

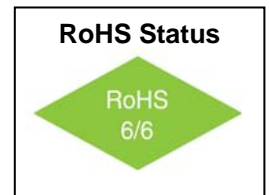
VFOV400 Series

OCXO - Ultra Miniature, Ultra Low Power

HCMOS / SINEWAVE

Features

- 5MHz to 250MHz Frequency Range
 - Industry's smallest OCXO
 - Fastest Warm-up (approximately 30sec)
 - < 120mW power consumption
- Sine Wave or HCMOS output
- Multiple package options
- Vibration resistant construction



Applications

- PLL reference for Telecommunication Systems
- Portable (battery operated) devices
- Guidance Systems
- Instrumentation / Test and Measurement

Replaces Valpey Fisher Part Number(s): VFT14A, VFT14AS, VFT8S

Electrical Specifications

| Parameter | Symbol | Condition | Min | Typ | Max | Unit | Note |
|-----------------------------|--------------|--|-------------|-------------------------------------|-------------------|------------|---|
| Frequency Range | F | | 5 | | 250 | MHz | VFOV404 VFOV405 |
| Frequency Stability | $\Delta F/F$ | Vs. Operating Temp. E: -30°C to +70°C | | ± 50 | | ppb | STD option shown. See "How to Order" Chart below |
| | | Vs. Supply Voltage | | ± 2 | | ppb | Ref. Vcc typ. |
| | | Vs. Aging / Day Vs. Aging / Year | | | 0.5 ± 0.05 | ppb ppm | after 30 days |
| Operating Temperature Range | T | | -30° | | +70° | °C | STD option shown. See "How to Order" Chart below |
| Allan Variance | | 1s | | 20e-12 | | | |
| SSB Phase Noise | | 1Hz 10Hz 100Hz 1KHz 10KHz | | -90 -125 -145 -155 -165 | | dBc/Hz | For 10MHz Oscillator (For 100MHz see noise plot) |
| Retrace | | After 30 min. | | | ± 20 | ppb | |
| G-sensitivity | | worst direction | | | ± 1 | ppb/g | |
| Supply Voltage | Vcc | | 4.75 3.1 | 5.0 3.3 | 5.25 3.5 | V | |
| Power Consumption | P | steady state, 25°C start-up | | 0.12 0.7 | 0.13 1.2 | W | |
| Warm up time | τ | to 0.1ppm accuracy | 15 | 30 | 60 | Sec. | |

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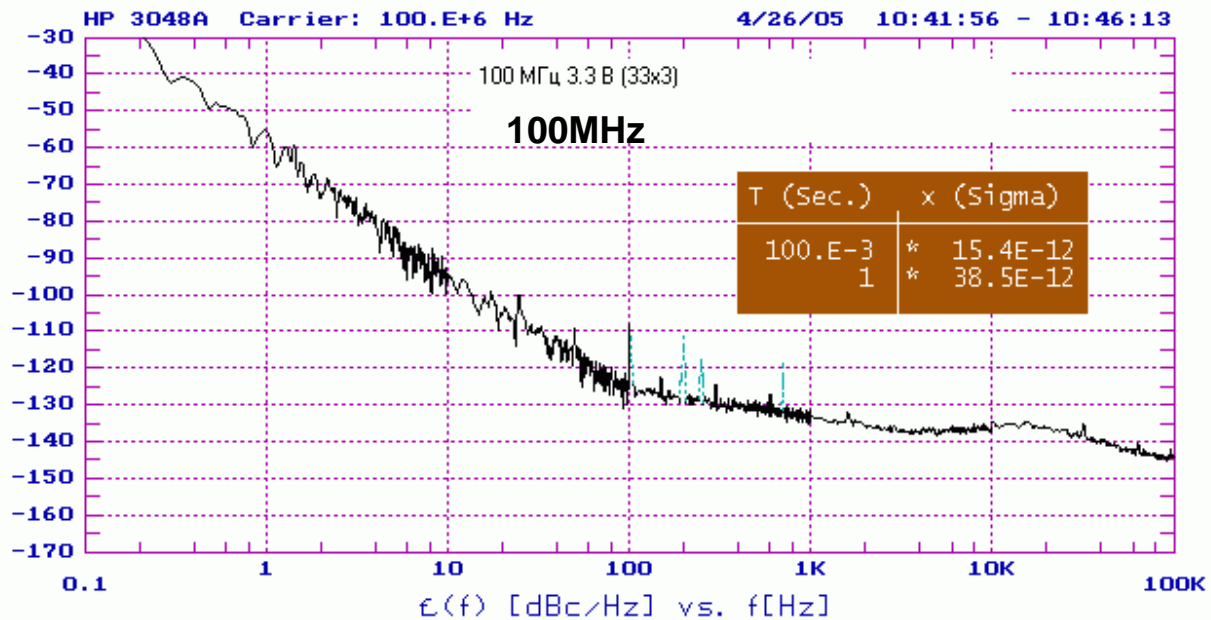
HCMOS / SINEWAVE



Electrical Specifications

| Parameter | Symbol | Condition | Min | Typ | Max | Unit | Note |
|-----------------------------------|------------------|--|---------------|------------|--------------|-----------|--|
| HCMOS / TTL Output Levels | | HCMOS/TTL | 10KOhm / 15pF | | | | Order Code H |
| | V _H | V _{CC} = 5 V _{CC} =3.3V | 3.9 2.4 | | | V | |
| | V _L | | | | 0.4 | V | |
| Rise / Fall time | | At 10MHz | | | 10 | ns | |
| Duty Cycle | | | 45 | | 55 | % | |
| Sine-Wave Output (VFOV404 only) | | V _{CC} =5 | +6 | +8 | +10 | dBm | Order Code S |
| | R _L | | | 50 | | Ω | |
| Harmonics | | | | | -25 | dBc | |
| Sub-Harmonics (VFOV404 only) | | Frequency >30MHz | | | -40 | dBc | **Multiplied fundamental |
| Control Voltage | V _c | V _{CC} = 5 V _{CC} =3.3V | 0 0 | | 4.3 2.8 | V | |
| Pull Range | | from nominal F | ±0.5 | ±1 | | ppm | At 100MHz |
| Deviation slope | | Monotonic, Positive | 0.4 0.25 | | | ppm/ V | V _{CC} = 3.3V V _{CC} = 5V |
| Reference output | V _{ref} | V _{CC} = 5 V _{CC} =3.3V | 4.19 2.73 | 4.3 2.8 | 4.41 2.87 | V | |

** High frequency fundamental (up to 120MHz) available without sub-harmonics. Please refer to VFOV500



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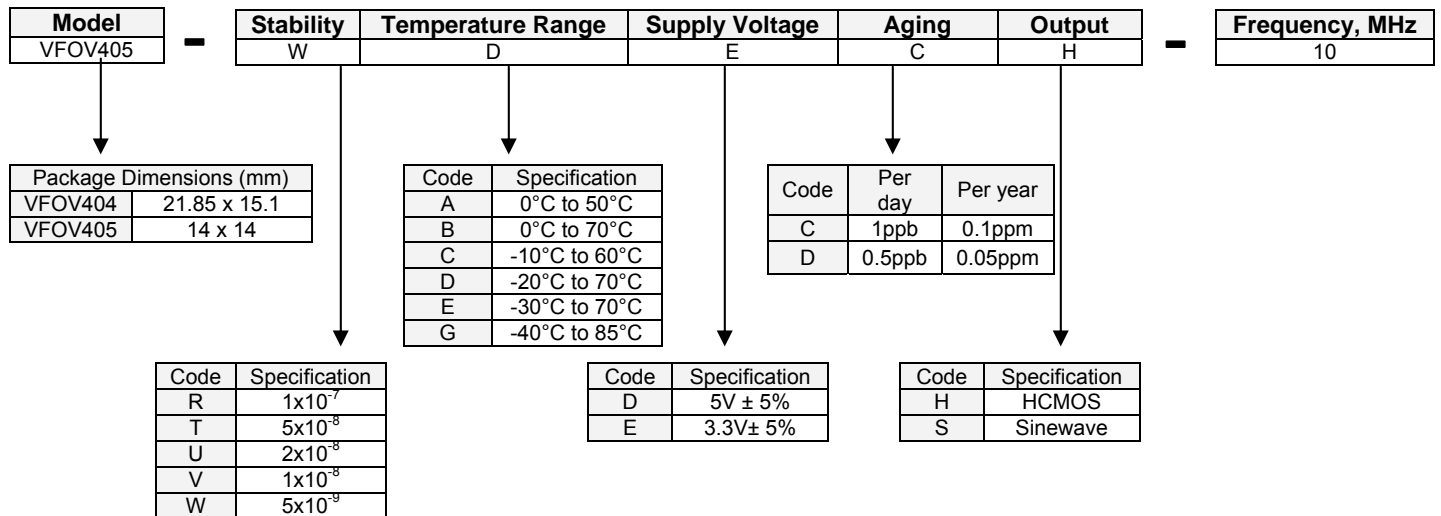
Absolute Maximum Ratings

| Parameter | Symbol | Condition | Min | Typ | Max | Unit | Note |
|---------------------------|-----------------|-----------|------|-----|----------------------|------|------|
| Supply Break Down Voltage | V _{cc} | | -0.5 | | V _{cc} +20% | V | |
| Control Voltage | V _c | | -1 | | 9 | V | |

Environmental and Mechanical

| Parameter | Specification |
|----------------------|---|
| Storage Temperature | -60°C to +90°C |
| Humidity | Non-condensing, 95% |
| Mechanical Shock | Per MIL-STD-202, 30g, half sine, 11ms |
| Vibration | Per MIL-STD-202, 10g swept Sine to 2000Hz |
| Soldering Conditions | 260°C for 10s |

How to Order



Available Frequency Stabilities over Operating Temperature Ranges

| Order Code | Temperature Range | Stability | | | | |
|------------|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | | 1x10 ⁻⁷ | 5x10 ⁻⁸ | 2x10 ⁻⁸ | 1x10 ⁻⁸ | 5x10 ⁻⁹ |
| A | 0°C to 50°C | * | * | * | * | ◇ |
| B | 0°C to 70°C | * | * | * | ◇ | |
| C | -10°C to 60°C | * | * | * | * | ◇ |
| D | -20°C to 70°C | * | * | * | | |
| E | -30°C to 70°C | * | * | * | | |
| G | -40°C to 85°C | * | * | ◇ | | |

◇ Only available below 30Mhz



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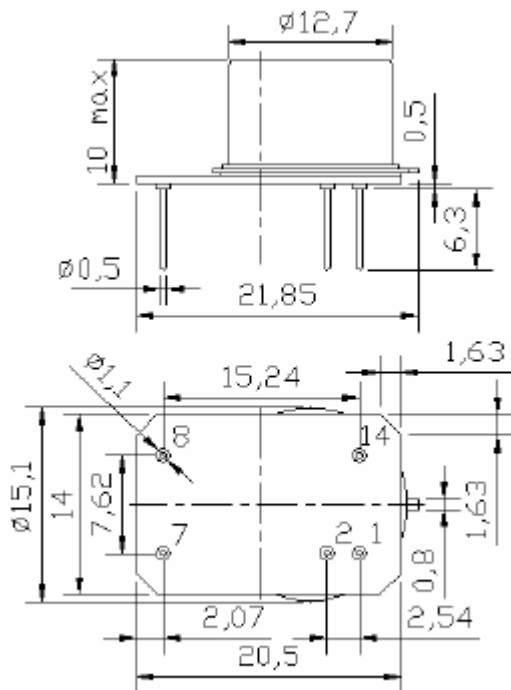
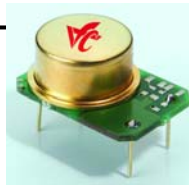
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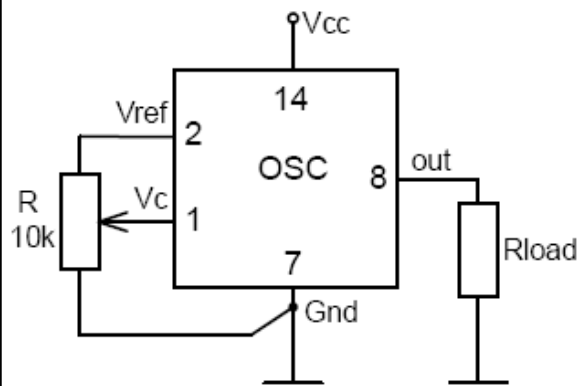


Package Options

VFOV404
CMOS or Sine

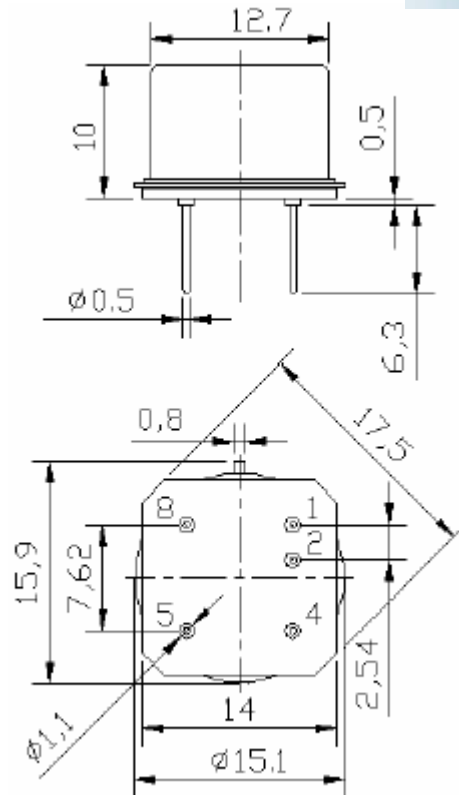


All tolerances 0.1mm (0.004")

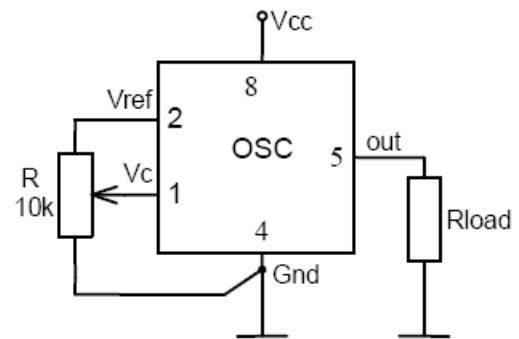


| Pin | Connection |
|-----|------------|
| 1 | Vcontrol |
| 2 | Vref. |
| 7 | GND |
| 8 | Output |
| 14 | Vcc |

VFOV405
CMOS only



All tolerances 0.1mm (0.004")



| Pin | Connection |
|-----|------------|
| 1 | Vcontrol |
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| 5 | Output |
| 8 | Vcc |