



MV197

Oven Controlled Crystal Oscillator
8.192-20 MHz

Revised 11/12/18

Your dedicated source for crystal oscillators and filters.

Features

- Package Height from 10 mm to 16 mm
- High Stability vs. Temperature: up to $\pm 3 \times 10^{-10}$
- Long Term Stability: up to $\pm 2 \times 10^{-8}$ /year
- Fast Warm-Up (1 min)
- HCMOS & Sinewave Output
- 12V & +5V

Applications

- SatCom
- Test equipment
- Network clock
- Base station

Specifications

| Temperature Range | Temperature Stability Availability | | Comments |
|-------------------|------------------------------------|---------------------------|--|
| | High | Higher | |
| 0 to +55° C | $< \pm 5 \times 10^{-9}$ | $< \pm 3 \times 10^{-10}$ | |
| -10 to +60° C | $< \pm 5 \times 10^{-9}$ | $< \pm 5 \times 10^{-10}$ | Contact factory for $< \pm 3 \times 10^{-10}$ |
| -20 to +70° C | $< \pm 5 \times 10^{-9}$ | $< \pm 1 \times 10^{-9*}$ | $< \pm 7.5$ & 5×10^{-10} available in B10 package |
| -40 to +70° C | $< \pm 5 \times 10^{-9}$ | $< \pm 1 \times 10^{-9*}$ | $< \pm 7.5$ & 5×10^{-10} available in B10 package |
| -40 to +85° C | $< \pm 5 \times 10^{-9}$ | $< \pm 1 \times 10^{-9*}$ | $< \pm 7.5$ & 5×10^{-10} available in B10 package |

* Contact factory and see ordering designations at the end of this data sheet.

Temperature ranges from -60° C to +85° C available.

| Standard Frequencies | Long Term Stability (Yearly Aging) Availability | | Comments |
|----------------------|---|---------------------------|--|
| | High | Higher | |
| 10.0 MHz | $< \pm 2 \times 10^{-7}$ | $< \pm 2 \times 10^{-8*}$ | |
| 12.8 MHz | $< \pm 2 \times 10^{-7}$ | $< \pm 3 \times 10^{-8}$ | Contact factory for $< \pm 2 \times 10^{-8}$ |
| 13.0 MHz | $< \pm 2 \times 10^{-7}$ | $< \pm 5 \times 10^{-8}$ | Contact factory for $< \pm 3 \times 10^{-8}$ |
| 16.384 MHz | $< \pm 2 \times 10^{-7}$ | $< \pm 1 \times 10^{-7}$ | Contact factory for $< \pm 5 \times 10^{-8}$ |
| 20 MHz | $< \pm 2 \times 10^{-7}$ | C | Contact factory for $< \pm 1 \times 10^{-7}$ |

* -only for B16 package

Contact factory for non-standard long term stability performance and see ordering designations at the end of this data sheet.

| Specification | Short Term, Pulling & Pushing Stability | | Comments |
|--|---|-----------------------|-------------------------|
| | Standard | Option | |
| Short term stability per 1 sec. | $< 5 \times 10^{-12}$ | $< 1 \times 10^{-12}$ | Allan deviation, 10 MHz |
| Stability vs. Load ($\pm 5\%$) | $< \pm 5 \times 10^{-10}$ | - | |
| Stability vs. power supply ($\pm 5\%$) | $< \pm 5 \times 10^{-10}$ | - | |
| Warm-up time to w/ in $< \pm 2 \times 10^{-7}$ | <3 minutes | <1 minute | @25° C |

Contact factory for 1 minute warm-up.

Specifications-Continued

Phase Noise, 10 MHz, 12V, Sinewave (dBc/Hz)

| Frequency Offset | - | LN | UNLF 12V Only | UNL 12V Only | IUNL 12V Only | EUNL 12V Only |
|------------------|--------|--------|------------------|-----------------|------------------|------------------|
| 1 Hz | < -95 | < -100 | < -100 | < -103 | < -110 | < -117 |
| 10 Hz | < -125 | < -130 | < -130 | < -133 | < -138 | < -140 |
| 100 Hz | < -145 | < -153 | < -155 | < -155 | < -155 | < -155 |
| 1 kHz | < -150 | < -158 | < -160 | < -160 | < -160 | < -160 |
| 10 kHz | < -155 | < -160 | < -165 | < -161 | < -161 | < -161 |

See ordering designations at the end of this data sheet.

Output Parameters

| Output | HCMOS | Sinewave |
|----------------|--------------------------|-----------------------------------|
| Level | “0” “1” | 300 mV to 9±1 dBm (12V option) |
| Load | 10kOhms/30pF | 50 Ohms±5% |
| Rise/Fall Time | < 6 nS (3 nSec Optional) | - |
| Harmonics | - | >-30 dBc |

See ordering designations at the end of this data sheet.

Power Supply & Voltage Control Parameters

| Specification | 12V ±5% | 5V ±5% |
|---------------------------------|------------------------|------------------------|
| Steady state current @ 25° C | < 150 mA | < 400 mA |
| Peak warm-up current @ -40° C | < 400 mA | < 1000 mA |
| Frequency Adjust range (10 MHz) | >±4.0x10 ⁻⁷ | >±4.0x10 ⁻⁷ |
| Frequency Adjust Voltage (Uin) | 0 to +5V | 0 to +4.5V |
| Reference Voltage (Uref) | +5V | +4.5V |

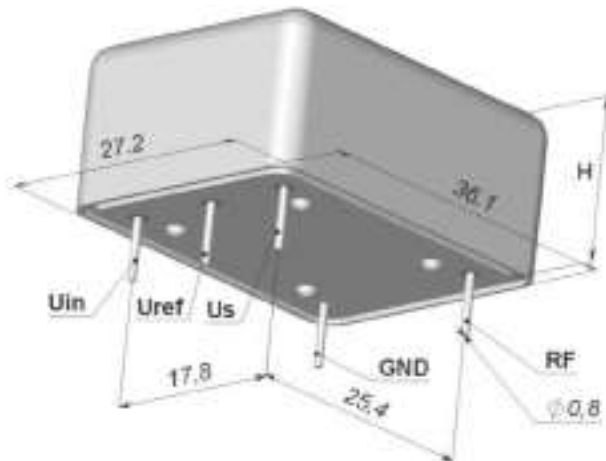
See ordering designations at the end of this data sheet.

Environmental Parameters

| Specification | Conditions |
|------------------------|---------------|
| Vibration Frequency | 10-200 Hz |
| Vibration Acceleration | 5 gs |
| Shock Acceleration | 75 gs |
| Shock Duration | 3±1 mS |
| Humidity | 98% |
| Storage Temperature | -55 to +85° C |
| RoHs | Option |

Contact factory for extended environmental conditions.

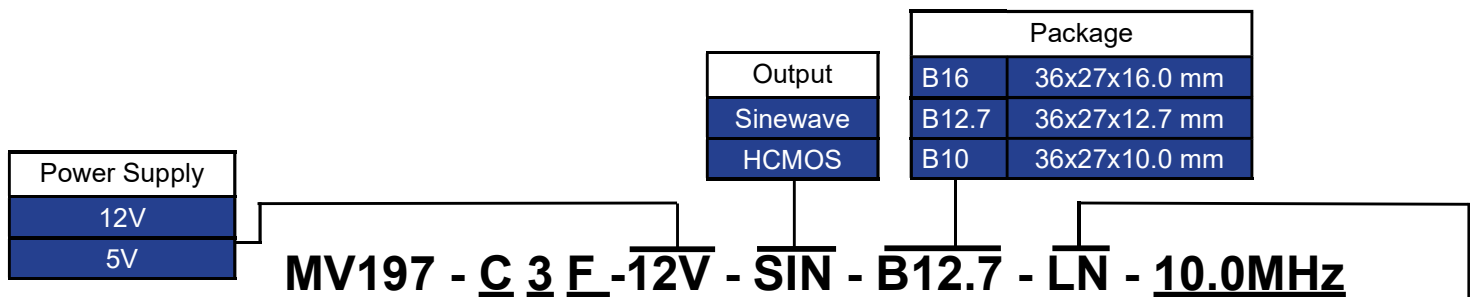
Outline Drawing



| Pin | Value |
|------|------------------------------|
| Ub | Power Supply |
| Uref | Reference Voltage |
| Us | Power Supply |
| RF | RF Out |
| GND | Ground |
| Uc | Frequency Adjustment Voltage |

For "H" definition please see package type

Ordering Guide



MV197 - C 3 E -12V - SIN - B12.7 - LN - 10.0MHz

| Availability of certain stability vs. operating temperature range. | | Standard Frequencies | | | | | | |
|--|---------------|------------------------|------------------------|------------------------|------------------------|---------------------------|-------------------------|-------------------------|
| | | $\pm 5 \times 10^{-9}$ | $\pm 3 \times 10^{-9}$ | $\pm 2 \times 10^{-9}$ | $\pm 1 \times 10^{-9}$ | $\pm 7.5 \times 10^{-10}$ | $\pm 5 \times 10^{-10}$ | $\pm 3 \times 10^{-10}$ |
| | | 5 | 3 | 2 | 1 | 075 | 05 | 03 |
| A | 0 to +55° C | A | A | A | A | A | A | A |
| B | -10 to +60° C | A | A | A | A | A | A | C |
| C | -20 to +70° C | A | A | A | A | A* | A* | N |
| D | -40 to +70° C | A | A | A | A | A* | A* | N |
| EX | -40 to +85° C | A | A | A | A | A* | C | N |

*For B10 package.
A=Available, C=Contact Factory, N=Not available

| Availability of certain aging values for certain frequencies. | | Standard Frequencies | | | | |
|---|------------------------------|----------------------|----------|----------|------------|----------|
| | | 10.0 MHz | 12.8 MHz | 13.0 MHz | 16.384 MHz | 20.0 MHz |
| H | $\pm 2 \times 10^{-7}$ /year | A | A | A | A | A |
| G | $\pm 1 \times 10^{-7}$ /year | A | A | A | A | A |
| F | $\pm 5 \times 10^{-8}$ /year | A | A | A | C | A |
| E | $\pm 3 \times 10^{-8}$ /year | A | A | C | N | N |
| D* | $\pm 2 \times 10^{-8}$ /year | A | C | C | N | N |

A=Available, C=Contact Factory, N=Not available
*=B16 package only.

Additional Notes:

- 1) Contact factory for ADEV.
- 2) Contact factory for daily aging values.
General rule: $x10^{-x}$ /year = $x10^{-(x+2)}$ /day.
- 2) Advise RoHs requirement at Order.
- 3) Contact factory for non-standard temperature ranges.

| Phase Noise (dBc/Hz) | - | LN | ULNF 12V | ULN 12V | IULN 12V | EULN 12V |
|----------------------|-------|-------|-------------|------------|-------------|-------------|
| 1 Hz | <-95 | <-100 | <-100 | <-103 | <-110 | <-110 |
| 10 Hz | <-125 | <-130 | <-130 | <-133 | <-138 | <-138 |
| 100 Hz | <-145 | <-153 | <-155 | <-155 | <-155 | <-155 |
| 1 kHz | <-150 | <-158 | <-160 | <-160 | <-160 | <-160 |
| 10 kHz | <-155 | <-160 | <-165 | <-161 | <-161 | <-161 |