

3M™ Biometric Security System (BSS)

Collimator (BSS-C)

IR Rejector (BSS-IR)

Collimator & IR Rejector (BSS-CIR)

A system to allow biometric security in any OLED smartphone and other applications.

Product Description

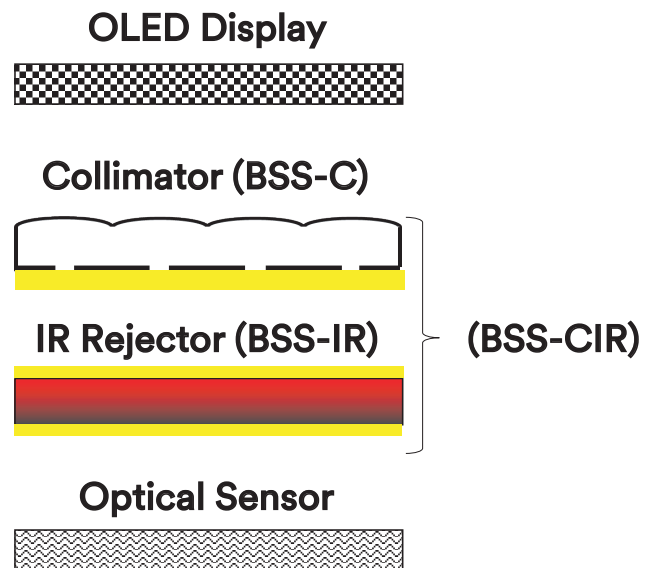
3M Biometric Security System (BSS) allows optical sensors to detect and read fingerprints for quick and secure access to the phone.

The system has two components: Collimator and IR Rejector.

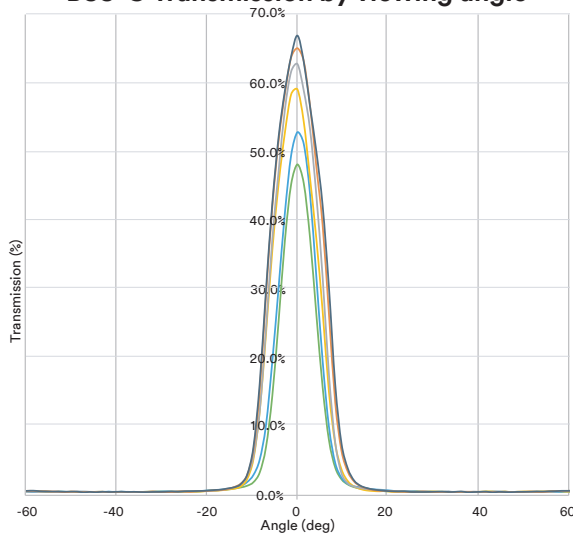
The 3M BSS system is a customizable, film-based solution which is flexible and eases processing constraints compared to conventional OLED optical sensor system components.

System adapts to full screen and small area designs for fingerprint sensing (FPS) under OLED display as well as applications needing transmission of light lower than 630 nm.

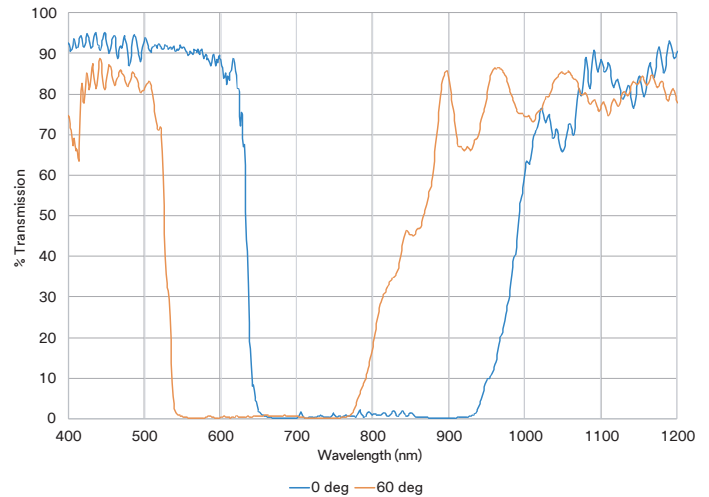
Products are supplied as converted parts between liner and premask.



BSS-C Transmission by viewing angle



BSS-IR Transmission by light wavelengths



Physical Characteristics

3M BSS-Collimator (BSS-C) features:

Optical Collimation Film with micro lenses and absorptive coating:

45% - 65% Transmission at 0°

6° - 10° Full Width Half Max

15 µm - 25 µm OCA on absorber side of film for attachment.

~50 µm - 60 µm total thickness

3M BSS-C collimates the light passing through the OLED panel. It utilizes micro-lens technology to enable shorter focal length and thinner product. It additionally absorbs the non-collimated light leading to a reduction of sensor noise and a sharper image. An optically clear adhesive (OCA) is included on the absorber side of the product.

3M BSS-IR Rejector (BSS-IR) features:

Multi-layer Optical Film:

>80% Transmission (420 - 585 nm)

<1% Transmission (660 - 880 nm)

Band Edges at 630 nm & 960 nm

15 µm OCA on both sides of film for attachment.

~63 µm total thickness

3M BSS-IR utilizes 3M multi-layer technology to reject light within the block band region (630 nm - 960 nm) and pass visible light utilized to image the fingerprint. It includes optically clear adhesive on both sides of the film for easy integration into the optical sensor system.

3M BSS-Collimator + IR Rejector (BSS-CIR) features:

Combined product in a laminate construction, utilizing two layers of 15 µm OCA.

~100 µm total thickness

3M BSS-CIR is an all in one solution (laminate of BSS-C + BSS-IR products) for easier integration into the optical sensor system. The peel force of the OCA liner is lower than the lens side premask.

OCA Features

3M optically clear acrylic adhesive designed for compatibility with ITO and other transparent display films (non-UV cure).

Haze	0.1%
Transmission	(400 nm+) ~90%
Adhesion	1.2 N/in (15 µm) & 1.6 N/in (25 µm)

Suggested Lamination Process

Film to film: Roller lamination recommended.

Applied pressure of around 0.1 – 0.2 MPa and roller speed 0.5 - 1m/min.

Film to rigid: Vacuum lamination with conditions <50 Pa and applied pressure around 0.1 - 0.2 MPa

Post lamination autoclave process recommended:
30-60°C, 3-5 kgf/cm², 20-30 min

Durability Performance after Environmental Conditions

The following environmental tests were conducted in the 3M laboratory under the conditions specified without any appreciable deterioration in optical quality.

Temperature (C°) / Humidity (%)	Collimator Time (hrs)	IR Rejector Time (hrs)
85/85	240	500
85 Dry	240	1000
60/90	240	1000
-40 Dry	240	1000
Thermal shock (-40 to 85°C)	100 cycles, 1 hr/cycle	100 cycles, 1 hr/cycle

Storage

- Store product flat and avoid applying pressure or resting objects on the product to prevent marking, denting, or deforming the surface.
- Wear gloves to prevent fingerprints or nail marks when handling.
- Product needs to be unpacked and handled in a clean-room facility.
- Product must be protected from moisture / temperature exposure. (Relative Humidity: 30-60%, Temperature: 14-30°C)



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Regulatory

For regulatory information about this product, please contact your 3M representative.

Technical Information

The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes reliable, but the accuracy or completeness of such information is not guaranteed.

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