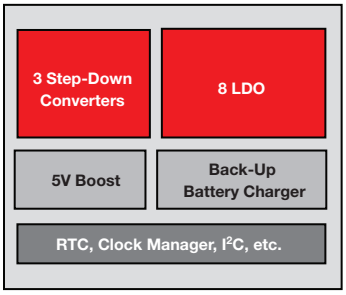
Power Management Units for Embedded Processors

Texas Instruments

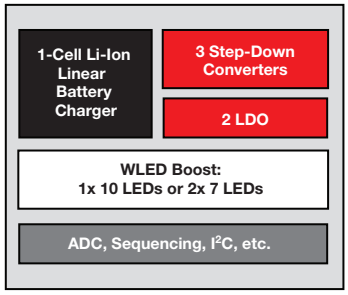
1Q 2011

The **TPS65K** family of Power Management Units (PMU) – also called PMIC – offers complete solutions for a wide range of processor-based applications. The latest generation is highly flexible, making them true general-purpose devices. PMUs can integrate several high-efficiency DC/DC converters and LDOs for the processor core, IO, memory and other voltages. Additional integrated functions such as a battery charger (linear or switch-mode), Light Management Unit (LMU) like Flash and WLED backlighting, ADCs, touch-screen controller, audio codec and USB 2.0 PHY are also available. TI's SmartReflex™ technology and dynamic voltage scaling (DVS) can significantly extend battery lifetime by adjusting the output voltages to the required performance. Visit **www.ti.com/pmu** or **power.ti.com**

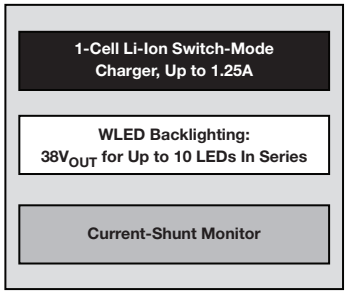
TPS65910 NEW
Highly flexible PMU integrating several DC/DC and LDO to power processors like OMAP™, Sitara, Samsung, and other popular processors. Available in 6mm x 6mm QFN package.



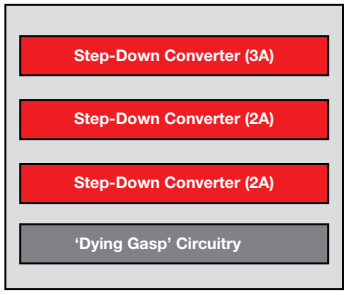
TPS65072
General purpose PMU integrating several DC/DC, LDO, battery charger and WLED backlighting. Reference design available for different processors. Available in 6mm x 6mm QFN package.



TPS65200 NEW
First PMU in the market with switch-mode charger, WLED backlighting and current-shunt for battery monitoring. Ideal companion PMU for portable applications. Available in small 3mm x 3mm WCSP and 6mm x 6mm QFN packages.



TPS65250/1 NEW
General purpose PMU integrating 3x buck-converters with integrated FETs (2A, 2A, 3A) and wide V_{IN} from 4.5V to 18V. In case of power shut-down, the 'Dying Gasp' function (x250 only) allows to save critical data before shutting-down. Available in 6mm x 6mm QFN package.



Embedded Processors Supported by TI's Power-Management Units (PMUs)

Processor	Part Number	PMU
TI	DM335, DM355, DM365	TPS65053, TPS65070
TI	DM368	TPS650532, TPS65023
TI	DM37x	TPS6595x/30/2x/10, TPS65023, TPS65073
TI	DM37x @ 1GHz	TPS65950A3/x21B1/x10, TPS65023, TPS65073
TI	DM643x, DM644x	TPS65023, TPS659105
TI	DM812x	TPS659113
TI	DM816x	TPS65232, TPS659112
TI	AM17x, AM18x	TPS65910, TPS650061, TPS65070
TI	AM35x	TPS65910, TPS650732, TPS65023
TI	AM37x	TPS6595x/30/2x/10, TPS65023, TPS65073
TI	AM37x @ 1GHz	TPS65950A3/x21B1/x10, TPS65023, TPS65073
TI	AM387x	TPS659113, TPS65232
TI	AM389x	TPS65232, TPS659112
TI	OMAP3503/15/25/30	TPS6595x/30/2x/10, TPS65073x, TPS65023
TI	OMAP3611/21/30	TPS6595x/30/2x/10, TPS65023
TI	OMAP4	TWL6030 + TWL6040
TI	OMAP-L137	TPS65910, TPS65023
TI	OMAP-L138	TPS65910, TPS65070, TPS65023
TI	C2834x	TPS65000, TPS650061
TI	C6742/6/8	TPS65910, TPS65070, TPS65023
TI	C6745/7	TPS65910, TPS65023
TI	C6A816x	TPS65232, TPS659112

Processor	Part Number	PMU
Freescale	IMX25	TPS65051/2
Freescale	IMX27	TPS65053, TPS659107
Freescale	IMX31	TPS650240
Freescale	IMX35	TPS650250, TPS659107
Freescale	IMX37, IMX51	TPS659109
Freescale	IMX508	TPS659108
Marvell	PXA270	TPS65021/2
Marvell	Armada MMP2	Please contact TI
Nvidia	APX2500/ 2600	TPS658600
Nvidia	Tegra 600/ 650	TPS658610
Nvidia	T20	TPS658621/3/4
Nvidia	AP20	TPS658622
Samsung	S3C2410/2/3	TPS65051/2
Samsung	S3C2416	TPS650250, TPS650240
Samsung	S3C6410	TPS650240
Samsung	S5PV210, S5PC110	TPS659101
Samsung	S5PC100	TPS659103
Samsung	S5P6440	TPS659104
RMI	AU1200/ 1300	TPS65021
Sirf	ATLAS 4	TPS65072
STM	STA2065	TPS65215
Rockchip	RK2818	TPS65053, TPS65215

Selection Guide

Device	V_{IN} (V)	No. of Regulator Outputs	Charger	Audio Codec	USB 2.0 OTG Transceiver	WLED Boost	DC/DC Step-Down Converter	DC/DC Step-Down Controller	LDO	Communication Interface	Description	Package	Automotive Qualified	Price*
TPS65200	2.5 to 6.5	0	Switch	—	—	✔	—	—	—	I²C	With current shunt monitor, also QFN	WCSP-36	—	2.45
TPS65831	3.0 to 6.0	0	Switch	—	—	✔	—	—	—	I²C	SW charger with Flash, WLED and RGB LEDs	WCSP-49	—	3.45
TPS80010	1.8 to 3.6	2	—	—	—	—	1	—	1	—	Ideal for 2-cell Alkaline	QFN-32	—	1.55
TPS65720/1	4.3 to 28.0	2	Linear	—	—	—	1	—	1	I²C	Smallest 1-Li-Ion applications, also QFN	WCSP-25	—	1.65
TPS65252	4.5 to 16.0	2	—	—	—	—	2	—	—	—	USB switch with adjustable current limit	QFN-28	—	2.95
TPS65000/6	1.8 to 6.0	3	—	—	—	—	1	—	2	—	General purpose. TPS65001 with supervisor	QFN-16	—	1.40
TPS75003	2.2 to 6.5	3	—	—	—	—	—	2	1	—	PMU for FPGA, DPS and ASIC	QFN-20	—	1.90
TPS657051/2	3.3 to 6.0	3	—	—	—	—	2	—	1	—	General purpose	WCSP-16	—	1.20
TPS65210	1.8 to 5.5	3	—	—	—	✔	2	—	—	—	With buck/boost	QFN-28	—	TBD
TPS65250/1	4.5 to 18.0	3	—	—	—	—	3	—	—	—	With 'dying gasp' function	QFN-40	—	3.05
TPS65232	10.8 to 22.0	3	—	—	—	—	2	1	—	I²C	Wide input voltage range, also QFN	HTSSOP-48	—	2.70
TPS65230/1	10.8 to 22.0	3	—	—	—	—	2	1	—	I²C	With two 0.5A or 1A USB switches	HTSSOP-48	—	2.80
TPS65708	3.5 to 6.0	4	—	—	—	—	2	—	2	—	With 7.5mA PWM dimmable current sink	WCSP-16	—	1.65
TPS65256	4.5 to 16.0	4	—	—	—	—	3	—	1	—	General purpose 4x channel PMU	QFN-40	—	TBD
TPS65010/1/2/3/4	4.5 to 5.5	4	Linear	—	—	—	2	—	2	I²C	General purpose PMU with charger	QFN-48	—	2.55
TPS65220	2.7 to 9.9	5	Linear	✔	—	✔	2	—	3	I²C	Integrated mono class D amplifier	QFN-56	—	TBD
TPS65053/8	2.5 to 6.0	5	—	—	—	—	2	—	3	—	Low-cost 5-channel PMU	QFN-24	—	1.85
TPS65070/2/3	2.8 to 6.3	5	Linear	—	—	✔	3		2	I²C	With and without touchscreen controller	QFN-48	—	3.60
TPS65020/1/2	2.5 to 6.0	6	—	—	—	—	3	—	3	I²C	PMU with high-current DC/DC	QFN-40	—	3.05
TPS65023x	2.5 to 6.0	6	—	—	—	—	3	—	3	I²C	Flexible 6x channel PMU, also WCSP package	QFN-40	✔	3.30
TPS650240/1/2/3/4/5	2.5 to 6.0	6	—	—	—	—	3	—	3	Logic H/L	PMU with logic high/low voltage scaling	QFN-32	✔	2.95
TPS650250	2.5 to 6.0	6	—	—	—	—	3	—	3	—	Flexible PMU with all V_{OUT} externally adjustable	QFN-32	✔	2.95
TPS65050/1/2/4/6	2.5 to 6.0	6	—	—	—	—	2	—	4	Logic H/L	General purpose PMU	QFN-32	—	1.85
TPS65215	2.7 to 6.5	7	Linear	—	—	✔	3	—	4	—	WLED with 38V output for up to 2 x 10 LEDs in series	QFN-48	—	TBD
TPS65921	2.7 to 4.5	7	—	—	✔	—	3	—	4	2x I²C	Optimized for OMAP35x processors	BGA-139	—	3.60
TPS65930	2.7 to 4.5	7	—	✔	✔	—	3	—	4	2x I²C	Optimized for OMAP35x processors	BGA-139	—	3.95
TPS65951	2.7 to 4.5	12	—	✔	✔	—	3	—	9	2x I²C	Optimized for OMAP35x processors, 0.8mm pitch	BGA-169	—	TBD
TPS65910x	2.7 to 5.5	13	—	—	—	—	3	—	9	2x I²C	Very flexible PMU, with 5V boost.	QFN-48	—	3.45
TPS65911x	2.7 to 5.5	13	—	—	—	—	3	1	9	2x I²C	Flexible PMU with DC/DC controller up to 10A	BGA-98	—	TBD
TPS65950	2.7 to 4.5	13	Linear	✔	✔	—	3	—	10	2x I²C	Optimized for OMAP35x processors	BGA-209	—	4.50
TPS658620/1/2/3/4	4.3 to 6.5	14	Linear	—	—	✔	3	—	11	I²C	Optimized for Nvidia processors	BGA-121	✔	5.95
TWL6030/40	2.3 to 5.5	18	Switch	✔	—	—	7	—	11	2x I²C	Dual ICs: audio and power, optimized for OMAP4	FBGA + PBGA	—	TBD

[1]Suggested resale price in U.S. dollars in quantities of 1,000.

New products are listed in ***bold red.*** Preview products are listed in ***bold blue.***

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