



L6925D

HIGH EFFICIENCY MONOLITHIC SYNCHRONOUS STEP DOWN REGULATOR

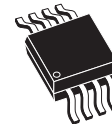
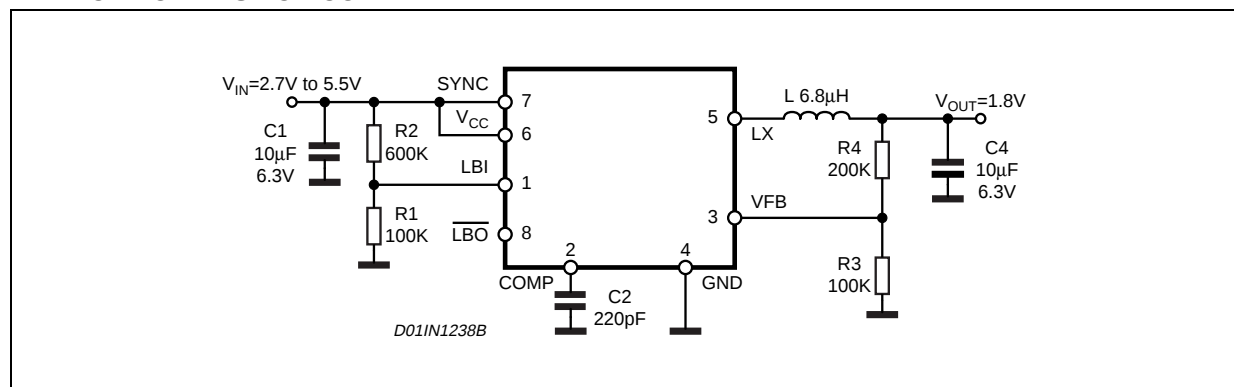
PRODUCT PREVIEW

- 2.7V TO 5.5V BATTERY INPUT RANGE
- HIGH EFFICIENCY: UP TO 95%
- INTERNAL SYNCHRONOUS SWITCH
- NO EXTERNAL SCHOTTKY REQUIRED
- EXTREMELY LOW QUIESCENT CURRENT
- 800mA MAX OUTPUT CURRENT
- ADJUSTABLE OUTPUT VOLTAGE FROM 0.6V
- LOW DROP-OUT OPERATION: UP TO 100% DUTY CYCLE
- SELECTABLE LOW NOISE/LOW CONSUMPTION MODE AT LIGHT LOAD
- LOW BATTERY INPUT
- LOW BATTERY OUTPUT
- $\pm 1\%$ OUTPUT VOLTAGE ACCURACY
- CURRENT-MODE CONTROL
- 600kHz SWITCHING FREQUENCY
- EXTERNALLY SYNCHRONIZABLE FROM 500kHz TO 1.4MHz
- OVP
- SHORT CIRCUIT PROTECTION

APPLICATIONS

- BATTERY-POWERED EQUIPMENTS
- PORTABLE INSTRUMENTS
- CELLULAR PHONES
- PDAs AND HAND HELD TERMINALS
- DSC
- GPS

APPLICATION TEST CIRCUIT



MSOP8

ORDERING NUMBER: L6925D

DESCRIPTION

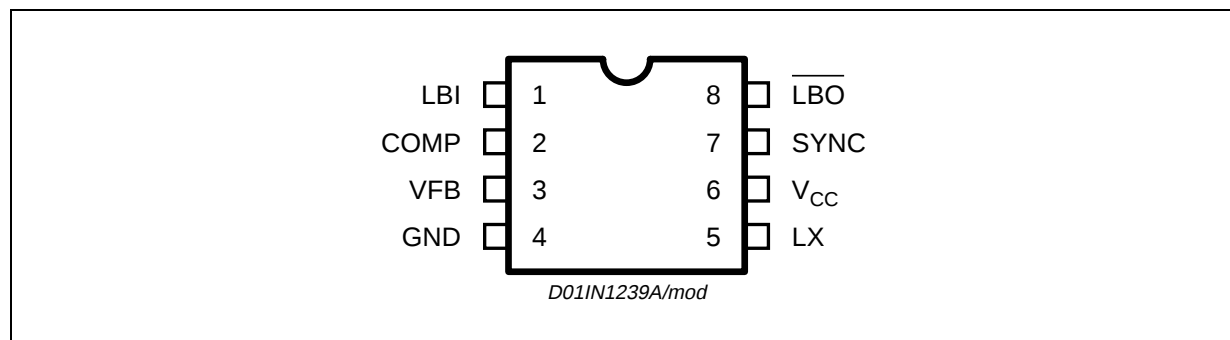
The device is dc-dc monolithic regulator specifically designed to provide extremely high efficiency.

The device has on UVLO set at 2.7V cause it is particularly thought for single Li-ion cell applications. Output voltage can be selected by an external divider down to 0.6V. Duty Cycle can saturate to 100% allowing low drop-out operation. The device is based on a 600kHz fixed-frequency, current mode-architecture. Low Consumption Mode operation can be selected at light load conditions, allowing switching losses to be reduced. L6925D is externally synchronizable with a clock which makes it useful in noise-sensitive applications. LBI pin can be used to have a LBO signal when the Battery voltage is lower than a preset value. Other features like Powergood, Over-voltage protection, Shortcircuit protection and Thermal Shutdown (150°C) are also present.

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V ₆	Input voltage	-0.3 to 6	V
V ₅	Output switching voltage	-1 to V _{CC}	V
V ₁	Shutdown	-0.3 to V _{CC}	V
V ₃	Feedback voltage	-0.3 to V _{CC}	V
V ₂	Analog input voltage	-0.3 to V _{CC}	V
P _{tot}	Power dissipation at Tamb=70°C	0.45	W
T _j	Junction operating temperature range	-40 to 150	°C
T _{stg}	Storage temperature range	-65 to 150	°C

PIN CONNECTION



THERMAL DATA

Symbol	Parameter	Value	Unit
R _{th j-amb}	Thermal Resistance Junction to Ambient	180	°C/W

PIN FUNCTIONS

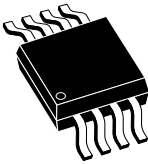
N	Name	Description
2	COMP	Error amplifier output. Compensate it with a 220pF capacitor
6	VCC	Input voltage.
4	GND	Ground.
3	VFB	Error amplifier input. The output voltage can be adjusted by using an external resistor divider connected to this pin (V _{FB} = 0.6V).
7	SYNC	This pin allows to select Low Noise/ Low Consumption Mode or to synchronize the device.
1	LBI	Battery low voltage detector input. The internal threshold is set to 0.6V. The external threshold can be adjusted by using an external resistor divider.
5	LX	Switch node connection to the inductor.
8	LBO	Battery low voltage detector output. If the voltage at the LBI pin drops below the internal threshold, LBO goes low. The LBO is an open drain output. A pull_up resistor should be connected between the pin and the output voltage

ELECTRICAL CHARACTERISTICS

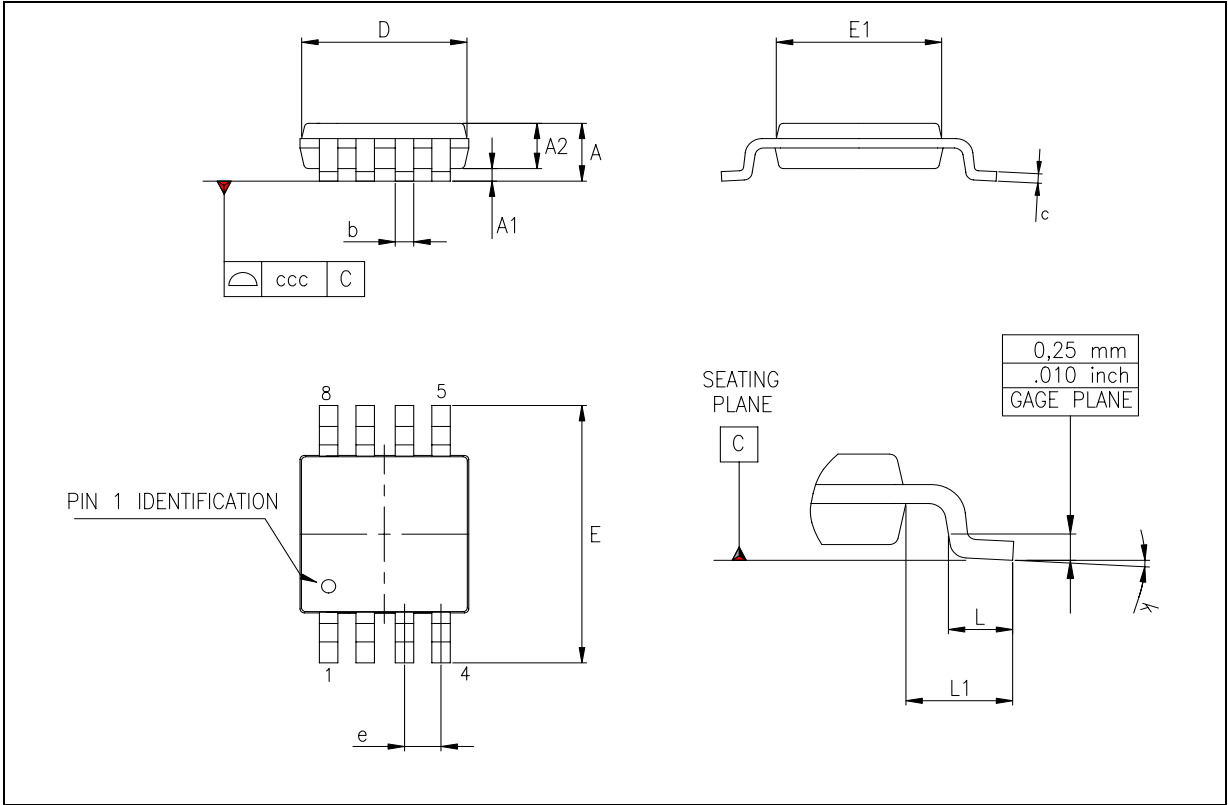
Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
V _{CC}	Operating input voltage	After Turn On	2.7		5.5	V
V _{CC ON}	Turn On threshold			2.85		V
V _{CC OFF}	Turn Off threshold				2.7	V
V _{CC hys}	Hysteresis			150		mV
R _p	High side Ron	V _{CC} = 3.6V, I _{LX} =100mA		240		mΩ
R _n	Low side Ron	V _{CC} = 3.6V, I _{LX} =100mA		215		mΩ
I _{lim}	Peak current limit	V _{CC} = 3.6V		1		A
	Valley current limit	V _{CC} = 3.6V		1.2		A
V _{out}	Output voltage range		0.6		V _{CC}	V
f _{osc}	Oscillator frequency			600		KHz
f _{sync}	Sync mode clock		500		1400	KHz
t _{on}	Minimum ON time				200	ns
DC CHARACTERISTICS						
I _q	Quiescent current (low noise mode)	2.7V<V _{CC} <5.5V, V _{sync} = 0V, no load, V _{FB} > 0.6V		230	400	μA
	Quiescent current (low consumption mode)	2.7V<V _{CC} <5.5V, V _{sync} = V _{CC} , no load		25	33	μA
I _{sh}	Shutdown current	V _{CC} < 2.7V, V _{FB} > 0.6V			5	μA
I _{LX}	LX leakage current	V _{CC} < 2.7V, V _{LX} = V _{CC}			3	μA
		V _{CC} < 2.7V, V _{LX} = 0V			1	μA
ERROR AMPLIFIER CHARACTERISTICS						
V _{fb}	Voltage feedback	V _{CC} = 3.6V	0.594	0.6	0.606	V
I _{fb}	Feedback input current		-50		50	nA
SYNC/MODE FUNCTION						
V _{sync_H}	Sync mode threshold high				1.3	V
V _{sync_L}	Sync mode threshold low		0.5			V
LBI SECTION						
V _{LBI}	LBI Threshold		0.588	0.6	0.612	V
V _{LBO}	LBO Logic Low	I _{sink} = 1mA, V _{CC} = 3.6V, V _{LBI} < 0.6V		0.2	0.4	V
I _{LK-LBO}	LBO Leakage Current	V _{LBO} = 3.6V, V _{CC} = 3.6V, V _{LBI} > 0.6V			25	nA
PROTECTIONS						
HOVP	Hard overvoltage threshold			10		%Vout

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.10			0.043
A1	0.050		0.150	0.002		0.006
A2	0.750	0.850	0.950	0.03	0.033	0.037
b	0.250		0.400	0.010		0.016
c	0.130		0.230	0.005		0.009
D (1)	2.900	3.000	3.100	0.114	0.118	0.122
E	4.650	4.900	5.150	0.183	0.193	0.20
E1 (1)	2.900	3.000	3.100	0.114	0.118	0.122
e		0.650			0.026	
L	0.400	0.550	0.700	0.016	0.022	0.028
L1		0.950			0.037	
k	0° (min.) 6° (max.)					
aaa			0.100			0.004
Note: 1. D and F does not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15mm (.006inch) per side.						

**OUTLINE AND
MECHANICAL DATA**



**MSOP8
(Body 3mm)**



Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics
® 2003 STMicroelectronics - All Rights Reserved

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - Canada - China - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco -
Singapore - Spain - Sweden - Switzerland - United Kingdom - United States.

<http://www.st.com>