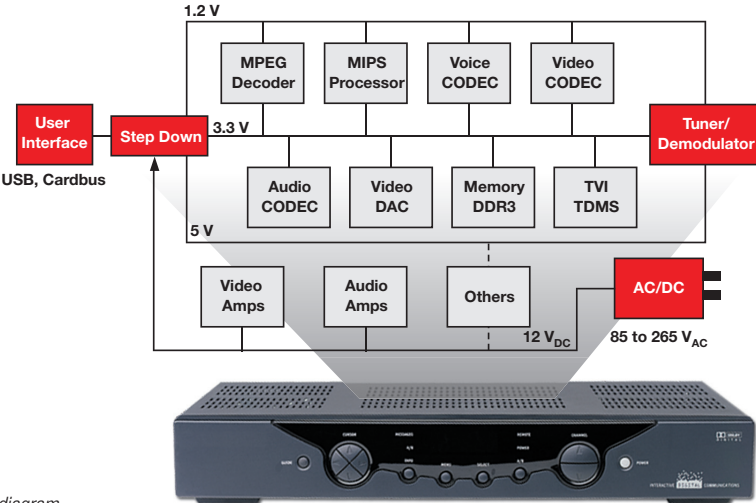


Power Management Solutions for Set-Top Box and Digital TV



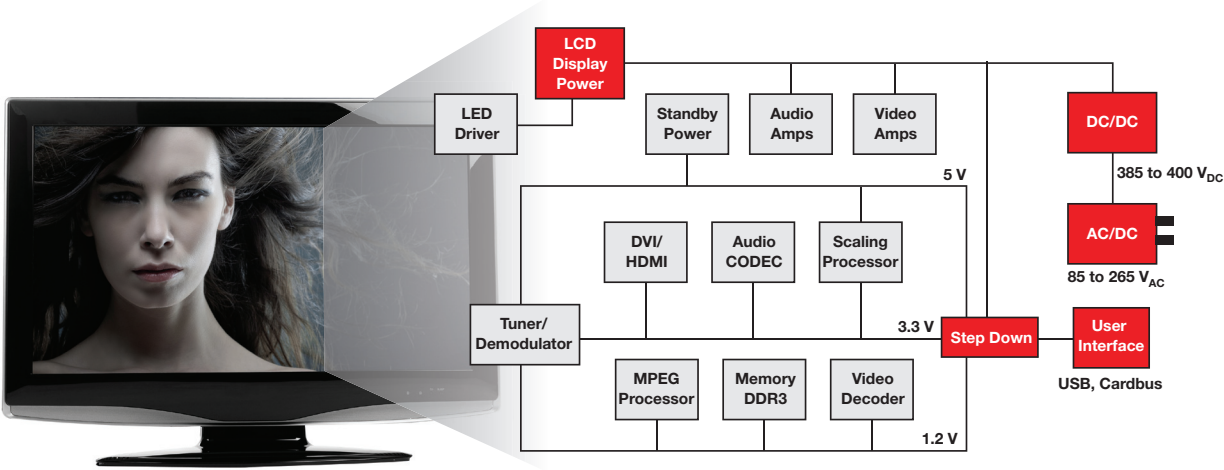
Advancements of technology with video electronic equipment are opening doors for new exciting products. To remain viable in today's competitive marketplace, an efficient, reliable power management system is vital for lower power consumption to meet energy usage requirements. At Texas Instruments (TI), we provide design experience and differentiated power management products to give your application a competitive edge. Our cost-competitive offering includes products such as power factor correction ICs, AC/DC PWM controllers, point of load DC/DC controllers and converters with integrated MOSFETs, low dropout (LDO) and linear regulators, and power interface switches. In addition, we supply the tools and support to get your video application to market quickly. TI Power Management Products wants to help you create the next generation of video electronics.

Set-Top Box



Example digital set-top box power block diagram.

Digital Television



Example digital television power block diagram.

Device	Description	Function	Features	Package(s)
Power Factor Correction ICs				
UCC28063	Natural interleaving, transition mode	PFC Controller	Advanced audible noise performance, phase management failsafe OVP, reduced bias current	16SOIC
UCC28019A	Continuous conduction mode	PFC Controller	Fixed 65 kHz operating frequency, max duty cycle 98% OVP, UVP, brown out protection	8PDIP, 8SOIC
PWM Controllers for Off-Line Supply				
UCC25600	LLC half bridge resonant controller	Resonant Mode Controller	Prog. max/min switch freq with 4% accuracy, dead time and soft start, bias voltage UVLO and OVP, integrated gate driver	8SOIC
UCC28600	Green Mode, quasi-resonant flyback controller	PWM Controller	Freq foldback and burst modes for light or no load operation, low standby and startup current, prog. OVP, dual mode OCP	8SOIC
UCC2897A	Advanced current mode active clamp controller	PWM Controller	110 V start-up, 1 MHz max Fsw, prog. dead time between outputs, internal slope compensation, peak current mode with cycle-by-cycle current limit, 2 A outputs, precise prog. max duty cycle	20QFN, 20TSSOP
LM5027/A	Voltage mode active clamp controller with SR control output	PWM Controller	105 V start-up, voltage feed-forward, 1 MHz Fsw, prog. UVLO and soft start, dual mode OCP, prog. delay between outputs, 2 A NFET driver and 3 A SR driver	16SON, 16TSSOP, 16WQFN
Step-Down DC/DC Converters (Integrated FETs)				
TPS54294/5	4.5 to 18 V _{IN} , 0.76 minimum V _{OUT} , dual 2 A	Synchronous	D-CAP2™ mode ¹ , enable, PG, fixed 700 kHz, soft start (1 ms)	16HTSSOP, 16QFN
TPS54327/8	4.5 to 18 V _{IN} , 0.76 minimum V _{OUT} , 3 A	Synchronous	D-CAP2 mode ¹ , enable, fixed 700 kHz, adj. soft start	8SO PowerPAD™
TPS54319	2.95 to 6 V _{IN} , 0.8 minimum V _{OUT} , 3 A	Synchronous	Adj. frequency (to 2 MHz), PG, enable adj. soft start/sequencing	16WQFN
TPS54331	3.5 to 28 V _{IN} , 0.8 minimum V _{OUT} , 3 A	Non-Synchronous	Fixed 570 kHz, adj. soft start, enable, Eco-mode™	8SO PowerPAD
LMR10520	SIMPLE SWITCHER® 5.5 V _{IN} , 2 A step-down voltage regulator	Non-Synchronous	3 MHz Fsw, low Iq, soft start, min. BOM count	8SOIC
LMR12010	SIMPLE SWITCHER 20 V _{IN} , 1 A step-down nano regulator	Non-Synchronous	1.6 MHz Fsw, low Iq, soft start, min. BOM count	SOT23-6, QFN-6
TPS54527/8	4.5 to 18 V _{IN} , 0.76 minimum V _{OUT} , 5 A	Synchronous	D-CAP2 mode, enable, fixed 650 kHz, adj. soft start	SOT23-6
TPS54821	4.5 to 17 V _{IN} , 0.6 minimum V _{OUT} , 8 A	Synchronous	Adj. frequency (to 1.6 MHz), PG, enable power sequencing, adj. soft start	8SO PowerPAD
TPS5432	2.95 to 6 V _{IN} , 0.8 minimum V _{OUT} , 3 A	Synchronous	Fixed 700 kHz, adj. soft start, current mode control	14QFN
LM20323/33/43	4.5 to 36 V _{IN} , 0.8 minimum V _{OUT} , 3 A	Synchronous	Fixed, adj. or sync Fsw; PG, EN, UVLO, 1.5% accuracy	8SO PowerPAD
LM20242	4.5 to 36 V _{IN} , 0.8 minimum V _{OUT} , 2 A	Synchronous	Adj. Fsw, PG, EN, UVLO, 1.5% accuracy	TSSOP-20
LM21305	3 to 18 V _{IN} , 0.6 minimum V _{OUT} , 5 A	Synchronous	Adj. Fsw, sync, PG, EN, 1.5% accuracy	TSSOP-20
LM20123/33/43	2.95 to 5.5 V _{IN} , 0.8 minimum V _{OUT} , 3 A	Synchronous	Fixed, adj. or sync Fsw; PG, EN, UVLO, 1.5% accuracy	QFN-28
Power Management Units				
TPS652510	4.5 to 16 V _{IN} , triple DC/DC sync buck with integrated FETs	PMU	300 kHz to 2.2 MHz, 3.5 A, 2.5 A max I, PG, enable, automatic pulse skipping, soft start	40VQFN
TPS65258	4.5 to 16 V _{IN} , triple DC/DC sync buck with integrated FETs and 2 USB switches	PMU	300 kHz to 2.2 MHz, 3.5 A, 2.5 A max I, PG, enable, 1 A, 2 USB power switches with thermal protection	40VQFN
TPS65252	4.5 to 16 V _{IN} , dual DC/DC sync buck with integrated FETs and 1 USB switch and SVS	PMU	300 kHz to 2.2 MHz, 3.5 A, 2.5 A max I, PG, enable, supervisory circuit, soft start	28VQFN
TPS65270	4.5 to 16 V _{IN} , dual DC/DC sync buck with integrated MOSFET	PMU	300 kHz to 1.4 MHz, 3 A, 2 A max I, enable, soft-start current mode control, pulse skipping mode	24HTSSOP, 24VQFN

¹D-CAP2: No compensation, fast transient response.

Device	Description	Function	Features	Package(s)
Power Interface Products				
LM3017	High efficiency low-side boost controller with true shutdown	Boost Controller	Thunderbolt™ compliant, true shutdown	QFN-10
LM34902/04	300 mA/500 mA current limited power switch	Accessory Switch	Thermal protection and load detection	micro SMD-6
TPS2051C	500 mA current limited power switch	USB Switch	Thermal and short circuit protection	SOT23-5
TPS2223A	Dual slot carbus switch	PCMCIA	Thermal and short circuit protection	24SSOP/HTSSOP
Low Drop Out Regulators				
LP5900	2.5 V to 5.5 V input, 150 mA	LDO	Low noise (6.5 μ V _{rms})	SON, WCSP
TPS709	2.5 V to 30 V input, 150 mA	LDO	1 μ A low I _q , enable, reverse current protection	SOT
TLV702	2 V to 5.5 V input, 300 mA	LDO	LDO with enable	SOT-23, SON
LP2992/89	2.5 V to 16 V input, 250 mA, 3.98 V to 16 V input, 500 mA	LDO	High precision output voltage accuracy	SOT23-5, 6SON, 6USON, 6WSON, 8QFN, 8SOIC, 8VSSOP, 8WSON
TPS75005	Dual LDO + 3 SVS	LDO	Dual 500 mA rails with sequencing	SON
TPS737	2.2 V to 5.5 V input, 1 A	LDO	Enable, fast transient, low dropout: 130 mV @ 1 A	SON, SOT-223, SON
TLV1117	2 V to 5.5 V input, 1 A	LDO	General purpose 117, value line	3 TO-263/220, SOT
LP38502/3	2.7 V to 5.5 V input, 1.5 A/3 A	LDO	Enable, stable with any cap	5PFM, 8QFN, 8WSON, TO-263, TO-263
TPS7A7001	1.5 V to 6.5 V input, 2 A	LDO	Enable, 2% accuracy	8 SOIC
TLV710	Dual LDO	LDO	Dual 200 mA rail with enable	6 SON
TPS717	High BW PSRR, 150 mA	LDO	Enable, low noise, ultra-high PSRR	SC-70, SON
Display Power				
TPS65161A/B	4-ch LCD bias (2.8 A min. boost current limit) up to 19 V, 2.3 A min. buck current limit)	Bias PS for TV and LCD	8 V to 14.7 V V _{IN} , V _{OUT} up to 19 V, 2.8 A to 3.7 A switch current limit, 2.3 A step down converter	28HTSSOP
TPS65162	4-ch LCD bias with integrated input-to-output isolation switch, 2 op-amps and GPM	LCD Bias + HS Amps	8 V to 14.7 V V _{IN} , boost up to 19 V, 2.5 A step down 500/750 kHz fixed freq, soft start, \pm charge pump	48VQFN
TPS65163	4-ch LCD bias with integrated 9-ch level shifter	LCD Bias + Level Shift	8.6 V to 14.7 V V _{IN} , boost up to 18.5 V, 1.5 A buck 750 kHz switch freq, 9-ch level shifter, gate shaping	48VQFN
TPS65168	High resolution, fully programmable LCD bias IC for TV	Prog. LCD Bias	8.6 V to 14.7 V V _{IN} , 6-bit boost converter prog. buck, isolation switch, reset signal and sequencing	40WQFN
TPS65176	LCD bias IC for TV	LCD Bias	9.5 V to 14 V input range, 18.5 V boost with 3.5 A switch current, 2.5 A buck, soft start, UVLO, OVP	28VQFN
TPS65177	8-ch level-shifter supporting different charge-sharing methods and panel discharge	Level Shifter	Gate pulse modulation, temperature compensation for VGH, I ² C compatible Interface, 8.6 V to 14.7 V input	
TPS65178	Fully programmable LCD bias IC for TV with 6-ch gamma buffer, Vcom reference and dynamic gain	Prog. LCD Bias	8.6 V to 14.7 V V _{IN} , 6-bit boost converter buck conv., 6-ch gamma buffers, 9-bit Vcom ref, 2-bit Vcom gain, prog. sequencing delays	48VQFN
TPS65170	4-ch LCD bias with regulators for external charge pump	LCD Bias Supply	8.6 V to 14.7 V V _{IN} , boost up to 18.5 V, 2.8 A boost, 1.5 A buck switch current limit	28VQFN
TPS65192	9-ch level shifter for LCD displays with GPM	Level Shifter	V _{High} levels to 38 V, V _{Low} levels to -13 V panel discharge fn, gate voltage shaping	28VQFN
TPS65193	5-ch level shifter for LCD displays (dual channel scan driver)	Level Shifter	V _{High} levels to 35 V, V _{Low} levels to -28 V logic level inputs, dual HV scan driver	24VQFN
TPS65194	13-ch level shifter for LCD TVs and monitors	Level Shifter	V _{st} and reset outputs, odd and even outputs panel discharge output, abnormal op detection	24VQFN
TPS65196	15-ch level shifter for large size TVs	Level Shifter	8 CLK outputs, panel discharge output, soft start, supports all display resolutions and forward/reverse operation	28VQFN
TPS65197	8-ch level-shifter supporting different charge-sharing methods and panel discharge	Level Shifter	Supports 6 x CLK, STV, RESET selectable charge sharing, 2-ch panel discharge	28WQFN
TPS65198	13-ch level shifter with op-amp for LCD TVs and monitors	Level Shifter	6 CLK outputs, panel discharge output, supports all display resolution, high-speed op amp	28WQFN

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Device	Description	Function	Features	Package(s)
LED Backlighting				
TPS61199	White LED driver for LCD monitors backlighting	White LED Driver	8 V to 30 V input voltage, drives 8 parallel LED strings high power boost with adaptive output, max 70 mA/string 5000:1 PWM dimming ratio at 200 kHz	20HTSSOP
TLC5960	8-ch LED driver controller with integrated intelligent thermal controller	LED Driver	8-ch, 250 kHz PWM dimming, integrated 5 V reg. and POR, LED protection	38TSSOP
Supervisors				
TLV803/09/10/63, LM809	3-pin voltage supervisor	Supervisor	200 ms of fixed delay	3 Pin SOT-23, LLP-6
TPS3895/6/7/8, LM3704	Ultra-small package	Supervisor	Enable, cap adj. delay time, threshold down to 0.5 V	µSON, Micro SMD-9, MSOP-10
TPS3103, LM8365	Ultra-low Iq	Supervisor	Iq 1.2 µA, 130 ms delay time, 0.75% accuracy	6 SOT-23
TPS3700, LM3704/10/24	High-voltage, OV, UV, supervisor	Supervisor	Supply up to 18 V, 1% accuracy, OV/UV detection	6 SOT-23, Micro SMD-9/mini SOIC/SOT23-5
TPS3839	Ultra-low-power 3-pin supervisor	Supervisor	250 nA Iq, 200 ms delay	µSON, 3 SOT-23
DDR Memory Power Solutions				
TPS51916	DDR2, DDR3, DDR3L memory power solution	PWM+LDO	Sync buck controller, 2-A LDO, buffered ref. termination reg. output of 0.5 to 0.9 V, 2 A sink/source buffered ref. 10 mA sink/source, 1% accuracy	20QFN
TPS51206	2 A peak sink/source DDR termination regulator with buffered reference for DDR2, DDR3, DDR3L	LDO	Termination reg. output of 0.5 to 0.9 V, 2 A sink/source buffered ref. 10 mA sink/source, 1% accuracy	10SON
TPS51100	3 A source/sink DDR terminator regulator	LDO	2.5 to 7 V _{IN} , 50 kHz to 1 MHz operating freq, UVLO internal precision ref. 1.25 V ± 1%, totem-pole ref.	16TSSOP
TPS51200	Sink/source DDR/DDR2/DDR3 termination regulator	LDO	Enable, PG, soft start, UVLO, OCL, 10 mA buffered ref	10SON
LP2997/8	DDR/DDR2 termination regulator	LDO	2.5 to 5.5 V _{IN} , up to 1.5 A output current sink/source current, low offset voltage, no ext. R required	8SOIC

¹D-CAP2: No compensation, fast transient response.

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