

### Field Programmable Crystal Oscillator

Series CPPD

- Programmed in the field with the PG-3200 oscillator programming instrument within seconds.
- Factory Programmable
- Standard Package Options

### Instrument Part Number:

CPPD C 1 L Z - A5 B6 - XX.XXXX / YY.YYYY

| CPPD<br>SERIES | C<br>OUTPUT         | 1<br>PACKAGE STYLE                                                                        | L<br>VOLTAGE                       | Z<br>ADDED FEATURE                                            | A5<br>OPERATING TEMP                                                         | B6<br>STABILITY                            | XX.XXXX<br>FREQUENCY                   | YY.YYYY<br>FREQUENCY                   |
|----------------|---------------------|-------------------------------------------------------------------------------------------|------------------------------------|---------------------------------------------------------------|------------------------------------------------------------------------------|--------------------------------------------|----------------------------------------|----------------------------------------|
| CPPD           | C = CMOS<br>T = TTL | 1 = Full Size<br>4 = Half Size<br>5 = 3.2x5 Ceramic<br>7 = 5x7 Ceramic<br>8 = PLASTIC SMD | Blank = 5V<br>L = 3.3V<br>R = 2.7V | Blank = Cut Tape<br>B = Bulk<br>T = Tube<br>Z = Tape and Reel | Blank = 0°C~+70°C<br>A3 = -55~+125°C<br>A5 = -20°C~+70°C<br>A7 = -40°C~+85°C | B6 = ±100PPM<br>BP = ±50PPM<br>BR = ±25PPM | 0.500 ~ 133.000 MHz<br>Pin 1 Logic "0" | 0.500 ~ 133.000 MHz<br>Pin 1 Logic "1" |

### Specifications:

| Description                                                                       | Min                                                | Typ               | Max                | Unit                 |
|-----------------------------------------------------------------------------------|----------------------------------------------------|-------------------|--------------------|----------------------|
| <b>Frequency Range:</b><br>Programmable to any discrete frequency                 | 0.500                                              |                   | 133                | MHz                  |
| <b>Available Stability Options:</b>                                               | -100<br>-50<br>-25                                 |                   | +100<br>+50<br>+25 | PPM                  |
| <b>Programmable Supply Voltage:</b><br>(1-133 MHz)<br>(1-100 MHz)<br>(1-66.0 MHz) | 4.5<br>3.0<br>2.5                                  | 5.0<br>3.3<br>2.7 | 5.5<br>3.6<br>3.0  | V<br>V<br>V          |
| <b>Operating Temperature Range Options:</b>                                       | -55<br>-20<br>-40                                  |                   | +125<br>+70<br>+85 | °C<br>°C<br>°C       |
| <b>Storage Temperature:</b>                                                       | -55                                                |                   | +125               | °C                   |
| <b>Aging:</b><br>Ta=°25C,Vdd=5V/3.3V                                              | 1 <sup>st</sup> Year<br>After 1 <sup>st</sup> year |                   | ±5<br>±1           | PPM/Year<br>PPM/Year |

### Programmable Output Level:

CMOS/TTL

### Operating Conditions:

| Description                                                                                                                                                                                                                                                                           | Min | Max                        | Unit                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----------------------------|----------------------------|
| <b>V<sub>DD</sub></b> Supply Voltage                                                                                                                                                                                                                                                  | 2.5 | 5.5                        | V                          |
| <b>C<sub>TTL</sub></b> Max capacitive load on outputs for TTL levels<br>4.5V-5.5V V <sub>DD</sub> , ≤ 40 MHz<br>4.5V-5.5V V <sub>DD</sub> , 40 - 133 MHz                                                                                                                              |     | 50<br>25                   | pF<br>pF                   |
| <b>C<sub>CMOS</sub></b> Max capacitive load on outputs for CMOS levels<br>4.5V-5.5V V <sub>DD</sub> , ≤ 66 MHz<br>4.5V-5.5V V <sub>DD</sub> , 66 - 133 MHz<br>3.0V-3.6V V <sub>DD</sub> , ≤ 40 MHz<br>3.0V-3.6V V <sub>DD</sub> , 40 - 100 MHz<br>2.5-3.0V V <sub>DD</sub> , ≤ 66 MHz |     | 50<br>25<br>30<br>15<br>25 | pF<br>pF<br>pF<br>pF<br>pF |

**Output Clock Switching Characteristics:**

| Description              | Test Conditions                                            | Min | Typ | Max | Unit |
|--------------------------|------------------------------------------------------------|-----|-----|-----|------|
| <b>Duty Cycle:</b>       | $\leq 50$ MHz, $C_L = 50$ pF                               | 45  | -   | 55  | %    |
| TTL @ 1.4V               | 50 - 66 MHz, $C_L = 15$ pF                                 | 45  | -   | 55  | %    |
| 4.5-5.5 $V_{DD}$         | 66 - 125 MHz, $C_L = 25$ pF                                | 40  | -   | 60  | %    |
|                          | 125 - 133 MHz, $C_L = 15$ pF                               | 40  | -   | 60  | %    |
| <b>Duty Cycle:</b>       | $\leq 66$ MHz, $C_L \leq 25$ pF                            | 45  | -   | 55  | %    |
| CMOS @ $V_{DD}/2$        | 66 - 125 MHz, $C_L \leq 25$ pF                             | 40  | -   | 60  | %    |
| 4.5-5.5 $V_{DD}$         | 125 - 133 MHz, $C_L \leq 15$ pF                            | 60  | -   | 60  | %    |
|                          |                                                            |     |     |     | %    |
| 3.0-3.6 $V_{DD}$         | $\leq 40$ MHz, $C_L \leq 30$ pF                            | 45  | -   | 55  | %    |
|                          | 40 - 100 MHz, $C_L \leq 15$ pF                             | 40  | -   | 60  | %    |
| <b>Rise/Fall:</b>        | 0.8V - 2.0V, 4.5 - 5.5 $V_{DD}$ , $C_L = 50$ pF            |     |     | 1.8 | ns   |
|                          | 0.8V - 2.0V, 4.5 - 5.5 $V_{DD}$ , $C_L = 25$ pF            |     |     | 1.2 | ns   |
|                          | 0.8V - 2.0V, 4.5 - 5.5 $V_{DD}$ , $C_L = 15$ pF            |     |     | 0.9 | ns   |
|                          | 0.2V - 0.8 * $V_{DD}$ , 4.5 - 5.5 $V_{DD}$ , $C_L = 50$ pF |     |     | 3.4 | ns   |
|                          | 0.2V - 0.8 * $V_{DD}$ , 3.0 - 3.6 $V_{DD}$ , $C_L = 30$ pF |     |     | 4.0 | ns   |
|                          | 0.2V - 0.8 * $V_{DD}$ , 3.0 - 3.6 $V_{DD}$ , $C_L = 15$ pF |     |     | 2.4 | ns   |
| <b>Start Up Time</b>     | From Power On                                              | -   | -   | 10  | ms   |
| <b>RMS Period Jitter</b> | 1 - 133.00 MHz                                             |     | 8   | 11  | ps   |
| <b>Peak to Peak*</b>     | $\leq 33.000$ MHz                                          |     | 65  | 99  | ps   |
|                          | $> 33.000$ MHz                                             |     | 65  | 80  | ps   |

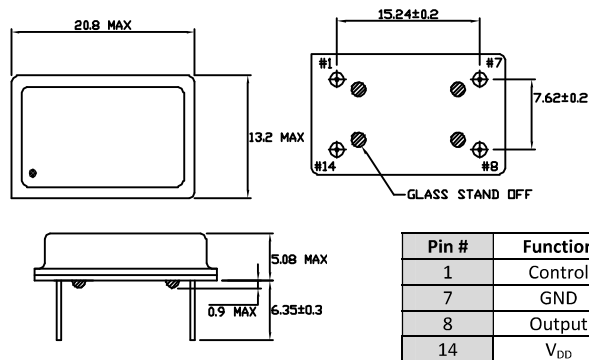
\* Jitter Tested at > 1,000,000 samples, exceeding JEDEC std JESD65

**Electrical Characteristics:**

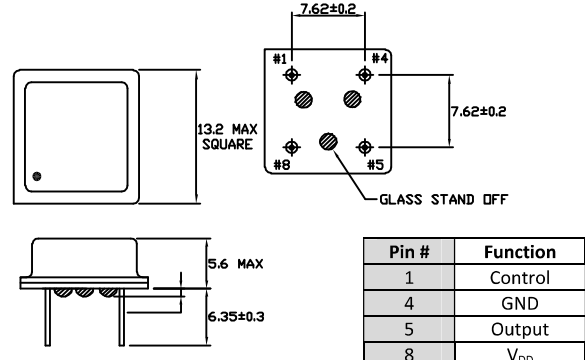
| Description                                                                        | Test Conditions                                    | Min                   | Typ | Max                   | Unit |
|------------------------------------------------------------------------------------|----------------------------------------------------|-----------------------|-----|-----------------------|------|
| <b>Input Characteristics (Pin 1):</b>                                              |                                                    |                       |     |                       |      |
| V <sub>IL</sub> , Low-Level Input Voltage<br>(To switch to F <sub>0</sub> output)  | V <sub>DD</sub> = 5.0 V                            | -                     | -   | 0.8                   | V    |
|                                                                                    | V <sub>DD</sub> = 3.3 V                            | -                     | -   | 0.2 * V <sub>DD</sub> | V    |
|                                                                                    | V <sub>DD</sub> = 2.7 V                            | -                     | -   | 0.2 * V <sub>DD</sub> | V    |
| V <sub>IH</sub> , High-Level Input Voltage<br>(To switch to F <sub>1</sub> output) | V <sub>DD</sub> = 5.0 V                            | 2.0                   | -   | -                     | V    |
|                                                                                    | V <sub>DD</sub> = 3.3 V                            | 0.7 * V <sub>DD</sub> | -   | -                     | V    |
|                                                                                    | V <sub>DD</sub> = 2.7 V                            | 0.7 * V <sub>DD</sub> | -   | -                     | V    |
| I <sub>IL</sub> , Input Low Current                                                | V <sub>IN</sub> = 0 V                              | -                     | -   | 10                    | μA   |
| I <sub>IH</sub> , Input High Current                                               | V <sub>IN</sub> = V <sub>DD</sub>                  | -                     | -   | 5                     | μA   |
| <b>Output Characteristics:</b>                                                     |                                                    |                       |     |                       |      |
| V <sub>OL</sub> , Low-Level Output Voltage                                         | V <sub>DD</sub> = 5.0 V, I <sub>OL</sub> = 16mA    | -                     | -   | 0.4                   | V    |
|                                                                                    | V <sub>DD</sub> = 3.3 V, I <sub>OL</sub> = 8mA     | -                     | -   | 0.4                   | V    |
| V <sub>OHTTL</sub> , High-Level Output Voltage                                     | V <sub>DD</sub> = 5.0 V, I <sub>OL</sub> = -16mA   | 2.4                   | -   | -                     | V    |
| V <sub>IHCMOS</sub> , High-Level Output Voltage                                    | V <sub>DD</sub> = 5.0 V, I <sub>OL</sub> = -16mA   | V <sub>DD</sub> -0.4  | -   | -                     | V    |
|                                                                                    | V <sub>DD</sub> = 3.3 V, I <sub>OL</sub> = -8mA    | V <sub>DD</sub> -0.4  | -   | -                     | V    |
|                                                                                    | V <sub>DD</sub> = 2.7 V, I <sub>OL</sub> = 6mA     | V <sub>DD</sub> -0.4  | -   | -                     | V    |
| <b>Power Supply Current:</b><br>(Unloaded)                                         | V <sub>DD</sub> = 5.0 V, F <sub>O</sub> ≤ 133 MHz  | -                     | -   | 45                    | mA   |
|                                                                                    | V <sub>DD</sub> = 3.3 V, F <sub>O</sub> ≤ 100 MHz  | -                     | -   | 25                    | mA   |
|                                                                                    | V <sub>DD</sub> = 2.7 V, F <sub>O</sub> ≤ 66.0 MHz | -                     | -   | 20                    | mA   |
| <b>Standby Current:</b>                                                            |                                                    | -                     | 10  | 50                    | μA   |
| <b>Input Pull-Up Resistor (Pin 1)</b>                                              | V <sub>DD</sub> = 5.0 V, V <sub>IN</sub> = 0 V     | 1.1                   | 3.0 | 8.0                   | MΩ   |
|                                                                                    | V <sub>DD</sub> = 5.0 V, V <sub>IN</sub> = 0.7 V   | 50                    | 100 | 200                   | KΩ   |
| <b>Frequency Select Switching Time</b>                                             |                                                    |                       |     | 500                   | μs   |

\*Note: Bypass  $V_{DD}$  to GND with a  $0.01\mu F$  capacitor

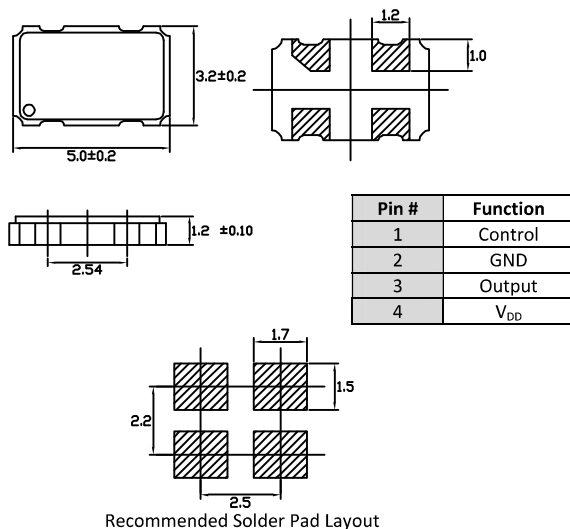
**Style 1 Full Size 14 Pin Dip**



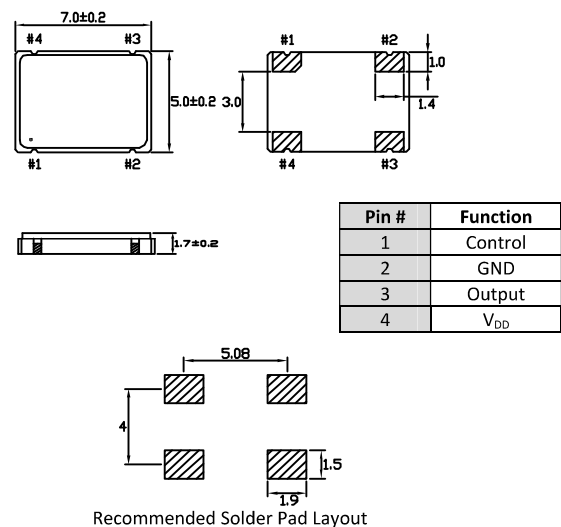
**Style 4 Half Size 8 Pin Dip**



**Style 5 3.2x5 Ceramic SMD**



**Style 7 5x7 Ceramic SMD**



\*Note: Bypass  $V_{DD}$  to GND with a  $0.01\mu\text{F}$  capacitor

