

■ Features, Benefits and Applications

- The world's lowest power programmable oscillator with 3.2 mA typical active current
- 1-110 MHz frequency range
- LVCMOS/LVTTL compatible output
- Frequency stability as low as ± 20 PPM
- Standby current as low as 0.5 μ A
- Fast resume time of 3.0 ms typical
- Standby or output enable modes
- Four industry-standard packages: 2.5 x 2.0, 3.2 x 2.5, 5.0 x 3.2, 7.0 x 5.0 mm
- Outstanding mechanical robustness for portable applications
- All-silicon device with outstanding reliability of 2 FIT (10x improvement over quartz-based devices), enhancing system mean-time-to-failure (MTBF)
- Ultra short lead time
- Ideal for portable applications: portable media players, digital cameras, digital camcorders, portable navigation devices, handheld gaming, cell phones and other battery-powered handheld applications
- Ideal for high-speed serial protocols such as: USB 1.1, USB 2.0, USB 3.0, SATA, SAS, Firewire, Ethernet, etc.

■ Specifications

Electrical Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Condition |
|-----------------------------|----------|------|------|------|---------|--|
| Output Frequency Range | f | 1 | – | 110 | MHz | |
| Frequency Stability | F_stab | -20 | – | +20 | PPM | Inclusive of: Initial stability, operating temperature, rated power, supply voltage change, load change, shock and vibration ± 20 PPM available in extended commercial temperature only |
| | | -25 | – | +25 | PPM | |
| | | -30 | – | +30 | PPM | |
| | | -50 | – | +50 | PPM | |
| Aging | Ag | -1.0 | – | 1.0 | PPM | 1st year at 25°C |
| Operating Temperature Range | T_use | -20 | – | +70 | °C | Extended Commercial |
| | | -40 | – | +85 | °C | Industrial |
| Supply Voltage | Vdd | 1.71 | 1.8 | 1.89 | V | |
| | | 2.25 | 2.5 | 2.75 | V | |
| | | 2.52 | 2.8 | 3.08 | V | |
| | | 2.97 | 3.3 | 3.63 | V | |
| Current Consumption | Idd | – | 3.7 | 4.1 | mA | No load condition, f = 20 MHz, Vdd = 2.5 V, 2.8 V or 3.3 V |
| | | – | 3.2 | 3.5 | mA | No load condition, f = 20 MHz, Vdd = 1.8 V |
| Standby Current | I_std | – | 2.4 | 4.3 | μ A | \overline{ST} = GND, Vdd = 3.3 V, Output is Weakly Pulled Down |
| | | – | 1.2 | 2.2 | μ A | \overline{ST} = GND, Vdd = 2.5 or 2.8 V, Output is Weakly Pulled Down |
| | | – | 0.4 | 0.8 | μ A | \overline{ST} = GND, Vdd = 1.8 V, Output is Weakly Pulled Down |
| Duty Cycle | DC | 45 | 50 | 55 | % | All Vdds. f \leq 75 MHz |
| | | 40 | 50 | 60 | % | All Vdds. f > 75 MHz |
| Rise/Fall Time | Tr, Tf | – | 1 | 2 | ns | 20% - 80% Vdd=2.5 V, 2.8 V or 3.3 V, 15 pf load |
| | | – | 1.3 | 2.5 | ns | 20% - 80% Vdd=1.8 V, 15 pf load |
| Output Voltage High | VOH | 90% | – | – | Vdd | IOH = -4 mA (Vdd = 3.3 V) IOH = -3 mA (Vdd = 2.8 V and Vdd = 2.5 V) IOH = -2 mA (Vdd = 1.8 V) |
| Output Voltage Low | VOL | – | – | 10% | Vdd | IOL = 4 mA (Vdd = 3.3 V) IOL = 3 mA (Vdd = 2.8 V and Vdd = 2.5 V) IOL = 2 mA (Vdd = 1.8 V) |
| Output Load | Ld | – | – | 15 | pF | At maximum frequency and supply voltage. Contact SiTime for higher output load option |
| Input Voltage High | VIH | 70% | – | – | Vdd | Pin 1, OE or \overline{ST} |
| Input Voltage Low | VIL | – | – | 30% | Vdd | Pin 1, OE or \overline{ST} |
| Startup Time | T_osc | – | – | 10 | ms | Measured from the time Vdd reaches its rated minimum value |
| Resume Time | T_resume | – | 3.0 | 3.8 | ms | Measured from the time ST pin crosses 50% threshold |
| RMS Period Jitter | T_jitt | – | – | 4.0 | ps | f = 75 MHz, Vdd = 2.5 V, 2.8 V or 3.3 V |
| | | – | – | 5.5 | ps | f = 75 MHz, Vdd = 1.8 V |
| RMS Phase Jitter (random) | T_phj | – | 0.6 | – | ps | f = 75 MHz, Integration bandwidth = 900 kHz to 7.5 MHz, VDD = 2.5 V, 2.8 V, or 3.3 V |
| | | – | 0.8 | – | ps | f = 75 MHz, Integration bandwidth = 900 kHz to 7.5 MHz, VDD = 1.8 V |

Specifications (Cont.)

Pin Description Tables

| Pin #1 Functionality |
|--|
| OE |
| H or Open ¹⁾ : specified frequency output |
| L: output is high impedance |
| $\overline{\text{ST}}$ |
| H or Open: specified frequency output |
| L: output is low level (weak pull down). Oscillation stops |

| Pin Map | |
|---------|----------------------------|
| Pin | Connection |
| 1 | OE/ $\overline{\text{ST}}$ |
| 2 | GND |
| 3 | CLK |
| 4 | VDD |

Absolute Maximum Table

Attempted operation outside the absolute maximum ratings of the part may cause permanent damage to the part. Actual performance of the IC is only guaranteed within the operational specifications, not at absolute maximum ratings.

| Parameter | Min. | Max. | Unit |
|--|--------|------|-------|
| Storage Temperature | -65 | 150 | °C |
| VDD | -0.5 | 4 | V |
| Electrostatic Discharge | – | 2000 | V |
| Theta JA (with copper plane on VDD and GND) | – | 75 | °C/W |
| Theta JC (with PCB traces of 0.010 inch to all pins) | – | 24 | °C/W |
| Soldering Temperature (follow standard Pb free soldering guidelines) | – | 260 | °C |
| Number of Program Writes | – | 1 | NA |
| Program Retention over -40 to 125°C, Process, VDD (0 to 3.65 V) | 1,000+ | – | years |

Environmental Compliance

| Parameter | Condition/Test Method |
|----------------------------|---------------------------|
| Mechanical Shock | MIL-STD-883F, Method 2002 |
| Mechanical Vibration | MIL-STD-883F, Method 2007 |
| Temperature Cycle | JESD22, Method A104 |
| Solderability | MIL-STD-883F, Method 2003 |
| Moisture Sensitivity Level | MSL1 @ 260°C |

Startup and Resume Timing Diagram



Note:

- In 1.8 V mode, a resistor of <100 kΩ between OE pin and VDD is recommended.

■ Dimensions and Land Patterns

| Package Size – Dimensions (Unit: mm) ^[2] | Recommended Land Pattern (Unit: mm) ^[3] |
|---|--|
| <p>2.5 x 2.0 x 0.75 mm</p> | |
| <p>3.2 x 2.5 x 0.75 mm</p> | |
| <p>5.0 x 3.2 x 0.75 mm</p> | |
| <p>7.0 x 5.0 x 0.90 mm</p> | |

Notes:

2. Y denotes manufacturing origin and XXXX denotes manufacturing lot number. The value of "Y" will depend on the assembly location of the device.
3. A capacitor of value 0.1 μ F between Vdd and GND is recommended.
4. The 7050 package with part number designation "-8" has NO center pad.

Part No. Guide - How to Order

The Part No. Guide is for reference only. For real-time customization and exact part number, use the SiTime [Part Number Generator](#).

SiT8003AC-12-18E-105.12345T



Note:

- 5. Contact SiTime for different drive strength options for driving higher loads or reducing EMI.
- 6. Without Center Pad.

Frequency Stability vs. Temperature Range Options

| Frequency Stability (PPM) | Temperature Range | Supply Voltage | | | |
|---------------------------|-------------------|----------------|-------|-------|-------|
| | | 1.8 V | 2.5 V | 2.8 V | 3.3 V |
| ±20 | C (-20 to +70°C) | ✓ | ✓ | ✓ | ✓ |
| | I (-40 to +85°C) | - | - | - | - |
| ±25 | C (-20 to +70°C) | ✓ | ✓ | ✓ | ✓ |
| | I (-40 to +85°C) | - | - | - | - |
| ±30 | C (-20 to +70°C) | ✓ | ✓ | ✓ | ✓ |
| | I (-40 to +85°C) | - | - | - | - |
| ±50 | C (-20 to +70°C) | ✓ | ✓ | ✓ | ✓ |
| | I (-40 to +85°C) | - | - | - | - |

© SiTime Corporation 2010. The information contained herein is subject to change at any time without notice. SiTime assumes no responsibility or liability for any loss, damage or defect of a Product which is caused in whole or in part by (i) use of any circuitry other than circuitry embodied in a SiTime product, (ii) misuse or abuse including static discharge, neglect or accident, (iii) unauthorized modification or repairs which have been soldered or altered during assembly and are not capable of being tested by SiTime under its normal test conditions, or (iv) improper installation, storage, handling, warehousing or transportation, or (v) being subjected to unusual physical, thermal, or electrical stress.

Disclaimer: SiTime makes no warranty of any kind, express or implied, with regard to this material, and specifically disclaims any and all express or implied warranties, either in fact or by operation of law, statutory or otherwise, including the implied warranties of merchantability and fitness for use or a particular purpose, and any implied warranty arising from course of dealing or usage of trade, as well as any common-law duties relating to accuracy or lack of negligence, with respect to this material, any sitime product and any product documentation. products sold by sitime are not suitable or intended to be used in a life support application or component, to operate nuclear facilities, or in other mission critical applications where human life may be involved or at stake. all sales are made conditioned upon compliance with the critical uses policy set forth below.

CRITICAL USE EXCLUSION POLICY
BUYER AGREES NOT TO USE SITIME'S PRODUCTS FOR ANY APPLICATION OR IN ANY COMPONENTS USED IN LIFE SUPPORT DEVICES OR TO OPERATE NUCLEAR FACILITIES OR FOR USE IN OTHER MISSION-CRITICAL APPLICATIONS OR COMPONENTS WHERE HUMAN LIFE OR PROPERTY MAY BE AT STAKE.

SiTime owns all rights, title and interest to the intellectual property related to SiTime's products, including any software, firmware, copyright, patent, or trademark. The sale of SiTime products does not convey or imply any license under patent or other rights. SiTime retains the copyright and trademark rights in all documents, catalogs and plans supplied pursuant to or ancillary to the sale of products or services by SiTime. Unless otherwise agreed to in writing by SiTime, any reproduction, modification, translation, compilation, or representation of this material shall be strictly prohibited.



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.