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IC Knowledge – Cost and Price Model Product Line Summary

IC Knowledge produces five cost and price models, and, in this document, the five models will be summarized and compared. The five models are:

1. Assembly and Test Cost and Price Model - formerly known as the Packaging Cost and Price Model, we are adding test functionality to provide a complete backend solution. The Assembly and Test Cost and Price Model is designed to provide cost and price estimates for most semiconductor assembly and test operations. Assembly supports leadframe and organic substrate packages including EMIB as well as wafer level packages including InFO. The price includes twelve months of updates with reasonable levels of phone and email support. This model is sold as individual and enterprise licenses.
2. Discrete and Power Products Cost and Price Model - The Discrete and Power Products Cost and Price Model is designed to easily calculate the manufacturing cost and selling price of past and current high-power ICs and discrete devices fabricated on silicon, GaAs, GaN and SiC. The price includes twelve months of upgrades with phone and email support. Wafer fabrication, test and packaging costs are all covered. This model is sold in individual and enterprise licenses.
3. IC Cost and Price Model - The IC Cost and Price Model is designed to easily calculate the manufacturing cost and selling price of low power silicon ICs (such as microprocessor, ASIC, analog, etc.). The price includes twelve months of upgrades with phone and email support. Wafer fabrication, test and packaging costs are all covered. This model is sold in individual and enterprise licenses.
4. MEMS Cost and Price Model - The MEMS Cost and Price Model is designed to easily calculate the manufacturing cost and selling price of most MEMS products and optical emitters such as VCSELs and LEDs. The model supports up to two MEMS die and up to two IC die in the same package with packaging and test costs. The price includes twelve months of upgrades with phone and email support. This model is sold in individual and enterprise licenses.
5. Strategic Cost and Price Model - The Strategic Cost and Price Model is a node-based model for forward projecting state-of-the-art semiconductor technology. The model covers the top three companies of each of four categories, DRAM, Foundry, IDM Logic and NAND Flash. The model presents user editable process, equipment and materials details and has every 300mm fab for the target companies pre-defined (also user editable). Output includes detailed wafer cost and equipment and materials requirements in units and cost. Also includes die counts and die yield projections, margins and selling prices. The price includes twelve months of updates with phone and email support. This model is sold in individual and enterprise licenses.

All of our model run in Microsoft Excel, the Packaging Cost and Price Model and Strategic Cost and Price Model require Excel 2010 or higher, the other models currently run in Excel 2007 or higher but will be transitioning to Excel 2010 or higher.

Summary and comparison table

Elements	Assembly and Test Cost and Price Model	Discrete and Power Products Cost and Price Model	IC Cost and Price Model	MEMS Cost and Price Model	Strategic Cost and Price Model
Model coverage	Wafer sort, semiconductor assembly, class test	High powered integrated circuits and discrete devices fabricated on silicon, GaAs, SiC and GaN	Low powered integrated circuits fabricated on silicon.	MEMS products and optical emitters	Leading edge integrated circuit processes
Difficulty of use	Moderate	Low	Low	Moderate	High
Cost elements					
- Wafer cost	No	Yes	Yes	Yes	Yes (detailed)
- Wafer sort	Yes	Yes	Yes	Yes	No
- Packaging	Yes (detailed)	Yes	Yes	Yes	No
- Class test	Yes	Yes	Yes	Yes	No
Target customers	Anyone needing detailed assembly and test costs. Ideal for our Strategic Cost and Price Model customers who want a complete front and back end solution.	Should cost for automotive (widely used), and electronic systems. Benchmarking for IDMs. General usage by analysts and consultants.	Should cost for automotive, electronic systems and fabless companies. Benchmarking for IDMs and foundries. General usage by analysts and consultants. Materials and OEMs.	Should cost for automotive and electronic systems companies. Benchmarking for IDMs and MEMS companies. General usage by analysts and consultants.	Preferred model for OEMs and Materials companies. Technology and cost planning for IDMs, Foundries, Fabless, Consultants and Analysts.
Processes	Molded leadframe, organic substrate, wafer level, InFO, EMIB	BCD, HVIC, Power MOSFET, IGBT, Thyristor, diodes, IPD	CMOS, RFCMOS, legacy DRAM, SRAM, 2D NAND, NOR.	MEMS and IC signal conditioning, optical emitters	Foundry and IDM CMOS logic, DRAM, 2D and 3D Flash, 3D XPoint, Silicon Photonics

Elements	Assembly and Test Cost and Price Model	Discrete and Power Products Cost and Price Model	IC Cost and Price Model	MEMS Cost and Price Model	Strategic Cost and Price Model
Typical products	IC and discrete assembly and test	Power control ICs, high and low side switches, power MOSFETs, IGBTs, high voltage diodes, thyristors	Low power ASICs, FPGAs, microcontrollers, microprocessors, DSP, SOC	Accelerometers, gyroscopes, MEMS microphones, pressure sensors. VCSELs and LEDs	Leading edge wafers for logic, 3D NAND, 3D XPoint, advanced DRAM
Companies covered	Top 10 OSATs, user entered	Any relevant to the model	Any relevant to the model	Any relevant to the model	Top 3 foundries, DRAM and 2D NAND, top 4 3D NAND, most advanced logic, Intel-Micron 3D XPoint
Nodes	NA	Past and current	Past and current	Past and current	All 300mm to-date, 3D NAND to 256 layers, logic to 1.5nm, DRAM and 2D NAND to 1z, 3D XPoint 3 generations
Wafer sizes					
- 75mm	Yes	No	No	No	No
- 100mm	Yes	Yes	Yes	Yes	No
- 125mm	Yes	Yes	Yes	No	No
- 150mm	Yes	Yes	Yes	Yes	No
- 200mm	Yes	Yes	Yes	Yes	Limited
- 300mm	Yes	Yes	Yes	Yes	Yes
- 450mm	No	No	No	No	Limited
Packages	Molded leadframe, organic substrate, wafer level, InFO, EMIB	Power and discrete packages such as SOT, DFN, TO, etc.	Standard IC packages such as QFN, BGA, LGA, QFP, etc.	Multiple die specialty packages used for MEMS.	None

Elements	Assembly and Test Cost and Price Model	Discrete and Power Products Cost and Price Model	IC Cost and Price Model	MEMS Cost and Price Model	Strategic Cost and Price Model
Customizability	Moderate, can activate/ deactivate an extensive list of packaging steps	Low, can add selected process steps	Low, can add selected process steps	High for MEMS processes, can build custom process flows	Very high, custom processes, materials and equipment usage and characteristics
Output details	Assembly and test cost and price including cost per step and detailed material requirements	Wafer, die, test and packaging costs. Approximate fab equipment and materials costs.	Wafer, die, test and packaging costs. Approximate fab equipment and materials costs.	Wafer, die, test and packaging costs. Detailed fab equipment and materials costs for MEMS.	Detailed wafer cost, cost per block and step, equipment set cost and units, material usage and cost
Comments	Detailed ability to define the assembly and test process elements and parameters.	Has a module calculator for multi-chip packaging. Compound semiconductor coverage. We recommend the assembly and test cost and price model for multi-chip packaging.	Has a multiple die calculator for multi-chip packaging. We recommend the assembly and test cost and price model for multi-chip packaging.	Can cost out up to 2 MEMS die and up to 2 IC die in the same product. Users can define their own MEMS processes.	The fabs, processes, equipment and materials can all be user adjusted.
Price [1]					
- Single user - new	$1,400	$2,300	$2,400	$1,995	$5,500
- Single user - renewal	$933	$1,533	$1,600	$1,330	$4,500
- Enterprise - new	$4,761	$7,821	$8,160	$6,783	$15,000
- Enterprise - renewal	$3,174	$5,214	$5,439	$4,521	$10,000

[1] Prices shown are for purchase orders with 30 days net terms, lower prices may be available for on-line purchases with a credit card. Renewal prices are only valid for users with a current license or a license that has expired in the last 30 days. Once a license has expired for more than 30 days you must pay the new license price. Prices and features are subject to change without notice. All models includes twelve months of updates with reasonable phone and email support.