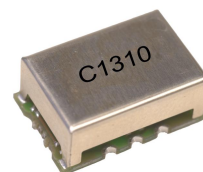


## Typical Applications

Base Stations  
 Test Equipment  
 Synthesizers

## Features

Surface Mount Package  
 Reflow Process Compatible  
 AT-Cut Crystal  
 SONET Minimum Clock Specification  
 Low Phase Noise  
 Tight Tolerances



## Frequency range

1 MHz – 700 MHz

## Standard frequencies

10; 20; 24.705; 30.720; 32.768; 50; 68.768; 76.8 MHz  
 77.76; 100; 125; 150; 155.52; 156.25; 175; 200 MHz  
 250; 280; 312.5; 340; 400; 622,08 MHz

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

Parameter	Min	Typ	Max.	Units	Operating temp range	Ordering Code <sup>5</sup>
vs. operating temperature range (Referenced to +25°C)	-10.0		+10.0	ppm	-20 ... +70°C	D105
Parameter	Min	Typ	Max.	Units	Condition	
Initial tolerance	-5.0		+5.0	ppm	V <sub>S</sub> ± 5% Load ± 5%	
vs. supply voltage change	-1.0		+1.0	ppm		
vs. load change	-1.0		+1.0	ppm		
vs. aging /1. Year	-3.0		+3.0	ppm		
vs. aging / year (following Years)	-1.0		+1.0	ppm		

## Frequency stabilities<sup>1</sup> [meets SONET Minimum Clock Specification - Option]

Parameter	Min	Typ	Max.	Units	Operating temp range	Ordering Code <sup>5</sup>
vs. operating temperature range					-20 ... +70°C	D205
Parameter	Min	Typ	Max.	Units	Condition	
overall tolerance	-20.0		+20.0	ppm	( 15 Years aging, temp, initial, supply, load )	

## Supply voltage

Parameter	Min	Typ	Max.	Units	Condition	Ordering Code <sup>5</sup>
Supply voltage (Vs)	4.75	5.0	5.25	VDC		SV050
Current consumption			40	mA	@ HCMOS < 155 MHz	
Current consumption			90	mA	@ PECL < 155 MHz	
Supply voltage (Vs)	3.135	3.3	3.465	VDC		SV033
Current consumption			30	mA	@ LVHCMOS < 155 MHz	
Current consumption			80	mA	@ LVPECL < 155 MHz	
Current consumption			25	mA	@ LVDS < 155 MHz	

## RF output

Parameter	Min	Typ	Max.	Units	Condition	Ordering Code <sup>5</sup>
Signal	HCMOS				@ 15 pF 10 to 90 % @ Vs/2	RFH
Load		15.0		pF		
Rise and Fall time			5	ns		
Duty cycle	40		60	%		
Signal	PECL				Vs - 2V 20 to 80 %	RFP
Load		50		Ω		
Rise and Fall time			1	ns		
Duty cycle	45		55	%		
Signal	LVDS				10 to 90 %	RFL
Load		100		Ω		
Rise and Fall time			1	ns		
Duty cycle	40		60	%		
Signal	Sinewave					RFS
Load		50		Ω		
Output Power	-3	0	3	dBm		

## Additional parameters

Parameter	Min	Typ	Max.	Units	Condition
Phase Noise		-85		dBc/Hz	10 Hz @49,408 MHz
		-120		dBc/Hz	100 Hz HCMOS
		-145		dBc/Hz	1 kHz 3,3V
		-155		dBc/Hz	10 kHz
		-160		dBc/Hz	100 kHz
Jitter		0,2		ps RMS	@ 12 kHz to 20 MHz
Phase Noise		-80		dBc/Hz	10 Hz @125 MHz
		-115		dBc/Hz	100 Hz PECL
		-135		dBc/Hz	1 kHz 3,3V
		-141		dBc/Hz	10 kHz
		-141		dBc/Hz	100 kHz
Jitter		0,6		ps RMS	@ 12 kHz to 20 MHz
Phase Noise		-62		dBc/Hz	10 Hz @400 MHz
		-93		dBc/Hz	100 Hz PECL
		-124		dBc/Hz	1 kHz 3,3V
		-142		dBc/Hz	10 kHz
		-143		dBc/Hz	100 kHz
Jitter		0,2		ps RMS	@ 12 kHz to 20 MHz
Weight				2	g
Processing & Packing	handling&processing note				

## Enclosures

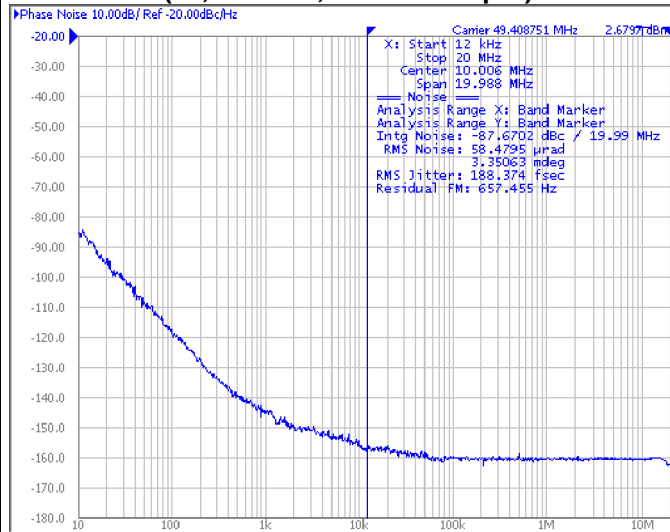
Type G223A for HCMOS and LVHCMOS Version			Type G218B for HCMOS; PECL; LVPECL and LVDS Version		
Package Codes:					
Code A1	Height "H" 5,9	Pin Length "L" NA	Code B1	Height "H" 5,9	Pin Length "L" NA
<p>G 223 H = 5,9; G223 B</p> <p>Dimensions: mm</p>			<p>G 218 H = 5,9; G218 B H = 2,8; G218 C</p> <p>Dimensions: mm</p>		

Pin Connections		Pin Connections				
1 NC / Enable (optional) 2 Ground (Case) 3 RF Output 4 Supply Voltage Input (Vs)  Outline Drawing: G223B		1 N/C 2 N/C / Enable (optional) 3 Ground (Case) 4 RF Output 5 Complementary RF Output / (N/C: HCMOS only) 6 Supply Voltage Input (Vs)  Outline Drawing: G218B				
		<b>Enable true table</b>	<b>HCMOS</b>		<b>LVPECL / LVDS</b>	
		Pin 2	Pin 4	Pin 5	Pin 4	Pin 5
		High	Data	N/C	No Data	No Data
		Open	Data	N/C	Data	compl. Data
		Low	High Tristate	N/C	Data	compl. Data
<b>Marking</b>						
C1310A1-xxxx frequency * VI AYYWW						

## Absolute Maximum Ratings

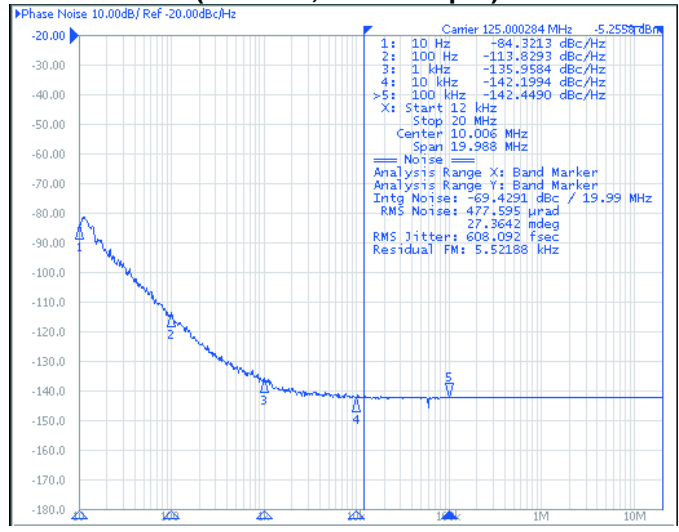
Parameter	Min	Typ	Max.	Units	Condition
Supply voltage (Vs)			7	V	
Operable temperature range	-30		+80	°C	
Storage temperature range	-40		+90	°C	

### Typical Phase Noise and Jitter (49,408 MHz; HCMOS output)



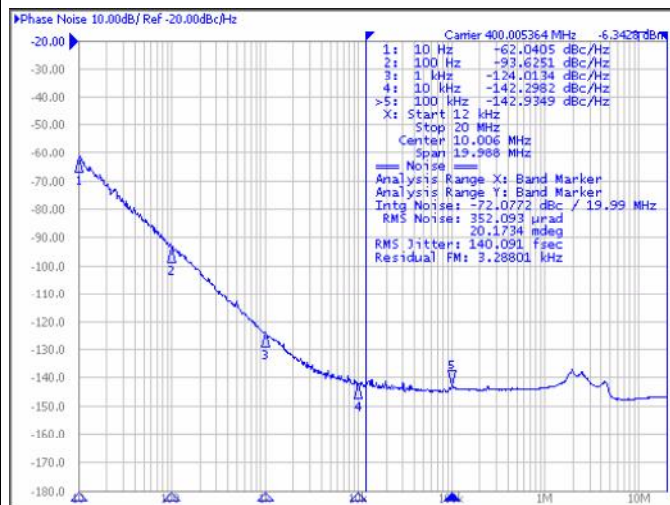
Frequency range [Hz]	Jitter [ps rms]
12kHz to 20MHz	0.188ps

### (125 MHz; PECL output)



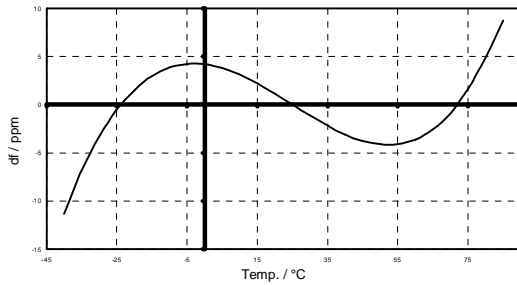
Frequency range [Hz]	Jitter [ps rms]
12kHz to 20MHz	0.608ps

### (400 MHz; PECL output)



Frequency range [Hz]	Jitter [ps rms]
12kHz to 20MHz	0.140ps

**Typical frequency stability vs temp**



**Standard Shipping Method**

Lage im Gurt  
Position in tape  
Pin 1

Abwickelrichtung  
Unwinding direction

Gurtunterseite  
Tape bottom side

Gurtoberseite  
Tape upper side

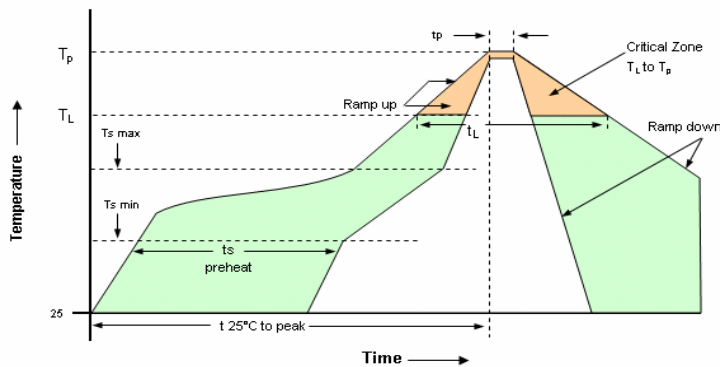
\*bei  $W \leq 24$  mm nur untere Lochreihe  
\*by  $W \leq 24$  mm only lower hole line

Production tolerance complying DIN IEC 286-3

Enclosure Type	Tape width W [mm]	Quantity per meter	Quantity per reel	Dimension P
G218B / G223B	24	83,3	850	12

**Recommended Reflow Profile**

Solderprofile:



Profile Feature	Pb-Free Assembly /Sn-Pb Assembly	Profile Feature	Pb-Free Assembly /Sn-Pb Assembly

Average ramp-up rate ( $T_L$ to $T_p$ )	3°C/second max.	Time 25°C to Peak Temperature	8 minutes max.
Preheat -Temperature Min $T_{S_{min}}$ -Temperature Min $T_{S_{max}}$ -Time (min to max) (ts)	150°C 200°C 60-180 seconds	Time maintained above - Temperature ( $T_L$ ) - Time ( $t_L$ )	217°C 60-150 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	Time within 5°C of actual Peak Temperature ( $t_p$ )	20-40 seconds
Peak Temperature ( $T_p$ )	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.  
SMD oscillators must be on the top side of the PCB during the reflow process.

## How to Order this Product:

Model	Stability Code	Supply Voltage Code	RF Output Code	Package Code	Frequency Control / Enable	Frequency
C1310	D105	SV050	RFH	A1		

vs.operat. temp. range:   

D105:     ±10ppm     -20 ... +70°C  
D205:     -20 ... +70°C

### Enclosures:

A1: G223B (4 pad)  
B1: G218B (6 pad)

### Signal:

RFH: HCMOS  
RFP: PECL  
RFL: LVDS  
RFS: Sinewave

### Supply:

SV050: 5V  
SV033: 3.3V

Dimension: mm