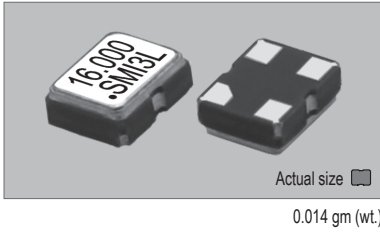
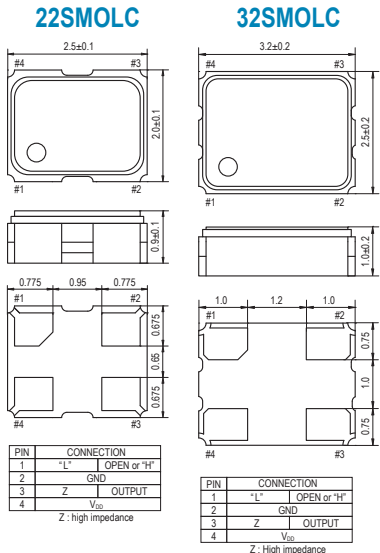
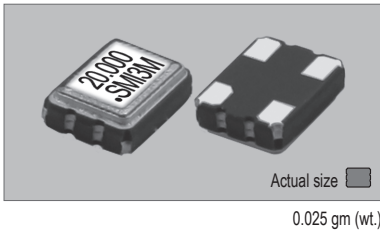


### 22SMOLC & 32SMOLC (+0.8V, +1.2V, +1.5V or +1.8V FIXED MODELS) 2.5x2.0 mm 3.2x2.5 mm STANDARD SMD CLOCK OSCILLATORS

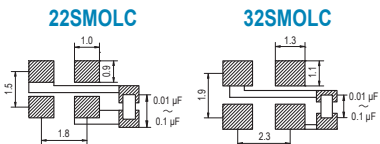
#### 22SMOLC



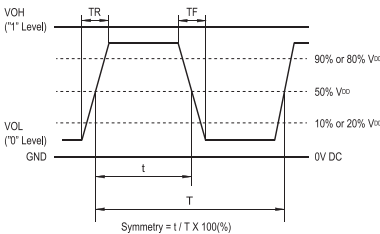
#### 32SMOLC



#### SOLDERING PATTERN



#### OUTPUT WAVEFORM



## STANDARD SPECIFICATIONS

- CMOS OUTPUT
- LOW VOLTAGE OPERATION
- LOW POWER CONSUMPTION
- PACKAGE SIZE 2.5x2.0 mm & 3.2x2.5 mm

| Item   |                                   | Specifications  |
|--|-----------------------------------|---|
| General part number  |                                   | 22SMOLC* <sup>1</sup> 32SMOLC* <sup>1</sup>   |
| Frequency range  |                                   | 1.250 MHz to 50.000 MHz   |
| Frequency stability (over all conditions)                  |                                   | 22SMOLC(A) & 32SMOLC(A) : ±100 ppm over -20°C to +70°C<br>22SMOLC(B) & 32SMOLC(B) : ±50 ppm over -20°C to +70°C<br>22SMOLC(C) & 32SMOLC(C) : ±30 ppm over -20°C to +70°C<br>22SMOLC(D) & 32SMOLC(D) : ±25 ppm over -20°C to +70°C<br>22SMOLC(E) & 32SMOLC(E) : ±20 ppm over -20°C to +70°C<br>22SMOLC(AW) & 32SMOLC(AW) : ±100 ppm over -40°C to +85°C<br>22SMOLC(BW) & 32SMOLC(BW) : ±50 ppm over -40°C to +85°C<br>22SMOLC(CW) & 32SMOLC(CW) : ±30 ppm over -40°C to +85°C<br>22SMOLC(DW) & 32SMOLC(DW) : ±25 ppm over -40°C to +85°C |
| Operating Conditions                                       | Operating temperature             | -20°C to +70°C (Standard)<br>-40°C to +85°C (W = Option)  |
|  | Supply voltage (V <sub>DD</sub> ) | +0.8V, +1.2V, +1.5V or +1.8V DC ±5%   |
|  | 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>2</sup>  |
| Absolute Max. Ratings                                      | Supply voltage                    | -0.5V to +4.0V DC   |
|  | Storage temperature               | -55°C to +100°C   |
| Input current (no load) (Pin#1 = Open or V <sub>IH</sub> ) |                                   | 1.4 mA max. (V <sub>DD</sub> = +0.8V)<br>2 mA max. (V <sub>DD</sub> = +1.2V)<br>3 mA max. (V <sub>DD</sub> = +1.5V & +1.8V)   |
| Stand-by current* <sup>2</sup>                             |                                   | 100 µA max. (Pin#1 = V <sub>IL</sub> )  |
| Output (-40°C to +85°C)                                    | Symmetry                          | 45% to 55% at 1/2 V <sub>DD</sub> level   |
|  | Rise and fall times               | 4 ns max. (20% V <sub>DD</sub> to 80% V <sub>DD</sub> level)  |
|  | "0" Level                         | V <sub>OL</sub> : 20% V <sub>DD</sub> max.  |
|  | "1" Level                         | V <sub>OH</sub> : 80% V <sub>DD</sub> min.  |
| Load   |                                   | 15 pF max. (CMOS)   |
| Disable delay time   |                                   | 50 µs max.  |
| Enable delay time  |                                   | 10 ms max.  |
| Start-up time  |                                   | 10 ms max.  |
| Aging  |                                   | ±5 ppm max. at +25°C ±3°C for first year.   |
| SSB phase noise (at V <sub>DD</sub> = +1.2V & 48.000 MHz)  |                                   | -130 dBc / Hz, Typical at 1 kHz offset  |
| Reflow condition   |                                   | +250°C ±10°C for 10 seconds<br>+170°C ±10°C for 1 to 2 minutes (preheating)   |

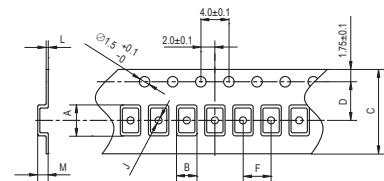
(\*<sup>1</sup>) Final part number to be assigned with package type, input voltage, frequency stability, operating temperature and frequency. e.g. 22SMOLC(1.2VD) 27.000MHz

(\*<sup>2</sup>) Internal crystal oscillation to be halted (Pin#1 = V<sub>IL</sub>)

## PACKAGE DATA

| Item             | Package | 22SMOLC & 32SMOLC                 |
|------------------|---------|-----------------------------------|
| Lid              |         | Metal                             |
| Base             |         | Ceramic                           |
| Sealing          |         | Seam                              |
| Terminal         |         | Tungsten (metalized)              |
| Terminal plating |         | Gold / Nickel (surface) / (under) |
| RoHS             |         | Compliant (Pb-free)               |

## TAPE SPECIFICATIONS



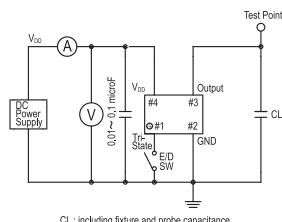
#### 22SMOLC

| A   | B   | C   | D   | F   | J   | L    | M   | Reel Dia. | Qty/Reel                      |
|-----|-----|-----|-----|-----|-----|------|-----|-----------|-------------------------------|
| 2.7 | 2.3 | 8.0 | 3.5 | 4.0 | 1.1 | 0.25 | 1.1 | 180       | 1000pcs<br>2000pcs<br>3000pcs |

#### 32SMOLC

| A   | B   | C   | D   | F   | J   | L   | M   | Reel Dia. | Qty/Reel           |
|-----|-----|-----|-----|-----|-----|-----|-----|-----------|--------------------|
| 3.5 | 2.8 | 8.0 | 3.5 | 4.0 | 1.0 | 0.3 | 1.4 | 180       | 1000pcs<br>2000pcs |

## TEST CIRCUIT



CL : including fixture and probe capacitance.