

## Typical Applications

Base Stations  
 Test Equipment  
 Synthesizers  
 Digital Switching

## Previous Vectron Model Numbers

## Frequency range

## Standard frequencies

## Features

Surface Mount Package Optional  
 Reflow Process Compatible Optional  
 AT-Cut and SC-Cut Crystal Options  
 Low Profile Compact Package



OCO50, OCO1000, MC4004X4

6 MHz – 60 MHz

8.192; 10; 12, 12.8; 16.384;20; 32.768; 38.88MHz

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

Parameter	Min	Typ	Max.	Units	Operating temp range	Ordering Code
vs. operating temperature range (Referenced to +25°C)	-50		+50	ppb	-20 ... +70°C	D508
	-100		+100	ppb	-20 ... +70°C	D107
	-100		+100	ppb	-40 ... +85°C	F107
Parameter	Min	Typ	Max.	Units	Condition	
Initial tolerance	-500		+500	ppb	at time of shipment, nominal EFC	
vs. supply voltage change	-10		+10	ppb	V <sub>s</sub> ± 5%	
vs. load change	-10		+10	ppb	Load ± 5%	
vs. aging / day	-5.0		+5.0	ppb	after 30 days of operation	
vs. aging / year	-250		+250	ppb	after 30 days of operation	
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 (Referenced to +25°C)	-10		+10	ppb	-20 ... +70°C	D108
	-20		+20	ppb	-20 ... +70°C	D208
	-20		+20	ppb	-40 ... +85°C	F258
Parameter	Min	Typ	Max.	Units	Condition	
Initial tolerance	-200		+200	ppb	at time of shipment, nominal EFC	
vs. supply voltage change	-2.0		+2.0	ppb	V <sub>s</sub> ± 5%	
vs. load change	-5.0		+5.0	ppb	Load ± 5%	
vs. aging / day	-1.0		+1.0	ppb	after 30 days of operation	
vs aging / year	-75		+75	ppb	after 30 days of operation	
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			3.0	Watts	during warm-up	
			1.0	Watts	steady state @ +25°C	

## RF output

Parameter	Min	Typ	Max.	Units	Condition	Ordering Code
Signal [Standard]		HCMOS				RFH
Load		15		pF		
Signal Level (Vol)			0.5	VDC	with Vs=12.0V or 5.0V and 15pF load with Vs=3.3V and 15pF load with Vs=12.0V or 5.0V and 15pF load with Vs=3.3V and 15pF load @ (Voh-Vol)/2	
Signal Level (Voh)	4.5		0.3	VDC		
Duty cycle	3.0			VDC		
	45		55	%		

## Frequency Tuning (EFC)

Parameter	Min	Typ	Max.	Units	Condition
Tuning Range	±1.0	±1.75	±2.5	ppm	with SC Cut Crystal
	±3.0	±5.0	±8	ppm	with AT Cut Crystal
Linearity			5	%	
Tuning Slope	Positive				
Control Voltage Range	0.0	2.0	4.0	VDC	with Vs=5.0VDC
	0.0	2.0	4.0	VDC	with Vs=12VDC
	0.0	1.4	2.8	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>			-90	dBc/Hz	1 Hz with 10 MHz SC Cut
			-120	dBc/Hz	
			-140	dBc/Hz	
			-145	dBc/Hz	
			-150	dBc/Hz	
Phase Noise <sup>3</sup>			-75	dBc/Hz	1 Hz with 10 MHz AT Cut
			-105	dBc/Hz	
			-130	dBc/Hz	
			-140	dBc/Hz	
			-150	dBc/Hz	
Weight			14	g	
Processing & Packing	Handling & processing note				

## 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	
Operable temperature range	-55		+85	°C	
Storage temperature range	-55		+125	°C	

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**Enclosures**

Type A			Type B			Type C		
Package Codes:								
Code A1	Height "H" 10.5	Pin Length "L" 4.5 min.	Code B1	Height "H" 12.7	Pin Length "L" NA	Code C1 C2	Height "H" 11.3 15.0	Pin Length "L" NA NA
<p>H = 10.5 max.; G143 Standard H = 7.5 max.; G143 A Dimensions: mm</p>			<p>Dimensions: mm</p>			<p>Dimensions: mm</p>		
<p><b>Pin Connections</b></p> <ol style="list-style-type: none"> <li>Supply Voltage Input (Vs)</li> <li>RF Output</li> <li>Ground (Case)</li> <li>Electronic Frequency Control Input (EFC)</li> <li>N.C. or Reference Voltage Output</li> </ol> <p>Version with 7 pins available see Type B</p> <p>* Pin 5 must be remain unconnected.</p>			<p><b>Pin Connections</b></p> <ol style="list-style-type: none"> <li>Supply Voltage Input (Vs)</li> <li>RF Output</li> <li>Ground (Case)</li> <li>Electronic Frequency Control Input (EFC)</li> <li>N/C*</li> <li>RF Output Enable (Option)</li> <li>Reference Voltage Output</li> </ol> <p>*Pin 5 must be remain unconnected.</p>			<p><b>Pin Connections</b></p> <ol style="list-style-type: none"> <li>Electronic Frequency Control Input (EFC)</li> <li>Reference Voltage Output</li> <li>Supply Voltage Input (Vs)</li> <li>RF Output</li> <li>N/C*</li> <li>N.C. or RF Output Enable (Option)</li> <li>Ground (Case)</li> </ol> <p>*Pin 5 must be remain unconnected.</p>		

**Standard Shipping Method**

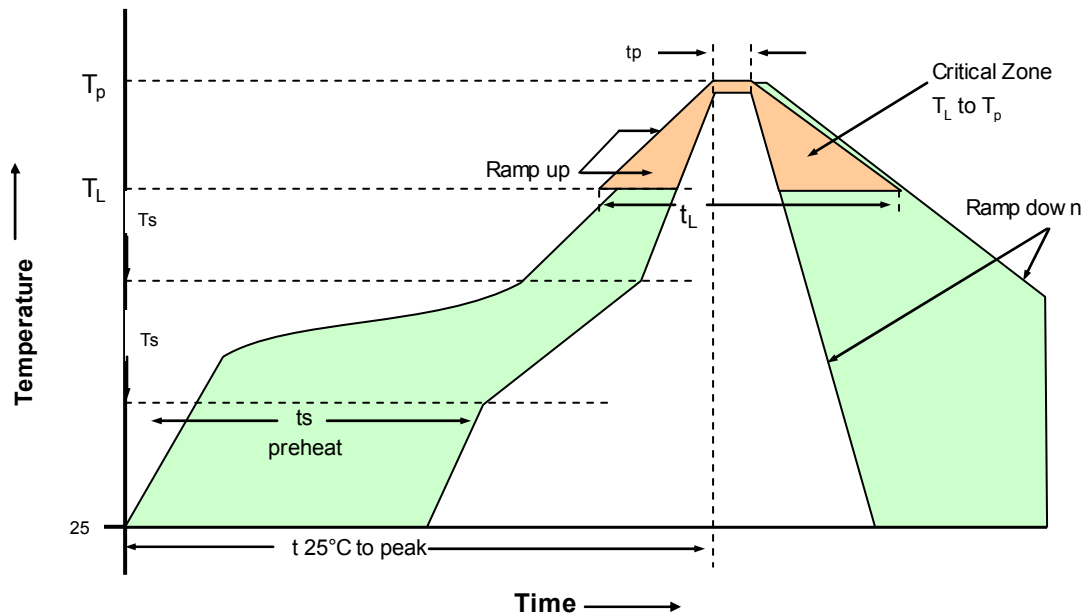
\*bei W ≤ 24 mm nur untere Lochreihe  
\*by W ≤ 24 mm only lower hole line

Production tolerance complying DIN IEC 286-3

Enclosure Type	Tape width W [mm]	Quantity per meter	Quantity per reel	Dimension P
Type B and C	44	37.5	280	32

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**Recommended Reflow Profile**



Profile Feature	Pb-Free Assembly/Sn-Pb Assembly
Average ramp-up rate ( $T_L$ to $T_p$ )	3°C/second max.
Preheat -Temperature Min $T_{s_{min}}$ -Temperature Min $T_{s_{max}}$ -Time (min to max) ( $t_s$ )	150°C 200°C 60-180 seconds
$T_{s_{max}}$ to $T_L$ - Ramp-up Rate	3°C/second max.
Time maintained above - Temperature ( $T_L$ ) - Time ( $t_L$ )	217°C 60-150 seconds
Peak Temperature ( $T_p$ )	max 260°C
Time within 5°C of actual Peak Temperature ( $t_p$ )	20-40 seconds
Ramp-down Rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.

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

## 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
C4500					
<i>Example: C4500</i>	<i>D107</i>	<i>SV050</i>	<i>RFH</i>	<i>A1</i>	<i>20MHz</i>

Step 2	The factory representative will then respond with a Corning Model Number in the following Configuration:			
Model	Package Code	Dash	Dash Number	
C4500	[Customer Specified Package Code]	-	[Factory Generated 4 digit number]	

Typical P/N = C4500A1-0001

### 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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