

# *Power Management*

**Programmable Power**  
Universal PMICs

**Power Conversion**  
Power Modules  
Switching Regulators  
Advanced DrMOS  
Switching Controllers  
LDOs  
DDR Termination  
Linear Regulators

**System Controls**  
Power Switches  
Voltage References  
Supervisors

**LED Lighting**  
AC Step Drivers  
Switching Regulators  
Linear Drivers



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# Power Management Portfolio

Programmable Power			
Triple PMICs		Quad PMICs	
XRP7713		XRP7704	XRP7724
XR77103		XRP7714	XR77128
		XRP7740	XR77129

Power Conversion											
Power Modules	Switching Regulators				Power Stage Advanced DrMOS	Switching Controllers Step-Down	Linear				
	AEC-Q100 Qualified	Step-Down >20V	Step-Down	Step-Up			LDOs			DDR Termination	Linear Regulators
XR79110	XR76203-Q	SP7650	SP6650	SP6641	XR78021	SP6120	LP2950	SPX1117	SPX2941	XRP2997	SP78L05
XR79115	XR76205-Q	SP7651	SP6651	SP6660		SP6123	LP2951	SPX1521	SPX2945		
XR79120	XR76208-Q	SP7652	SP6652	SP6661		SP6128	SP6201	SPX1582	SPX29501		
XR79103		SP7662	SP6654	SP6648		SP6132	SP6203	SPX1587	SPX29502		
XR79106		SP7663	SP6669	SP34063		SP6133	SP6205	SPX2815	SPX2951		
XR79203		XRP7662	XRP6657			SP6134	SP6213	SPX29150	SPX2954		
XR79206		XR76108	XRP6658			SP6136	SP6214	SPX29151	SPX3819		
		XR76112	XRP6668			XRP6124	SP6260	SPX29152	SPX3940		
		XR76115	SP34063			XRP6141		SPX29300	SPX5205		
		XR76117	XRP6670			XRP6142		SPX29301	XRP29302		
		XR76121	XRP7674			XR75100		SPX29302	XRP6272		
		XR76203	XRP7675					SPX2940	XRP6274		
		XR76205	XRP7659					XR71211	XRP6275		
		XR76208									

System Controls						
Power Switches		Voltage References		Supervisors		
Single	Dual					
SP2525A	SP2526A	SPX1431	SPX2431	SP690	SP691	SP705
XRP2525	XRP2526	SPX385	SPX431	SP706	SP707	SP708
XRP2527	XRP2528	SPX432	XRP431L	SP791	SP809	SP810
XRP2523	XRP2524			SP813		
SP619						

LED Lighting					
AC Step Drivers		Switching Regulators			Linear Drivers
		Step-Down	Step-Up/Down	Step-Up	
XR46203	XR46084	XRP7613	SP6686	SP6699	XRP7618
XR46110	XR46083		SP7685		
XR46073	XR46010				
XR46050	XR46014				
XR46051	XR46000				

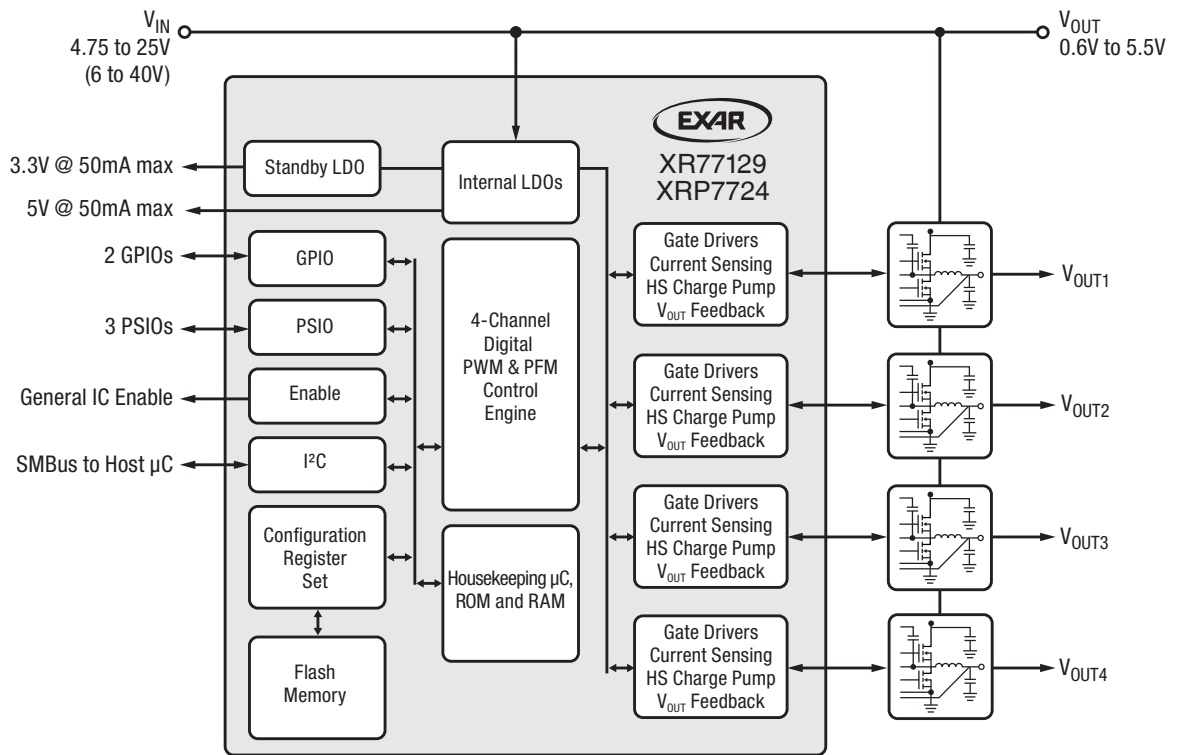
Exar's universal PMICs with programmable power technology offer advanced dynamic control, telemetry and remote reconfigurability. PowerArchitect design and configuration software speeds development and significantly reduces overall time to market compared to legacy analog power solutions. An I<sup>2</sup>C interface and multiple GPIO pins ensure easy system integration. Configurable warning and fault levels, fault behavior and power up and down sequencing ensure that any load can be properly powered and protected.

## Applications

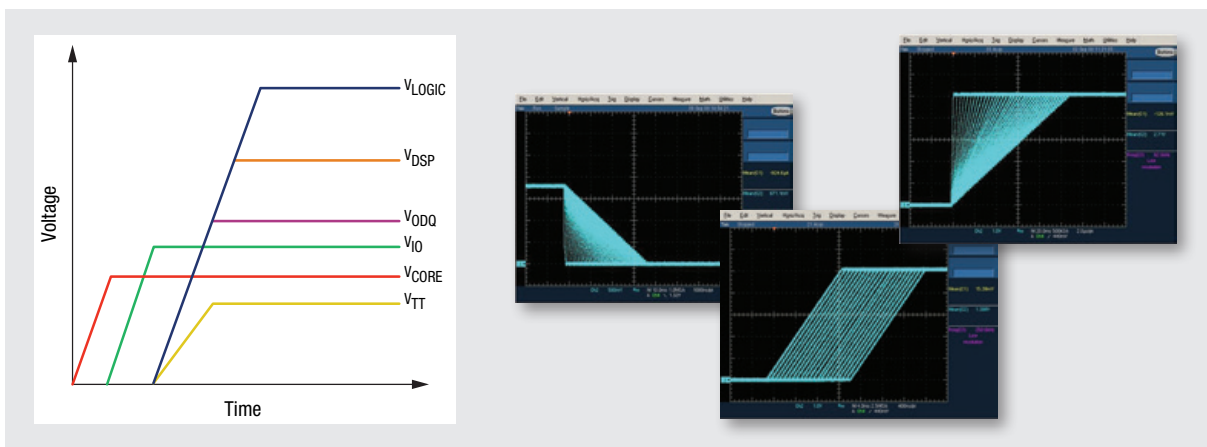
- FPGA, DSP and ASIC power systems
- Base stations
- x86 and ARM servers
- Networking
- Telecommunications
- Industrial and embedded systems

## Universal PMICs

Part Number	Ch.	Gate Drive Resistance Up/Down (Ω)	Operating Voltage (V)		Min Output Voltage (V)	Quiescent Current (mA)	Programmable Frequency Range (MHz)	Package	Features
			Min	Max					
XR77103	3	Integrated MOSFETs	4.5	14	0.8	1.5	0.3 to 2.2	TQFN-32	<ul style="list-style-type: none"> <li>▪ Synchronous</li> <li>▪ UVLO, OTP, soft-start</li> <li>▪ Light load efficiency - PFM and PWM mode</li> <li>▪ Overcurrent and output overvoltage protection</li> <li>▪ I<sup>2</sup>C reconfigurable</li> </ul>
XR77129	4	4/2	6	40	0.6	4	0.1 to 1.2	TQFN-44	<ul style="list-style-type: none"> <li>▪ 40V digital PWM/PFM controller</li> <li>▪ I<sup>2</sup>C reconfigurable</li> <li>▪ Built-in 3.3V/5V LDO</li> <li>▪ Integrated MOSFET drivers</li> </ul>
XR77128	4	4/2 DrMOS output	4.75	25					<ul style="list-style-type: none"> <li>▪ Updated fault management and GPIO functionality, with the ability to drive MOSFETs and DrMOS</li> </ul>
XRP7724	4	4/2	4.75	25	0.6	4	0.1 to 1.2	TQFN-44	<ul style="list-style-type: none"> <li>▪ Digital PWM controller with DPFM mode</li> <li>▪ I<sup>2</sup>C reconfigurable</li> <li>▪ Built-in 3.3V/5V LDO</li> <li>▪ Integrated MOSFET drivers</li> <li>▪ Full protection</li> </ul>
XRP7725			4.75	25					<ul style="list-style-type: none"> <li>▪ Intel® Node Manager compatible</li> <li>▪ Programmable power system</li> <li>▪ XRP7724 pin and function compatible</li> </ul>
XRP7720			4.75	18					<ul style="list-style-type: none"> <li>▪ Configurable universal PMIC</li> <li>▪ Fault, warning, conditional sequencing, GPIOs and PID compensation are all I<sup>2</sup>C reconfigurable in development, production units omit I<sup>2</sup>C</li> <li>▪ Integrated MOSFET drivers</li> </ul>
XRP7713	3	6/3	4.75	25	0.9	9	0.3 to 1.5	TQFN-32	<ul style="list-style-type: none"> <li>▪ Digital PWM controller</li> <li>▪ Faults, warnings, sequencing, GPIOs and PID compensation are all I<sup>2</sup>C reconfigurable</li> <li>▪ 3.3V or 5V selectable LDO</li> <li>▪ Integrated MOSFET drivers</li> </ul>
XRP7714	4							TQFN-40	
XRP7704	4	-/-	6.5	20	0.9	9	0.3 to 1.5	TQFN-40	<ul style="list-style-type: none"> <li>▪ 3.3V or 5V selectable LDO</li> <li>▪ Integrated MOSFET drivers</li> </ul>
XRP7740	4	3/1.8							



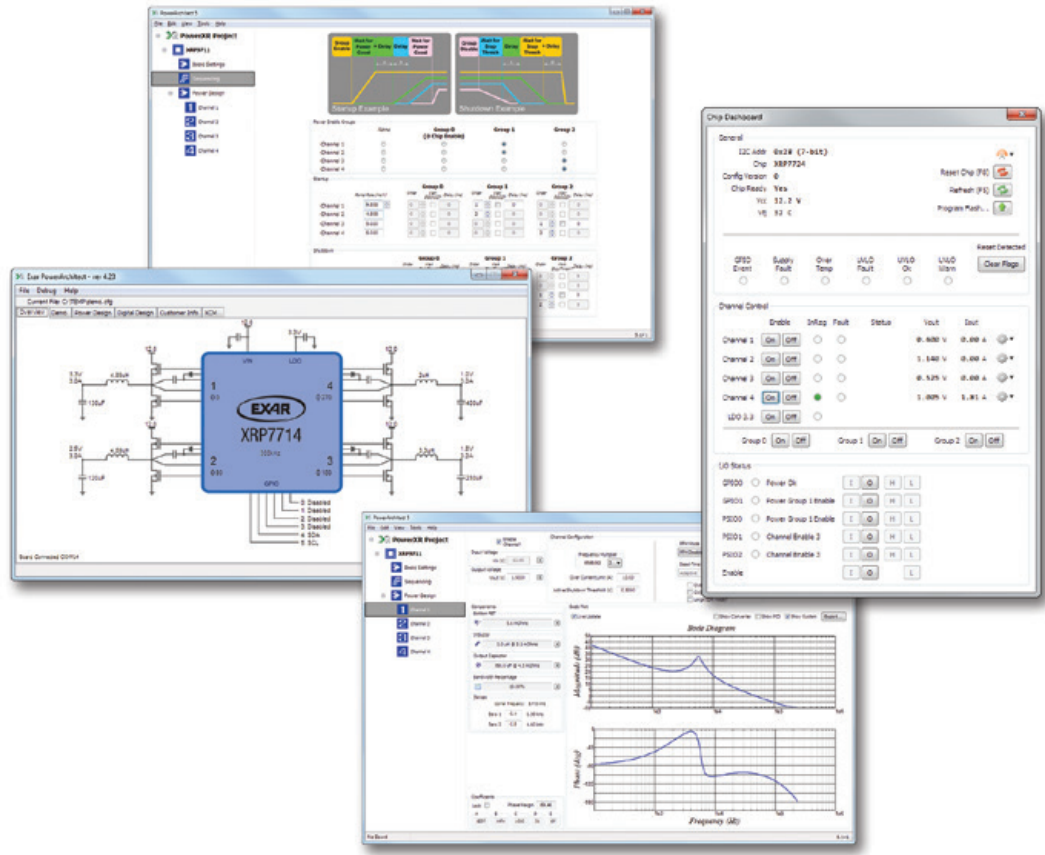
Functional Block Diagram



Control Power Up/Down Sequencing with Different Delays and Slopes

**PowerArchitect – Configuration Software**

Exar's PowerArchitect interactive design tool enables you to create a complete 4- to 6-channel optimized power supply design with complex sequencing and advanced power management features, all with a few clicks of the mouse. A free download of PowerArchitect is available at [powerxr.exar.com](http://powerxr.exar.com)



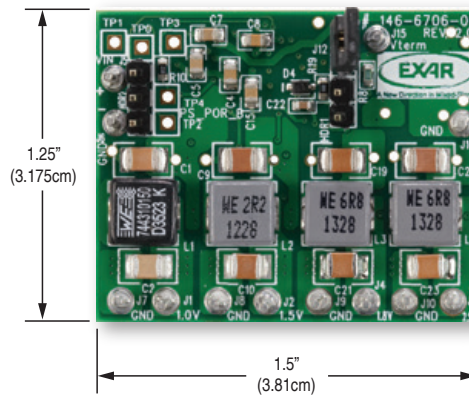
**Evaluation Boards**

Evaluation boards for all programmable power management devices are available, along with their user manuals.

**Complete Programmable Power Kits Available**



**Zynq-7000 Power System Featuring XRP7714**



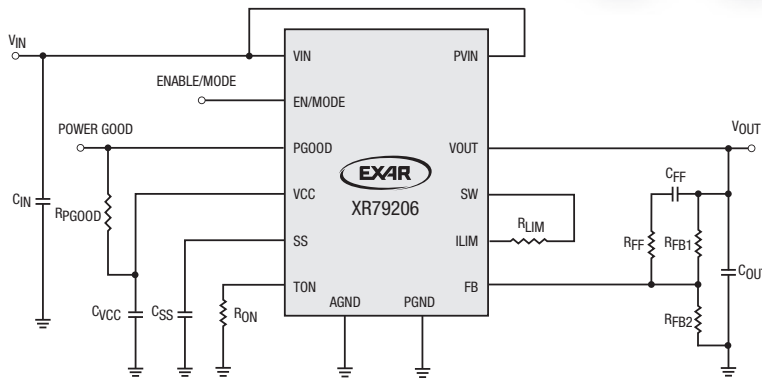
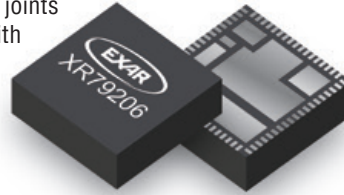
Ready-made configurations for:

- Zynq-7XXX
- i.MX5 and i.MX6
- Smartfusion2
- Cyclone IV
- Cyclone V SOC
- Intel Wellsburg

## Power Modules

This family of power modules addresses high-current single channel solutions for various end applications. These synchronous step-down power modules are complete system-in-package power management solutions with fully integrated power converters including MOSFETs, inductors and internal input and output capacitors. A patented emulated current mode Constant On-Time (COT) control provides exceptional full range 0.1% line regulation and 1% output accuracy over the full temperature range. This COT control loop enables operation with ceramic output capacitors, eliminating loop compensation components.

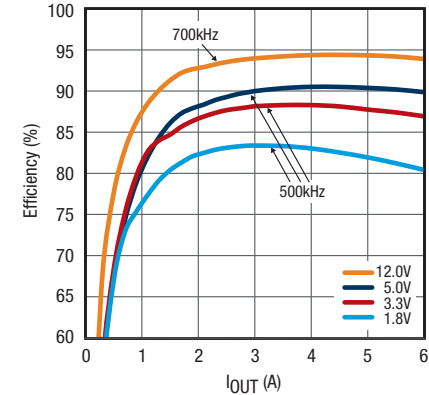
Available in a QFN package, our modules provide superior thermal performance and manufacturability, all in the smallest footprint. The QFN package makes visual inspection of solder joints possible and eases electrical debugging. At 85°C with no airflow, no thermal de-ratings are required for output voltages of 1.8V and below.



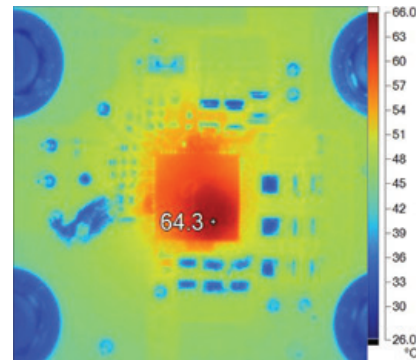
40V, 6A Power Module

### Applications

- FPGA, DSP and ASIC power systems
- Base stations
- Repeaters
- Networking
- Telecommunications
- Industrial and embedded systems



XR79206 Efficiency



1.8V 500kHz 0 LFM

XR79110 Thermal Image

Part Number	Ch.	Output Current (A)	V <sub>IN</sub> Range (V)	V <sub>OUT</sub> Range (V)	Frequency (kHz)	Efficiency (%)	X-Y Dimension (mm)	Z Dimension (mm)	Features
XR79203	1	3	3 to 40	0.6 to 13.2	400 to 800	95	8 x 8	4	<ul style="list-style-type: none"> <li>▪ QFN package</li> <li>▪ Patented COT control</li> <li>▪ UVLO, OTP, soft-start, adjustable hiccup current limit and short-circuit protection</li> <li>▪ PGOOD</li> </ul>
XR79206		6	3 to 40	0.6 to 13.2	400 to 800	95	10 x 10		
XR79103		3	3 to 22	0.6 to 5.5	600 to 800	95	6 x 6		
XR79106		6	3 to 22	0.6 to 5.5	600 to 800	95	8 x 8		
XR79110		10	3 to 22	0.6 to 5.5	400 to 600	96	10 x 10		
XR79115		15	3 to 22	0.6 to 5.5	400 to 600	96	12 x 12		
XR79120		20	3 to 22	0.6 to 5.5	400 to 600	93	12 x 14		

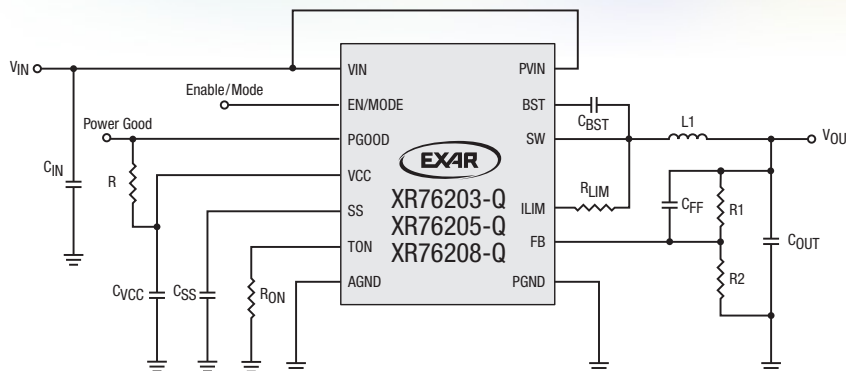
**AEC-Q100 Qualified Step-Down Switching Regulators**

This family of synchronous step-down regulators combine the controller, drivers, bootstrap diode and MOSFETs in a single package for point-of-load supplies well suited for automotive applications.

**Applications**

- Automotive infotainment
- Advanced Driver Assistance Systems (ADAS)
- GPS / Navigation systems
- Event data recorders
- Automotive systems

Part Number	Output Current (A)	Frequency (kHz)	Operating Voltage (V)		Output Voltage	Output Voltage Range (V)		Accuracy (%)	Efficiency (%)	Package (mm)	Features
			Min	Max		Min	Max				
XR76203-Q	3	100 to 800	3	40	Adj.	0.6	30	0.5	95	5 x 5 QFN	<ul style="list-style-type: none"> <li>▪ AEC-Q100 Qualified Automotive</li> <li>▪ Patented COT control</li> <li>▪ UVLO, OTP, soft-start, hiccup, PGOOD</li> <li>▪ Current limit and short protection</li> </ul>
XR76205-Q	5								96		
XR76208-Q	8								96		



**3A, 5A, 8A Step-Down Regulator**



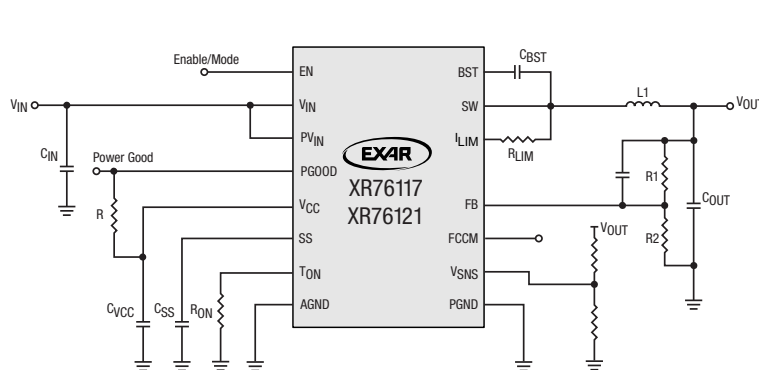
## Step-Down Regulators >20V

Exar's family of synchronous and non-synchronous step-down regulators provides a fully integrated single-chip solution for Point-of-Load (POL) applications with high current output requirements. With high input voltage range and operating switching frequency options, these regulators fit in a wide range of applications and power architectures by enabling step-down DC/DC conversions from various intermediate power bus levels and providing a highly efficient and high performing solution in the most compact footprint.

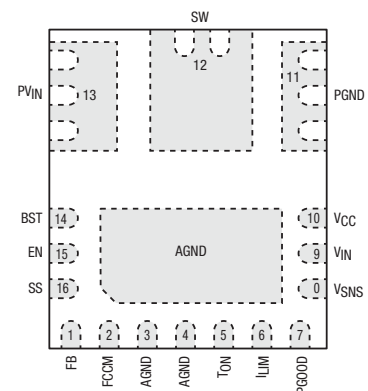
### Applications

- Distributed power architectures
- Point-of-Load (POL) converters
- Point-of-Load (POL) modules
- FPGAs, DSPs and processor power supplies

Part Number	Output Current (A)	Frequency (kHz)	Operating Voltage (V)		Output Voltage	Output Voltage Range (V)		Accuracy (%)	Efficiency (%)	Package (mm)	Features
			Min	Max		Min	Max				
XR76203	3	100 to 800	3	40	Adj.	0.6	30	0.5	95	5x5 QFN	<ul style="list-style-type: none"> <li>▪ Patented COT control</li> <li>▪ UVLO, OTP, soft-start, hiccup, PGOOD</li> <li>▪ Current limit and short protection</li> </ul>
XR76205	5										
XR76208	8										
SP7650	3	300	2.5	28	Adj.	0.8	27	1	95	7x4 DFN	<ul style="list-style-type: none"> <li>▪ Synchronous</li> <li>▪ UVLO, OTP, soft-start</li> <li>▪ Short-circuit protection/auto-restart</li> </ul>
SP7652	6	600	2.5	28	Adj.	0.8	27	1	92	7x4 DFN	<ul style="list-style-type: none"> <li>▪ Synchronous</li> <li>▪ UVLO, OTP, soft-start</li> <li>▪ Short-circuit protection/auto-restart</li> </ul>
SP7663	6	600	3	22	Adj.	0.8	20.2	1	91	7x4 DFN	<ul style="list-style-type: none"> <li>▪ Synchronous</li> <li>▪ UVLO, OTP, soft-start, current limiting</li> <li>▪ Short-circuit protection/auto-restart</li> </ul>
SP7662/ XRP7662	12	300	3	22	Adj.	0.8	20.2	1	93	7x4 DFN	<ul style="list-style-type: none"> <li>▪ Synchronous</li> <li>▪ UVLO, OTP, soft-start, current limiting</li> <li>▪ Short-circuit protection/auto-restart</li> </ul>
XR76108	8	200 to 800	3	22	Adj.	0.6	18	0.5	96	5x5 QFN	<ul style="list-style-type: none"> <li>▪ Patented COT control</li> <li>▪ UVLO, OTP, soft-start, hiccup, PGOOD</li> <li>▪ Current limit and short protection</li> </ul>
XR76112	12										
XR76115	15										
XR76117	15	200 to 800	4.5	22	Adj.	0.6	18	0.5	97	5x6 QFN	<ul style="list-style-type: none"> <li>▪ Patented COT control</li> <li>▪ UVLO, OTP, soft-start, hiccup, PGOOD</li> <li>▪ Current limit and short protection</li> </ul>
XR76121	20	200 to 800	4.5	22	Adj.	0.6	18	0.5	97	5x6 QFN	<ul style="list-style-type: none"> <li>▪ Patented COT control</li> <li>▪ UVLO, OTP, soft-start, hiccup, PGOOD</li> <li>▪ Current limit and short protection</li> </ul>
SP7651	3	900	2.5	20	Adj.	0.8	19	1	92	7x4 DFN	<ul style="list-style-type: none"> <li>▪ Synchronous</li> <li>▪ UVLO, OTP, soft-start</li> <li>▪ Short-circuit protection/auto-restart</li> </ul>



15A and 20A Step-Down Regulator



XR76121 Pin Assignment

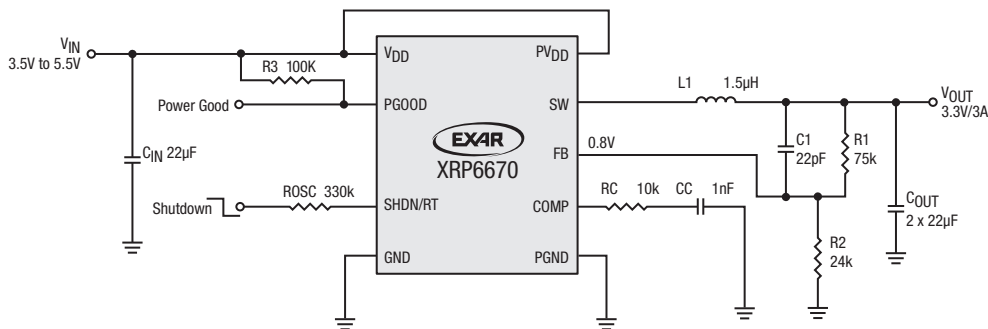
Step-Down Regulators

Step-down regulators, also known as buck regulators, are used to lower the input voltage to the desired output level with higher efficiency than an LDO. A step-down regulator integrates power FET ICs, providing a monolithic power converter.

Applications

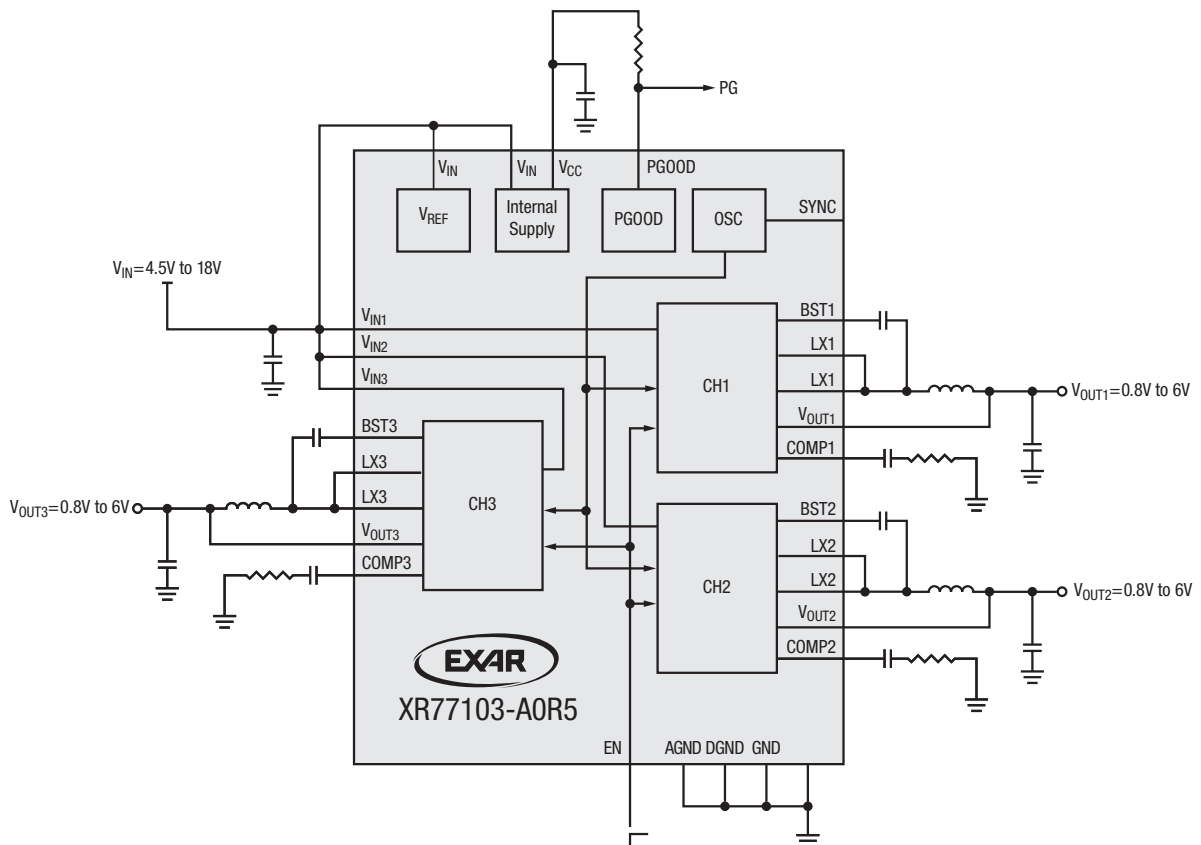
- Distributed power architectures
- Point-of-Load (POL) converters
- Point-of-Load (POL) modules
- FPGAs, DSPs and processor power supplies

Part Number	Ch.	Output Current	Frequency Mode (MHz)	Operating Voltage (V)		Output Voltage	Output Voltage Range (V)		Quiescent Current ( $\mu$ A)	Efficiency (%)	Package	Features
				Min	Max		Min	Max				
SP6650	1	600mA	PFM	2.7	6.5	Adj.	1.3	6	70	95	MSOP-10	<ul style="list-style-type: none"> <li>▪ Synchronous</li> <li>▪ Enable pin</li> <li>▪ Low battery detection</li> <li>▪ UVLO, over temperature protection</li> </ul>
SP6669	1	600mA	1.5	2.5	5.5	Adj.	0.6	5	200	95	SOT23-5	<ul style="list-style-type: none"> <li>▪ Synchronous</li> <li>▪ Enable pin</li> <li>▪ Pulse skipping at light load</li> <li>▪ Over temperature protection</li> </ul>
SP6651	1	800mA	PFM	2.7	5.5	Adj.	1	5	20	98	MSOP-10 DFN-10	<ul style="list-style-type: none"> <li>▪ Synchronous</li> <li>▪ Enable pin</li> <li>▪ Low battery detection</li> <li>▪ Adjustable UVLO, over temperature protection</li> </ul>
SP6654	1	800mA	PFM	2.7	5.5	Adj.	0.8	5	20	98	MSOP-10 DFN-10	<ul style="list-style-type: none"> <li>▪ Synchronous</li> <li>▪ Enable pin</li> <li>▪ Power good indicator</li> <li>▪ Adjustable UVLO, over temperature protection</li> </ul>
SP6652	1	1A	1.4	2.7	5.5	Adj.	0.75	5	1mA	97	MSOP-10 DFN-10	<ul style="list-style-type: none"> <li>▪ Synchronous</li> <li>▪ Enable pin, soft-start</li> <li>▪ External clock synchronization</li> <li>▪ Overcurrent and over temperature protection</li> </ul>
XRP6658	1	1A	1.5	2.5	5.5	Adj.	0.6	5	15	97	SOT23-5	<ul style="list-style-type: none"> <li>▪ Synchronous</li> <li>▪ Light load efficiency, PFM and PWM mode</li> <li>▪ Enable pin</li> <li>▪ UVLO and over temperature protection</li> </ul>
SP34063	1	Adj. <1.5A	0.11	3	36	Adj.	1	27	4mA	80	NSOIC-8	<ul style="list-style-type: none"> <li>▪ Can be implemented in buck, boost or inverting topologies</li> </ul>
XRP6657	1	1.5A	1.3	2.5	5.5	Adj.	0.6	5	240	95	DFN-6	<ul style="list-style-type: none"> <li>▪ Synchronous</li> <li>▪ Enable pin</li> <li>▪ Pulse skipping at light load</li> <li>▪ Over temperature protection</li> </ul>
XRP7659	1	1.5A	1.4	4.5	18	Adj.	0.81	15	800	92	SOT23-6	<ul style="list-style-type: none"> <li>▪ Non synchronous</li> <li>▪ Enable pin, soft-start</li> <li>▪ Internal compensation</li> <li>▪ Overcurrent, over temperature and UVLO protection</li> </ul>
XRP7664	1	2A	0.3	4.5	18	Adj.	0.925	16	1.2mA	95	SOIC-8	<ul style="list-style-type: none"> <li>▪ Synchronous</li> <li>▪ UVLO, OTP, soft-start</li> <li>▪ Light load efficiency and PWM mode</li> <li>▪ Overcurrent and output overvoltage protection</li> </ul>



3A Synchronous Step-Down Regulator

Part Number	Ch.	Output Current	Frequency Mode (MHz)	Operating Voltage (V)		Output Voltage	Output Voltage Range (V)		Quiescent Current ( $\mu$ A)	Efficiency (%)	Package	Features
				Min	Max		Min	Max				
XRP7674	1	2A	0.3	4.5	18	Adj.	0.925	16	1.2mA	95	SOIC-8	<ul style="list-style-type: none"> <li>Synchronous</li> <li>UVLO, OTP, soft-start</li> <li>Light load efficiency, PFM and PWM mode</li> <li>Overcurrent and output overvoltage protection</li> </ul>
XRP6670	1	3A	Prog. 0.3 to 2.5	2.6	5.5	Adj.	0.8	5	460	95	DFN-10	<ul style="list-style-type: none"> <li>Synchronous, programmable frequency</li> <li>Enable pin, Power Good flag</li> <li>OTP, OCP and UVLO protection</li> </ul>
XRP7665	1	3A	0.34	4.5	18	Adj.	0.925	16	1.2mA	95	HSOIC-8	<ul style="list-style-type: none"> <li>Synchronous</li> <li>UVLO, OTP, soft-start</li> <li>Light load efficiency and PWM mode</li> <li>Overcurrent and output overvoltage protection</li> </ul>
XRP7675	1	3A	0.34	4.5	18	Adj.	0.925	16	1.2mA	95	HSOIC-8	<ul style="list-style-type: none"> <li>Synchronous</li> <li>UVLO, OTP, soft-start</li> <li>Light load efficiency, PFM and PWM mode</li> <li>Overcurrent and output overvoltage protection</li> </ul>
XRP6668	2	1A/1A	1.5	2.5	5.5	Adj.	0.6	5	30	97	NSOIC-8	<ul style="list-style-type: none"> <li>Synchronous</li> <li>Light load efficiency, PFM and PWM mode</li> <li>Individual enable pin</li> <li>UVLO and over temperature protection</li> </ul>
XR77103-A1R0	3	1.5A	1	4.5	14	Adj.	0.8	6	2.8mA	93	TQFN-32	<ul style="list-style-type: none"> <li>Synchronous</li> <li>UVLO, OTP, soft-start</li> <li>Light load efficiency, PSM and PWM mode</li> <li>Overcurrent and output overvoltage protection</li> </ul>
XR77103-AOR5	3	2A	0.5	4.5	14	Adj.	0.8	6	2.6mA	93	TQFN-32	<ul style="list-style-type: none"> <li>Synchronous</li> <li>UVLO, OTP, soft-start</li> <li>Light load efficiency, PSM and PWM mode</li> <li>Overcurrent and output overvoltage protection</li> </ul>



3-Output Synchronous Buck Regulator

**Step-Up Regulators**

Step-up regulators, also known as boost regulators, are used to step up an input voltage to the desired higher output level. They are typically used in portable equipment where the power supply is provided by a battery.

**Applications**

- Handheld and portable equipment
- Bias supplies

Part Number	Output Current	Operating Voltage (V)		Startup Voltage (V)	Output Voltage	Output Voltage Range (V)		Quiescent Current (µA)	Efficiency (%)	Package	Features
		Min	Max			Min	Max				
SP6641A	100mA	0.9	4.5	0.85	Fixed	3.3		10	87	SOT23-5	<ul style="list-style-type: none"> <li>▪ Non synchronous</li> <li>▪ Enable pin</li> <li>▪ Current limiting</li> </ul>
					Fixed	5					
SP6660	200mA	1.5	4.25	n/a	Inverter	-4.25	-1.5	400	94	SOIC-8	<ul style="list-style-type: none"> <li>▪ Charge pump topology</li> <li>▪ Selectable oscillator</li> <li>▪ External oscillator input</li> </ul>
					Doubler	3	8		96		
SP6661	200mA	1.5	5.3	n/a	Inverter	-5	-1.5	3mA	89	SOIC-8 MSOP-8	<ul style="list-style-type: none"> <li>▪ Charge pump topology</li> <li>▪ Selectable oscillator</li> <li>▪ External oscillator input</li> </ul>
		2.5	5.3		Doubler	5	10		94		
SP6648	400mA	0.7	4.5	0.85	Adj.	2.5	5.5	13	94	MSOP-10	<ul style="list-style-type: none"> <li>▪ Synchronous</li> <li>▪ Enable pin</li> <li>▪ Programmable low battery detection</li> <li>▪ Undervoltage lockout protection</li> </ul>
SP6641B	500mA	0.9	4.5	0.85	Fixed	3.3		10	87	SOT23-5	<ul style="list-style-type: none"> <li>▪ Non synchronous</li> <li>▪ Enable pin</li> <li>▪ Current limiting</li> </ul>
					Fixed	5					
SP34063	Adj. <1.5A	3	36	n/a	Adj.	1	27	4mA	80	NSOIC-8	<ul style="list-style-type: none"> <li>▪ Can be implemented in buck, boost or inverting topologies</li> </ul>

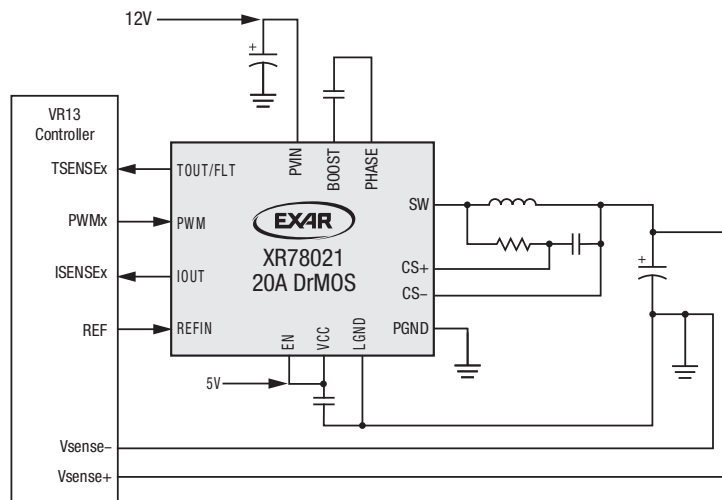
**Advanced DrMOS**

This family of integrated power stages contains a synchronous buck gate driver packaged with both half bridge MOSFETs. Also known as DrMOS (Driver plus MOSFETs), this package design provides very low thermal impedance and minimizes parasitic inductances resulting in excellent EMI performance.

**Applications**

- Servers
- Networking equipment
- Industrial PC

Part Number	I <sub>out</sub> (A)	V <sub>IN</sub> MIN (V)	V <sub>IN</sub> MAX (V)	V <sub>OUT</sub> MAX (V)	Minimum On-Time (ns)	Switching Frequency (kHz)	Efficiency (%) [V <sub>IN</sub> =12V, V <sub>OUT</sub> = 1V, full load, 600kHz]	Junction Temp Range (°C)	Package	Features
XR78021	20A	4.5	17	3.3	30	1500	84	-40 to 125	QFN	<ul style="list-style-type: none"> <li>▪ UVLO, TMON, IMON</li> </ul>



**XR78021 Typical Application**

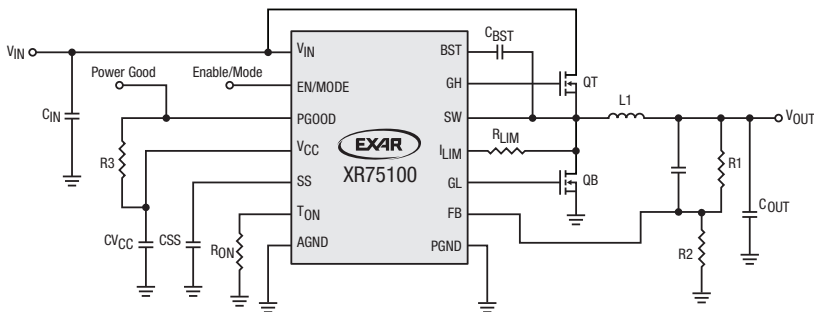
## Step-Down Controllers

Step-down controllers, also known as buck controllers, are the basic building blocks for high efficiency and high power point-of-loads. Step-down controllers allow maximum flexibility and customization for high performance conversions.

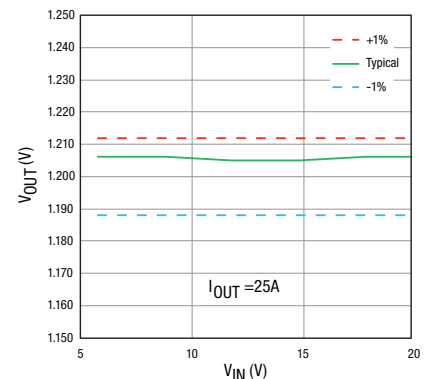
### Applications

- Distributed power architectures
- Point-of-Load (POL) converters/modules
- Set-top boxes

Part Number	Rec. Output Current (A)	Operating Voltage (V)		Min. Output Voltage (V)	Quiescent Current ( $\mu$ A)	Frequency (kHz)	Efficiency (%)	Package	Features
		Min	Max						
XR75100	<20	3	40	0.6	700	200 to 800	96	QFN-16	<ul style="list-style-type: none"> <li>▪ Proprietary emulated current mode constant on-time architecture</li> <li>▪ No external compensation</li> <li>▪ Adjustable frequency</li> <li>▪ Precision enable, soft-start, force PWM</li> <li>▪ Adjustable temperature compensated current limit</li> </ul>
XRP6124	<5	3	18	1.2	500	200 to 1000	92	SOT23-5	<ul style="list-style-type: none"> <li>▪ Non synchronous, 500ns constant on-time</li> <li>▪ Enable pin, soft-start</li> <li>▪ UVLO and output short-circuit protection</li> </ul>
XRP6124HV		4.5	30						
SP6134H	<15	3	28	0.8	1.5mA	600	94	MSOP-10	<ul style="list-style-type: none"> <li>▪ Synchronous voltage mode PWM</li> <li>▪ Programmable soft-start</li> <li>▪ UVLO, over temperature and output short-circuit protection</li> </ul>
SP6132H	<20	3	28			300			
SP6136	<15	3	24	0.8	1.5mA	600	92	QFN-16	<ul style="list-style-type: none"> <li>▪ Synchronous voltage mode PWM</li> <li>▪ Enable pin, Power Good flag indicator</li> <li>▪ Programmable soft-start, current limiting</li> <li>▪ UVLO, over temperature and output short-circuit protection</li> </ul>
SP6133	<30					300			
XRP6141	<35	3	22	0.6	700	200 to 800	95	QFN-16	<ul style="list-style-type: none"> <li>▪ Proprietary emulated current mode constant on-time architecture</li> <li>▪ No external compensation</li> <li>▪ Adjustable frequency</li> <li>▪ Precision enable, soft-start, force PWM</li> <li>▪ Adjustable temperature compensated current limit</li> </ul>
SP6120	<10	3	5.5	1.3	950	250 to 550	95	TSSOP-16	<ul style="list-style-type: none"> <li>▪ Synchronous voltage mode PWM</li> <li>▪ Enable pin, high side N or P FET capable</li> <li>▪ Programmable frequency</li> <li>▪ Soft-start, UVLO and overcurrent protection</li> </ul>
SP6123A	<10	3	5.5	0.8	500	500	95	NSOIC-8	<ul style="list-style-type: none"> <li>▪ Synchronous voltage mode PWM</li> <li>▪ Soft-start, on/off mode</li> <li>▪ UVLO and overcurrent protection</li> </ul>
SP6123						300			
SP6128A	<10	3	5.5	0.8	500	300	95	TSSOP-14	<ul style="list-style-type: none"> <li>▪ Synchronous voltage mode PWM</li> <li>▪ Soft-start, on/off mode</li> <li>▪ UVLO and overcurrent protection</li> </ul>
XRP6142	<20	1	5.5	0.5	400	500 to 1000	96	QFN-16	<ul style="list-style-type: none"> <li>▪ Constant on-time architecture</li> <li>▪ 0.5<math>\mu</math>s, 1.0<math>\mu</math>s and 2.0<math>\mu</math>s options</li> <li>▪ No external compensation</li> <li>▪ DDR memory support</li> </ul>



40V Synchronous Step-Down COT Controller



XR75100 Line Regulation

**LDOs**

Exar manufactures a broad line of low dropout linear regulators (LDO). The simplest and lowest cost technique for stepping down a DC voltage, LDOs offer a quiet, well-regulated DC voltage supply with excellent transient response.

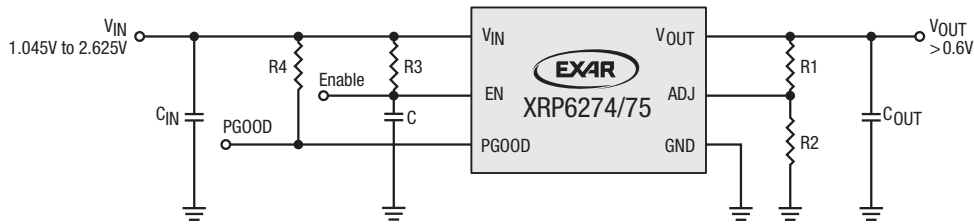
**Applications**

- Portable equipment
- Handheld devices
- Mobile phones and PDAs
- Medical and industrial instrumentation

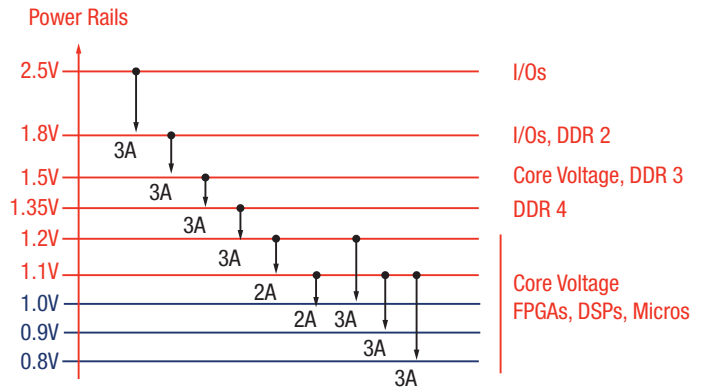
Part Number	Output Current	Output Voltage (V)	V <sub>OUT</sub> (V) Adjustable		Accuracy (%)	Typical Dropout Voltage (mV)	Operating Voltage (V)		Quiescent Current (μA)	Package	Features
			Min	Max			Min	Max			
SP6213	100mA	1.8, 2.5, 3, 3.3			2.5	250	2.5	7	65	SC70-5	<ul style="list-style-type: none"> <li>▪ Enable pin</li> <li>▪ Current limiting and thermal protection</li> </ul>
SP6214	100mA	1.8, 3, 3.3			2.5	250	2.5	7	65	SC70-5	<ul style="list-style-type: none"> <li>▪ Enable pin</li> <li>▪ Current limiting and thermal protection</li> </ul>
LP2950	100mA	3.3, 5			0.5, 1	380	2.4	30	150	TO92-3	<ul style="list-style-type: none"> <li>▪ Current limiting and thermal protection</li> </ul>
LP2951	100mA	3.3, 5			0.5, 1	380	2.4	30	150	NSOIC-8	<ul style="list-style-type: none"> <li>▪ Enable pin</li> <li>▪ Output error flag indicator</li> <li>▪ Current limiting and thermal protection</li> </ul>
SPX2951	150mA	5			0.5, 1	300	2.4	30	150	NSOIC-8	<ul style="list-style-type: none"> <li>▪ Enable pin</li> <li>▪ Output error flag indicator</li> <li>▪ Current limiting and thermal protection</li> </ul>
SPX5205	150mA	Adj., 1.2, 1.8, 2.5, 3, 3.3, 5	1.24	15.725	1	210	2.5	16	70	SOT23-5	<ul style="list-style-type: none"> <li>▪ Reverse battery protection</li> <li>▪ Current limiting and thermal protection</li> </ul>
SP6201	200mA	Adj., 1.5, 1.8, 2.5, 3, 3.3, 5	2.5	6	2	320	2.5	7	28	SOT23-5	<ul style="list-style-type: none"> <li>▪ Enable pin</li> <li>▪ Power good indicator</li> </ul>
		Adj., 1.8, 3.3								DFN-8	<ul style="list-style-type: none"> <li>▪ Enable pin</li> <li>▪ Power good indicator (fixed voltage version)</li> </ul>
SP6260	200mA	1.5, 1.8, 2.5, 2.8, 3, 3.3			2	200	2	6	25	SOT23-5	<ul style="list-style-type: none"> <li>▪ Low noise: 30μV<sub>RMS</sub>, no bypass cap needed</li> <li>▪ Enable pin</li> <li>▪ Current limiting and thermal protection</li> </ul>
SPX2954	250mA	5			0.5	310	2.4	30	150	NSOIC-8 SOT223-3	<ul style="list-style-type: none"> <li>▪ Enable pin</li> <li>▪ Output error flag indicator</li> <li>▪ Current limiting and thermal protection</li> </ul>
		3.3, 5	1	NSOIC-8 SOT223-3							
SP6203	300mA	Adj., 2.5, 2.8, 3, 3.3	2.7	5.7	2	180	2.7	6	45	SOT23-5	<ul style="list-style-type: none"> <li>▪ Low noise: 12μV<sub>RMS</sub> (fixed voltage version)</li> <li>▪ Enable pin</li> <li>▪ Current limiting and thermal protection</li> </ul>
		Adj., 1.8								DFN-8	
SPX1521	300mA	3.3, 5			1	300	4.1	20	150	SOT223-3	<ul style="list-style-type: none"> <li>▪ Reverse battery protection</li> <li>▪ Current limiting and thermal protection</li> </ul>
SPX2945	400mA	3.3, 5			0.5, 1	420	4.1	30	100	SOT223-3	<ul style="list-style-type: none"> <li>▪ Enable pin</li> <li>▪ Output error flag indicator</li> <li>▪ Current limiting and thermal protection</li> </ul>
SP6205	500mA	Adj., 1.8, 2.5, 2.8, 3, 3.3	2.7	5.7	2	300	2.7	6	45	SOT23-5	<ul style="list-style-type: none"> <li>▪ Low noise: 12μV<sub>RMS</sub> (fixed voltage version)</li> <li>▪ Enable pin</li> <li>▪ Current limiting</li> <li>▪ Over temperature protection</li> </ul>
		Adj., 2.5								DFN-8	

Part Number	Output Current	Output Voltage (V)	V <sub>OUT</sub> (V) Adjustable		Accuracy (%)	Typical Dropout Voltage (mV)	Operating Voltage (V)		Quiescent Current (µA)	Package	Features
			Min	Max			Min	Max			
SPX3819	500mA	Adj., 1.2, 1.5, 1.8, 2.5, 3, 3.3, 5	1.235	15.45	1	340	2.5	16	90	SOT23-5	<ul style="list-style-type: none"> <li>Enable pin</li> <li>Reverse battery protection</li> <li>Current limiting and thermal protection</li> </ul>
		Adj., 1.2, 1.8								DFN-8	
		Adj., 1.2, 1.5, 1.8, 2.5, 3.3, 5								NSOIC-8	
SPX1117	800mA	Adj., 1.5, 1.8, 2.5, 3.3, 5	1.25	15	1	1100	2.6	15	5mA	SOT223-3	<ul style="list-style-type: none"> <li>Current limiting and thermal protection</li> </ul>
SPX2940	1A	5			3	280	3.2	16	12mA	T0263-3 T0220-3	<ul style="list-style-type: none"> <li>Reverse battery protection</li> <li>Current limiting and thermal protection</li> </ul>
SPX2941	1A	Adj.	1.24	15.45	3	280	3	16	12mA	T0263-5	<ul style="list-style-type: none"> <li>Enable pin</li> <li>Reverse battery protection</li> <li>Current limiting and thermal protection</li> </ul>
SPX3940A	1A	1.8, 2.5, 3.3, 5			1	280	3.1	16	18mA	SOT223-3	<ul style="list-style-type: none"> <li>Reverse battery protection</li> <li>Current limiting and thermal protection</li> </ul>
		1.8, 3.3, 5								T0263-3	
SPX3940		2.5, 3.3, 5		2	SOT223-3						
		3.3, 5			T0263-3						
SPX2815	1.5A	Adj., 3.3	1.25	8.8	1, 2	1100	2.5	10	4mA	T0263-3	<ul style="list-style-type: none"> <li>Current limiting and thermal protection</li> </ul>
SPX29150	1.5A	1.8, 2.5, 3.3			1	390	2.5	16	12mA	T0263-3	<ul style="list-style-type: none"> <li>Reverse battery protection</li> <li>Current limiting and thermal protection</li> </ul>
SPX29151	1.5A	1.8, 2.5, 5			1	390	2.5	16	12mA	T0263-5	<ul style="list-style-type: none"> <li>Enable pin</li> <li>Output error flag indicator</li> <li>Current limiting and thermal protection</li> </ul>
SPX29152	1.5A	Adj.	1.25	15.4	1	390	2.5	16	12mA	T0263-5 T0220-5	<ul style="list-style-type: none"> <li>Enable pin</li> <li>Current limiting and thermal protection</li> </ul>
XR71211	1.5A	Adj.	0.6	2.4	0.5	130	1.4	2.625	3.5mA	DFN-10	<ul style="list-style-type: none"> <li>Enable pin</li> <li>Power good, soft-start</li> <li>Current limiting and thermal protection</li> </ul>
XRP6272	2A	Adj., 5	0.7	5.3	2	550	1.8	6	30	T0252-5 HSOIC-8	<ul style="list-style-type: none"> <li>Enable and power good functions</li> <li>Current limiting and thermal protection</li> </ul>
XRP6274	2A	Adj.	0.6	2.4	0.5	40	1.045	2.625	3.5mA	DFN-10	<ul style="list-style-type: none"> <li>Power good, precision enable, current and thermal protection</li> <li>Reverse bias protection</li> </ul>
SPX1582	3A	Adj., 2.5	1.25	6	2	400	1.8	5.5	5mA	T0263-5	<ul style="list-style-type: none"> <li>Enable pin</li> <li>External sense pin</li> <li>Current limiting and thermal protection</li> </ul>
SPX1587	3A	Adj.	1.25	8.8	1	1100	2.8	10	4mA	T0252-3	<ul style="list-style-type: none"> <li>Current limiting</li> <li>Over temperature protection</li> </ul>
		Adj., 2.5, 3.3								T0263-3	
SPX29300	3A	1.8, 2.5, 3.3, 5			1	600	2.5	16	37mA	T0263-3	<ul style="list-style-type: none"> <li>Current limiting and thermal protection</li> <li>Reverse battery protection</li> </ul>

Part Number	Output Current	Output Voltage (V)	V <sub>OUT</sub> (V) Adjustable		Accuracy (%)	Typical Dropout Voltage (mV)	Operating Voltage (V)		Quiescent Current (μA)	Package	Features
			Min	Max			Min	Max			
SPX29301	3A	3.3, 5			1	600	4	16	37mA	T0263-5	<ul style="list-style-type: none"> <li>Enable pin</li> <li>Output error flag indicator</li> <li>Current limiting and thermal protection</li> </ul>
SPX29302	3A	Adj.	1.25	16	1	600	2.8	16	37mA	T0263-5	<ul style="list-style-type: none"> <li>Enable pin</li> <li>Current limiting and thermal protection</li> <li>Reverse battery protection</li> </ul>
XRP6275	3A	Adj.	0.6	2.4	0.5	80	1.045	2.625	3.5mA	DFN-10	<ul style="list-style-type: none"> <li>Power good, precision enable, current and thermal protection</li> <li>Reverse bias protection</li> </ul>
SPX29501	5A	3.3, 5			1	420	2.8	16	20mA	T0263-5	<ul style="list-style-type: none"> <li>Enable pin</li> <li>Output error flag indicator</li> <li>Current limiting and thermal protection</li> <li>Reverse battery protection</li> </ul>
SPX29502	5A	Adj.	1.24	15.2	1	420	2.8	16	20mA	T0263-5 T0220-5	<ul style="list-style-type: none"> <li>Enable pin</li> <li>Current limiting and thermal protection</li> <li>Reverse battery protection</li> </ul>



2A and 3A Ultra LDO Voltage Regulators



XRP6274/75 Achievable Conversions



## DDR Termination

Voltage regulators convert various input voltages and produce a constant regulated output voltage with current up to 2A.

### Applications

- DDR I/II/III termination

Part Number	Output Current	Output Voltage	Accuracy (%)	Operating Voltage (V)		Quiescent Current ( $\mu$ A)	Package	Features
				Min	Max			
XRP2997	2A	Adjustable	1	1.1	5.5	2	NSOIC-8	<ul style="list-style-type: none"><li>▪ DDR I/II/III bus termination regulator</li><li>▪ Over temperature protection</li><li>▪ Overcurrent protection</li></ul>

## Linear Regulators

Part Number	Output Current (mA)	Output Voltage (V)	Accuracy (%)	Operating Voltage (V)		Quiescent Current (mA)	Package	Features
				Min	Max			
SP78L05	100	5	5	7.5	18	1.5	NSOIC-8	<ul style="list-style-type: none"><li>▪ Over temperature protection</li><li>▪ Short-circuit protection</li></ul>

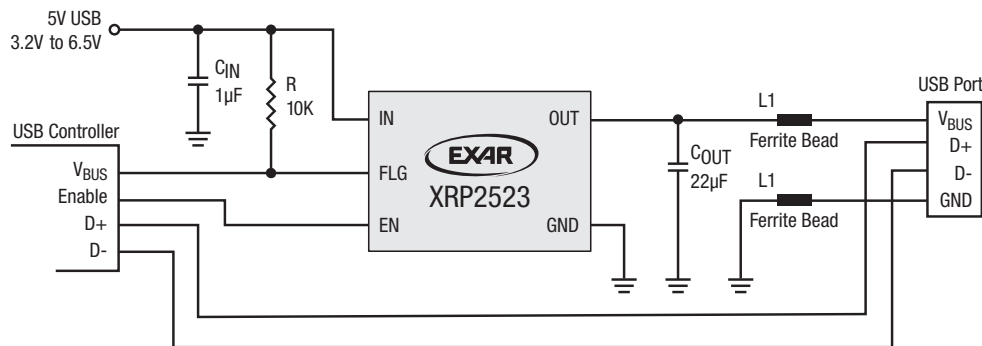
## Power Switches

Power switches provide low loss, high efficiency power management, monitoring and fault handling capabilities for any power distribution network. Use of these compact devices results in safer, more stable and more reliable interconnecting systems.

### Applications

- USB V<sub>BUS</sub> power management
- Set-top boxes
- USB peripherals
- Battery charger circuits

Part Number	Channel(s)	Output Current	Current Limit	Operating Voltage (V)		Quiescent Current (µA)	Package	Features
				Min	Max			
SP2525A	1	500mA	850mA	3	5.5	75	NSOIC-8	<ul style="list-style-type: none"> <li>▪ Active high or low enable pin(s)</li> <li>▪ USB 2.0 compliant</li> <li>▪ Current limiting</li> <li>▪ Fault flag indicator(s)</li> <li>▪ Over temperature protection</li> <li>▪ Undervoltage lock out protection</li> </ul>
SP2526A	2	500mA	850mA	3	5.5	110	NSOIC-8	<ul style="list-style-type: none"> <li>▪ Active high enable pin</li> <li>▪ Current limiting</li> <li>▪ Short-circuit protection</li> <li>▪ Over temperature protection</li> </ul>
SP619	1	600mA	800mA	2.5	5.5	350	SOT23-6	<ul style="list-style-type: none"> <li>▪ Active high or low enable pin(s)</li> <li>▪ USB 3.0 compliant</li> <li>▪ Current limiting</li> <li>▪ Blanking fault flag indicator(s)</li> <li>▪ Over temperature/reverse current protection</li> <li>▪ Undervoltage lock out protection</li> </ul>
XRP2525	1	900mA	1.15A	1.8	5.5	65	NSOIC-8	<ul style="list-style-type: none"> <li>▪ Active high or low enable pin(s)</li> <li>▪ USB 3.0 compliant</li> <li>▪ Current limiting</li> <li>▪ Blanking fault flag indicator(s)</li> <li>▪ Over temperature/reverse current protection</li> <li>▪ Undervoltage lock out protection</li> </ul>
XRP2526	2	900mA	1.15A	1.8	5.5	65	NSOIC-8	<ul style="list-style-type: none"> <li>▪ Active high or low enable pin(s)</li> <li>▪ USB 3.0 compliant</li> <li>▪ Current limiting</li> <li>▪ Blanking fault flag indicator(s)</li> <li>▪ Over temperature/reverse current protection</li> <li>▪ Undervoltage lock out protection</li> </ul>
XRP2527	1	900mA	Adj.	1.8	5.5	65	TDFN-8	<ul style="list-style-type: none"> <li>▪ Active high or low enable pin(s)</li> <li>▪ USB 3.0 compliant</li> <li>▪ Current limiting</li> <li>▪ Blanking fault flag indicator(s)</li> <li>▪ Over temperature/reverse current protection</li> <li>▪ Undervoltage lock out protection</li> </ul>
XRP2528	2	900mA	Adj.	1.8	5.5	65	TDFN-10	<ul style="list-style-type: none"> <li>▪ Active high enable and soft-start</li> <li>▪ USB 3.0 compliant</li> <li>▪ Current limiting</li> <li>▪ Blanking fault flag indicator(s)</li> <li>▪ Over temperature protection</li> <li>▪ Undervoltage lock out protection</li> </ul>
XRP2523	1	1.5A	1.6A	3.2	6.5	40	SOT23-5	<ul style="list-style-type: none"> <li>▪ Active high enable and soft-start</li> <li>▪ USB 3.0 compliant</li> <li>▪ Current limiting</li> <li>▪ Blanking fault flag indicator(s)</li> <li>▪ Over temperature protection</li> <li>▪ Undervoltage lock out protection</li> </ul>
XRP2524	2	1A	1.5A	2.7	6.5	80	NSOIC-8	<ul style="list-style-type: none"> <li>▪ Active high enable and soft-start</li> <li>▪ USB 3.0 compliant</li> <li>▪ Current limiting</li> <li>▪ Blanking fault flag indicator(s)</li> <li>▪ Over temperature protection</li> <li>▪ Undervoltage lock out protection</li> </ul>



1.5A USB Power Distribution Switch

## Voltage References

Voltage references provide a precise and stable output voltage over a wide range of conditions such as input voltage fluctuations and/or operating temperature change. These devices guarantee system accuracy and performance.

### Applications

- Power supplies
- Mother boards
- Medical and industrial instrumentation

Part Number	V <sub>REF</sub> (V)	Accuracy (%)	Operating Current (mA)	Max Operating Voltage (V)	I <sub>REF</sub> (μA)	Operating Temperature Range (°C)	Temperature Coefficient (ppm/°C)	Package	Features
SPX385	1.235	1	0.01 to 20	–	–	-40 to 85	80	NSOIC-8	<ul style="list-style-type: none"> <li>▪ Shunt reference</li> <li>▪ Replacement for LM285/385</li> </ul>
	2.5 5							SOT23-3	
	2.5	2						T092-3	
SPX431A	2.5	0.5	1 to 150	36	0.7	-40 to 125	30	SOT89-3 T092-3	<ul style="list-style-type: none"> <li>▪ V<sub>REF</sub> adjustable up to 36V</li> <li>▪ Replaces TL431 and AS431</li> </ul>
SPX431L	2.5	0.5	1 to 100	20	0.7	0 to 105	30	T092-3	<ul style="list-style-type: none"> <li>▪ V<sub>REF</sub> adjustable up to 20V</li> <li>▪ Replaces TL431 and AS431</li> </ul>
		1						SOT89-3 T092-3	
SPX432	1.24	0.5	1 to 80	15	3	0 to 105	50	SOT23-3	<ul style="list-style-type: none"> <li>▪ V<sub>REF</sub> adjustable to 15V</li> <li>▪ Replaces TLV431 and AS432</li> </ul>
		1						SOT23-3	
SPX1431	2.5	0.4	1 to 150	36	0.7	-55 to 125	30	SOT89-3	<ul style="list-style-type: none"> <li>▪ V<sub>REF</sub> adjustable up to 36V</li> <li>▪ Replaces TL1431</li> </ul>
SPX2431	2.5	0.5, 1	1 to 100	20	0.7	0 to 105	30	SOT23-3	<ul style="list-style-type: none"> <li>▪ V<sub>REF</sub> adjustable up to 20V</li> <li>▪ Replaces TL2431 and AS2431</li> </ul>
XRP431L	1.24	0.5	0.1 to 100	18	0.15	-40 to 125	20	SOT23-5	<ul style="list-style-type: none"> <li>▪ V<sub>REF</sub> adjustable up to 18V</li> </ul>

**Supervisors**

Supervisory circuits ensure safe operating conditions for microprocessor and memory-based systems. By monitoring one or more system supplies, supervisory circuits provide basic protection such as power-on reset as well as fault monitoring during power-up, power down and undervoltage (brownout) conditions. Additional functions typically include a watchdog timer, a manual reset and battery backup supply switching.

**Applications**

- Mother boards
- Telecom and datacom equipment
- Medical and industrial instrumentation

Part Number	Channel(s)	Reset Threshold (V)	Reset Accuracy	Reset Active	Operating Voltage(V)		Quiescent Current (µA)	Package	Features
					Min	Max			
SP690A	1	4.65	125mV	Low	1	5.5	35	NSOIC-8 PDIP-8	<ul style="list-style-type: none"> <li>▪ Watchdog timer</li> <li>▪ Back-up battery switchover</li> <li>▪ Power fail, low battery indicator</li> </ul>
SP690S	1	2.925	75mV	Low	1	5.5	25	NSOIC-8	<ul style="list-style-type: none"> <li>▪ Watchdog timer</li> <li>▪ Back-up battery switchover</li> <li>▪ Power fail, low battery indicator</li> </ul>
SP690T	1	3.075	75mV	Low	1	5.5	25	NSOIC-8	<ul style="list-style-type: none"> <li>▪ Watchdog timer</li> <li>▪ Back-up battery switchover</li> <li>▪ Power fail, low battery indicator</li> </ul>
SP691	1	4.65	125mV	Low/High	1	5.5	35	NSOIC-16 WSOIC-16	<ul style="list-style-type: none"> <li>▪ Programmable watchdog timer</li> <li>▪ Back-up battery switchover</li> <li>▪ Power fail, low battery indicator</li> <li>▪ Chip enable gating</li> </ul>
SP705	1	4.65	150mV	Low	1.1	5.5	40	NSOIC-8 MSOP-8	<ul style="list-style-type: none"> <li>▪ Watchdog timer</li> <li>▪ Power fail, low battery indicator</li> <li>▪ Manual reset</li> </ul>
SP706	1	4.40	150mV	Low	1.1	5.5	40	NSOIC-8 MSOP-8	<ul style="list-style-type: none"> <li>▪ Watchdog timer</li> <li>▪ Power fail, low battery indicator</li> <li>▪ Manual reset</li> </ul>
SP706R	1	2.63	80mV	Low	1.1	5.5	25	NSOIC-8 MSOP-8	<ul style="list-style-type: none"> <li>▪ Watchdog timer</li> <li>▪ Power fail, low battery indicator</li> <li>▪ Manual reset</li> </ul>
SP706S	1	2.93	80mV	Low	1.1	5.5	25	NSOIC-8 MSOP-8	<ul style="list-style-type: none"> <li>▪ Watchdog timer</li> <li>▪ Power fail, low battery indicator</li> <li>▪ Manual reset</li> </ul>
SP706T	1	3.08	80mV	Low	1.1	5.5	25	NSOIC-8 MSOP-8	<ul style="list-style-type: none"> <li>▪ Watchdog timer</li> <li>▪ Power fail, low battery indicator</li> <li>▪ Manual reset</li> </ul>
SP707	1	4.65	150mV	Low/High	1.1	5.5	40	NSOIC-8 MSOP-8	<ul style="list-style-type: none"> <li>▪ Power fail, low battery indicator</li> <li>▪ Manual reset</li> </ul>
SP708	1	4.40	150mV	Low/High	1.1	5.5	40	NSOIC-8	<ul style="list-style-type: none"> <li>▪ Power fail, low battery indicator</li> <li>▪ Manual reset</li> </ul>
SP708R	1	2.63	80mV	Low/High	1.1	5.5	25	NSOIC-8	<ul style="list-style-type: none"> <li>▪ Power fail, low battery indicator</li> <li>▪ Manual reset</li> </ul>
SP708S	1	2.93	80mV	Low/High	1.1	5.5	25	NSOIC-8 MSOP-8	<ul style="list-style-type: none"> <li>▪ Power fail, low battery indicator</li> <li>▪ Manual reset</li> </ul>
SP708T	1	3.08	80mV	Low/High	1.1	5.5	25	NSOIC-8	<ul style="list-style-type: none"> <li>▪ Power fail, low battery indicator</li> <li>▪ Manual reset</li> </ul>
SP791	1	4.65	150mV	High	1	5.5	40	NSOIC-16	<ul style="list-style-type: none"> <li>▪ Programmable watchdog timer</li> <li>▪ Back-up battery switchover</li> <li>▪ Power fail, low battery indicator</li> <li>▪ Chip enable gating</li> <li>▪ Manual reset</li> </ul>
SP809	1	2.3, 2.6, 2.9 3.1, 4.6	1.50%	Low	0.9	6	1	SOT23-3	<ul style="list-style-type: none"> <li>▪ 140ms reset pulse width</li> <li>▪ Push-pull output</li> </ul>
SP809N	1	2.3, 2.9 3.1, 4.6	1.50%	Low	0.9	6	1	SOT23-3	<ul style="list-style-type: none"> <li>▪ 140ms reset pulse width</li> <li>▪ Open drain output</li> </ul>
SP810	1	2.6, 4.4	1.50%	High	0.9	6	1	SOT23-3	<ul style="list-style-type: none"> <li>▪ 140ms reset pulse width</li> </ul>
SP813	1	4.65	150mV	High	1.1	5.5	40	NSOIC-8 PDIP-8	<ul style="list-style-type: none"> <li>▪ Watchdog timer</li> <li>▪ Manual reset</li> </ul>

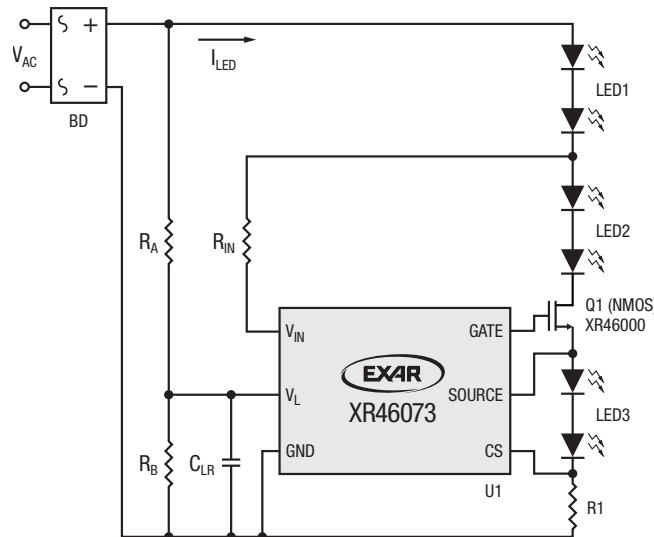
## AC Step Drivers

Exar is the world leader in AC step driver solutions for LED bulbs, tubes, troffers, downlights and decorative LED applications. Our patented distributed architecture eliminates the need for magnetics, MOVs and electrolytic capacitors providing robust, cost effective and extremely small solutions with low flicker, high power factor and low THD.

### Applications

- Downlight
- High bay
- Specialty
- Architectural

Part Number	Steps	Max Voltage (V)	V <sub>OUT</sub> MAX (mA)	Power Line Regulation	Dimming	Package	Features
XR46203	2	78	180	Y	Y; Triac	TDFN-8	<ul style="list-style-type: none"> <li>▪ 2-step integrated driver</li> <li>▪ Better thermal performance</li> <li>▪ Built in thermal foldback and VIN pin clamp</li> </ul>
XR46110	1	78	180	Y	Y; Triac	TDFN-6	<ul style="list-style-type: none"> <li>▪ 1-step driver</li> <li>▪ Improved line regulation</li> <li>▪ Built in thermal foldback and VIN pin clamp</li> </ul>
XR46073	2	78	180	Y	Y; Triac	TDFN-6	<ul style="list-style-type: none"> <li>▪ 2-step integrated driver</li> <li>▪ Improved line regulation</li> <li>▪ Built in thermal foldback and VIN pin clamp</li> </ul>
XR46050	2	78	180	N	Y; Triac	TDFN-6	<ul style="list-style-type: none"> <li>▪ 2-step integrated driver</li> <li>▪ Smallest footprint solution</li> <li>▪ Built in thermal foldback and VIN pin clamp</li> </ul>
XR46051	2	78	180	N	Y; Triac	TDFN-8	<ul style="list-style-type: none"> <li>▪ 2-step integrated driver</li> <li>▪ Smallest footprint solution</li> <li>▪ Built in thermal foldback and VIN pin clamp</li> </ul>
XR46084	1	80	130	N	Y; Triac	TDFN-6, SOT-89-5	<ul style="list-style-type: none"> <li>▪ 1-step driver</li> <li>▪ For use in non-dimmable applications</li> </ul>
XR46083	1	80	130	N	N	TDFN-6, SOT-89-5	<ul style="list-style-type: none"> <li>▪ 1-step driver</li> <li>▪ For use in non-dimmable applications</li> </ul>
XR46010	1	80	60	-	Y; Improved Triac	SOT23-3	<ul style="list-style-type: none"> <li>▪ Improves TRIAC dimmable performance when used with other AC step drivers</li> </ul>
XR46014	1	80	250	N	Y; Triac	SOT223-3	<ul style="list-style-type: none"> <li>▪ 1-step driver</li> <li>▪ For use in dimmable applications and full balance systems</li> </ul>
XR46000	-	600	-	-	-	SOT223-3	<ul style="list-style-type: none"> <li>▪ N-Channel Power MOSFET</li> <li>▪ Use with all Exar step driver solutions</li> <li>▪ Provides &gt; 750V native surge capability</li> </ul>



Two-Step LED Current Controller

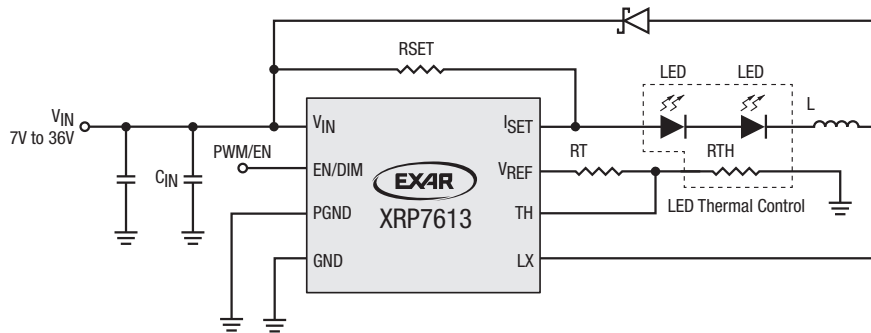
**Switching Regulators**

Efficiency, performance, size and reliability are rapidly imposing LEDs as the lighting solution of choice in space-constrained portable electronic equipment as well as in architectural and accent lighting fixtures. Exar's LED lighting products offer compact and efficient solutions for line and battery-operated devices and are capable of driving multiple LEDs in various series or parallel topologies.

**Applications**

- General lighting and display
- Medical and industrial instrumentation
- Keypad and signage backlighting

Part Number	Ch.	Max Current/Ch.	LEDs/Ch.	Operating Voltage (V)		Ref. Voltage (mV)	Freq. (MHz)	Max Output Voltage (V)	Quiescent Current (µA)	Efficiency (%)	Package	Application	Features
				Min	Max								
XRP7613	1	1.2A	8	7	36	100	<1	36	35	95	SOIC-8	High-powered LED	<ul style="list-style-type: none"> <li>▪ Hysteretic PFM control</li> <li>▪ Enable and soft-start functions</li> <li>▪ Analog and PWM dimming</li> <li>▪ Dynamic LED current thermal control</li> </ul>
SP7685	1	1.2A	1	2.7	5.5	50	2.4	5.5	500	94	DFN-10	Flash	<ul style="list-style-type: none"> <li>▪ Charge pump topology</li> <li>▪ Enable pin, flash/torch mode</li> <li>▪ Adjustable flash current, soft-start</li> <li>▪ Flash timeout protection</li> <li>▪ Overvoltage, overcurrent and temperature protection</li> </ul>
SP6685	1	700mA	1	2.7	5.5	50	2.4	5.5	500	94	DFN-10	Flash	<ul style="list-style-type: none"> <li>▪ Charge pump topology</li> <li>▪ Enable pin, flash/torch mode</li> <li>▪ Adjustable flash current, soft-start</li> <li>▪ Overvoltage, overcurrent and temperature protection</li> </ul>
SP6686	1	400mA	1	2.7	5.5	50	2.4	5.5	500	94	DFN-10	Flash	<ul style="list-style-type: none"> <li>▪ Overvoltage, overcurrent and temperature protection</li> </ul>
SP6699	1	20mA	6	2.5	16	200	1.2	27	3.2	84	SOT23-6	Backlight	<ul style="list-style-type: none"> <li>▪ Integrated Schottky diode</li> <li>▪ Enable pin, PWM dimming</li> <li>▪ Soft-start</li> </ul>



**1.2A 36V Step-Down LED Driver**

**Linear Drivers**

Part Number	Ch.	Max Current/Ch. (mA)	LEDs/Ch.	Operating Voltage (V)		Dropout Voltage (mV)	Ch./Ch. Accuracy (%)	Control Interface	Package	Application	Features
				Min	Max						
XRP7618	8	100	7	4.2	30	450	1.5	TTL	TSSOP-20	General	<ul style="list-style-type: none"> <li>▪ Enable pin, PWM dimming</li> <li>▪ Programmable LED current</li> <li>▪ Smart Talk power optimization</li> <li>▪ UVLO, OTP, open LED and overcurrent protection</li> </ul>

Exar Corporation designs, develops and markets high performance integrated circuits and system solutions for the industrial, infrastructure, automotive and audio/video markets. Exar's broad product portfolio includes power management, sensing and signal conditioning, interface, LED lighting, data management and video processing solutions. Exar has locations worldwide providing real-time customer support.

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