



UC2306

LINEAR INTEGRATED CIRCUIT

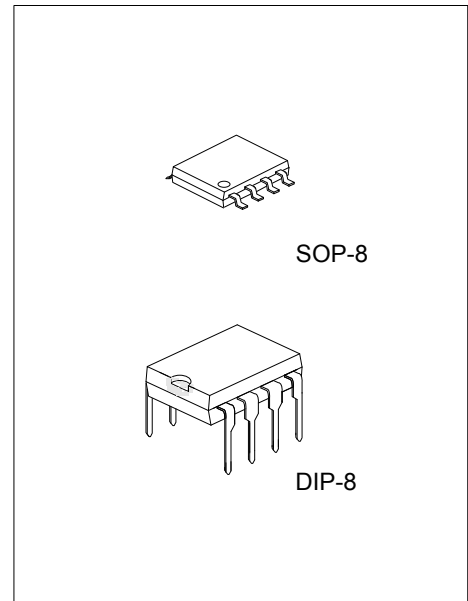
MICROPOWER DC/DC CONVERTERS WITH LOW-BATTERY DETECTOR ACTIVE IN SHUTDOWN

DESCRIPTION

The UTC **UC2306** is a step-up DC/DC converter which operate from a wide input supply range of 1.5V to 8V. Its peak switch current can be reduced by adding a single resistor at the I_{LIM} pin. It is an ideal for use in small, low voltage, battery-operated systems.

FEATURES

- *In shutdown mode: 10 μ A quiescent current.
- *Low battery detector active
- *Minimum Operating Voltage: 1.5V
- *Very Low V_{CESAT} : 370mV@1A (typ).
- *In active mode :120 μ A quiescent current.
- *Only by one resistor: peak current is programmable.



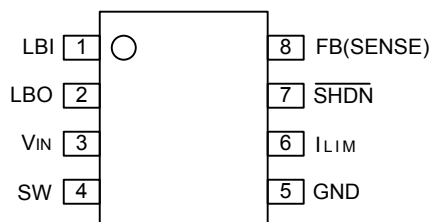
*Pb-free plating product number: UC2306L

ORDERING INFORMATION

Ordering Number		Package	Packing
Normal	Lead Free Plating		
UC2306-xx-D08-T	UC2306L-xx-D08-T	DIP-8	Tube
UC2306-xx-S08-R	UC2306L-xx-S08-R	SOP-8	Tape Reel
UC2306-xx-S08-T	UC2306L-xx-S08-T	SOP-8	Tube

UC2306L-xx-D08-T (1) Packing Type (2) Package Type (3) Voltage Code (4) Lead Plating	(1) T: Tube, R: Tape Reel (2) D08: DIP-8, S08: SOP-8 (3) xx: 33:3.3V, 50:5.0V, AD:ADJ (4) L: Lead Free Plating, Blank: Pb/Sn
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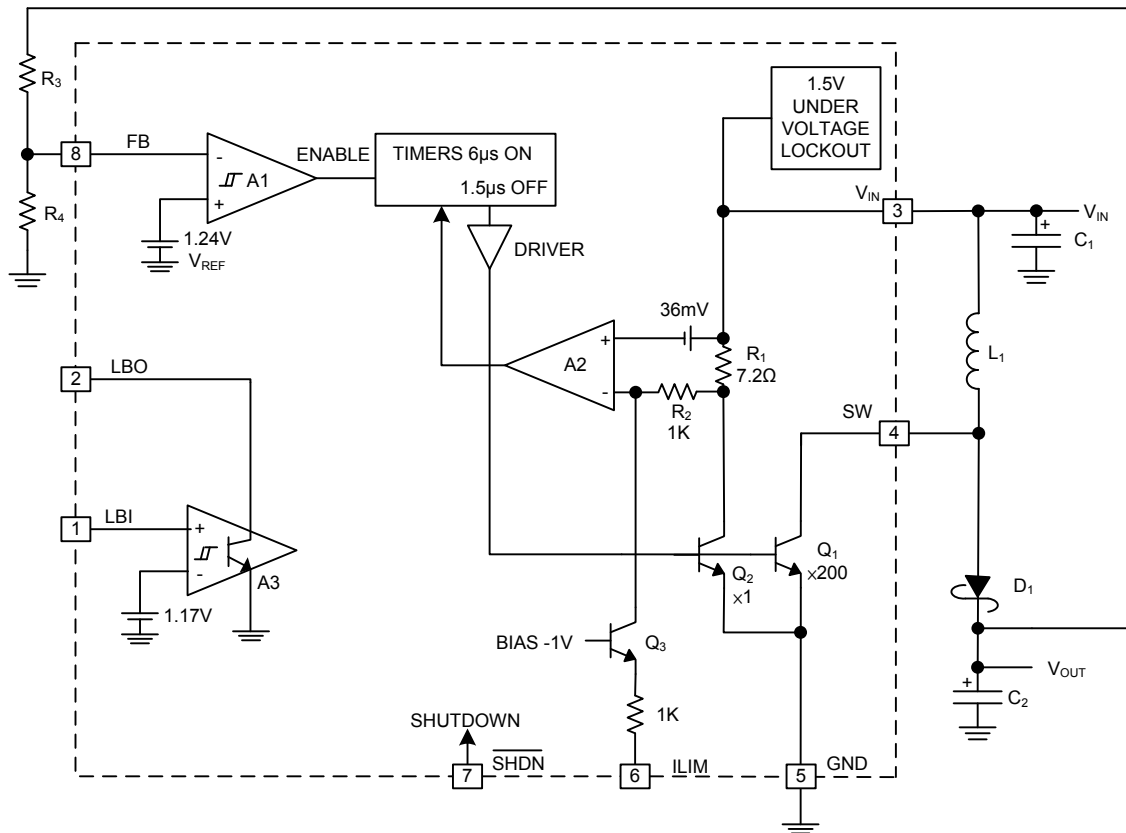
■ PIN CONFIGURATION



■ PIN DESCRIPTION

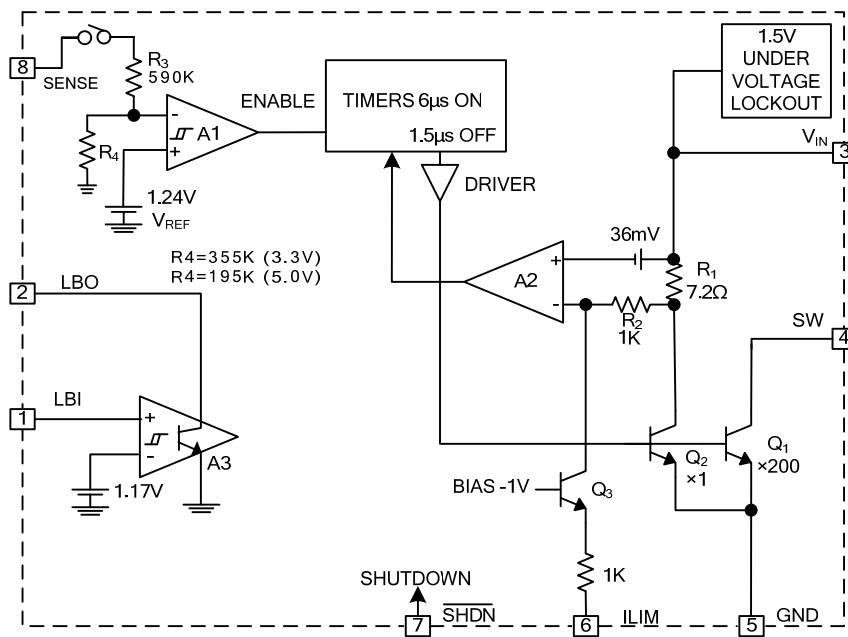
PIN No.	SYMBOL	DESCRIPTION
1	LBI	Input of Low Battery Detector. Detector output is low when voltage on this pin is less than 1.17V.
2	LBO	Output of Low Battery Detector.
3	V _{IN}	Input Voltage Supply.
4	SW	The Collector Pin of Power NPN.
5	GND	Ground.
6	I _{LIM}	Pin For Current Limit Set. Connected to nothing for 1A peak switch current; and connect to a resistor to ground will lower peak current
7	SHDN	Input of Shutdown. Held low, then switching regulator is turned off. This Pin should not be float. When SHDN mode is not used, connect it to V _{IN}
8	FB/SENSE	This pin connects to the resistor divider. In shutdown mode, the divider is disconnected from it.

■ BLOCK DIAGRAMS



UC2306 Block Diagram.

Note: A3 Remains Alive When Device Is in Shutdown



UC2306-3.3/UC2306-5.0 Block Diagram

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATING	UNIT
Input Voltage	V_{IN}	8	V
SW Voltage	V_{SW}	-0.4 ~ +25	V
FB Voltage(UC2306)	V_{FB}	$V_{IN}+0.3$	V
I_{LIM} Voltage(UC2306-3.3/UC2306-5.0)	V_{LIM}	5	V
SHDN Voltage	V_{SHDN}	6	V
LBI Voltage	V_{LBI}	V_{IN}	V
LBO Voltage	V_{LBO}	8	V
Maximum Power Dissipation	P_D	500	mW
Junction Temperature	T_J	125	°C
Operating Temperature	T_{OPR}	-20 ~ +85	°C
Storage Temperature	T_{STG}	-65 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

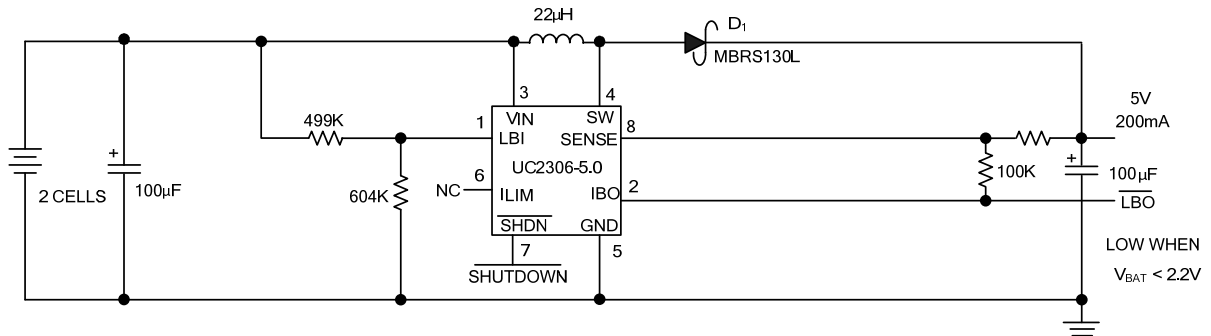
■ ELECTRICAL CHARACTERISTICS ($V_{IN}=2V$, $V_{SHDN}=2V$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Minimum Operating Voltage	$V_{CC(MIN)}$			1.5	1.65	V
Operating Voltage	V_{IN}				8	V
Quiescent Current	I_Q	$V_{SHDN}=2V$, Not switching(Note)		120	200	μA
Quiescent Current In Shutdown	I_{SD}	$V_{SHDN}=0V$, $V_{IN}=2V$ (Note)		7	15	μA
		$V_{SHDN}=0V$, $V_{IN}=5V$ (Note)		27	50	μA
Comparator Trip Point		(Note)	1.22	1.24	1.26	V
FB Pin Bias Current	I_{FB}	(Note)		10	25	nA
Sense Pin Leakage in Shutdown	$I_{LEAK(SD)}$	$V_{SHDN}=0V$, Fixed Output Versions(Note)		0.002	1	μA
Line Regulation	ΔV_{OUT}	$1.8V \leq V_{IN} \leq 8V$ (Note)		0.04	0.15	%/V
LBI Input Threshold	$V_{LBI(THR)}$	Falling Edge(Note)	1.10	1.17	1.25	V
LBI Bias Current	$I_{LBI(BIAS)}$	(Note)		6	20	nA
LBI Input Hysteresis	$I_{LBI(HYS)}$	(Note)		35	65	mV
LBO Output Voltage Low	$V_{LBO(OL)}$	$I_{SINK}=500\mu A$ (Note)		0.2	0.4	V
LBO Output Leakage Current	$I_{LBO(LEAK)}$	$LBI=1.5V$, $LBO=5V$ (Note)		0.01	0.1	μA
SHDN Input Voltage	V_{SHDN}	High	(Note)	1.4		V
		Low	(Note)		0.4	V
SHDN Pin Bias Current	I_{SHDN}	$V_{SHDN}=5V$ (Note)		5	8	μA
		$V_{SHDN}=0V$ (Note)	-5	-2		μA
Switching Off Time	t_{OFF}	(Note)	1	1.5	2	μs
Switch On Time	t_{ON}	Current Limit Not Asserted (Note)	4	6	8	μs
Maximum Duty Cycle	t_{DUTY}	Current Limit Not Asserted (Note)	76	80	88	%
Peak Switch Current	$I_{(SW)}$	I_{LIM} Pin Open, $V_{IN}=5V$	0.8	1	1.2	A
		20K from I_{LIM} to GND		500		mA
Switch Saturation Voltage	$V_{SW(SAT)}$	$I_{SW}=1A$		0.37		V
		$I_{SW}=700mA$ (Note)		0.26	0.35	V
Switch Leakage	$I_{LEAK(SW)}$	Switch off, $V_{SW}=5V$		0.01	7	μA

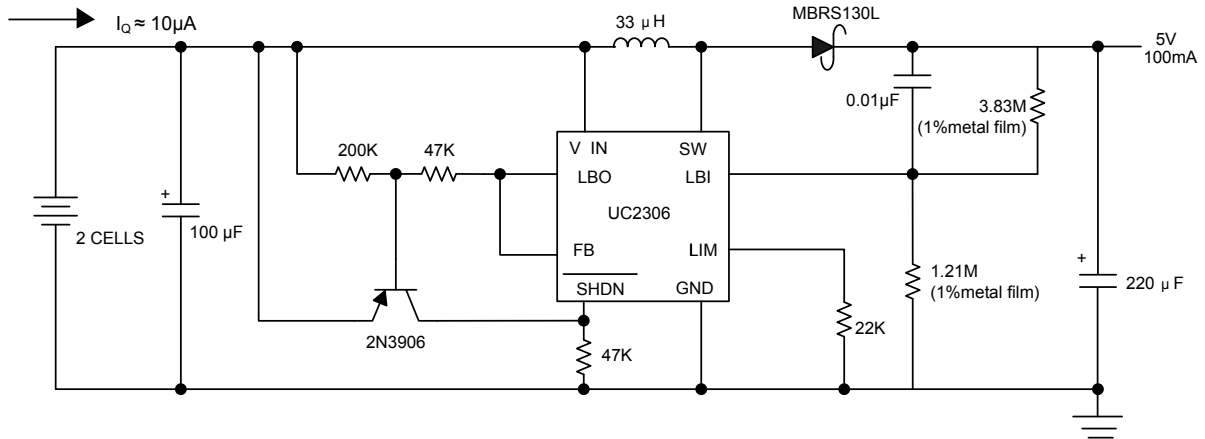
Note: Denotes specifications which apply over the 0°C to 70°C operating temperature range.

■ TYPICAL APPLICATION

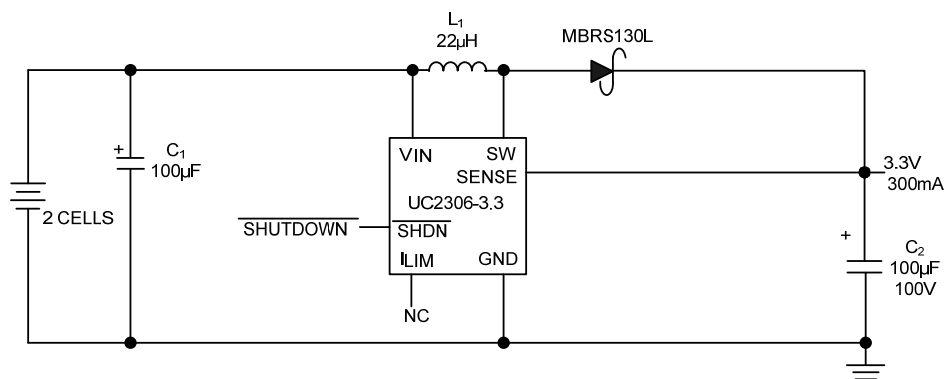
2-Cell to 5V Step-Up Converter with Low-Battery Detect



Super Burst Low I_Q DC/DC Converter

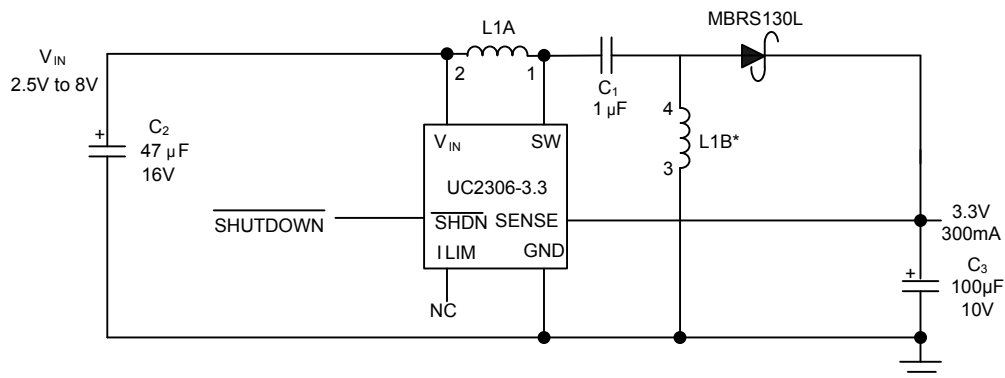


2-Cell to 3.3V Boost Converter

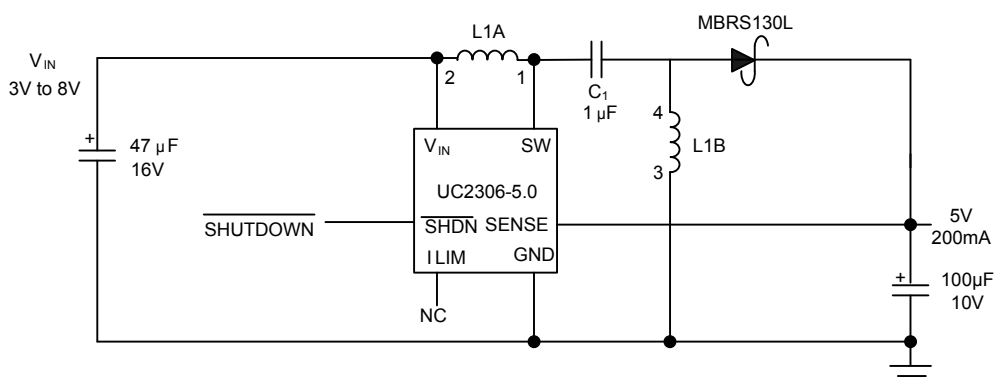


■ TYPICAL APPLICATION(Cont.)

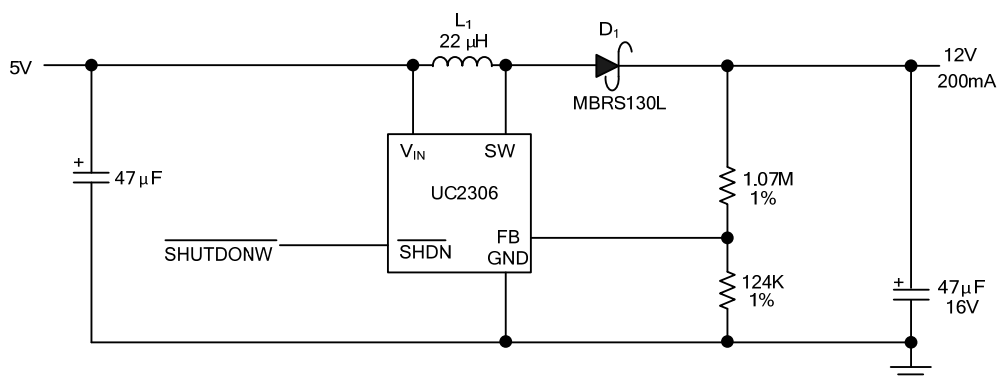
3.3V SEPIC Efficiency(Step-Up/Step-Down Converter)

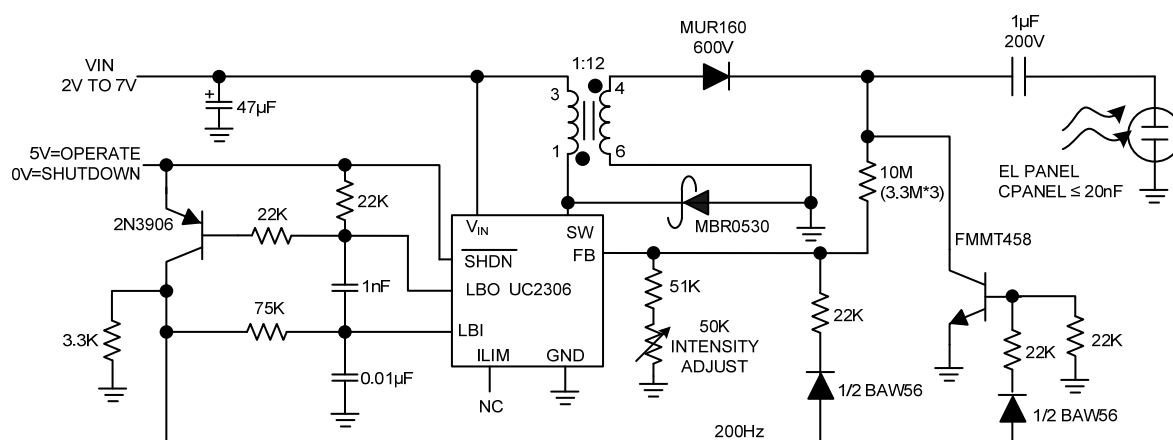


5V SEPIC (Step-Up/Step-Down Converter)



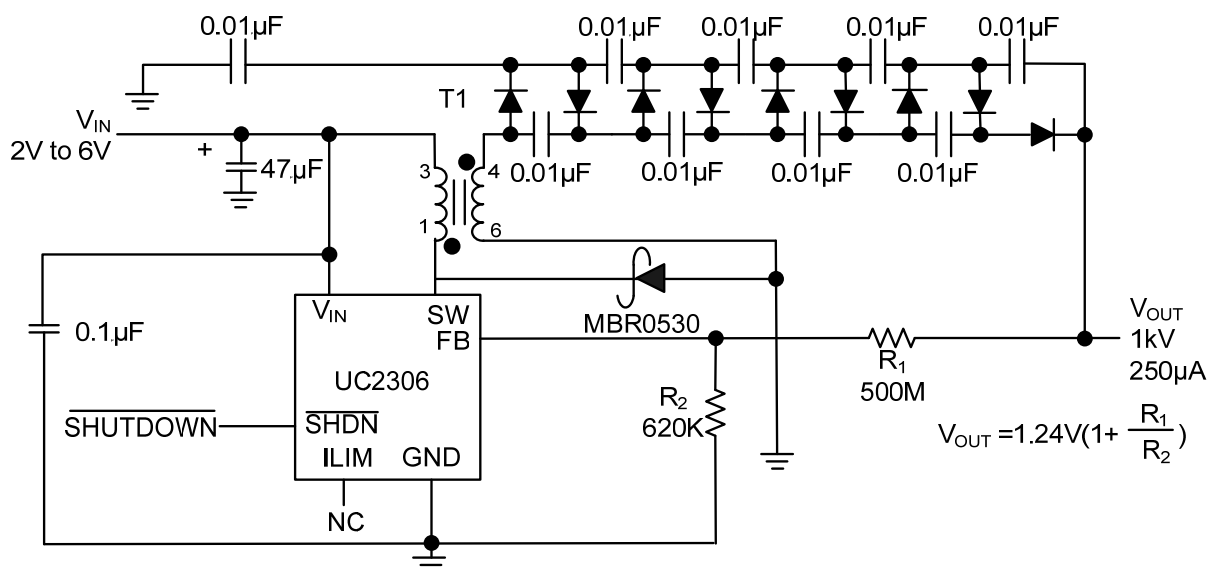
5V to 12V DC/DC Converter



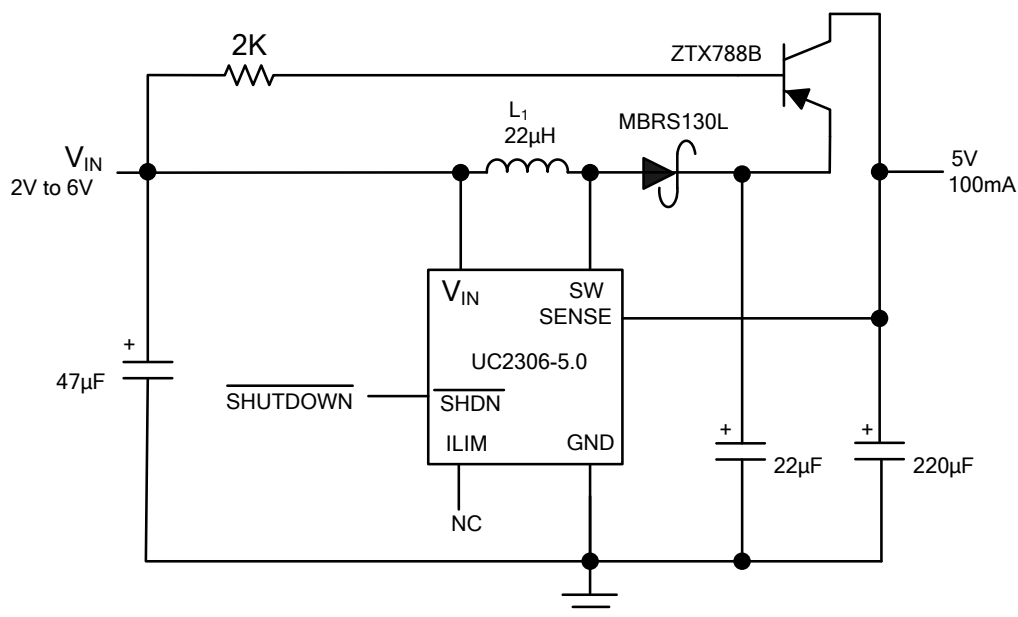
Single Li-Ion Cell to 5V Converter with Load Disconnect at $V_{IN} < 2.7V$ 

■ TYPICAL APPLICATION(Cont.)

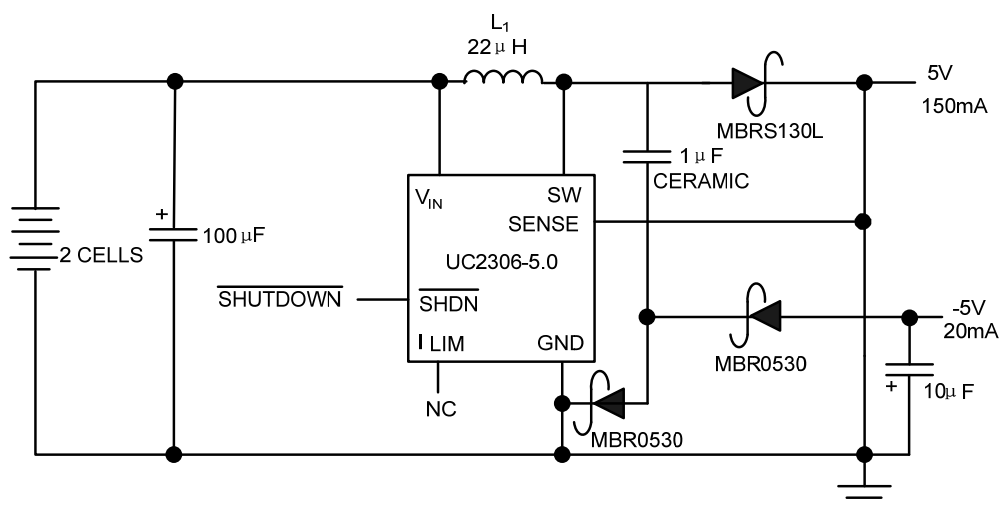
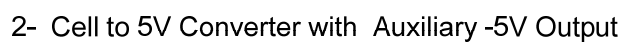
2-to 4-Cell to 1kV Step-Up Converter



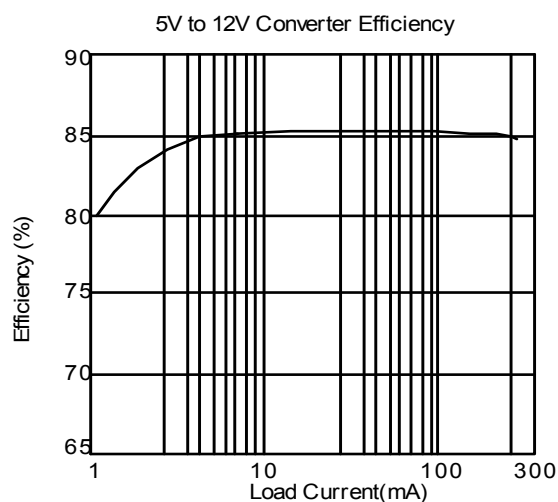
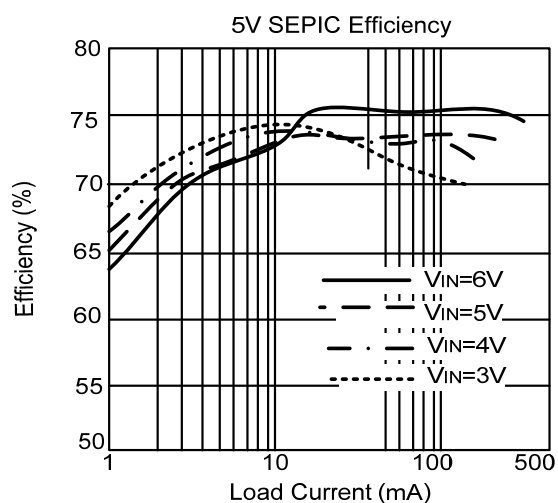
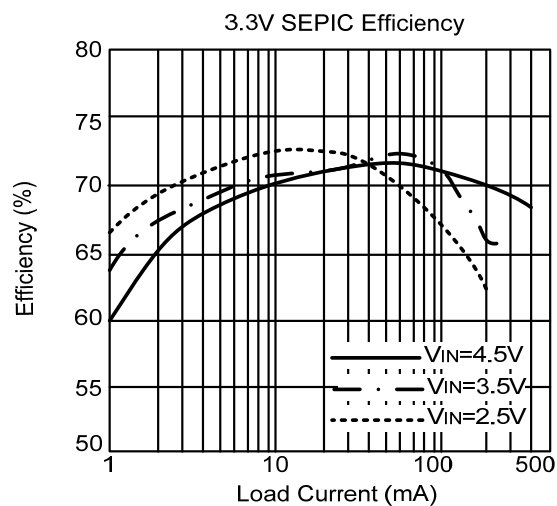
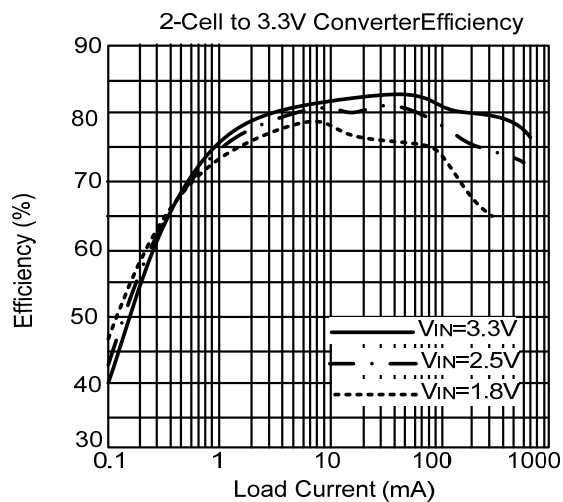
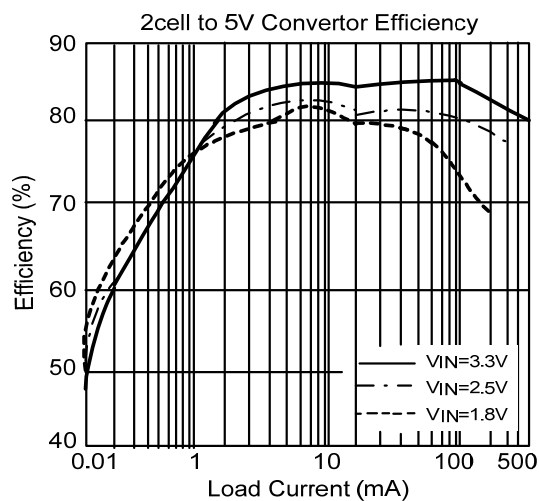
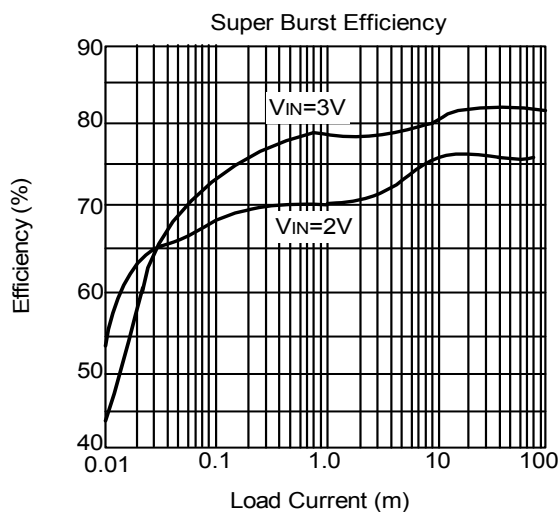
2- TO 4- Cell to 5V Converter with Output Disconnect



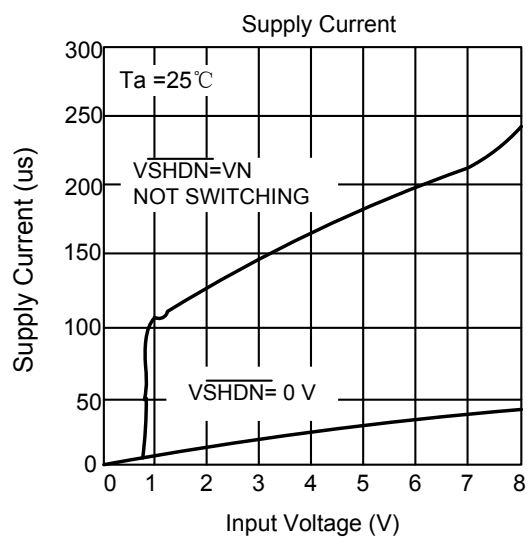
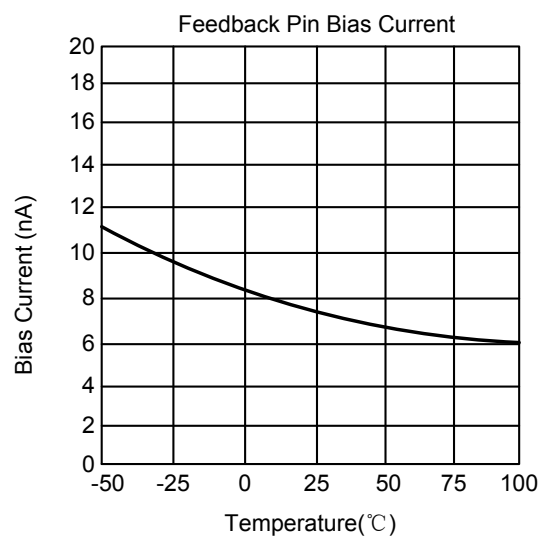
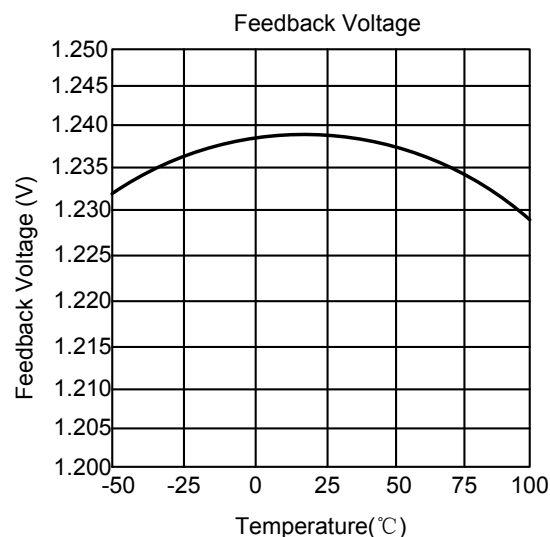
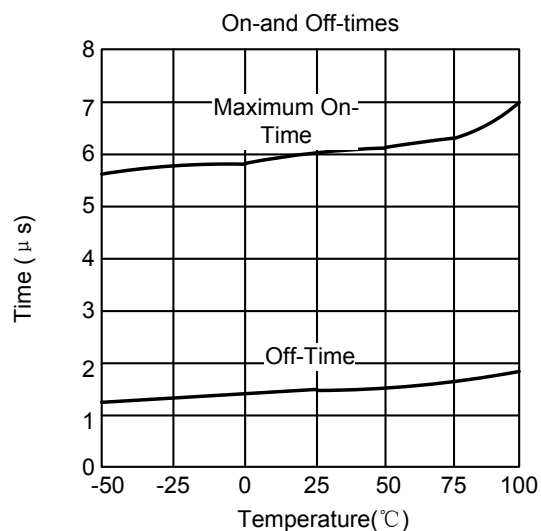
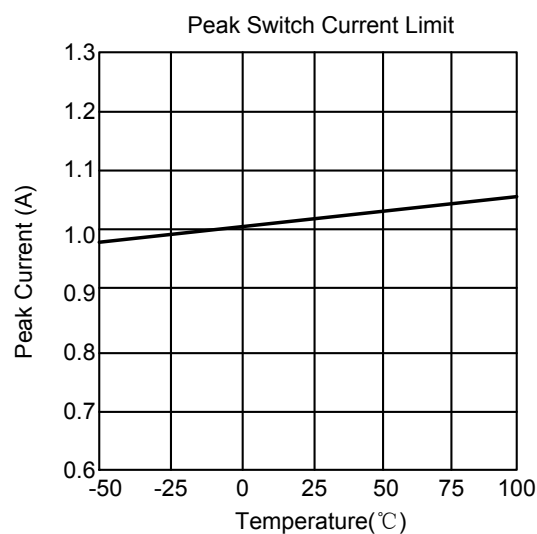
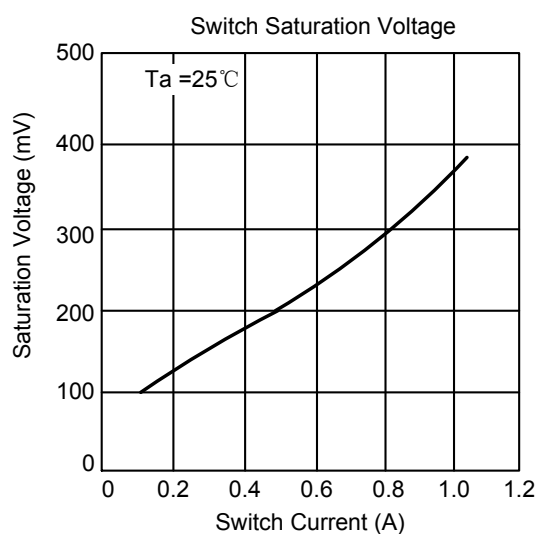
2- Cell to 5V Converter with Auxiliary 10V Output



TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



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