

# 2.5D & 3D Packaging Cost Model Screenshots

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# Screenshots

5	New Estimate	Construct Process and Run	Add To Sensitivity...
6	Load Estimate		
7	Save Estimate		
8		Reset To Defaults	
9	Estimate Description:		
10			

All parameters can be viewed and changed on the main tab. This screen shows the Design Options and Supplier Settings.

Design Options			Results	Current	Previous Run	
14	Configuration	Interposer	Interposer	Total Package Cost	\$0.000	\$0.000
15	Integration	Chip-on-Chip	Chip-on-Chip	Die To Interposer Ass	\$0.000	\$0.000
16	# of Die	2	2	Interposer to Substrat	\$0.000	\$0.000
17	Package Size	27x27	27 x 27	Integration Costs	\$0.000	\$0.000
18	<b>Interposer</b>			etc...	\$0.000	\$0.000
19	Interposer Size	12x12	12 x 12			
20	# Interposer to Die RDL	1	1	Interposer Yield	0.00%	0.00%
21	# Interposer to Substrate RDL	1	1	Package Yield	0.00%	0.00%
22	<b>TSV</b>					
23	# TSV Per Die	100	100			
24	TSV Diameter (um)	10.00	10.00			
25	TSV Depth (um)	90.00	90.00			
26	TSV Aspect Ratio (calcula	9.00	9.00			

Supplier Settings	Fab 1	Fab 2	Fab 3	OSAT 1	OSAT 2
29 Labor Rate	Taiwan	Taiwan	Taiwan	Korea	Singapore
30 Factory Utilization	85%	85%	85%	85%	85%
31 Lot Size / Batch Size (# Wafe	12.00	15.00	15.00	15.00	15.00
32 Overhead/Indirect %	110.00%	110.00%	100.00%	30.00%	40.00%
33 Margin/Risk Factor %	40.00%	40.00%	40.00%	40.00%	40.00%

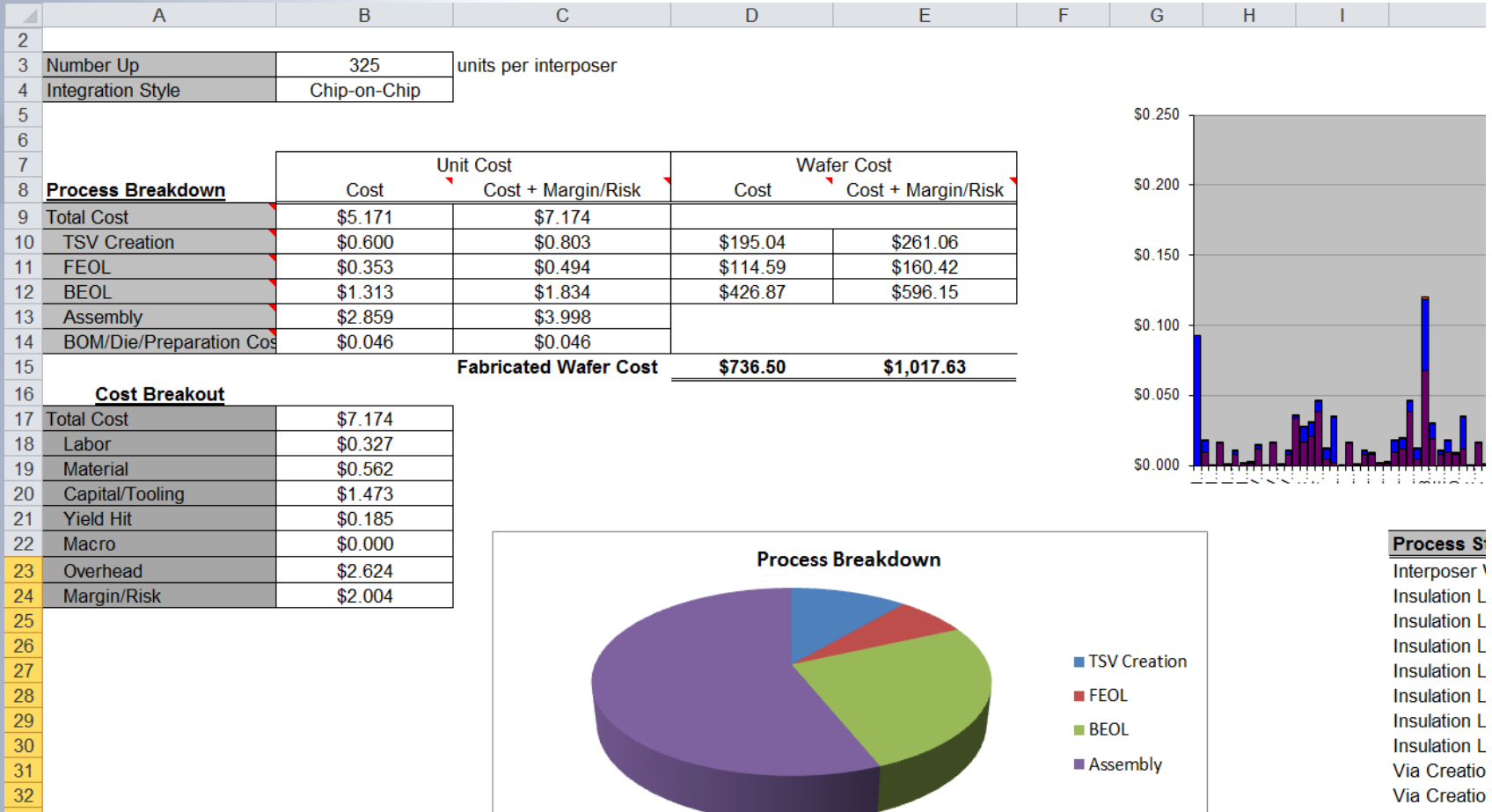
# Screenshots

62	Die Size (mm)	3x3	5x5	
61				
62	<b>Preparation of Die 3</b>			<b>Comme</b>
63	Incoming Wafer Cost	\$0.00	\$1,000.00	
64	Location/Labor Rate	Default	Fab 1	
65	Die Size (mm)	2x2	5x5	
74				
75	<b>Preparation of Die 4</b>			<b>Comme</b>
76	Incoming Wafer Cost	\$0.00	\$1,000.00	
77	Location/Labor Rate	Default	Fab 1	
78	Die Size (mm)	3x3	5x5	
87				
88				
89	<b>Advanced - Interposer Wafer Fabrication</b>			<b>Comme</b>
90	Incoming Wafer Cost	Default	\$30.00	
91	# Interposers Per Wafer (gross)	Default	Estimate	
92	Die Spacing (mm)	Default	1.00	
93	Edge Scrap (mm)	Default	10.00	
94	# Die Per Wafer	325		
95	<b>TSV Creation</b>			
96	Location/Labor Rate	Default	Fab 1	
97	Via Formation Process	Default	DRIE	
98	TSV Formation Process Yield	99.50%	99.50%	
99	<b>FEOL</b>			
100	Location/Labor Rate	Default	Fab 1	
101	Pad Surface Finish	Default	ENEPIG	
102	RDL Creation Process	Default	Dual Damascene	
103	<b>BEOL</b>			
104	Location/Labor Rate	Default	Fab 1	
105	Bumping Process	Default	Reflow	
106	Singulation	Default	Scribe and Saw	
107	Thin Handling Process Yield	99.50%	99.50%	
108				
109	<b>Die to Singulated Interposer</b>			<b>Comme</b>
110	Location	Default	Fab 1	

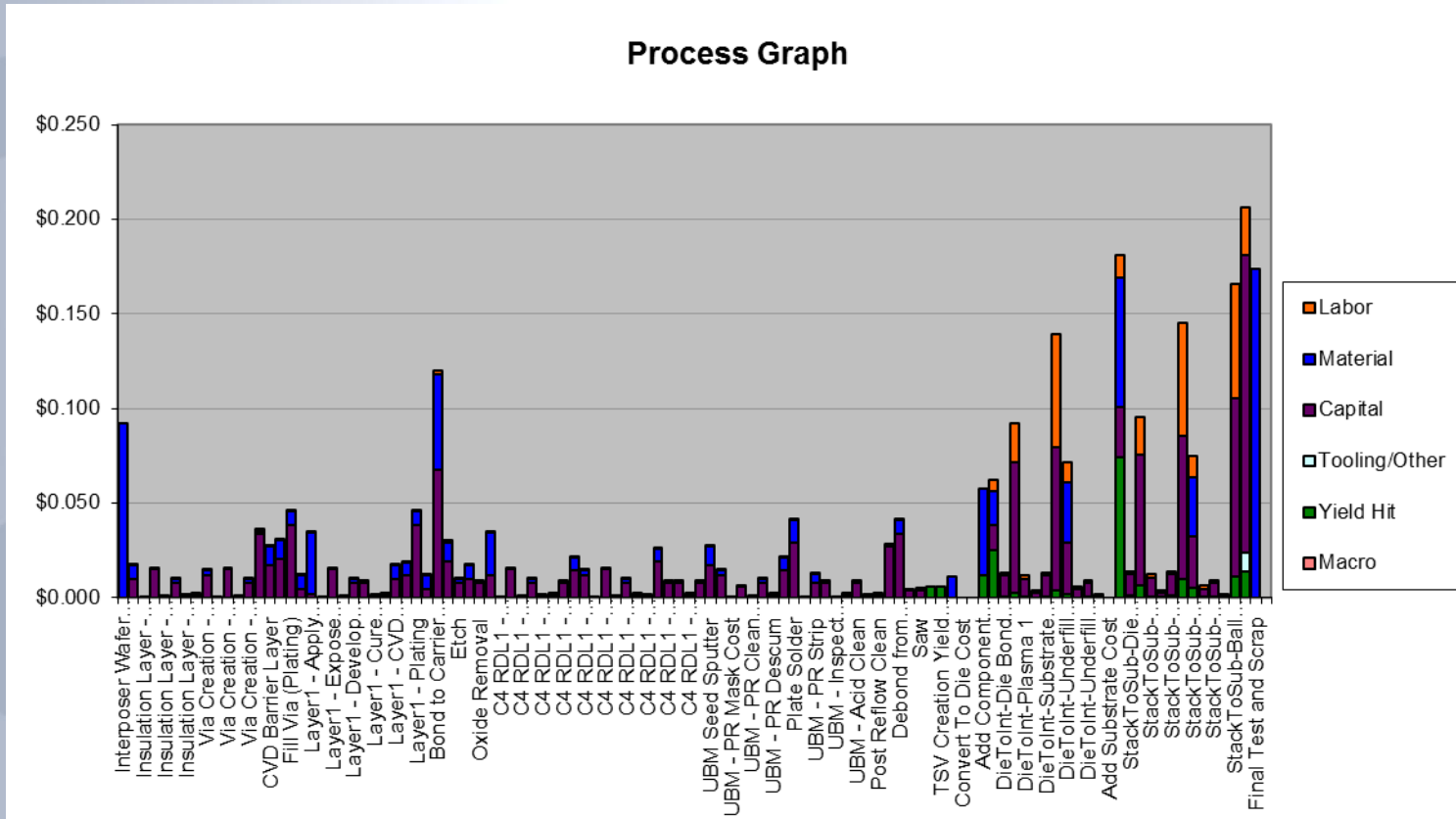
This screen shows the Die Preparation parameters and some advanced parameters for wafer fabrication.

# Screenshots

The results are displayed in two ways. This screen shows some total costs.



The results are displayed in a graph as well. The user can see exactly which process steps contribute to cost.



# Screenshots

Every step of the process can be viewed and edited on the Process Flow tab. The user can edit any value (time, defect density, equipment cost, material cost, etc.), or the step can be disabled entirely.

Step Name	Enabled?	Time (min)	Throughput (UPH)	Time Units	Operator Utilization	Defect Density or PPM	Defect Density Units	Step Yield	Equipment Cost
[01] Interposer Wafer Cost	YES	0.00		Per Panel	25%	0.00	Per cm <sup>2</sup>		\$0
[11] Insulation Layer - CVD	YES	2.00	30	Per Panel	25%	0.00	Per cm <sup>2</sup>		\$2,500.00
[11] Insulation Layer - Mask Cost	YES	0.00		Per Lot	25%	0.00	Per cm <sup>2</sup>		\$0
[11] Insulation Layer - Expose	YES	2.00	30	Per Panel	25%	0.00	Per cm <sup>2</sup>		\$4,000.00
[11] Insulation Layer - Clean Mask	YES	5.00	12	Per Lot	100%	0.00	Per cm <sup>2</sup>		\$1,000.00
[11] Insulation Layer - Etch	YES	20.00	3	Per Lot	25%	0.00	Per cm <sup>2</sup>		\$2,500.00
[11] Insulation Layer - Cure	YES	90.00	1	Per Lot	25%	0.00	Per cm <sup>2</sup>		\$100.00
[11] Insulation Layer - Descum	YES	1.00	60	Per Panel	25%	0.00	Per cm <sup>2</sup>		\$750.00
[11] Via Creation - Photoresist	YES	2.50	24	Per Panel	25%	0.00	Per cm <sup>2</sup>		\$2,500.00
[11] Via Creation - Mask Cost	YES	0.00		Per Lot	25%	0.00	Per cm <sup>2</sup>		\$0
[11] Via Creation - Expose	YES	2.00	30	Per Panel	25%	0.00	Per cm <sup>2</sup>		\$4,000.00
[11] Via Creation - Clean Mask	YES	5.00	12	Per Lot	100%	0.00	Per cm <sup>2</sup>		\$1,000.00
[11] Via Creation - Develop	YES	20.00	3	Per Lot	25%	0.00	Per cm <sup>2</sup>		\$2,500.00
[11] Deep Reactive Ion Etch	YES	5.00	12	Per Panel	50%	0.00	Per cm <sup>2</sup>		\$3,500.00
[11] CVD Barrier Layer	YES	2.50	24	Per Panel	25%	0.00	Per cm <sup>2</sup>		\$3,500.00
[11] PVD Cu Seed Layer	YES	3.00	20	Per Panel	25%	0.00	Per cm <sup>2</sup>		\$3,500.00
[11] Fill Via (Plating)	YES	5.00	12	Per Panel	25%	0.00	Per cm <sup>2</sup>		\$4,000.00
[11] CMP	YES	1.00	60	Per Panel	25%	0.00	Per cm <sup>2</sup>		\$2,500.00
[12] Layer1 - Apply Dielectric	YES	0.50	120	Per Panel	25%	0.00	Per cm <sup>2</sup>		\$2,000.00
[12] Layer1 - Mask Cost (Trench)	YES	0.00		Per Lot	25%	0.00	Per cm <sup>2</sup>		\$0
[12] Layer1 - Expose (Trench)	YES	2.00	30	Per Panel	25%	0.00	Per cm <sup>2</sup>		\$4,000.00
[12] Layer1 - Clean Mask (Trench)	YES	5.00	12	Per Lot	100%	0.00	Per cm <sup>2</sup>		\$1,000.00
[12] Layer1 - Develop (Trench)	YES	20.00	3	Per Lot	25%	0.00	Per cm <sup>2</sup>		\$2,500.00
[12] Layer1 - Etch (Trench)	YES	20.00	3	Per Lot	25%	0.00	Per cm <sup>2</sup>		\$2,500.00
[12] Layer1 - Cure (Trench)	YES	90.00	1	Per Lot	25%	0.00	Per cm <sup>2</sup>		\$100.00
[12] Layer1 - Clean (Trench)	YES	1.00	60	Per Panel	25%	0.00	Per cm <sup>2</sup>		\$750.00
[12] Layer1 - CVD Barrier Layer (TiN)	YES	2.00	30	Per Panel	25%	0.00	Per cm <sup>2</sup>		\$2,500.00
[12] Layer1 - PVD Cu Seed Layer	YES	2.50	24	Per Panel	25%	0.00	Per cm <sup>2</sup>		\$2,500.00
[12] Layer1 - Plating	YES	5.00	12	Per Panel	25%	0.00	Per cm <sup>2</sup>		\$4,000.00