

## SK-FM0-V48-S6E1A1

#### (PN:S6SE1A12C0ASA0002)

Hardware v1.1.0 / document v1.2.0

#### **Content of this document**

- Hardware
- Software
- Flash Programming
- JTAG debugger
- Finally





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#### Try this board

- This MCU on the board is preprogrammed with a test application.
- Follow the steps to test it:
  - Install the USB Virtual-COM port driver
  - <Release>:Tools\vcom\_drivers\_spansion.zip
  - Close J2, J4, J9, J11, J12
  - Check the availability of Virtual-COM (e.g. Windows Device Manager)
  - Open the "Spansion Serial Port Viewer"

#### <Release>:Tools\SerialPortViewerAndTerminalV5.5.zip

- Set the baud rate to "115200"
- Click "Disconnected", to be "Connected"
- Press <**Space**> to show the welcome menu
- Test the functions by enter the number

#### Learn more details...



**Congratulation!** 

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3



## Hardware

#### **Features of the MCU**

- The SK-FM0-V48-S6E1A1 is based on the Spansion ARM® Cortex<sup>™</sup>-M0+ device S6E1A12C0A
- The S6E1A1 Series have these features:
  - Power Supply: 2.7 to 5.5V
  - Up to 40MHz frequency
  - Up to 88Kbytes flash and 6Kbytes SRAM
  - Up to 3 channels of Multi-Function-Serial (MFS) interface with 128bytes FIFO
  - One 12-bit A/D Converter; Max. 8 channels
  - One Real Time Clock
  - DMA-Controller (2ch)
  - One Multi-Function-Timer (MFT) and Quadrature Position/Revolution Counter (QPRC), e.g. Motor control
  - Timers (base timer, dual timer, watch dog, etc.)
  - Low Voltage Detection and Clock Supervisor module
  - 32/48 LQFP and QFN, 52 LQFP



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The SK-FM0-V48-S6E1A1 has these features:

Features	Details	
Power supply	CN3 (USB), CN2 (Debugger), BAT (Cell battery) (Note: Cell battery is not included in this	
On-board voltage	3V3, 5V0 or Cell Battery (BAT)	
Buttons and Touch	Reset, External INT, NMI, Touch slider	
LED	Power, User	
Debug interface	CMSIS-DAP, SWD	
Programming I/F	Virtual-COM port	
Current Measure	Configurable jumper for measuring the current of the FM0+ MCU VCC pin	



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### MCU pin assignment – 48 LQFP(1/4)

Pin	Pin definition	Function
1	VCC	3V3, BAT, 5V0
2	P50/INT00_0/AIN0_2/SIN3_1/IC01_0	N/A
3	P51/INT01_0/BIN0_2/SOT3_1	N/A
4	P52/INT02_0/ZIN0_2/SCK3_1	N/A
5	P39/DTTI0X_0/ADTG_2	N/A
6	P3A/RTO00_0/TIOA0_1/AIN0_3/SUBOUT_2/RTCCO_2/INT03_ 0/SCK0_2	N/A
7	P3B/RTO01_0/TIOA1_1/BIN0_3/SOT0_2/INT04_0/SCS31_2	N/A
8	P3C/RTO02_0/TIOA2_1/ZIN0_3/SIN0_2/INT05_0/SCS30_2	N/A
9	P3D/RTO03_0/TIOA3_1/INT06_0/AIN0_0/SCK3_2	N/A
10	P3E/RTO04_0/TIOA0_0/BIN0_0/SOT3_2/INT15_0	N/A
11	P3F/RTO05_0/TIOA1_0/ZIN0_0/SIN3_2	N/A
12	VSS	VSS



### MCU pin assignment – 48 LQFP (2/4)

Pin	Pin definition	Function
13	C	4.7uF
14	VCC	3V3, BAT, 5V0
15	P46/X0A	Sub-crystal 32.768KHz
16	P47/X1A	Sub-crystal 32.768KHz
17	INITX	RESET
18	P49/TIOB0_0	N/A
19	P4A/TIOB1_0	N/A
20	PE0/ADTG_1/DTTI0X_1/INT02_2	N/A
21	MD0	MD0
22	PE2/X0	Main crystal 4MHz
23	PE3/X1	Main crystal 4MHz
24	VSS	VSS



### MCU pin assignment – 48 LQFP (3/4)

Pin	Pin definition	Function
25	P10/AN00	N/A
26	P11/AN01/SIN1_1/INT02_1/FRCK0_2/IC02_0	TSC slider part1
27	P12/AN02/SOT1_1/IC00_2/INT01_1	TSC slider part2
28	P13/AN03/SCK1_1/SUBOUT_1/IC01_2/RTCCO_1/INT00_1	N/A
29	P13/AN03/SCK1_1/SUBOUT_1/IC01_2/RTCCO_1/INT00_1	N/A
30	P15/AN05/SOT0_1/SCS11_1/IC03_2/INT15_2	TSC charger
31	AVCC	AVCC
32	AVRH	AVRH
33	AVSS	AVSS
34	P23/AN06/SCK0_0/TIOA2_0/IC02_1/AIN0_1/INT04_1	N/A
35	P22/AN07/SOT0_0/TIOB2_0/IC03_1/ZIN0_1/INT05_1	SOT0_0
36	P21/SIN0_0/INT06_1/TIOB1_1/IC01_1/BIN0_1/FRCK0_0	SIN0_0



### MCU pin assignment – 48 LQFP (4/4)

Pin	Pin definition	Function
37	P00	N/A
38	P01/SWCLK	SWCLK (SWD)
39	P02	N/A
40	P03/SWDIO	SWDIO (SWD)
41	P04/SCK3_0/INT03_2/TIOB0_1/IGTRG0_1	INT button
42	P0F/NMIX/SUBOUT_0/CROUT_1/RTCCO_0	NMIX button
43	P61/SOT3_0/TIOB2_2/DTTI0X_2/SCS11_2	LED
44	P60/SIN3_0/TIOA2_2/INT15_1/IC00_0/IGTRG0_0/SCS10_2	Pull-down to GND
45	P80/SCK1_2/FRCK0_1	N/A
46	P81/SOT1_2	N/A
47	P82/SIN1_2	N/A
48	VSS	VSS



### Jumper Table

Jumpers	Function	Setting
J1-J2	Select power source Please just select one power source!	J1: CN2 (Debugger) J2: CN3 (USB)
J3-J5	Select on-board voltage Do only set one jumper!	J3: 5V0 J4: 3V3 J5: BAT (Cell battery)
J6	VUSB detection	Open: for on-board voltage is 3V3 Close: for on-board voltage is 5V0
J7	CMSIS-DAP Reset	Do not close!
J8	CMSIS-DAP MD0	Open: user mode Close: flash programming for CMSIS-DAP
J9	Jumper for current metering	Open: connect a current meter in serial Close: normal mode
J10	FM0+ MD0	Open: user mode Close: flash programming for fm0
J11-J12	UART connecting between FM0+ and FM3	Use of virtual COM-port: Open: Disconnect from CMSIS-DAP UART Close: Connect to CMSIS-DAP UART



Power structure and jumpers



\* Please just select one power supply and on-board voltage!





#### Jumper - Default (Run mode, CMSIS-DAP)

Default jumper setting (Run mode, CMSIS-DAP, 3V3)





#### Jumper - Debug Mode(SWD)

Jumper Setting for SWD debugging mode (5V0)







## Software

#### Software

- s6e1a1-template-v1.1.0 (template project)
  - "Empty "project as base for user application
  - Find the template project <Release>:Template\s6e1a1-template-v1.1.0.zip
- tp-sk-fm0-v48-s6e1a1(testcode)
  - Touch slider implementation using ADC and I/O
  - LED driving by timer
  - For checking the functionality of starterkit
  - Find the hex file <Release>:Hex file\tp\_sk-fm0-v48-s6e1a1-v04.srec



#### **Software-Tools**

- The following tools are available
  - FLASH USB DIRECT Programmer
    - MCU flash programmer via USB port
    - Install from: <Release:> Tools\usbdirect-v01l08.zip
  - FLASH MCU Programmer
    - MCU flash programmer via UART (CN3, on-board USB-to-UART)
    - Install from: <Release:> Tools\ PCW\_for\_S6E1A1\_ES1\_[V01L11ca02].zip
  - USB Virtual-COM port
    - Allows UART communication by the PC's USB connection
    - On-board USB-to-UART converter (via CN3, CMSIS-DAP)
    - For driver installation: <Release:> Tools\ vcom\_drivers\_spansion.zip





## Flash programming

### Flash programming the FM0+ via CN3 (serial)

- FLASH MCU Programming the FM0+ via CN3
  - Jumper Setting
    - Close jumper J2, J3 and J6
    - Close jumper J9 and J10
    - Close jumper J11 and J12
  - Connect the board via CN3 with USB port of PC
  - FLASH MCU Programmer for FM0+
    - Programming the FM0+ via USB-to-UART converter(CMSIS-DAP)



#### Jumper - Programming mode (serial)

Jumper setting for Programming the FM0+ via CN3







## JTAG debugger

#### **CMSIS-DAP** Overview

- This starterkit also provides an on-board JTAG adapter
  - Compatible to CMSIS-DAP
  - Based on MB9AF312K



- To use CMSIS-DAP (for first time)
  - Install Virtual-COM port driver.<Release>:Tools\vcom\_drivers\_spansion.zip
  - Install CMSIS-DAP and Programming driver. <Release>: Tools\ cmsisdap\setup\_driver\_installer.zip
  - Update CMSIS-DAP firmware by FLASH USB DIRECT programmer



#### **CMSIS-DAP** within IAR EWARM6

- Select the CMSIS-DAP within IAR EWARM6
  - Right click on the project
  - Select "Options"
  - Select "Debugger"
  - Click "Setup"
  - Select "CMSIS-DAP"

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#### **CMSIS-DAP** within IAR EWARM6

- Select SWD interface for CMSIS-DAP
  - Click on "CMSIS-DAP" -> "JTAG/SWD" -> "SWD"

Options for node "S6E14	A1_template"	23	:
Category: General Options C/C++ Compiler Assembler Output Converter Custom Build Build Actions Linker Debugger Simulator Angel CMSIS DAP GDB Server IAR ROM-monitor I-jet/JTAGjet J-Link/J-Trace TI Stellaris Macraigor PE micro RDI ST-LINK Third-Party Driver TI XDS 100/200	A1_template         Setup       JTAG/SWD         Interface       Probe configuration         ITAG       Multitarget debug system         Target number (TAP or Multidrop ID):       0         Target with multiple CPUs       0         JTAG/SWD speed       CPU number on target:         Auto detect       0	tory Settings	
		31	

#### \*For FM0+, only SWD interface is available



#### CMSIS-DAP within Keil µVision5

- Select the CMSIS-DAP within Keil uVision5
  - Right click on the project
  - Select "Options for ..."
  - Click "Debug"
  - Select "CMSIS-DAP Debugger"
  - Click "Utilities"
  - Select "CMSIS-DAP Debugger"





#### CMSIS-DAP within Keil µVision5

- Select the SWD interface for CMSIS-DAP
  - Click "Settings" on Debug sheet
  - Click "Debug"
  - Select "SW"

\*For FM0+, only SWD interface is available

	User C/C++ Asm	Linker Debug Utilities	
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- Select the J-Link within IAR EWARM6
  - Right click on the project
  - Select "Options"
  - Select "Debugger"
  - Click "Setup"
  - Select "J-Link/J-Trace"

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- Select the SWD interface for J-Link
  - Click on the "J-Link/J-Trace" -> "Connection" -> "SWD"

Options for node "S6E1A1	L_template"
Category	
General Options C/C++ Compiler	Factory Settings
Output Converter	Setup Connection Breakpoints
Custom Build	
Build Actions	O USB: Device 0 ▼ Serial no:
Debugger	O TCP/IP: IP address     ▼
Simulator	IP address: aaa.bbb.ccc.ddd Serial no:
CMSIS DAP	Interface JTAG scan chain
GDB Server	JTAG scan chain with multiple targets
IAR ROM-monitor	TAP number: 0
I-jet/JTAGjet	Scan chain contains non-ARM devices
TI Stellaris	Preceeding bits: 0
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ST-LINK	\$PROJ_DIR\$\cspycomm.log
Third-Party Driver	
TI XDS100/200	
	OK Cancel

#### \*For FM0+, only SWD interface is available

- Select the J-Link within Keil µVision5
  - Right click on the project
  - Select "Options for ..."
  - Click "Debug"
  - Select "J-Link/J-Trace"
  - Click "Utilities"
  - Select "J-Link/J-Trace"





ON

- Select the SWD interface for J-Link
  - Click "Settings" on Debug sheet
  - Click "Debug"
  - Select "SW"

Options for Target 'S6E1A12X0A_Release'	
Device   Target   Output   Listing   User   C/C++   Asm	Linker Debug Utilities
C Use Simulator Settings Limit Speed to Real-Time	C Use: J-LINK / J-TRACE Cortex ▼ Settings
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CPU DLL: Parameter:	Driver DLL: Parameter:
SARMCM3.DLL	SARMCM3.DLL
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OK Car	ncel Defaults Help
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Connect & Reset Options Connect: Normal  Reset: Normal Reset after Connect	✓         Cache Options           ✓         Cache Code           ✓         Cache Memory           ✓         Download options           ✓         Download options
Interface     TCP/IP       Scan     IP-Address       State: ready     127	Port (Auto: 0) Autodetect JLink Info JLink Cmd
	OK Cancel Apply



# Finally

#### **Contact us**

- Please check the following web, for any available updates: <u>www.spansion.com/starterkit</u>
- Please contact local support team for technical support:
  - America: <u>Spansion.Solutions@spansion.com</u>
  - China : <u>mcu-ticket-cn@spansion.com</u>
  - Europe : <u>mcu-ticket-de@spansion.com</u>
  - Japan : <u>mcu-ticket-jp@spansion.com</u>

Other: <a href="http://www.spansion.com/Support/SES/Pages/Ask-Spansion.aspx">http://www.spansion.com/Support/SES/Pages/Ask-Spansion.aspx</a>



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- Gültig für EU-Länder:
  - Gemäß der Europäischen WEEE-Richtlinie und deren Umsetzung in landesspezifische Gesetze nehmen wir dieses Gerät wieder zurück.
  - Zur Entsorgung schicken Sie das Gerät bitte an die folgende Adresse:
- Valid for European Union Countries:
  - According to the European WEEE-Directive and its implementation into national laws we take this device back.
  - For disposal please send the device to the following address:



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Germany





This board is compliant with China RoHS



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