



Fabrication Guide

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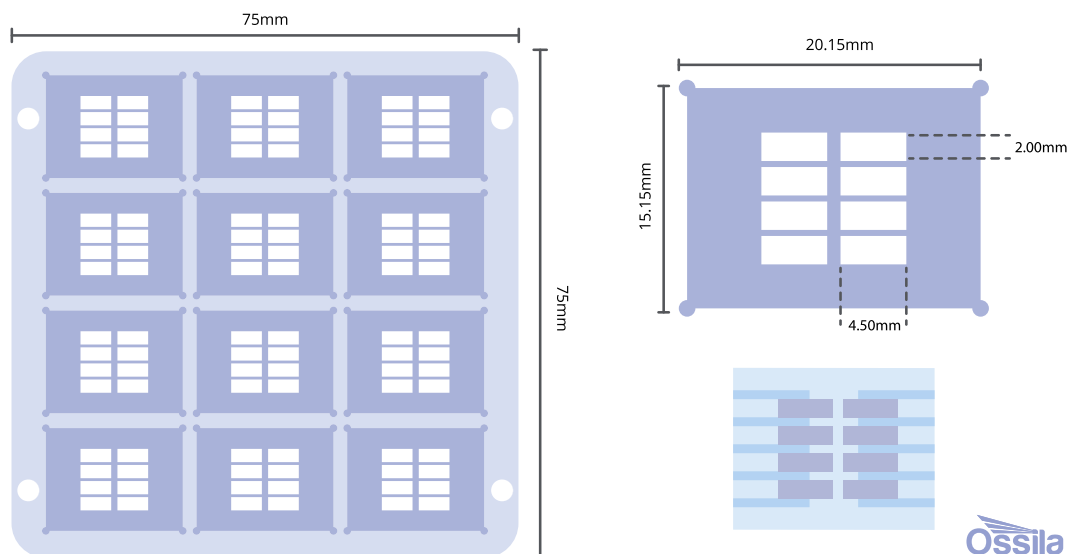
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About Our Masks

Ossila's range of [substrates, masks and testing boards](#) are designed to be used together, making a full device ecosystem. With these tools, users can quickly and easily fabricate and characterize OPVs, OLEDs, OFETs/TFTs, sensors and other thin film devices.



Each evaporation mask is designed to fit a particular substrate. For example, the E501 mask (pictured above) is designed for use with the 20 x 15 mm substrates eg. S211/S146). This ensures alignment between the different device layers.



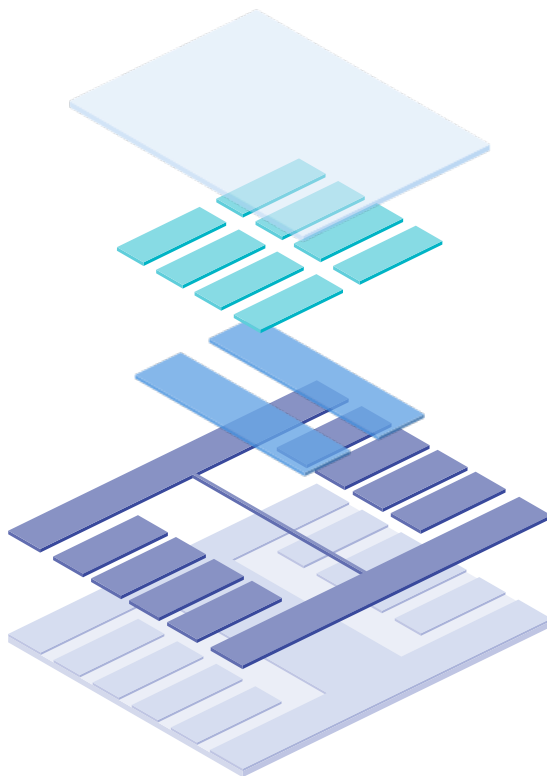
We can also provide custom evaporation masks upon request. For more information about this please contact us at info@ossila.com.

PV/LED on S211/S212

8-Pixel Devices

Method 1

- Substrate - S211 / S212
- Busbar Mask (optional) - E504
- Active Material Mask - E531
- Multi-Electrode Mask - E501
- Encapsulation Coverslips - C181 (optional)



Encapsulation Coverslips - C181

Multi-Electrode Mask - E501

Active Material Mask - E531

Busbar Mask (optional) - E504

20 x 15 mm Pre-Patterned Substrate

Test Boards

- Push-Fit Test Board for 20 x 15 mm Substrates – P2008A1
- PV Riser Board – P2009B2
- LED Riser Board – P2009B2-P2015B1

Method 2

- Substrate - S211 / S212
- Active Material Mask - E531 *or* Spin Coated Layer
- Multi-Electrode/Busbar Mask - E503
- Encapsulation Coverslips - C181 (optional)



Encapsulation Coverslips - C181

Multi-Electrode/Busbar Mask - E503

Active Material Mask - E531

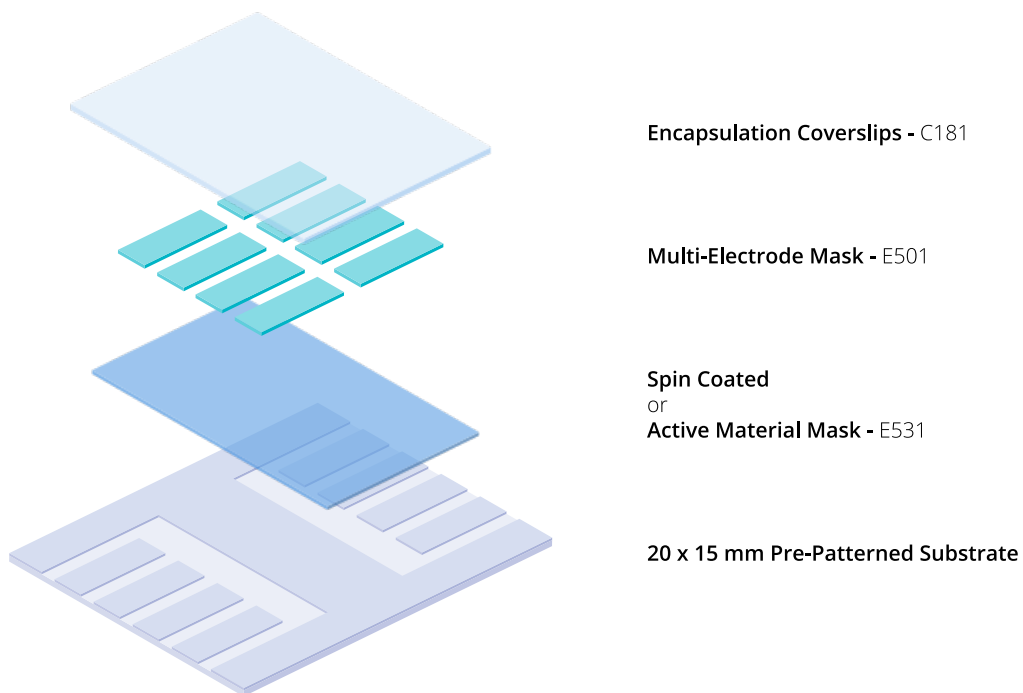
20 x 15 mm Pre-Patterned Substrate

Test Boards

- Push-Fit Test Board for 20 x 15 mm Substrates – P2008A1
- PV Riser Board – P2009B2
- LED Riser Board – P2009B2-P2015B1

Method 3

- Substrate - S211 / S212
- Active Material Mask - E531 *or* Spin Coated Layer
- Multi-electrode Mask - E501
- Encapsulation Coverslips - C181 (optional)



If you are using E503, you need to remove spin coated materials from the busbar region

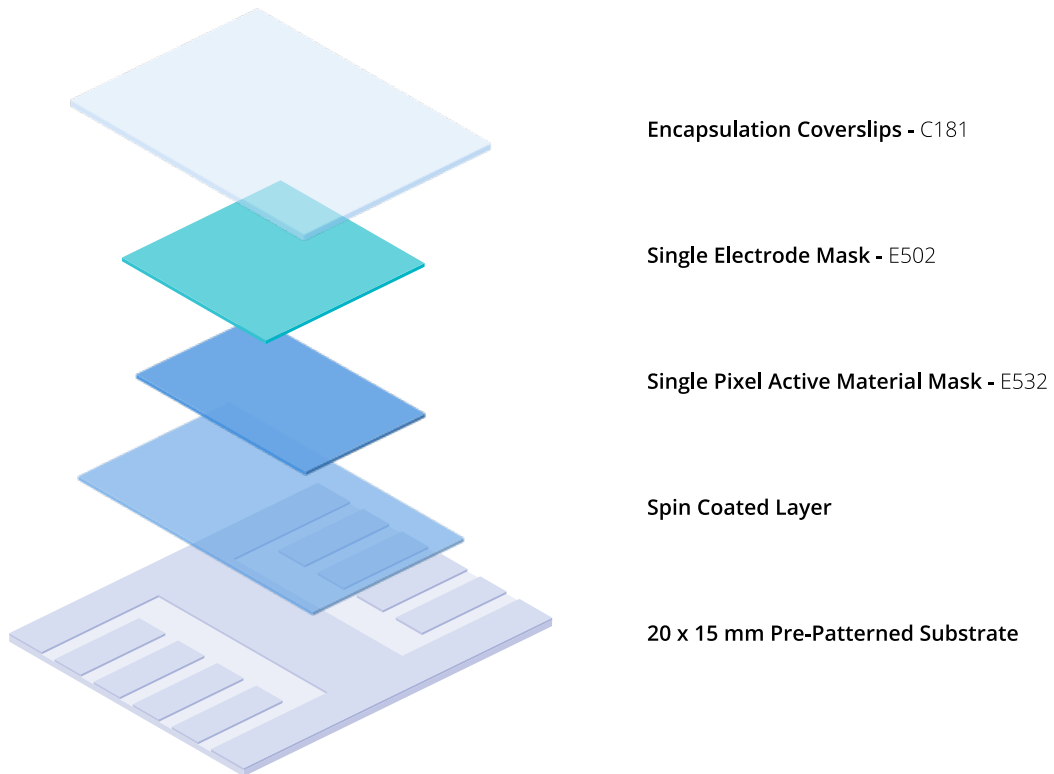
Test Boards

- Push-Fit Test Board for 20 x 15 mm Substrates – P2008A1
- PV Riser Board – P2009B2
- LED Riser Board – P2009B2-P2015B1

1 Pixel Devices

Method 1

- Substrate - S211 / S212
- Spin Coated Layer
- Single Pixel Active Material Mask - E532
- Single Electrode Mask - E502
- Encapsulation Coverslips - C181 (optional)

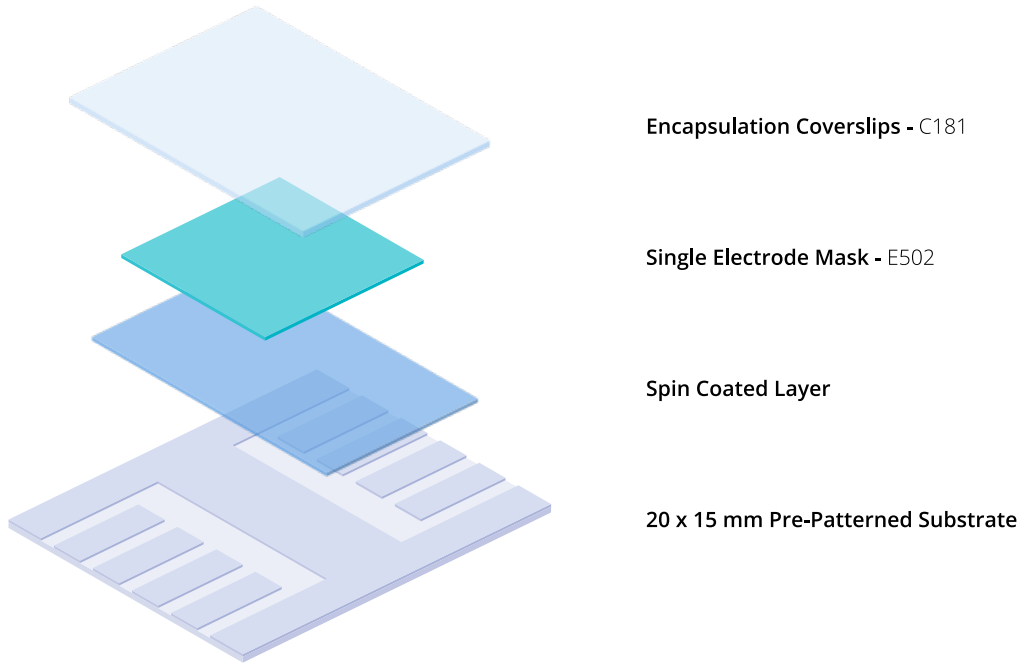


Test Boards

- Push-Fit Test Board for 20 x 15 mm Substrates – P2008A1
- PV Riser Board – P2009B2
- LED Riser Board – P2009B2-P2015B1

Method 2

- Substrate - S211 / S212
- Spin Coated Layer
- Single Electrode Mask - E502
- Encapsulation Coverslips - C181 (optional)



Test Boards

- Push-Fit Test Board for 20 x 15 mm Substrates – P2008A1
- PV Riser Board – P2009B2
- LED Riser Board – P2009B2-P2015B1

Compatibility Table

Substrate	Evaporation Mask	Aperture Masks	Riser Board	Test Board
S211, S212	E501	E521	P2009B2	P2008A1
	E502	E522		
	E503	E521		
	E504	-		
	E531	E521		
	E532	E522		
	E632	-		

PV/LED on S151/S2005

8-Pixel Devices

Method 1

- Substrate – S151 / S2005
- TCO pattern mask - E632
- Busbar Mask (optional) - E504
- Active Material Mask - E531
- Multi-Electrode Mask - E501
- Encapsulation Coverslips - C181 (optional)



Encapsulation Coverslips - C181

Multi-Electrode Mask - E501

Active Material Mask - E531

Busbar Mask (optional) - E504

TCO Pattern Mask - E632

20 x 15 mm Substrate

Test Boards

- Push-Fit Test Board for 20 x 15 mm Substrates – P2008A1
- PV Riser Board – P2009B2
- LED Riser Board – P2009B2-P2015B1

Method 2

- Substrate - S151 / S2005
- TCO Pattern Mask - E632
- Active Material Mask - E531
- Multi-Electrode/Busbar Mask - E503
- Encapsulation Coverslips - C181 (optional)



Encapsulation Coverslips - C181

Multi-Electrode / Busbar Mask - E503

Active Material Mask - E531

TCO Pattern Mask - E632

20 x 15 mm Substrate

Test Boards

- Push-Fit Test Board for 20 x 15 mm Substrates - P2008A1
- PV Riser Board - P2009B2
- LED Riser Board - P2009B2-P2015B1

1-Pixel Devices

Method 1

- Substrate – S151 / S2005
- TCO Pattern Mask - E632
- Busbar Mask (optional) - E504
- Single Pixel Active Material Mask – E532 *or* Spin Coated Layer
- Single Electrode Mask - E502
- Encapsulation Coverslips - C181 (Optional)



Encapsulation Coverslips - C181

Single Electrode Mask - E502

Single Pixel Active Material Mask - E532

Busbar Mask (optional) - E504

TCO Pattern Mask - E632

20 x 15 mm Substrate

Test Boards

- Push-Fit Test Board for 20 x 15 mm Substrates – P2008A1
- PV Riser Board – P2009B2
- LED Riser Board – P2009B2-P2015B1

Method 2

- Substrate - S151 / S2005
- TCO Pattern Mask - E632
- Spin Coated Layer
- Single Electrode Mask - E502
- Encapsulation Coverslips - C181 (Optional)



Encapsulation Coverslips - C181

Single Electrode Mask - E502

Spin Coated Layer

TCO Pattern Mask - E632

20 x 15 mm Substrate

Test Boards

- Push-Fit Test Board for 20 x 15 mm Substrates - P2008A1
- PV Riser Board - P2009B2
- LED Riser Board - P2009B2-P2015B1

Compatibility Table

Quartz	Evaporation Mask	Aperture Masks	Riser Board	Test Board
S151, S2005	E501	E521	P2009B2, P2009G2	P2008A1, P2008B1
	E502	E522		
	E503	E521		
	E504	-		
	E531	E521		
	E532	E522		
	E632	-		

PV/LED on S2006/S2008

4-Pixel Devices

Method 1

- Substrate - S2006 / S2008
- Active Area Mask - E2004A1
- Multi Electrode Mask - E2001A1
- Encapsulation Coverslips - C2010A1 (Optional)



Encapsulation Coverslips - C2010A1

Multi Electrode Mask - E2001A1

Active Area Mask - E2004A1

25 x 25 mm Substrate

Test Boards

- Push-Fit Test Board for 25 x 25mm Substrates - P2011A1
- PV Riser Board - P2009E2
- LED Riser Board - P2009E2-P2015E1

Method 2

- Substrate - S2006 / S2008
- Active Area Mask - E2004A1
- Multi Electrode Mask - E2001B1
- Encapsulation Coverslips - C2010A1 (Optional)



Encapsulation Coverslips - C2010A1

Multi Electrode Busbar mask - E2001B1

Active Area Mask - E2004A1

25 x 25 mm Substrate

Test Boards

- Push-Fit Test Board for 25 x 25mm Substrates - P2011A1
- PV Riser Board - P2009E2
- LED Riser Board - P2009E2-P2015E1

1-Pixel Devices

Method 1

- Substrate - S2006 / S2008
- Active Area Mask - E2004A1
- Single Electrode Mask - E2003A1
- Encapsulation Coverslips - C2010A1 (Optional)



Encapsulation Coverslips - C2010A1

Single Electrode Mask - E2003A1

Active Area Mask - E2004A1

25 x 25 mm Substrate

Test Boards

- Push-Fit Test Board for 25 x 25mm Substrates - P2011A1
- PV Riser Board - P2009E2
- LED Riser Board - P2009E2-P2015E1

Method 2

- Substrate - S2006 / S2008
- Active Area Mask - E2004A1
- Single Electrode Busbar Mask - E2003B1
- Encapsulation Coverslips - C2010A1 (Optional)



Encapsulation Coverslips - C2010A1

Single Electrode Busbar Mask - E2003B1

Active Area Mask - E2004A1

25 x 25 mm Substrate

Test Boards

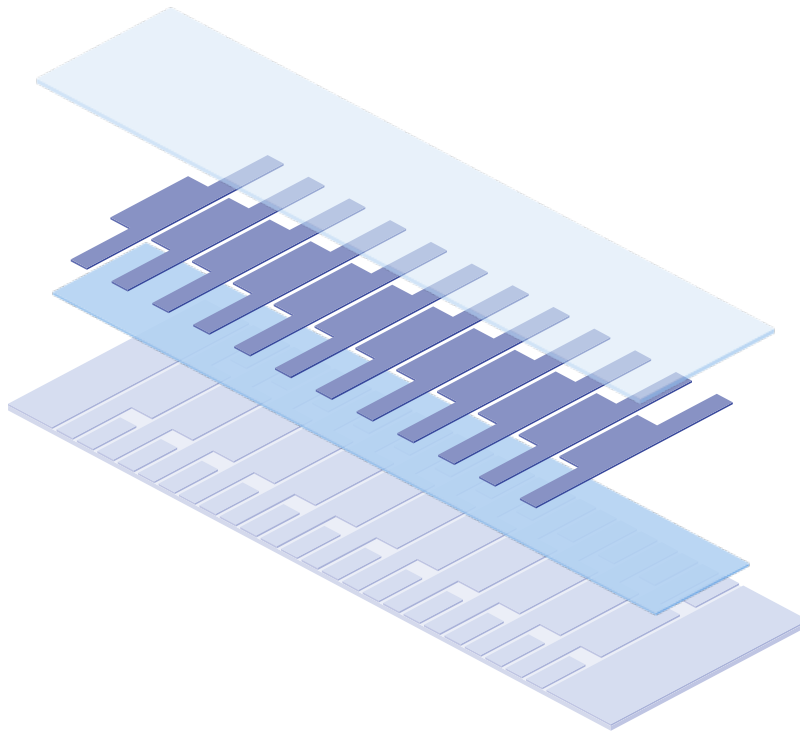
- Push-Fit Test Board for 25 x 25mm Substrates - P2011A1
- PV Riser Board - P2009E2
- LED Riser Board - P2009E2-P2015E1

Compatibility Table

Substrate	Evaporation Mask	Aperture Masks	Riser Board	Test Board
S2006C1, S2008C1	E2001A1	E2002A1	P2009E2	P2011A1
	E2001B1	E2002A1		
	E2003A1	E2002B1		
	E2003B1	E2002B1		
	E2004A1	E2002A1, E2002B1		

PV/LED on S251

- 75 x 25 mm Module Substrate – S251
- Spin Coated Layer
- Module Electrode Mask - E611
- Encapsulation Slide - C182



Encapsulation Slide - C182

Module Electrode Mask - E611

Spin Coated Layer

75 x 25 mm Module Substrate

Test Boards

- Push-Fit Test Board, 75 x 25 mm – P2012A1
- Riser Board – P2009F2

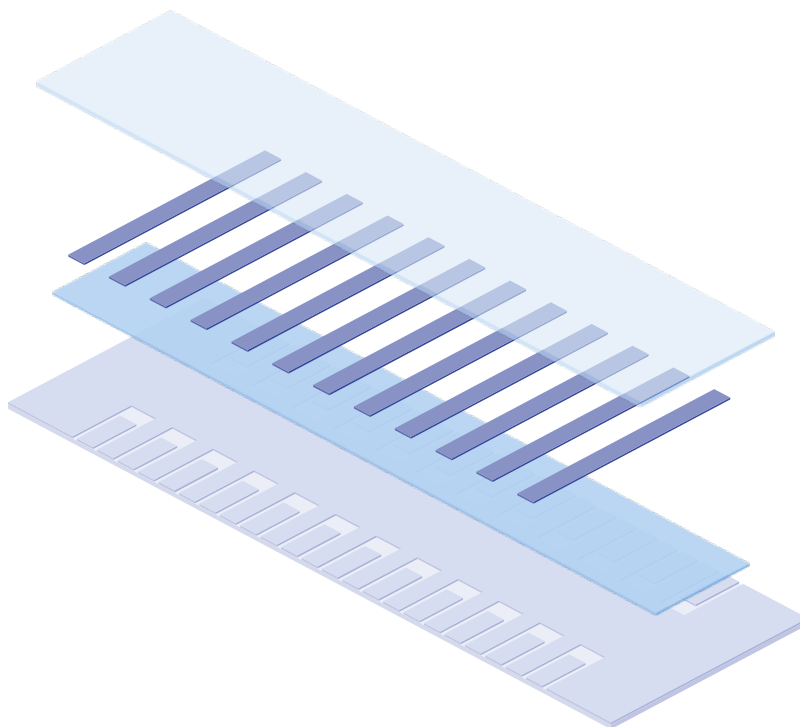
Compatibility Table

Substrate	Evaporation Mask	Aperture Masks	Riser Board	Test Board
S251	E611	-	P2009F2	P2012A1

PV/LED on S241

12-Pixel Devices

- 75 x 25 mm Substrate - S241
- Spin Coated Layer
- 12-Pixel Electrode Mask - E601
- Encapsulation Slide - C182 (Optional)



Encapsulation Slide - C182

12 Pixel
Electrode Mask - E601

Spin Coated Layer

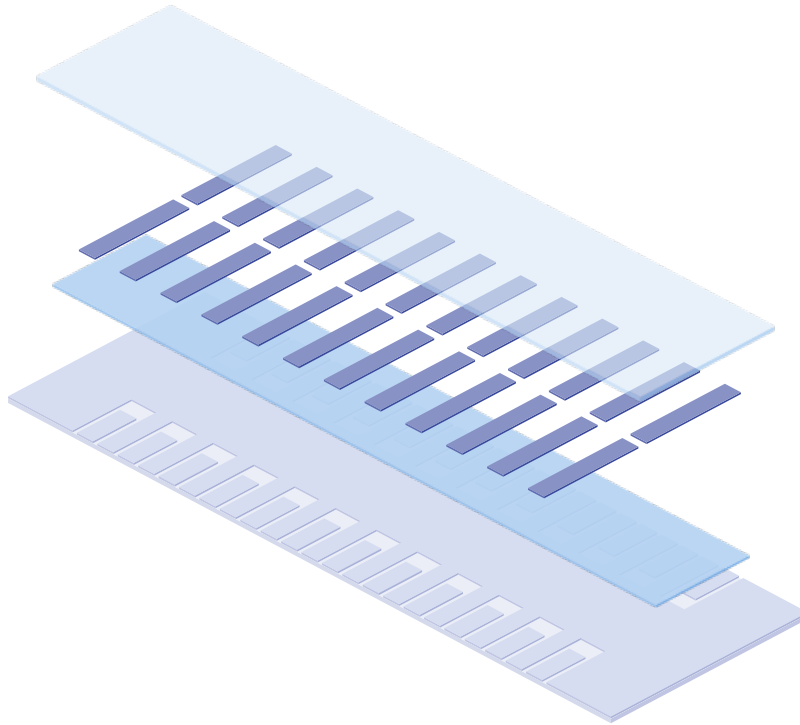
75 x 25 mm Substrate - S241

Test Boards

- Push-Fit Test Board, 75 x 25 mm - P2012A1
- Riser Board - P2009F2

24-Pixel Devices

- 75 x 25 mm Substrate – S241
- Spin Coated Layer
- 24-pixel Electrode Mask - E602
- Encapsulation Slide - C182 (Optional)



Encapsulation Slide - C182

24 Pixel
Electrode Mask - E602

Spin Coated Layer

75 x 25 mm Substrate - S241

Test Boards

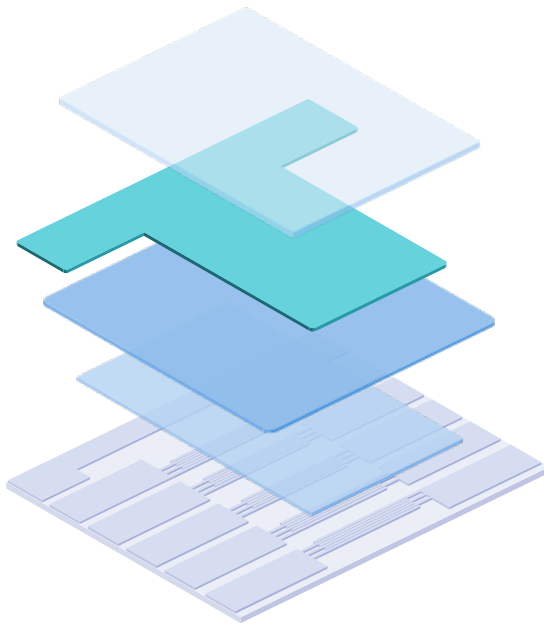
- Push-Fit Test Board, 75 x 25 mm – P2012A1
- Riser Board – P2009F2

Compatibility Table

Substrate	Evaporation Mask	Aperture Masks	Riser Board	Test Board
S241	E601	-	P2009F2	P2012A1
	E602			

FET on S161/S162

- 25 x 25 mm OFET Substrate – S161/S162
- Spin Coated Layer
- Insulator Mask – E309
- Gate Mask - E271
- Encapsulation Slide - C181 (Optional)



Encapsulation Slide - C181

Gate Mask - E271

Insulator Mask - E309

Spin Coated Layer

25 x 25 mm OFET Substrate

Test Boards

- Low Density OFET Test Board – P2013A1

Compatibility Table

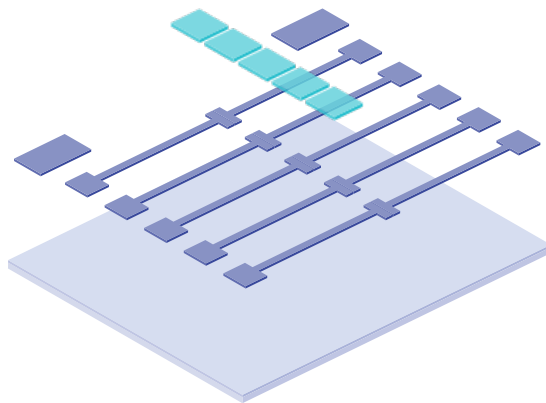
ITO FET	Evaporation Mask	Aperture Masks	Riser Board	Test Board
S161, S162	E271	-	-	P2013A1
	E309			

FET on S146/S148

Low Density Back Gated FET

*need low density OFET evaporation stack (E281) to hold substrates in place

- Si/SiO₂ Substrate – S146 / S148
- Source Drain Mask – E291/ E292
- Active Area Mask (Low Density) – E307



Active Area Mask (Low Density) - E307

Source Drain Mask - E291/E292

20 x 15 mm Substrate

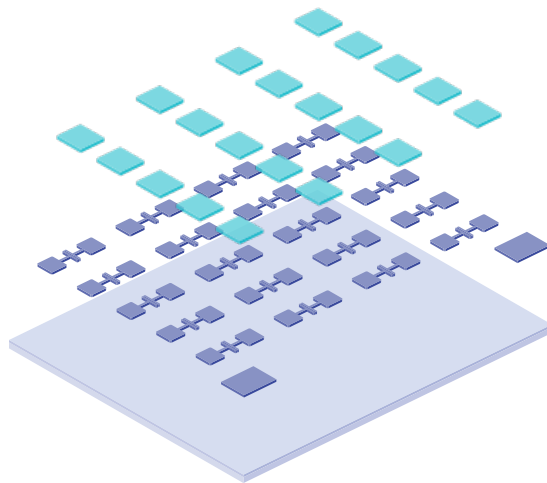
Test Boards

- Low Density OFET Test Board – P2013A1

High Density Back Gated FET

*need high density OFET evaporation stack (E312) to hold substrates in place

- Si/SiO₂ Substrate – S146 / S148
- Source Drain Mask – E321/E322
- Active Area Mask (High Density) - E338



Active Area Mask (High Density) - E338

Source Drain Mask - E321/E322

20 x 15 mm Substrate

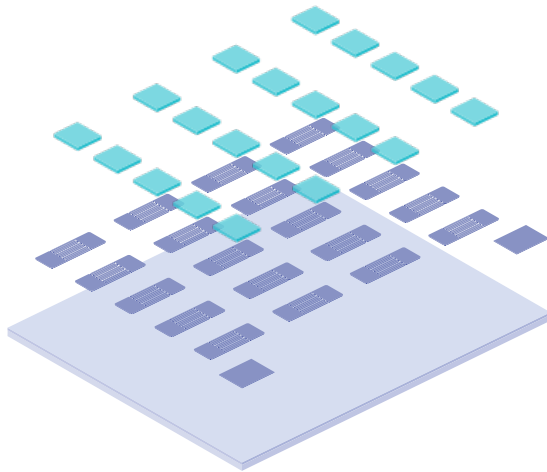
Test Boards

- OFET Test Board for High Density OFETs – P2014A1

High Density Interdigitated Back Gated FET

*need high density OFET evaporation stack (E312) to hold substrates in place

- Si/SiO₂ Substrate – S146 / S148
- Source-Drain Mask – E323
- Active Area Mask (High Density) – E338



Active Area Mask (High Density) - E338

Source Drain Mask - E323

20 x 15 mm Substrate

Test Boards

- OFET Test Board for High Density OFETs – P2014A1

Compatibility Table

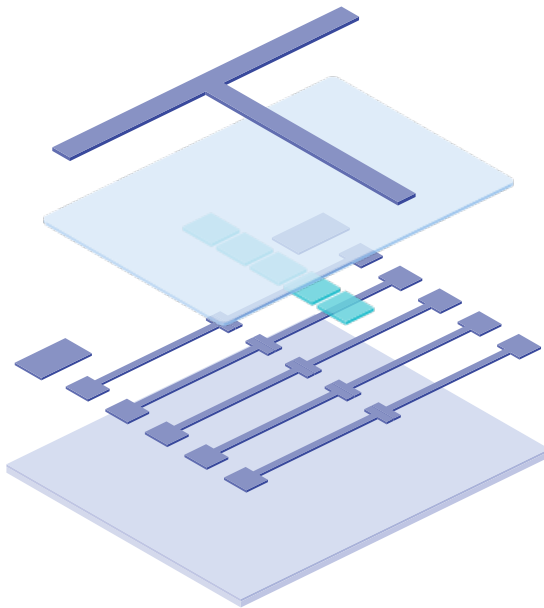
Substrate	Evaporation Mask	Aperture Masks	Riser Board	Test Board
S146, S148 (low density)	E281	-	-	P2013A1
	E291			
	E292			
	E307			
	E309			
S146, S148 (high density)	E305	-	-	P2014A1
	E312			
	E321			
	E322			
	E323			
	E338			
	E3310			
	E336			
E337				

FET on Any Substrate

Low Density Front Gated FET

*need low density OFET evaporation stack (E281) to hold substrates in place

- Substrate
- Source-Drain Mask - E291/E292
- Active Area Mask (Low Density) - E307
- Insulator Mask (Low Density) - E309
- Gate Mask - E305



Gate Mask - E305

Insulator Mask (Low Density) - E309

Active Area Mask (Low Density) - E307

Source Drain Mask - E291/E292

20 x 15 mm Substrate

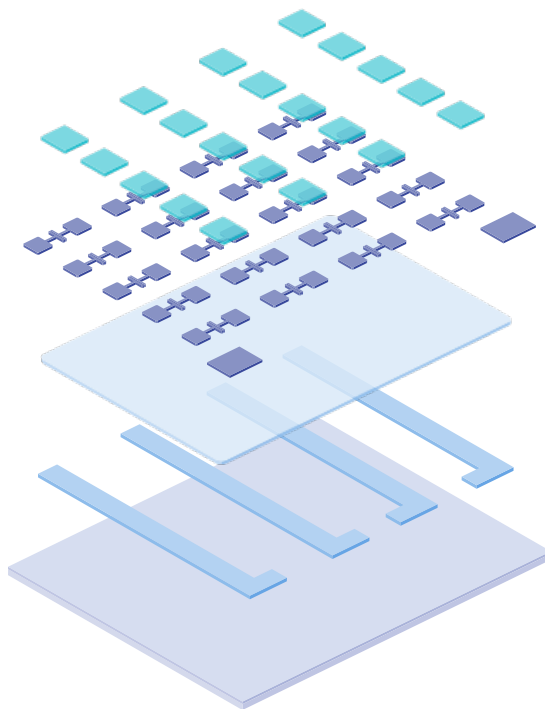
Test Boards

- Low Density OFET Test Board - P2013A1

High Density Back Gated FET

*need high density OFET evaporation stack (E312) to hold substrates in place

- Substrate
- Gate Mask (High Density) - E336
- Insulator Mask (High Density) - E3310
- Source Drain Mask - E321/E322
- Active Area Mask (High Density) - E338



Active Area Mask (High Density) - E338

Source Drain Mask - E321/E322

Insulator Mask (High Density) - E3310

Gate Mask - E336

20 x 15 mm Substrate

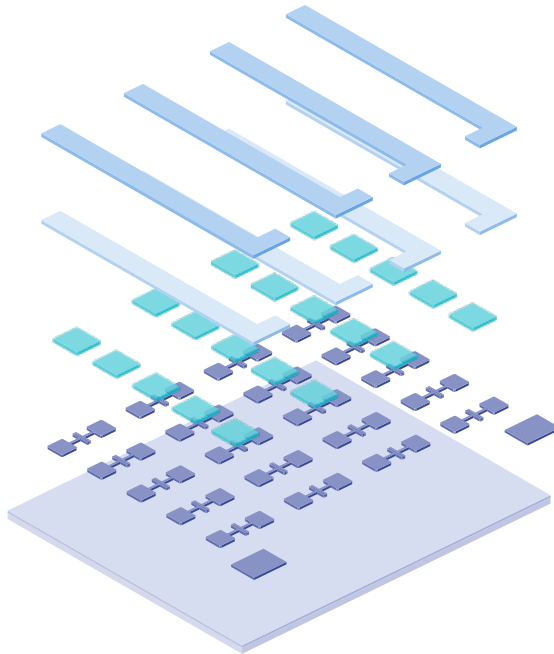
Test Boards

- OFET Test Board for High Density OFETs - P2014A1

High Density Front Gated FET

*need high density OFET evaporation stack (E312) to hold substrates in place

- Substrate
- Source Drain Mask - E321/E322
- Active Area Mask (High Density) - E338
- Insulator Mask (Using Gate Mask E336)
- Gate Mask (High Density) - E336



Gate Mask - E336

Insulator Mask - (Using Gate Mask E336)

Active Layer (High Density) - E338

Source Drain Mask - E321/E322

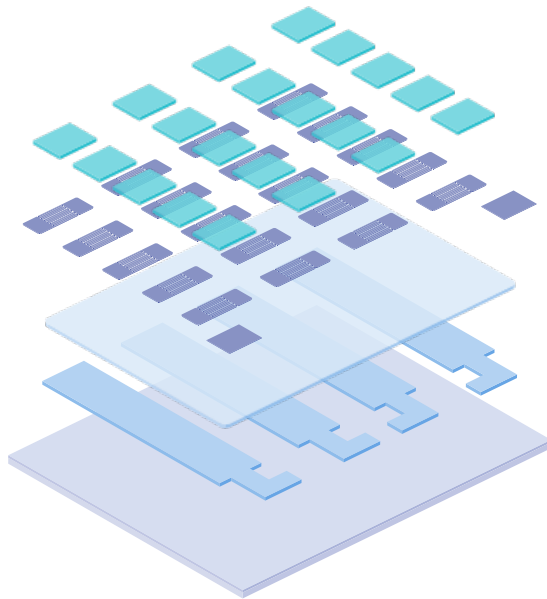
20 x 15 mm Substrate

Test Boards

- OFET Test Board for High Density OFETs - P2014A1

High Density Interdigitated Back Gated FET

- Substrate
- Gate Mask (High Density) - E337
- Insulator Mask (High Density) - E3310
- Source-Drain Mask - E323
- Active Area Mask (High Density) - E339



Active Area Mask (High Density) - E339

Source Drain Mask - E323

Insulator Mask (High Density) - E3310

Gate Mask (High Density) - E337

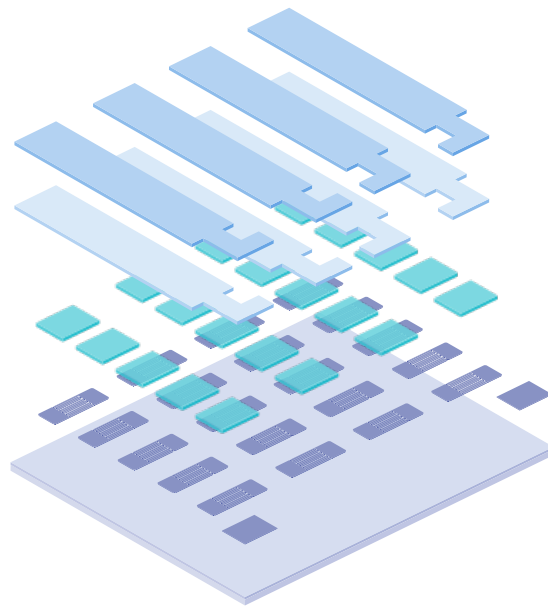
20 x 15 mm Substrate

Test Boards

- OFET Test Board for High Density OFETs - P2014A1

High Density Interdigitated Front Gated FET

- Substrate
- Source Drain Mask - E323
- Active Area Mask (High Density) - E339
- Insulator Mask (Using Gate Mask E337)
- Gate Mask (High Density) - E337



Gate Mask (High Density) - E337

Insulator Mask - (Using Gate Mask E337)

Active Area Mask (High Density) - E339

Source Drain Mask - E323

20 x 15 mm Substrate

Test Boards

- OFET Test Board for High Density OFETs - P2014A1

Substrates, Masks & Boards Compatibility

Patterned ITO	Evaporation Mask	Aperture Masks	Riser Board	Test Board
S211	E501	E521	P2009B2	P2008A1
	E502	E522		
	E503	E521		
	E504	-		
	E531	E521		
	E532	E522		
	E632	-		
S241	E601	-	P2009F2	P2012A1
	E602			
S251	E611	-	P2009F2	P2012A1
S2006C1	E2001A1	E2002A1	P2009E2	P2011A1
	E2001B1	E2002A1		
	E2003A1	E2002B1		
	E2003B1	E2002B1		
	E2004A1	E2002A1, E2002B1		

Unpatterned ITO	Evaporation Mask	Aperture Masks	Riser Board	Test Board
S111	E501	E521	P2009B2, P2009G2	P2008A1, P2008B1
	E502	E522		
	E503	E521		
	E504	-		
	E531	E521		
	E532	E522		
	E632	-		
S281	E601	-	P2009F2, P2009G2	P2012A1
	E602			
	E611			
S2006B1	E2001A1	E2002A1	P2009E2, P2009G2	P2008A1, P2011A1
	E2001B1	E2002A1		
	E2003A1	E2002B1		
	E2003B1	E2002B1		
	E2004A1	E2002A1, E2002B1		

Quartz	Evaporation Mask	Aperture Masks	Riser Board	Test Board
S151	E501	E521	P2009B2, P2009G2	P2008A1, P2008B1
	E502	E522		
	E503	E521		
	E504	-		
	E531	E521		
	E532	E522		
S261	-	-	P2009G2	-
S2006A1	E2001A1	E2002A1	P2009E2, P2009G2	P2008A1, P2011A1
	E2001B1	E2002A1		
	E2003A1	E2002B1		
	E2003B1	E2002B1		
	E2004A1	E2002A1, E2002B1		

Patterned FTO	Evaporation Mask	Aperture Masks	Riser Board	Test Board
S212	E501	E521	P2009B2	P2008A1
	E502	E522		
	E503	E521		
	E504	-		
	E531	E521		
	E532	E522		
S2008C1	E2001A1	E2002A1	P2009E2	P2011A1
	E2001B1	E2002A1		
	E2003A1	E2002B1		
	E2003B1	E2002B1		
	E2004A1	E2002A1, E2002B1		

Sapphire	Evaporation Mask	Aperture Masks	Riser Board	Test Board
S2005	E501	E521	P2009B2	P2008A1
	E502	E522		
	E503	E521		
	E504	-		
	E531	E521		
	E532	E522		
	E632	-		

Unpatterned FTO	Evaporation Mask	Aperture Masks	Riser Board	Test Board
S303, S304, S2009B1, S2010A1, S2010B1	E501	E521	P2009B2, P2009G2	P2008A1, P2008B1
	E502	E522		
	E503	E521		
	E504	-		
	E531	E521		
	E532	E522		
	E632	-		
S2004S1, S2003S1, S2001S1, S2002S1	E2001A1	E2002A1	P2009E2, P2009G2	P2008A1, P2011A1
	E2001B1	E2002A1		
	E2003A1	E2002B1		
	E2003B1	E2002B1		
	E2004A1	E2002A1, E2002B1		

Low Density FET	Evaporation Mask	Aperture Masks	Riser Board	Test Board
S146, S148	E281	-	-	P2013A1
	E291			
	E292			
	E307			
	E309			
	E305			

High Density FET	Evaporation Mask	Aperture Masks	Riser Board	Test Board
S146, S148	E312	-	-	P2014A1
	E321			
	E322			
	E323			
	E338			
	E3310			
	E336			
	E337			
S403A1, S403A2	E312	-	-	P2014A1
	E338			

ITO FET	Evaporation Mask	Aperture Masks	Riser Board	Test Board
S161, S162	E271	-	-	P2013A1
	E309			
S271	-	-	-	-

Riser & Test Boards Compatibility

Patterned ITO	Dimensions	Riser Board	Test Board
S211	20 x 15 x 1.1 mm	P2009B2	P2008A1
S241	75 x 25 x 1.1 mm	P2009F2	P2012A1
S251	75 x 25 x 1.1 mm	P2009F2	P2012A1
S2006C1	25 x 25 x 1.1 mm	P2009E2	P2011A1

Unpatterned ITO	Dimensions	Riser Board	Test Board
S111	20 x 15 x 1.1 mm	P2009G2	P2008B1
S281	75 x 25 x 1.1 mm	P2009G2	-
S2006B1	25 x 25 x 1.1 mm	P2009G2	P2008B1

Quartz	Dimensions	Riser Board	Test Board
S151	20 x 15 x 1.1 mm	P2009G2	P2008B1
S261	75 x 25 x 1.1 mm	P2009G2	-
S2006A1	25 x 25 x 1.1 mm	P2009G2	P2008B1

OFET	Dimensions	Riser Board	Test Board
S161	20 x 15 x 1.1 mm	-	P2013A1
S162	20 x 15 x 1.1 mm	-	P2013A1
S271	75 x 25 x 1.1 mm	-	-

Patterned FTO	Dimensions	Coating	Riser Board	Test Board
S212	20 x 15 x 1.6 mm	Ossila (6-9 Ω /Square)	P2009B2	P2008A1
S2008C1	25 x 25 x 1.6 mm	Ossila (6-9 Ω /Square)	P2009E2	P2011A1

FET	Dimensions	Coating	Riser Board	Test Board
S146	20 x 15 x 0.7 mm	300 nm oxide	-	P2013A1/P2014A1
S148	20 x 15 x 0.7 mm	90 nm oxide	-	P2013A1/P2014A1
S403A1	20 x 15 x 0.7 mm	Pre-fabricated platinum 2-10 μ m	-	P2014A1
S403A2	20 x 15 x 0.7 mm	Pre-fabricated platinum 4-10 μ m	-	P2014A1

Unpatterned FTO	Dimensions	Coating	Riser Board	Test Board
S2010A1, S2010B1	20 x 15 x 2.2 mm	Ossila (7-10 & 10-15 Ω /Square)	P2009G2	P2008B1
S2001S1	25 x 25 x 2.2 mm	TEC 8 (6-9 Ω /Square)	P2009G2	P2008B1
S2002S1	25 x 25 x 1.0 mm	TEC 10 (11-13 Ω /Square)	P2009G2	P2008B1
S303	20 x 15 x 3.2 mm	TEC 10 (11-13 Ω /Square)	P2009G2	P2008B1
S2003S1	25 x 25 x 3.2 mm	TEC 10 (11-13 Ω /Square)	P2009G2	P2008B1
S304	20 x 15 x 2.2 mm	TEC 15 (12-14 Ω /Square)	P2009G2	P2008B1
S2004S1	25 x 25 x 2.1 mm	TEC 15 (12-14 Ω /Square)	P2009G2	P2008B1
S2009B1	20 x 15 x 1.0 mm	Ossila (10-15 Ω /Square)	P2009G2	P2008B1