

Description

The Titan™ SiT11103 is an ultra-small 48 MHz resonator based on SiTime's advanced FujiMEMS™ process for applications where board space and power consumption are critical. The tiny 0505 footprint is available in a Chip-Scale (CSP) package for mounting on the PCB or as Known Good Die (KGD) for co-packaging with the SoC/MCU, facilitating the smallest product form factors. Enabling excellent phase noise, a wide operating temperature range of -40°C to 125°C, and unparalleled performance in high shock and vibration conditions, the SiT11103 is the ideal solution for IoT, medical, industrial, automotive and wearable applications.

Features

- Frequency: 48 MHz
- 0.46 mm x 0.46 mm, after singulation
- All-inclusive frequency stability as low as ±25 ppm
- Operating temperature range: up to -40°C to 125°C

Applications

- Bluetooth / BLE SoCs / Wi-Fi SoCs
- 802.15.4 (Matter, Zigbee, Thread) SoCs
- Proprietary wireless SoCs and Microcontrollers
- Wearables, portable medical, various IoT end nodes

Electrical Characteristics

Table 1. Electrical Characteristics

These parameters are specified under the following conditions unless otherwise noted: $T_A = 25 \pm 1^\circ\text{C}$

Parameters	Symbol	Min.	Typ.	Max.	Unit	Condition
Nominal Frequency	F _{NOM}	–	48	–	MHz	At specified external load capacitance and nominal drive level
Frequency Tolerance at 25°C	F ₂₅	-10	–	+10	ppm	At specified external load capacitance and nominal drive level
Aging	F _{AGING}	–	±0.5	–	ppm	1-year Aging @ 25°C
		–	±1	–	ppm	5-years Aging @ maximum specified temperature
Automotive temperature range applications (-40°C to 125°C)						
Total Frequency Tolerance	F _{TOL}	-40	–	+40	ppm	Maximum specified all inclusive stability value which includes frequency tolerance at 25°C, frequency stability over temperature and 5 year aging @ 125°C
Frequency Stability Over Temperature	F _{TEMP}	–	±25	–	ppm	Within -40°C to 125°C range, with reference to 25°C. MEMS die temperature
Extended Industrial temperature range applications (-40°C to 105°C)						
Total Frequency Tolerance	F _{TOL}	-30	–	+30	ppm	Maximum specified all inclusive stability value which includes frequency tolerance at 25°C, frequency stability over temperature and 5 year aging @ 105°C
Frequency Stability Over Temperature	F _{TEMP}	–	±8	–	ppm	Within -40°C to 105°C range, with reference to 25°C. MEMS die temperature
Industrial temperature range applications (-40°C to 85°C)						
Total Frequency Tolerance	F _{TOL}	-25	–	+25	ppm	Maximum specified all inclusive stability value which includes frequency tolerance at 25°C, frequency stability over temperature and 5 year aging @ 85°C
Frequency Stability Over Temperature	F _{TEMP}	–	±8	–	ppm	Within -40°C to 85°C range, with reference to 25°C. MEMS die temperature
Extended Commercial temperature range applications (-30°C to 70°C)						
Total Frequency Tolerance	F _{TOL}	-25	–	+25	ppm	Maximum specified all inclusive stability value which includes frequency tolerance at 25°C, frequency stability over temperature and 5 year aging @ 70°C
Frequency Stability Over Temperature	F _{TEMP}	–	±8	–	ppm	Within -30°C to 70°C range, with reference to 25°C. MEMS die temperature
Operating Conditions						
Operating Temperature	T _{OPR}	-40	–	125	°C	MEMS die temperature. Value depends on part number
		-40	–	105		
		-40	–	85		
		-30	–	70		
Voltage Drive Level	V _{X1}	–	various	–	V _{pk-pk}	Corresponds to the voltage drive level of the target SoC/MCU. Value depends on part number
External Load Capacitance	C _{EXT}	1	–	8	pF	Value depends on part number

Dimensions and Patterns of CSP

