swissbit®

Product Data Sheet

FIDO2 Hardware Authenticator

iShield Key Series
USB-C / NFC

Extended Temperature Grade

Date: August 26th, 2024
Revision: 1.00

Made in Germany

Contents

iShield Key Series USB-C / NFC

1. Product Summary

Mechanical Details	Form Factor / Device Type
47.5 x 18.5 x 6mm Thermoplastic polyamide (PA) / matte finish Rear Touch sensor, keychain hole Water resistant, robust construction	CCID Smartcard, FIDO2 HID Device USB-C Device with NFC interface and multi-color LED
Operating Temperature Range	**Certifications**
Extended: -25 °C to 70 °C	FIDO2/CTAP2 Level 1 Certified Universal 2nd Factor (U2F) CTAP1 Certified Microsoft Certified
Ingress protection	
IP68	Dust tight Protection against powerful water jets
Platforms Supported	
Operating Systems: Browsers:	Windows 10/11, MacOS, iOS, iPadOS, Linux, Chrome, Android Firefox, MS Edge, Chrome, Apple Safari

2. Product / Security Standards

HOTP

Hash-based one time password (HOTP) is event-based and a combination of private key & counter-based one-time password.

Function:

- Secures two-factor authentication (2FA) for web services in legacy scenarios that do not support WebAuthn
- HOTP function can also be utilized for offline use case scenarios, where users don't have access to the internet to execute FIDO.

PIV

Personal Identity Verification (PIV) allows the iShield Key Pro to store personal credentials for a given individual.

PKI TOKEN for Authentication, encryption and digital signing

Function:

- Securing 2FA windows login (local, MS Active Directory & Azure Active Directory)
- Storing digital certificates and private keys securely. When you need to encrypt, decrypt or sign something, the token does this internally in a secure chip meaning the keys are never at risk of being stolen.
- Storing security keys for device identification, authentication and registration using pkcs#11 cryptographic standards

TOTP

Time-based one time password (TOTP) is time-based and a combination of private key & time-based one-time password.

Function:

- Secures two-factor authentication (2FA) for web services in legacy scenarios that do not support WebAuthn
- TOTP function can also be utilized for offline use case scenarios, where users don't have access to the internet to execute FIDO.

3. Ordering Information

Table 1: Standard Product List

Product Type		Product Series	Part Number	Supported Standards / Features
	USB-C NFC	iShield Key FIDO2	SNU20000D1PBCN0-E-01-110-SBT *(Delivery in tray)*	WebAuthn, FIDO2/CTAP2 Universal 2nd Factor (U2F) CTAP1,
			SNU20000D1PBCN0-E-01-110-SBB *(Delivery in single packaging)*	
	USB-C NFC	iShield Key Pro	SNU20000D1PBCN0-E-01-112-SBT *(Delivery in tray)*	WebAuthn, FIDO2/CTAP2 Universal 2nd Factor (U2F) CTAP1, HOTP (Event) TOTP (Time) Smartcard (PIV-compatible) OpenSC-compatible
			SNU20000D1PBCN0-E-01-112-SBB *(Delivery in single packaging)*	

4. Product Description

4.1 Features

iShield Key is a FIDO Security Key with following features:

- Interfaces: USB-C and NFC
- Supports FIDO2 and FIDO U2F
- Storage of max 32 passkeys
- Touch authentication via USB
- Tap-and-go authentication with NFC (e.g. on mobile devices)
- OS: Windows 10/11, MacOS, iOS, iPadOS, Linux, Chrome OS, Android
- Browser: Firefox, MS Edge, Google Chrome, Apple Safari
- Pro version: TOTP, HOTP, PIV

4.2 Current Consumption

The drive-level current consumption as a function of operating mode is shown in Table 2.

Table 2: Current Consumption

Interface	Initialization	Idle	Unit
USB 2.0	30	19.5	mA

4.3 Environmental Specifications

4.3.1 Recommended Operating Conditions

The recommended operating conditions for the iShield Key Series are provided in Table 3.

Table 3: Recommended Operating Conditions[1]

Parameter	Value
Extended Operating Temperature	-25 °C to 70 °C
Power Supply V_{CC} Voltage	5,0 V ± 10%

4.3.2 Recommended Storage Conditions

The recommended storage conditions are listed in Table 4.

Table 4: Recommended Storage Conditions

Parameter	Value
Extended Storage Temperature	-25 °C to 85 °C

[1] Adequate airflow is required to ensure the temperature.

4.3.3 Ingress Protection

The ingress protection class is listed in Table 5.

Table 5: Ingress protection

Ingress protection	
IP68	Dust tight Protection against powerful water jets

4.3.4 Shock, Vibration and Humidity

The maximum shock, vibration and humidity conditions are listed in Table 6.

Table 6: Shock, Vibration and Humidity

Parameter	Value
Non-Operating Shock	1,500 g, 0,5 ms pulse duration, half-sine wave (IEC 60068-2-27, JESD22-B110)
Non-Operating Vibration	50 g, 10Hz – 2000Hz, 3 axes (IEC 60068-2-6,
Humidity (Non-Condensing)	85% RH 85 °C, 330 hrs, max. supply voltage (JESD22-A101)

4.4 Regulatory Compliance

The iShield Key Series USB-C / NFC comply with the regulations / standards listed in Table 7.

Table 7: Regulatory Compliance

Abbreviation	Regulation/ Standard
EMC	CE – 2014/30/EU FCC – 47 CFR Part 15 UKCA – S.I. 2016 No. 1091 and S.I. 2012 No. 3032
RoHS	2011/65/EU with 2015/863/EU and 2017/2102/EU
REACh	1907/2006/EU and 207/2011/EU
WEEE	2012/19/EU

4.5 Mechanical Specifications

Physical dimensions are detailed in Table 8. Figure 2 illustrates the iShield FID02 dimensions.

Table 8: Physical Dimensions

Physical Dimensions		Unit
Length	47,7±0,3	mm
Width	18,7±0,3	
Thickness (Max)	6,2±0,3	
Weight (Max Capacity)	6	g

4.6 Reliability

FIT and MTBF calculation

The Mean Time Between Failures (MTBF) for the Swissbit® iShield Key Hardware Authenticator is specified to exceed the value listed in the following Table 9.

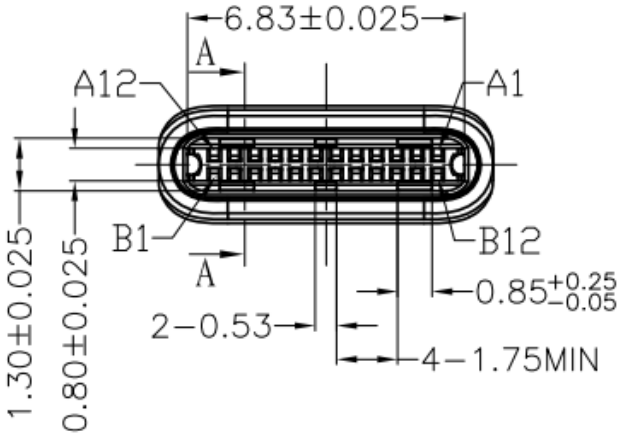
Table 9: MTBF

Parameter	Value
MTBF (at 25 °C)	> 4,000,000 hours

5. Electrical Interface

The signal/pin assignments and descriptions are listed in Figure 1.

Figure 1: USB2 Type-C connector pinout



PIN ASSIGNMENT(REF.)

A12	A11	A10	A9	A8	A7	A6	A5	A4	A3	A2	A1
GND	RX2+	RX2-	VBUS	SBU1	D-	D+	CC	VBUS	TX1-	TX1+	GND
GND	TX2+	TX2-	VBUS	VCONN			SBU2	VBUS	RX1-	RX1+	GND
B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12

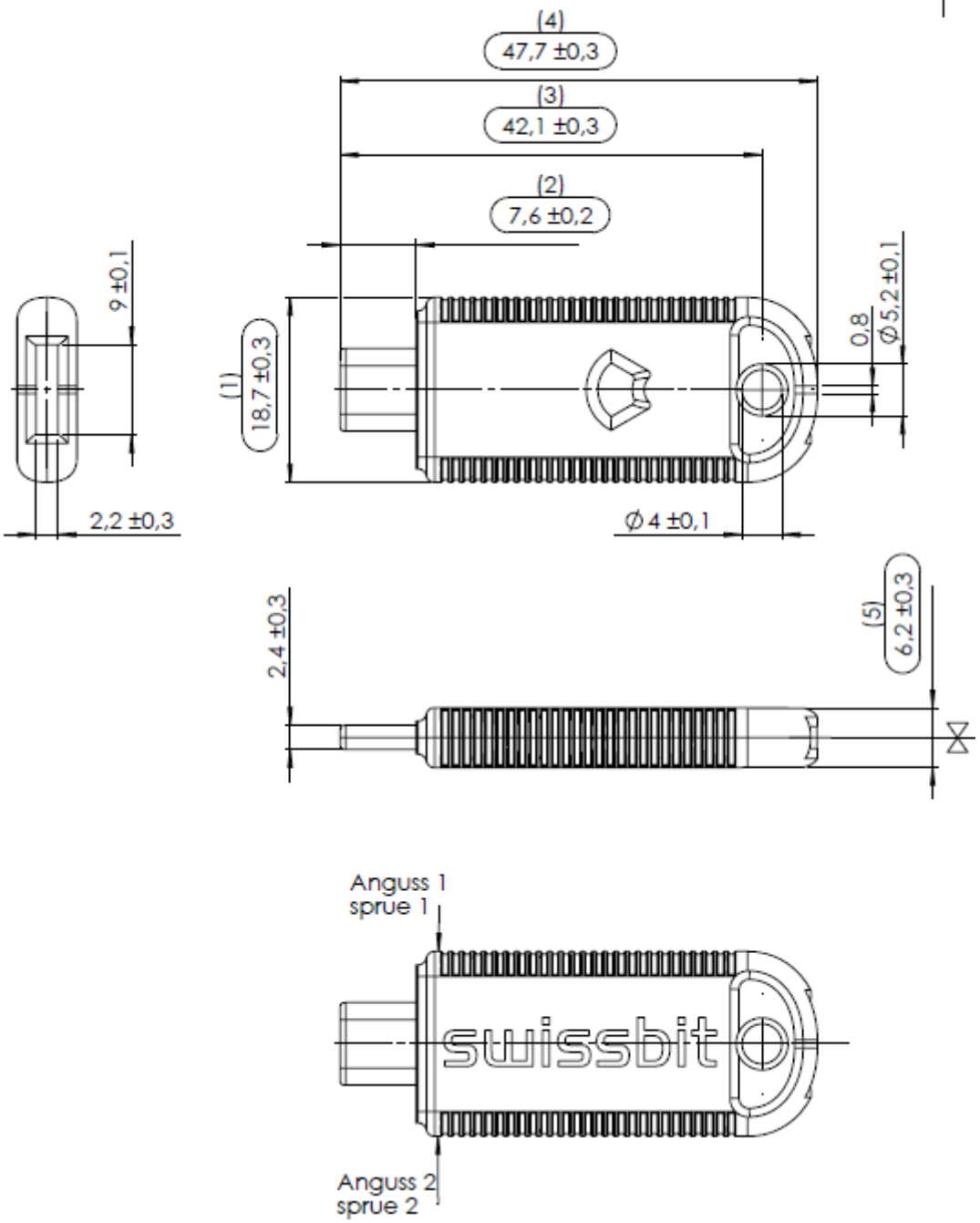
6. Electrical Specification

Table 10: Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Power Supply Voltage	V_Bus	-0.5	6.0	V
Voltage at D+ and D-	V_Data	-0.5	5.0	

7. Package Mechanical

Figure 2: iShield Key USB-C / NFC



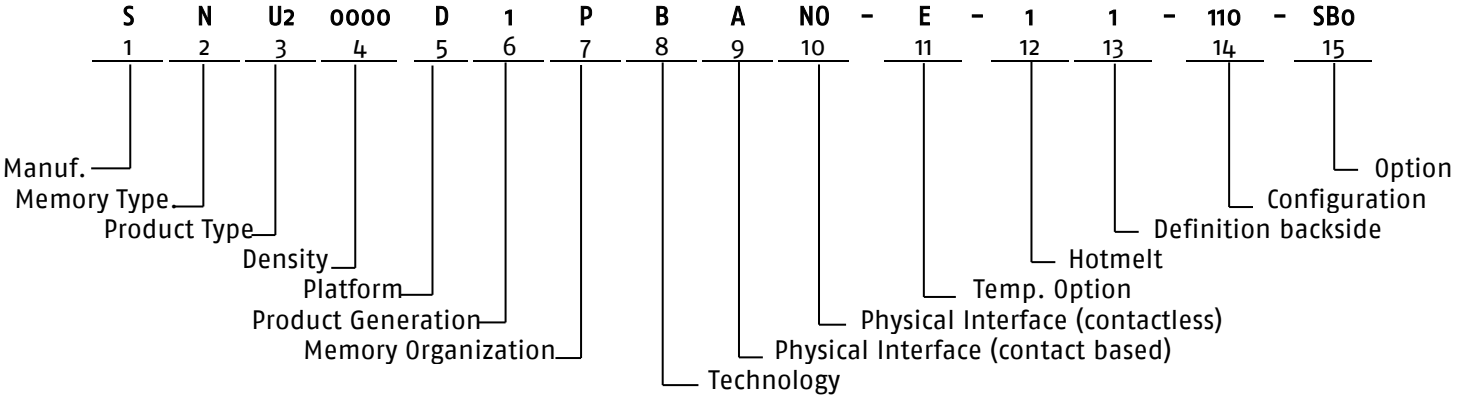
8. FIDO Functionality

See the following Table 11 for a list of FIDO Functionality.

Table 11: Function

Function	Value
FIDO	U2F / FIDO2 (CTAP 2.0)
Interface	USB-C / NFC
Supported Standards *(available in iShield Key Pro)*	HOTP / PIV / OpenSC

9. Part Number Decoder



9.1 Manufacturer

Swissbit code	S

9.2 Memory Type

Non-Flash	N

9.3 Product Type

USB 2.0 Drive	U2

9.4 Density

No user space	0000

9.5 Platform

Compact USB SMT	D

9.6 Product Generation

Generation	1

9.7 Memory Organization

Security Product	P

9.8 Technology

Infineon SLE78	B

9.9 Physical Interface (contact based)

USB-C	C

9.10 Physical Interface (contactless)

NFC	No

9.11 Temperature Option

Extended Temperature Range: -25 °C to 70 °C	E

9.12 Definition of Technology for Non-Flash Products: Hotmelt

Black	0

9.13 Definition of Technology for Non-Flash Products: Hotmelt Imprint (backside)

No imprint (flat backside)		0
Swissbit imprint		1

9.14 Configuration XYZ

X = Technology

FIDO2 / U2F	1

Y = Firmware Revision

FW Revision	1

Z = Feature list FIDO

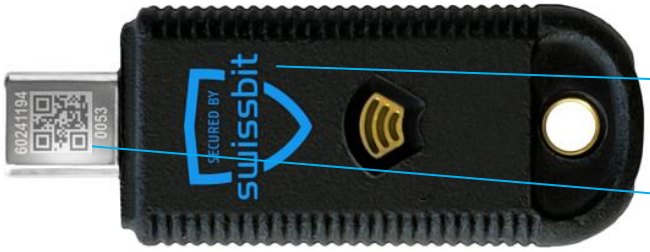
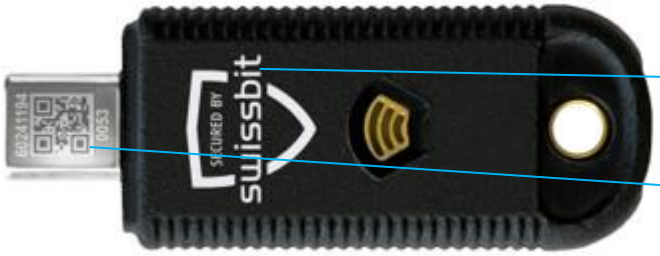
FIDO2, U2F	0
FIDO2, U2F, HOTP, PIV	1
FIDO2, U2F, HOTP, TOTP, PIV	2

9.15 Definition for Security Products

Swissbit iShield Key / Delivery in single packaging	SBB
Swissbit iShield Key / Delivery in tray	SBT

10. Marking Specification

Figure 3: iShield Key Series

Lasermarking / PCB (back side)	Swissbit iShield Key Series
	iShield Key Pro iShield Key FIDO2
Digital printing (front side)	**Swissbit iShield Key Series with secured by SB logo + QR-Code**
	**iShield Key FIDO2** Secured by Swissbit Logo color "blue" QR Code with Lot number/counter Serialization number
	**iShield Key Pro** Secured by Swissbit Logo color "white" QR Code with Lot number/counter Serialization number

11. Revision History

Table 12: Document Revision History

Date	Revision	Description	Revision Details
26.08.2024	1.00	Initial release	Doc req. no. 5162