

INTERSIL— POWER MANAGEMENT STRATEGY

ABSTRACT

This report (97 pages, 66 figures, 13 chapters) delivers in-depth and comprehensive coverage of Intersil's power management strategy – its businesses, markets, products, and technologies.

Intersil is a medium-sized (\$611M in 2009) Power IC company with a corporate commitment to join the leading-5 Analog and Power IC vendors – TI, National, ADI, Maxim, and Linear. The company is positioning itself for aggressive revenue growth of 30% annually; the management team is confident that Intersil will meet its \$1B revenue objective by 2011.

Of pivotal importance to Intersil's growth strategy are its acquisitions. Their primary purpose is to provide new strategic components for an added pull-through business in a range of applications. It has called it a "Moving-to-the Left" strategy – a focused strategy that is not well understood by industry analysts.

All analog IC vendors deploy the pull-through strategy, also called the solution strategy, with a corresponding S-factor. Intersil approaches its acquisitions in a highly systematic manner. Conceptually the pull-through strategy is an expansion of its successful strategy in the Computing sector where Intersil has a 50% market share in the notebook PC business and where growth potential is now limited.

	Motherboard/Battery Pack	Display
Strategic components	Core power for <ul style="list-style-type: none"> ▶ CPU ▶ System chipset, and ▶ graphics processor 	LCD power
Pull-through business components	<ul style="list-style-type: none"> ▶ Battery charger and safety ▶ Voltage references ▶ Power supply monitors and sequence ▶ Interface ICs ▶ System power ICs ▶ Wi-Fi power management ▶ Digitally controlled potentiometers ▶ Analog switchers and multiplexers ▶ SMBus accelerators ▶ DDR memory power ▶ MOSFET drivers 	<ul style="list-style-type: none"> ▶ Ambient light sensor ▶ LED backlighting ICs ▶ Gamma buffers and Vcom amplifiers ▶ Voltage references ▶ LCD clock driver ▶ Digitally controlled potentiometers ▶ Voltage regulators ▶ Lever shifter ▶ Programmable reference generator ▶ Panel repair operational amplifiers

Together with Texas Instruments and Maxim, Intersil is also in the forefront of the industry transition to power technology platforms -- 250nm in volume production and 180nm in development. These analog technology platforms represent the key enablers of the company's future growth.

180nm BCD Platform Technology Attributes			
NMOS/PMOS, isolated CMOS devices <ul style="list-style-type: none"> ▶ 180nm, 1.8V ▶ 3.6V BVds 	NMOS/PMOS, isolated CMOS devices <ul style="list-style-type: none"> ▶ 500nm, 5V ▶ 7V BVds 	NDMOS/PDMOS devices (isolated drain) <ul style="list-style-type: none"> ▶ Up to 100V ▶ 5V gate ▶ 10mohm x mm2 ▶ R_{dson} @ 12V V_{ds} ▶ Customizable 	Bipolar devices <ul style="list-style-type: none"> ▶ High-gain NPN ▶ (beta of 60, 9V BV_{ceo}) ▶ High voltage NPN ▶ (beta of 25, 74 BV_{ceo}) ▶ Vertical PNPs
Diodes <ul style="list-style-type: none"> ▶ Zener ▶ Schottky ▶ n-p buried 	Resistors <ul style="list-style-type: none"> ▶ High resistivity ▶ Poly ▶ Diffusion ▶ Metal 	Capacitors <ul style="list-style-type: none"> ▶ MIM 	Non-Volatile Memory <ul style="list-style-type: none"> ▶ Up to 250KB ▶ Flash or EEPROM
Interconnect <ul style="list-style-type: none"> <li style="margin-right: 10px;">• Copper <li style="margin-right: 10px;">• 200x200nm contact size <li style="margin-right: 10px;">• Thick top aluminum layer • 3-layer interconnect metal 			

Intersil's power technology platforms enable expansion into, for example, PMICs for high-end consumer applications, integration of discrete power MOSFETs, expansion of its digital power business, and expansion of its highly integrated application-specific standard (ASSP) products that serve as strategic components for an increasing pull-through business.

The new power technology platforms enable Intersil to consolidate a range of dedicated process flows (currently it uses 15 foundries), since platforms feature a comprehensive arsenal of devices enabling implementation of a broad range of power ICs from digital intensive to power-delivery intensive products. In addition, multiple technology platforms could share a common process design kit (a unified PDK), further enhancing the IC design implementation process and efficiency.

Intersil's power management products could be grouped into [eight power domains](#).

- [Analog power conversion domain](#) – it is expanding into high integration PMICs supported by the Rock Semiconductor acquisition. These PMICs represent new strategic components for high-end consumer applications such as smart cell-phones and handheld equipment.
- [Digital power domain](#) – this new growth business domain is supported by the Zilker Labs and D2Audio acquisitions which contributed new strategic components for high-end computing and consumer applications.
- [Lighting and displays domain](#) – a growth business in LED lighting and LCD display applications
- [Smart power grid domain](#) – a new business in the early incubation stage
- Four established power domains -- [battery management](#), [power supply support](#), [power distribution](#), and [power actuation](#). Business expansion into plug-in DC/DC modules and power conversion ICs integration discrete power MOSFETs

Power Domain	2009 Revenue (\$M)	% of total	Trends
Analog power conversion	159	45%	DC/DC conversion ICs dominate
Power supply support	67	19%	Voltage monitors dominate
Power actuation	40	11%	Power MOSFET drivers dominate
Power distribution	18	5%	Hot plug controllers dominate
Battery management	34	10%	Battery chargers dominate
Lighting and displays	28	8%	LCD power ICs dominate
Digital power	7	2%	Business expansion
Smart power grid	1	0%	Emerging business
Total Power ICs and modules	354	100%	--

Intersil focuses on [standard products](#) by balancing revenue streams derived from application-specific and general-purpose product types. General-purpose products contribute to the annuity foundation layer, while application-specific products contribute to the upper opportunistic layer of the revenue stream. In 2008 Intersil reorganized its business by consolidating five product lines into two product groups - Power Management and Analog & Mixed-signal groups.

Product category	2009 Revenue		Attributes
	\$M	%	
Analog & mixed-signal	257	42%	High margin products
▶ ASSPs	118		Kenet acquisition provides new strategic components
▶ GPPPs	139		More than corporate average R&D investments
Power management	354	58%	Lower margin products
▶ ASSPs	255		Zilker Labs, Rock Semiconductor, D2Audio, and Quellan acquisitions provide new strategic components
▶ GPPPs	99		
Total Intersil	611	100%	
• ASSPs	373	61%	ASSP/GPPP revenue balance is required to sustain the target 55+ percent gross margin
• GPPPs	238	39%	

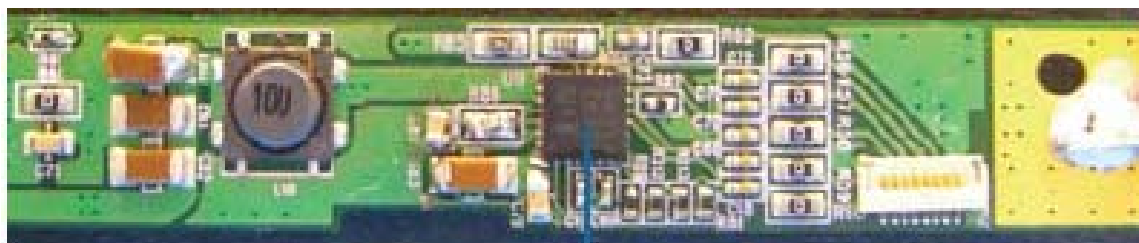
Intersil offers about 690 generic power management products of which analog power conversion ICs represent about 44 percent of products. The company's products are efficiently focused at their target end-equipment applications in a manner that maximizes solution sales. As a result, the company's products are tightly linked into an end-equipment application. This enables Intersil to maximize revenues per generic product.

Power domain	Number of generic standard products	% of total
Analog power conversion	304	34%
Power supply support	157	23%
Power distribution	37	5%
Battery management	62	9%
Lighting and displays	48	7%
Power actuation	72	11%
Smart power grid	2	0%
Digital power	7	1%
Total	689	100%

In the analog power conversion domain Intersil focuses on [non-isolated single-function inductor-based switching DC/DC converters and controllers](#) (controllers use external power MOSFETs).

Vendor	Single-function ICs							Multi-function ICs		Grand total
	Inductor based		Charge pump		Linear/LDO		Total generic products	Products	Grand total %	
	Products	%	Products	%	Products	%				
TI	460	32%	72	5%	908	63%	1,440	52	3%	1,492
National	209	53%	24	6%	162	41%	395	13	3%	408
Linear	567	84%	39	6%	68	10%	674	34	5%	708
Maxim	375	66%	51	9%	145	25%	571	53	8%	624
Intersil	195	86	2	1%	30	13	227	33	13	260
Analog Devices	23	32%	11	15%	37	52%	71	2	3%	73
AnalogicTech	63	79%	0	0%	17	21%	80	25	24%	105
MPS	99	86%	1	1%	15	13%	115	4	3%	119
Infineon	13	32%	0	0%	28	68%	41	8	16%	49
Rohm	89	24%	0	0%	275	76%	364	11	3%	375
STMicroelectronics	99	22%	1	0%	352	78%	452	6	1%	458

In the LED lighting and displays domain Intersil focuses on backlighting for LCDs up to 17-inch in size. Its ISL97677 enables small and 1.3mm thin PCB modules fit into slim notebooks.



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