

# Surface Mount Clock Oscillator

FRE TECHNOLOGIES

Series **GS**

- Extra Small Packaging Style
- Ultra Low Jitter
- Low Phase Noise
- Immediate Delivery



Part Numbering Example: **GSV133VM- XX.XXXXM**

| GS                   | 1                                      | 33V                                 | M                                                                                                               | XX.XXXXM                                     |                |           |
|----------------------|----------------------------------------|-------------------------------------|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------------|-----------|
| SERIES               | OUTPUT                                 | PACKAGE STYLE                       | VOLTAGE                                                                                                         | OPERATING TEMP.                              | STABILITY      | FREQUENCY |
| Blank=HCMos<br>T=TTL | V1 = 5X7<br>V3 = 2.5X3.2<br>V4 = 3.2X5 | 18V= 1.8V<br>33V= 3.3V<br>50V= 5.0V | F= -40 to 85°C<br>H= -55 to 105 °C<br>M=-55 to 125°C<br>(MIL-STD- 883B)<br>Q= -55 to 125°C<br>(MIL-PRF- 55310D) | Blank= ±50 ppm<br>2 = ±25 ppm<br>3 = ±20 ppm | 1.0MHz ~160MHz |           |

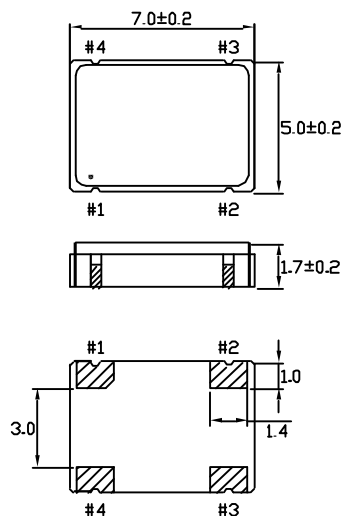
\* NOTE: @85/105/125 C, Burn-In,MIL-STD- 883B Method1015,Operating 160hours

## Specifications:

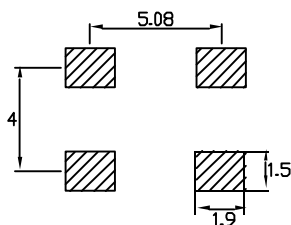
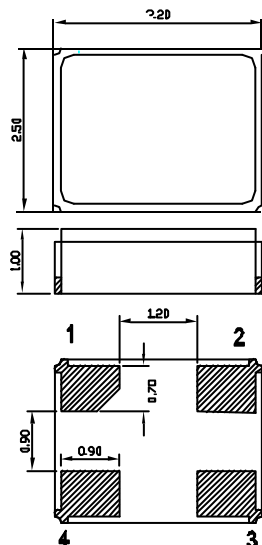
| Description                                                       | Min        | Typ | Max                | Unit       |
|-------------------------------------------------------------------|------------|-----|--------------------|------------|
| <b>Frequency Range:</b><br>Programmable to Any Discrete Frequency | 1.00       |     | 160.000            | MHz        |
| <b>Available Stability Options:</b>                               | -50<br>-25 |     | 50<br>25           | ppm<br>ppm |
| <b>Supply Voltage Options:</b><br>(1.5–133 MHz)                   | 1.62       | 1.8 | 3.3<br>2.5<br>1.98 | V          |
| <b>Operating Temperature Range Options:</b>                       |            |     |                    |            |
| <b>Storage Temperature:</b>                                       | -55        |     | +125               | °C         |
| <b>Aging (PPM/Year)</b><br>Ta=25C, Vdd=3.3V/2.5V                  |            |     | ±3                 |            |
| <b>Output Level:</b> HCMOS/TTL                                    |            |     |                    |            |

## Operating Conditions:

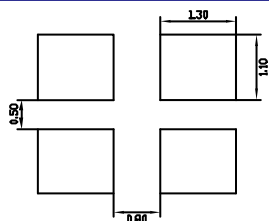
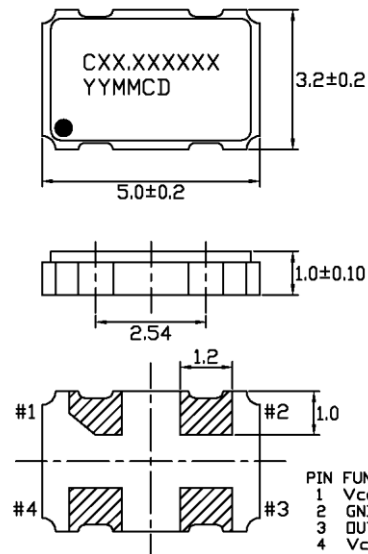
| Description                                                                                          | Min | Max      | Unit     |
|------------------------------------------------------------------------------------------------------|-----|----------|----------|
| Vdd Rise Time:                                                                                       | 100 |          | α S      |
| HCMOS Max Capacitive Load on outputs for CMOS levels<br>Frequency: < 40 MHz<br>Frequency: 40–133 MHz |     | 25<br>15 | pF<br>pF |

**Style 1 5x7 Ceramic SMD**

**PIN FUNCTION**  
 1 CONTROL  
 2 GND  
 3 OUTPUT  
 4 Vdd

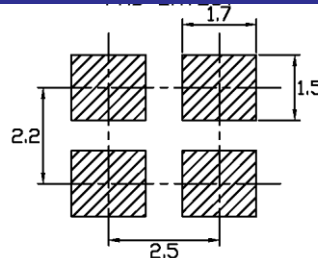
**Recommended Solder Pad Layout****Style 3 3.2x2.5 Ceramic SMD**

**PIN FUNCTION**  
 1 CONTROL  
 2 GND  
 3 OUTPUT  
 4 Vdd

**Recommended Solder Pad Layout****Style 4 5x3.2 Ceramic SMD**

**PIN FUNCTION**  
 1 CONTROL  
 2 GND  
 3 OUTPUT  
 4 Vdd

**PIN FUNCTION**  
 1 Vcont  
 2 GND  
 3 OUT  
 4 Vcc

**Recommended Solder Pad Layout**

## Surface Mount Clock Oscillator

## Electrical Characteristics

| Description                                                                                             | TEST CONDITIONS                                           | Min                  | Typ | Max                | Unit     |
|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|----------------------|-----|--------------------|----------|
| <b>Input Characteristics (Pin 1):</b><br>V <sub>IL</sub> , Low-Level Input Voltage<br>TO DISABLE OUTPUT |                                                           |                      |     | 0.2V <sub>dd</sub> | V        |
| V <sub>IH</sub> , High-Level Input Voltage<br>TO ENABLE OUTPUT OR open                                  |                                                           | 0.7V <sub>dd</sub>   |     |                    |          |
| I <sub>IL</sub> , Input Low Current<br>I <sub>IH</sub> , Input High Current                             | V <sub>IN</sub> = 0V<br>V <sub>IN</sub> = V <sub>dd</sub> |                      |     | 80<br>10           | μA<br>μA |
| <b>Output Characteristics:</b><br>V <sub>OL</sub> , Low-Level Output Voltage                            | 8 mA I <sub>OL</sub>                                      |                      |     | 0.4                | V        |
| V <sub>OHCMOS</sub> ,<br>High-level HCMOS Voltage                                                       | -8 mA I <sub>OL</sub>                                     | V <sub>dd</sub> -0.4 |     |                    | V<br>V   |
| <b>Power Supply Current:<br/>(Loaded)</b>                                                               | 1.8V V <sub>dd</sub> , OUTPUT FREQ < 133 MHz              |                      |     | 15                 | mA       |
| <b>Tri-State Internal Pull-up:</b>                                                                      | 1.8V V <sub>dd</sub>                                      | 50                   | 70  | 90                 | kΩ       |
| <b>Tri-State Leakage Current:</b>                                                                       | TS option, Pin 1 low                                      |                      |     | 20                 | μA       |
| <b>Power Down Current:</b>                                                                              |                                                           |                      |     | 10                 | μA       |

"Tristate internal pull up. Output active when high"

## Output Clock Switching Characteristics

| Description                                      | TEST CONDITIONS                              | Min | Typ | Max  | Unit     |
|--------------------------------------------------|----------------------------------------------|-----|-----|------|----------|
| <b>Duty Cycle:</b><br>HCMOS @ V <sub>dd</sub> /2 |                                              | 45  |     | 55   | %        |
| <b>Output Clock Rise/Fall:</b>                   | 0.2–0.8V <sub>dd</sub> , C <sub>L</sub> = 15 |     | 2   |      | nS<br>nS |
| <b>Start Up Time:</b>                            |                                              |     | 3   | 10   | mS       |
| <b>RMS Period Jitter:</b>                        |                                              |     | 3   | 5    | pS       |
| <b>RMS Integrated Jitter:</b>                    | 12kHz to 20MHz                               |     | 10  |      | pS       |
| <b>Phase Noise:</b>                              | @ 10kHz                                      |     |     | -120 | dBc/Hz   |

| Environmental And Mechanical |                                                  |
|------------------------------|--------------------------------------------------|
| Mechanical Shock             | Per MIL-STD-883 ,Method 2002 ,Cond.B             |
| Thermal Shock                | Per MIL-STD-883 ,Method 1011 ,Cond.A             |
| Vibration                    | Per MIL-STD-883 ,Method 2007 ,Cond.A             |
| Seal                         | Per MIL-STD-883, Method 1014,<br>Condition B & C |
| Solderability                | Per MIL-STD-883 ,Method 2003 ,Cond.A             |