

## Typical Applications

Base Stations  
 Digital Switching  
 Synthesizers  
 Test Equipment

## Features

Standard Package  
 Low Aging  
 AT-Cut and SC-Cut Crystal Options  
 Fast Warm-up

## Previous Vectron Model Numbers

OCO100, 4598, MC2001 Series

## Frequency range

5 MHz – 40 MHz

## Standard frequencies

10; 16.384 MHz



## Frequency stabilities<sup>1</sup> [AT Cut Crystal – Standard]

| Parameter                                                | Min                        | Typ | Max.                       | Units                    | Operating temp range                                           | Ordering Code                |
|----------------------------------------------------------|----------------------------|-----|----------------------------|--------------------------|----------------------------------------------------------------|------------------------------|
| vs. operating temperature range<br>(Referenced to +25°C) | -30<br>-80<br>-100<br>-200 |     | +30<br>+80<br>+100<br>+200 | ppb<br>ppb<br>ppb<br>ppb | 0 ... +70°C<br>-20 ... +70°C<br>-40 ... +70°C<br>-40 ... +85°C | C308<br>D808<br>E107<br>F207 |
| Parameter                                                | Min                        | Typ | Max.                       | Units                    | Condition                                                      |                              |
| Initial tolerance                                        | -300                       |     | +300                       | ppb                      | at time of shipment, nominal EFC                               |                              |
| vs. supply voltage change                                | -5                         |     | +5                         | ppb                      | V <sub>S</sub> ± 5%                                            |                              |
| vs. load change                                          | -5                         |     | +5                         | ppb                      | Load ± 5%                                                      |                              |
| vs. aging /1 day                                         | -2.0                       |     | +2.0                       | ppb                      | after 72 hours of operation                                    |                              |
| vs. aging /1 Year                                        | -500                       |     | +500                       | ppb                      | after 72 hours of operation                                    |                              |
| vs. aging / year (following Years)                       | -250                       |     | +250                       | ppb                      |                                                                |                              |
| Warm-up Time                                             |                            |     | 3                          | minutes                  | to ± 100ppb of final frequency (1 hour reading) @ +25°C        |                              |

## Frequency stabilities<sup>1</sup> [SC Cut Crystal – Option]

| Parameter                                                | Min                      | Typ | Max.                     | Units                    | Operating temp range                                           | Ordering Code                |
|----------------------------------------------------------|--------------------------|-----|--------------------------|--------------------------|----------------------------------------------------------------|------------------------------|
| vs. operating temperature range<br>(Referenced to +25°C) | -10<br>-15<br>-20<br>-30 |     | +10<br>+15<br>+20<br>+30 | ppb<br>ppb<br>ppb<br>ppb | 0 ... +70°C<br>-20 ... +70°C<br>-40 ... +70°C<br>-40 ... +85°C | C108<br>D158<br>E208<br>F308 |
| Parameter                                                | Min                      | Typ | Max.                     | Units                    | Condition                                                      |                              |
| Initial tolerance                                        | -100                     |     | +100                     | ppb                      | at time of shipment, nominal EFC                               |                              |
| vs. supply voltage change                                | -5.0                     |     | +5.0                     | ppb                      | V <sub>S</sub> ± 5%                                            |                              |
| vs. load change                                          | -5.0                     |     | +5.0                     | ppb                      | Load ± 5%                                                      |                              |
| vs. aging /1 day                                         | -1.0                     |     | +1.0                     | ppb                      | after 72 hours of operation                                    |                              |
| vs. aging /1 Year                                        | -100                     |     | +100                     | ppb                      | after 72 hours of operation                                    |                              |
| vs. aging / year (following Years)                       | -50                      |     | +50                      | ppb                      |                                                                |                              |
| Warm-up Time                                             |                          |     | 3                        | minutes                  | to ± 10ppb of final frequency (1 hour reading) @ +25°C         |                              |

## Supply voltage (Vs)

| Parameter                 | Min   | Typ  | Max.       | Units          | Condition                              | Ordering Code |
|---------------------------|-------|------|------------|----------------|----------------------------------------|---------------|
| Supply voltage [Standard] | 4.75  | 5    | 5.25       | VDC            |                                        | SV050         |
| Supply voltage [Option]   | 11.4  | 12.0 | 12.6       | VDC            |                                        | SV120         |
| Supply voltage [Option]   | 3.135 | 3.3  | 3.465      | VDC            |                                        | SV033         |
| Power consumption         |       |      | 3.5<br>1.2 | Watts<br>Watts | during warm-up<br>steady state @ +25°C |               |

## RF output

| Parameter          | Min      | Typ  | Max. | Units | Condition                                                                                                                                               | Ordering Code |
|--------------------|----------|------|------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Signal [Standard]  | HCMOS    |      |      |       |                                                                                                                                                         | RFH           |
| Load               |          | 15   |      | pF    | with Vs=12.0V or 5.0V and 15pF load<br>with Vs=3.3V and 15pF load<br>with Vs=12.0V or 5.0V and 15pF load<br>with Vs=3.3V and 15pF load<br>@ (Voh-Vol)/2 |               |
| Signal Level (Vol) |          |      | 0.5  | VDC   |                                                                                                                                                         |               |
| Signal Level (Voh) | 4.5      |      | 0.3  | VDC   |                                                                                                                                                         |               |
| Duty cycle         | 3.0      |      |      | VDC   |                                                                                                                                                         |               |
|                    | 45       |      | 55   | %     |                                                                                                                                                         |               |
| Signal [Option]    | Sinewave |      |      |       |                                                                                                                                                         | RFS           |
| Load               |          | 50   |      | Ω     | 50 Ohm load<br>50 Ohm load                                                                                                                              |               |
| Output Power       | +3.0     | +5.5 | +8.0 | dBm   |                                                                                                                                                         |               |
| Harmonics          |          |      | -30  | dBc   |                                                                                                                                                         |               |

## Frequency Tuning (EFC)

| Parameter             | Min                   | Typ   | Max. | Units | Condition           | Ordering Code <sup>5</sup> |
|-----------------------|-----------------------|-------|------|-------|---------------------|----------------------------|
| Tuning Range          | Fixed OCXO; No adjust |       |      |       |                     | 0                          |
| Tuning Range          | ±0.75                 | ±1.25 | ±2.0 | ppm   | with SC Cut Crystal | 1                          |
|                       | ±6.0                  | ±8.0  | ±12  | ppm   | with AT Cut Crystal | 1                          |
| Linearity             |                       |       | 20   | %     |                     |                            |
| Tuning Slope          | Positive              |       |      |       |                     |                            |
| Control Voltage Range | 0.0                   | 2.0   | 4.0  | VDC   | with Vs=5.0VDC      |                            |
|                       | 0.0                   | 2.5   | 5.0  | VDC   | with Vs=12VDC       |                            |
|                       | 0.0                   | 1.5   | 3.0  | VDC   | with Vs=3.3VDC      |                            |

## Reference Voltage Output (Vref)

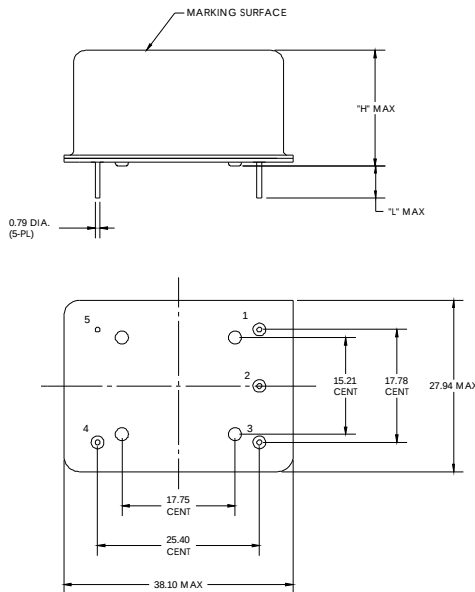
| Parameter         | Min  | Typ | Max. | Units | Condition      |
|-------------------|------|-----|------|-------|----------------|
| Reference Voltage | 3.92 | 4.0 | 4.08 | VDC   | with Vs=5.0VDC |
|                   | 4.9  | 5.0 | 5.1  | VDC   | with Vs=12VDC  |
|                   | 2.75 | 2.8 | 2.85 | VDC   | with Vs=3.3VDC |

## Additional parameters

| Parameter                | Min                        | Typ | Max. | Units  | Condition |
|--------------------------|----------------------------|-----|------|--------|-----------|
| Phase Noise <sup>3</sup> |                            |     | -85  | dBc/Hz | 1 Hz      |
|                          |                            |     | -120 | dBc/Hz | 10 Hz     |
|                          |                            |     | -140 | dBc/Hz | 100 Hz    |
|                          |                            |     | -145 | dBc/Hz | 1 kHz     |
|                          |                            |     | -150 | dBc/Hz | 10 kHz    |
| Phase Noise <sup>3</sup> |                            |     | -75  | dBc/Hz | 1 Hz      |
|                          |                            |     | -100 | dBc/Hz | 10 Hz     |
|                          |                            |     | -130 | dBc/Hz | 100 Hz    |
|                          |                            |     | -140 | dBc/Hz | 1 kHz     |
|                          |                            |     | -150 | dBc/Hz | 10 kHz    |
| Weight                   |                            |     | 3.0  | g      |           |
| Processing & Packing     | Handling & processing note |     |      |        |           |

## Enclosures

| Type A          |            |                |
|-----------------|------------|----------------|
| Package Codes:  |            |                |
| Code            | Height "H" | Pin Length "L" |
| A1              | 19.00      | 5.0            |
| A2              | 15.00      | 5.0            |
| A3 <sup>5</sup> | 12.70      | 5.0            |

Dimensions: mm

| Pin Connections |                                          |  |  |  |  |
|-----------------|------------------------------------------|--|--|--|--|
| 1               | Electronic Frequency Control Input (EFC) |  |  |  |  |
| 2               | Reference Voltage Output                 |  |  |  |  |
| 3               | Supply Voltage Input (Vs)                |  |  |  |  |
| 4               | RF Output                                |  |  |  |  |
| 5               | Ground (Case)                            |  |  |  |  |

## Absolute Maximum Ratings

| Parameter                  | Min | Typ | Max. | Units | Condition            |
|----------------------------|-----|-----|------|-------|----------------------|
| Supply voltage (Vs)        |     |     | 7.0  | V     | with Vs=5.0VDC       |
|                            |     |     | 15.0 | V     | with Vs=12VDC        |
|                            |     |     | 7.0  | V     | with Vs=3.3VDC       |
| Output Load                |     |     | 50   | pF    | with HCMOS signal    |
|                            |     |     | 25   | Ohms  | with Sinewave signal |
| Operable temperature range | -55 |     | +85  | °C    |                      |
| Storage temperature range  | -55 |     | +125 | °C    |                      |

## How to order this product:

| Step 1 | Use this worksheet to forward the following information to your factory representative : |                     |                |              |                           |           |
|--------|------------------------------------------------------------------------------------------|---------------------|----------------|--------------|---------------------------|-----------|
| Model  | Stability Code                                                                           | Supply Voltage Code | RF Output Code | Package Code | Frequency Control/ Enable | Frequency |
| C4600  | D808                                                                                     | SV050               | RFH            | A1           | 1                         | 5MHz      |

### Vs.operat. Temp. Range

|       |         |              |
|-------|---------|--------------|
| C308: | ±30ppb  | 0 ...+70°C   |
| D808: | ±80ppb  | -20 ...+70°C |
| E107: | ±100ppb | -40 ...+70°C |
| F207: | ±200ppb | -40 ...+85°C |
| C108: | ±10ppb  | 0 ...+70°C   |
| D158: | ±15ppb  | -20 ...+70°C |
| E208: | ±20ppb  | -40 ...+70°C |
| F208: | ±30ppb  | -40 ...+85°C |

### Signal:

RFH: HCMOS  
RFS: Sinewave

### Tuning Range:

0: Fixed OCXO; No adjust  
1: ±0.75 ppm...±2.0 ppm(SC)  
1: ±6.0 ppm...±12.0 ppm(AT)

### Supply:

SV033: 3.3V  
SV050: 5V  
SV120: 12V

### Enclosure:

A1: H: 19.0 L: 5  
A2: H: 15.0 L: 5  
A3: H: 12.7 L: 5

|        |                                                                                                          |                                   |      |                                    |
|--------|----------------------------------------------------------------------------------------------------------|-----------------------------------|------|------------------------------------|
| Step 2 | The factory representative will then respond with a Vectron Model Number in the following configuration: |                                   |      |                                    |
| Model  |                                                                                                          | Package Code                      | Dash | Dash Number                        |
| C4600  |                                                                                                          | [Customer Specified Package Code] | -    | [Factory Generated 4 digit number] |

Typical P/N = C4600A1-0001

### Notes:

- 1 Contact factory for improved stabilities or additional product options. Not all options and codes are available at all 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.

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