# **CWSMF SERIES: Dual** Frequency Selectable Oscillator 1MHz – 200MHz

## ■ PRODUCT DESCRIPTION

The CWSMF clock series is a cutting edge family of Dual Frequency Selectable Oscillators based on an advanced digital PLL platform. The CWSMF clocks are available in a 5x3.2mm ceramic package with output frequency from 1 MHz to 200 MHz. The CWSMF units are pre-programmed with 2 different output frequencies, any of which are user selectable. Such flexibility significantly reduces design cycle time and overall cost. The CWSMF clock design incorporates a low frequency crystal to provide a wide range of frequencies. The CWSMF Clocks are suitable for a wide range of applications.

## ■ APPLICATION

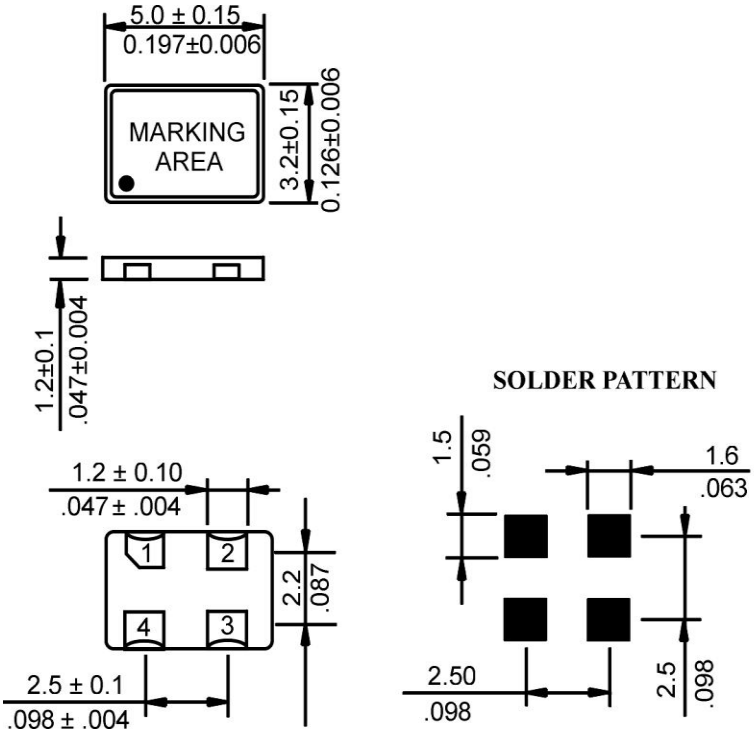
- SONET/SDH
- FIBRE CHANNEL
- 10G,100G, GIGABIT ETHERNET
- CLOCK / DATA RECOVERY
- TEST AND MEASUREMENT

## ■ ELECTRICAL SPECIFICATION

| PARAMETER | SYMBOL | CONDITIONS | VALUE | UNIT |
|---|---|---|---|---|
| Frequency, nominal | $f_O$ | $V_{cc}$ = 1.8 V<br>$V_{cc}$ = 2.5 V<br>$V_{cc}$ = 3.3 V | 1.0 to 133.0<br>1.0 to 166.0<br>1.0 to 200.0 | MHz |
| Supply voltage, nom. | $V_{CC}$ | | 1.8 or 2.5 or 3.3 | V |
| Supply current | Is | Typical Frequency Dependent) | 4 ~ 50 | mA |
| LVCMOS output levels | VOH / VOL | min/max | 0.7Vcc / 0.3Vcc | V |
| Duty cycle | DC | Load = 15pF | 45/55 | % |
| Rise / fall time, max. | tr / tf | 10% - 90% (VOL, VOH) | 2.5 | ns |
| Overall freq. stability, max.[1] | Δf/fc | Various available, specified when ordered:<br>-10°C to +70°C<br>-40°C to +85°C<br>Inclusive of 25°C calibration, tolerance, operating temperature range, input voltage variation, load change, ageing, shock and vibration | <br>±15<br>±25<br>± 50<br>±25<br>±50<br>±100 | ppm |
| Start-Up time, max | $t_{start}$ | Ta=25°C | 10 | msec |
| Aging, max | | First year<br>Year thereafter | ±5<br>±2 | ppm |
| Operating temperature [1] | Ta | | -40 ~ +85 | °C |
| Storage temperature | T(stg) | Absolute max | -55 ~ +125 | °C |
| Absolute voltage range | Vcc(abs) | | Vcc ± 0.5 | V |

**Notes**
[1] See part numbering table

## MECHANICAL SPECIFICATION




OUTLINE TOLERANCE
IF NOT SPECIFIED:
±0.006" / 0.2mm

PIN FUNCTIONS:
[1] FREQ SELECT (SEL)[2]
[2] GROUND
[3] OUTPUT
[4] SUPPLY VOLTAGE

MARKING:
CM243THS – (family)
X-Y– (frequency codes)
Q D/C – (date code)

***0.01uF external bypass capacitor is recommended as seen in solder pattern**
**** RoHS compliant**

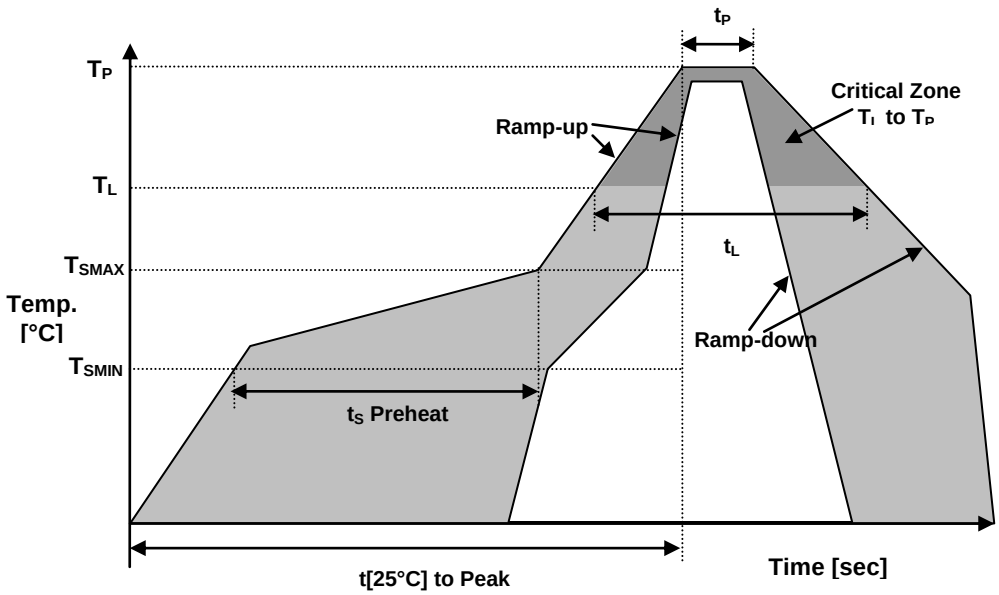
**Notes**
[2] Frequency Select pin (SEL)
Logic 1 (NC) = Output Frequency 1 – First frequency listed in part # is the default value. Customer specified at time of order
Logic 0 = Output Frequency 2 - Second frequency listed in part #. Customer sets SEL pin to Low

## PART NUMBERING SYSTEM:

| SERIES | NUMBER OF OUTPUTS | OUTPUT | SUPPLY VOLTAGE (V) | SYMMETRY (%) | TEMP RANGE (°C) | FREQUENCY STABILITY (ppm) | ENABLE / DISABLE PIN | | OUTPUT FREQUENCY (MHz) |
|---|---|---|---|---|---|---|---|---|---|
| Surface mount Multi-frequency Clock Oscillator | **2**: Dual Frequency | **4**: LVCMOS | **1**: Vcc =1.8<br>**2**: Vcc=2.5<br>**3**: Vcc =3.3 | **T**: 45/55 | **R**: 0~50<br>**S**: 0~70<br>**U**: -20~70<br>**V**: -40~85 | **L:** ±15<br>**I**: ±25<br>**H**: ±50<br>**J**: ±100 | **0: No E/D** | | **XXX.XXX-YYY.YYY**<br>Freq1- Freq 2 |
| **CWSMF** | **2** | **4** | **3** | **T** | **S** | **H** | **0** | **-** | **XXX / YYY** |

**EXAMPLE: CWSMF243TSH0-12.8 / 6.4**
Clock Oscillator, 5x3.2 mm package, Dual output, LVCMOS, +3.3V Supply, 45/55 Symmetry, 0~+70°C Operating Temperature Range, ±50ppm overall Frequency Stability, No Enable/Disable, 12.80 MHz and 6.4 MHz output frequency.

## REFLOW PROFILE:




| Recommended Solder Reflow Profile | | |
|---|---|---|
| Temperature Min Preheat | $T_{SMIN}$ | 150°C |
| Temperature Max Preheat | $T_{SMAX}$ | 175°C |
| Time ($T_{SMIN}$ to $T_{SMAX}$) | $t_S$ | 60-180 sec. |
| Temperature | $T_L$ | 217°C |
| Peak Temperature | $T_P$ | 260°C |
| Ramp-up rate | $R_{UP}$ | 3°C/sec max. |
| Ramp-down rate | $R_{DOWN}$ | 6°C/sec max. |
| Time within 5°C of Peak Temperature | $t_P$ | 10 sec max. |
| Time t[25°C] to Peak Temperature | t[25°C] to Peak | 480 sec. |
| Time | $t_L$ | 60-150 sec. |