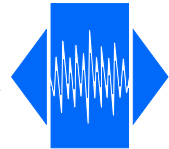# VTX 11M-LG

Low G-sensitive, vibration and shock resistant
Ultra-low noise floor, low jitter   (VC)TCXO

QuartzCom
the communications company

Application: 5G Repeaters, Link and micro cells, Low noise microwave

Frequency range	**50.000 to 150.000 MHz**		
Standard frequencies	**50, 75, 100, 122.88, 125 MHz**		
Frequency stability:			
vs. temperature referenced to (F$_{MAX}$+F$_{MIN}$)/2	≤ ±0.50 ppm	over -40 to +85 °C	(∗)
vs. supply voltage changes referenced to frequency at nominal supply	≤ ±0.05 ppm	±5%	
vs. load changes referenced to frequency at nominal load	≤ ±0.05 ppm	±10%	
vs. aging @ +40 °C	≤ ±1.0 ppm	1st year	
Short term stability ADEV	< 1∗10^{-10}	τ = 1 sec.	
G-sensitivity	0.25 ppb/g	per axis	(∗)
Frequency tolerance ex factory	0 ~ +1 ppm	@+25 °C	
Supply voltage	3.3 V or 5.0 V		(∗)
Current consumption	< 45 mA	without load	
Output signal	Sine wave	(LV)HCMOS (45/55%)	(∗)
Output level	+3 to +6 dBm	V$_{OH}$ > 0.9∗Vcc / V$_{OL}$ < 0.1∗Vcc	
Output load	50 Ω	15 pF max.	(∗)
Electronic Frequency Control (EFC)	ΔF = ±5 to ±10 ppm	positive slope	(∗)
Control voltage (Vc)	+1.50 V ±1.0 V for 3.3 V	+2.50 V ±2.0 V for 5.0 V	(∗)
EFC input impedance	> 100 kΩ		
Phase noise (typical value for 125 MHz)	-105 dBc/Hz -128 dBc/Hz -150 dBc/Hz -170 dBc/Hz -175 dBc/Hz	@ 100 Hz @ 1 kHz @ 10 kHz @ 100 kHz @ 1'000 kHz	
RMS phase jitter	15 fs (typ.)	12 kHz ~ 20 MHz	
Sub-harmonics	-65 dBc max.	-70 dBc typ.	
Operating temperature range	-40 ~ +85 °C		(∗)
Reflow Profiles as per IPC/JEDEC J-STD-020C	≤ 245 °C over 10 sec. Max.		

(∗) See available options on page #2   Note: Unless otherwise specified conditions are @+25 °C
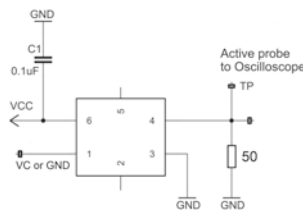

Pin function

1   Vc (EFC) for VC-TCXO
         GND or NC for TCXO
2   NC or GND
3   GND
4   RF output
5   NC or GND
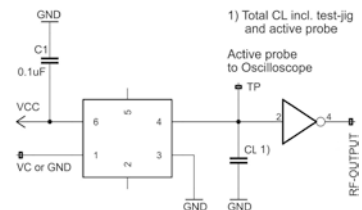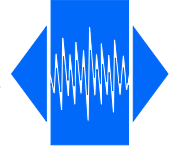# 6   Vcc

Solder pattern

Test circuit for Sine wave

Test circuit for (LV)HCMOS

1) Total CL incl. test-jig and active probe

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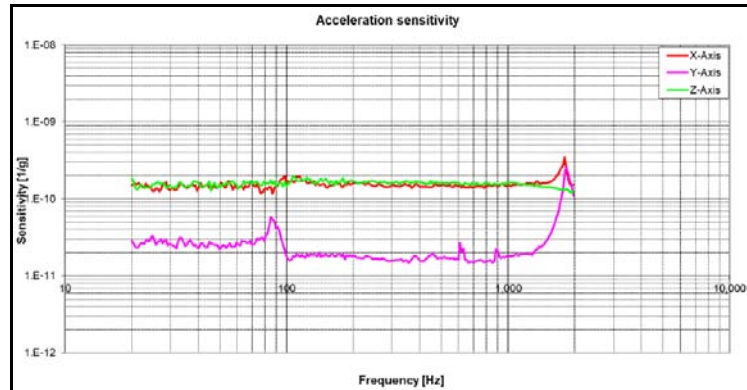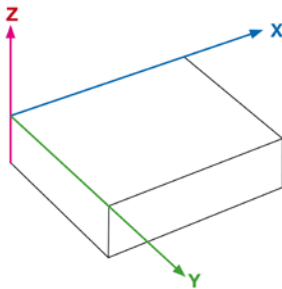## G-Sensitivity performance

Noise shape vibration from 20-2'000 Hz
with 0.1 g²/Hz (G_{RMS} = 14.11g) for the axis

The table shows the averaged values of the G-Sensitivity in the range 20 Hz to 1000 Hz.
At 1500 Hz appear resonances, which are caused by the mounting structure on the shaker.

Osc-#	X-axis [ppb/g]	Y-axis [ppb/g]	Z-axis [ppb/g]	Gamma Γ [ppb/g]
#1	0.154	0.030	0.304	0.342
#2	0.151	0.048	0.177	0.237
#3	0.151	0.022	0.161	0.221
#4	0.098	0.039	0.260	0.280

Definitions of vibration axes

Ordering code

(0)11M-(1)(2)-(3)(4)-(5)(6)-100.000MHz   *Example:* **VT11M-S33-NNu50-GCV05-100.000MHz**

(0) Oscillator type	**(1) Output signal**	**(2) Supply voltage**	**(6) Pulling range** (VT only)
TX = TCXO VT = VC-TCXO	H = (LV)HCMOS S = Sine wave	33 = 3.3 V 50 = 5.0 V	V05 = 1.5 ± 1.0 V ±5 ppm V10 = 1.5 ± 1.0 V ±10 ppm
(3) Operating temperature	**(4) Frequency stability**	**(5) G-sensitivity per axis**	X05 = 2.5 ± 2.0 V ±5 ppm X10 = 2.5 ± 2.0 V ±10 ppm
JK = -20 to +70 °C NN = -40 to +85 °C NP = -40 to +95 °C NR = -40 to +105 °C QN = -55 to +85 °C	u25 = ± 0.25 ppm u50 = ± 0.50 ppm 1u0 = ± 1.00 ppm 1u5 = ± 1.50 ppm	GA = 0.10 ppb/g GB = 0.25 ppb/g GC = 0.50 ppb/g GD = 1.00 ppb/g GE = 1.50 ppb/g GZ = special spec	Z = special spec

Frequency stability vs. temperature

ppm	≤± 0.25	≤± 0.50	≤± 1.00	≤± 1.50
-20 to +70 °C	O	O	O	O
-40 to +85 °C	O	O	O	O
-40 to +95 °C	Δ	Δ	Δ	O
-40 to +105 °C	Δ	Δ	Δ	Δ
-55 to +85 °C	X	Δ	Δ	Δ

Δ Ask factory
O Available
X Not available

Absolute max. ratings

Supply voltage (Vcc)	6.0 V
Storage temperature range	-55 ~ +105 °C
Control voltage (Vc)	0 / Vcc