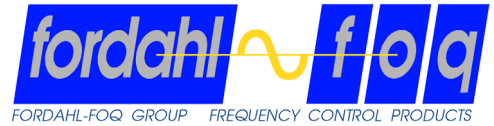


Oscillator specification: PTOC50601.004  
Custom designation: 13MHz OCXO



Supervision by:

Date , Sign. : 20.07.2009 U. Schweickert

**TYP: OCXO with 13,000000 MHz**

### 1. Electrical Parameters

#### Supply / Power:

Supply Voltage:	5 V ± 5 %
Max. Current Consumption @ 25 °C:	250 mA
Max. Current Consumption during warm up:	600 mA
Warm Up Time: (from 25 °C)	≤ 6 minutes to ± 0,01 ppm

#### Nominal Frequency (f0):

@ Reference Temperature:	13,000000 MHz
@ Reference Control Voltage:	25 °C ± 3 °C
	2 V

#### Temperature Range:

Operating Temperature Range 1:	0 °C ... 70 °C
Operable Temperature Range:	-10 °C ... 75 °C

#### Frequency Tolerance:

Nominal Frequency Tolerance ( $\Delta f/f_0$ ):	≤ ± 0,3 ppm @ Vc = 2 V
Tolerance vs Temperature Range 1 ( $\Delta f/f$ ):	≤ ± 0,05 ppm
Tol. vs Supply Voltage ( $\Delta f/f$ ) @ 5% Supply Change:	≤ ± 0,015 ppm
Tolerance vs Load ( $\Delta f/f$ ) @ 5% Load Change:	≤ ± 0,005 ppm

#### Aging:

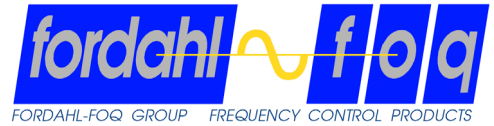
After 30 Days of Continuous Operation:	
Aging Tolerance per day ( $\Delta f/f$ ):	≤ ± 0,001 ppm
Aging Tolerance 1. Year ( $\Delta f/f$ ):	≤ ± 0,1 ppm
Aging Tolerance after 15 Years ( $\Delta f/f$ ):	≤ ± 0,3 ppm

#### Short Term Stability:

Allan Variance $1\sigma^2(\tau)$ :	≤ ± 5E-11 / 1 s
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Specification accepted by Customer

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Tuning range:

Method:	External Control Voltage
Control Voltage = 0 V ( $\Delta f/f$ ):	- 1,5 ppm ... - 1 ppm
Control Voltage = 2 V ( $\Delta f/f$ ):	- 0,3 ppm ... + 0,3 ppm
Control Voltage = 4 V ( $\Delta f/f$ ):	+ 1,5 ppm ... + 1 ppm
Linearity:	$\leq \pm 10 \%$

Output:

Load:	1 k $\Omega$ // 15 pF
Output Voltage:	HCMOS
Duty cycle:	45 % ... 55 % at 2,5 V
Low-level:	0 V ... 4,5 V
High-Level:	4,5 V ... 5 V
Rise time:	$\leq 6$ ns, ,5 V ... 4,5 V
Fall time:	$\leq 6$ ns, 4,5 V ... ,5 V

Phase noise

at 1 Hz	$\leq -80$ dBc/Hz
at 10 Hz	$\leq -120$ dBc/Hz
at 100 Hz	$\leq -140$ dBc/Hz
at 1 kHz	$\leq -145$ dBc/Hz
at 10 kHz	$\leq -150$ dBc/Hz

Others:

Warm up: Frequency after 3min  $\leq \pm 0,01$ ppm ( in reference to f @ 10min)

**2. Mechanical Data**

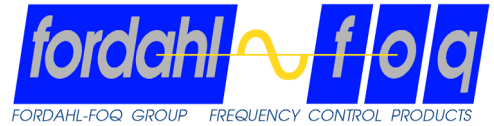
Case:	CO-115_1
Pin Connections:	1:HF;2:GND;3:VC;4:NC;5:VS

**3. Marking:**

FOQ Piezo Technik  
PTOC50601  
<FREQUENZ> MHz  
SN <SN> <DC>LF

Specification accepted by Customer

Oscillator specification: PTOC50601.004  
 Custom designation: 13MHz OCXO



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**Deviations between**

**Huawei inquiry specification and FOQ offer specification:**

Description	Huawei	FOQ
Case	Height <b>12.57mm</b> max	Height <b>13.3mm</b> max
Aging	$\leq \pm 1 \cdot 10^{-9}$ max <b>after 3 days</b> $\leq \pm 1 \cdot 10^{-7}$ max for 1 year $\leq \pm 3 \cdot 10^{-7}$ max for 10 years	<b>After 30 Days</b> of Continuous Operation: Aging Tolerances per day ( $\Delta f/f$ ): $\leq \pm 0,001$ ppm 1. Year ( $\Delta f/f$ ): $\leq \pm 0,1$ ppm after 15 Years ( $\Delta f/f$ ): $\leq \pm 0,3$ ppm
Supply Voltage		
Current	<b>&lt;5 Watts</b> max at turn on ( <b>1A!</b> ) <b>&lt;600mA</b> @ turn on	Max. Current Consumption during warm up: 600 mA
Warm up	$\leq \pm 0,01$ ppm after 3 minutes <b>of final frequency</b> at +25degC	$\leq 6$ minutes to $\pm 0,01$ ppm (in reference to <b>f@10min</b> )
Frequency tuning	$\geq \pm 1$ ppm with VC=0V...4V	VC=0 V ( $\Delta f/f$ ): -1,5 ppm ... -1 ppm VC=4 V ( $\Delta f/f$ ): 1,5 ppm ... 1 ppm
Output		
Rise/Fall Time	Tr&Tf<6nsec <b>(10% to 90% levels)</b>	Rise time: $\leq 6$ ns, <b>0,5 V ... 4,5 V</b> Fall time: $\leq 6$ ns, <b>4,5 V ... 0,5 V</b>
Load	15pF	1k $\Omega$ // 15 pF

Specification accepted by Customer

Drawing Name:  
Drawing No:

CO-115\_1  
M003-037-ME01-003

**F O Q** Piezo Technik

