IT2100F

The IT2100F employs an analogue ASIC for the oscillator and a high order temperature compensation circuit in a 2.0 x 1.6 mm size package. The device can be placed in power down mode through a single input pin. During standard operation, power consumption is minimised by operating down to a supply voltage of 1.8 V. The IT2100F's high stability, low power consumption, small footprint and powerful compensation method makes it a TCXO ideally suited for demanding GNSS mobile applications.

Features

- Excellent phase noise performance
- Low start up drift rate
- Height less than 0.8 mm
- Power down mode
- Standard temperature stability of ±0.5 ppm over wide temperature ranges

Applications

- **Time and frequency reference**
  - GNSS
  - Smartphone
  - Communications
  - Consumer

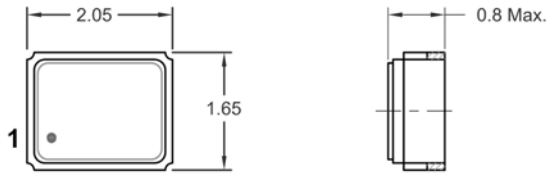
2.0 x 1.6 mm

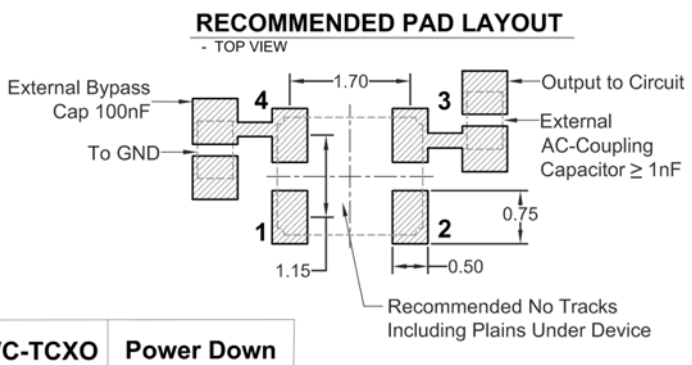
Standard Specifications

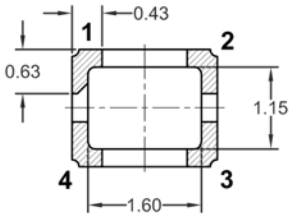
Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
Nominal frequency		13 - 52		MHz	
Frequency calibration			±1	ppm	Offset from nominal frequency measured at 25°C ±2°C
Reflow shift			±1	ppm	Two consecutive reflows as per attached profile after 2 hours relaxation at 25°C
Operating temperature range	-40		85	°C	The operating temperature range over which the frequency stability is measured
Frequency stability over temperature			±0.5 – ±2	ppm	Referenced to the midpoint between minimum and maximum frequency value over the specified temperature range[1] Control voltage set to midpoint of Vc
Frequency slope			±0.05 – ±1	ppm/°C	Minimum of one frequency reading every 2°C over the operating temperature range[1]
Static temperature hysteresis			0.6	ppm	Frequency change after reciprocal temperature ramped over the operating range. Frequency measured before and after at 25°C
Sensitivity to supply voltage variations			±0.1	ppm	V_{DD} varied ±5% at 25°C
Sensitivity to load variations			±0.2	ppm	±10% load change at 25°C
Long term stability			±1	ppm	Frequency drift over 1 year at 25°C
Supply voltage (V_{DD})		1.8 – 3.3		V	With a tolerance of ±5%
Supply current			2.2	mA	At minimum V_{DD}[2]
Control voltage (Vc) range $V_{DD} \leq 2.3$ V	0.3		1.5	V	The nominal Vc value is midway between the minimum and maximum. Voltage control should not exceed the V_{DD} +0.2 V or GND
Control voltage (Vc) range $V_{DD} > 2.3$ V	0.4		2.4	V	The nominal Vc value is midway between the minimum and maximum. Voltage control should not exceed the V_{DD} +0.2 V or GND
Frequency tuning	±6 – ±30			ppm	Frequency shift from minimum to maximum Vc
Start-up time (amplitude)			0.5	ms	Within 90% of the minimum specified output level
Start-up time (frequency)			2	ms	Within ±0.5 ppm of steady state frequency

[1] Parts should be shielded from drafts causing unexpected thermal gradients. Temperature changes due to ambient air currents on the oscillator can lead to short term frequency drift.
[2] Specified for load stated in oscillator output section at 25°C.

Model Outline and Recommended Pad Layout





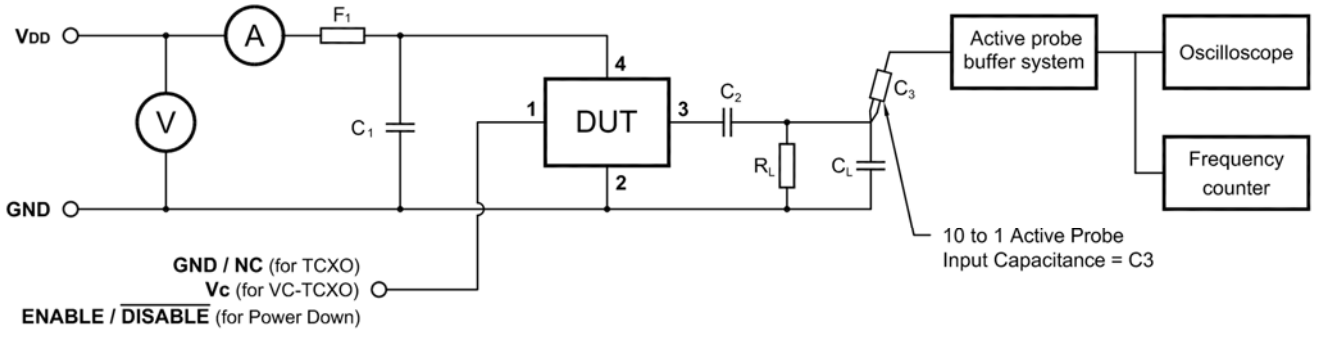


PIN	TCXO	VC-TCXO	Power Down
1 *	GND / NC	Vc	Enable / $\overline{\text{Disable}}$
2	GND	GND	GND
3	OUTPUT	OUTPUT	OUTPUT
4	V_{DD}	V_{DD}	V_{DD}

* Depending on specification

NOTE: Outline unit is mm.

Test Circuit



C_1: 100nF	$C_T = C_L + C_3$ (C_3 - Oscilloscope probe capacitance)
C_2: ≥1nF	C_T as stated in OSCILLATOR OUTPUT section
R_L: 10K	F_1: A ferrite bead or a resistor between 22Ω ~ 47Ω recommended.