

## Typical Applications

Military Systems  
 Avionics and Instrumentation  
 Test Equipment  
 Medical Equipment

## Features

9X14 J Leaded Surface Mount Package  
 Reflow Process Compatible  
 AC MOS, TTL, LVPECL and LVDS  
 MIL-PRF-55310 Class B Screening (optional)  
 Military Operating Temperature Range (optional)

## Frequency Range

**1 to 800 MHz** (ACMOS and TTL outputs available up to 125 MHz. LVPECL and LVDS output frequencies above 220 MHz are achieved through the use of a PLL multiplier.)

## Standard Frequencies

19.44, 32.768, 44.736, 51.84, 77.76, 155.52, 622.08 MHz

## Frequency Stabilities<sup>1</sup>

| Parameter  | Min  | Typ | Max  | Units | Condition      | Ordering Code <sup>5</sup> |
|--|--|-----|------|-------|----------------|----------------------------|
| Operating temperature range (referenced to +25°C)                                    | -100   |     | +100 | ppm   | 0 ... +70°C    | <b>C104</b>                |
|  | -50  |     | +50  | ppm   | 0 ... +70°C    | <b>C505</b>                |
|  | -25  |     | +25  | ppm   | 0 ... +70°C    | <b>C255</b>                |
|  | -15  |     | +15  | ppm   | 0 ... +70°C    | <b>C155</b>                |
|  | -100   |     | +100 | ppm   | -40 ... +85°C  | <b>F104</b>                |
|  | -50  |     | +50  | ppm   | -40 ... +85°C  | <b>F505</b>                |
|  | -25  |     | +25  | ppm   | -40 ... +85°C  | <b>F255</b>                |
|  | -100   |     | +100 | ppm   | -55 ... +125°C | <b>M104</b>                |
|  | -50  |     | +50  | ppm   | -55 ... +125°C | <b>M505</b>                |
|  | Initial accuracy (do not use with overall tolerance code below)  | -15 |      | +15   | ppm            | @ 25°C                     |
| -25  |  |     | +25  | ppm   | @ 25°C         | <b>T255</b>                |
| -50  |  |     | +50  | ppm   | @ 25°C         | <b>T505</b>                |
| -100   |  |     | +100 | ppm   | @ 25°C         | <b>T104</b>                |
| -100   |  |     | +100 | ppm   | @ 25°C         | <b>T104</b>                |
| Parameter  | Min  | Typ | Max  | Units | Condition      | Ordering Code <sup>5</sup> |
| Overall tolerance (includes operating temperature and initial accuracy) <sup>7</sup> | -100   |     | +100 | ppm   | 0 ... +70°C    | <b>TC104</b>               |
|  | -50  |     | +50  | ppm   | 0 ... +70°C    | <b>TC505</b>               |
|  | -25  |     | +25  | ppm   | 0 ... +70°C    | <b>TC255</b>               |
|  | -20  |     | +20  | ppm   | 0 ... +70°C    | <b>TC205</b>               |
|  | -100   |     | +100 | ppm   | -40 ... +85°C  | <b>TF104</b>               |
|  | -50  |     | +50  | ppm   | -40 ... +85°C  | <b>TF505</b>               |
|  | -25  |     | +25  | ppm   | -40 ... +85°C  | <b>TF255</b>               |
|  | -100   |     | +100 | ppm   | -55 ... +125°C | <b>TM104</b>               |
|  | -65  |     | +65  | ppm   | -55 ... +125°C | <b>TM605</b>               |
|  | Additional stability parameters:<br>vs. Supply voltage change<br>vs. Load change<br>vs. Aging / 1st year<br>vs. Aging / year (following years) | -2  |      | +2    | ppm            | V <sub>S</sub> ± 5%        |
| -1   |  |     | +1   | ppm   | Load ± 5%      |                            |
| -3   |  |     | +3   | ppm   |                |                            |
| -1   |  |     | +1   | ppm   |                |                            |

## Supply Voltage (Vs)

| Parameter                                  | Min   | Typ | Max                                   | Units                                  | Condition   | Ordering Code <sup>5</sup> |
|--|-------|-----|---------------------------------------|--|---|----------------------------|
| <b>Supply voltage</b>                      | 4.75  | 5.0 | 5.25                                  | VDC                                    |   | <b>SV050</b>               |
| Current consumption (+5 VDC)               |       |     | 15<br>20<br>40                        | mA<br>mA<br>mA                         | ACMOS or TTL 1.0 to 23.9 MHz<br>ACMOS or TTL 24 to 49.9 MHz<br>ACMOS or TTL 50 to 125.00 MHz  |                            |
| <b>Supply voltage</b>                      | 3.135 | 3.3 | 3.465                                 | VDC                                    |   | <b>SV033</b>               |
| <b>Supply voltage</b>                      | 2.375 | 2.5 | 2.625                                 | VDC                                    |   | <b>SV025</b>               |
| Current consumption (+3.3 VDC or +2.5 VDC) |       |     | 6<br>8<br>12<br>16<br>40<br>75<br>100 | mA<br>mA<br>mA<br>mA<br>mA<br>mA<br>mA | ACMOS 1.0 to 14.90 MHz<br>ACMOS 15.0 to 39.9 MHz<br>ACMOS 40.0 to 59.9 MHz<br>ACMOS 60.0 to 84.9 MHz<br>ACMOS 85.0 to 125.0 MHz<br>LVPECL or LVDS No load <200 MHz<br>LVPECL or LVDS No load >200 MHz |                            |

## RF Output

| Parameter   | Min                | Typ | Max                | Units             | Condition  | Ordering Code <sup>5</sup> |
|---|--------------------|-----|--------------------|-------------------|--|----------------------------|
| <b>Signal</b>                                       | <b>ACMOS</b>       |     |                    |                   |  | <b>RFA</b>                 |
| Load  |                    | 15  | 50                 | pF                |  |                            |
| Signal Level (Vol)                                  |                    |     | 0.5<br>0.3<br>0.25 | VDC<br>VDC<br>VDC | Vs= 5.0V and 15pF load<br>Vs=3.3V and 15pF load<br>Vs=2.5V and 15pF load |                            |
| Signal Level (Voh)                                  | 4.5<br>3.0<br>2.25 |     |                    | VDC<br>VDC<br>VDC | Vs= 5.0V and 15pF load<br>Vs=3.3V and 15pF load<br>Vs=2.5V and 15pF load |                            |
| Rise and fall times for ACMOS (measured 10% to 90%) |                    |     | 10<br>6<br>3       | ns<br>ns<br>ns    | 1.0 to 23.9 MHz<br>24.0 to 79.9 MHz<br>80.0 to 125.0MHz                  |                            |
| Duty cycle  | 45<br>40           |     | 55<br>60           | %<br>%            | @ 50% Vs< 15 MHz<br>@ 50% Vs > 15 MHz                                    |                            |
| <b>Signal</b>                                       | <b>TTL</b>         |     |                    |                   |  | <b>RFT</b>                 |
| Load  |                    |     | 10                 |                   |  |                            |
| Signal Level (Vol)                                  |                    |     | 0.5                | VDC               | Vs= 5.0V and 15pF load   |                            |
| Signal Level (Voh)                                  | 4.5                |     |                    | VDC               | Vs= 5.0V and 15pF load   |                            |
| Rise and fall times for TTL (measured 0.8V to 2.0V) |                    |     | 5<br>3             | ns<br>ns          | 1.0 to 23.9 MHz<br>24 to 125 MHz   |                            |
| Duty Cycle  | 45<br>40           |     | 55<br>60           | %<br>%            | @ 1.4V < 15 MHz<br>@ 1.4V > 15 MHz                                       |                            |
| <b>Signal</b>                                       | <b>LVPECL</b>      |     |                    |                   |  | <b>RFP</b>                 |
| Load  |                    |     | 50                 | Ω                 | Into Vcc-2V or Thevenin Equivalent                                       |                            |
| Signal Level (Vol)                                  |                    |     | Vs -1.62           | VDC               | -40 ... +85°C operating temp   |                            |
| Signal Level (Voh)                                  | Vs- 1.025          |     |                    | VDC               | -40 ... +85°C operating temp   |                            |
| Rise and fall times (measured @ 20% to 80%)         |                    |     | 1000<br>600        | ps<br>ps          | <100 MHz<br>> 100 MHz  |                            |
| Duty cycle LVPECL                                   | 45                 |     | 55                 | %                 | @ 50% Vdd  |                            |
| Jitter (rms)  |                    |     | 10<br>0.5          | ps<br>ps          | BW = 10Hz to 20 MHz<br>BW = 12 kHz to 20 MHz                             |                            |
| Period Jitter (pk-pk)                               |                    |     | 40                 | ps                | 10,000 Samples - Rising edge   |                            |
| <b>Signal</b>                                       | <b>LVDS</b>        |     |                    |                   |  | <b>RFL</b>                 |
| Load  | 60                 | 100 | 140                | Ω                 | Between outputs  |                            |
| Signal Level (Vol)                                  |                    | 1.2 |                    | VDC               |  |                            |
| Signal Level (Voh)                                  |                    | 1.4 |                    | VDC               |  |                            |
| Differential Voltage (Vod)                          | 240                | 330 | 460                | mVpeak            |  |                            |
| Common Mode (Offset) Voltage (Vos)                  | 1.125              | 1.2 | 1.375              | V                 |  |                            |
| Start-up Time                                       |                    |     | 10                 | mS                |  |                            |
| Rise and fall times                                 |                    | 600 | 1000               | ps                | measured @ 20% to 80% of Vod   |                            |
| Duty cycle  | 45                 |     | 55                 | %                 | @ 50% of Vod   |                            |
| Jitter (rms)  |                    |     | 5<br>1             | ps<br>ps          | BW = 10Hz to 20 MHz<br>BW = 12 kHz to 20 MHz                             |                            |
| Period Jitter (pk-pk)                               |                    |     | 40                 | ps                | 10,000 Samples - Rising edge   |                            |

## Additional Parameters

| Screening                  | Vectron Verification <sup>9</sup>  |   | V |
|----------------------------|--|---|---|
| Screening                  | Class B, MIL-PRF-55310, Rev.D  |   | B |
| Output Enable <sup>6</sup> | Logic "0" input = Outputs disabled (Tri-state)<br>Logic "1" or floating input = Outputs enabled) | Standard (All outputs)                    |   |
|                            | Logic "0" or floating input = Outputs enabled<br>Logic "1" input = Outputs disabled (Tri-state)  | Custom (Contact factory for availability) |   |
| Weight                     | < 2 grams  |   |   |
| Processing & Packing       | Handling & processing note   |   |   |

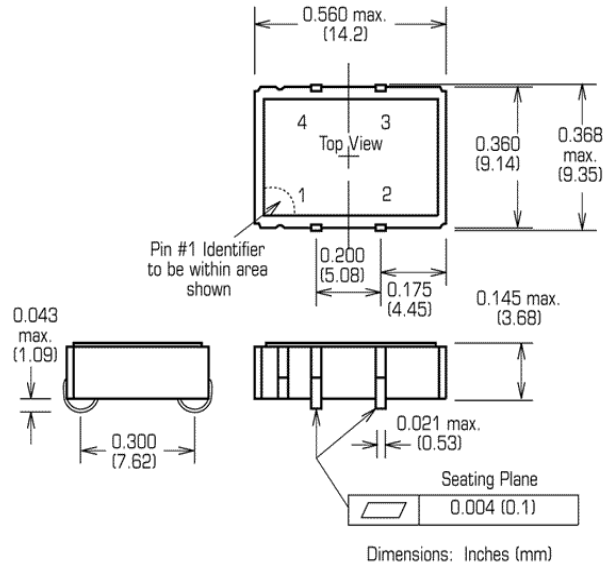
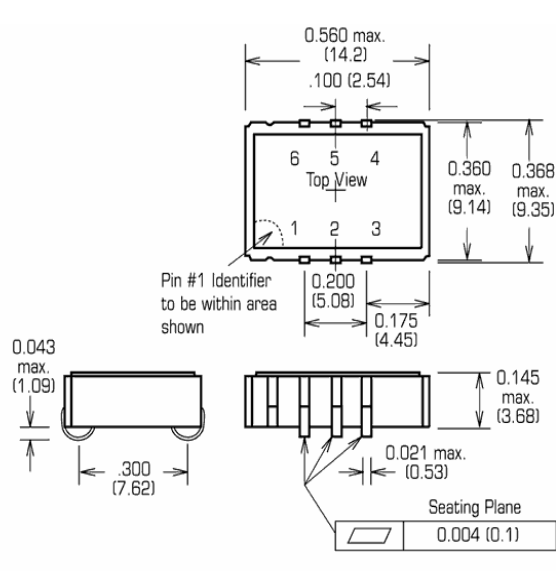
## Standard Environmentals

| Parameter                  | Test Condition  |
|----------------------------|---|
| Vibration                  | MIL-STD-202, Method 204, Condition G (30 G, 10Hz-2000Hz)    |
| Shock                      | MIL-STD-202, Method 213, Condition I (100 G, 6ms, Sawtooth) |
| Acceleration               | MIL-STD-883, Method 2001, Condition A (5000 G, Y1 Plane)    |
| Temperature Cycling        | MIL-STD-883, Method 1010, Condition B                       |
| Thermal Shock              | MIL-STD-883, Method 107, Condition B                        |
| Solderability              | MIL-STD-202, Method 208                                     |
| Leak Test (Fine and Gross) | MIL-STD-883, Method 1014, Condition A1 and C1               |

## Absolute Maximum Ratings

| Parameter                  | Min | Typ | Max  | Units | Condition |
|----------------------------|-----|-----|------|-------|-----------|
| Supply voltage (Vs)        |     |     | 7.0  | V     | Vs=5.0VDC |
|                            |     |     | 7.0  | V     | Vs=3.3VDC |
| Operable temperature range | -55 |     | +125 | °C    |           |
| Storage temperature range  | -62 |     | +125 | °C    |           |

## Enclosures

| Type A – AC MOS or TTL  |                                     |                     | Type B – LVPECL or LVDS  |   |                     |
|---|-------------------------------------|---------------------|--|---|---------------------|
| Package Codes:  |                                     |                     |  |   |                     |
| Codes   | Height                              | Stand-off           | Codes  | Height  | Stand-off           |
| A1 = 4 leads  | 0.188 max<br>(4.77)                 | 0.043 max<br>(1.09) | B1 = 6 leads   | 0.188 max<br>(4.77)   | 0.043 max<br>(1.09) |
| E1 = Enable/Disable pin 1<br>X = N/C pin 1  |                                     |                     | E1 = Enable/Disable pin 1<br>E2 = Enable/Disable pin 2<br>X = N/C pin 1 and pin 2                                  |   |                     |
| T = Tinned J leads <sup>8</sup><br>X = No Tinning   |                                     |                     | T = Tinned J leads <sup>8</sup><br>X = No Tinning  |   |                     |
|  <p>Dimensions: Inches (mm)</p> |                                     |                     |  <p>Dimensions: Inches (mm)</p> |   |                     |
| Pin Connections   |                                     |                     | Pin Connections  |   |                     |
| 1 – Enable/Disable or N/C<br>2 – Ground (case)  | 3 – RF Output<br>4 – Supply Voltage |                     | 1 – Enable/Disable or N/C<br>2 – N/C<br>3 – Ground (Case)  | 4 – RF Output<br>5 – Complementary Output<br>6 – Supply Voltage |                     |

## How to Order this Product: <sup>10</sup>

| Step 1 Use this worksheet to forward the following information to your factory representative (example follows): |                |                                     |                     |                |                |              |                     |              |
|--|----------------|-------------------------------------|---------------------|----------------|----------------|--------------|---------------------|--------------|
| Model  | Stability Code | Initial Accuracy Code (if required) | Supply Voltage Code | RF Output Code | Screening Code | Package Code | Enable/Disable Code | Tinning Code |
| C1300  | C505           | T505                                | SV033               | RFA            | V              | A1           | E1                  | T            |

| Step 2 The factory representative will then respond with a Vectron Part Number in the following configuration: |                                   |      |                                    |
|--|-----------------------------------|------|------------------------------------|
| Model  | Package Code                      | Dash | Dash Number                        |
| C1300  | [Customer Specified Package Code] | -    | [Factory Generated 4 digit number] |

Typical P/N C1300A1-0001

### Notes:

- 1 Contact factory for improved stabilities or additional product options. Not all options and codes are available at all RF outputs and frequencies.
- 2 Unless otherwise stated all values are valid after warm-up time and refer to typical conditions for supply voltage, frequency control voltage, load, temperature (25°C).
- 3 Phase noise degrades with increasing output frequency.
- 4 Subject to technical modification.
- 5 Contact factory for availability.
- 6 Contact factory for other options.
- 7 Overall stabilities do not require an initial accuracy code.
- 8 Leads tinned IAW Vectron International standard procedure (GR-37409).
- 9 Vectron Verification IAW Vectron International standard process (HK-69314).
- 10 Please be sure to specify nominal frequency.