

M3 Series

PIEZOELECTRIC DEVICE

VOLTAGE CONTROLLED OSCILLATOR

DESCRIPTION

The M3 series voltage control led oscillators (VCO) operate in the frequency range of 50 to 300 MHz. The M3 series VCOs use a single LiTaO_3 (lithium tantalate) piezoelectric crystal with a high electromechanical coupling coefficient and a SAW resonator that has an original configuration. The M3 series VCOs oscillate directly in the VHF band up to 300 MHz, and have a wide variable frequency width and high temperature stability.

FEATURES

- Direct oscillation at high frequencies: 50 to 300 MHz
- Wide variable frequency width: 800 ppm/V minimum (0.5 to 4.5 V)
- Superb temperature characteristics: Within +200 ppm (0 to 60°C)
- High-precision oscillation frequency, ready for use without adjustment
- High reliability due to hermetically sealed package
- High carrier noise ratio: -90 dB or less (12.5 kHz detuning, 8 kHz band)
- Compact size: Compatible with 1 DIP IC packages
- Frequency offset by built-in offset terminal
- Three types of standard frequencies available

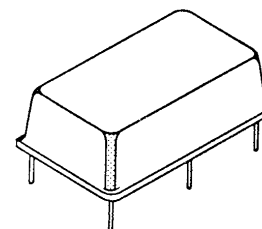
ABSOLUTE MAXIMUM RATINGS (See Note)

| Parameter | Symbol | Ratings | Unit |
|-----------------------------|--------|-------------------|------|
| Power Supply Voltage | VCC | -0.5 to 7.0 | V |
| Input Control Voltage | VIN2 | -0.5 to 7.0 | V |
| Operating Temperature | Ta | 0 to 60 | °C |
| Storage Temperature | TSTG | -40 to 85 | °C |
| Control Polarity | | Positive Polarity | |
| Oscillation Frequency Range | | 50 to 300 | MHz |

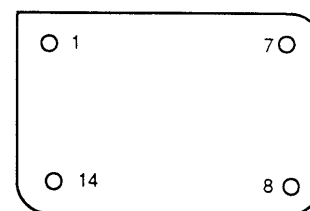
RECOMMENDED OPERATING CONDITIONS

| Parameter | Symbol | Ratings | Unit |
|-----------------------|--------|------------|------|
| Power Supply Voltage | VCC | 5.0 | V |
| Input Control Voltage | VIN2 | 0.5 to 4.5 | V |
| Operating Temperature | Ta | 0 to 60 | °C |

Note: Permanent device damage may occur if absolute maximum ratings are exceeded. Functional operation should be restricted to the conditions as detailed in the operation sections of this data sheet. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



Metal Case
DIP-14



Bottom View

| Terminal No. | Terminal Name | Description |
|--------------|---------------|--------------------------------|
| 1 | VIN1 | Offset Terminal |
| 7 | GND | Grounding Terminal |
| 8 | VOUT | Oscillation Output Terminal |
| 9 | VCC | Power Supply Terminal |
| 16 | VIN2 | Control Voltage Input Terminal |

This device contains circuitry to protect the inputs against damage due to high static voltages or electric fields. However, it is advised that normal precautions be taken to avoid application of any voltage higher than maximum rated voltages to this high impedance circuit.

M3 Series (D001)

STANDARD FREQUENCIES

| Frequency | Application | Part Number |
|------------|----------------------------|------------------|
| 74.25 MHz | Professional HDTV | M3DA-74M250-D001 |
| 97.2 MHz | Transmission Standard HDTV | M3DA-97M200-D001 |
| 115.52 MHz | Broad-band ISDN | M3DA-155M52-D001 |

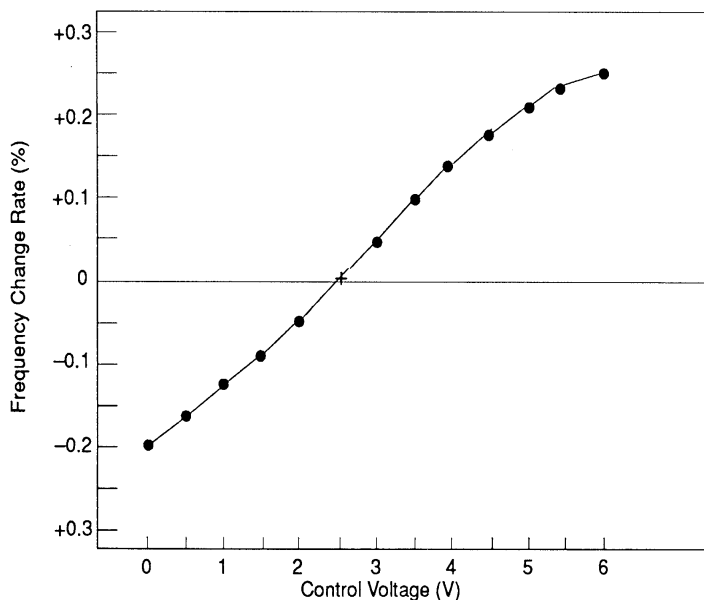
ELECTRICAL CHARACTERISTICS

| Item | Symbol | Condition | Ratings | | | Unit | Remarks |
|--|-----------|------------------------------|---------|---------|---------|-------|-------------------------------|
| | | | Minimum | Typical | Maximum | | |
| Oscillation Frequency Deviation | Af_0 | VIN2 = 2.5 V | -500 | — | +500 | ppm | f0 reference |
| Variable Width of Oscillation Frequency | (fH — fL) | VIN2 = 0.5 V VIN2 = 4.5 V | 800 | — | — | ppm/V | |
| Temprature Stability of Oscillation Frequency | f (Ta) | VIN2 = 2.5 V | -200 | — | +200 | ppm | 25C reference, Ta = 0 to 60 C |
| Output Level | POUT | VIN2 = 2.5 V | 0 | 5 | 7 | dBm | 50 R termination |
| Output Level Stability | P (VF) | VIN2 = 0.5 V VIN2 = 4.5 V | -2 | — | +2 | dB | VIN2 = 2.5 V reference |
| Output Level Temperature Stability | P (Ta) | VIN2 = 2.5 V | -2 | — | +2 | dB | 25C reference, Ta = 0 to 60C |
| Current Consumption | ICC | — | — | — | 30 | mA | |
| Oscillation Frequency Power Supply Voltage Fluctuation | bf (VcCC) | VIN2 = 2.5 V | —50 | | +50 | ppm | VCC = % v reference, 5% |

STANDARD CHARACTERISTICS

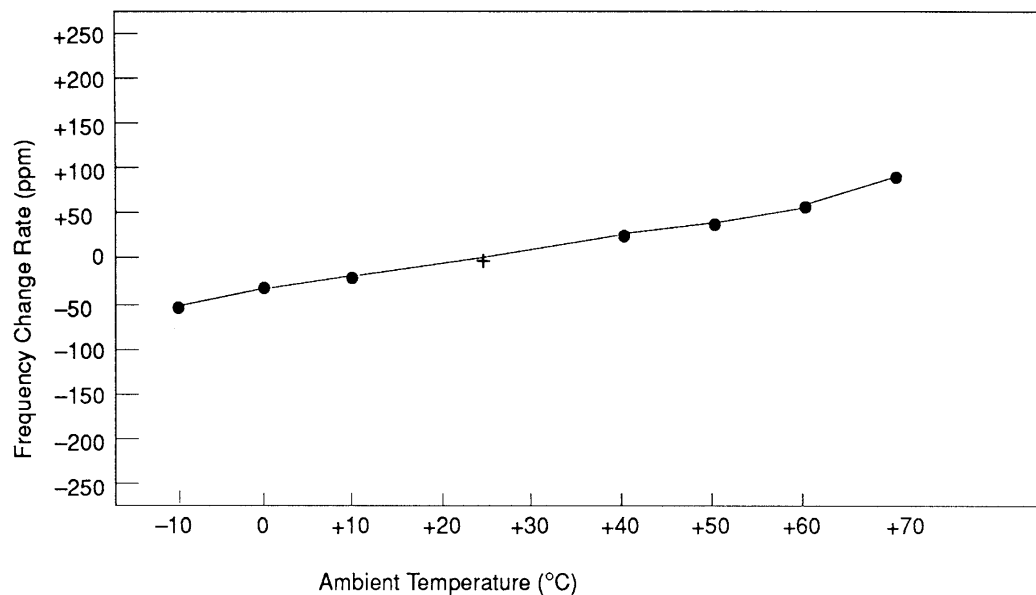
The examples below show characteristics of the M3 VCO devices at 155.52 MHz.

Example 1. Frequency Variable Characteristics

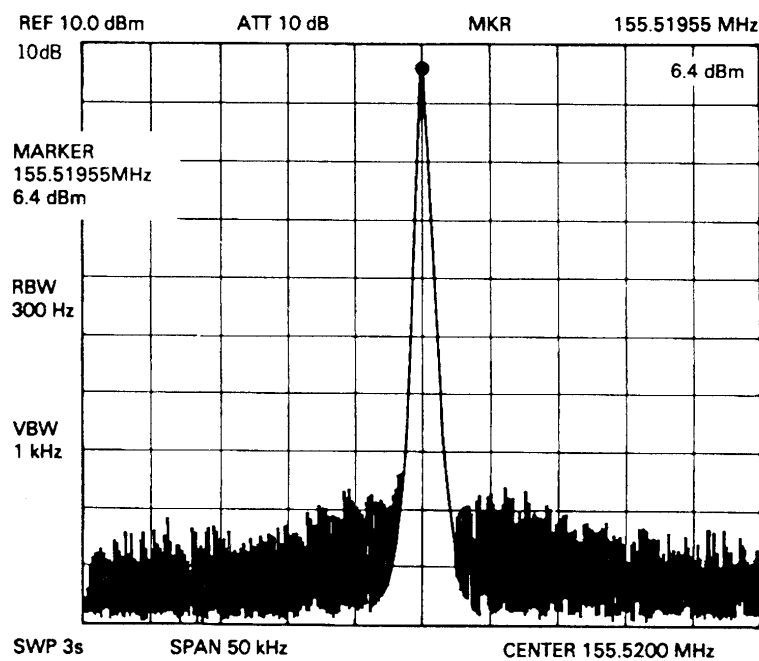


STANDARD CHARACTERISTICS (Continued)

Example 2. Temperature Characteristics



Example 3. Oscillation Spectrum



PART NUMBERING SYSTEM

(Part Number Example)

M3DA - - D

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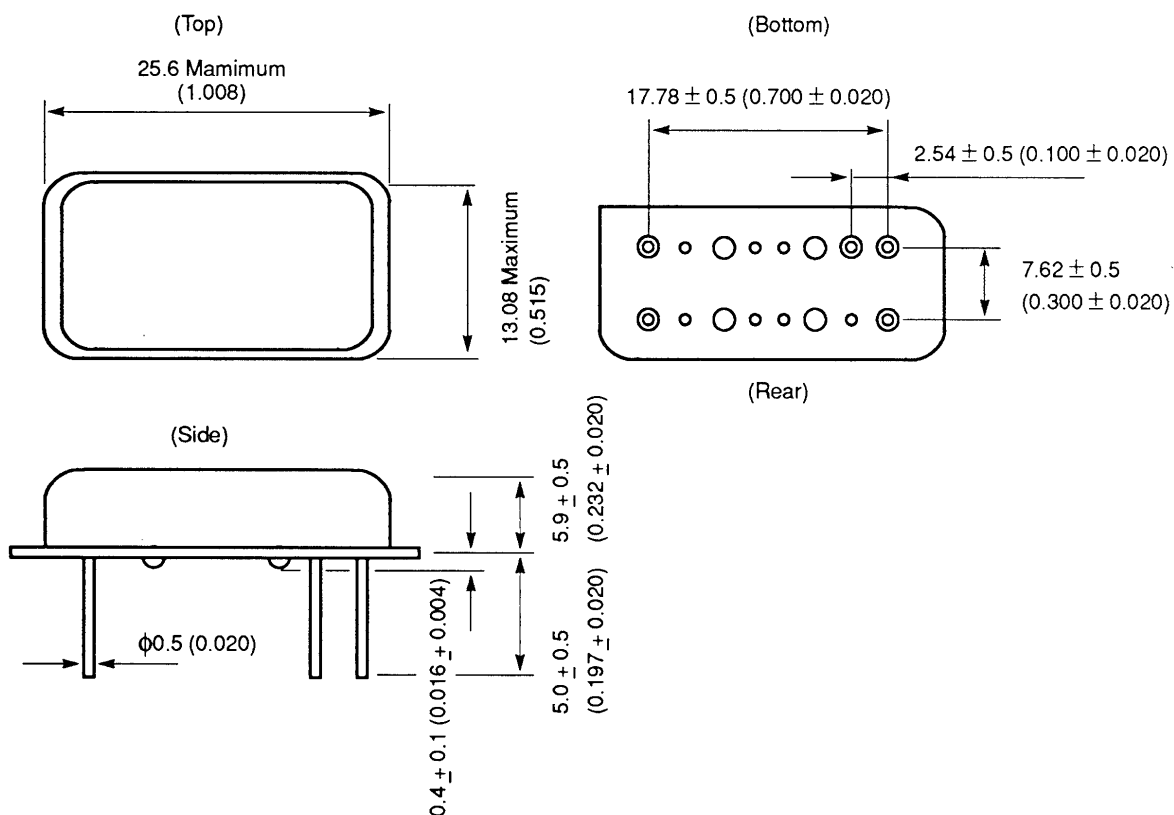
②

- ① Frequency Designation: Designate the nominal frequency in six alphanumeric characters.
M indicates the decimal point in MHz.

| Frequency | Destination |
|------------|-------------|
| 74.25 MHz | 74M250 |
| 97.2 MHz | 97M200 |
| 115.52 MHz | 115M52 |

- ② Serial Number (of the Series): Standard: 100
Non-Standard products: 001 to 099

PACKAGE DIMENSIONS



Units: mm (in.)