



RealSense ID Solution

F45X Product Datasheet

F450 · F455

Revision 004 | July 20

RealSense™ and the RealSense™ logo are trademarks of RealSense, Inc. in the U.S. and/or other countries. Other names and brands may be the trademarks or registered trademarks of third parties. INTEL® REALSENSE™, INTEL® and the INTEL® Logo are trademarks of Intel Corporation or its subsidiaries used under license. Certain RealSense™ products are sold by RealSense, Inc. under license from Intel Corporation.

Revision History

Revision	Description	Date
001	Initial Public Release	May 2026
002	Added section 6. Software	May 2026
003	Added section 7. Vision Intelligence	May 2026
004	Updated Branding	July 2026

Table of Contents

1. Overview	5
1.1 RealSense ID Solution SKUs	5
2. Hardware Details	6
2.1 Hardware Components	6
2.2 Processor & Memory	6
2.3 Connectivity & Interfaces	7
2.3.1 Data Interface	7
2.3.2 Power Interface	7
2.3.3 Power Consumption	7
2.3.4 Receptacle Pinout	7
2.3.5 Interposer Interconnect Signal Description	8
2.3.6 Peripheral Pinout	10
2.4 Optical System	10
2.4.1 IR Illuminators	10
2.5 Thermal	11
2.5.1 Heat Sink	11
3. Mechanical	11
3.1 Mechanical Dimensions	11
3.1.1 Module Dimensions	11
3.1.2 Peripheral Dimensions	12
3.2 Cover Glass	12
3.3 Module Installation Guidelines	13
3.4 System Tilt & Mounting	13
3.4.1 Human Height	13
3.5 Optical Isolation	14
4. System Integration	15
4.1 Product Assembly	15
4.1.1 Product Assembly Recommendations	15
4.1.2 Product Design Recommendations	15
4.1.3 Optical Assembly Considerations	16
5. Security	17
5.1 Security Features Overview	17
5.2 Security Objectives	17
5.3 Cryptographic Algorithms	17
5.4 Privacy	18

6. Software	19
6.1 Firmware (FW)	19
6.1.1 Update Procedure	19
6.1.2 Communication Interfaces	19
6.2 Biometric Features Database	20
6.2.1 DB Performance	20
6.2.2 DB Versioning	20
6.3 SDK	21
6.3.1 Android Requirements	21
7. Vision Intelligence	22
7.1 Supported Lighting Conditions	22
7.2 Supported Operating Distances	22
7.3 Face Recognition	22
7.3.1 KPIs and Accuracy Benchmarks	22
7.4 Presentation Attack Detection	23
7.4.1 KPIs and Benchmark Results	23
8. Appendix: Reference Diagrams and Drawings	24
8.1 USB Interposer Reference Design	24
8.2 Mechanical Drawings	25
9. Regulatory Compliance	26
9.1 Regulatory Compliance	26
9.1.1 Manufacturer's Information	26
9.1.2 EU Single Place of Contact	26
9.1.3 UK Single Place of Contact	26
9.1.4 FCC Part 15 Declaration of Conformity	26
9.1.5 Canada	27
9.1.6 European Directives	27
9.1.7 Australia	27
9.1.8. Japan	27
9.1.9 South Korea	27
9.2 Ecology Compliance	28
9.2.1 China RoHS Declaration	28
9.2.2 Waste Electrical and Electronic Equipment (WEEE)	28
9.2.3 Turkey	28

1. Overview

RealSense™ ID is an AI-powered, on-device facial authentication platform.

The RealSense ID module runs multiple neural network models on a dedicated NPU within a closed real-time operating system (RTOS), providing secure and accurate face authentication. Biometric processing remains on-device, authentication requires active user awareness, and presentation attack detection helps protect against attacks using photographs, videos, or masks.

1.1 RealSense ID Solution SKUs

Config	SKU	Label	Description
Module	F450	F450L	The RealSense™ ID F450 is an embedded device. An SOC controls all boot-up and runtime flows of the RealSense F450 module through an internal data link connection.
Peripheral	F455	F455L	The RealSense F450 integrated into a mechanical housing. The RealSense™ ID F455 peripheral connects to an external system through an external cable, typically USB2

Throughout this document, "**device**" refers to both the F450 module and the F455 peripheral unless stated otherwise.

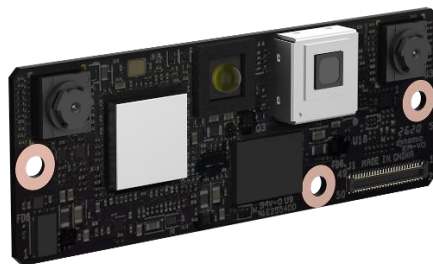


Figure 0-1: RealSense F450 Module

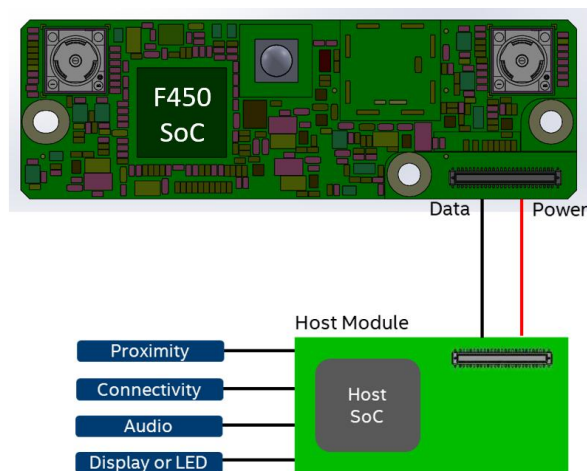


Figure 0-2: RealSense F450 Module System Topology

2. Hardware Details

The RealSense™ ID F450 is a single-board optical and processing module designed for installation in a system chassis and connection to a host. Its optical components include image sensors and infrared illumination.

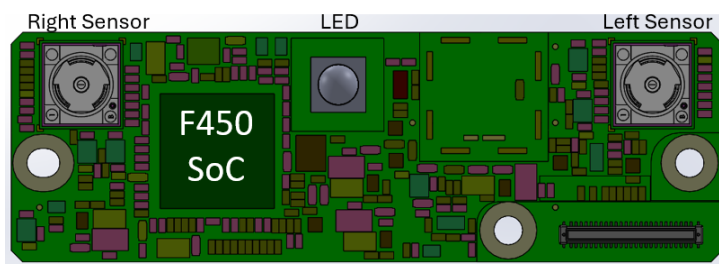


Figure 2-1: RealSense ID F450 Module Front Side

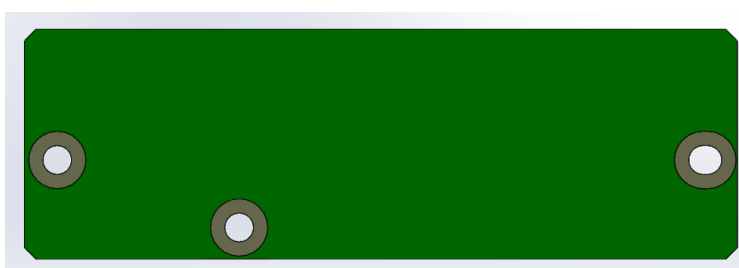


Figure 2-2: RealSense ID F450 Module Rear Side

2.1 Hardware Components

Section	Description
SoC	System-on-chip
Right Sensor	Full HD sensor
Left Sensor	Full HD sensor
LED	850 nm IR LED
Host Connector	IPEX 20708-050E Plug (50-pin)
Crystal	24 MHz
Flash	512 Mb (64 MB) SPI NOR flash — RAW storage
Secure Element	Secure cryptographic element

2.2 Processor & Memory

Feature	Specification
CPU	32-bit RISC (ARM A7)
RAM	128 MB (up to 800 MHz)
NPU	0.3 TOPS

2.3 Connectivity & Interfaces

The RealSense™ ID F450 module requires external power and a serial data connection for initialization and control. Both are routed through a single host connector.

The host power supply must meet the peak power requirements at the selected VDD voltage. If the host uses power-gating control, ensure that power sequencing does not conflict with data-link initialization during power-up or power-down.

2.3.1 Data Interface

Interface	Data Rate	Pins
UART (3V)	115.2 kbps to 4 Mbps	UART_TX (Pin 47), UART_RX (Pin 49)
USB2	480 Mbps	USB2_DP (Pin 46), USB2_DN (Pin 48)

2.3.2 Power Interface

Pin	Voltage Range	Peak Power
VDD (Pin 51/52)	3.15V to 5.5V	3.6 W
GND	—	—

(1) The power range depends primarily on the illumination power configured for the device.

(2) The typical maximum current for a USB 2.0 port is 450 mA.

2.3.3 Power Consumption

State	Power	Description
Off	0 mW	Power supply from host disabled.
Operation	1.5 W	SoC operating; facial authentication pipeline running continuously; optical components active at a 30% LED duty cycle.

2.3.4 Receptacle Pinout

The module connector is IPEX 20708-050E. The host cable must use an IPEX 20709-050E receptacle.

Pin	Signal	Pin	Signal
2	GND	1	CPU_RXD (Debug UART input)
4	AUDGPIO_2	3	CPU_TXD (Debug UART output)
6	AUDGPIO_1	5	GND
8	GND	7	-
10	CSI_DN1	9	VCC_IO
12	CSI_DP1	11	VCC_IO
14	GND	13	HOST_ADC_In
16	AUDGPIO_0	15	EXT_RSTn (Active Low)
18	-	17	GPO_1

Pin	Signal	Pin	Signal
20	GND	19	GPO_0
22	GPIO_6	21	GND
24	GPIO_5	23	-
26	GND	25	SDO1
28	GPIO_3	27	SCK1
30	GPIO_2	29	SDI1
32	GND	31	SEN1
34	CSI_CKN	33	GPO_4
36	CSI_CKP	35	GND
38	GND	37	CSI_VSD0
40	CSI_DN0	39	SCL_3
42	CSI_DP0	41	SDA_3
44	GND	43	PWM4
46	USB_DP	45	PWM3
48	USB_DM	47	CPU_TXD2 (UART output from F450 module)
50	GND	49	CPU_RXD2 (UART input to F450 module)
52	5V (3.15V-5.5V)	51	5V (3.15V-5.5V)
54	GND	53	GND

2.3.5 Interposer Interconnect Signal Description

See Section 8.1 for the complete USB interposer reference design [here](#).

Pin	Signal	In/Out	Interconnect Description
1	CPU_RXD	Input	Debug UART RxD or USB AUX_IN (3V)
2	GND		Ground
3	CPU_TXD	Output	Debug UART TxD or USB AUX_OUT (3V)
5	GND		Ground
8	GND		Ground
9	VCC_IO	Power out	IO level power out (3V)
11	VCC_IO	Power out	IO level power out (3V)
14	GND		Ground
15	EXT_RSTn	Input	External Reset, Open/GND discrete, of RealSense F450 module (should be connected to open drain I/O).

Pin	Signal	In/Out	Interconnect Description
17	GPO_1	Output	GPIO Output (No external PU/PD needed) (3V)
19	GPO_0	Output	GPIO Output (No external PU/PD needed) (3V)
20	GND		Ground
21	GND		Ground
25	SPI - SDO	Output	Secondary SPI port (3V)
26	GND		Ground
27	SPI - SCK	Output	Secondary SPI port (3V)
28	GPIO_3	Input/Output	General Purpose I/O, defined by FW (No external PU/PD needed) (3V)
29	SPI - SDI	Input	Secondary SPI port (3V)
30	GPIO_2	Input/Output	General Purpose I/O, defined by FW (No external PU/PD needed) (3V)
31	SPI - SEN	Output	Secondary SPI port (3V)
32	GND		Ground
35	GND		Ground
38	GND		Ground
44	GND		Ground
46	USB2+		USB 2 differential pair positive
48	USB2-		USB 2 differential pair negative
50	GND		Ground
51	Vin	Power IN	Power IN – 3.15V – 5.5V (Peak power consumption = 3.6 W)
52	Vin	Power IN	Power IN – 3.15V – 5.5V (Peak power consumption = 3.6 W)
53	GND	Ground IN	Ground
54	GND	Ground IN	Ground

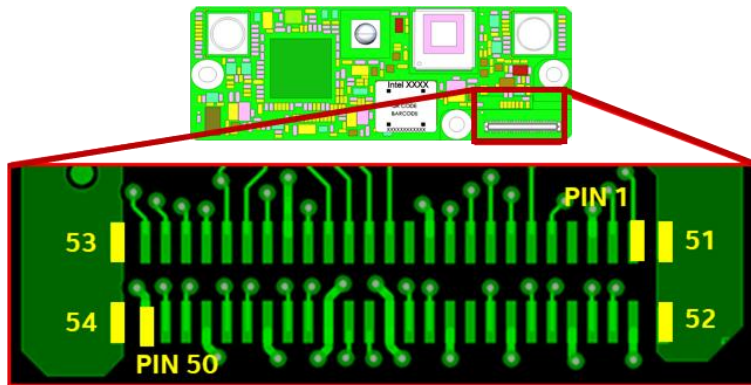


Figure 2-3: RealSense F450 Connector Pin 1 Location

2.3.6 Peripheral Pinout

Pin	Signal	In/Out	Interconnect Description
1	Vin	Power IN	Power IN – 3.15V – 5.5V (Peak power consumption = 3.6 W) (This should be connected only when USB power is not connected)
2	SDO	NA	SPI Data Output
3	SDI	NA	SPI Data Input
4	SCK	NA	SPI Clk
5	SEN	NA	SPI Enable (Not Connected)
6	CPU_TXD	Output	Debug UART TxD (3V)
7	GPO_1	Output	GPIO Output (No external PU/PD needed).
8	CPU_RXD	Input	Debug UART RxD (3V)
9	GPIO_3	Input/Output	General Purpose I/O, defined by FW (No external PU/PD needed) (3V)
10	GND		



Figure 2-4: RealSense F455 Peripheral Connector Pin 1 Location

2.4 Optical System

The optical system uses two synchronized, mechanically aligned sensors that capture images from different perspectives for stereo disparity and 3D triangulation. Both sensors are mounted in portrait orientation, with a monocular field of view of 59° horizontal and 80° vertical. The RealSense™ ID F450 uses these sensors for face authentication.

2.4.1 IR Illuminators

The optical system consists of an IR LED for face illumination in low or non-uniform lighting conditions. The illumination angle and placement of these components is chosen based on the field of view for both cameras.

The IR illumination system is tested for eye safety in accordance with IEC 62471.

Dimension	LED
Orientation	Portrait
Wavelength	850 nm
Regulatory	RG0 (IEC-62471)

2.5 Thermal

The RealSense™ ID F450 module is designed to operate indoors and outdoors across a wide temperature range.

Parameter	Min	Nom	Max	Unit
Storage temperature (ambient), not powered	-30	—	+70	°C
Ambient temperature, powered	-30	—	+70	°C

Notes:

1. All temperatures assume 100% duty cycle. A heat sink may be required for continuous-operation designs.
2. These specifications are preliminary and will be finalized after quality and reliability testing is complete.

2.5.1 Heat Sink

Although peak power reaches 3.6 W, the RealSense F450 module is expected to dissipate approximately 1.5 W during typical AI vision operation at a 30% illumination duty cycle. If required, include a heat sink to maintain the module within its operating-temperature range.

3. Mechanical

3.1 Mechanical Dimensions

The compact form factor of the RealSense F450 module supports flexible system integration. Mounting position and tilt angle depend on the installation height, user height range, and approach path.

Consider the following factors when defining system placement and orientation:

1. Sensor and lens field of view
2. User height range and approach path
3. Detection range

3.1.1 Module Dimensions

Dimension	Min (mm)	Nom (mm)	Max (mm)	Tolerance (mm)
X	49.70	49.80	49.90	±0.10
Y	17.90	18.00	18.10	±0.10
Z	4.23	4.38	4.53	±0.15

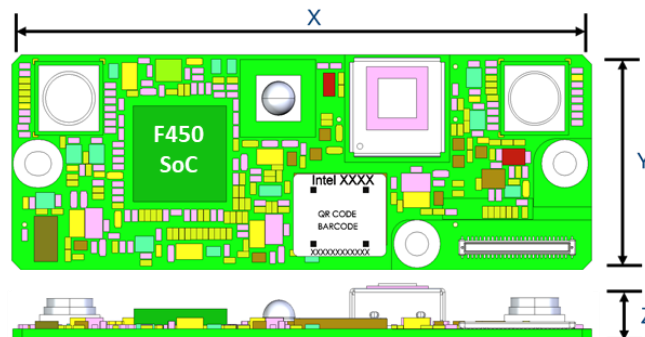


Figure 3-1: RealSense F450 Module Dimensions

3.1.2 Peripheral Dimensions

Dimension	Min (mm)	Nom (mm)	Max (mm)	Tolerance (mm)
X	61.90	62.00	62.10	±0.10
Y	32.40	32.50	32.60	±0.10
Z	10.85	11.00	11.15	±0.15

3.2 Cover Glass

The RealSense™ ID F450 module components must be covered to minimize impact of dust and humidity. The transparent cover glass material stack-up must provide acceptable transmission based on the component wavelengths. The through hole sizes of the cover glass is dependent on the optical component field of view or field of illumination as well as the cone diameter from the optical component to the cover glass. Use the 3D CAD model to verify that each optical cone clears the corresponding cover-glass opening.

Window optical quality

The cover-glass stack-up must provide high transmission across the wavelengths used by the components. Requirements are summarized below:

Requirement	
Camera opening optical transmission	>96% @ 400nm–870nm (0°) >92% @ 400nm–870nm (10°–45°)
IR Illumination opening optical transmission	>96% @ 820nm–870nm (0°) >92% @ 820nm–870nm (10°–45°)
Material	Transparent to visible and NIR wavelengths
Window quality	Optically flat, non-scattering and non-distorting
Window thickness	<2 mm preferred

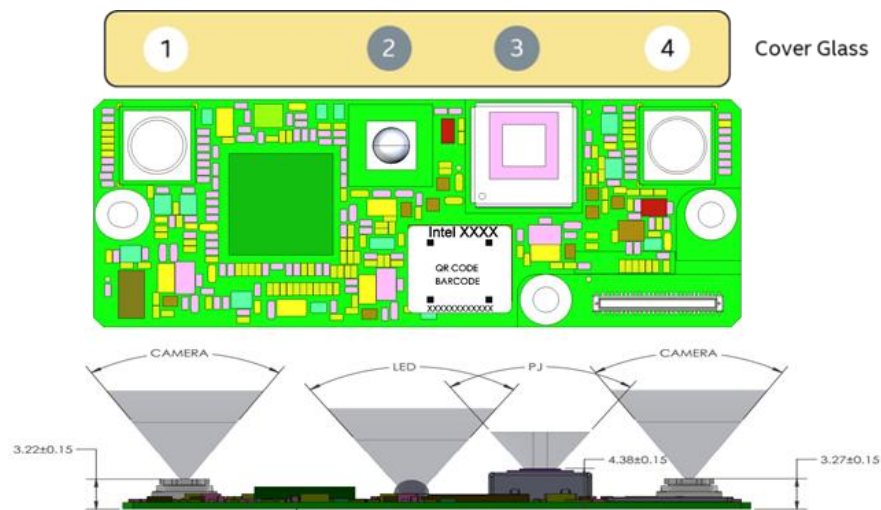


Figure 3-2: RealSense F450 Module Through Hole Design

Openings in the silkscreen are required for optical transmission. Cover-glass aperture sizes depend on two factors:

1. The Field of View (FOV) or Field of Illumination (FOI) of the optical component.
2. The distance (cone diameter) between the optical component and the cover glass.

Silkscreen and Appearance

Outside the optical field of view, black silkscreen transmission does not affect system performance. In these areas, ink color is a cosmetic consideration only.

3.3 Module Installation Guidelines

Recommendations for installing the RealSense™ ID F450 module:

- Back plate flatness of 0.1 mm
- Thermal interface material shall cover all the backside of the module, except the holes for screws and alignment pins
- Recommended thermal interface material:
 - Thickness: 0.2–0.3 mm
 - Thermal conductivity 3–5 W/m·K, (depends on the application and ambient temperature)
 - Hardness: Shore A 40–60
 - For example: TG-ALC High Performance Thermal Pad
- Recommended screw torque: 1.6 kgf·cm
- Use M1.6 screws secured with thread locker

Notes:

- *Make sure the chassis is stiff, or the module is isolated to avoid transmitting flex forces from the chassis to the module*
- *Applying bending forces to the module may result in degraded performance*
- *Dust protection: dust particles can accumulate over the camera lenses which can be visually unappealing and degrade image quality.*
- *pay attention during the connection of the IPEX 20708-050E connector not to force un-even pressure on the connector in order not to harm it*

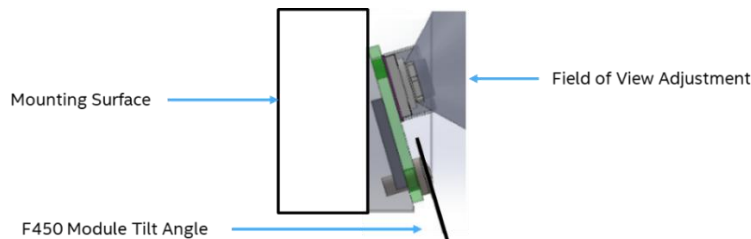
3.4 System Tilt & Mounting

The RealSense F450 module can be installed at 0°, 90°, 180°, or 270° rotation.

Mounting the RealSense F450 module parallel to the installation surface may not cover the required user height range. Install the module at an angle as needed to adjust minimum and maximum height coverage.

3.4.1 Human Height

Parameter	Min	Nom	Max	Unit
Vertical range @ 55cm	120	—	190	cm
System tilt	11	16	21	°
Height placement (sensor centre line position)	1.1	1.2	1.25	m

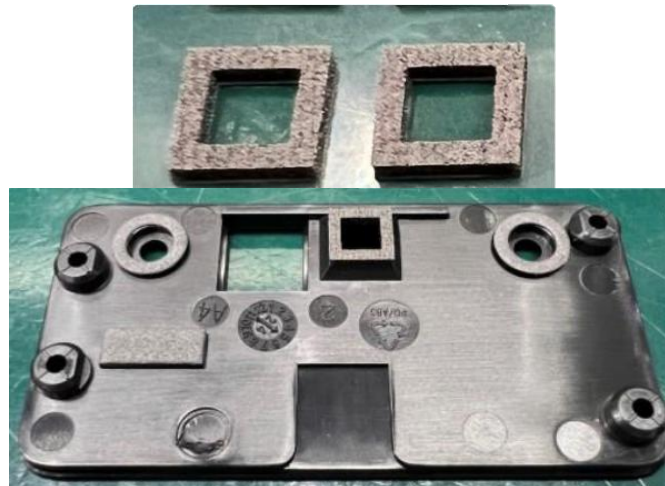


3.5 Optical Isolation

Isolate the cameras from the illumination components to prevent reflections from the cover material. Insufficient optical isolation may allow illumination light to leak into the camera sensors.

Recommendations:

- Install a soft gasket between the cover glass and the module
- Use a compliant gasket material that does not transfer chassis flex to the module
- Minimize the distance between the cover glass and the module
- Position the gasket outside the LED keep-out zone specified in the CAD model



4. System Integration

The host system OEM is responsible for the overall product design. RealSense provides assembly recommendations for the F450 module; product-level requirements, including user sensing and feedback, remain the OEM's responsibility.

4.1 Product Assembly

4.1.1 Product Assembly Recommendations

Install the RealSense™ ID F450 module in a horizontal or landscape orientation. Secure the module so camera and illumination alignment remains within specification after assembly and across the product's operating-temperature range.

Alignment Parameter	Tolerance	Unit
YAW (camera to camera)	1	deg
PITCH (camera to camera)	1	deg
ROLL (camera to camera)	1	deg
YAW (camera to illumination)	1	deg
PITCH (camera to illumination)	1	deg
ROLL (camera to illumination)	1	deg

4.1.2 Product Design Recommendations

The following design and assembly recommendations help minimize the effects of moisture and dust on optical performance.

Name	Description
Ingress Protection	The system integrator will define ingress protection level based on the installation location of the product (e.g., indoor or outdoor). The RealSense F450 optical elements should be protected from dust and moisture accumulation.
Anti-Fog Coating	If this is a design consideration based on the installation location of the product, a coating should be applied to the glass to prevent fogging from occurring. Initial testing has shown that a standard glass coating (e.g. DuPont de-icing spray) proved insufficient.
Enclosure	Based on installation location of the product (e.g., indoor or outdoor), recommend designing metal enclosure and not using plastic materials that might allow humidity to pass through.
Purging	Guarantee below 5% humidity during assembly.
Pressurizing (*)	0.5psig with N2 (nitrogen) so no humidity will be able to enter the system.
Desiccant (*)	Replaceable bag/capsule - Molecular Sieve (ZEOLITE) or Activated Alumina.

(*) Might not be required due to the small dimensions of the enclosure, but nice to have to provide best protection against humidity.

4.1.3 Optical Assembly Considerations

The RealSense™ ID F450 module ships with removable protective film over the camera and illumination components. Remove the film before assembly; the module will not function with it in place. Apply similar film protection to the cover glass to minimize dust and fingerprints during handling.

Assembly should be performed in a clean room environment of greater than 10,000 PPM to minimize dust and particles on the lens and cover glass. Operators handling components directly should wear gloves and a mask.

The following steps should be followed during assembly and validation:

1. Remove the protective film from the module optical components.
2. Remove the protective film from the cover glass.
3. Remove the liner from the cover glass edge protecting the adhesive.
4. Assemble the module and cover glass.
5. Validate the device.
6. Clean the cover glass and apply protective film for shipping.

5. Security

The RealSense™ ID F450 module protects biometric data, firmware, and runtime code using industry-standard cryptographic controls, implemented in hardware where possible. These controls protect the boot process, runtime operation, firmware updates, and stored data.

5.1 Security Features Overview

The following table summarizes the security features implemented in the F450 module:

Security Feature	Design	Details
Bootloader	HW Locked Flash	System Root of Trust (ROT). Verifies and loads FW.
Secure FW Boot	AES-256-CTR SHA-256 ECDSA-P256	Verifies FW integrity and authenticity.
Biometric DB Storage	AES-256-CTR	Protects biometric user data.
FW Update	AES-256-CTR SHA-256 ECDSA-P256	Verifies FW image authenticity and integrity before applying update.

5.2 Security Objectives

The RealSense F450 module is designed to meet the following security objectives:

- Prevent device spoofing
- Prevent man-in-the-middle attacks
- Preventing replay attacks
- Prevent hardware flash read attacks (data is encrypted)
- Prevent malicious hardware flash replacement (data is verified)
- Prevent unauthorized firmware updates (signature verification required)

5.3 Cryptographic Algorithms

Algorithm	Usage
SHA-256	Bootloader hash for platform attestation. FW payload digest for update verification.
AES-256-CTR	Encryption of biometric data and application FW at rest on external flash. Decryption at boot into DRAM.
ECDSA-P256	Signature verification of bootloader and FW image during secure boot and FW update.
TRNG (RNG)	Generation of session values used to prevent replay attacks on the host data link.

5.4 Privacy

The F450 module protects user privacy by ensuring that biometric data never leaves the device in plain text. Face features are stored in encrypted form and decrypted only in DRAM within the SoC package at runtime.

- Biometric data is never transmitted to the host in raw form.
- Face authentication is performed entirely on-device.
- No cloud connectivity is required or used.
- Authentication requires active user awareness — the module does not authenticate passively.

6. Software

Each RealSense™ ID release includes the following deliverables, available from the open-source GitHub repository: <https://github.com/realsenseai/RealSenseID/releases/latest>

- Firmware binaries — for flashing the RealSense device (the same firmware binary is used for both).
- Windows tools installer — includes the compiled host SDK library, a viewer tool for evaluating and exploring product capabilities, a firmware upgrade tool, and a CLI tool.
- Android sample APK — a reference application for Android-based host integrations.

Firmware and SDK must always be updated together from the same release to ensure compatibility.

6.1 Firmware (FW)

6.1.1 Update Procedure

The RealSense SDK provides two tools for performing a FW upgrade on the RealSense device: *rsid-fw-upgrade.exe* and *rsid-viewer.exe*.

FW must always be upgraded using a compatible SDK version. Using an older SDK tool to flash a newer FW version may result in a compatibility error.

For a step-by-step FW upgrade tutorial, refer to [link].

6.1.1.1 FW Rollback

FW rollback is supported. To perform a rollback, use the SDK version that is compatible with the target FW version and follow the standard FW update procedure.

Rollback is supported down to SDK version 0.19.0 / FW 3.1.0.29, which is the earliest version that introduced SKU1 and SKU2.

⚠ Rollback carries the following risks:

- Device settings — settings that are not supported in the target FW version may be reset or corrupted.
- Database — rolling back to an older DB version will break the existing database. Ensure you have a backup or are prepared to re-enroll users.

6.1.1.2 SKU1 and SKU2

The RealSense ID devices are available in two SKUs, each with its own FW binary corresponding to a different FW signing method. If you are unsure which SKU your device is, attempt to flash either FW binary — the tool will return a message indicating a SKU mismatch if the wrong binary is selected.

6.1.2 Communication Interfaces

The RealSense device provides two physical communication interfaces for host-device communication:

Interface	Supported Functions
USB	UVC (preview stream) + CDC (control path)
UART	Control path only

6.2 Biometric Features Database

The RealSense™ ID device stores up to 1,000 biometric feature templates on-device. Each template requires approximately 1 KB of storage.

6.2.1 DB Performance

Database matching time increases with the number of enrolled feature templates:

Number of Features	Matching Time
500	~5ms
1,000	~10ms

6.2.2 DB Versioning

Database versions are not backward compatible. When a new version is introduced, the release notes will identify the change and provide migration instructions or tools.

6.3 SDK

The RealSense™ ID host SDK is open source and available at <https://github.com/realsenseai/RealSenseID>

Resource	Location
General documentation and build instructions	README.md
API documentation	include/RealSenseID/README.md
Embedded API documentation	embedded/README.md
Sample code (multiple languages)	samples
Utilities	tools
Latest SDK release	https://github.com/realsenseai/RealSenseID/releases/latest

6.3.1 Android Requirements

6.3.1.1 Android SDK

The SDK supports Android 8.1 (Oreo, API level 27) and above. Prebuilt libraries are provided for arm64 and x64 architecture. For other architectures, the SDK source code can be used to build the required library.

6.3.1.2 Power Requirements

Android deployments require careful attention to power delivery. Authentication and anti-spoofing operations on the F50x series may require up to 4.5W, which can exceed the USB power output of standard tablets. In such cases, an externally powered USB hub is recommended to ensure stable operation.

A USB Type-C cable with Power Delivery (PD) support is required. USB Type-A cables may not supply sufficient power in all scenarios.

7. Vision Intelligence

7.1 Supported Lighting Conditions

The device operates in lighting conditions ranging from complete darkness at 0 lux to bright outdoor light at up to 50,000 lux. In low-light environments, the integrated IR LED supports reliable operation.



Figure 7-1: Examples of Supported Lighting Conditions

7.2 Supported Operating Distances

The device supports authentication distances from 30 cm to 150 cm. At the High security setting, the maximum supported distance is 100 cm.

7.3 Face Recognition

The RealSense™ ID face recognition engine is NIST-evaluated and ranked Tier 1 in accuracy.

- 1:1 verification — confirms a person matches a known identity.
- 1:N identification — matches a person against a database of enrolled users.
- External image support — feature extraction and comparison from both device-captured images and external identity documents such as a passport or driver's license.

7.3.1 KPIs and Accuracy Benchmarks

FPR — False Positive Rate (wrong recognition, one out of many to say that “Eyal” is “Joe”)

FNMR — False Non-Match Rate (percentage that I won’t know that “Eyal” is “Eyal”)

FPR	FNMR
1:1,000	0.05%
1:10,000	0.1%
1:100,000	0.32%
1:1,000,000	0.55%
1:2,500,000	0.72%

7.4 Presentation Attack Detection

RealSense™ ID uses a multispectral presentation attack detection (PAD) architecture that independently analyzes RGB, near-infrared, and stereo-depth data. Combining these complementary channels strengthens resistance to presentation attacks, including photographs, video replays, and 3D silicone masks.

The system has achieved zero successful attacks in iBeta Level 1 and Level 2 certification testing, and Level 3 testing is currently in progress.

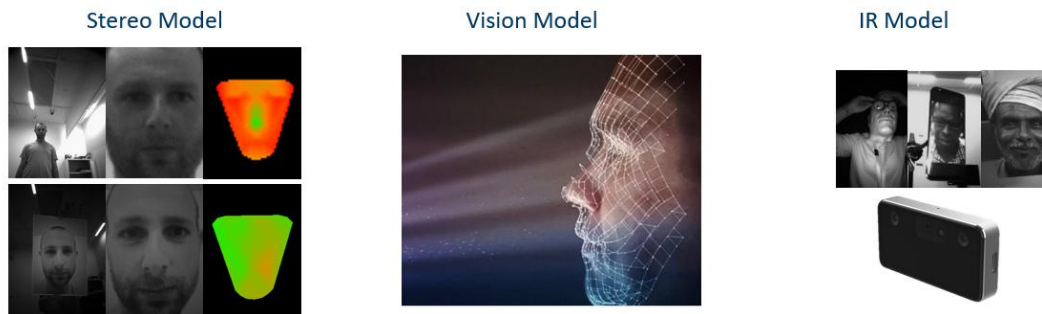


Figure 7-2: Multi-Spectral Anti-Spoofing Models

7.4.1 KPIs and Benchmark Results

The device supports three configurable security levels, selectable via the SDK API.

Security Level	TPR	TNR	Recommended For
Standard	99.2%	1.3%	Default for most deployments — optimal balance of security and user experience
Enhanced	97.4%	0.3%	Deployments requiring stronger spoof resistance with moderate impact on TAR
High (*)	96.1%	0.02%	Security-sensitive applications such as ATMs and border control

(*) High security level is most effective in controlled environments where the user faces the camera directly under normal lighting conditions.

8.2 Mechanical Drawings

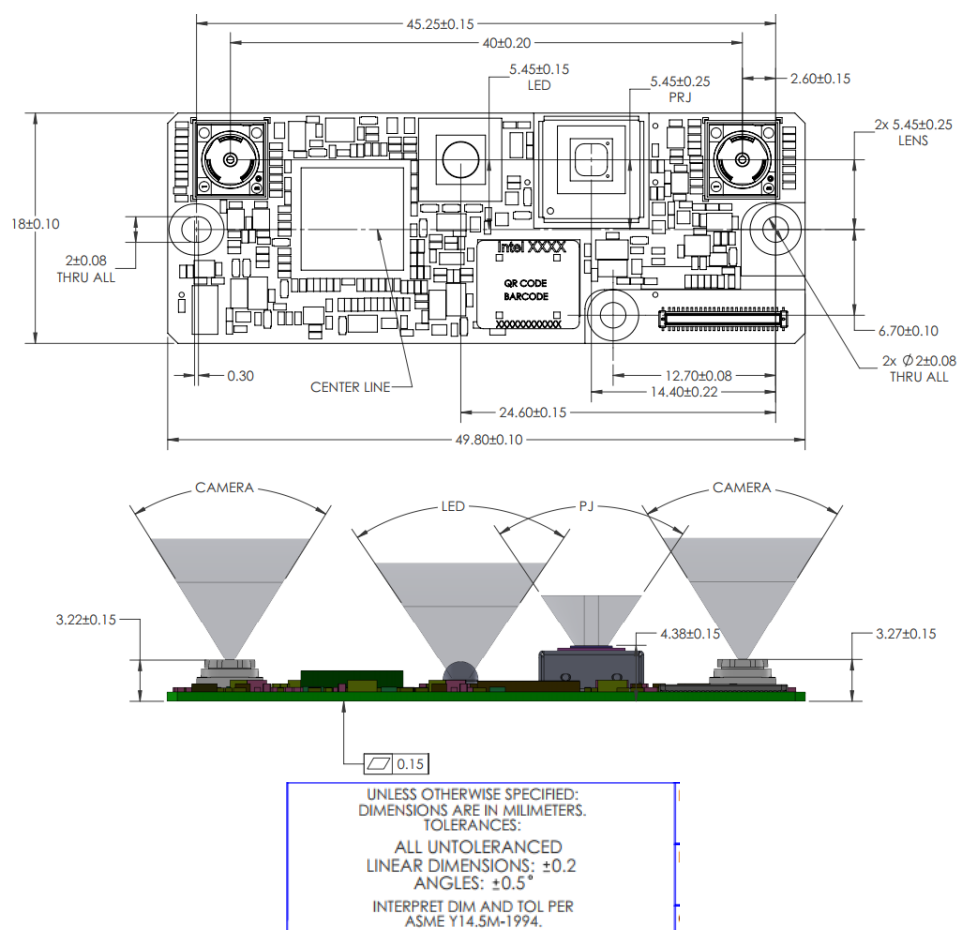


Figure 8-2: RealSense F450 Mechanical Drawings

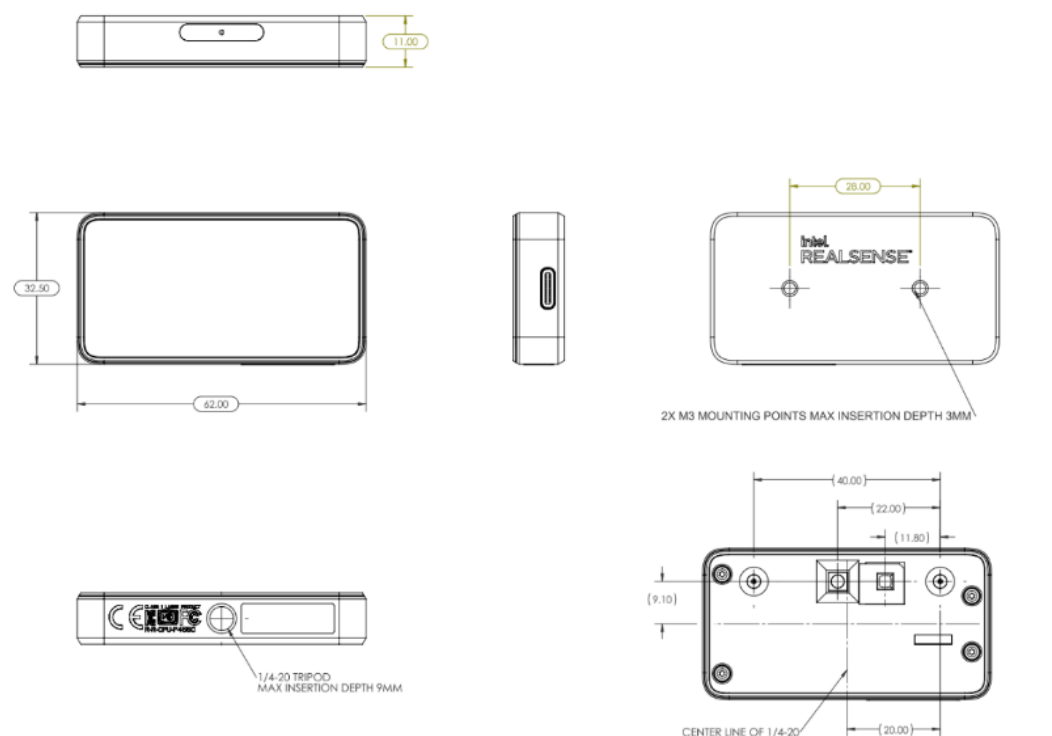


Figure 8-3: RealSense F455 Mechanical Drawings

9. Regulatory Compliance

9.1 Regulatory Compliance

9.1.1 Manufacturer's Information

RealSense Inc.
20400 Stevens Creek Boulevard,
Suite 290,
Cupertino, CA 95014, USA

9.1.2 EU Single Place of Contact

EaseCert | GPSR Compliance
Wald str. 33, 54413 Damflos, Germany
compliance@easecert.com;
www.easecert.com
Tel: +49 170 5738 555

9.1.3 UK Single Place of Contact

RealSense, Inc.
Attn: Miro Mlejnek
16 Hallsfield Swindon SN6 6LS
United Kingdom
realsense@realsenseai.com
https://realsenseai.com

9.1.4 FCC Part 15 Declaration of Conformity



RealSense™ ID F455

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

RealSense Inc., 20400 Stevens Creek Boulevard, Suite 290, Cupertino, CA 95014

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

CAUTION: To comply with the limits of the Class B digital device, pursuant to Part 15 of the FCC Rules, this device must be installed with computer equipment certified to comply with Class B limits. All cables used to connect to the computer and peripherals must be shielded and grounded. Operation with non-certified computers or non-shielded cables may result in interference to radio or television reception.

9.1.5 Canada

CAN ICES-3 (B)/NMB-3(B)

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Interference-Causing Equipment Standard ICES-003.

Le présent appareil numérique n'émet pas de bruits radio électriques dépassant les limites applicables aux appareils numériques de la classe B prescrites dans la présente norme sur le matériel brouilleur, NMB-003.

9.1.6 European Directives



This product complies with all applicable European directives.

CAUTION: To keep the product in compliance with the European CE requirement, the device must be installed with CE-certified computer equipment which meets the Class B limits. Operation with non-certified computers or incorrect cables may result in interference to other devices or undesired operation of the product.

9.1.7 Australia



Due to the very small size of the product, the marking has been placed in this datasheet.

9.1.8. Japan



この装置は、クラスB機器です。この装置は、住宅環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。取扱説明書に従って正しい取り扱いをして下さい。 VCCI-B

This device is a Class B information technology device. This device is intended for use in a home environment, but if this device is used close to a radio or television receiver it may cause reception interference. Please handle according to the instruction manual correctly. VCCI-B

9.1.9 South Korea



인증 번호: R-R-RSX-F455

제조사: RealSense, Inc.

상품명: RealSense™ Depth Camera

모델: F455

제조국: 태국, 중국

인증 번호: R-R-RSX-F450

제조사: RealSense, Inc.

상품명: RealSense™ ID Module

제조국: 중국, 태국, 베트남

9.2 Ecology Compliance

9.2.1 China RoHS Declaration



China RoHS Declaration

产品中有害物质的名称及含量 Hazardous Substances Table

部件名称 Component Name	有毒有害物质或元素 Hazardous Substance					
	铅 Pb	汞 Hg	镉 Cd	六价铬 Cr (VI)	多溴联苯 PBB	多溴二苯醚 PBDE
解决方案 Solution	X	○	○	○	○	○
印刷电路板组件 Printed Board Assemblies	X	○	○	○	○	○
三角架 Tripod	○	○	○	○	○	○
电缆 Cable	○	○	○	○	○	○

○：表示该有毒有害物质在该部件所有均质材料中的含量均在GB/T 26572标准规定的限量要求以下。

○：Indicates that this hazardous substance contained in all homogeneous materials of such component is within the limits specified in GB/T 26572.

×：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572标准规定的限量要求。

×：Indicates that the content of such hazardous substance in at least a homogeneous material of such component exceeds the limits specified in GB/T 26572.

对销售之日的所售产品,本表显示我公司供应链的电子产品信息产品可能包含这些物质。注意：在所售产品中可能会也可能不会含有所有所列的部件。

This table shows where these substances may be found in the supply chain of our electronic information products, as of the date of sale of the enclosed product. Note that some of the component types listed above may or may not be a part of the enclosed product.

除非另外特别的标注,此标志为针对所涉及产品的环保使用期限标志. 某些可更换的零部件可能会有一个不同的环保使用期限(例如,电池单元模块).

此环保使用期限只适用于产品在产品手册中所规定的条件下工作。



The Environment-Friendly Use Period (EFUP) for all enclosed products and their parts are per the symbol shown here, unless otherwise marked. Certain field-replaceable parts may have a different EFUP (for example, battery modules) number. The Environment-Friendly Use Period is valid only when the product is operated under the conditions defined in the product manual.

9.2.2 Waste Electrical and Electronic Equipment (WEEE)



“In the EU, this symbol means that this product must not be disposed of with household waste. It is your responsibility to bring it to a designated collection point for the recycling of waste electrical and electronic equipment. For more information, contact the local waste collection center or your point of purchase of this product.”

9.2.3 Turkey

Türkiye Cumhuriyeti: EEE Yönetmeliğine Uygundur