

World's Smallest Micro DC/DC with Integrated Coil

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2A High Speed LDO with Reverse Current Protection

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Low Capacitance TVS Diode Array for ESD Protection

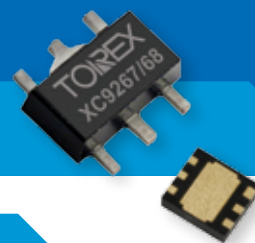
XBP06V0U25R-G

Ultra Low Capacitance TVS Diode for ESD Protection

XBP14E5UFN-G

Ultra Low Capacitance TVS Diode Array for ESD Protection

XC9267/68 36V 0.6A Synchronous Step-Down DC/DC Converter



The XC9267/68 is a synchronous step-down DC/DC with **P-Ch High Side Switch** to ensure low voltage operation with 100% max duty ratio. It can operate from 3.0V~36.0V and deliver loads up to 600mA making it an ideal replacement for inefficient Linear Regulators used in many industrial applications.

Designed for very **high efficiencies at low output loads**, with low quiescent current and automatic PFM/PWM mode. The XC9267/68 also works with Low ESR ceramic capacitors and comes with a choice of two switching frequencies, adjustable soft start and a power good output.

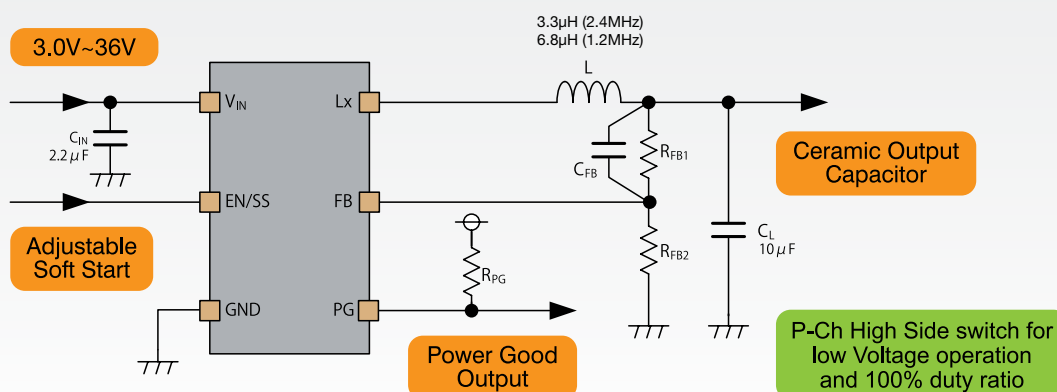
Available in the ultra-small USP-6C package, measuring only 2.0 x 1.8 x 0.6mm an extremely small DC/DC circuit can be implemented with a minimal number of external components.

The XC9267/68 includes a **fold-back type current limit circuit** and the IC will automatically resume normal operation as soon as the over-current condition disappears.

KEY FEATURES

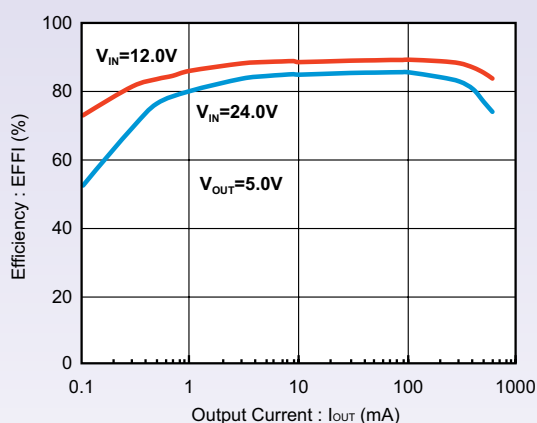
Output Current		600mA
ON Resistance	N-Ch	0.44Ω (typ)
	P-Ch	1.12Ω (typ)
Input Voltage Range		3.0V ~ 36V (Ab. Max 40V)
FB Voltage		0.75V±1.5%
Output Voltage Range		1.0V ~ 25.0V
Switching Frequency		1.2MHz or 2.4MHz
Quiescent Current		11.6μA (1.2MHz)
Product Select	XC9267	Fixed PWM Control
	XC9268	PWM/PFM Automatic Switching
Max Duty Cycle		100%
Protection Circuits	Current Limit Fold-back Circuit	
	UVLO (2.7V)	
	Thermal Shutdown	
Additional Features	Adjustable Soft-start	
	Optional Power Good Output	
	Low ESR Ceramic capacitors	
Op. Ambient Temperature		-40°C ~ +105°C
Package		USP-6C or SOT89-5

TYPICAL APPLICATION CIRCUIT



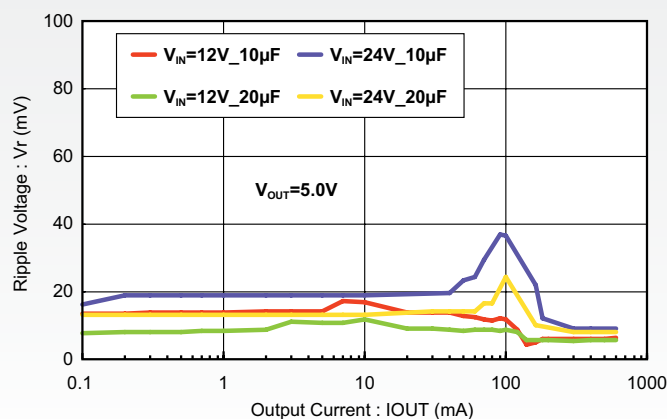
EFFICIENCY VS. OUTPUT CURRENT

XC9268B75C (PWM/PFM, 1.2MHz), L = 6.8μH, CIN = 2.2μF, CL = 10μF



OUTPUT RIPPLE VS. OUTPUT CURRENT

XC9268B75D (PWM/PFM, 2.4MHz), L=3.3μH, CIN = 2.2μF



FOLD-BACK TYPE CURRENT LIMIT PROTECTION

The current limiting circuit has both High Side Switch Current Limit and Low Side Switch Current Limit. These two current limits realize the fold-back current limiting operation and the Oscillation Frequency goes down automatically under current limit situation.

A Inductor Current reaches to the High Side Current Limit

When inductor current reaches to the High Side current limit (ILMH), the Low Side switch is kept on until the current reached to the Low Side current limit (ILML).

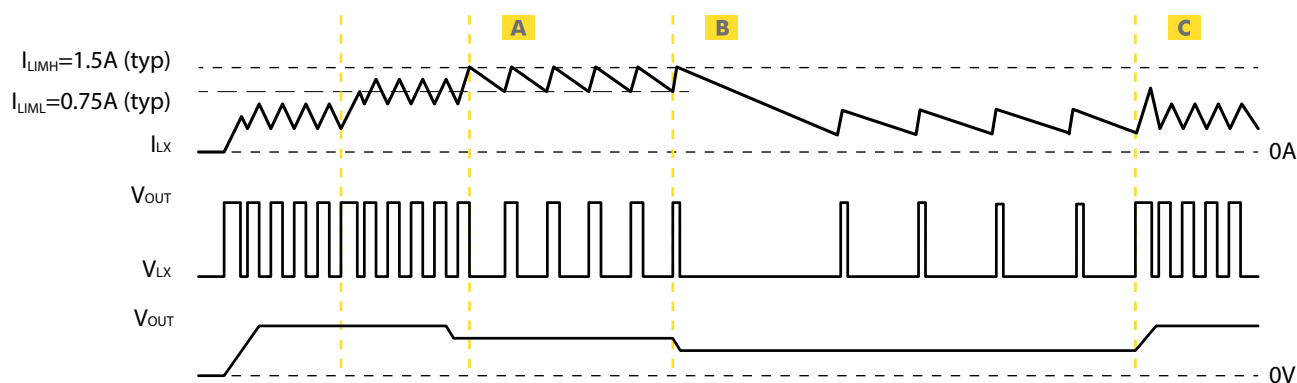
It makes the oscillation frequency lower.

B Fold-back Operation

When V_{OUT} (FB) voltage falls down with the current limit operation, ILMH and ILML values go down also for the fold-back operation.

C Automatic Restart

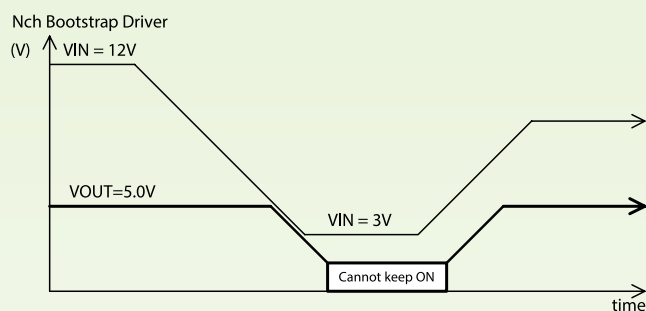
When the load becomes lighter, V_{OUT} rises up automatically without inrush current along with the fold-back current limit rising.



STABLE OPERATION FROM LOWER INPUT VOLTAGES

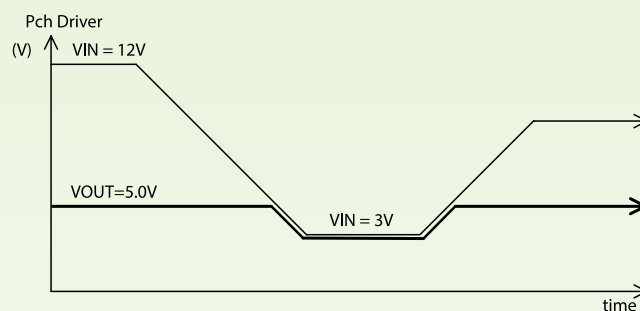
Many traditional mid-voltage DC/DC converters use an Nch MOSFET for the High Side switch. Whilst an Nch FET is excellent for high speed switching it normally needs a special bootstrap circuit to drive it.

A bootstrap circuit has the advantage of being simple and low cost, but it also has limitations. The Duty-cycle and on time is limited by the requirement to refresh the charge in the bootstrap capacitor, which means the maximum duty ratio can never be 100% and this has implications when the input Voltage goes below V_{OUT} as shown in the diagram below.

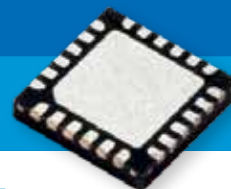


The XC9267/68 uses a Pch MOSFET for the High Side Switch that does not need a bootstrap circuit, so the maximum duty ratio can be 100%. This means that the output remains stable even when the input drops beneath V_{OUT} as shown in the diagram below:

The XC9267/68 output follows the input when it goes below V_{OUT} and this can be important for automotive 'cold crank' applications or for when the V_{IN} source has a high impedance (for example from a long cable).



XC9273 5.5V 3A Hi-SAT COT Step-Down DC/DC Converter



The XC9273 incorporates Hi-SAT COT, Torex's own Constant On-Time architecture, to deliver **extremely fast transient response** performance and high efficiency.

With Hi-SAT the XC9273 only needs one low cost 47 μ F ceramic capacitor at the output side, whilst competitors often need multiple capacitors to achieve similar levels of performance. However adding an extra capacitor will allow the user to reduce output ripple further if required.

Hi-SAT COT also provides **less fluctuation in oscillation frequency against load and input voltage** when compared to traditional COT control architectures.

With a 0.6V reference voltage source the output voltage can be set freely from 0.8V using external resistors. Furthermore, it is possible to control the output voltage dynamically using an external digital-to-analog converter (DAC).

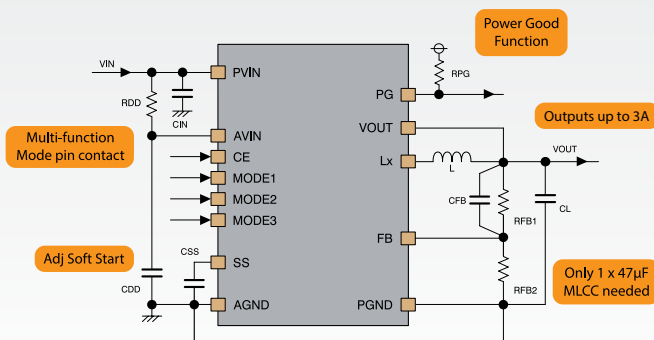
The XC9273 also allows the engineer to select different features using the MODE pins. Using a High or Low signal the engineer can select PWM control or PWM/PFM auto switching control (MODE1), Short Protection with latch or hiccup mode (MODE2) and optional CL discharge with soft OFF (MODE3).

The integral soft start time can be adjusted with an external capacitor (CSS) and a Power Good feature is also included to help with system power-up sequencing.

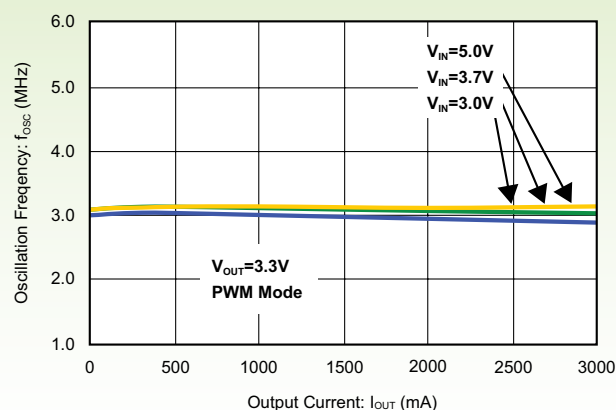
KEY FEATURES

Control Method	Hi-SAT COT	
Output Current	3.0A	
ON Resistance	N-Ch	38m Ω (typ)
	P-Ch	50m Ω (typ)
Input Voltage Range	2.7V ~ 5.5V	
FB Voltage	0.6V $\pm$ 1%	
Output Voltage Range	0.8V ~ 3.6V	
Switching Frequency	1.2MHz or 3.0MHz	
Mode Select	PWM or PWM/PFM Auto Switching	
Max Duty Cycle	100%	
Protection Circuits	Current Limit (Hiccup or Latch)	
	Thermal Shutdown	
	Short Circuit Protection	
	UVLO	
Additional Features	Adjustable Soft-start	
	CL Discharge with Soft Off	
	Low ESR Ceramic capacitors	
Op. Ambient Temperature	-40°C ~ +105°C	
Packages	QFN0404-24C	

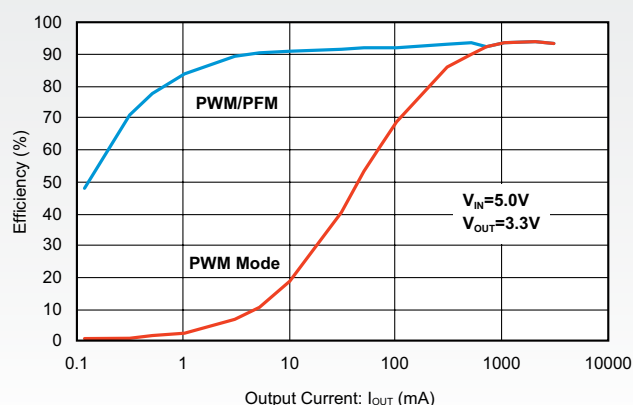
TYPICAL APPLICATION CIRCUIT



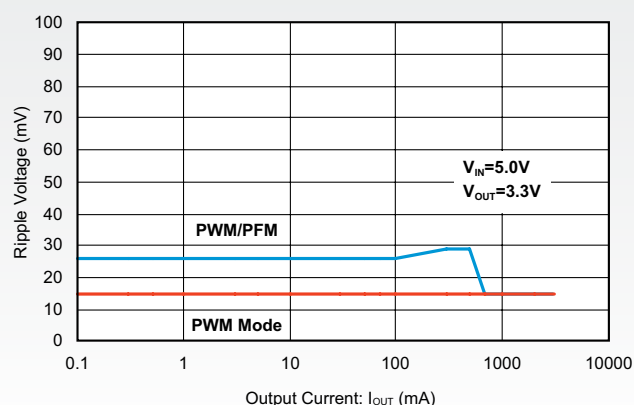
OSCILLATION FREQUENCY VS. OUTPUT CURRENT



EFFICIENCY VS. OUTPUT CURRENT



OUTPUT RIPPLE VS. OUTPUT CURRENT



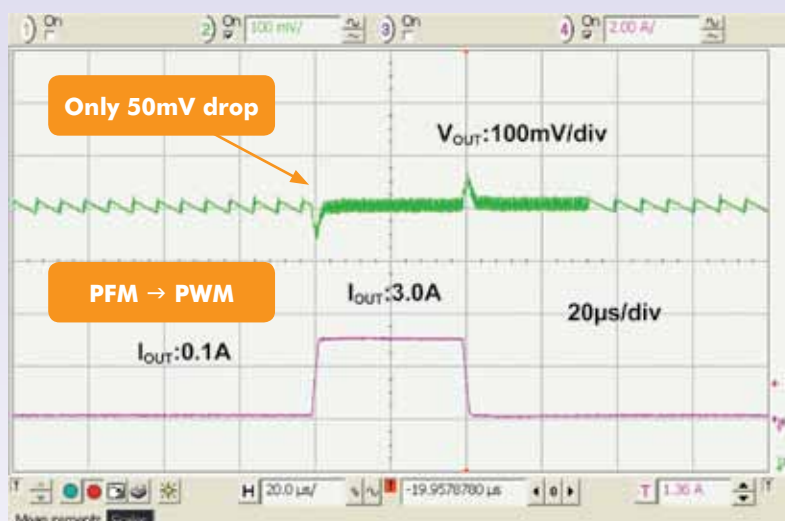
XC9273B06D (3MHz)

L = MWSA0624 (0.22 μ H), CIN = 47 μ F (GRM31CR61A476ME15L), CL = 94 μ F (GRM31CR60J476ME19Lx2), RFB1 = 68k Ω , RFB2 = 15 Ω , CFB = 820pF

FAST TRANSIENT RESPONSE WITH HI-SAT COT

With only 1 x 47 μ F / 10V Ceramic Capacitor (1206 size) for C_L

Hi-SAT COT
For Fast Transient Response

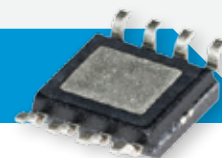


XC9273B06D

$V_{IN} = 5.0V$ $V_{OUT} = 1.8V$ $f_{OSC} = 3.0MHz$ $I_{OUT} = 0.1A \rightarrow 3.0A$, $T_r = 2.0\mu s$, $T_f = 2.0\mu s$

$L = MWSA0624$ (0.22 μH), $C_{IN} = 47\mu F$ (GRM31CR61A476ME15L), $C_L = 47\mu F$ (GRM31CR60J476ME19L) $R_{FB1} = 36k\Omega$, $R_{FB2} = 18k\Omega$, $CFB = 1500pF$ $MODE1 = L$ (PFM/PWM)

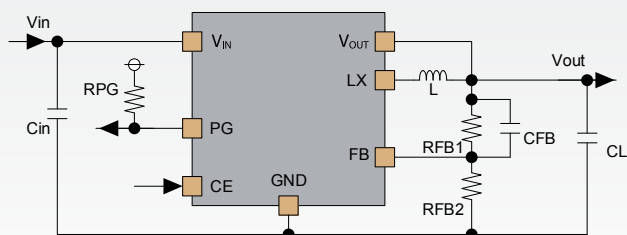
XC9274/75 5.5V 3A Hi-SAT COT Step-Down DC/DC Converter



The XC9274/75 are simplified versions of the XC9273 without the extra MODE pins. Many of the features are still available, but the parameters are set at the factory and users select their preferences through the part number ordered.

This reduces the number of pins needed and the XC9274/75 is available in SOP-8FD measuring 6.0mm x 4.9mm x 1.55mm and the package incorporates an exposed GND tab to maximize heat dissipation.

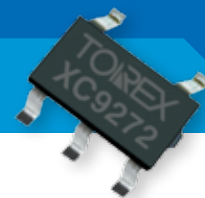
TYPICAL APPLICATION CIRCUIT



KEY FEATURES

Control Method		Hi-SAT COT
Output Current		3.0A
ON Resistance	N-Ch	47m Ω (typ)
	P-Ch	47m Ω (typ)
Input Voltage Range		2.7V ~ 5.5V
FB Voltage		0.6V $\pm$ 1%
Output Voltage Range		0.8V ~ 3.6V
Switching Frequency		1.2MHz or 3.0MHz
Product Select	XC9274	PWM only
	XC9275	PWM/PFM Auto Switching
Max Duty Cycle		100%
Protection Circuits	Current Limit (Hiccup or Latch)	
	Thermal Shutdown	
	Short Circuit Protection	
	UVLO	
Additional Features	Soft-start	
	CL Discharge with Soft Off	
	Low ESR Ceramic capacitors	
Op. Amb. Temperature		-40°C ~ +105°C
Packages		SOP-8FD

XC9272 Low Voltage, Ultra Low Power Synchronous Step-Down DC/DC



The XC9272 series of DC/DC converters supports lower output voltages from 0.6V to 0.95V, and achieves an ultra-low supply current of 0.5 μ A. This enables power to be supplied with high-efficiency to chipsets that require a core voltage under 1.0V and maximizes the performance of low-voltage chipsets.

Optimization of the analog circuitry to realize a supply current of 0.5 μ A and the use of PFM control for the operation method enable this product to achieve a significant increase of efficiency at light loads compared to conventional products.

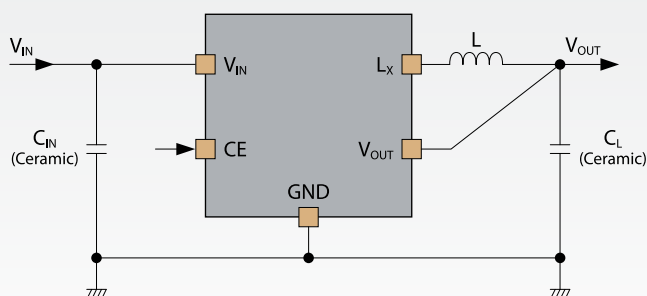
These characteristics make this power IC ideal for applications that require a long battery drive time, such as devices with a GPS function, wearable devices, energy harvesting and other devices in which efficiency in the sleep state is important.

The XC9272 series also features an enable pin to turn the IC on and off and an optional CL discharge function that can quickly discharge the output capacitor when the IC is turned off. During stand-by, all circuits are shutdown to reduce consumption to less than 0.1 μ A.

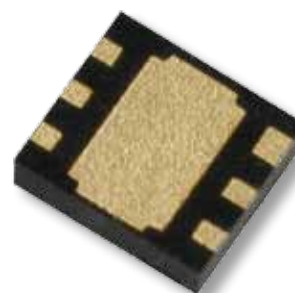
KEY FEATURES

Quiescent Current		0.5 μ A
Output Current		50mA
PFM Switching Current		180mA
ON Resistance	N-Ch	0.4 Ω (typ)
	P-Ch	0.4 Ω (typ)
Input Voltage Range		2.0V ~ 6.0V
Output Voltage Range		0.6V~0.95V ($\pm$ 20mV, 0.05V steps)
Control Method		PFM
Protection Circuits	Current Limit Circuit	
	Short Circuit Protection	
	UVLO (1.8V)	
Additional Features	CL Auto Discharge	
	Low ESR Ceramic capacitors	
Op. Ambient Temperature		-40°C ~ +85°C
Packages		SOT-25, USP-6EL

TYPICAL APPLICATION CIRCUIT



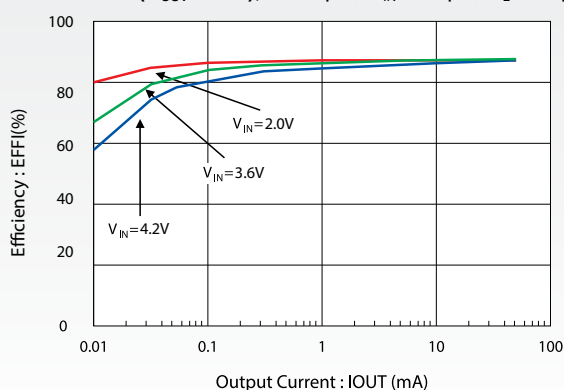
Available in
Ultra-Small Package



USP-6EL
(2.0 x 1.8 x 0.4mm)

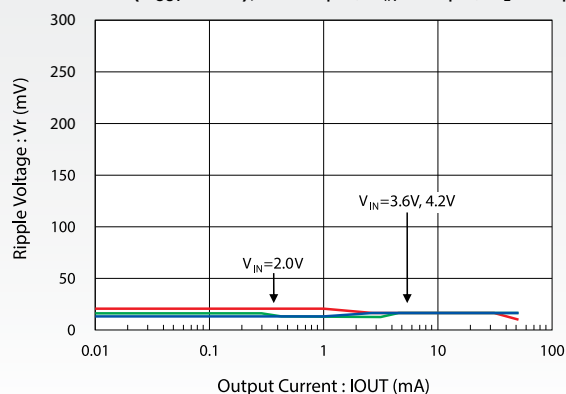
EFFICIENCY VS. OUTPUT CURRENT

XC9272A09B ($V_{OUT}=0.9V$), $L=10\mu H$, $C_{IN}=10\mu F$, $C_L=22\mu F$



OUTPUT RIPPLE VS. OUTPUT CURRENT

XC9272A09B ($V_{OUT}=0.9V$), $L=10\mu H$, $C_{IN}=10\mu F$, $C_L=22\mu F$



BENEFITS OF OPERATING AT LOWER VOLTAGES FOR CHIPSET CORE SUPPLY

It's well known that operating a microprocessor core at lower voltages will reduce overall power consumption, which in turn leads to less heat being produced and cooler devices can be made to run faster.

So as designers look to improve battery life whilst also increasing levels of performance the trend is inevitably towards lower and lower chipset voltages as can be seen in fig.1 to the right.

Previously core voltages operated between 1.8V and 1.1V but increasingly voltages below 1.0V are becoming popular for wearable devices and energy harvesting applications

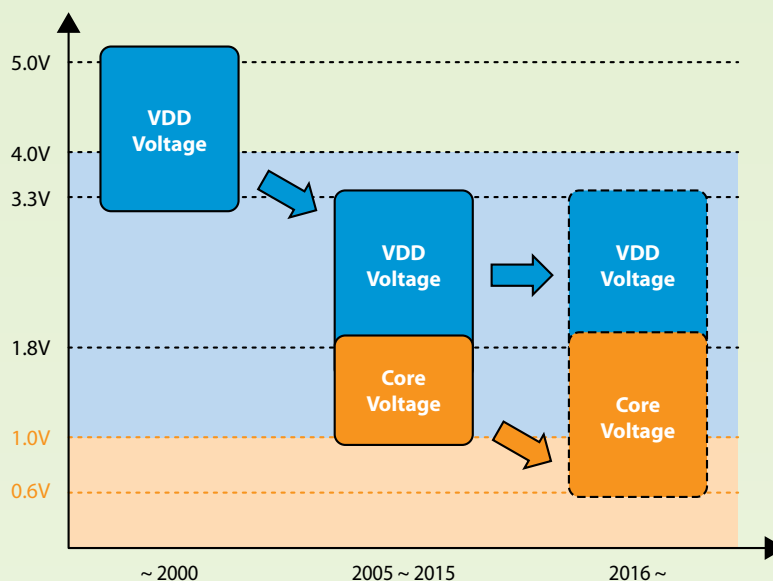


Fig.1 The evolution of chipset operating voltages

The new XC9272 combines small size, high-efficiency and the ability to supply a low voltage under 1V with high accuracy and this enables the engineer to significantly extend battery life.

To explore this further, we compare the performance under the following conditions at different output voltages.

Test Condition

$V_{IN} = 3.6V$

Operating Modes

- Active: $I_{OUT} = 10mA$ for 10ms
- Sleep: $I_{OUT} = 10\mu A$ for 5s

First, we tested a standard DC/DC with an IQ of $15\mu A$ and used it to generate 1.8V which is the typical core voltage required for many of today's microprocessor cores.

We then used the same DC/DC to generate 0.7V under the same conditions and finally we used the new XC9272 in the same circuit to generate 0.7V.

All three tests used the active and sleep modes indicated above and in fig.2 and fig.3 you can see the results.

Using the XC9272 to drive a 0.7V core voltage dramatically reduced overall power consumption and subsequently increased the system battery life almost 5 times.

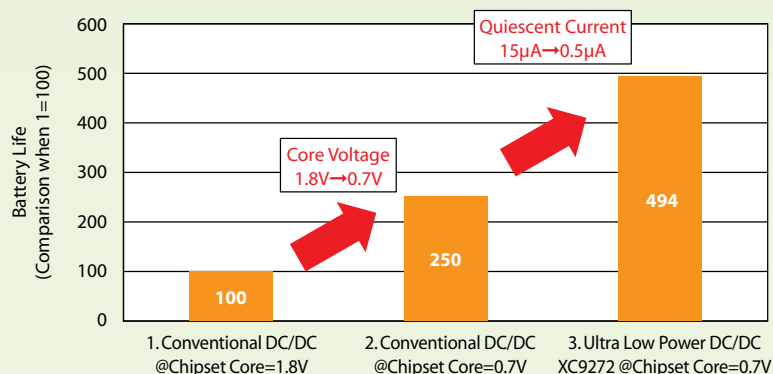


Fig.2 Battery life time vs. product and core voltage

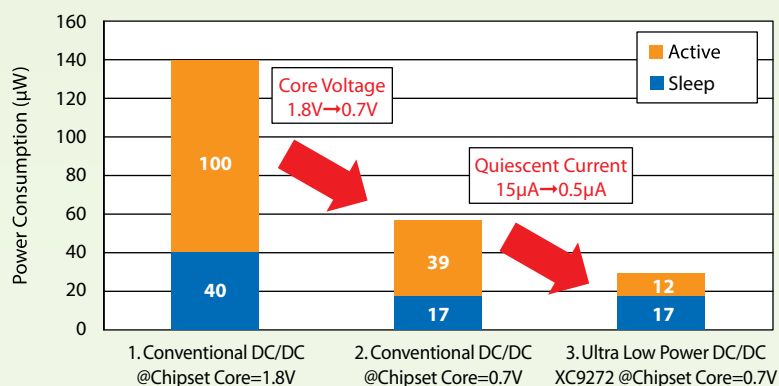


Fig.3 Power consumption vs. product and core voltage

XC6806

Li-Ion / Li-Polymer Battery Charger with Temperature Monitoring, Current Path & Shutdown



The XC6806 is a linear Li-Ion/Li-Po battery charger with a 450mA Input Current Limit and integrated Current Path to maintain and prioritize the system load during the charging cycle. It also includes a novel Storage Mode Shutdown function to help conserve battery life whilst the end product is in transit to the shops.

The integral input current limit makes the XC6806 ideal for USB charging or applications that use smaller AC/DC adaptors. The temperature monitoring function meets JEITA standards and by controlling the charge voltage and charge current as appropriate for the temperature, the battery can be charged safely. Additional protective functions include a safety timer, UVLO, thermal control, and reverse current protection.

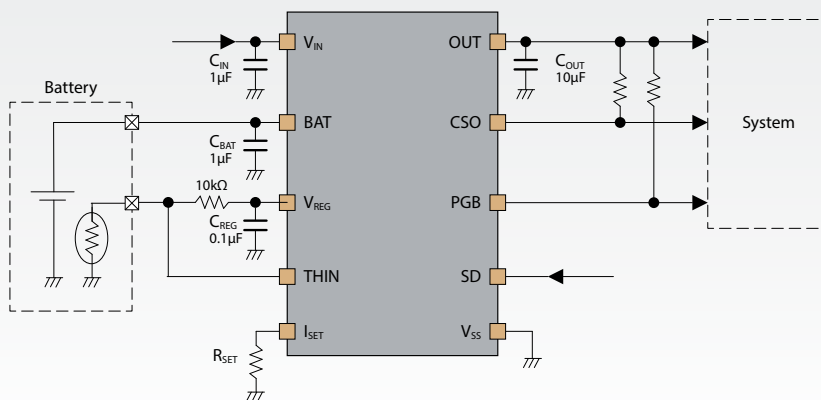
The Storage Mode Shutdown function completely shuts off power supply from the battery to the system to prevent battery leakage current while the device is in storage. When a power is connected to V_{IN} the Shutdown Mode is cleared. This allows the device to be operated with full battery immediately after purchase even if it has been in storage for extended periods of time.

The XC6806 is available in the small USP-10B or LGA-10B01 package and a charging circuit can be designed with minimal external components.

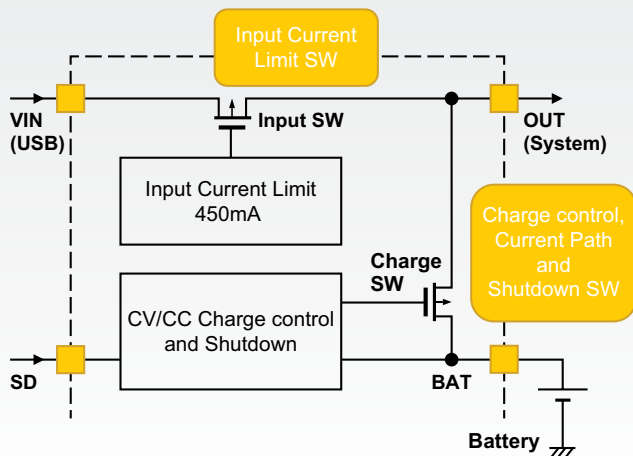
KEY FEATURES

Operating Voltage Range	4.5V ~ 6.0V
CC Charge Current	10mA ~ 380mA
CV Charge Voltage	3.5V ~ 4.45V
BAT Sink Reverse Current	0.1 μ A
Supply Current	200 μ A
Trickle Charge Mode	Yes
Recharge Function	Yes
Recharge Voltage 25°C	V _{CV} -0.1
Battery Temperature Monitor	Optional
	JEITA
Thermal Shutdown	Thermal Control
Reverse Current Protection	Yes
Mains Charge Hold Time	5hr
Trickle Charge Hold Time	0.5hr
Current Path	Yes
Shutdown Mode	Yes
Packages	USP-10B, LGA-10B01

TYPICAL APPLICATION CIRCUIT



OPERATION OF STORAGE-MODE, SHUTDOWN FUNCTION



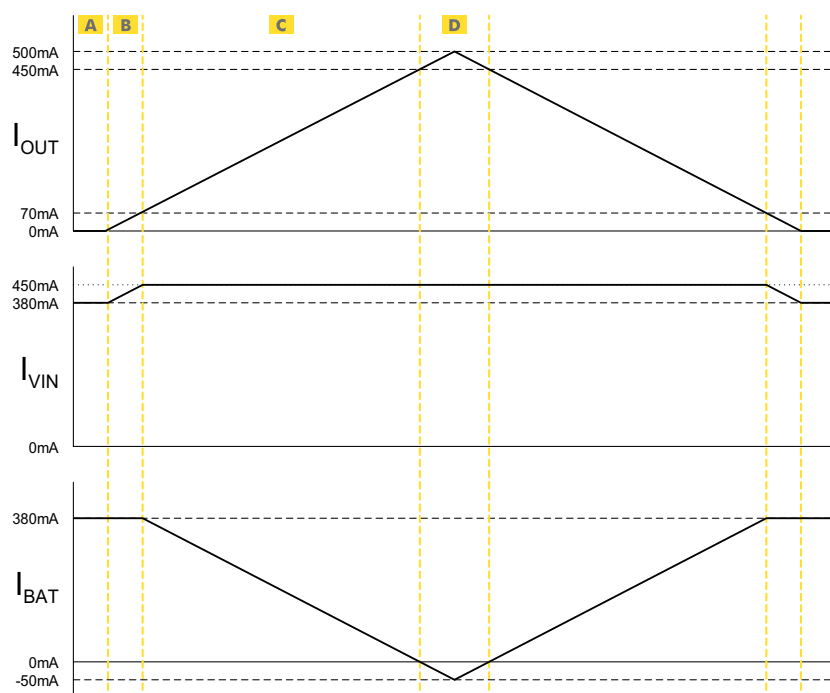
Shutdown Operation

After production, the time from shipment of finished goods to them being sold and used by the end customer may be a few months or more, depending on the supply route from factory to warehouse and to retail outlet.

During this time, to avoid the battery discharging, the Li-ion / Li-Po cell should ideally be disconnected from the system. This is not always possible with traditional Charging IC, but the XC6806 includes an additional Charge Switch to allow the user to cut-off the connection between battery and the System

The connection is cut using the integral diode of the Charge SW. A toggle signal to the SD pin enables the Shutdown mode operation when there is no VIN and once enabled, the consumption current from the BAT pin is only 0.1 μ A.

XC6806: OPERATION OF CURRENT PATH FUNCTION



Example: CC = 380mA case

A I_{OUT} for the system is 0mA, so, both I_{IN} and the charge current (I_{BAT}) are 380mA.

B When the system uses 0 to 70mA, I_{BAT} is kept as 380mA and I_{IN} increases 380mA to 450mA.

C When the system needs more current, the charge current (I_{BAT}) decreases to fit to the input current limit: 450mA as total.

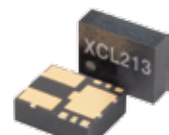
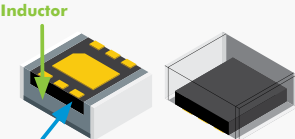
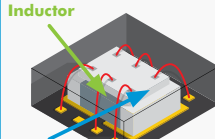
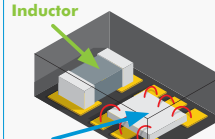
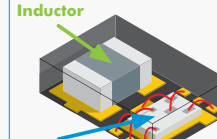
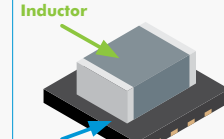
D When the system requires higher current larger than the input current limit: 450mA, the battery supports the gap, therefore I_{BAT} value goes to minus.

KEY FEATURES

SERIES	XC6801	XC6802	XC6803	XC6804	XC6805	XC6806
Operating Voltage Range	4.25V~6.0V	4.25V~6.0V	4.5V~6.0V	4.5V~6.0V	4.5V~6.0V	4.5V~6.0V
CC Charge Current	100mA~500mA	100mA~800mA	40mA~280mA	200mA~800mA	5mA~40mA	10mA~380mA
CV Charge Voltage	4.2V					3.5V~4.45V
BAT Pin Reverse Current	2.0μA	1.0μA	0.5μA	4.5μA	0.5μA	0.1μA
Supply Current	12μA	15μA	100μA	100μA	100μA	200μA
Charge Functions						
Trickle Charge Mode	Yes				Optional	Yes
Recharge Function	Yes		Optional		Yes	
Recharge Voltage (25°C)	-		3.9V			V _{CV} -0.1
Battery Temperature Monitor	No		Yes		Optional	Yes
	-		JEITA			
Protection Circuits						
Thermal Shutdown	Yes					Thermal Control
Reverse Current Protection	-		Yes			
Main Charge Hold Time	-		5hr	10hr	5hr	
Trickle Charge Hold Time	-		0.5hr	2hr	0.5hr	
Other Functions						
Current Path	-					Yes
Shutdown Mode	-					Yes
Packages	SOT89-5 SOT25 USP-6C	SOT89-5 SOT25 USP-6C USP-6EL	USP-6EL	USP-6EL SOP-8FD	USP-6EL	USP-10B LGA-10B01
Smallest Package Dimensions (mm)	2.0 x 1.8 x 0.6	2.0 x 1.8 x 0.4	2.0 x 1.8 x 0.4	2.0 x 1.8 x 0.4	2.0 x 1.8 x 0.4	2.5 x 1.6 x 0.4

One Concept – Four Solutions

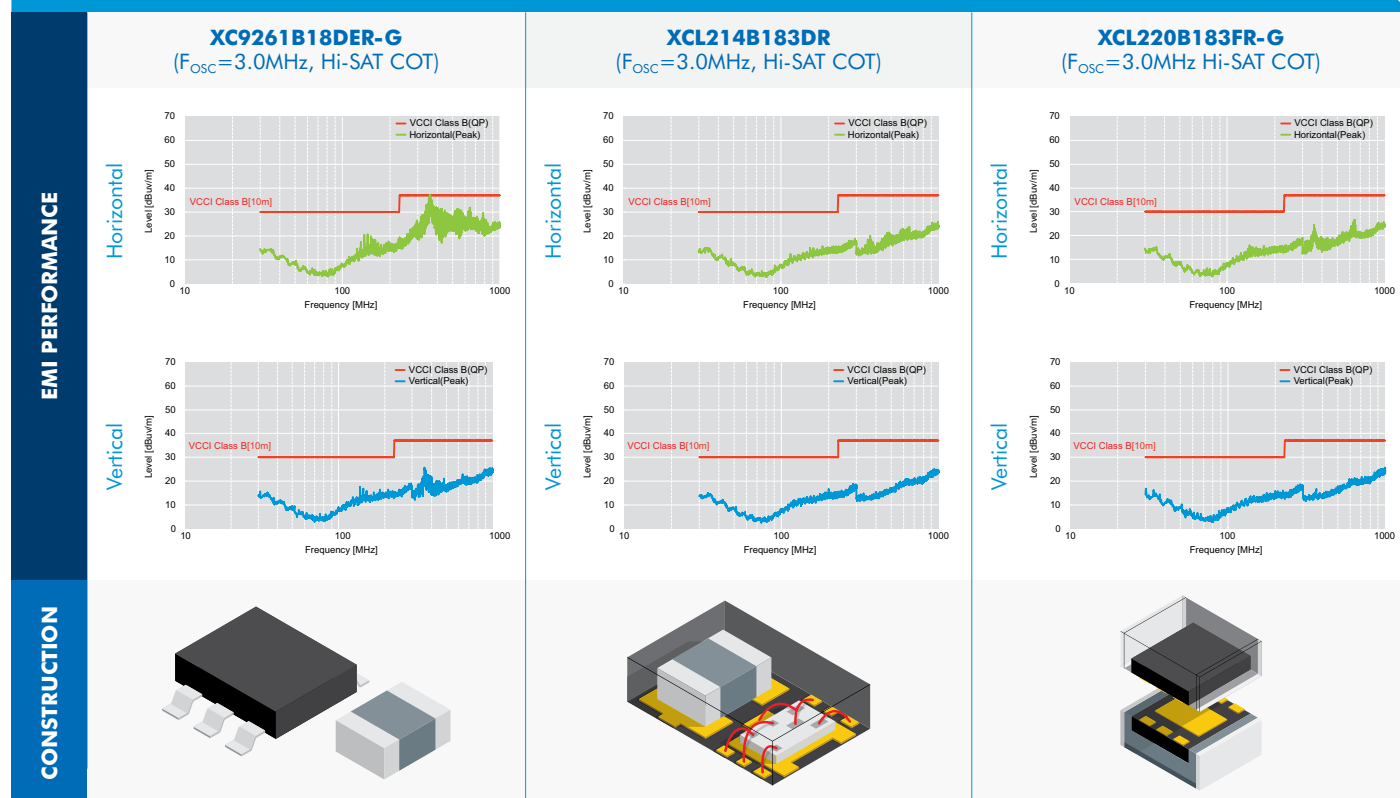
Torex offer MICRO DC/DC with four different internal constructions. Each one has advantages, so you can choose the one that best fits your application. Please see the table below.

	Packaged DC/DC Embedded into coil	DC/DC chip on top of coil	DC/DC chip beside coil		DC/DC package below coil
PHOTO	2.5 x 2.0 x 1.0mm 	2.5 x 2.15 x 1.05mm 	2.25 x 1.5 x 0.75mm 	3.2 x 2.5 x 1.05mm 4.7 x 3.1 x 1.35mm 	3.0 x 3.0 x 1.6mm 
CONSTRUCTION	 Inductor DC/DC Package	 Inductor DC/DC Chip	 Inductor DC/DC Chip	 Inductor DC/DC Chip	 Inductor DC/DC Chip
SERIES	XCL101, XCL102/03, XCL201/02, XCL205/06/07, XCL210, XCL219/20, XCL221/22	XCL208/09	XCL223/24	XCL211/12, XCL213/14	XCL225/26
COIL	The coil lies flat on the IC package. This shortens the path of the switching current and minimizes noise.	Lowest cost as very standard coil can be used.	Special wire bonding for ultra-low profile.	The IC and coil have good heat dissipation, so large currents can be used.	New construction for mid-voltage products

Low EMI / Radiated Noise

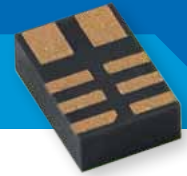
Another benefit for Torex MICRO DC/DC is much lower radiated noise compared with a normal DC/DC IC with an external coil. The data below compares the EMI performance and magnetic field strength for the different packaging options. When the IC is embedded under the Coil we see the lowest emissions (XCL220 type), but all MICRO DC/DC generate considerably less radiated noise compared to the traditional topology (XC9261 type):

MICRO DC/DC – UNBEATABLE EMI PERFORMANCE



XCL223/24

Low Profile, Step-Down, Micro DC/DC Converter with Integrated Coil



11

The XCL223/24 is a family of Ultra Low Profile Micro DC/DC Step-Down Converters with integrated coil. Measuring only 2.25mm x 1.5mm x 0.75mm (max), the XCL223/24 series is designed to minimize EMI emissions and maximize efficiency, while delivering a very stable output with low peak to peak ripple Voltage (<10mV).

Utilizing Hi-SAT COT, Torex's Constant ON Time architecture gives the XCL223/24 extremely fast load transient response performance in comparison to standard DC/DC solutions. Hi-SAT COT also provides less fluctuation in oscillation frequency against load and input voltage when compared to traditional COT control architectures.

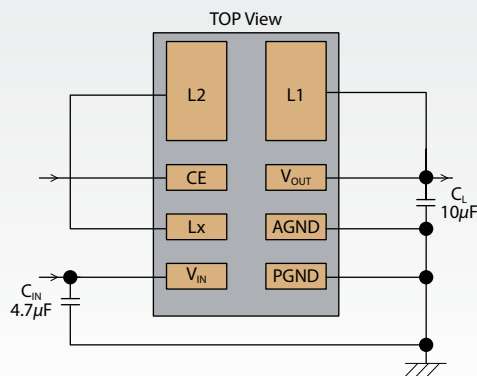
The small size and simple circuit architecture makes the XCL223/24 an ideal replacement for inefficient LDO voltage regulators and by integrating the coil, Torex has simplified the circuit layout for the designer and reduced the number of external components normally needed to implement this type of DC/DC solution. The smaller circuit layout also means less PCB tracking, which helps further reduce the radiated noise.

**World's Smallest Micro DC/DC
2.25 x 1.5 x 0.75mm**

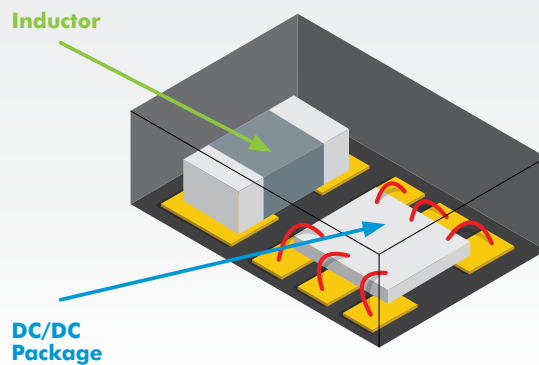
KEY FEATURES

Output Current		400mA (B Type)
		700mA (A Type)
ON Resistance	N-Ch	0.10Ω (typ)
	P-Ch	0.14Ω (typ)
Input Voltage Range		2.7V ~ 5.5V
Output Voltage Range		0.8V ~ 3.6V
Switching Frequency		3.0MHz
Quiescent Current		25μA (typ)
Max Duty Cycle		100%
Product Select	XCL223	Fixed PWM Control
	XCL224	PWM/PFM Automatic Switching
Protection Circuits		Current Limit Circuit
		Thermal Shut Down
		Short Circuit Protection
		ULVO (2.0V)
Additional Features		High Speed Soft-start
		CL Discharge
		Low ESR Ceramic capacitors
Package		USP-8B04

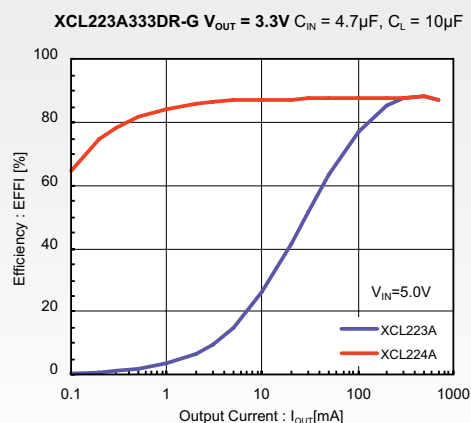
TYPICAL APPLICATION CIRCUIT



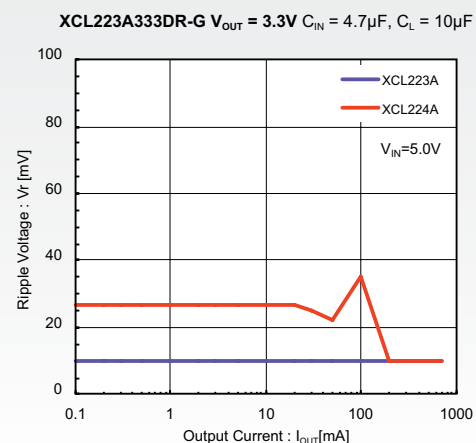
INTERNAL CONSTRUCTION



EFFICIENCY VS. OUTPUT CURRENT



OUTPUT RIPPLE VS. OUTPUT CURRENT



XCL225/26

18V 500mA Step-Down Micro DC/DC Converter with Integrated Coil

COMING SOON

The XCL225/26 series is a synchronous step-down Micro DC/DC converter with integrated coil in an ultra-small 3.0 x 3.0 x 1.6mm DFN3030-10B package.

A stable and efficient power supply circuit can be configured by simply adding only two ceramic capacitors externally thereby contributing to PCB space saving and the shortening of development time. Integration of the coil simplifies the board layout and minimizes any unwanted radiated noise.

With a P-Ch High Side Switch to ensure low Voltage operation and 100% max duty ratio, the XCL225/26 can operate from 3.0V~18.0V and deliver loads up to 500mA. It's designed for very high efficiencies at low output loads, with low quiescent current and automatic PFM/PWM mode.

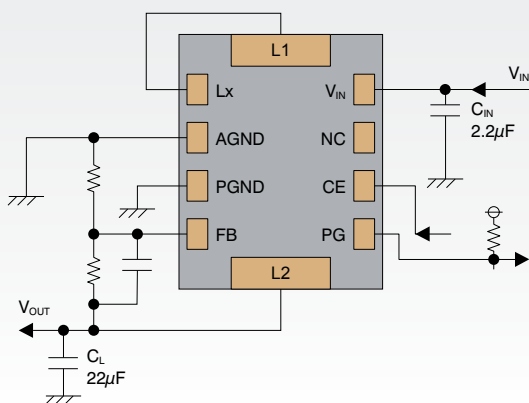
The XCL225/26 includes Current Limit Fold-back circuit, adjustable soft start and a power good output.

Wide V_{IN} Range: 3.0V ~ 18V
Low Quiescent Current: 12 μ A

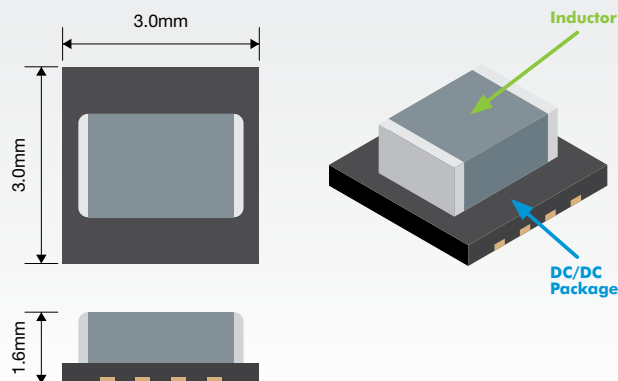
KEY FEATURES

Output Current		500mA
ON Resistance	N-Ch	0.64 Ω (typ)
	P-Ch	0.99 Ω (typ)
Input Voltage Range		3.0V ~ 18V (Ab. Max 20V)
FB Voltage		0.75V $\pm$ 1.5%
Output Voltage Range		1.0V ~ 15.0V
Switching Frequency		1.2MHz
Quiescent Current		12 μ A
Product Select	XCL225	Fixed PWM Control
	XCL226	PWM/PFM Automatic Switching
Max Duty Cycle		100%
Protection Circuits	Current Limit Fold-back Circuit	
	UVLO (2.7V)	
	Thermal Shutdown	
Additional Features	Adjustable Soft-start	
	Power Good Output	
	Optional CL Discharge	
	Low ESR Ceramic capacitors	
Op. Ambient Temperature		-40°C ~ +105°C
Package		DFN3030-10B

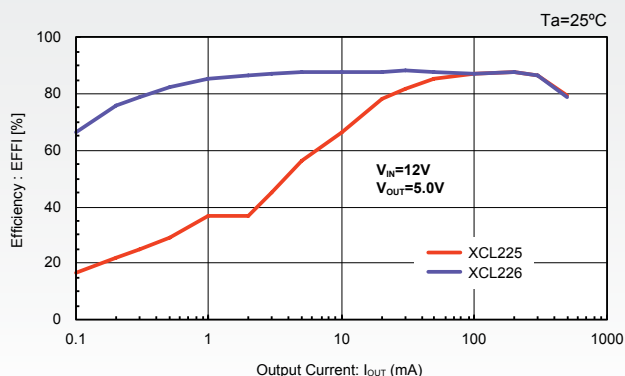
TYPICAL APPLICATION CIRCUIT



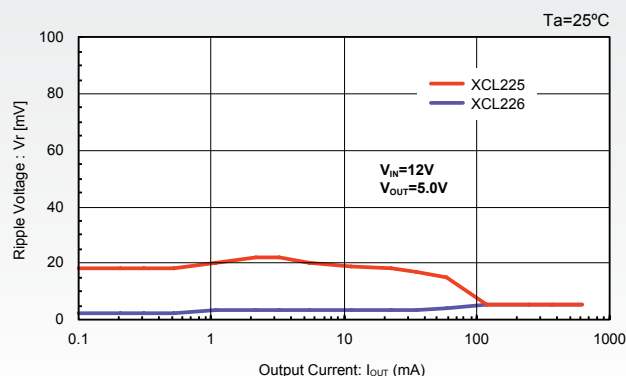
INTERNAL CONSTRUCTION



EFFICIENCY VS. OUTPUT CURRENT



OUTPUT RIPPLE VS. OUTPUT CURRENT





The XCL102/03 series is a synchronous boost converter with integrated coil that is optimized to provide high efficiencies under all load conditions. The DC/DC circuit integrates a 0.30Ω Nch driver transistor and a 0.30Ω synchronous Pch switching transistor. The internal switching frequency is 3.0MHz and output currents up to 500mA can be realized with only two low cost ceramic capacitors.

The internal circuit can start operation from Input voltages as low as 0.85V and once started will continue to operate until the input goes below 0.65V.

The output voltage is set internally between 2.2V~5.5V ($\pm 2\%$) in 0.1V increments and with a quiescent current of only $26\mu A$ reducing to $0.1\mu A$ during standby, the XCL102/03 helps to further maximize battery life in portable applications.

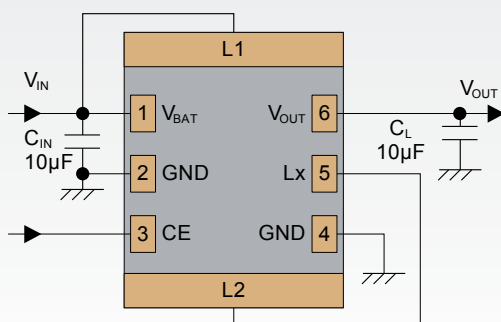
This series also features an optional load disconnect function that prevents the battery charge from leaking to the output while the IC is not operating or an Input bypass mode function to keep the connection between the input and output side during shutdown.

Ultra Small Size
2.5 x 2.0 x 1.0mm

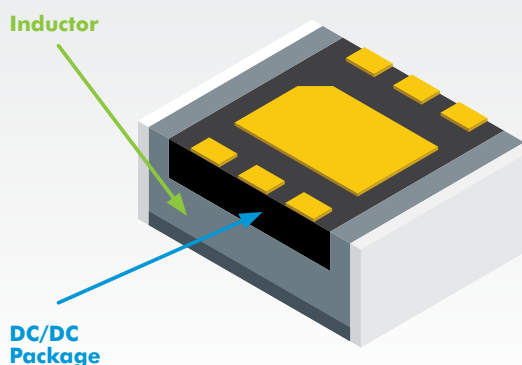
KEY FEATURES

Input Current Limit		800mA
ON Resistance	N-Ch	0.30Ω (typ)
	P-Ch	0.30Ω (typ)
Input Voltage Range		0.65V ~ 6.0V
Output Voltage Range		2.2V ~ 5.5V (0.1V steps)
Switching Frequency		3.0MHz ($\pm 15\%$)
Quiescent Current		$26\mu A$
Product Select	XCL102	Fixed PWM Control
	XCL103	PWM/PFM Automatic Switching
Max Duty Cycle		93% (TYP)
Protection Circuits		Current Limit
		Short Circuit
Additional Features		Soft Start
		Load Disconnect (D Type)
		180 Ω Bypass Switch (E Type)
		Ceramic Capacitors
Op. Ambient Temperature		-40°C ~ +85°C
Package		CL-2025-02

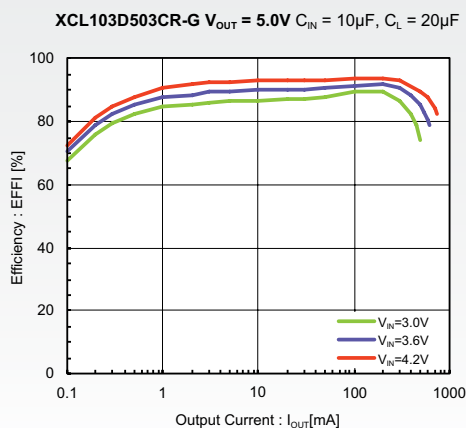
TYPICAL APPLICATION CIRCUIT



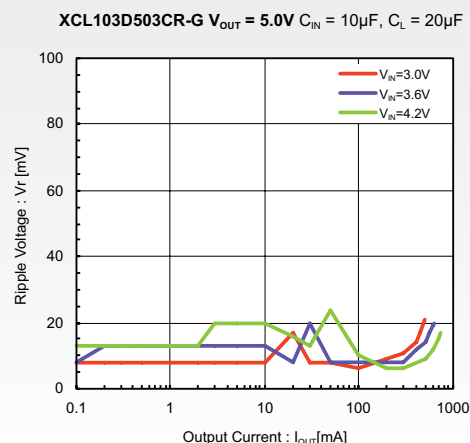
INTERNAL CONSTRUCTION



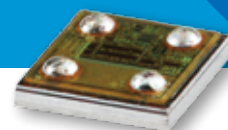
EFFICIENCY VS. OUTPUT CURRENT



OUTPUT RIPPLE VS. OUTPUT CURRENT



XC6501 200mA High Speed LDO in an Ultra Low Profile Package



This low noise CMOS LDO regulator can provide a stable output voltage without needing an external load capacitor (C_L) because unlike other LDO the phase compensation is carried out internally, on chip.

The CE function enables the circuit to be put into stand-by mode by inputting a low level signal to the CE pin thereby reducing current consumption from an already low $13\mu\text{A}$ (in operation) to less than $0.1\mu\text{A}$.

The current limit fold-back circuit operates as a short circuit protection and a current limiter function for the output pin.

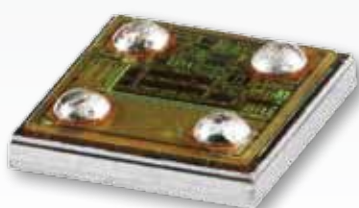
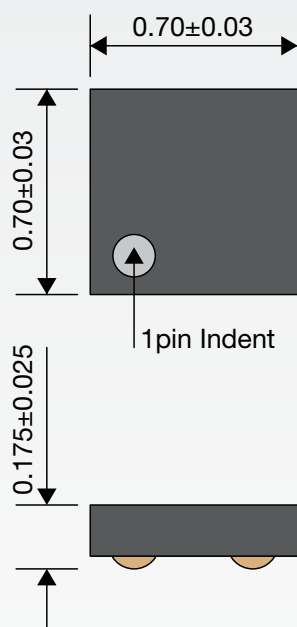
The XC6501 is now available in the new tiny, ultra-low profile WLP-4-01 package. It is one of the thinnest on the market, making it ideal for smart card and wearable applications.

Available in
Ultra-Small Package

PACKAGE DIMENSIONS

WLP-4-01

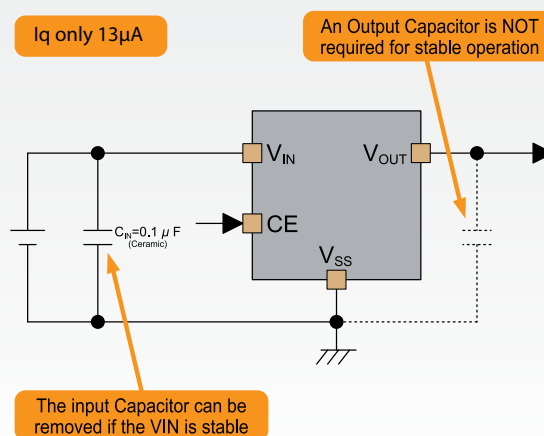
Maximum Height 0.2mm



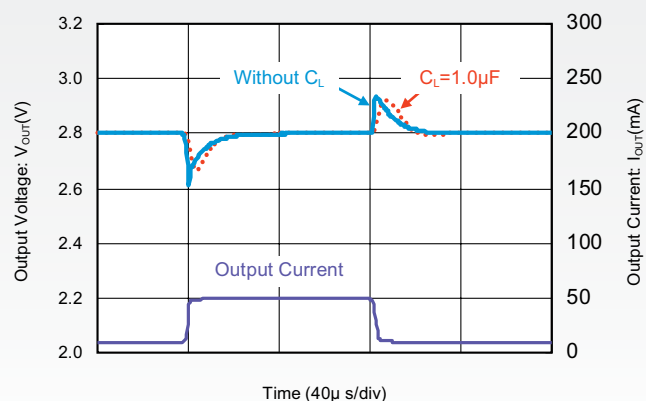
KEY FEATURES

Output Current	200mA
Dropout Voltage ($V_{OUT}=3.0V$)	150mV @ $I_{OUT}=100mA$
Operating Voltage Range	1.4V ~ 6.0V
Output Voltages	1.2V ~ 5.0V (0.05V steps)
Output Accuracy	$\pm 1\%$ or $\pm 20mV$
Quiescent Current (TYP)	$13\mu\text{A}$
Stand-by Current (TYP)	$0.01\mu\text{A}$
Ripple Rejection	50dB
Current Limit Threshold (TYP)	300mA
Short Circuit Protection (TYP)	25mA
Additional Features:	Optional CL Discharge
Packages	SOT25, SSOT24, USP-4, USP-4, USP-3 or WLP-4-01

TYPICAL APPLICATION CIRCUIT



LOAD TRANSIENT RESPONSE



The XC6230 is a small and fast multifunction LDO regulator with a maximum output current of 2A and an adjustable output voltage and current limit value.

An internal 0.17Ω low ON resistance P-ch Tr. and a stable output voltage with small dropout voltage make these products ideal for post regulators (DC/DC rear-stage ripple removal), various types of microcontrollers, regulators for logic applications, and secondary power supplies. The XC6230 series can also be used in consumer electronics, industrial equipment, communication modules, and electricity smart meters.

In addition to a function that enables the output voltage and current limit value to be set externally and a function that prevents a reverse current higher than the input pin (VIN) from flowing into the output pin (VOUT), a rich variety of protective circuits such as overheating protection (TSD) and startup rush current prevention can be added.

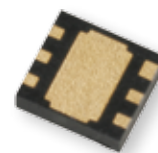
The output voltage and over-current limit value can be set using a total of only five chip capacitors and chip resistors.

KEY FEATURES

Output Current	2.0A
Adjustable Current Limit	0.3A ~ 2.5A
On Resistance	0.17Ω @ 3.3V / 1A
Dropout Voltage	$0.17V$ @ 3.3V / 1A
Input Voltage	1.7V ~ 6.0V
Output Voltage	1.2V ~ 5.0V
Quiescent Current	45 μ A
Reverse Current Protection	YES
Inrush Current Prevention	YES
CL High Speed Discharge	YES
Thermal shutdown	YES
Op. Ambient Temperature	-40°C ~ +105°C

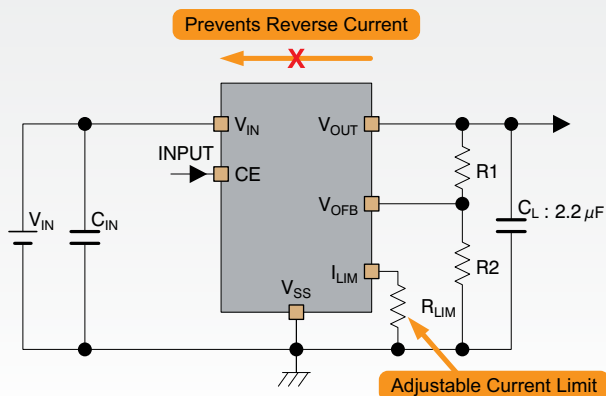


SOP-8FD
(6.0 x 4.9 x 1.55mm)

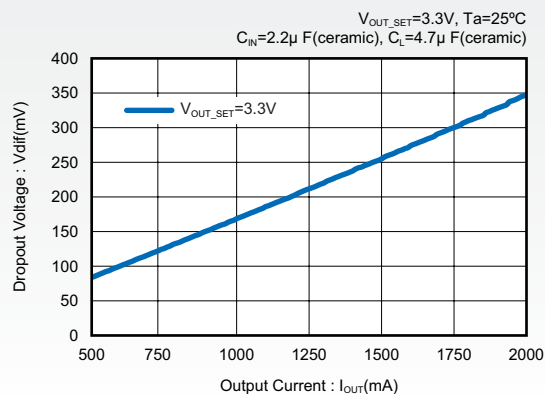


USP-6C
(2.0 x 1.8 x 0.6mm)

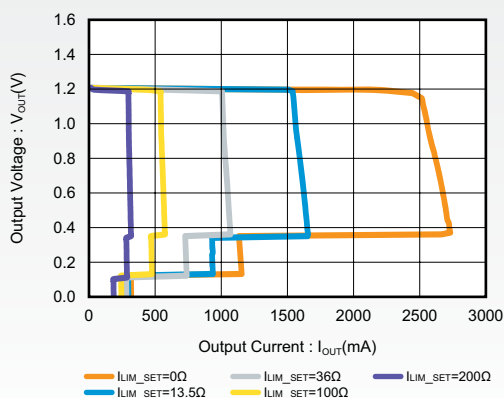
TYPICAL APPLICATION CIRCUIT



ULTRA LOW VOLTAGE DROP

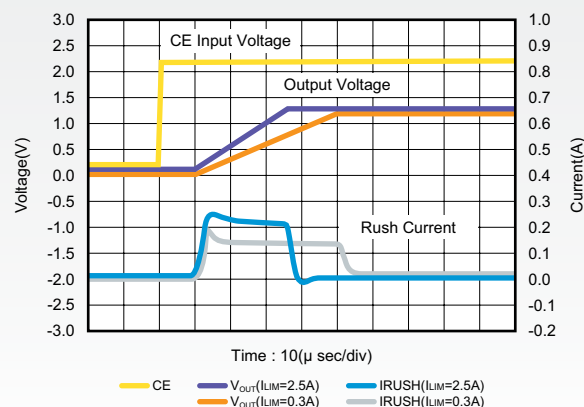


ADJUSTABLE CURRENT LIMIT



$V_{OUT_SET} = 1.2V$, $V_{IN} = 2.2V$, $C_{IN} = 2.2\mu F$ (Ceramic), $C_L = 4.7\mu F$ (Ceramic), $T_a = 25^\circ C$

INRUSH CURRENT PROTECTION



XBP15SVR05W-G

Low Capacitance TVS Diode Array
for ESD Protection



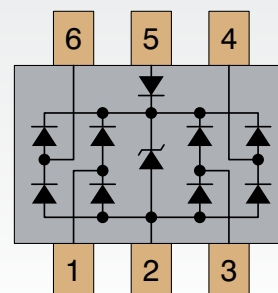
- IEC61000-4-2 (ESD) Air ± 15 kV
- IEC61000-4-2 (ESD) Contact ± 10 kV

ELECTRICAL CHARACTERISTICS

$T_a = 25^\circ\text{C}$

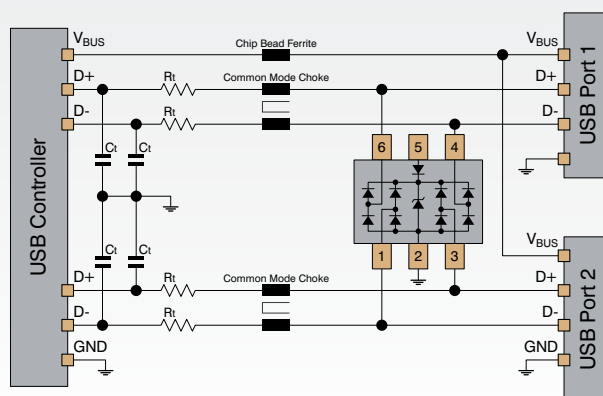
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN.	TYP.	MAX.	
Stand-Off Voltage	V_{RWM}		-	-	5	V
Breakdown Voltage	V_{BR}	$I_R = 1\text{ mA}$, Pin5 to Pin2	6	-	-	V
Leakage Current	I_R	$V_R = 5\text{ V}$, Pin5 to Pin2	-	-	5	μA
Clamping Voltage (8/20 μs)	V_C	$I_{PP} = 3\text{ A}$, I/O pin to Pin2	-	-	10	V
Terminal Capacitance	C_t	$V_R = 0\text{ V}$, $f = 1\text{ MHz}$ Between I/O pin and Pin2	-	1.0	1.2	pF
	C_t	$V_R = 0\text{ V}$, $f = 1\text{ MHz}$ Between I/O pins	-	0.5	0.6	pF

INTERNAL CONFIGURATION



SOT26P
(2.9 x 2.8 x 1.45mm)

TYPICAL APPLICATION CIRCUIT



XBP06V0U25R-G

Ultra Low Capacitance TVS Diode
for ESD Protection



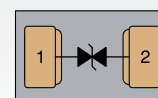
- IEC61000-4-2 (ESD) Air ± 15 kV
- IEC61000-4-2 (ESD) Contact ± 15 kV

ELECTRICAL CHARACTERISTICS

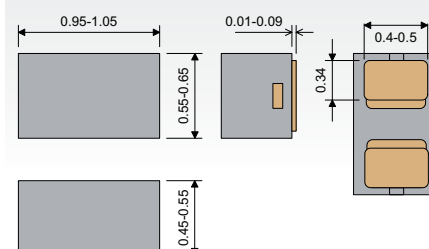
$T_a = 25^\circ\text{C}$

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN.	TYP.	MAX.	
Stand-Off Voltage	V_{RWM}				5	V
Breakdown Voltage	V_{BR}	$I_R = 1\text{ mA}$	6	8.4	11.2	V
Leakage Current	I_R	$V_R = 5\text{ V}$	-	-	1	μA
Clamping Voltage (8/20 μs)	V_C	$I_{PP} = 1\text{ A}$	-	12.00	14.00	V
Terminal Capacitance	C_t	$V_R = 0\text{ V}$, $f = 1\text{ MHz}$	-	0.25	0.35	pF

INTERNAL CONFIGURATION



PACKAGE DIMENSIONS



XBP14E5UFN-G

Ultra Low Capacitance TVS Diode Array
for ESD Protection



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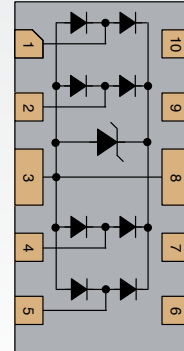
- IEC61000-4-2 (ESD) Air ± 15 kV
- IEC61000-4-2 (ESD) Contact ± 8 kV

ELECTRICAL CHARACTERISTICS

$T_a = 25^\circ\text{C}$

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN.	TYP.	MAX.	
Stand-Off Voltage	V_{RWM}				5	V
Breakdown Voltage	V_{BR}	$I_R = 1\text{mA}$, I/O pin to Pin3	6	-	9	V
Leakage Current	I_R	$V_R = 5\text{V}$, I/O pin to Pin3	-	-	1	μA
Clamping Voltage (8/20 μs)	V_C	$I_{pp} = 2.5\text{A}$, I/O pin to Pin3	-	11	13	V
Terminal Capacitance	C_i	$V_R = 0\text{V}$, $f = 1\text{MHz}$, between I/O pin to Pin3	-	0.6	0.8	pF
	C_1	$V_R = 0\text{V}$, $f = 1\text{MHz}$, between I/O pins	-	0.35	0.4	pF

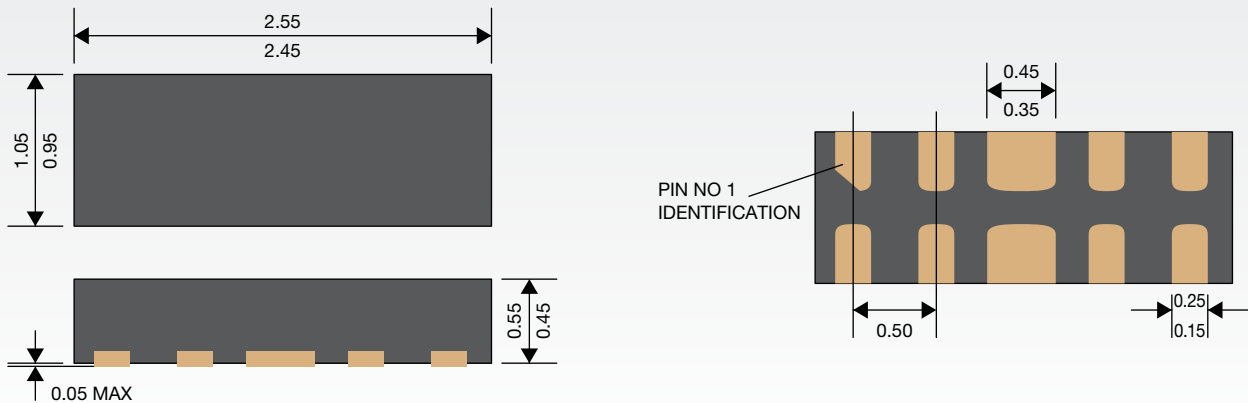
INTERNAL CONFIGURATION



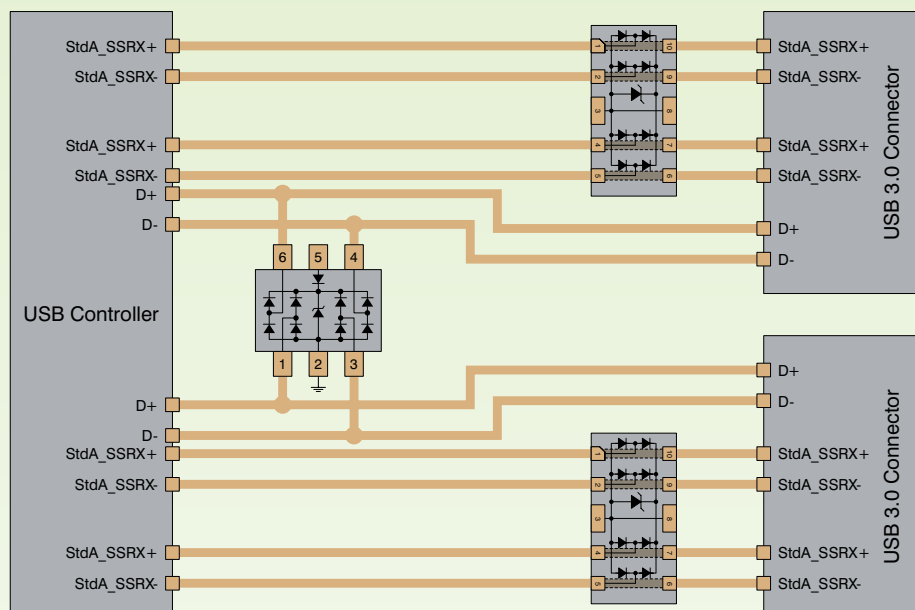
DFN2510-10A

PACKAGE DIMENSIONS

DFN2510-10A



TYPICAL APPLICATION CIRCUIT



INDUCTOR BUILT-IN MICRO DC/DC CONVERTERS

SERIES	TYPE	CONTROL	EFFICIENCY	INPUT VOLTAGE	OUTPUT VOLTAGE	ACCURACY	OSCILLATION FREQUENCY	OUTPUT CURRENT	PACKAGE
XCL101	Step-Up	PFM	90%	0.9 ~ 5.5V	1.8 ~ 5.0V	±2.0%	1.2MHz	100mA	CL-2025, CL-2025-02
XCL102	Step-Up	PWM	90%	0.85 ~ 6.0V	2.2 ~ 5.5V	±2.0%	3MHz	500mA	CL-2025-02
XCL103		PWM/PFM							
XCL201	Step-Down	PWM	92%	2.0 ~ 6.0V	0.8 ~ 4.0V	±2.0%	1.2MHz	400mA	CL-2025, CL-2025-02
XCL202		PWM/PFM							
XCL205	Step-Down	PWM	85%	2.0 ~ 6.0V	0.8 ~ 4.0V	±2.0%	3MHz	600mA	CL-2025, CL-2025-02
XCL206		PWM/PFM							
XCL207		PWM/PFM Manual							
XCL208	Step-Down	PWM	90%	1.8 ~ 6.0V (F Type) 2.0 ~ 6.0V (A/B Type)	0.8 ~ 4.0V	±2.0%	3MHz	400mA	USP-10B03
XCL209		PWM/PFM							
XCL210	Step-Down	PFM	93%	2.0 ~ 6.0V	1.0 ~ 4.0V	±2.0%	-	50mA, 200mA	CL-2025-02
XCL211	Step-Down	PWM	94%	2.7 ~ 6.0V	0.9 ~ V _{IN}	±2.0%	2.4MHz	2000mA	USP-11B01
XCL212	Step-Down	PWM/PFM	94%	2.7 ~ 6.0V	0.9 ~ V _{IN}	±2.0%	2.4MHz	2000mA	USP-11B01
XCL213	Step-Down	Hi-SAT COT + PWM	92%	2.7 ~ 5.5V	0.8 ~ 3.6V	±2.0%	3MHz	1500mA	USP-9B01
XCL214	Step-Down	Hi-SAT COT + PWM/PFM	92%	2.7 ~ 5.5V	0.8 ~ 3.6V	±2.0%	3MHz	1500mA	USP-9B01
XCL219	Step-Down	Hi-SAT COT + PWM	92%	2.5 ~ 5.5V	0.8 ~ 3.6V	±2.0%	3MHz	1000mA	CL-2025-02
XCL220	Step-Down	Hi-SAT COT + PWM/PFM	92%	2.5 ~ 5.5V	0.8 ~ 3.6V	±2.0%	3MHz	1000mA	CL-2025-02
XCL221	Step-Down	Hi-SAT COT + PWM	93%	2.5 ~ 5.5V	0.8 ~ 3.6V	±2.0%	1.2MHz	500mA	CL-2025-02
XCL222	Step-Down	Hi-SAT COT + PWM/PFM	93%	2.5 ~ 5.5V	0.8 ~ 3.6V	±2.0%	1.2MHz	500mA	CL-2025-02
XCL223	Step-Down	PWM	90%	2.7 ~ 5.5V	0.8 ~ 3.6V	±2.0%	3MHz	400mA, 700mA	USP-8B04
XCL224	Step-Down	PWM/PFM	90%	2.7 ~ 5.5V	0.8 ~ 3.6V	±2.0%	3MHz	400mA, 700mA	USP-8B04
XCL225	Step-Down	PWM	90%	3.0 ~ 18V	1.0 ~ 15V	±1.5%	500kHz, 1.2MHz, 3MHz	500mA	DFN3030-10B
XCL226	Step-Down	PWM/PFM	90%	3.0 ~ 18V	1.0 ~ 15V	±1.5%	500kHz, 1.2MHz, 3MHz	500mA	DFN3030-10B

STEP UP DC/DC CONVERTERS & CONTROLLERS

SERIES	CONTROL	EFFICIENCY	INPUT VOLTAGE	OUTPUT VOLTAGE	ACCURACY	OSCILLATION FREQUENCY	FUNCTIONS	PACKAGE
XC6371	PWM	85%	0.9 ~ 10V	2.0 ~ 7.0V	±2.5%	50kHz 100kHz 180kHz	100mA (V _{IN} = 3.0V, V _{OUT} = 5.0V)	SOT-89, SOT-89-5, USP-6B
XC6372	PWM/PFM							
XC9103	PWM							
XC9104	PWM/PFM	85%	0.9 ~ 10V	1.5 ~ 30V ADJ = 0.9V	±2.0%	100kHz, 180kHz 300kHz, 500kHz	400mA (V _{IN} = 1.8V, V _{OUT} = 3.3V) FB = 0.9V (1.5 ~ 30V)	SOT-25, USP-6B
XC9105	PWM/PFM Manual							
XC9106	PWM							
XC9107	PWM/PFM	85%	0.9 ~ 10V	ADJ = Variable	±2.0%	100kHz 300kHz	Variable Output Voltage 30mA (V _{IN} = 3.3V, V _{OUT} = 20V)	SOT-25, USP-6B
XC9110	PFM	87%	0.9 ~ 10V	1.5 ~ 7.0V	±2.5%	100kHz	200mA (V _{IN} = 2.4V, V _{OUT} = 3.3V)	SOT-23, SOT-25, SOT-89, USP-6C
XC9111								
XC9119	PWM	86%	2.5 ~ 6.0V	ADJ = 1.0V	±2.0%	1MHz	50mA (V _{IN} = 3.6V, V _{OUT} = 15V) FB = 1.0V (2.5 ~ 19.5V)	SOT-25, USP-6C
XC9120	PWM	85%	0.9 ~ 6.0V	1.5 ~ 3.0V ADJ = 0.9V	±2.0%	100kHz	80mA (V _{IN} = 3.6V, V _{OUT} = 15V) FB = 0.9V (1.5 ~ 30V)	SOT-25, USP-6C
XC9121	PWM/PFM							
XC9122	PWM/PFM Manual							
XC9128	PWM/PFM Manual	93%	0.8 ~ 6.0V	ADJ = 0.45V	0.45V ± 10mV	1.2MHz	700mA (V _{IN} = 3.7V, V _{OUT} = 5.0V)	USP-10B
XC9129								
XC9131	PWM PWM/PFM	93%	0.9 ~ 5.5V	1.8 ~ 5.0V	±10mV	1.2MHz	500mA@V _{OUT} = 3.3V, V _{IN} = 1.8V(TYP.) 100mV, V _{OUT} = 3.3V, V _{IN} = 1.8V, I _{OUT} = 1mA 200mA	USP-10B
XC9133	PWM	85%	2.5 ~ 6.0V	2.5 ~ 17.5V ADJ = 0.2V	0.2V ± 5.0%	1MHz	3 white LEDs in series V _{IN} = 3.6V, I _{LED} = 20mA	SOT-25
XC9135	PWM PWM/PFM	93%	0.9 ~ 5.5V	1.8 ~ 5.0V	±10mV	1.2MHz	500mA@V _{OUT} = 3.3V, V _{IN} = 1.8V(TYP.) 100mV V _{OUT} = 3.3V, V _{IN} = 1.8V, I _{OUT} = 1mA 200mA	USP-10B
XC9136								
XC9140	PFM	90%	0.9 ~ 5.5V	1.8 ~ 5.0V	±2.0%	1.2MHz	100mA (V _{IN} = 1.8V, V _{OUT} = 3.3V) Load Disconnect or Input Bypass Quiescent Current 6.3μA	USP-6EL, SOT-25
XC9141	PWM	93%	0.9 ~ 6.0V	2.2 ~ 5.5V	±2.0%	1.2MHz, 3MHz	500mA@V _{OUT} = 5.0V, V _{IN} = 3.3V(TYP.) 100mV, V _{OUT} = 3.3V, V _{IN} = 1.8V, I _{OUT} = 1mA 200mA	SOT-25, USP-6C, WLP-6-01
XC9142	PWM/PFM							

STEP-DOWN DC/DC CONVERTERS & CONTROLLERS

SERIES	CONTROL	EFFICIENCY	OPERATING VOLTAGE	OUTPUT VOLTAGE	ACCURACY	OUTPUT CURRENT	OSCILLATION FREQUENCY	SUPPLY CURRENT	PACKAGE
XC9220	PWM	92%	2.8 ~ 16V	ADJ = 0.9V	±1.5%	3A	300kHz 500kHz 1MHz	25μA	SOT-25, USP-6C
XC9221	PWM/PFM								
XC9223	PWM/PFM Manual	95%	2.5 ~ 6.0V	ADJ = 0.8V	±2.5%	1A	1MHz 2MHz	30μA	MSOP-10, USP-10B
XC9224									
XC9235	PWM	92%	1.8 ~ 6.0V	0.8 ~ 4.0V	±2%	600mA	1.2MHz 3MHz	15μA	SOT-25, USP-6C, USP-6EL, WLP-5-03
XC9236	PWM/PFM								
XC9237	PWM/PFM Manual								
XC9242	PWM PWM/PFM	95%	2.7 ~ 6.0V	0.9 ~ 6.0V	±2%	2A	1.2MHz 2.4MHz	41μA	USP-10B, SOP-8FD
XC9243									
XC9244	PWM	90%	2.3 ~ 6.0V	0.8 ~ 4.0V	±2%	400mA	1.2MHz	18μA	USPN-6
XC9245	PWM/PFM								
XC9246	PWM	90%	4.5 ~ 16V	1.2 ~ 5.5V	±2%	1A	1.2MHz	100μA	USP-6C, SOT-26W
XC9247	PWM/PFM								
XC9248	PWM	93.8%	4.5 ~ 18.0V	1 ~ 12V	±1.5%	2.2A	500kHz	800μA	SOP-8FD
XC9252	PWM/PFM	90%	3.0 ~ 30V	1.5 ~ Vin V	±2%	3A	280kHz, 550kHz	30μA	TSSOP-16, USP-10B
XC9257	PWM	90%	2.5 ~ 5.5V	0.8 ~ 3.6V	±2%	1A	1.2MHz, 6MHz	250μA	SOT-25, USP-6C
XC9258	PWM/PFM	90%	2.5 ~ 5.5V	0.8 ~ 3.6V	±2%	1A	1.2MHz, 6MHz	15μA	SOT-25, USP-6C
XC9259	PWM/PFM Manual	92%	2.5 ~ 5.5V	0.8 ~ 3.6V	±2%	1A	1.2MHz, 6MHz	15μA	LGA-8B01
XC9260	PWM	90%	2.7 ~ 5.5V	0.8 ~ 3.6V	±2%	1.5A	1.2MHz, 3MHz	250μA	SOT-89-5, USP-6C
XC9261	PWM/PFM	90%	2.7 ~ 5.5V	0.8 ~ 3.6V	±2%	1.5A	1.2MHz, 3MHz	15μA	SOT-89-5, USP-6C
XC9262	PWM/PFM Manual	92%	2.5 ~ 5.5V	0.8 ~ 3.6V	±2%	1.5A	1.2MHz, 3MHz	15μA	LGA-8B01
XC9263	PWM	90%	3.0 ~ 18V	1.0 ~ 15V	±1.5%	0.5A	500kHz, 1.2MHz, 2.2MHz	11.5μA	SOT-25, USP-6C
XC9264	PWM/PFM								
XC9265	PFM	90%	2.0 ~ 6.0V	1.0 ~ 4.0V	±2%	50mA, 200mA	-	0.5μA	SOT-25, USP-6EL
XC9266	PWM PWM/PFM	93%	2.7 ~ 5.5V	0.8 ~ 3.6V	±1%	6A	1.2MHz, 3MHz	40μA	QFN0404-24C
XC9267	PWM	85%	3.0 ~ 36V	1.0 ~ 25V	±1.5%	0.6A	1.2MHz, 2.4MHz	11.6μA	SOT-89-5, USP-6C
XC9268	PWM/PFM								
XC9270	PWM	91%	7.0 ~ 30V	1.2 ~ 12V	±2%	2A	300kHz, 500kHz	200μA	SOP-8FD
XC9271	PWM/PFM	91%	7.0 ~ 30V	1.2 ~ 12V	±2%	2A	300kHz, 500kHz	200μA	SOP-8FD
XC9272	PFM	90%	2.0 ~ 6.0V	0.6 ~ 0.95V	±2%	50mA	-	0.5μA	SOT-25, USP-6EL
XC9273	PWM PWM/PFM	91.5%	2.7 ~ 5.5V	0.8 ~ 3.6V	±1%	3A	1.2MHz, 3MHz	40μA	QFN0404-24C
XC9274	PWM	93%	2.7 ~ 5.5V	0.8 ~ 3.6V	±1%	3A	1.2MHz, 3MHz	40μA	SOP-8FD
XC9275	PWM/PFM								

STEP-UP/DOWN DC/DC CONVERTERS & CONTROLLERS

SERIES	CONTROL	EFFICIENCY	OPERATING VOLTAGE	OUTPUT VOLTAGE	ACCURACY	OSCILLATION FREQUENCY	OUTPUT CURRENT	PACKAGE
XC9303	PWM/PFM Manual	84%	2.0 ~ 10V	ADJ = 0.9V	±2%	300kHz	800mA (Vin = 2.7V, Vout = 3.3V)	MSOP-8A
XC9306	PWM/PFM	92%	2.5 ~ 5.5V	0.8 ~ 5.0V	±2%	6MHz	800mA (Vin = 3.1V, Vout = 4.5V)	WLP-20

MULTI CHANNEL DC/DC CONVERTERS & CONTROLLERS

SERIES	TYPE	CONTROL	EFFICIENCY	OPERATING VOLTAGE	OUTPUT VOLTAGE	ACCURACY	OSCILLATION FREQUENCY	OUTPUT CURRENT	PACKAGE
XC9501	Step-up + Step-up	PWM/PFM Manual	83%	0.9 ~ 10V	ADJ = 0.9V	±2.0%	100kHz, 180kHz 300kHz, 500kHz	~200mA (Vin = 1.8V, Vout = 3.3V)	MSOP-10, USP-10
XC9502	Step-up + Step-down	PWM/PFM Manual	92%	2.0 ~ 10V	ADJ = 0.9V	±2.0%	180kHz, 300kHz, 500kHz	~300mA (Vin = 1.8V, Vout = 3.3V) ~1A (Vin = 3.3V, Vout = 1.8V)	MSOP-10, USP-10
XC9503	Step-down + Step-down	PWM/PFM Manual	92%	2.0 ~ 10V	ADJ = 0.9V	±2.0%	180kHz, 300kHz, 500kHz	~1A (Vin = 5.0V, Vout = 3.3V)	MSOP-10, USP-10
XC9504	Step-up + Inverting	PWM/PFM Manual	83%	2.0 ~ 10V	ADJ = 0.9V	±2.0%	180kHz, 300kHz, 500kHz	~20mA (Vin = 3.3V, Vout = 15V) ~20mA (Vin = 3.3V, Vout = -7.0V)	MSOP-10, USP-10
XC9505	Step-down + Inverting	PWM/PFM Manual	92%	2.0 ~ 10V	ADJ = 0.9V	±2.0%	180kHz, 300kHz, 500kHz	~1A (Vin = 5.0V, Vout = 3.3V) ~200mA (Vin = 5.0V, Vout = -3.3V)	MSOP-10, USP-10
XC9515	Step-down + Step-down + VD	PWM	95%	2.5 ~ 5.5V	Vout1 = 1.2 ~ 4.0V Vout2 = 1.2 ~ 4.0V	±2.0%	1MHz	800mA	QFN-20
XC9516	Step-up + 2x Charge Pump	—	95%	2.5 ~ 5.5V	19V (Step-up DC/DC)	±1.5%	300kHz ~ 1.2MHz	500mA (Vin = 5.0V, Vout = 9.0V)	QFN-20
XC9519	Step-up + Inverting	PWM PWM/PFM	83%	2.7 ~ 5.5V	4.0 ~ 18.0V, -15.0 ~ -4.0V	±1.5%	1.2MHz	500mA @ Vin = 3.7V, (VoutP = 5.0V, VoutN = -5.0V)	QFN-24

CHARGE PUMPS

SERIES	TYPE	EFFICIENCY	OPERATING VOLTAGE	OUTPUT VOLTAGE	SUPPLY CURRENT	OSCILLATION FREQUENCY	OUTPUT CURRENT	PACKAGE
XC6351A	Inverter	90%	-1.2 ~ 5.0V	Inverting	310 μ A 100 μ A	120kHz 35kHz	10mA	SOT-26, USP-6B
XC9801 XC9802	Step-up Doubler	69%	1.8 ~ 5.5V	2.5 ~ 6.0V	80 μ A	300kHz	80mA (V _{IN} = 3.6V, V _{OUT} = 5.0V)	MSOP-8A, USP-8

VOLTAGE REGULATORS

SERIES	TYPE	INPUT VOLTAGE	OUTPUT VOLTAGE	ACCURACY	MAX. OUTPUT CURRENT	SUPPLY CURRENT	DROPOUT VOLTAGE@100mA	OUTPUT CAPACITOR	PACKAGE
XC6201	Low Power	2.0 ~ 10V	1.3 ~ 6.0V	±2%(1%)	250mA	2 μ A	160mV	Ceramic	SOT-25, SOT-89, TO-92, USP-6B
XC6203	Large Current	2.0 ~ 8.0V	1.8 ~ 6.0V	±2%(1%)	400mA	8 μ A	150mV		SOT-89, SOT-223, TO-92, SOT-23
XC6204	High Speed	2.0 ~ 10V	1.8 ~ 6.0V	±2%(1%)	300mA	70 μ A	200mV	Ceramic	SOT-25, USP-6B, SOT-89-5
XC6205	High Speed	2.0 ~ 10V	0.9 ~ 1.75V		150mA				
XC6206	Low Power	1.8 ~ 6.0V	1.2 ~ 5.0V	±2%(1%)	250mA	1 μ A	250mV	Ceramic	SOT-23, SOT-89, TO-92, USP-6B
XC6209	High Speed	2.0 ~ 10V	0.9 ~ 6.0V	±2%	300mA	25 μ A	200mV	Ceramic	SOT-25, USP-6B, SOT-89-5
XC6210	High Speed Large Current	1.5 ~ 6.0V	0.8 ~ 1.5V	±2%	500mA	35 μ A	50mV	Ceramic	SOT-25, USP-6B, SOT-89-5
			1.6 ~ 5.0V		700mA				
XC6214	Large Current	1.8 ~ 6.0V	1.2, 1.5, 1.8, 2.5, 3.0, 3.3V	±2%	500mA	8 μ A	100mV	Ceramic	SOT-89, TO-252
XC6215	Low Power CE Pin	1.5 ~ 6.0V	0.9 ~ 5.0V	±2%	200mA	0.8 μ A	320mV	Ceramic	USP-4, SSOT-24, USP-3, SOT-25, USPN-4
XC6216 XE6216	28V Input Low Power Consumption	2.0 ~ 28V	2.0 ~ 23V ADJ	±2%(1%)	150mA	5 μ A	1500mV	Ceramic	SOT-23, SOT-25, SOT-89, SOT-89-5, SOT-223, TO-252, USP-6C, USP-6B06
XC6217	High Speed "GreenOperation"	1.6 ~ 6.0V	0.8 ~ 4.0V	±2%	200mA	4.5 μ A	80mV	Ceramic	USP-4D, SOT-25, SSOT-24, USPN-4
XC6218	Low Power	1.5 ~ 6.0V	0.9 ~ 4.0V	±2%	200mA	1 μ A	200mV	Ceramic	USP-3, SSOT-24
XC6219	High Speed	2.0 ~ 6.0V	0.9 ~ 5.0V	±2%(1%)	300mA	25 μ A	200mV	Ceramic	SOT-25, USP-6B, SOT-89-5
XC6220	1A LDO	1.6 ~ 6.0V	0.8 ~ 5.0V	±1%	1000mA	8 μ A	20mV	Ceramic	USP-6C, SOT-25, SOT-89-5, SOP-8FD
XC6221	High Speed	1.6 ~ 6.0V	0.8 ~ 5.0V	±2%(1%)	200mA	25 μ A	80mV	Ceramic	USPN-4, USP-4, SOT-25, SSOT-24
XC6222	High Speed	1.7 ~ 6.0V	0.8 ~ 5.0V	±1%	700mA	100 μ A	40mV	Ceramic	USP-6C, SOT-25, SOT-89-5
XC6223	High Speed	1.6 ~ 5.5V	1.0 ~ 4.0V	±1%	300mA	100 μ A	70mV	Ceramic	USPQ-4B03, SSOT-24, SOT-25, SOT-89-5, USP-4
XC6224	Low Power High Speed	1.2 ~ 3.6V	0.8 ~ 3.0V	±1.5%	150mA	33 μ A	140mV	Ceramic	USPN-4B02, SOT-25
XC6225	High Speed	2.5 ~ 6.0V	0.8 ~ 5.0V	±2%	30mA	25 μ A	—	Ceramic	USP-4, SOT-25, SSOT-24
XC6227	High Speed Reverse Current Protection	1.7 ~ 6.0V	0.8 ~ 5.0V	±1%	700mA	100 μ A	40mV	Ceramic	USP-6C, SOT-25, SOT-89-5
XC6229	Ultra-Small Inrush Current Protection	1.6 ~ 5.5V	1.2 ~ 4.0V	±1%	300mA	100 μ A	60mV	Ceramic	LGA-4B01
XC6230	2A LDO	1.7 ~ 6.0V	1.2 ~ 5.0V	±1%	2000mA	45 μ A	17mV	Ceramic	USP-6C, SOP-8FD
XC6231	High Speed	2.0 ~ 10V	0.9 ~ 5.5V	±2%	500mA	35 μ A	200mV	Ceramic	SOT-89-5
XC6233	High Speed Inrush Current Protection	1.7 ~ 5.5V	1.2 ~ 3.6V	±1%	200mA	45 μ A	140mV	Ceramic	USP-4, SSOT-24, SOT-25, USPQ-4B04
XC6501	Ct Capacitor-Less	1.4 ~ 6.0V	1.2 ~ 5.0V	±1%	200mA	13 μ A	150mV	-	USP-3, USP-4, USPN-4, SSOT-24, SOT-25, WLP-4-1
XC6503	Ct Capacitor-Less High Speed	1.7 ~ 6.0V	1.2 ~ 5.0V	±1%	500mA	15 μ A	60mV	-	USP-4, SOT-25, SOT-89-5, SOT-89
XC6504	Ct Capacitor-Less Ultra Low IQ	1.4 ~ 6.0V	1.1 ~ 5.0V	±1%	150mA	0.6 μ A	340mV	-	USPN-4B02, SSOT-24, SOT-25, USPQ-4B04
XC6505	10.5V Operation High Speed	1.7 ~ 10.5V	1.5 ~ 8.0V	±1%	200mA	5.5 μ A	190mV	Ceramic	USP-6C, SOT-25, SOT-89-5
XC6601	N Channel Driver Low Voltage	1.0 ~ 3.0V	0.7 ~ 1.8V	±20mV	400mA	25 μ A	38mV	Ceramic	USP-6C, SOT-25, SOT-89-5
XC6602	N Channel Driver Low Voltage 1A	0.5 ~ 3.0V	0.5 ~ 1.8V	±15mV ±20mV	1A	100 μ A	15mV	Ceramic	USP-6C, SOT-26W, SOT-89-5, WLP-5-02
XC6603	Adjustable Soft-start	0.5 ~ 3.0V	0.5 ~ 1.8V	±0.015V ±0.020V	1A	100 μ A	15mV	Ceramic	USP-6C, SOT-26W
XC6604	Adjustable Current Limit	0.5 ~ 3.0V	0.5 ~ 1.8V	±0.015V ±0.020V	1A	100 μ A	15mV	Ceramic	USP-6C, SOT-26W
XC6701	28V Operation High Speed	2 ~ 28V	1.8V ~ 18V	±2%	150mA	50 μ A	1300mV	Ceramic	SOT-25, SOT-89, SOT-89-5, USP-6C, SOT-223, TO-252
XC6702	36V Operation High Speed	4.5V ~ 36V	1.8V ~ 18V	±1%	300mA	40 μ A	450mV	Ceramic	SOP-8FD, SOT-89-5, USP-6C
XC62FJ	Low Power	1.8 ~ 10V	1.7 ~ 6.0V	±2%	200mA	2 μ A	160mV	Ceramic	SOT-89

NEGATIVE VOLTAGE REGULATORS

SERIES	TYPE	INPUT VOLTAGE	OUTPUT VOLTAGE	ACCURACY	MAX. OUTPUT CURRENT	SUPPLY CURRENT	DROPOUT VOLTAGE@100mA	OUTPUT CAPACITOR	PACKAGE
XC62KN	Negative Voltage	-2.1 ~ -10V	-2.1 ~ -6.0V	±2%(1%)	100mA	3μA	380mV		SOT-23, SOT-89, TO-92, USP-6B
XC6901	Negative Voltage	-2.4 ~ -12.4V	-0.9 ~ -12V	±1.5%	200mA	100μA	400mV	Ceramic	SOT-25, SOT-89-5, USP-6C
XC6902	Negative Voltage	-2.4 ~ -16.0V	-0.9 ~ -12V	±1.5%	200mA	100μA	400mV	Ceramic	SOT-23, SOT-89, USP-6C

DUAL CHANNEL VOLTAGE REGULATORS

SERIES	TYPE	INPUT VOLTAGE	OUTPUT VOLTAGE	ACCURACY	MAX. OUTPUT CURRENT	SUPPLY CURRENT	DROPOUT VOLTAGE@100mA	OUTPUT CAPACITOR	PACKAGE
XC6415	High Speed Dual	1.5 ~ 6.0V	0.8 ~ 5.0V	±1%	200mA	28μA	95mV	Ceramic	SOT-26, USPN-6, USP-6C
XC6416	Dual	1.5 ~ 6.0V	0.8 ~ 4.0V	±1%	200mA	10μA	95mV	Ceramic	USP-6C, SOT-26
XC6419	ON/OFF 2ch	1.5 ~ 6.0V	0.8 ~ 5.0V	±2%(1%)	300mA (ch1) 100mA (ch2)	28μA (ch1) 23μA (ch2)	60mV(ch1) 230mV (ch2)	Ceramic	USP-6C, SOT-26
XC6420	Small 150mA High Speed	1.6 ~ 5.5V	1.2 ~ 3.6V	±1.5%	150mA	55μA	130mV	Ceramic	SOT-26, USPN-6, USP-6B04
XC6421	Inrush Current Protection 300mA	1.6 ~ 5.5V	1.2 ~ 3.6V	±1%	300mA	90μA	70mV	Ceramic	USP-6C

VOLTAGE REGULATORS WITH BUILT-IN DETECTOR

SERIES	TYPE	INPUT VOLTAGE	OUTPUT VOLTAGE	ACCURACY	MAX. OUTPUT CURRENT	SUPPLY CURRENT	DROPOUT VOLTAGE@100mA	OUTPUT CAPACITOR	PACKAGE
XC6402	700mA LDO with VD	1.5 ~ 6.0V	0.8 ~ 5.0V	±2%	700mA	35μA	50mV	Ceramic	SOT-25, SOT-89-5, USP-6B
XC6403	300mA LDO with VD	2.0 ~ 6.0V	0.9 ~ 5.6V	±2%	300mA	35μA	200mV	Ceramic	SOT-25, SOT-89-5, USP-6B
XC6404	500mA LDO with VD	2.0 ~ 6.0V	0.9 ~ 5.1V	±2%	500mA	35μA	200mV	Ceramic	SOT-25, SOT-89-5, USP-6B
XC6405	500mA LDO with VD	2.0 ~ 6.0V	0.9 ~ 5.1V	±2%	500mA	90μA	200mV	Ceramic	SOT-25, SOT-89-5
XC6408	Large Current	2.0 ~ 28V	2.0 ~ 18V	±1%	150mA	8μA	1100mV	Ceramic	SOT-89-5, SOT-25, USP-6C
XC6413	10V Input LDO with VD	2.0 ~ 10V	0.9 ~ 5.5V	±2%	300mA	35μA	200mV	Ceramic	SOT-25, SOT-89-5, USP-6B
XC6414	10V Input LDO with VD	2.0 ~ 10V	0.9 ~ 5.5V	±2%	500mA	35μA	200mV	Ceramic	SOT-25, SOT-89-5, USP-6B

POWER SWITCHES

SERIES	TYPE	INPUT VOLTAGE	OUTPUT CURRENT	SUPPLY CURRENT	ON RESISTANCE	PACKAGE
XC8102	Low On-Resistance	1.2 ~ 6.0V	0.4A	3μA	280mΩ @V _{IN} =5.0V	USPN-4, USP-4, SOT-25, SSOT-24
XC8107	Low On-Resistance	2.5 ~ 5.5V	0.5A, 1A, 1.5A, 2A	40μA	85mΩ @V _{IN} =5.0V	USP-6C, SOT25
XC8108	Low On-Resistance	2.5 ~ 5.5V	0.9A ~ 2A	40μA	85mΩ @V _{IN} =5.0V	USP-6C
XC8109	Low On-Resistance	2.5 ~ 5.5V	0.075A ~ 0.9A	40μA	85mΩ @V _{IN} =5.0V	USP-6C

BATTERY CHARGER ICs

SERIES	TYPE	OPERATING VOLTAGE RANGE		CHARGE TERMINATION VOLTAGE	CHARGE CURRENT	SUPPLY CURRENT	PACKAGE
		TYP.	MAX.				
XC6801	1Cell + Li-ion	4.25V	6.0V	4.2V±0.7%	500mA	12μA	SOT-89-5 SOT-25, USP-6C
XC6802	1Cell + Li-ion	4.25V	6.0V	4.2V±0.7%	800mA	15μA	SOT-89-5, SOT-25, USP-6C, USP-6EL
XC6803	1Cell + Li-ion	4.5V	6.0V	4.2V±0.7%	40 ~ 280mA	100μA	USP-6EL
XC6804	1Cell + Li-ion	4.5V	6.0V	4.2V±0.7%	200 ~ 800mA	100μA	USP-6EL, SOP-8FD
XC6805	1Cell + Li-ion	4.5V	6.0V	4.2V±0.7%	5 ~ 40mA	100μA	USP-6EL
XC6806	Current Path	4.5V	6.0V	4.2V±0.7%	10 ~ 380mA	200μA	USP-10B, LGA-10B01

VOLTAGE DETECTORS

SERIES	TYPE	DETECT VOLTAGE	ACCURACY	OPERATING VOLTAGE	SUPPLY CURRENT	OUTPUT	PACKAGE
XC61C	Standard	0.8 ~ 1.5V	±2%	0.7 ~ 6.0V	0.7μA (V _{IN} =1.5V)	Open Drain CMOS	SSOT-24, SOT-23, SOT-89
XE61C		1.6 ~ 6.0V	±2% (±1%)	0.7 ~ 10V			
XC61F	Delay Built-in	1.6 ~ 6.0V	±2%	0.7 ~ 10V	1.0μA (V _{IN} =2V)	Open Drain CMOS	SOT-23 SOT-89
XC61G	Small Package	0.8 ~ 6.0V	±2%	0.7 ~ 10V	0.7μA (V _{IN} =1.5V)	Open Drain CMOS	USP-3
XC61H	Delay Circuit Built-in	1.6 ~ 6.0V	±2%	0.7 ~ 10V	1.0μA(TYP.)(V _{IN} =2.0V)	Open Drain CMOS	SOT-23
XC6101~6103	Watchdog & Manual Reset	1.6 ~ 5.0V	±2%	1.0 ~ 6.0V	5μA (TYP.)	Open Drain CMOS	SOT-25, USP-6C
XC6111~6113	Watchdog & Manual Reset	1.6 ~ 5.0V	±2%	1.0 ~ 6.0V	5μA (TYP.)	Open Drain CMOS	SOT-25, USP-6C
XC6104~6105	Watchdog	1.6 ~ 5.0V	±2%	1.0 ~ 6.0V	5μA (TYP.)	Open Drain CMOS	SOT-25, USP-6C
XC6114~6115	Watchdog	1.6 ~ 5.0V	±2%	1.0 ~ 6.0V	5μA (TYP.)	Open Drain CMOS	SOT-25, USP-6C
XC6118	Separated Sense Pin	0.8 ~ 5.0V	±2%	1.0 ~ 6.0V	0.8μA (V _{IN} =2.0V)	Open Drain CMOS	USP-4, SOT-25
XC6119	External Delay Capacitor	0.8 ~ 5.0V	±2%	0.7 ~ 6.0V	0.9μA (V _{IN} =2.0V)	Open Drain CMOS	USPN-4, SSOT-24
XC6120	Super Small, Low Supply	1.0 ~ 5.0V	±2%	0.7 ~ 6.0V	0.6μA (V _{IN} =2.0V)	Open Drain CMOS	USP-3, SSOT-24
XC6121~24	Watchdog, ON/OFF	1.6 ~ 5.0V	±2%	1.0 ~ 6.0V	5μA (V _{IN} =V _{DF} ×0.9) 10μA (V _{IN} =V _{DF} ×1.1)	Open Drain CMOS	SOT-25, USP-6C
XC6126	Ultra-Small High Accuracy	1.5 ~ 5.5V	±0.8%	0.7 ~ 6.0V	0.6μA(TYP.)(V _{IN} =1.62V)	Open Drain CMOS	USPN-4B0, SSOT-24
XC6127	Manual Reset Function	1.5 ~ 5.5V	±0.8%	0.7 ~ 6.0V	0.6μA(TYP.)(V _{IN} =1.62V)	Open Drain CMOS	USPN-4, SSOT-24, SOT-25
XC6130~31	Watchdog	1.6 ~ 5.0V	±1%	1.5 ~ 6.0V	8.1μA (V _{IN} =V _{DF} ×0.9)	Open Drain	SOT-26
XC6132	Separated Sense Pin	0.8 ~ 2.0V	±1.2%	1.6 ~ 6.0V	1.28μA	Open Drain CMOS	USP-6C, SOT26
XC6133	Separated Sense Pin	1.0 ~ 5.0V	±1.2%	1.6 ~ 6.0V	1.28μA	Open Drain CMOS	USP-6C, SOT26
XC6134	Separated Sense Pin	0.8 ~ 5.0V	±1.2%	1.6 ~ 6.0V	1.28μA	Open Drain CMOS	USP-6C, SOT26

PUSH BUTTON REBOOT CONTROLLER

SERIES	INPUT VOLTAGE RANGE	LOW POWER CONSUMPTION	RE-BOOT DELAY TIME ACCURACY	RE-BOOT TIME	PACKAGE
XC6190	1.65 ~ 6.0V	0.01μA (typ.) 0.1μA (max)	±5%	0.4s±10%	USPN-6, USPN-6B01

TEMPERATURE SENSOR

SERIES	TYPE	TEMPERATURE COEFFICIENTS	DETECTABLE TEMPERATURE RANGE	INPUT VOLTAGE	OUTPUT VOLTAGE	ACCURACY	SUPPLY CURRENT	PACKAGE
XC3101	Analog Output	-11.77mV/°C	-40°C ~ +100°C	2.7 ~ 5.5V	1.6V@25°C	±3.5°C	3.5μA	USPN-4 SSOT-24

HALL IC (MAGNETIC SENSOR)

SERIES	TYPE	OPERATING VOLTAGE		AVERAGE SUPPLY CURRENT	OPERATING MAGNETIC FLUX DENSITY	HYSTERESIS WIDTH	PACKAGE
		(TYP.)	(MAX.)				
XC3202B	Low power consumption	2.4V	5.5V	8μA	±3mT	1mT	SOT-23D, QFN-0601

SINGLE PHASE BRIDGE RECTIFIERS

SERIES	IF (AV)	VRRM	VF (MAX)	CJ (TYP)	PACKAGE
XBR11A	1.0A	600 ~ 1000V	1.1V	10pF	MDIP
XBR12A	1.5A	600 ~ 1000V	1.1V	25pF	SDIP

SWITCHING DIODES

SERIES	IF (AV)	VR	VF	IR	PACKAGE
XBW1SS400-G	100mA	80V	1.2V@IF=100mA	0.1μA@VR=80V	SOD-523P
XBW21P0204-G	150mA	75V	1.25V@IF=150mA	0.03μA@VR=25V	SOT-323

ZENER DIODES

SERIES	VZ (IZT=5.0mA)	ZZT1 (IZT=5.0mA)	ZZT2 (IZT=1.0mA)	IR	PACKAGE
XBZ02Pxxx1-G	7.5V ~ 36V	15Ω ~ 90Ω	80Ω ~ 350Ω	0.1μA ~ 1.0μA	SOD-523P

SCHOTTKY BARRIER DIODES

SERIES	VR(V)	IF(A)	VF(TYP)	IR(MAX.)	CT@VR=10Vf=1MHZ	PACKAGE
XBS013P11R-G	30	0.1	0.35V (MAX.) @10mA	10μA@VR=10V	4pF	SOD-923
XBS013R1DR-G	30	0.1	0.46V (MAX.) @10mA	0.3μA@VR=10V	2pF	USP-2B01
XBS013S15R-G	30	0.1	0.71V@100mA	2μA@VR=25V	6pF	SOD-523
XBS013S16R-G	30	0.1	0.71V@100mA	2μA@VR=25V	6pF	SOD-723
XBS013S1CR-G	30	0.1	0.71V@100mA	2μA@VR=25V	2pF	USP-2B02
XBS013V1DR-G	30	0.1	0.37V@10mA (MAX.)	7μA@VR=10V	2pF	USP-2B01
XBS023P11R-G	30	0.2	0.50V (MAX.) @200mA	100μA@VR=30V	5pF	SOD-523P
XBS024S15R-G	40	0.2	0.53V@200mA	2μA@VR=40V	5pF	SOD-523
XBS053P11R-G	30	0.5	0.49V (MAX.) @500mA	100μA@VR=20V	15pF	SOD-323P
XBS053V13R-G	30	0.5	0.40V@500mA	100μA@VR=20V	12pF	SOD-323A
XBS053V15R-G	30	0.5	0.40V@500mA	100μA@VR=20V	12pF	SOD-523
XBS104P11R-G	40	1	0.56V@1A	500μA@VR=40V	230pF	SOD-123P
XBS104S13R-G	40	1	0.49V@1A	200μA@VR=40V	35pF	SOD-323A
XBS104S14R-G	40	1	0.49V@1A	200μA@VR=40V	35pF	SOD-123A
XBS104V14R-G	40	1	0.365V@1A	2mA@VR=40V	150pF	SOD-123A
XBS203V19R-G	30	2	0.35V@2A	3mA@VR=30V	110pF	SMA-XG
XBS204S19R-G	40	2	0.485V@2A	200μA@VR=40V	70pF	SMA-XG
XBS204V19R-G	40	2	0.46V@2A	0.1mA@VR=40V	75pF	SMA-XG
XBS206S19R-G	60	2	0.615V@2A	300μA@VR=60V	45pF	SMA-XG
XBS303V19R-G	30	3	0.355V@3A	3mA@VR=30V	385pF	SMA-XG
XBS303V29R-G	30	3	0.39V@3A	0.9mA@VR=30V	190pF	SMA-XG
XBS304F11R-G	40	3	0.45V@3A	1mA@VR=20V	120pF	SMA-PG
XBS304S19R-G	40	3	0.465V@3A	300μA@VR=40V	180pF	SMA-XG
XBS306P11R-G	60	3	0.75V@3A	100μA@VR=60V	80pF	SMA-PG
XBS306S19R-G	60	3	0.59V@3A	300μA@VR=60V	195pF	SMA-XG
XBS504A1AR-G	40	5	0.49V@5A	0.1mA@VR=40V	210pF	SMBT
XBS506A1AR-G	60	5	0.60V@5A	0.05mA@VR=60V	150pF	SMBT

TRANSIENT VOLTAGE SUPPRESSORS (TVS)

SERIES	BREAKDOWN VOLTAGE (MIN)	LEAKAGE CURRENT (MAX)	INTER-TERMINAL CAPACITY	ESD DURABILITY	NUMBER OF ELEMENTS	PACKAGE
XBP06V4E4GR-R	6.4V	1.0μA	40pF	30kV	4	USP-4
XBP06V4E2HR-G	6.4V	1.0μA	40pF	30kV	2	USP-3
XBP06V1E4MR-G	6.1V	2.5μA	170pF	30kV	4	SOT-25
XBP06V0U26R-G	6.0V	1.0μA	0.4pF	8kV	2	DFN1006-2B
XBP1006-G	6.0V	1.2μA	1pF	8kV	4	SOT-23P
XBP1007-G	27.27V	1.0μA	3pF	8kV	3	SOD-323P
XBP1008-G	6.0V	20μA	1pF	8kV	4	SOT-23P
XBP1010-G	6.2V	1.0μA	35pF	8kV	1	SOD-923
XBP1011-G	6.0V	5.0μA	110pF	25kV	1	SOD-523P
XBP1012-G	13.3V	1.0μA	100pF	8kV	2	SOD-323P
XBP1013-G	6.0V	10μA	300pF	25kV	1	SOD-323P
XBP14E5UFN-G	6.0V	1.0μA	0.6pF	8kV	10	DFN2510-10A
XBP15SRV05W-G	6.0V	5.0μA	1pF	10kV	10	SOT-26P
XBP4SMAJxxx-C-G	11.1V ~ 26.7V	1.0μA	180pF ~ 470pF	—	—	SMA-PG

POWER MOSFETS

SERIES	CHANNEL	Vdss (MAX.)	Vgss (MAX.)	Id (MAX.)	Rds_ON (MAX.)	DRIVING VOLTAGE (MIN.)	PACKAGE
XP151	Nch (Single)	20 ~ 30V	±8 ~ 20V	0.8 ~ 1A	0.1 ~ 0.33Ω	1.5 ~ 4.5V	SOT-23
XP152	Pch (Single)	-20 ~ -30V	±12 ~ 20V	-0.5 ~ -0.7A	0.3 ~ 0.48Ω	-2.5 ~ -4.5V	SOT-23
XP202A0003MR-G	P-ch (Single)	-30V	±20v	-3A	0.067Ω	-4.0V	SOT23
XP161	Nch (Single)	20 ~ 30V	±8 ~ 20V	3 ~ 4A	0.05 ~ 0.18Ω	1.5 ~ 4.5V	SOT-89
XP162	Pch (Single)	-20 ~ -30V	±12 ~ 20V	-1.5 ~ -2.5A	0.17 ~ 0.45Ω	-2.5 ~ -4.5V	SOT-89
XP202A0003PR-G	P-ch (Single)	-30V	±20v	-5A	0.07Ω	-4.0V	SOT-89

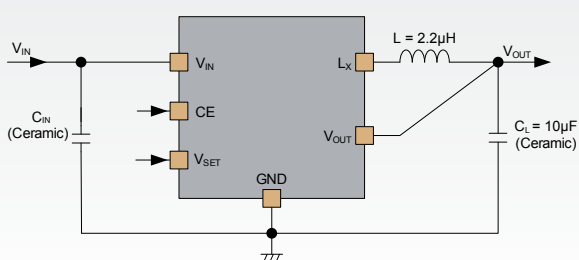
* Values shown in the chart can be changed without any prior notice.

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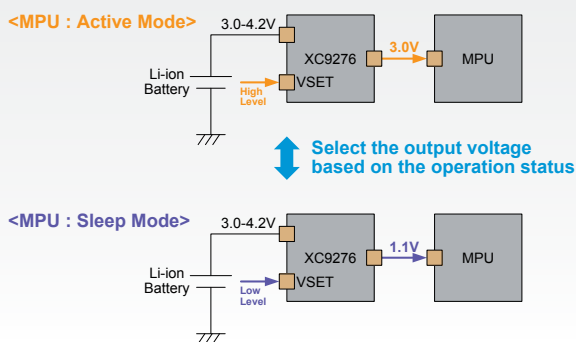
Ultra-Low Power Step-Down DC/DC Converter with VSET function

COMING SOON

TYPICAL APPLICATION CIRCUIT



TWO PRE-SET V_{OUT} VOLTAGES ARE SELECTABLE



KEY FEATURES

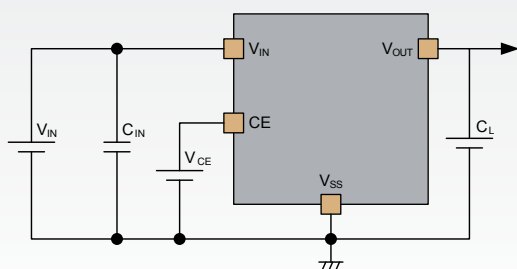
Quiescent Current		0.5μA
Output Current		50mA or 400mA
PFM Switching Current		180mA or 600mA
ON Resistance	N-Ch	0.3Ω (typ)
	P-Ch	0.3Ω (typ)
Input Voltage Range		1.8V ~ 6.0V
Output Voltage Range		0.6V ~ 3.6V (0.1V steps) 2 x V _{OUT} levels selectable by V _{SET}
Control Method		PFM Only
Protection Circuits		Current Limit Circuit
		Inrush Current Protection
		Short Circuit Protection
		UVLO
Additional Features		Optional CL Discharge
		Low ESR Ceramic capacitors
Op. Ambient Temperature		-40°C ~ +85°C
Packages		DFN2020-8, WLP-6-03

XC6237

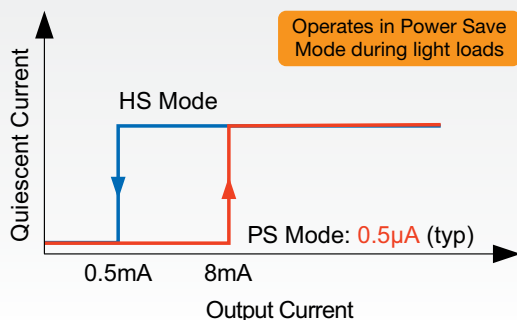
Low IQ, High Speed 'Green Operation'
LDO Voltage Regulator

COMING SOON

TYPICAL APPLICATION CIRCUIT



GREEN OPERATION



KEY FEATURES

Operating Voltage	1.6V ~ 6.0V
Output Voltages	1.2V ~ 5.0V +1.0%
Temp Characteristics	100ppm/°C (typ)
Output Current	150mA
Dropout Voltage	165mV @ IOUT=150mA (RON=1.1Ω)
Quiescent Current	0.5μA (PS:typ)
Standby Current	≤0.1μA
PSRR	60dB @ 1kHz (HS mode)
Protection Circuits	Short Circuit Protection
	Current Limiter
Other Features	Optional CL Discharge
	Low ESR Ceramic Capacitors
Op. Ambient Temperature	-40°C ~ 105°C
Packages	USPQ-4B0x, SOT-23, SSOT-24

PACKAGE PINOUT

