



## Power Management Selector Guide

Semtech offers feature rich, highly integrated power management solutions aimed at reducing system cost and providing design flexibility to meet applications requirements.

Semtech's latest power management portfolio consists of robust, highly efficient, integrated solutions in small form factors designed to conserve PCB area and streamline end-equipment manufacturing.

The wide breadth of product offering features: switching/linear regulators & controllers, LED drivers, and battery chargers designed to provide an overall system solution.

### Semtech Power Management provides

- High Power Density
- Highly integrated solutions in small form factor
- High reliability
- Low system cost

by utilizing industry leading BCD process and strong technical support to address the needs of the following markets:

### Portable devices

- Smallest and thinnest in industry: 1.5 x 1.5 x 0.6mm
- Simplified design using VID and serial control
- Low quiescent current and Powersave for increased battery life

### Displays

- Solutions to support 1 to 6 LED string configurations
- Parts supporting screen sizes: 2" to 20"
- Best current matching accuracy: 1-3%
- Best efficiency at maximum load: >90%

### Integrated Access Devices/Telecom

- Simple Robust Solutions
- High Voltage Integration
- High Power Density
- Power Good & Soft-start
- Serial and Digital Control

### Applications:

#### Portable/Personal Electronics

- Cellular Phones
- PDAs / Smart Phones
- GPS / Navigation
- Portable Instruments
- Medical Electronics

#### Broadband Communications

- VoIP
- WLAN
- xDSL Modems
- IP Telephony
- Cable Modems
- Set Top Boxes

#### Displays

- Backlight
- LCD Panels
- Car Navigation
- Office Automation

#### Computing

- Servers
- Desktops
- Notebooks & Netbooks
- UMPCs
- Industrial PCs & COMs

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## Multiple Output Non-Synchronous Regulators

Part Number	VIN (V)		# of outputs	Vout (V)		Iout Max (A)	Isw Min (A)	Shutdown current (µA)	fsw (kHz)	Package	Features
	Min	Max		Min	Max						
SC2440	2.78	20	2	1	0.8* Vin	1.7/1.7	2.0/2.0	<60	250-2500	TSSOP-16 EDP	Independent shutdown, Soft-start and Power Good, external synchronization
SC2620	2.8	30	2	1	0.9* Vin	2/2	2.3/2.3	<60	100-1400	SO-16 EDP	Independent Soft-start and Power Good, low output ripple, external synchronization

## Multiple Output Synchronous Regulators

Part Number	VIN (V)		# of outputs	Vout (V)		Iout Max (A)	Isw Min (A)	Shutdown current (µA)	Quiescent current (µA)	fsw (kHz)	Package	Features
	Min	Max		Min	Max							
SC198	2.7	5.5	2	1.0/1.0	1.875/1.875	0.6/0.6	0.9/0.9	<1	50	1000	MLPQ-20, 4x4mm	8 programmable output voltage pairs Powersave, MODE/SYNC function
SC198A	2.7	5.5	2	1.0/1.8	1.8/3.3	0.8/0.8	1.2/1.2	<1	50	1000	MLPQ-20, 4x4mm	

## Single Output Synchronous Regulators

Part Number	VIN (V)		Vout (V)		Iout Max (A)	Isw Min (A)	Shutdown current (µA)	Quiescent current (µA)	fsw (kHz)	Package	Features
	Min	Max	Min	Max							
SC183C	2.9	5.5	0.8	3.3	2	2.5	1	10,000	2500	MLPQ-UT16	Ultrafast transient response & Dynamic Voltage Scaling
SC189	2.9	5.5	1.5	Vin	1.5	<2.5	<1	7500	2500	SOT23-5, MLPD-6 2X2mm	Overvoltage protection, Pre-bias output, 5mV output ripple
SC190	2.7	5.5	1	2.8	0.3	0.5	<1	10	1000	MLPD-10, 3x3mm	Very low input ripple: <1mV, 2 VID programmable output voltages
SC191	2.7	5.5	1.2	1.2	0.33	0.55	<1	2500	1000	MLPD-8, 2.3x2.3mm	Very low noise, <1mV input ripple no external compensation required, LDO Mode
SC192	2.7	7	0.75	Vin	0.7	>1A	<1	35	750	MLPD-10, 3x3mm	Powersave, adjustable current limit, external synchronization
SC194A/B	2.7	5.5	1	3.6	1	1.33	<1	17	1000	MLPD-10, 3x3mm	Fixed frequency or 750kHz to 1.25MHz synchronized operation, VID programmable output, Powersave
SC196A	2.7	5.5	1.0	1.8	1.5	1.9	<1	17	1000	MLPD-10, 3x3mm	Fixed frequency or 750kHz to 1.25MHz synchronized operation, Powersave, 4 VID programmable output
SC196	2.5	5.5	0.8	Vin	1.5	1.96	<1	17	1000	MLPD-UT10, 3x3x0.6mm	Fixed frequency or 750kHz to 1.25MHz synchronized operation
SC414	3.0	28	0.75	Vin	6	ADJ	<27	See datasheet	Up to 1000	MLPQ-28, 4x4mm	Integrated LDO with crossover circuitry, SmartDrive™, Ultrasonic power save
SC417	3.0	28	0.5	Vin	10	ADJ	<27	See datasheet	200-1000	MLPQ-32, 5x5mm	Integrated LDO with crossover circuitry, SmartDrive™, Ultrasonic power save
SC424	3.0	28	0.75	Vin	6	ADJ	<27	See SC414 datasheet	Up to 1000	MLPQ-28, 4x4mm	Integrated LDO with crossover circuitry, SmartDrive™, regular power save
SC427	3.0	28	0.5	Vin	10	ADJ	<27	See SC417 datasheet	200-1000	MLPQ-32, 5x5mm	Integrated LDO with crossover circuitry, SmartDrive™, regular power save
SC4624	2.3	5.5	0.5	Vin	4	<1.9	<1	10000	200-2000	SO-16 EDP, MLPQ-20, 4x4mm	Programmable Soft-start and current limit, Power Good, external synchronization
SC4620	2.3	5.5	0.5	Vin	2.5	<1.9	<1	10000	200-2000	SO-16 EDP, MLPQ-20, 4x4mm	Programmable Soft-start and current limit, Power Good, external synchronization
SC4626	2.9	5.5	1.0	Vin	1.0	<1.8	<1	10000	2500	SOT23-5	Overvoltage protection, Pre-bias output, 5mV output ripple

## Single Output Non-Synchronous Regulators

Part Number	VIN (V)		Vout (V)		Iout Max (A)	Isw Min (A)	Shutdown current (µA)	fsw (kHz)	Package	Features
	Min	Max	Min	Max						
SC4519(H)	3	16	1.2	0.85* Vin	2.7	3.0	<45	600	SO-8 EDP	External synchronization: 750kHz to 1.2MHz, independent synch and enable pins
		24			3.0	3.5				
SC4520	4.4	24	0.8	0.85* Vin	2.7	3.0	250	100-600	SO-8 EDP	Adjustable frequency, independent enable pin
SC4521	4.4	24	0.8	0.85* Vin	3.0	3.5	250	600	SO-8 EDP	Programmable Soft-start
SC4524A	3.0	28	1	0.8* Vin	2.0	2.6	40	200 to 2000	SO-8 EDP	Programmable Soft-start, Frequency Foldback
SC4524B	3.0	16	1	0.8* Vin	2.0	2.6	40	200 to 2000	SO-8 EDP	Programmable Soft-start, Frequency Foldback
SC4525A	3.0	28	1	0.8* Vin	3.0	3.9	40	200 to 2000	SO-8 EDP	Programmable Soft-start, Frequency Foldback
SC4525B	3.0	16	1	0.8* Vin	3.0	3.9	40	350	SO-8 EDP	Programmable Soft-start, Frequency Foldback

# Step-down Switching Regulators / Controllers

## Multiple Output Controllers

\*Values dependent upon type of MOSFET used

Part Number	VIN (V)		# of outputs	Vout (V)		Iout <sup>A</sup> Max (A)	Gate drive current (A)	On-time Min (ns)	fsw (kHz)	Control method	Package	Features
	Min	Max		Min	Max							
SC2441A	1.8	20	3	0.5	0.88* Vin	20/20/0.6	2	18	Up to 1000	Current	TSSOP-28 EDP	2 buck controllers + 1 boost regulator, pre-bias startup, external synchronization, 2 phase-1 output
SC2442(H)	4.75	30/36	2	0.75	0.85* Vin	10/10	0.5	-	Up to 500	Voltage	TSSOP-24	External synchronization, 7V AVCC/PVCC controller
SC2443	4.7	16	2	0.5	0.88*Vin	20/20	1.5	150	500	Current	MLPQ-24, 4x4mm	External synchronization, Programmable Soft-start, inductor current sensing, two phase or a single phase shared current
SC2446	4.7	16	2	0.5	0.88* Vin	20/20	1.5	150	Up to 1000	Current	TSSOP-28 EDP	Separate Soft-start and Enable, sink/source available for DDR, external synchronization
SC2447	4.65	15	2	0.5	0.88* Vin	-	NA	-	Up to 1000	Current	TSSOP-28	Optimized for DrMOS, pre-bias startup, external synchronization, tri-state PWM, able to sink/source current
SC2545	4.5	28	2	0.75	0.9* Vin	10/10	0.5	-	100-300	Voltage	TSSOP-24, MLPQ-24, 4x4mm	Sequential & coincidental start-up tracking, Power Good
SC2672	3.0	15	2	0.9	0.9* Vin	20/20	1.7	-	300	Voltage	SO-16	Simple dual channel controller, Power Good, Soft-start, 180° out-of-phase
SC2677B	3.0	15	2	0.5	0.86* Vin	20/20	1.7	300	300-1000	Voltage	TSSOP-24, TSSOP-24 EDP	Single output, dual phase with current sharing from two inputs or dual output, Power Good, Soft-start, adjustable phase shift
SC415	3	25	2	0.75	5.25	25/25	3.1	50	Up to 600/720	Constant on-time	MLPQ-24, 4x4mm	SmartDrive™, Powersave, Soft-start, Power Goods
SC416	3	25	2	0.75	5.25	25/25	3.1	50	Up to 600/720	Constant on-time	MLPQ-24, 4x4mm	Startup/Shutdown tracking, Powersave, SmartDrive™, Soft start, Power Good

## Single Output Controllers

\*Values dependent upon type of MOSFET used

Part Number	VIN (V)		Vout (V)		Iout <sup>A</sup> Max (A)	Gate drive current (A)	Synch or Non-Synch	fsw (kHz)	Control method	Package	Features
	Min	Max	Min	Max							
SC2602L	4.2	12.6	0.8	0.9* Vin	20	1	Synch	200	Voltage	SO-14	Power Good, Enable, Soft-start
SC2608A	4.5	14	0.8	0.85* Vin	15	0.6	Synch	250	Voltage	SO-8	Integrated boot strap diode, Rds(on) current sensing
SC2618	4.75	14	1.25	12.6	6	0.5	Synch	Up to 500	Hysteretic	SOT-23-6	Internal 100µs Soft-start
SC418	3	28	0.5	5.5	30	4	Synch	Up to 1000	Constant on-time	MLPQ-20, 3x3mm	On-board programmable LDO, Ultrasonic & regular power save, SmartDrive™
SC419	3	28	0.5	5.5	30	4	Synch	Up to 1000	Constant on-time	MLPQ-20, 3x3mm	Ultrasonic & regular power save, SmartDrive™
SC4508A	2.7	15	0.5	0.97* Vin	15	0.875	Non-Synch	Up to 1500	Current	MLPQ-12, 4x4mm	Buck & buck/boost (inverting configuration)
SC4510	4.75	16	0.5	0.75* Vin	25	1	Synch	100-1000	Current	TSSOP-20	Source & Sink Current, reference tracking, external synchronization, Power Good
SC4603	2.25	5.5	0.5	Vin	20	1	Synch	Up to 1000	Voltage	MSOP-10	Drive PMOS and NMOS, 100% duty ratio, external synchronization
SC4612	4.5	28	0.5	0.82* Vin	40	1.7	Synch	1200	Voltage	SO-14, MLPD-12, 4x3mm	Programmable current limit, non-synchronous start-up
SC4612H	4.5	40	0.5	0.82* Vin	40	1.7	Synch	Up to 1200	Voltage	SO-14, MLPD-12, 4x3mm	Programmable current limit, synchronous start-up, programmable soft start, programmable frequency
SC4614	4	25	0.5	0.97* Vin	20	1.5	Synch	500	Voltage	MSOP-10	Internal gate-drive LDO, adaptive shoot-through protection, Hiccup mode current limit
SC471/A	3	25	0.75	5.25	20	3.1	Synch	325	Constant on-time	MLPQ-16, 3x3mm	SmartDrive™, Powersave, voltage margining

## Step-down Switching Regulators / Controllers

### DDR Regulators/Controllers (Switching & LDO)

Part Number	V <sub>CC</sub> (V)		V <sub>DDQ</sub> (V)	I <sub>VDDQ</sub> (A) Max	V <sub>TT</sub> type	V <sub>TT</sub> (V)	I <sub>VTT</sub> (A) Max	f <sub>sw</sub> (kHz)	Peak gate drive current (A)	DDR type	Synch or Non-Synch	Integrated driver	Package	Features
	Min	Max												
<b>SC1116</b>	3	15	N/A	N/A	LDO	0.25-1.25	±4	N/A	-	1,2,3	N/A	Yes	SOT-23 6L	Simple DDR VTT LDO controller
<b>SC2446</b>	4.7	16	1	20	Switcher	0.5	20	Up to 1000	1.5	1,2,3	Synch	Yes	TSSOP-28	Individual Soft-start and Enable, Sink/source available for DDR
<b>SC2447</b>	4.65	15	N/A	N/A	Switcher	0.5	60	Up to 1000	-	1,2,3	Synch	Yes	TSSOP-28	Dual 30A or 2-phase 60A output, optimized for Phillips or Renesas DrMOS
<b>SC2595</b>	2.3	5.5	N/A	N/A	LDO	1.25	±1.5	N/A	-	1	N/A	N/A	SO-8 EDP	Integrated DDR VTT LDO with on-board buffered reference, remote sense
<b>SC2596</b>	2.3	5.5	N/A	N/A	LDO	0.9 - 1.25	±2.5	N/A	-	1,2	N/A	N/A	SO-8 EDP	Integrated DDR VTT LDO with on-board buffered reference, remote sense
<b>SC4510</b>	4.75	16	0.6-6	15	Switcher	0.3-3.0	15	100-1000	1	1,2,3	Synch	Yes	TSSOP-20	Power Good
<b>SC486</b>	2.5	25	1.5-3.0	20	LDO	0.75-1.5	±3	Up to 600	3.1	1,2,3	Synch	Yes	MLPQ-24 4x4mm	SmartDrive™, Integrated LDO regulator for VTT, buffered reference, remote sense for VTT

## CPU & GPU Controllers

### Processor Power

Part Number	V <sub>IN</sub> (V)		V <sub>OUT</sub> (V)		I <sub>OUT</sub> (A) *	f <sub>sw</sub> (kHz)	Platform	Integrated driver	Package	Features
	Min	Max	Min	Max						
<b>SC450</b>	3	25	0.7	1.708	55	200-500	Intel	Yes	TSSOP-38	SmartDrive™, Dual Phase, IMVP 4/4+
<b>SC451</b>	3	25	0.7	1.708	30	200-500	Intel	Yes	TSSOP-38, TSSOP-28	SmartDrive™, Single Phase, IMVP 4/4+
<b>SC452</b>	4.5	24	0.3	1.5	55	200-500	Intel	Yes	MLPQ-44, 7x7mm	SmartDrive™, Dual Phase, IMVP 6/6+
<b>SC453</b>	3	25	0.7	1.708	30	200-500	VIA C7	Yes	TSSOP-28, MLPQ-32, 5x5mm	SmartDrive™, Single Phase, 6 bit DAC
<b>SC454</b>	3	24	0.3	1.5	30	200-500	Intel	Yes	MLPQ-32, 5x5mm	SmartDrive™, Single Phase, IMVP 6/6+
<b>SC457</b>	3	24	0.3	1.5	30	200-500	Freescale	Yes	MLPQ-32, 5x5mm	SmartDrive™, Single Phase, 7 bit DAC
<b>SC458</b>	4.5	24	0.3	1.5	55	200-500	Freescale	Yes	MLPQ-44, 7x7mm	SmartDrive™, Dual Phase, 7 bit DAC

\* Recommended values based on typical inductors and FETs

### Graphics Processor Power

Part Number	V <sub>IN</sub> (V)		V <sub>OUT</sub> (V)		I <sub>OUT</sub> (A)	f <sub>sw</sub> (kHz)	# of VIDs	Intended chipset	Integrated driver	Package	Features
	Min	Max	Min	Max							
<b>SC471(A)</b>	3	24	0.75	5.25	20	325	2	Intel, Nvidia	Yes	MLPQ-16, 3x3mm	SmartDrive™, Powersave
<b>SC472B</b>	3	24	0.412	1.2875	30	200-500	5	Intel	Yes	MLPQ-24, 4x4mm	SmartDrive™, IMVP 6/6+
<b>SC473</b>	3	24	0.375	1.15	30	200-500	5	ATI	Yes	MLPQ-24, 4x4mm	SmartDrive™, Powersave
<b>SC475A</b>	3	24	0.75	5.25	25	325	1	ATI	Yes	MLPQ-16, 3x3mm	SmartDrive™, Powersave

## Step-up Switching Regulators / Controllers

### Single Output Step-up Controllers

Part Number	VIN (V)		VOUT (V)		IOUT (A)	Gate drive current (A)	Shutdown current (µA)	Quiescent current (mA)	fsw (kHz)	Package	Features
	Min	Max	Min	Max	Max						
<b>SC2603</b>	4.5	16	4.5	* (1)	* (2)	0.8	5	8	200	SOT23-6	Internal compensation, over-current protection
<b>SC2604</b>	4.5	13.5	4.5	* (1)	* (2)	0.8	200	9	400	MSOP-8	Input disconnect FET drive, internal compensation, programmable current limit and soft-start

\* (1) = External FET Voltage \* (2) IOUT is function of VIN, VO, Fsw, and inductor value

### Single Output Step-up Regulators

Part Number	VIN (V)		VOUT (V)		IOUT (A)	Isw (A)	Shutdown current (µA)	Quiescent current (mA)	fsw (kHz)	Package	Features
	Min	Max	Min	Max	Max	Min					
<b>SC4501</b>	1.4	16	1.4	30	*	2	<18	1.6	Up to 2000	MSOP-8 EDP MLPD-10, 3x3mm	Adjustable frequency and UVLO, programmable Soft-start, SEPIC configuration
<b>SC4502</b> <b>SC4502H</b>	1.4	16	1.4	32 40	*	1.4	10	1.1	Up to 2000	MLPD-10, 3x3mm	Adjustable frequency, programmable Soft-start, SEPIC configuration
<b>SC4503</b>	2.5	20	3	25	*	1.4	<1	1.1	Up to 1300	TSOT-23	Programmable Soft-start, can be used in SEPIC configuration

\* IOUT is function of VIN, VO, FS and inductor values.

## Inverting Buck / Boost Controller

Part Number	VIN (V)		VOUT (V)		IOUT (A)	Gate drive RDSon (Ω)	Shutdown current (µA)	Quiescent current (mA)	fsw (kHz)	Package	Features
	Min	Max	Min	Max	Max						
<b>SC4508A</b>	2.7	15	-0.5	* (1)	* (2)	8	<500	3	100-1500	MLPQ, 4x4mm	Current mode control, can be used buck or inverting buck/boost configuration

\* (1) = External FET Voltage \* (2) IOUT is function of VIN, VO, Fsw, and inductor value

## Combo Regulators / Controllers

Part Number	Topologies	VIN (V)		Buck VOUT (V)		IOUT Max (A)	Package	Features
		Min	Max	Min	Max			
<b>SC1109</b>	1 buck controller + 2 LDO controllers	4.4	5.25	1.2	0.9* VIN	10/4/4	SO-16	200/500kHz for buck, Power Good, programmable current limit, soft-start
<b>SC2441A</b>	2 buck controllers + 1 boost regulator	1.8	20	0.5	0.88* VIN	20/20/0.6	TSSOP-28	Up to 1MHz Frequency, Pre-bias startup, external synchronization, 2 phase-1 output
<b>SC2463</b>	2 buck controllers + 2 LDO controllers	4.5	30	0.5	0.8* VIN	20/20/2/2	TSSOP-28	Up to 1MHz frequency, auto startup sequence
<b>SC2621A</b>	1 buck controller + 1 LDO controller	4	25	0.5	0.97* VIN	20/2	SO-14	1.5A gate drive for buck controller, hiccup short circuit protection

## LDOs

### Single Output LDOs

Part Number	VIN (V)		VOUT (V)		IOUT (A) Max	VDROPOUT (V) Max	Enable Pin (Y/N)	Pgood? (Y/N)	Package	Features
	Min	Max	Min	Max						
<b>EZ1580</b> <b>EZ1581</b> <b>EZ1582</b> <b>EZ1583</b>	2.05*	7.0	1.25	6.2	7 5 3 1.5	0.8 0.6 0.6 0.6	N	N	TO-263-5, TO-220-5	Separate control and power inputs for lower dropout, remote output sense
<b>SC1202</b>	2.65	7	1.25	5.7	0.6	1.3	N	N	SOT-223	±2% output voltage regulation over line, load and temperature
<b>SC1563</b>	2.2	6.5	1.2	4.8	0.5	0.7	Y	N	SOT-23-5	Fixed and adjustable versions, works with ceramic capacitors
<b>SC1565</b>	2.2	5.5	1.2	4.8	1.5	0.6	Y	N	TO-263-5, SO-8, SOT-223, TO-263-3	Works with ceramic capacitors, 10µA quiescent current in shutdown, fixed and adjustable versions
<b>SC1566</b>	2.2	5.5	1.2	4.8	3	0.45	Y	N	TO-220-5, TO-263-3, TO-220-3, TO-263-5	Works with ceramic capacitors, 350mV <sub>VDROPOUT</sub> typical @ 3A, 10µA quiescent current in shutdown, fixed and adjustable versions
<b>SC1592</b>	1.25*	16	0.8	V <sub>IN</sub> -V <sub>VDROPOUT</sub>	3	0.52	Y	N	TO-263-7, SO-8 EDP	Separate control and power inputs for lower dropout, programmable current limit & independent enable pin
<b>SC4205</b>	2.2	5.5	1.2	4.8	1	0.4	Y	N	SO-8 EDP	10µA quiescent current in shutdown, over-current and over-temperature protection
<b>SC4211</b>	1.4	5.5	0.5	V <sub>IN</sub> -V <sub>VDROPOUT</sub>	1	0.4	Y	N	SO-8 EDP	Simple LDO, adjustable output, low Vin ≅ 1.4V
<b>SC4215A</b>	1.4	6.0	0.5	V <sub>IN</sub> -V <sub>VDROPOUT</sub>	2	0.4	Y	N	SO-8 EDP	Simple LDO, adjustable output, low Vin ≅ 1.4V
<b>SC4215H</b>	1.4	5.5	0.5	3.3	2	0.5	Y	N	SOIC-8EDP	Very low input / very low dropout 2 Amp regulator with Enable
<b>SC4216</b>	1.45	5.5	0.5	V <sub>IN</sub> -V <sub>VDROPOUT</sub>	3	0.55	Y	N	SO-8 EDP	Simple LDO, adjustable output, low Vin ≅ 1.4V
<b>SC4216H</b>	1.45	5.5	0.5	5	3	0.6	Y	N	SOIC-8EDP	Very low input / very low dropout 3 Amp regulator with Enable
<b>SC553</b>	2.25	6.5	1.25	6	0.15	0.23	Y	N	SOT-23-5	2% output accuracy guaranteed over line, load and temperature, 75µA typical supply current over line and load, industry standard pinout

\* Control voltage also required. See datasheet.

### Multiple Output LDOs

Part Number	VIN (V)		VOUT (V)		IOUT (mA)	VDROPOUT (mV)	Pgood? (Y/N)	Iq (µA)	Enable pin (Y/N)	# of LDOs	Noise (µVRMS)	PSRR (dB)	Serial interface	Package	Features
	Min	Max	Min	Max											
<b>SC560</b>	2.5	5.5	1.2	3.3	300*	100	Y	100	Y	2	50	65	No	MLPQ-UT8 1.5x1.5x0.6mm	Power Good / dual enable / low noise Features available by option
<b>SC561</b>	2.5	5.5	2.85	3.1	300*	100	Y	40	Y	2	50	65	No	MLPQ-UT8 1.5x1.5x0.6mm	Power Good / Standby Mode / low noise
<b>SC1458</b>	2.5	5.5	1.8	2.85	300*	100	Y	100	Y	2	50	65	No	MLPD-W6, 3x3mm	Power Good / low noise

\* Per output \*\* All regulators active

## LDO Controllers

Part Number	VIN (V)		VOUT (V)		# Channels	VDROPOUT (V)	Enable pin (Y/N)	Pgood? (Y/N)	Package	Features
	Min	Max	Min	Max						
<b>SC338(A)</b>	4.5*	13.2	0.5	3.3	2	user selectable	Y	Y	MSOP-10	Reference: +/-2.5% for SC338, +/-1.5% for SC338A, soft-start, separate enable and power good pins for each output
<b>SC339</b>	4.5*	5.5	0.5	3.3	1	user selectable	Y	Y	SOT-23-6	Reference: +/-1%, low quiescent current, soft-start

\*Applies to IC - input to MOSEFET(s) is user selectable

# LED Drivers

## Inductor Based

Part Number	VIN (V)		Vout (V)	fsw (MHz)	Max # LED's	# LED Strings	# LED's per String Max (Vf=3.5V)	Current Per LED String Max (mA)	Total current Max (mA)	Dimming Max. (Freq.)	Package	Features
	Min	Max	Max									
SC104	1.55	10	38	Various	10	1	10	-	-	Analog/PWM	MLP-8 3x3x1.0mm	Up to 10 white LEDs in series
SC440A	4.5	21	42	0.8	72	6	12	30	180	PWM Up to 50KHz	MLPQ-24 4x4x1.0mm	Integrated high voltage boost with a wide input range. Open/Short LED string disable. OCP, OTP, OVP & FFLAG
SC441	4.5	21	36	0.8	40	4	10	150	600	PWM Up to 50KHz	TSSOP-20 EDP	Integrated high voltage boost with a wide input range for High Brightness LEDs. Open/Short LED string disable. OCP, OTP, OVP & FFLAG.
SC443	4.5	27	42	0.2 - 1.2	36	3	12	30	90	PWM Up to 50KHz	MLPQ-UT-16 3x3x0.6mm	Integrated high voltage boost with a wide input range and adjustable frequency. Open/Short LED string disable. OCP, OTP & OVP.
SC4505	2.6	12	28	1	12	2	6	Backlight= 75, Flash= 125	200	PWM Up to 50KHz	MLPQ-16 3x3x1.0mm	Dual channel: WLED & Torch/Flash with independent channel current setting. OCP, OTP & OVP.
SC4509	2.7	10	20	1.2	5	1	5	30	30	PWM Up to 10KHz	SOT23-6, MLPD-W8 2x2x0.8mm	Tiny solution size with integrated Schottky. Ballast resistor sets LED current. OCP, OTP & OVP.
SC4538	2.8	5.5	38	0.8	10	1	10	30	30	PWM Up to 50KHz	MLPD-UT-8 2x2x0.6mm	Excellent dimming range, high dimming linearity. OCP, OTP & OVP.
SC4539	2.8	5.5	22	0.8	6	1	6	30	30	PWM Up to 50KHz	MLPD-UT-8 2x2x0.6mm	Excellent dimming range, high dimming linearity. OCP, OTP & OVP.
SC4540	4.5	12	38	0.8	10	1	10	30	30	PWM Up to 50KHz	MLPD-UT-8 2x2x0.6mm	Excellent dimming range, high dimming linearity. OCP, OTP & OVP.

## Charge Pump Based

Part Number	VIN (V)		Vout (V)	fsw (kHz)	Iout (mA)	Mode	Backlight sink current (mA)	Flash Sink current (mA)	Spotlight to flash ratio (%)	Flash safety timer	Control interface	Dimming	Package	Features
	Min	Max	Max											
SC600	2.5	6.5	4, 4.5, 5	8, 32, 262, 650	60, 120	Fractional	-	-	N/A	-	None	PWM	MSOP-10, MLPD-10 3x3mm	Low noise
SC603	2.5	6.5	4.5, 5	262, 650	160, 200	Doubler	-	-	N/A	-	None	PWM	MLPD-10 3x3mm	High current
SC613					100, 400									
SC606	2.85	5.5	-	250, 1330	120	Fractional	32	-	N/A	-	I <sup>2</sup> C	Register	MLPQ-16 4x4mm	6 backlight sinks, low noise, tight accuracy and matching, high efficiency
SC605	3	5.25	-	250	700	Doubler	-	-	20, 30, 40	N/A	None	-	MLPD-10 3x3mm	Individual spotlight and flash control pins
SC615(A)					700(A)				20 (40)					
SC635					200				40					
SC618	3	5.25	-	250	700	Single, Doubler	-	-	40	Yes	None	-	MLPD-10 3x3x0.6mm	1x mode, flash safety timer, individual spotlight and flash control pins
SC619									20					
SC621(A)	3	5.5	-	250	500	Fractional	25	400	Programmable	Yes	SemWire™, I <sup>2</sup> C (A)	Register	MLPQ-UT-20 3x3x0.6mm	Two 100mA low noise LDOs, four 25mA backlight sinks, one 400mA flash sink with dedicated enable
SC622(A)	3	5.5	-	250	400	Fractional	N/A	400	Programmable	Yes	SemWire™, I <sup>2</sup> C (A)	Register	MLPQ-UT-20 3x3x0.6mm	Two 100mA low noise LDOs, one 400mA flash sink with dedicated enable

(Continued on next page)

## LED Drivers

### Charge Pump Based (Continued from pg 8)

Part Number	VIN (V)		VOUT (V)	fsw (kHz)	IOUT (mA)	Mode	Backlight sink current (mA)	Flash Sink current (mA)	Spotlight to flash ratio (%)	Flash safety timer	Control interface	Dimming	Package	Features
	Min	Max					Max	Max						
<b>SC623(A)</b>	3	5.5	-	250	500	Fractional	4 x 25	400	Programmable	Yes	SemWire™, I <sup>2</sup> C (A)	Register	MLPQ-UT-20 3x3x0.6mm	Four 25mA backlight sinks, one 400mA flash sink with dedicated enable
<b>SC624(A)</b>	3	5.5	-	250	100	Fractional	4 x 25	N/A	N/A	N/A	SemWire™, I <sup>2</sup> C (A)	Register	MLPQ-UT-20 3x3x0.6mm	Two 100mA low noise LDOs, four 25mA backlight sinks
<b>SC627(A)</b>	3	5.5	-	250	800	Fractional	4 x 25	700	Programmable	Yes	SemWire™, I <sup>2</sup> C (A)	Register	MLPQ-UT-20 3x3x0.6mm	Two 100mA low noise LDOs, four 25mA backlight sinks, one 700mA flash sink with dedicated enable
<b>SC643</b>	2.9	5.5	-	250	125	1x,1.5x,2x	5 x 25	N/A	N/A	N/A	SemPulse™	Register	MLPQ-UT-20 3x3x0.6mm	4 programmable LDOs, ±0.5% matching, ±1.5% accuracy, 5 current sinks, fade-in/fade-out, programmable for main and sub displays
<b>SC644</b>	2.9	5.5	-	250	150	1x,1.5x,2x	6 x 25	N/A	N/A	N/A	SemPulse™	Register	MLPQ-UT-20 3x3x0.6mm	4 programmable LDOs, ±0.5% matching, ±1.5% accuracy, 6 current sinks, fade-in/fade-out, programmable for main and sub displays
<b>SC652</b>	2.9	5.5	-	250	125	1x,1.5x,2x	5 x 25	N/A	N/A	N/A	PWM	-	MLPQ-UT-14 2x2x0.6mm	±0.5% matching, ±1.5% accuracy, 5 current sinks, 200Hz to 50KHz PWM Frequency
<b>SC653</b>	2.9	5.5	-	250	100	1x,1.5x,2x	4 x 25	N/A	N/A	N/A	SemPulse™	-	MLPQ-UT-18 2.3x2.3x0.6mm	2 programmable LDOs, ±0.5% matching, ±1.5% accuracy, 4 current sinks
<b>SC654</b>	2.9	5.5	-	250	150	1x,1.5x,2x	6 x 25	N/A	N/A	N/A	SemPulse™	-	MLPQ-UT-14 2x2x0.6mm	6 current sinks, ±0.5% matching, ±1.5% accuracy, 3 LED grouping, fade-in/fade-out
<b>SC657</b>	2.9	5.5	-	250	125	1x,1.5x,2x	5 x 25	N/A	N/A	N/A	SemPulse™	-	MLPQ-UT-14 2x2x0.6mm	5 current sinks, ±0.5% matching, ±1.5% accuracy, fade-in/fade-out, LED float detection
<b>SC658</b>	2.9	5.5	-	250	100	1x,1.5x,2x	4 x 25	N/A	N/A	N/A	SemPulse™	-	MLPQ-UT-14 2x2x0.6mm	4 current sinks, ±0.5% matching, ±1.5% accuracy, fade-in/fade-out, LED float detection

## LED Drivers / Sinks

### LED Current Sinks

Part Number	VIN (V)		Sink dropout voltage (mV)	Sink current range (mA)	Sink quantity	Control interface	Dimming	Package	Features
	Min	Max							
<b>SC620</b>	2.7	5.5	150 max	31.25µA - 25mA	8	I <sup>2</sup> C Interface	Register	MLPQ-UT-16 3x3x0.6mm	Output expansion capability, individually controllable current sinks

## Charge Pump Regulators

Part Number	Vin (V)		Vout (V)	Iout (mA)	fsw (kHz)	Mode	Package	Features
	Min	Max		Max				
SC1462	1.65	5.5	2 x Vin	80	160	Doubler	SOT-23-6	94% efficiency @ 3.6V Vin, integrated protection diode
SC600	2.5	6.5	4, 4.5, 5	60, 120	8, 32, 262, 650	Fractional	MSOP-10, MLPD-10, 3x3mm	Very low noise, regulated output
SC603	2.5	6.5	4.5, 5	160, 200	262, 650	Doubler	MLPD-10, 3x3mm	Minimal BOM
SC613				100, 140				
SC630	2.9	5.5	3.3	400	200	1x,1.5x,2x	MLPD-UT-8, 2x2mm	Buck-Boost <20mV Vripple, Soft Start
SC631	2.9	5.5	4.4	250	200	1x,1.5x,2x	MLPD-UT-8, 2x2mm	Buck-Boost <30mV Vripple, Soft Start
SC632	2.9	5.5	5.0	275	200	1x,1.5x,2x	MLPD-UT-8, 2x2mm	Buck-Boost <30mV Vripple, Soft Start

## Linear Battery Chargers

Part Number	Max. charge current (A)/ accuracy		Operating input voltage (V)		Input voltage withstand (V)	Output voltage (V)	Output voltage accuracy (%)	LDO mode	NTC interface	Safety timer	Charger present indicator	Charge status indicator	Fault indicator	Package	Features
			Min	Max			Max								
SC801	1.5	+/- 50mA	4.2	6.5	14	4.1, 4.2, ADJ	+/-1	Yes	No	No	Yes	Yes	Yes	MLPQ-16 4x4mm	High input voltage protection, high current, programmable pre-, fast- and termination charge current
SC802	1	+/- 50mA	4.3	6.5	14	4.1, 4.2, ADJ	+/-1	Yes	Yes	Yes	Yes	Yes	Yes	MLPQ-16 4x4mm	Fully featured, high input voltage protection, programmable pre-, fast- and termination current
SC802A		+/- 60mA													
SC805A	1	+/- 5%	3.5	5.9	7	4.2	+/-1	Yes	Yes	Yes	Yes	Yes	Yes	MLPD-10 3x3mm	Fully featured, programmable pre-, fast- and termination current
SC806	1	+/- 5%	3.15	6.3	7	4.2	+/-1	No	Yes	No	Yes	Yes	Yes	MLPD-10 3x3mm	Programmable pre-, fast- and termination current
SC810	1	+/- 9%	4.6	8.2	30	4.2	+/-1	Yes	No	No	No	Yes	No	MLPD-UT-6 2x2mm	Termination options: float charge, automatic re-charge, forced re-charge.
SC811	1	+/- 9%	4.0	4.6	30	4.2	+/-1	Yes	No	No	No	Yes	No	MLPD-UT-8 2x2mm	Charging mode pin: selects USB high, USB low or adapter inputs, OVP 9.6V
SC813	1	+/- 9%	4.0	4.6	30	4.2	+/-1	Yes	No	No	No	Yes	No	MLPD-UT-8 2x2mm	Charging mode pin: selects USB high, USB low or adapter inputs, OVP 6.0V
SC820	1	+/- 9%	4.0	8.2	30	4.2	+/-1	Yes	No	No	No	Yes	No	MLPD-UT-8 2x2mm	Dual input adapter and USB, individual charging current
SC824	1	+/- 9%	4.0	8.2	30	4.2	+/-1	Yes	Yes	Yes	Yes	Yes	Yes	MLPD-UT-10 2x2mm	Charging mode pin: selects USB high, USB low or adapter inputs, OVP 9.6V

## uPMIC

Part Number	V <sub>IN</sub> (V)		# of LDOs	LDO output voltage range (V)	LDO output current (mA)	# of DC-DCs	DC-DC output voltage range (V)	DC-DC output current range (A)	Charger (Y/N)	Fast charge current (A) (Y/N)	Interface	Package	Features
	Min	Max											
SC908	4.45	7	1	1.5-3.3	300	1	1-3	150	Y	0.5	Logic	MLPQ-24 4x4mm	Bluetooth PMIC, Charger + Buck + LCO+LBI

## Isolated PWM Controllers

Part Number	Start Up current (µA) Max	Topologies	# of outputs	Mode of operation	fsw (kHz)	Max duty cycle	Turn on threshold (V <sub>MAX</sub> )	Package	Features
SC4806	150	Pushpull, Full Bridge, Half Bridge	2	Voltage Mode or Current Mode	1000	49% each channel	8.6	MLPQ-12 4x4mm	Independent Soft-start, shutdown, UVLO
SC4808B-2	150	Pushpull, Full Bridge, Half Bridge	2	Voltage Mode or Current Mode	1000	50% each channel	4.4	MSOP-10	UVLO, external synchronization
SC4809A	110	Forward / Flyback, Boost	1	Voltage Mode or Current Mode	1000	90%	4.5	MSOP-10	Programmable duty cycle
SC4809B							12		
SC4809C							6.95		
SC4810B/E	250	Forward / Flyback	2	Voltage Mode or Current Mode	1000	90%	8.8	TSSOP-16, MLPQ-16 4x4mm	Dual-phase mode of operation or low ripple
SC4905A	100	Forward / Flyback, Boost	1	Voltage Mode	1000	90%	4.6	MSOP-10	External synchronization
SC4905B							12		
SC4911	80	Flyback	1	Voltage Mode	500	57%	7	MSOP-8	Ultra low startup current: <45µA (Typical), UVLO

## Voltage References

Part Number	V <sub>IN</sub> (V)		Ref voltage (V)	Accuracy (%)	Package	Features
	Min	Max				
SC431	2.5	36	2.5	0.5	SOT23/SO-8	Adjustable shunt regulator
SC431L	1.24	20	1.24	0.25	SOT23/SOT-23-5	Low voltage adjustable shunt regulator
SC4431	1.5	15	1.224	0.5	SOT-23-5	Adjustable shunt regulator with open collector output for driving an opto-isolator

## MOSFET Drivers

Part Number	V <sub>IN</sub> (V)		Gate drive current (A)	Rise/Fall time (ns)	Prop delay (ns)	Package	Features
	Min	Max					
SC1301	4.5	16.5	2	15	60	SOT23-5	TTL compatible input, non-inverting output
SC1302	4.5	16.5	2	20	40	SO-8	TTL compatible input, UVLO

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