

# Description

SiTime offers a wide range of field programmable (FP) MEMS oscillators including simple oscillators, differential oscillators, high temperature oscillators, precision TCXO, VCXO and spread spectrum oscillators. These FP devices support the same specifications and performance as their factory-programmed counterparts.

They enable engineers to experiment with different configurations and generate customized samples in seconds for fast prototyping.

Figure 1 illustrates the simple programming setup required for programming SiTime FP devices by using the SiT6100DK, a field programming kit. Refer to SiT6100DK quick start guide and other documents for more information.

For production volume, SiTime offers factory programming of its entire portfolio with the shortest lead time available in the industry.

# **Applications**

- Generic samples in seconds for prototype builds
- Experiment with different options for optimal timing margin
- Configure different drive strengths for best EMI and/or to drive larger loads
- Fast prototype builds

## Features

- Support for 9 MEMS oscillator families
  - Low power (SiT1602, SiT8008, SiT8009)
  - Ultra-performance (SiT8208, SiT8209)
  - Ultra-performance differential (SiT9120, SiT9121, SiT9122)
  - High temp (SiT1618, SiT8918, SiT8919, SiT8920, SiT8921)
  - AEC-Q100 Automotive (SiT2024, SiT2025, SiT8924, SiT8925)
  - SOT23 oscillator (SiT2001, SiT2002, SiT2018, SiT2019, SiT2020, SiT2021)
  - VCXO (SiT3807, SiT3808, SiT3809)
  - Spread spectrum (SiT9003, SiT9005)
  - Ruggedized (SiT5146, SiT5147, SiT5346, SiT5347, SiT5348, SiT5349, SiT9346, SiT9347)
  - µPower (SiT1581)
- Wide variety of programmable options
  - Frequency from 1 725 MHz
  - Frequency stability from ±0.1 ppb to ±50 ppm
  - Supply voltages of 1.8V or 2.5 to 3.3V
  - Operating temperature up to 125°C and down to -55°C
  - Package sizes for 1.5 x 0.8 to 7.0 x 5.0 mm x mm
  - Pull ranges from ±50 to ±3200 ppm
  - Spread percentage from ±0.25% to ±2% or -0.5% to -4% (Spread spectrum only)
  - Rise/fall time from 0.25 ns to 40 ns
- Pb-free, RoHS and REACH compliant



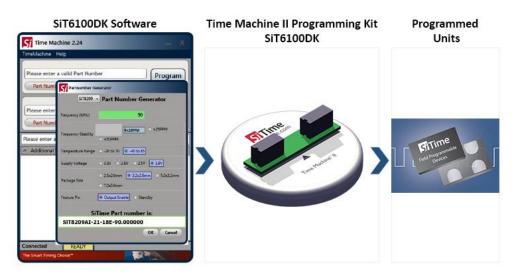


Figure 1. Field Programmable Software and Hardware



# Field Programmable Device Ordering Information

A FP device works as a superset of its programmed counterpart. In certain cases, it can also be mapped to different programmed base products.

As an example, SiT8008BI-71-XXX-000.FP0000 is a field programmable device in the low power family. It comes in the 2.0 x 1.6 mm package, and can be programmed to support different combinations of the following:

- Frequency: 1 MHz to 110 MHz with 6 decimal places of accuracy
- Frequency stability: ±20 ppm, ±25 ppm, ±50 ppm
- Temperature range: -20°C to 70°C, -40°C to 85°C
- Supply voltages: 1.8V or 2.5V to 3.3V
- Output drive strength: 8 different options for different rise/fall time

# apped tofield programmable devices, but they support different<br/>frequencies.s a field<br/>hes in the<br/>o supportPlease see Supported Device column to determine<br/>which product families can be programmed using the<br/>given FP part.cesContact SiTime for devices of your interest that are not<br/>covered here.

In addition, the SiT8008BI-11--XXX-000.FP0000 can be used for either SiT1602 or SiT8008 in the

2.0 x 1.6 mm x mm package. The SiT1602 and the

SiT8008 share similar electrical specs and the same

Oscillator Product Family	Field Programmable (FP) Part Number	Supported Devices	Signaling Type	Frequency Range (MHz)	Frequency Stability (ppm)	Temp Range (°C)	Voltage (V)	Package Size (mm x mm)	Socket Card
	SiT8008BI-71-XXX-000.FP0000							2.0 x 1.6	SiT6161DK
	SiT8008BI-11-XXX-000.FP0000	0.74000[2]						2.5 x 2.0	SiT6161DK
	SiT8008BI-21-XXX-000.FP0000	SiT1602 <sup>[2]</sup> SiT8008	LVCMOS	1 to 110	±20, ±25, ±50	-40 to 85, -20 to 70	1.8V, 2.5-3.3V	3.2 x 2.5	SiT6165DK
	SiT8008BI-31-XXX-000.FP0000							5.0 x 3.2	SiT6160DK
Low Power Single-Ended	SiT8008BI-81-XXX-000.FP0000							7.0 x 5.0	SiT6160DK
Oscillator	SiT8009BI-71-XXX-000.FP0000							2.0 x 1.6	SiT6161DK
	SiT8009BI-11-XXX-000.FP0000							2.5 x 2.0	SiT6161DK
	SiT8009BI-21-XXX-000.FP0000	SiT8009	LVCMOS	115 to 137	±20, ±25, ±50	-40 to 85, -20 to 70	1.8V, 2.5-3.3V	3.2 x 2.5	SiT6165DK
	SiT8009BI-31-XXX-000.FP0000							5.0 x 3.2	SiT6160DK
	SiT8009BI-81-XXX-000.FP0000							7.0 x 5.0	SiT6160DK
	SiT8208AI-21-XXX-000.FP0000							3.2 x 2.5	SiT6165DK
	SiT8208AI-31-XXX-000.FP0000	SiT8208	LVCMOS	1 to 80	±20, ±25, ±50	-40 to 85, -20 to 70	1.8V, 2.5-3.3V	5.0 x 3.2	SiT6160DK
Ultra- Performance	SiT8208AI-81-XXX-000.FP0000							7.0 x 5.0	SiT6160DK
Single-Ended Oscillator	SiT8209AI-21-XXX-000.FP0000		LVCMOS					3.2 x 2.5	SiT6165DK
Coomator	SiT8209AI-31-XXX-000.FP0000	SiT8209		80 to 220	±20, ±25, ±50	-40 to 85, -20 to 70	1.8V, 2.5-3.3V	5.0 x 3.2	SiT6160DK
	SiT8209AI-81-XXX-000.FP0000					201010		7.0 x 5.0	SiT6160DK
	SiT9121AI-1B1-XXX000.FP0000				±20, ±25, ±50	-40 to 85, -20 to 70	2.5V, 3.3V	3.2 x 2.5	SiT6165DK
	SiT9121AI-1C1-XXX000.FP0000		LVPECL	1 to 220				5.0 x 3.2	SiT6160DK
	SiT9121AI-1D1-XXX000.FP0000	SiT9120 <sup>[3]</sup>						7.0 x 5.0	SiT6160DK
	SiT9121AI-2B1-XXX000.FP0000	SiT9121						3.2 x 2.5	SiT6165DK
	SiT9121AI-2C1-XXX000.FP0000		LVDS	1 to 220	±20, ±25, ±50	-40 to 85, -20 to 70	2.5V, 3.3V	5.0 x 3.2	SiT6160DK
High Performance	SiT9121AI-2D1-XXX000.FP0000							7.0 x 5.0	SiT6160DK
Differential Oscillator	SiT9122AI-1B1-XXX000.FP0000							3.2 x 2.5	SiT6165DK
	SiT9122AI-1C1-XXX000.FP0000	SiT9122	LVPECL	220 to 625	±20, ±25, ±50	-40 to 85, -20 to 70	2.5V, 3.3V	5.0 x 3.2	SiT6160DK
	SiT9122AI-1D1-XXX000.FP0000					-201070		7.0 x 5.0	SiT6160DK
	SiT9122AI-2B1-XXX000.FP0000	0113122						3.2 x 2.5	SiT6165DK
	SiT9122AI-2C1-XXX000.FP0000	]	LVDS	220 to 625	±20, ±25, ±50	-40 to 85, -20 to 70	2.5V, 3.3V	5.0 x 3.2	SiT6160DK
	SiT9122AI-2D1-XXX000.FP0000	]						7.0 x 5.0	SiT6160DK

#### Table 1. Field Programmable Devices – MEMS XO<sup>[4]</sup>

#### Note:

1. Revision number which is placed right after SiTXXXX in the part number is fixed and not programmable. For instance, SiT8008A cannot be programed to SiT8008B.

2. SiT8008 FP devices are used to program SiT1602 part numbers. Excluding family, SiT8008 and SiT1602 also share the same ordering codes.

3. SIT9121 FP devices are used to program SIT9120 part numbers. Excluding family, SIT9121 and SIT9120 also share the same ordering codes.



# Table 1. Field Programmable Devices – MEMS XO<sup>[4]</sup> (continued)

Oscillator Product Family	Field Programmable (FP) Part Number	Supported Devices	Signaling Type	Frequency Range (MHz)	Frequency Stability (ppm)	Temp Range (°C)	Voltage (V)	Package Size (mm x mm)	Socket Card
	SiT8920BM-71-XXX-000.FP0000			1 to 110				2.0 x 1.6	SiT6161DK
	SiT8920BM-11-XXX-000.FP0000	SiT1618 <sup>[5]</sup>		Refer "Supported		-40 to 105.		2.5 x 2.0	SiT6161DK
	SiT8920BM-21-XXX-000.FP0000	SiT8918 <sup>[6]</sup> SiT8920	LVCMOS	Frequencies" tables in	±20, ±25, ±30, ±50	-40 to 125,	1.8V, 2.5-3.3V	3.2 x 2.5	SiT6165DK
	SiT8920BM-31-XXX-000.FP0000	3116920		SiT1618, SiT8918 and SiT8920		-55 to 125		5.0 x 3.2	SiT6160DK
High Temperature	SiT8920BM-81-XXX-000.FP0000			datasheets				7.0 x 5.0	SiT6160DK
Single-Ended Oscillator	SiT8921BM-71-XXX-000.FP0000							2.0 x 1.6	SiT6161DK
	SiT8921BM-11-XXX-000.FP0000			115.194001 to 137		-40 to 105,		2.5 x 2.0	SiT6161DK
	SiT8921BM-21-XXX-000.FP0000	SiT8919 <sup>[7]</sup> SiT8921	LVCMOS	Refer "Supported Frequencies" tables in	±20, ±25, ±30, ±50	-40 to 125,	1.8V, 2.5-3.3V	3.2 x 2.5	SiT6165DK
	SiT8921BM-31-XXX-000.FP0000			SiT8919 and SiT8921 datasheets	100, 100	-55 to 125		5.0 x 3.2	SiT6160DK
	SiT8921BM-81-XXX-000.FP0000			udidoneelo				7.0 x 5.0	SiT6160DK
	SiT2024BM-S1-XXX-000.FP0000	SiT2024	LVCMOS	1 to 110 Refer "Supported Frequencies" table in SiT2024 datasheet	±20, ±25, ±30, ±50	-40 to 85, -40 to 105, -40 to 125, -55 to 125	1.8V, 2.5-3.3V	2.9 x 2.8 (SOT23-5)	SiT6165DK
	SiT2025BM-S1-XXX-000.FP0000	SiT2025	LVCMOS	115.2 to 137 Refer "Supported Frequencies" table in SiT2025 datasheet	±20, ±25, ±30, ±50	-40 to 85, -40 to 105, -40 to 125, -55 to 125	1.8V, 2.5-3.3V	2.9 x 2.8 (SOT23-5)	SiT6165DK
	SiT8924BM-71-XXX-000.FP0000							2.0 x 1.6	SiT6161DK
AEC-Q100	SiT8924BM-11-XXX-000.FP0000			1 to 110		-40 to 85,		2.5 x 2.0	SiT6161DK
Automotive Oscillator	SiT8924BM-21-XXX-000.FP0000	SiT8924	LVCMOS	Refer "Supported	±20, ±25, ±30, ±50	-40 to 105, -40 to 125,	1.8V, 2.5-3.3V	3.2 x 2.5	SiT6165DK
	SiT8924BM-31-XXX-000.FP0000			Frequencies" table in SiT8924 datasheet		-55 to 125		5.0 x 3.2	SiT6160DK
	SiT8924BM-81-XXX-000.FP0000							7.0 x 5.0	SiT6160DK
	SiT8925BM-71-XXX-000.FP0000							2.0 x 1.6	SiT6161DK
	SiT8925BM-11-XXX-000.FP0000			115.2 to 137		-40 to 85,		2.5 x 2.0	SiT6161DK
	SiT8925BM-21-XXX-000.FP0000	SiT8925	LVCMOS	Refer "Supported	±20, ±25, ±30, ±50	-40 to 105, -40 to 125,	1.8V, 2.5-3.3V	3.2 x 2.5	SiT6165DK
	SiT8925BM-31-XXX-000.FP0000			Frequencies" table in SiT8925 datasheet	130, 130	-55 to 125	210 010 1	5.0 x 3.2	SiT6160DK
	SiT8925BM-81-XXX-000.FP0000							7.0 x 5.0	SiT6160DK
	SiT2001BI-S1-XXX-000.FP0000	SiT2001	LVCMOS	1 to 110	±20, ±25, ±50	-40 to 85, -20 to 70	1.8V 2.5-3.3V	2.9 x 2.8 (SOT23-5)	SiT6165DK
	SiT2002BI-S1-XXX-000.FP0000	SiT2002	LVCMOS	115 to 137	±20, ±25, ±50	-40 to 85, -20 to 70	1.8V, 2.5-3.3V	2.9 x 2.8 (SOT23-5)	SiT6165DK
SoT23 Oscillator	SiT2020BM-S1-XXX-000.FP0000	SiT2018 <sup>[8]</sup> SiT2020	LVCMOS	1 to 110 Refer "Supported Frequencies" tables in SIT2018 and SIT2020 datasheets	±20, ±25, ±30, ±50	-40 to 105, -40 to 125, -55 to 125	1.8V, 2.5-3.3V	2.9 x 2.8 (SOT23-5)	SiT6165DK
	SiT2021BM-S1-XXX-000.FP0000	SiT2019 <sup>[9]</sup> SiT2021	LVCMOS	115.194001 to 137 Refer "Supported Frequencies" tables in SiT2019 and SiT2021 datasheets	±20, ±25, ±30, ±50	-40 to 105, -40 to 125, -55 to 125	1.8V, 2.5-3.3V	2.9 x 2.8 (SOT23-5)	SiT6165DK

Note:

5. SiT8920 FP devices are used to program SiT1618 part numbers. Excluding family, SiT8920 and SiT1618 also share the same ordering codes.

6. SiT8920 FP devices are used to program SiT8918 part numbers. Excluding family, SiT8920 and SiT8918 also share the same ordering codes.

7. SiT8921 FP devices are used to program SiT8919 part numbers. Excluding family, SiT8921 and SiT8919 also share the same ordering codes.

8. SiT2020 FP devices are used to program SiT2018 part numbers. Excluding family, SiT2020 and SiT2018 also share the same ordering codes.

9. SiT2021 FP devices are used to program SiT2019 part numbers. Excluding family, SiT2021 and SiT2019 also share the same ordering codes.

<sup>4.</sup> Revision number which is placed right after SiTXXXX in the part number is fixed and not programmable. For instance, SiT8008A cannot be programed to SiT8008B.



# Table 2. Field Programmable Devices – MEMS VCXO<sup>[10]</sup>

Oscillator Product Family	Field Programmable (FP) Part Number	Supported Devices	Signaling Type	Frequency Range (MHz)	Frequency Stability (ppm)	Temp Range (°C)	Voltage (V)	Pull Range (ppm)	Package Size (mm x mm)	Socket Card
	SiT3808AI-22-XXXX-000.FP0000								3.2 x 2.5	SiT6165DK
	SiT3808AI-C2-XXXX-000.FP0000	SiT3807 <sup>[11]</sup> SiT3808	LVCMOS	1 to 80	±25, ±50	-40 to 85, -20 to 70	1.8V, 2.5-3.3V	±50 to ±1600	5.0 x 3.2	SiT6160DK
High Performance	SiT3808AI-D2-XXXX-000.FP0000								7.0 x 5.0	SiT6160DK
Single-Ended VCXO	SiT3809AI-22-XXXX-000.FP0000								3.2 x 2.5	SiT6165DK
	SiT3809AI-C2-XXXX-000.FP0000	SiT3809	LVCMOS	80 to 220	±25, ±50	-40 to 85, -20 to 70	1.8V, 2.5-3.3V	±50 to ±1600	5.0 x 3.2	SiT6160DK
	SiT3809AI-D2-XXXX-000.FP0000								7.0 x 5.0	SiT6160DK

# Table 3. Field Programmable Devices – MEMS Spread Spectrum XO<sup>[10]</sup>

Oscillator Product Family	Field Programmable (FP) Part Number	Supported Devices	Signaling Type	Frequency Range (MHz)	Frequency Stability (ppm)	Temp Range (°C)	Voltage (V)	Spread Range (%)	Package Size (mm x mm)	Socket Card
Spread	SiT9005AI-71-XXXX000.FP0000			1 to 141	±20, ±25, ±50	-40 to 85, -20 to 70	1.8V, 2.5-3.3V	±0.125 to ±2, -0.25 to -4	2.0 x 1.6	SiT6161DK
Spectrum Single- Ended	SiT9005AI-11-XXXX000.FP0000	SiT9005		Refer to Table 6 for unsupported frequencies					2.5 x 2.0	SiT6161DK
Oscillator	SiT9005AI-21-XXXX000.FP0000								3.2 x 2.5	SiT6165DK
	SiT9003AI-33-33XX-000.FP000						2.5V, 2.8V,	±0.25 to ±0.5,	5.0 x 3.2	SiT6160DK
Spread Spectrum Single-	SiT9003AI-83-33XX-000.FP000	SiT9003				-40 to 85,	3.3V		7.0 x 5.0	SiT6160DK
Ended Oscillator	SiT9003AI-33-18XX-000.FP000		1 to 110	±30, ±100	±50, ±100 -20 to 70	1.8V	-0.5 to -1	5.0 x 3.2	SiT6160DK	
	SiT9003AI-83-18XX-000.FP000						1.00		7.0 x 5.0	SiT6160DK

## Table 4. Field Programmable Devices – MEMS µPower XO<sup>[10]</sup>

Oscillator Product Family	Field Programmable (FP) Part Number	Supported Devices	Signaling Type	Frequency Range (MHz)	Frequency Stability (ppm)	Temp Range (°C)	Voltage (V)	Package Size (mm x mm)	Availability
µPower XO	SiT1581AI-J3-XXE-000.FP0000	SiT1581	LVCMOS	32.768	±0.5	-40 to 85, -20 to 70	1.8V	1.5 x 0.8	Contact SiTime

#### Note:

- 10. Revision number which is placed right after SiTXXXX in the part number is fixed and not programmable. For instance, SiT8008A cannot be programed to SiT8008B.
- 11. SiT3808 FP devices are used to program SiT3807 part numbers. Excluding family, SiT3808 and SiT3807 also share the same ordering codes.



# Table 5. Field Programmable Devices – MEMS Ruggedized TCXO<sup>[12]</sup>

Oscillator Product Family	Field Programmable (FP) Part Number	Supported Devices	Signaling Type	Frequency Range (MHz)	Frequency Stability (ppm)	Temp Range (°C)	Voltage (V)	Optional Pull Range (ppm)	Package Size (mm x mm)	Availability	
	SiT5146AE-FKDXXXB000.FP0000	SiT5146	LVCMOS Clipped Sine	1 to 60	±0.5, ±1,	-40 to 105, -40 to 85,	2.5V, 2.8V,		±6.25 to ±3200	5.0 x 3.2	Contact SiTime
	SiT5147AE-FKDXXXB000.FP0000	SiT5147	LVCMOS	60 to 189 200 to 220	±2.5	-40 to 85, -20 to 70,	3.0V, 3.3V	10.23 10 13200	5.0 x 3.2	Contact SiTime	
Ruggedized	SiT5346AE-FQDXXXB000.FP0000	SiT5346	LVCMOS Clipped Sine	1 to 60	±0.1, ±0.2,	-40 to 105,	2.5V, 2.8V, 3.0V, 3.3V 2.5V, 2.8V, 3.0V, 3.3V	±6.25 to ±3200 6.25 to ±3200	5.0 x 3.2	Contact SiTime	
Super-TCXO	SiT5347AE-FQDXXXB000.FP0000	SiT5347	LVCMOS	60 to 189 200 to 220	±0.25, ±0.5, ±1, ±2.5	-40 to 85, -20 to 70,			5.0 x 3.2	Contact SiTime	
	SiT5348AN-FRDXXXB000.FP0000	SiT5348	LVCMOS Clipped Sine	1 to 60	±0.05, ±0.1, ±0.2, ±0.25,	-40 to 105, -40 to 85,			5.0 x 3.2	Contact SiTime	
	SiT5349AN-FRDXXXB000.FP0000	SiT5349	LVCMOS	60 to 189 200 to 220	±0.5, ±1, ±2.5	-20 to 70, 0 to 70			5.0 x 3.2	Contact SiTime	

# Table 6. Field Programmable Devices – MEMS Differential Ruggedized XO<sup>[12]</sup>

Oscillator Product Family	Field Programmable (FP) Part Number	Supported Devices	Signaling Type	Frequency Range (MHz)	Frequency Stability (ppm)	Temp Range (°C)	Voltage (V)	Package Size (mm x mm)	Availability
	SiT9346AE-1BFAXXX000.FP0000							3.2 x 2.5	Contact SiTime
	SiT9346AE-1CFAXXX000.FP0000		LVPECL					5.0 x 3.2	Contact SiTime
	SiT9346AE-1EFAXXX000.FP0000	SiT9346		1 to 220	±10	-40 to 105, -40 to 95,	2.5V, 2.8V,	7.0 x 5.0	Contact SiTime
	SiT9346AE-2BFAXXX000.FP0000	5119346	9346 LVDS HCSL	1 10 220		-40 to 85, -20 to 70, -40 to 105, -40 to 95,	3.0V, 3.3V	3.2 x 2.5	Contact SiTime
	SiT9346AE-2CFAXXX000.FP0000							5.0 x 3.2	Contact SiTime
Ruggedized	SiT9346AE-2EFAXXX000.FP0000							7.0 x 5.0	Contact SiTime
Differential XO	SiT9347AE-1BFAXXX000.FP0000						2.5V, 2.8V,	3.2 x 2.5	Contact SiTime
	SiT9347AE-1CFAXXX000.FP0000		LVPECL					5.0 x 3.2	Contact SiTime
	SiT9347AE-1EFAXXX000.FP0000	0:700.47		1 to 725 for LVPECL and	.10			7.0 x 5.0	Contact SiTime
	SiT9347AE-2BFAXXX000.FP0000	Si19347	LVDS, 1 to 500 for HCSL	±10	-40 to 85, -20 to 70.	3.0V, 3.3V	3.2 x 2.5	Contact SiTime	
	SiT9347AE-2CFAXXX000.FP0000				201070,	3.3V	5.0 x 3.2	Contact SiTime	
	SiT9347AE-2EFAXXX000.FP0000							7.0 x 5.0	Contact SiTime

Note: 12. Revision number which is placed right after SiTXXXX in the part number is fixed and not programmable. For instance, SiT8008A cannot be programed to SiT8008B.



# Table 7. List of SiT9005 FP Oscillator Unsupported Frequencies

SiT9005 FP Oscillator Unsupported Frequency Range (MHz)									
±2.06% ce	nter spread	-4.01% do	own spread	-4.28% center spread					
Min.	Max.	Min.	Max.	Min.	Max.				
120.100000	121.100000	121.000000	121.300000	120.100000	122.300000				
				122.900000	123.100000				
				123.500000	124.000000				
				124.9000000	125.200000				



# Tape & Reel Options

FP devices are shipped with standard Tape & Reel options. An additional letter is affixed to the end of the FP device part numbers in Tables Table to Table to specify the tape size and the reel quantity. For example, the last letter "G" in the SiT8008AI-71-XXX-000.FP0000G indicates 250 pieces of SiT8008AI FP devices shipped in 8 mm tape.

The complete list of T&R options for different device package sizes are shown in tables below.

### Table 8. Ordering Codes for Supported Tape & Reel Packing Method

Supported FP Device: SiT8008, SiT8009, SiT8920, SiT8921, SiT8924, SiT8925, SiT9005,

Tape & Reel	Tape & Reel 8 mm Tape		12 mr	n Tape	16 mm Tape		
Package Size (mm x mm)	250 pcs reel	1ku reel	250 pcs reel	1ku reel	250 pcs reel	1ku reel	
2.0 x 1.6	G	E	-	-	-	-	
2.5 x 2.0	G	E	-	-	-	-	
3.2 x 2.5	G	E	-	-	-	-	
5.0 x 3.2	-	-	Х	Y	-	-	
7.0 x 5.0	-	-	-	-	Х	Y	

## Table 9. Ordering Codes for Supported Tape & Reel Packing Method

Supported FP Device: SiT3808, SiT3809, SiT3821, SiT3822, SiT8208, SiT8209, SiT9002, SiT9003, SiT9121, SiT9122

Tape & Reel	12 mn	n <b>Tape</b>	16 mm Tape			
Package Size (mm x mm)	250 pcs reel	1ku reel	250 pcs reel	1ku reel		
2.5 x 2.0	Х	Y	-	-		
3.2 x 2.5	Х	Y	-	-		
5.0 x 3.2	х	Y	-	-		
7.0 x 5.0	_	_	Х	Y		

## Table 10. Ordering Codes for Supported Tape & Reel Packing Method

Supported FP Device: SiT2024, SiT2025, SiT9201, SiT2001, SiT2002, SiT2020, SiT2021

Tape & Reel	8mm Tape				
Package Size (mm x mm)	250 pcs reel	1ku reel			
2.9 x 2.8	G	E			



# Time Machine II Programmer Kit

FP devices are programmed with SiTime's oscillator programmer. Time Machine II is a complete programming kit. It comes with the programmer base unit and three socket cards, each of which accommodates two different oscillator package sizes. The ordering codes for the programming kit and the socket cards are shown in the table below. Note that earlier versions of the programming kit were shipped with the SiT6162DK socket card that accommodates  $2.7 \times 2.4 \text{ mm x mm}$  ( $2.5 \times 2.0 \text{ compatible}$ ) and  $3.2 \times 2.5 \text{ mm x mm}$  4-pin packages. The SiT6162DK has since been replaced with SiT6165DK, which supports the  $2.9 \times 2.8 \text{ mm x mm}$  (SOT23-5) packages in addition to  $3.2 \times 2.5 \text{ mm x mm}$  packages.

Device Name	Part Number	Description			
Programming Kit	SiT6100DK	The complete kit that includes the programmer base (SiT61650DK) and three socket cards (SiT6160DK, SiT6161 and SiT6165)			
Programmer Base	SiT6150DK	The base programmer with no sockets			
Programming Socket	SiT6160DK	5.0x3.2 and 7.0x5.0 packages programming sockets to program all 6-in and 4-pin field programmable devices			
Programming Socket	SiT6161DK	2.0x1.6 and 2.5x2.0 packages programming sockets to program all 6-in and 4-pin field programmable devices			
Programming Socket	SiT6165DK	3.2x2.5 package programming sockets to program all 6-in and 4-pin field programmable devices. 2.9x2.8 (SOT23-5) package supports 5-pin field programmable devices			

## Socket Card Selection for Programming

Each socket card for the Time Machine II programmer comes with two sockets, each of which accommodates a particular package size. In addition, some sockets are designed to work with 4-pin devices only whereas other sockets can accommodate both 4-pin and 6-pin devices. Table 12 shows how to select the proper socket card for the desired FP device package size. Note that the package sizes are also printed right next to the sockets on the socket cards for visual identification during device programming.

### Table 12. Supported Packages

Package Size	2.0 x 1.6 (4-pin)	2.5 x 2.0 (4-pin)	2.9 x 2.8 (5-pin)	3.2 x 2.5 (4-pin & 6-pin)	5.0 x 3.2 (4-pin & 6-pin)	7.0 x 5.0 (4-pin & 6-pin)
Socket to use	SiT6161DK		SiT6165DK		SiT6160DK	
Supported	SiT8008	SiT8008	SiT2024	SiT8008	SiT8008	SiT8008
Field	SiT8009	SiT8009	SiT2025	SiT8009	SiT8009	SiT8009
Programmable	SiT8920	SiT8920	SiT9201	SiT8208	SiT8208	SiT8208
Devices	SiT8921	SiT8921	SiT2001	SiT8209	SiT8209	SiT8209
	SiT8924	SiT8924	SiT2002	SiT8920	SiT8920	SiT8920
	SiT8925	SiT8925	SiT2020	SiT8921	SiT8921	SiT8921
	SiT9005	SiT9003	SiT2021	SiT8924	SiT8924	SiT8924
		SiT9005		SiT8925	SiT8925	SiT8925
				SiT3808	SiT3808	SiT3808
				SiT3809	SiT3809	SiT3809
				SiT9121	SiT9121	SiT9121
				SiT9122	SiT9122	SiT9122
				SiT9003	SiT9003	SiT9003
				SiT9005		



#### Table 13. Revision History

Revision	Release Date	Change Summary			
0.8	04/01/2013	First release			
1.0	02/27/2014	Added more field programmer devices Updated Time Machine Socket Card information Formatted enhancement			
1.01	03/12/2014	Corrected the ordering code for High Temperature, Single-Ended devices			
1.1	03/30/2015	Updated revision from A to B for SiT8008/8009/8920/8921 Corrected frequency stability of SiT9002			
1.2	07/21/2015	Added supports for AEC-Q100 automotive products;SiT2024, SiT2025, SiT8924,SiT8925 Added supports for clock generators products;SiT9201, 2001, 2002, SiT2018, SiT2019, SiT2020, SiT2021 Corrected frequency range and frequency stability of the high temperature products (SiT8920/SiT8921) in Table.1 Updated the part number of the program kits in Table.6			
1.3	09/15/2015	Added ±25 ppm frequency stability option to AEC-Q100 family Revised spread percentage of SiT9001 Added 2.8 V voltage option to SiT9003			
1.4	03/14/2016	Corrected and added one more "0" at the end of all part numbers except for SiT900x"			
1.5	02/01/2018	Added SiT9005 Added SiT9002 unsupported frequencies list Took out 2520 and 3225 package options from SiT9003 Took out 2520 package option from SiT8208, SiT8209, SiT3807 and SiT3808 Took out SiT9001 Updated logo and company address, other page layout changes			
1.6	11/26/2019	Added SiT5155, SiT5156, SiT5157, SiT5356, SiT5357 Added SiT6166DK Corrected SiT8208, SiT8209, SiT3808 and SiT3809 part numbers Corrected SiT3808, SiT3809, SiT3821, SiT3822 pull range options Corrected SiT3808, SiT3809 p/ns			
1.7	03/04/2020	Added footnotes to supported devices Removed SiT3821, SiT3822, SiT9001, SiT9002 Removed SiT6166DK			
1.75	03/09/2020	Added SiT1581, SiT5146, SiT5147, SiT5346, SiT5347, SiT5348, SiT5349, SiT9346, SiT9347			

#### SiTime Corporation, 5451 Patrick Henry Drive, Santa Clara, CA 95054, USA | Phone: +1-408-328-4400 | Fax: +1-408-328-4439

© SiTime Corporation 2013-2020. 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.