

## Crystal Clock Oscillators

SPXO

±8 to ±15 ppm

4 to 55 MHz

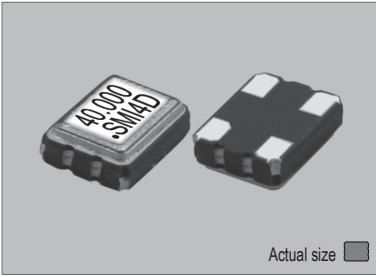
3.2x2.5 mm

CMOS

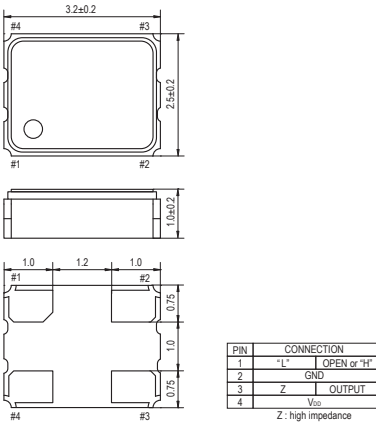
**32SMOHG** (+1.8V, +2.5V, +3.0V or +3.3V HIGH STABILITY FIXED MODELS) 3.2x2.5 mm

STANDARD SMD CLOCK OSCILLATORS

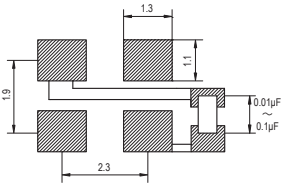
## 32SMOHG

Actual size  
0.025 gm (wt.)

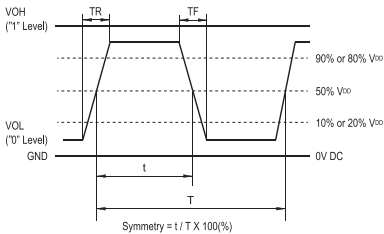
## 32SMOHG



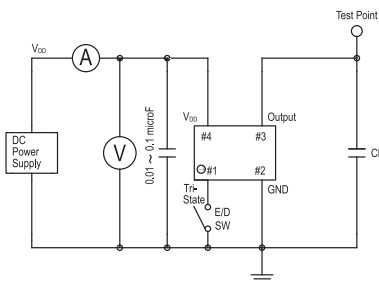
## SOLDERING PATTERN



## OUTPUT WAVEFORM



## TEST CIRCUIT



CL: including fixture and probe capacitance.

## STANDARD SPECIFICATIONS

● HIGH STABILITY CMOS OUTPUT  
● PACKAGE SIZE 3.2x2.5 mm

| Item                                                         |                                   | Specifications                                                                                                               |
|--------------------------------------------------------------|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| General part number                                          |                                   | 32SMOHG <sup>*1</sup>                                                                                                        |
| Frequency range                                              |                                   | 4.000 MHz to 55.000 MHz                                                                                                      |
| Standard frequencies (MHz)                                   |                                   | 5.000, 10.000, 12.000, 16.000, 20.000, 24.000, 32.000, 40.000, 44.000                                                        |
| Frequency stability <sup>*2</sup><br>(over all conditions)   |                                   | 32SMOHG(F): ±15 ppm over -40°C to +85°C<br>32SMOHG(G): ±10 ppm over -40°C to +85°C<br>32SMOHG(H): ±8 ppm over -40°C to +85°C |
| Operating Conditions                                         | Operating temperature             | -40°C to +85°C (Standard)                                                                                                    |
|                                                              | Supply voltage (V <sub>DD</sub> ) | +1.8V, +2.5V, +3.0V or +3.3V DC ± 10%                                                                                        |
|                                                              | Stand-by control voltage (Pin#1)  | V <sub>IH</sub> : 70% V <sub>DD</sub> min.<br>V <sub>IL</sub> : 30% V <sub>DD</sub> max. <sup>*3</sup>                       |
| Absolute Max. Ratings                                        | Supply voltage                    | -0.3V to +4.0V DC                                                                                                            |
|                                                              | Storage temperature               | -40°C to +85°C                                                                                                               |
| Input current<br>(Pin#1 = Open or V <sub>IH</sub> )          |                                   | 7 mA max. (no load)                                                                                                          |
| Stand-by current <sup>*3</sup>                               |                                   | 10 µA max. (Pin#1 = V <sub>IL</sub> )                                                                                        |
| Output<br>(-40°C to +85°C)                                   | Symmetry                          | 45% to 55% at 1/2 V <sub>DD</sub> level                                                                                      |
|                                                              | Rise and fall times               | 5 ns max. (10% V <sub>DD</sub> to 90% V <sub>DD</sub> level)                                                                 |
|                                                              | "0" Level                         | V <sub>OL</sub> : 10% V <sub>DD</sub> max.                                                                                   |
|                                                              | "1" Level                         | V <sub>OH</sub> : 90% V <sub>DD</sub> min.                                                                                   |
| Load                                                         |                                   | 15 pF max. (CMOS)                                                                                                            |
| Disable delay time                                           |                                   | 100 ns max.                                                                                                                  |
| Enable delay time                                            |                                   | 10 ms max.                                                                                                                   |
| Start-up time                                                |                                   | 10 ms max.                                                                                                                   |
| SSB phase noise<br>(at V <sub>DD</sub> = +3.3V & 48.000 MHz) |                                   | -136 dBc / Hz, Typical at 1 kHz offset<br>-160 dBc / Hz, Typical at 1 MHz offset                                             |
| RMS jitter (12 kHz to 20.000 MHz band)                       |                                   | 168 fs, Typical (at V <sub>DD</sub> = +3.3V & 48.000 MHz)                                                                    |
| Reflow condition                                             |                                   | +250°C ±10°C for 10 seconds<br>+170°C ±10°C for 1 to 2 minutes (preheating)                                                  |

(\*) Final part number to be assigned with package type, input voltage, frequency stability, operating temperature and frequency.  
e.g. 32SMOHG(3.0VG) 44.000MHz

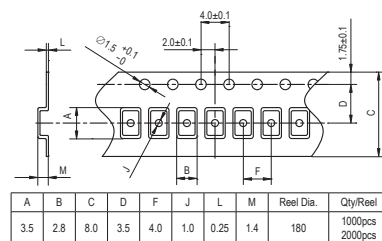
(\*) The frequency stability is inclusive of frequency tolerance (+25°C), temperature stability (-40°C to +85°C), input voltage change, load change, reflow frequency shift and aging (1st year at +25°C).

(\*) Internal crystal oscillation to be halted (Pin#1 = V<sub>IL</sub>)

## PACKAGE DATA

| Item             | Package | 32SMOHG                           |
|------------------|---------|-----------------------------------|
| Lid              |         | Metal                             |
| Base             |         | Ceramic                           |
| Sealing          |         | Seam                              |
| Terminal         |         | Tungsten (metalized)              |
| Terminal plating |         | Gold / Nickel (surface) / (under) |
| RoHS             |         | Compliant (Pb-free)               |

## TAPE SPECIFICATIONS



| A   | B   | C   | D   | F   | J   | L    | M   | Reel Dia. | Qty/Reel           |
|-----|-----|-----|-----|-----|-----|------|-----|-----------|--------------------|
| 3.5 | 2.8 | 8.0 | 3.5 | 4.0 | 1.0 | 0.25 | 1.4 | 180       | 1000pcs<br>2000pcs |

XTAL

CLK OSC

VCXO

TCXO

OCXO

MCF