functional operation of the device under Absolute Maximum Rating conditions is not implied.

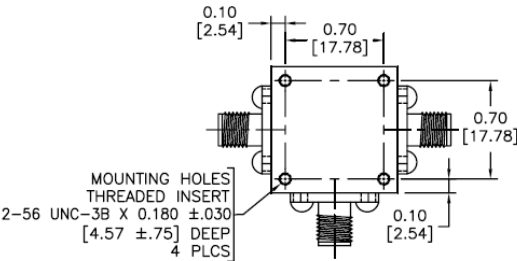
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| Parameter                 | Specification |       |       | Unit               | Condition              |
|---------------------------|---------------|-------|-------|--------------------|------------------------|
|                           | Min.          | Typ.  | Max.  |                    |                        |
| Frequency                 |               |       |       |                    |                        |
| Frequency Range           | 25            |       | 50    | MHz                | 100% Production Tested |
| Tuning Voltage            |               |       |       |                    |                        |
| 25MHz                     | 0             | 1.2   |       | V <sub>DC</sub>    | 100% Production Tested |
| 50MHz                     |               | 17    | 20    | V <sub>DC</sub>    | 100% Production Tested |
| Tuning Sensitivity        |               |       |       |                    |                        |
| 25MHz                     | 1.0           | 1.3   | 1.7   | MHz/V              | 100% Production Tested |
| 31.25MHz                  | 1.6           | 2.1   | 2.7   | MHz/V              | 100% Production Tested |
| 37.5MHz                   | 1.8           | 2.4   | 2.9   | MHz/V              | 100% Production Tested |
| 43.75MHz                  | 1.2           | 1.6   | 2.0   | MHz/V              | 100% Production Tested |
| 50MHz                     | 0.6           | 0.8   | 1.0   | MHz/V              | 100% Production Tested |
| Output Power              | 10.0          | 12.5  | 16.0  | dBm                | 100% Production Tested |
| Output Phase Noise        |               |       |       |                    |                        |
| 10kHz                     |               | -115  | -109  | dBc/Hz             | 100% Production Tested |
| 100kHz                    |               | -135  | -129  | dBc/Hz             | 100% Production Tested |
| 1000kHz                   |               | -160  | -154  | dBc/Hz             | 100% Production Tested |
| Power Supply              | 14.75         | 15.00 | 15.25 | V                  | 100% Production Tested |
| Supply Current            |               | 12.5  | 15.0  | mA                 | 100% Production Tested |
| Harmonic Suppression      |               |       |       |                    |                        |
| 2nd Harmonic              |               | -15   | -10   | dBc                | 100% Production Tested |
| 3rd Harmonic              |               | -12   | -10   | dBc                | 100% Production Tested |
| Spurious (Non-Harmonic)   |               |       | -80   | dBc                |                        |
| Frequency Pushing         |               | 0.05  | 0.10  | MHz <sub>p-p</sub> | 14.75V to 15.25V       |
| Frequency Pulling 12dB RL |               | 0.50  | 1.25  | MHz <sub>p-p</sub> |                        |
| Output Impedance          |               | 50    |       | Ω                  |                        |
| 3dB Modulation Bandwidth  | 80            | 125   |       | kHz                | Z <sub>G</sub> = 50Ω   |
| Tune Port Impedance (DC)  |               | 50    |       | kΩ                 |                        |

| Pin | Function  | Description     |
|-----|-----------|-----------------|
| 1   | VTUNE     | Tuning Voltage. |
| 2   | VCC       | Supply Voltage. |
| 3   | RF OUTPUT | VCO RF Output.  |

Package Drawing



| PINOUT | FUNCTION |                |         |               |
|--------|----------|----------------|---------|---------------|
|        | PIN      | VCO            | MIXER   | POWER DIVIDER |
|        | 1        | TUNING VOLTAGE | RF PORT | OUT 2         |
|        | 2        | SUPPLY VOLTAGE | X PORT  | IN            |
|        | 3        | RF OUTPUT      | LO PORT | OUT 1         |

