

CMP702-SERIES



- 0.6 ps RMS Phase Jitter over 12 kHz to 20 MHz bandwidth
- 31 Standard frequencies from 25 MHz to 212.5 MHz
- LVPECL and LVDS Output types
- SMD package 7.0 x 5.0 mm

ELECTRICAL SPECIFICATIONS

| PARAMETER | SYMBOL | CONDITION | VALUE | | | UNIT |
|-------------------------------|-----------------------|---|--------------------------|------|--------------------------|--------------------------|
| | | | Min. | Typ. | Max. | |
| Frequency Range | f_0 | 31 standard frequencies, see table 1 | 25 | | 212.5 | MHz |
| Supply Voltage | V_s | $V_s \pm 5\%$ | 2.25 | - | 3.63 | V |
| | | $V_s \pm 5\%$ | 2.25 | 2.5 | 2.75 | V |
| | | $V_s \pm 5\%$ | 2.97 | 3.3 | 3.63 | V |
| Operating Temperature | T_a | | -20 | | +70 | °C |
| | | | -40 | | +85 | °C |
| Frequency Stability | $\Delta f/f_0$ | Including First Year aging, initial frequency tolerance at 25°C, Frequency stability over temperature range, supply variation, load variation | -10 -20 -25 -50 | | +10 +20 +25 +50 | ppm ppm ppm ppm |
| Long Term stability (Aging) | $\Delta f/\Delta t_y$ | First Year @ 25°C | -2 | | +2 | ppm |
| | | 10 Years @ 25°C | -5 | | +5 | ppm |
| Input Voltage High | V_{IH} | Pin 1 , E/D or STBY | 70% V_s | | | V |
| Input Voltage Low | V_{IL} | Pin 1 , E/D or STBY | | | 30% V_s | V |
| Input Pull-up Impedance | Z_{in} | Pin 1 , E/D=High or Low or STBY=High Pin 1 , STBY = Low | 2 | 100 | 250 | kΩ MΩ |
| Start-up Time | T_{st} | Measured from the time V_s reaches its rated minimum value | | 6 | 10 | ms |
| Resume Time | T_{res} | Measured from the time STBY pin crosses 50% threshold | | 6 | 10 | ms |
| Duty Cycle | DC | | 45 | | 55 | % |

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OUTPUT CHARACTERISTICS

| | PARAMETER | SYMBOL | CONDITION | VALUE | | | UNIT |
|------------------|-----------------------------------|---|---|------------|------|------------|---------|
| | | | | Min | Typ. | Max | |
| LVPECL | Output Levels | V_{OH} | Output termination load 50Ω connected to $V_S -2.0V$, $V_S \pm 5\%$ | $V_S -1.1$ | | $V_S -0.7$ | V |
| | | V_{OL} | Output termination load 50Ω connected to $V_S -2.0V$, $V_S \pm 5\%$ | $V_S -1.9$ | | $V_S -1.5$ | V |
| | Output differential voltage swing | V_{SWING} | | 1.2 | 1.6 | 2.0 | V |
| | Current consumption | I_S | Excluding Load termination, $V_S=2.5V$ or $3.3V$ | | 61 | 69 | mA |
| | E/D current consumption | $I_{E/D}$ | E/D = Low | | | 35 | mA |
| | Output Disable Supply leakage | I_{LEAK} | E/D = Low | | | 1 | μA |
| | STBY current | I_{STBY} | STBY= Low, for all V_S | | | 100 | μA |
| | Maximum Output Current | I_{driver} | Maximum average current drawn from Out + or Out - | | | 30 | mA |
| | Rise / Fall Time | T_r / T_f | 20% to 80% | | 300 | 500 | ps |
| | E/D time | $T_{E/D}$ | $f_0=212.5$ MHz, for other frequencies $T_{E/D}=100$ ns + 3 period | | | 115 | ns |
| | RMS Period Jitter | J_P | $f_0=100$ MHz, $V_S= 3.3v$ or $2.5V$ $f_0=156.25$ MHz, $V_S= 3.3v$ or $2.5V$ $f_0=212.5$ MHz, $V_S= 3.3v$ or $2.5V$ | | 1.2 | 1.7 | ps |
| | | | | | 1.2 | 1.7 | ps |
| RMS Phase Jitter | J_{PH} | $f_0=156.25$ MHz, integrated bandwidth, 12 KHz to 20 MHz, all V_S | | 0.6 | 0.85 | ps | |

| | PARAMETER | SYMBOL | CONDITION | VALUE | | | UNIT |
|------------------|--|---|---|-------|------|-------|---------|
| | | | | Min | Typ. | Max | |
| LVDS | Output differential voltage | V_{OD} | Output termination load 100Ω connected between OUT+ and OUT- , $V_S \pm 5\%$ | 250 | 350 | 450 | mV |
| | Output differential voltage Magnitude change | ΔV_{OD} | | | | 50 | mV |
| | Offset Output Voltage | V_{OOFF} | Output termination load 100Ω connected between OUT+ and OUT- , $V_S \pm 5\%$ | 1.125 | 1.2 | 1.375 | V |
| | Offset Output Voltage Magnitude change | ΔV_{OOFF} | | | | 50 | mV |
| | Current consumption | I_S | Excluding Load termination, $V_S=2.5V$ or $3.3V$ | | 47 | 55 | mA |
| | E/D current consumption | $I_{E/D}$ | E/D = Low | | | 35 | mA |
| | Output Disable Supply leakage | I_{LEAK} | E/D = Low | | | 1 | μA |
| | STBY current | I_{STBY} | STBY= Low, for all V_S | | | 100 | μA |
| | Rise / Fall Time | T_r / T_f | 20% to 80% | | 495 | 600 | ps |
| | E/D time | $T_{E/D}$ | $f_0=212.5$ MHz, for other frequencies $T_{E/D}=100$ ns + 3 period | | | 115 | ns |
| | RMS Period Jitter | J_P | $f_0=100$ MHz, $V_S= 3.3v$ or $2.5V$ $f_0=156.25$ MHz, $V_S= 3.3v$ or $2.5V$ $f_0=212.5$ MHz, $V_S= 3.3v$ or $2.5V$ | | 1.2 | 1.7 | ps |
| | | | | | 1.2 | 1.7 | ps |
| RMS Phase Jitter | J_{PH} | $f_0=156.25$ MHz, integrated bandwidth, 12 KHz to 20 MHz, all V_S | | 0.6 | 0.85 | ps | |

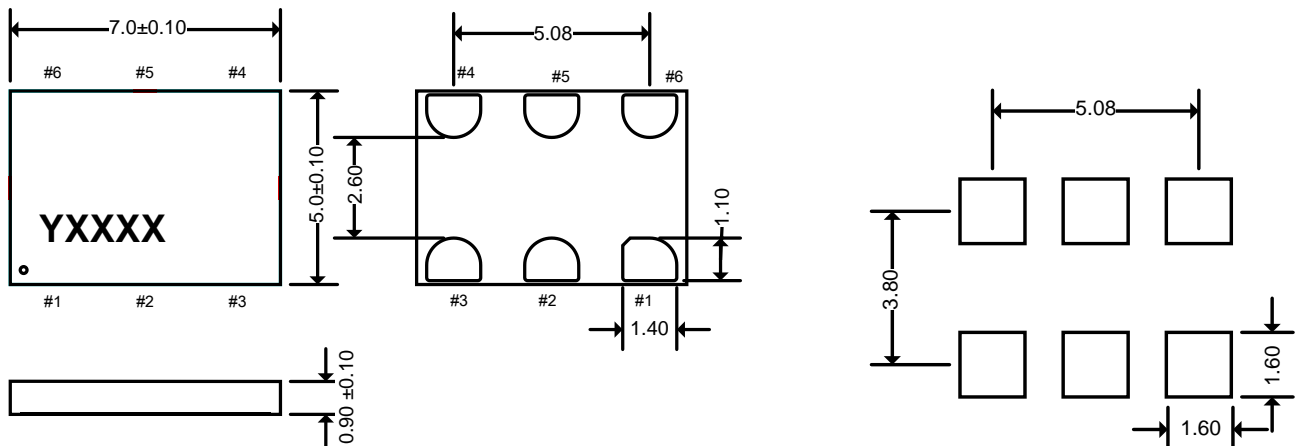
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Table 1. List of Supported Frequencies

| | | | | | | | |
|----------------|-------------|---------------|---------------|---------------|---------------|--------------|----------------|
| 25 MHz | 50 MHz | 74.175824 MHz | 74.250 MHz | 75 MHz | 98.304 MHz | 100 MHz | 106.250MHz |
| 125 MHz | 133 MHz | 133.3 MHz | 133.33 MHz | 133.333 MHz | 133.3333 MHz | 133.33333MHz | 133.333333 MHz |
| 148.351648 MHz | 148.5 MHz | 150 MHz | 155.520 MHz | 156.250 MHz | 161.13280 MHz | 166 MHz | 166.6 MHz |
| 166.66 MHz | 166.666 MHz | 166.6666 MHz | 166.66666 MHz | 166.666666MHz | 200 MHz | 212.5MHz | |

MECHANICAL DIMENSIONS AND PIN FUNCTIONING

Recommended land pattern



| PIN | SYMBOL | FUNCTION |
|-----|--------|---|
| 1 | E/D | H or Open: Oscillator frequency output L: Output is high impedance |
| | STBY | H or Open: Oscillator frequency output L: Device goes to sleep mode. Supply current reduces to I _{STBY} |
| 2 | GND | Electrical Ground |
| 3 | NC | No connect, leave it floating or connect to GND for better heat dissipation |
| 4 | OUT+ | Oscillator Output Signal |
| 5 | OUT- | Complementary Oscillator Output signal |
| 6 | Vs | Supply Voltage |

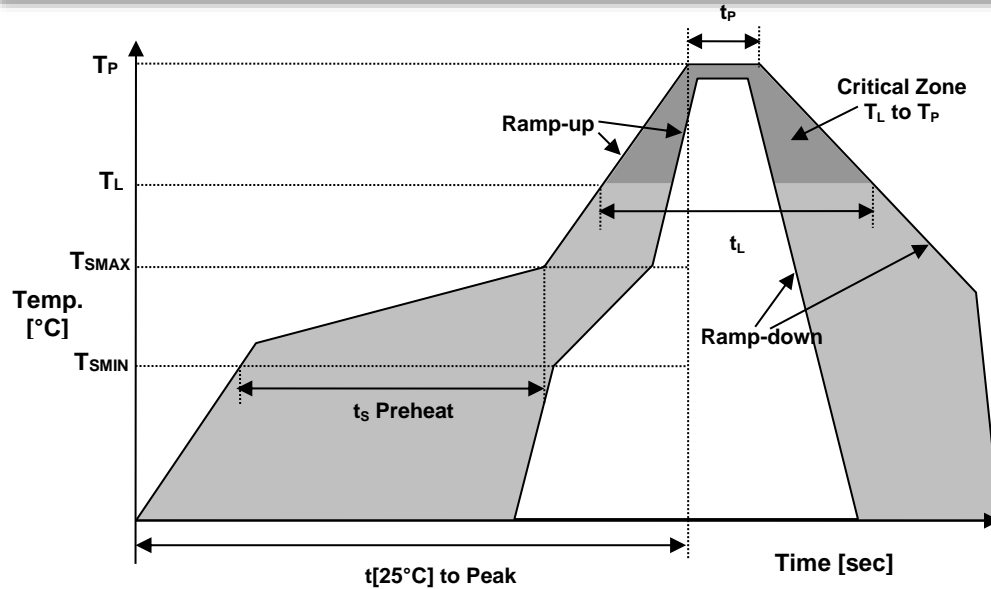
Note: Connect a capacitor of 0.1µF or higher value between Vs and GND

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ENVIRONMENTAL

| | |
|----------------------------|---------------------------|
| Soldering | MIL-STD-883F, Method 2003 |
| Moisture Sensitivity Level | MSL 1 at 260°C |
| Temperature Cycle | JESD22, Method A104 |
| Vibration | MIL-STD-883F, Method 2007 |
| Mechanical Shock | MIL-STD-883F, Method 2002 |
| Storage Temperature | -65° +150°C |

REFLOW PROFILE



Recommended Solder Reflow Profile

| | | |
|-------------------------------------|-----------------|--------------|
| Temperature Min Preheat | T_{SMIN} | 150°C |
| Temperature Max Preheat | T_{SMAX} | 200°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. |
| Time t[25°C] to Peak Temperature | t[25°C] to Peak | 480 sec. |
| Time | t_L | 60-150 sec. |

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ORDERING INFORMATION

| SERIES | SUPPLY VOLTAGE (V) | Frequency Stability | TEMP RANGE (°C) | Output Type | Enable/Disable Function | - | OUTPUT FREQUENCY (MHz) |
|--------|---|--|------------------------|--------------------|----------------------------|---|------------------------|
| CMP702 | 25: Vs=2.5V 33: Vs=3.3V XX: Vs=2.25V to 3.63V | A:±10ppm B:±20ppm C:±25ppm D:±50ppm | U: -20~70 V: -40~85 | 1:LVPECL 2:LVDS | E: E/D output S:Standby | - | See table 1 |

APPROVALS

Eng. approval, date: SP, 07/19/2016

Created by, date: SP, 07/19/2016

Revision: A