

## Typical Applications

PCS Base Stations  
 Land Mobile Radio  
 Cellular Telephony  
 Radio in the Local Loop

## Features

Wide Frequency range  
 Mechanical control  
 EFC Standard  
 Standard Surface Mount Package



## Previous Vectron Model Numbers

STO150; STO150S3;

## Frequency range

10 MHz – 100 MHz

## Standard frequencies

37.72102; 64.0; 67.584 MHz

## Frequency stabilities<sup>1</sup> [ Standard TCXO]

| Parameter  | Min   | Typ | Max. | Units | Operating temp range             | Ordering Code <sup>5</sup> |
|--|-------|-----|------|-------|----------------------------------|----------------------------|
| vs. operating temperature range<br>(Referenced to +25°C) | -2.0  |     | +2.0 | ppm   | -40 ... +85°C                    | F206                       |
|  | -1.0  |     | +1.0 | ppm   | -40 ... +85°C                    | F106                       |
|  | -2.0  |     | +2.0 | ppm   | -20 ... +70°C                    | D206                       |
|  | -1.0  |     | +1.0 | ppm   | -20 ... +70°C                    | D106                       |
|  | -1.0  |     | +1.0 | ppm   | 0 ... +50°C                      | B106                       |
|  | -0.5  |     | +0.5 | ppm   | 0 ... +50°C                      | B507                       |
| Parameter  | Min   | Typ | Max. | Units | Condition                        |                            |
| Initial tolerance  | - 1.0 |     | +1.0 | ppm   | at time of shipment, nominal EFC |                            |
| vs. supply voltage change                                | - 0.2 |     | +0.2 | ppm   | V <sub>S</sub> ± 5%              |                            |
| vs. load change  | - 0.2 |     | +0.2 | ppm   | Load ± 10%                       |                            |
| vs aging /1. Year  | - 1.0 |     | +1.0 | ppm   |                                  |                            |

## Frequency stabilities<sup>1</sup> [ Stratum 3 TCXO]

| Parameter  | Min   | Typ | Max.  | Units | Operating temp range  | Ordering Code <sup>5</sup> |
|--|-------|-----|-------|-------|---|----------------------------|
| vs. operating temperature range<br>(Referenced to +25°C) | -0.8  |     | +0.8  | ppm   | -40 ... +85°C   | F807                       |
|  | -0.28 |     | +0.28 | ppm   | -30 ... +85°C   | G287                       |
|  | -0.8  |     | +0.8  | ppm   | -20 ... +70°C   | D807                       |
|  | -0.28 |     | +0.28 | ppm   | -20 ... +70°C   | D287                       |
|  | -0.28 |     | +0.28 | ppm   | 0 ... +50°C   | B287                       |
| Parameter  | Min   | Typ | Max.  | Units | Condition   |                            |
| Initial tolerance  | - 1.0 |     | +1.0  | ppm   | at time of shipment, nominal EFC  |                            |
| vs. supply voltage change                                | - 0.2 |     | +0.2  | ppm   | V <sub>S</sub> ± 5%   |                            |
| vs. load change  | - 0.1 |     | +0.1  | ppm   | Load ± 10%  |                            |
| vs aging /15 Years                                       | - 2.5 |     | +2.5  | ppm   |   |                            |
| overall tolerance  | -4.6  |     | +4.6  | ppm   | (*Stratum 3 per GR-1244-CORE:<br><±4.6 ppm for all causes and 20 years aging, Holdover:<br><±0.37 ppm over 24 hours (Code: D287 & B287) |                            |

## Supply voltage (Vs)

| Parameter                 | Min   | Typ | Max.  | Units | Condition                     | Ordering Code <sup>5</sup> |
|---------------------------|-------|-----|-------|-------|-------------------------------|----------------------------|
| Supply voltage [Standard] | 3.135 | 3.3 | 3.465 | VDC   |                               | SV033                      |
| Supply voltage [Option]   | 4.75  | 5   | 5.25  | VDC   |                               | SV050                      |
| Current consumption       |       |     | 60    | mA    | steady state @ +25°C & 3.3VDC |                            |
|                           |       |     | 50    | mA    | steady state @ +25°C & 5.0VDC |                            |

## RF output

| Parameter          | Min   | Typ | Max. | Units | Condition   | Ordering Code <sup>5</sup> |
|--------------------|-------|-----|------|-------|---|----------------------------|
| Signal [Standard]  | HCMOS |     |      |       |   | RFH                        |
| Load               | 13.5  | 15  | 16.5 | pF    | with Vs= 5.0V and 15pF load<br>with Vs=3.3V and 15pF load<br>with Vs= 5.0V and 15pF load<br>with Vs=3.3V and 15pF load<br><br>@ (Voh-Vol)/2 |                            |
| Signal Level (Vol) |       |     | 0.5  | VDC   |   |                            |
|                    |       |     | 0.3  | VDC   |   |                            |
| Signal Level (Voh) | 4.5   |     |      | VDC   |   |                            |
|                    | 3.0   |     |      | VDC   |   |                            |
| Rise and Fall time |       |     | 5    | ns    |   |                            |
| Duty cycle         | 40    | 50  | 60   | %     |   |                            |
| Subharmonics       | -45   |     |      | dBc   |   |                            |

## Frequency Tuning (EFC)

| Parameter                     | Min      | Typ   | Max.   | Units | Condition        |
|-------------------------------|----------|-------|--------|-------|------------------|
| Mechanical (No EFC)           | ± 3.0    |       |        |       |                  |
| Tuning Range                  | ± 8.0    | ±14.0 | ± 20.0 | ppm   | Standard Version |
|                               | ± 5.0    | ±12.0 | ± 20.0 | ppm   | S3 Version       |
| Linearity                     |          |       | 10     | %     |                  |
| Tuning Slope                  | Positive |       |        |       |                  |
| Control Voltage Range         | 0.3      | 1.65  | 3.0    | VDC   | with Vs=3.3VDC   |
|                               | 0.5      | 2.5   | 4.5    | VDC   | with Vs=5.0VDC   |
| Freq. control input impedance | 10       |       |        | kΩ    |                  |

## Additional parameters

| Parameter                | Min                        | Typ  | Max. | Units  | Condition         |
|--------------------------|----------------------------|------|------|--------|-------------------|
| Phase Noise <sup>3</sup> |                            | -70  |      | dBc/Hz | 10 Hz @ 67.584MHz |
|                          |                            | -105 |      | dBc/Hz | 100 Hz            |
|                          |                            | -130 |      | dBc/Hz | 1 kHz             |
|                          |                            | -145 |      | dBc/Hz | 10 kHz            |
|                          |                            | -150 |      | dBc/Hz | 100 kHz           |
| Weight                   |                            |      | 5    | g      |                   |
| Processing & Packing     | Handling & processing note |      |      |        |                   |

## Absolute Maximum Ratings

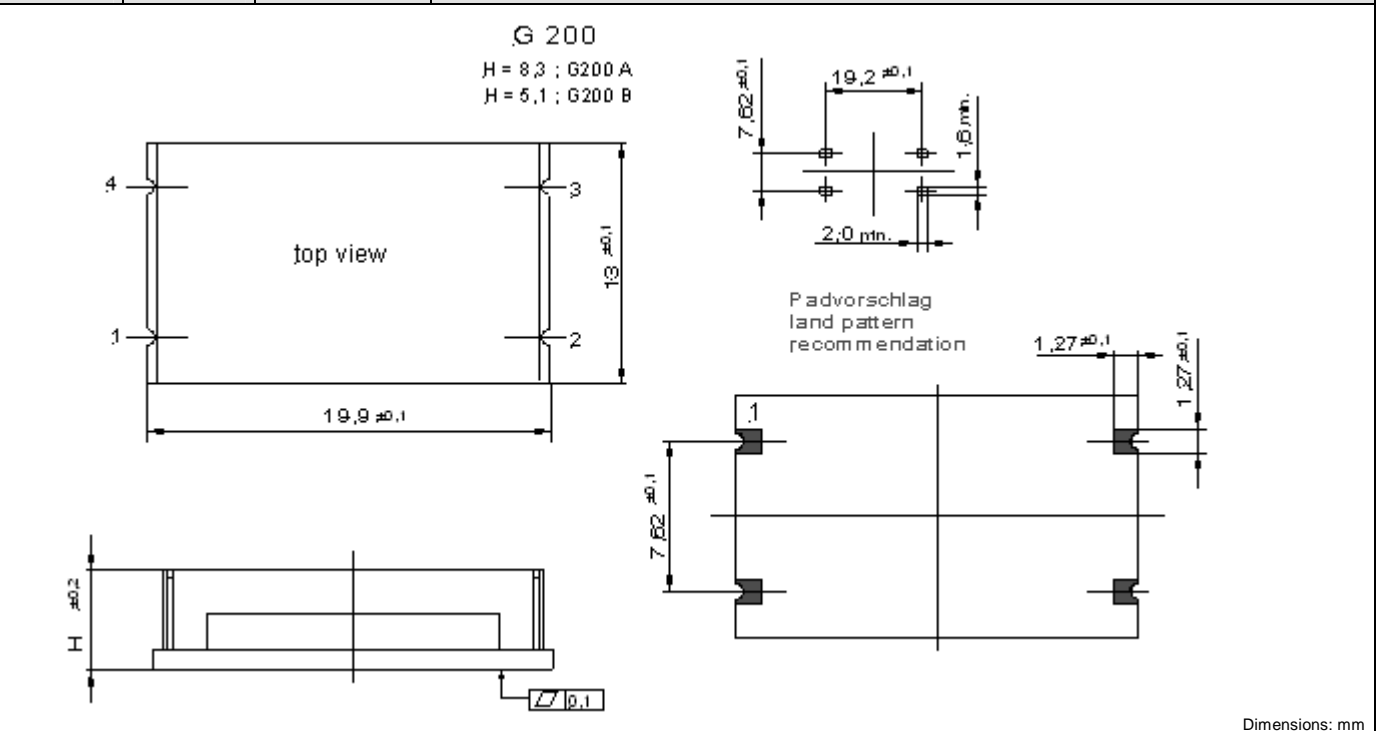
| Parameter                  | Min | Typ | Max. | Units | Condition |
|----------------------------|-----|-----|------|-------|-----------|
| Supply voltage (Vs)        |     |     | 6.0  | V     |           |
| Control Voltage            | 0   |     | Vs   | V     |           |
| Maximum output load @ CMOS |     |     | 40   | pF    |           |
| Operable temperature range | -40 |     | +85  | °C    |           |
| Storage temperature range  | -55 |     | +125 | °C    |           |

## Enclosures

### Type G200

Package Codes:

| Code | Height "H" | Pin Length "L" |       |
|------|------------|----------------|-------|
| A1   | 5.1        | NA             | G200A |
| A2   | 5.1        | NA             | G200B |



#### Pin Connections

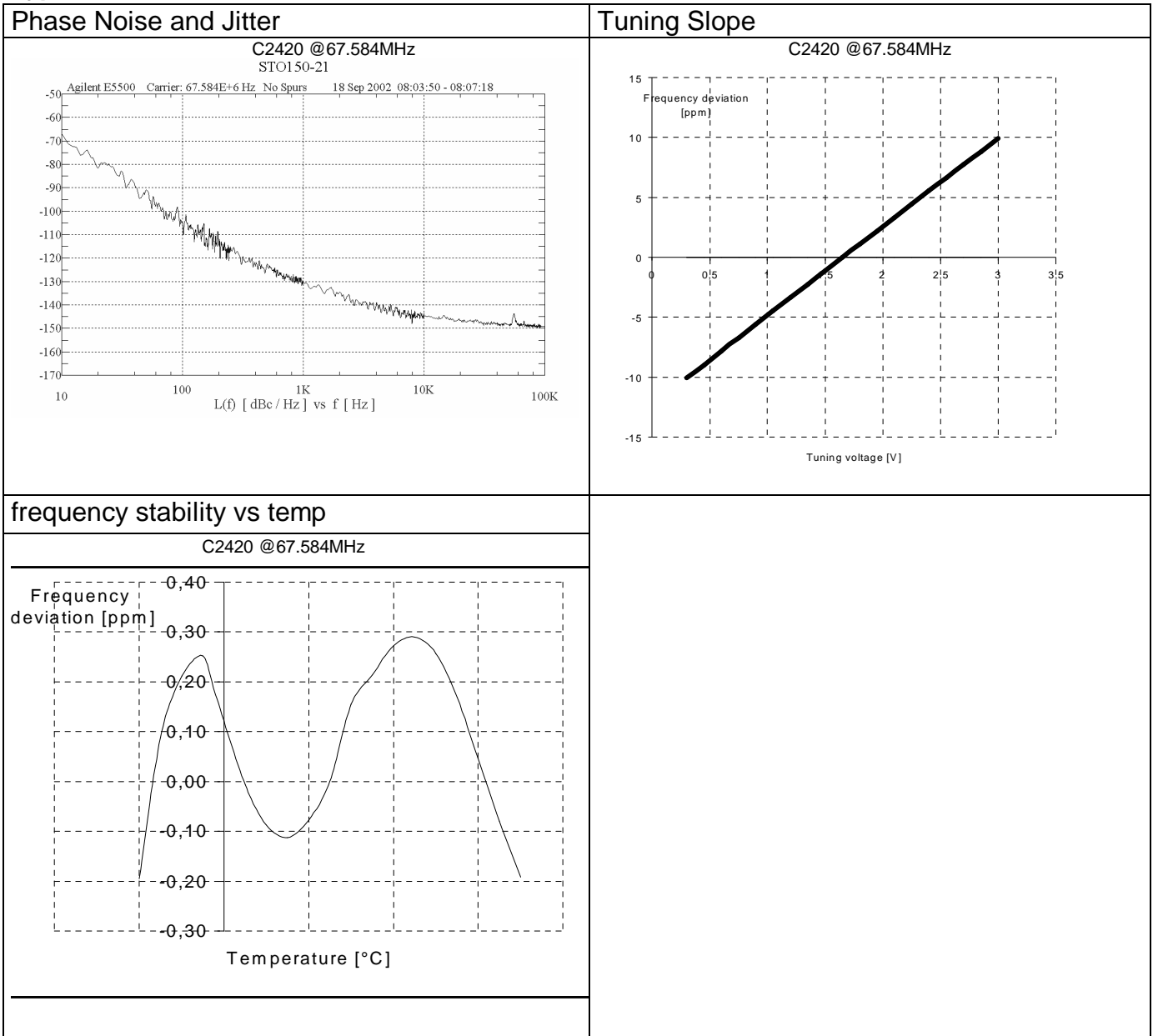
- 1 Voltage Control (V<sub>c</sub>)
- 2 GND, case
- 3 RF output
- 4 Supply Voltage (V<sub>s</sub>)

Outline Drawing: G200

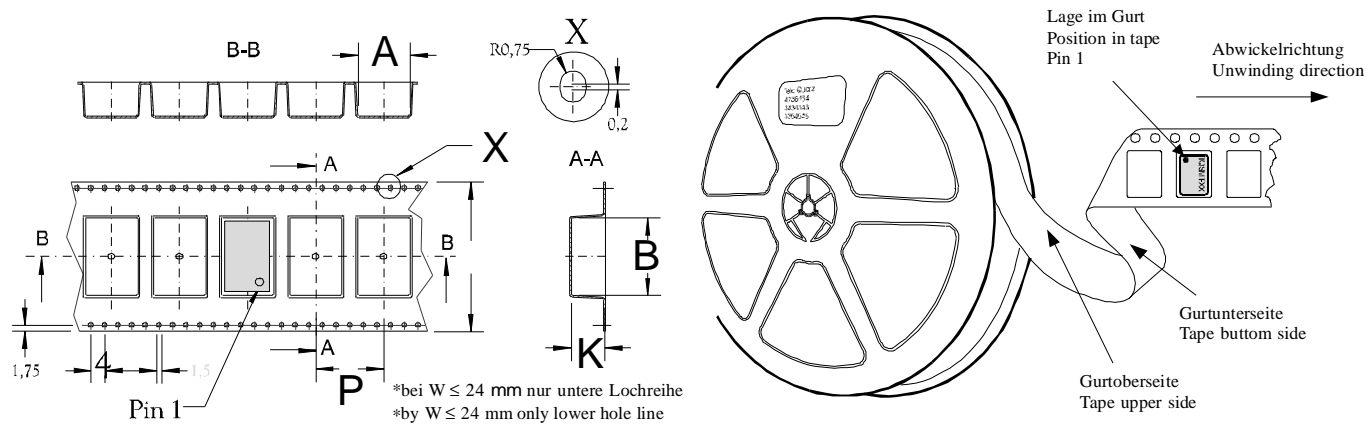
#### Marking

 C2420A1-xxxx  
 Frequency  
 \* C AYYWW

## Typical measurement data



## Standard Shipping Method

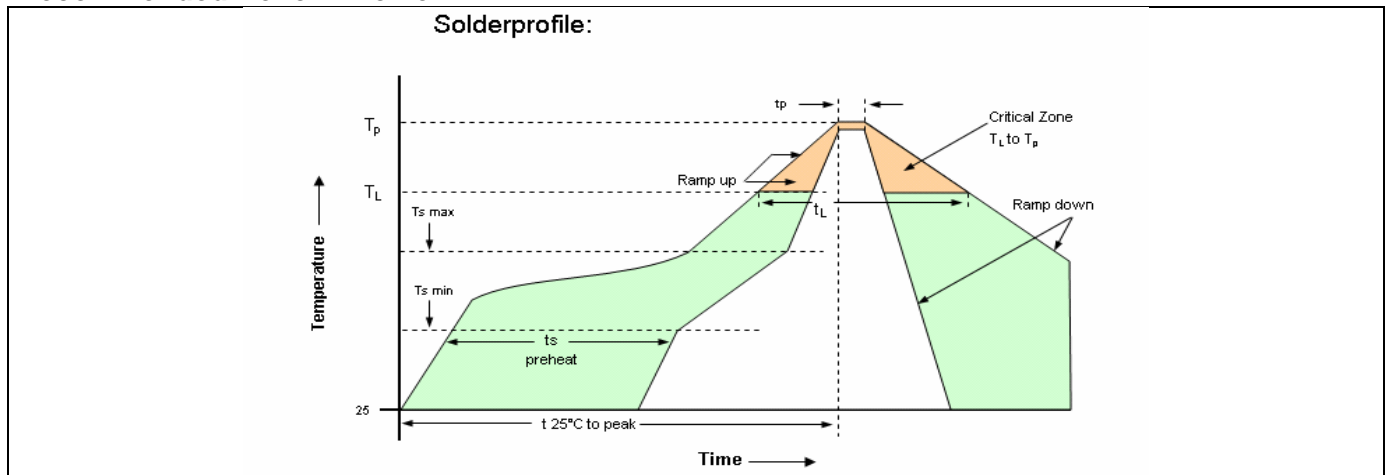


\*bei  $W \leq 24$  mm nur untere Lochreihe  
\*by  $W \leq 24$  mm only lower hole line

Production tolerance complying DIN IEC 286-3

| Enclosure Type | Tape width W [mm] | Quantity per meter | Quantity per reel | Dimension P |
|----------------|-------------------|--------------------|-------------------|-------------|
| G200           | 32                | 50                 | 380               | 20          |

## Recommended Reflow Profile



| Profile Feature  | Pb-Free Assembly /Sn-Pb Assembly | Profile Feature  | Pb-Free Assembly /Sn-Pb Assembly |
|--|----------------------------------|--|----------------------------------|
| Average ramp-up rate (T <sub>L</sub> to T <sub>p</sub> )   | 3°C/second max.                  | Time 25°C to Peak Temperature  | 8 minutes max.                   |
| Preheat<br>-Temperature Min T <sub>smin</sub> )<br>-Temperature Min T <sub>smax</sub> )<br>-Time (min to max) (ts) | 150°C<br>200°C<br>60-180 seconds | Time maintained above<br>- Temperature (T <sub>L</sub> )<br>- Time (t <sub>L</sub> ) | 217°C<br>60-150 seconds          |
| T <sub>smax</sub> to T <sub>L</sub> - Ramp-up Rate   | 3°C/second max.                  |  |                                  |
| Time maintained above - Temperature (T <sub>L</sub> )<br>- Time (t <sub>L</sub> )                                  | 217°C<br>60-150 seconds          | Time within 5°C of actual<br>Peak Temperature (tp)                                   | 20-40 seconds                    |
| Peak Temperature (T <sub>p</sub> )   | max 260°C                        | Ramp-down Rate   | 6°C/second max.                  |

Note: All temperatures refer to topside of the package, measured on the package body surface.

## How to order this product:

| Model | Stability Code | Supply Voltage Code | RF Output Code | Package Code | Frequency |
|-------|----------------|---------------------|----------------|--------------|-----------|
| C2520 | F206           | SV033               | RFH            | A1           | 10MHz     |

### Vs.operat. Temp. Range

|      |          |               |
|------|----------|---------------|
| F206 | ±2.0ppm  | -40 ... +85°C |
| F106 | ±1.0ppm  | -40 ... +85°C |
| D206 | ±2.0ppm  | -20 ... +70°C |
| D107 | ±1.0ppm  | -20 ... +70°C |
| B106 | ±1.0ppm  | 0 ... +50°C   |
| B507 | ±0.5ppm  | 0 ... +50°C   |
| F807 | ±0.8ppm  | -40 ... +85°C |
| G287 | ±0.28ppm | -30 ... +85°C |
| D807 | ±0.8ppm  | -20 ... +70°C |
| D287 | ±0.28ppm | -20 ... +70°C |
| B287 | ±0.28ppm | 0 ... +50°C   |

### Supply:

SV050: 5V  
SV033: 3.3V

### Enclosure:

A1: G200A  
B1: G200B

### Signal:

RFH: HCMOS

### Notes:

- Contact factory for improved stabilities or additional product options. Not all options and codes are available at all frequencies.
- 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)
- Phase noise degrades with increasing output frequency.
- Subject to technical modification.
- Contact factory for availability.