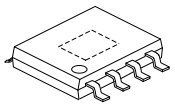
3A ULTRA LOW DROPOUT LINEAR REGULATOR



HSOP-8

■ DESCRIPTION

The UTC **LXXLD38** is a typical LDO with the features of very low dropout voltage as low as 0.20V at output current 3A.

For normal operation, two supply voltages are necessary. One called control voltage from other equipment can shutdown the output voltage and it should pull and hold the voltage of EN pin less than 0.4V. Another one is the main supply voltage whose purpose is for main power conversion, to keep the power dissipation low, and to make the dropout voltage lower.

Internally, in the UTC **LXXLD38**, there're many functions which can be seen in the block figure to prevent the IC from being damaged. Internal Power-On-Reset (POR) circuit can control the two supply voltages to prevent fault operations of the circuit; the thermal shutdown circuit is able to protect the device from over thermal operation, and a current limit function will keep the device work safely under current over-loads.

The UTC **LXXLD38** can be used as an ideal to provide well supply voltage in the applications, such as front-side-bus termination on motherboard, NB applications, front side bus V_{TT} (1.0V/3A) and note book PC applications.

■ FEATURES

* Low Dropout V_D=0.20V(typ.)@ I_{OUT}=3A
* Low ESR Output Capacitor
* V_{REF}=0.5V
* Fast Transient Response
* Output Voltage Adjustable through External Resistors
* POR(Power-On-Reset) controlling V_{CNTL} and V_{IN}
* With internal Soft-Start
* Internal Current Limit Protection
* Internal Under Voltage Protection
* Hysteretic Thermal Shutdown
* With Power-OK Output (with a Delay Time)
* Low Shutdown Quiescent Current (<30μA)
* Shutdown/Enable Control Function

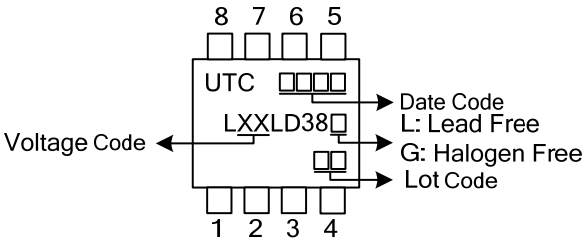
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
LXXLD38L-SH2-R	LXXLD38G-SH2-R	HSOP-8	Tape Reel

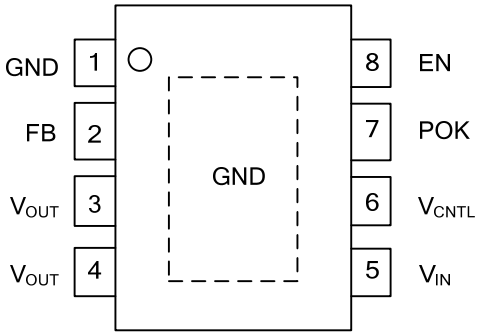
Note: XX: Output Voltage, refer to Marking Information.

LXXLD38G-SH2-R (1) Packing Type (2) Package Type (3) Green Package (4) Output Voltage Code	(1) R: Tape Reel (2) SH2: HSOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free (4) XX: refer to Marking Information

■ MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
HSOP-8	AD :ADJ	

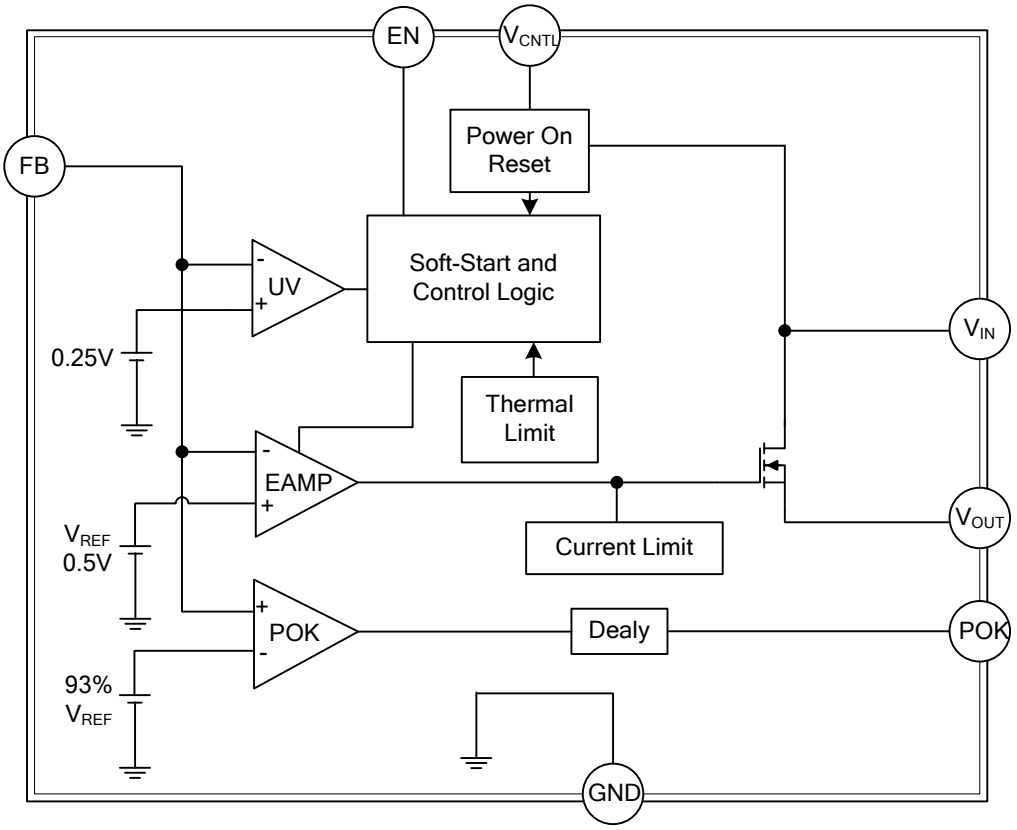
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	GND	GND pin
2	FB	Feedback pin
3, 4	V_{OUT}	IC power supply pin
5	V_{IN}	Input Voltage
6	V_{CNTL}	CNTL Pin Input Voltage
7	POK	Power OK Output Pin
8	EN	Internal Pull High. EN=high or Floating→ Enable EN=Low→Shutdown mode
Exposed Pad	GND	Connect exposed pad to GND.

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
V_{CNTL} Supply Voltage	V_{CNTL}	-0.3 ~ 7	V
V_{IN} Supply Voltage	V_{IN}	-0.3 ~ 6	V
EN and FB Pin Voltage	$V_{I/O}$	-0.3 ~ V_{CNTL}+0.3	V
Power Good Voltage	V_{POK}	-0.3 ~ 7	V
Power Dissipation	P_D	2.5	W
Junction Temperature	T_J	+150	°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.

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER		SYMBOL	RATINGS	UNIT
V_{CNTL} Supply Voltage		V_{CNTL}	3 ~ 5.5	V
V_{IN} Supply Voltage		V_{IN}	0.9 ~ 3.65	V
Output Voltage	V_{CNTL}-V_{OUT}>1.9V	V_{OUT}	0.6 ~ V_{IN}-V_{DROP}	V
Output Current		I_{OUT}	0 ~ 3	A

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	220	°C/W

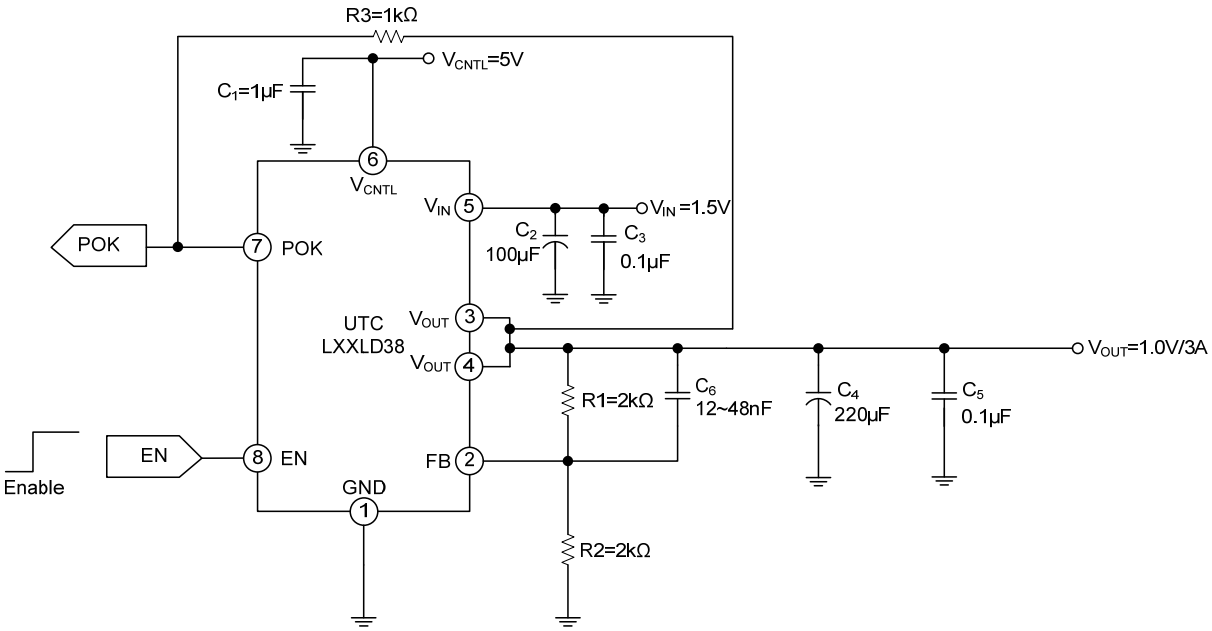
■ ELECTRICAL CHARACTERISTICS

(V_{CNTL}=5V, V_{IN}=1.5V, V_{OUT}=1.0V, T_A=25°C unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
V_{CNTL} POR Threshold	V_{CNTL}			2.4		V
V_{CNTL} POR Hysteresis	$V_{CNTL(hys)}$			0.5		V
V_{IN} POR Threshold	V_{IN}			0.6		V
V_{IN} POR Hysteresis	$V_{IN(hys)}$			0.4		V
V_{CNTL} Nominal Supply Current	I_{CNTL}	EN=V_{CNTL}		1.0	3.0	mA
V_{CNTL} Shutdown Current	I_{SD}	EN=0V		15	50	μA
Feedback Voltage	V_{FB}	V_{CNTL}=5V, I_{OUT}=10mA	0.49	0.5	0.51	V
Load Regulation		I_{OUT}=0A~3A		0.2	0.6	%
Line Regulation		V_{CNTL}=V_{EN}=5V V_{IN}=V_{OUT} +0.5V~5V I_{OUT}=10mA		0.01	0.1	%/V
Dropout Voltage	V_{DROP}	I_{OUT}=3A, V_{CNTL}=5V, V_{OUT}=0.9V		0.20		V
V_{OUT} Pull Low Resistance		EN=0V		85		Ω
Soft Start Time	T_{SS}			2		mS
EN Pin Logic High Threshold Voltage	V_{ENH}	Enable	1.2			V
	V_{ENL}	Disable			0.4	V
EN Hysteresis				50		mV
EN Pin Pull-Up Current	I_{EN}	EN=GND		10		μA
Current Limit	I_{LIM}	V_{CNTL}=5V	3.5			A
Ripple Rejection V_{IN}	PSRR	F=120Hz, I_{OUT}=100mA		65		dB
Ripple Rejection V_{CNTL}				65		dB
Under-Voltage Threshold		V_{FB} Falling		0.25		V
POK Threshold Voltage for Power OK	V_{POK}	V_{FB} Rising		93%		V_{FB}
POK Threshold Voltage for Power Not OK	V_{PNOK}	V_{FB} Falling		85%		V_{FB}
POK Low Voltage		POK sinks 5mA		0.25	0.4	V
Thermal Shutdown Temp	T_{SD}			160		°C
Thermal Shutdown Hysteresis	T_{SH}			50		°C

■ TYPICAL APPLICATION CIRCUIT

1. Using an Output Capacitor with ESR ≥ 20mΩ



2. Using an MLCC as the Output Capacitor