



## L4120

Preliminary

CMOS IC

### 40V/1.2A INTEGRATED POWER LED DRIVER

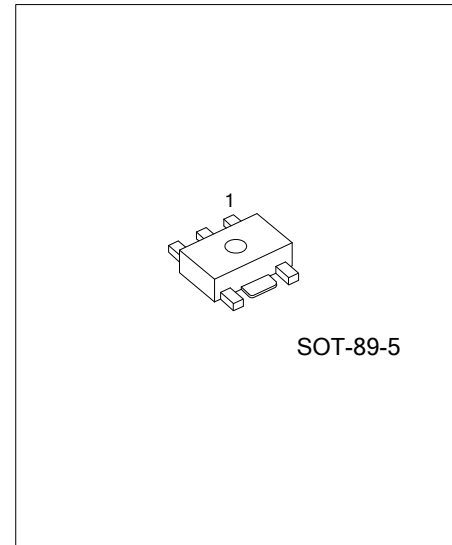
#### DESCRIPTION

The UTC **L4120** is a continuous conduction mode inductive step-down converter, designed for driving single or multiple series connected LEDs. Using a few external components.

The UTC **L3080** has a build-in power switch, based on different input voltage, The UTC **L4120** can drive several 1W or 3W LEDs. The device has the function of thermal shutdown protection and LED short-circuit/open-circuit protection.

#### FEATURES

- \* Up to 1.2A output current
- \* High efficiency (up to 97%)
- \* Wide input voltage range: 5V~30V
- \* Typical ±5% output current accuracy
- \* Single DIM pin on/off and brightness control using DC voltage or PWM signal
- \* Internal thermal shutdown protection.
- \* Adjustable Constant LED Current

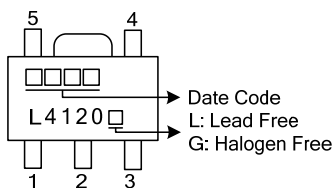


#### ORDERING INFORMATION

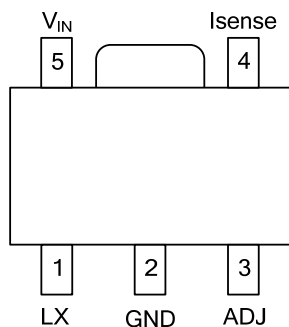
Ordering Number		Package	Packing
Lead Free	Halogen Free		
L4120L-AB5-R	L4120G-AB5-R	SOT-89-5	Tape Reel

<p>L4120L-AB5-R</p> <p>(1) Packing Type (2) Package Type (3) Lead Free</p>	<p>(1) R: Tape Reel (2) AB5: SOT-89-5 (3) L: Lead Free, G: Halogen Free</p>
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#### MARKING



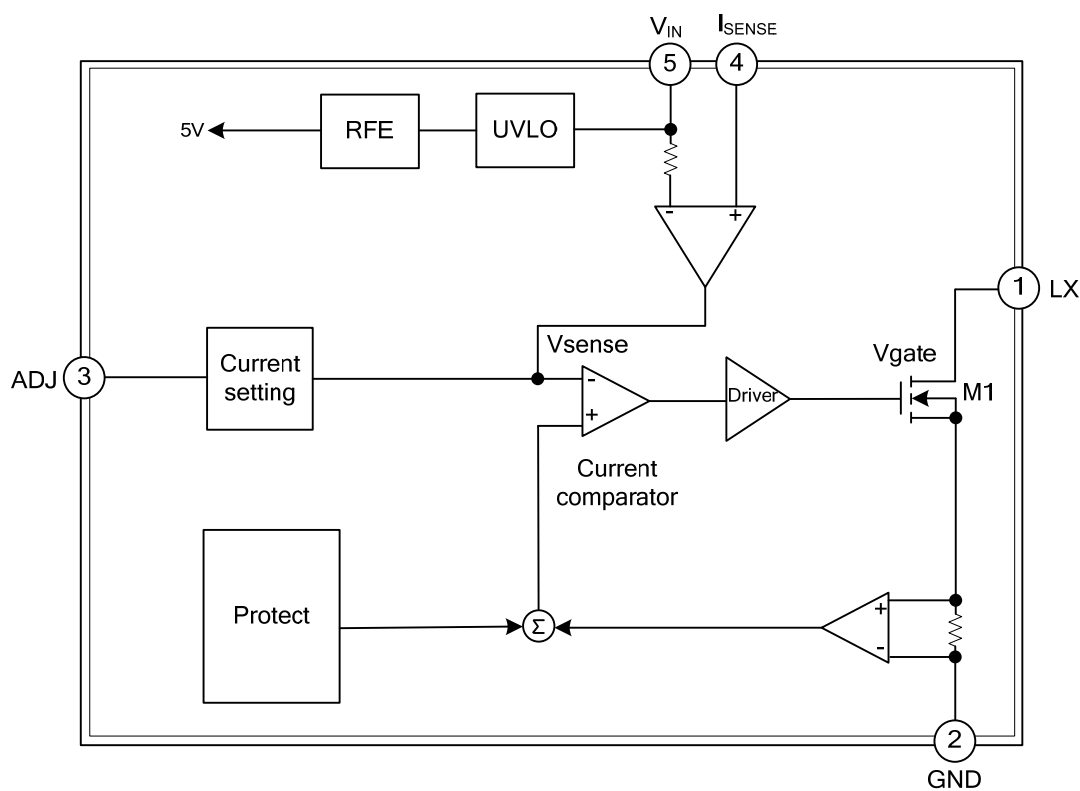
### ■ PIN CONFIGURATION



### ■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	LX	Switch pin
2	GND	Ground
3	ADJ	Multi-function On/Off and brightness control pin
4	I <sub>SENSE</sub>	Current sense input
5	V <sub>IN</sub>	Input voltage

### ■ BLOCK DIAGRAM



### ■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	$V_{IN}$	-0.3~+40	V
I <sub>SENSE</sub> Voltage	$V_{ISENSE}$	$V_{IN} \geq 5V$	$V_{IN} + 0.3 \sim V_{IN} - 5$
		$V_{IN} < 5V$	$V_{IN} + 0.3 \sim -0.3$
LX Output Voltage	$V_{LX}$	-0.3~+40	V
Adjust Pin Input Voltage	$V_{ADJ}$	-0.3~+6	V
Switch Output Current	$I_{LX}$	1.5	A
Power Dissipation	$P_{TOT}$	0.5	W
Operating Temperature	$T_{OP}$	-40~105	°C
Storage Temperature	$T_{STG}$	-55~150	°C
Junction Temperature	$T_J$	150	°C
Junction to Ambient	$\theta_{JA}$	180	°C/W

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

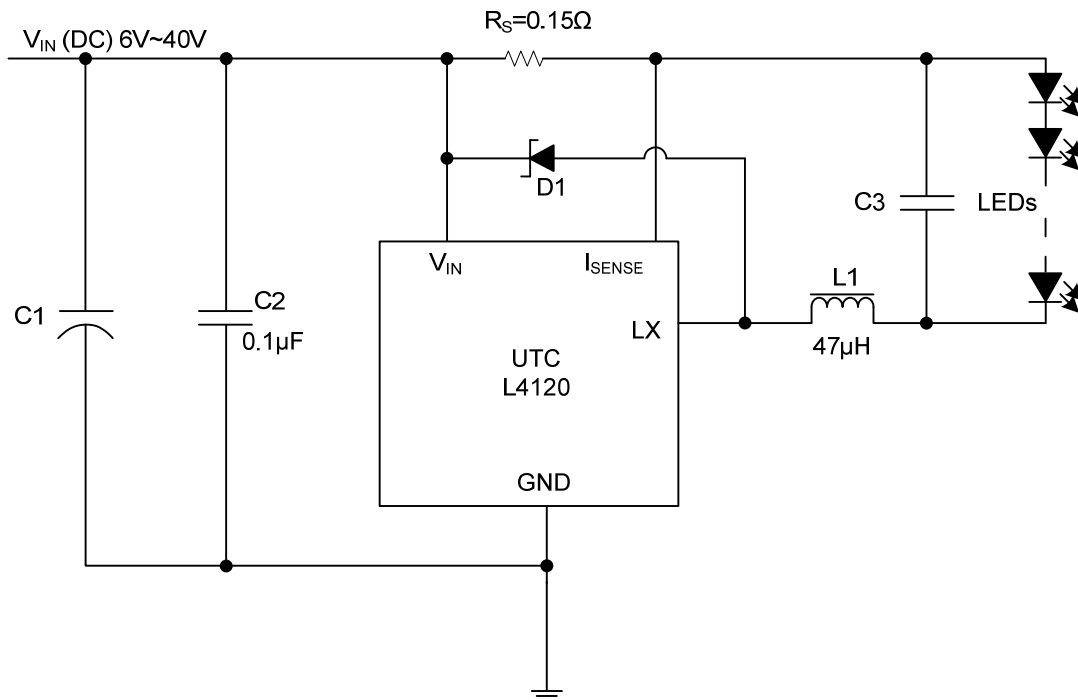
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

### ■ ELECTRICAL CHARACTERISTICS ( $V_{IN}=12V$ , $T_{AMB}=25^\circ C$ unless otherwise stated) (Note 1)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Voltage	$V_{IN}$		6		40	V
Quiescent Supply Current with Output Off	$I_{INQoff}$	ADJ Pin Grounded			400	$\mu A$
Quiescent Supply Current with Output Switching	$I_{INQon}$	ADJ Pin Floating			1000	$\mu A$
Mean Current Sense Threshold Voltage	$V_{SENSE}$			115		mV
Sense Threshold Hysteresis	$V_{SENSEHYS}$			$\pm 15$		%
External Control Voltage Range On ADJ Pin for DC Brightness Control	$V_{ADJ}$		0.3		1.2	V
DC Voltage On ADJ Pin to Switch Chip from Active (On) State to Quiescent (Off) State	$V_{ADJoff}$	$V_{ADJ}$ Falling	0.15	0.2	0.25	V
DC Voltage On ADJ Pin to Switch Chip from Quiescent (Off) State to Active (On) State	$V_{ADJon}$	$V_{ADJ}$ Rising	0.2	0.25	0.3	V
Resistance Between ADJ Pin and $V_{REF}$	$R_{ADJ}$			500		K $\Omega$
Continuous LX Switch Current	$I_{LXmean}$			1.2		A
LX Switch "On" Resistance	$R_{LX}$			0.4		$\Omega$
LX Switch Leakage Current	$I_{LX(leak)}$				1	$\mu A$
Minimum Switch "ON" Time	$T_{ONmin}$	LX Switch "ON"		200		ns
Minimum Switch "OFF" Time	$T_{OFFmin}$	LX Switch "OFF"		200		ns
Typical Dimming Ratio	$D_{dim}$	$F=100Hz$ , $V_{IN}=15V$ , 1LED, $L=27\mu H$		1200:1		
Recommended Maximum Operating Frequency	$f_{LXmax}$				1	MHz
Recommended Duty Cycle Range of Output Switch at $f_{LXmax}$	$D_{LX}$		0.3	0.7	0.9	
Internal Comparator Propagation Delay	$T_{PD}$			50		ns
Thermal Shutdown Temperature	$T_{SD}$			150		°C
Thermal Shutdown Hysteresis	$T_{SD-HYS}$			20		°C

Note: Production testing of the chip is performed at 25°C. Functional operation of the chip and parameters specified are guaranteed by design, characterization and process control in other temperature.

## ■ TYPICAL APPLICATION CIRCUIT



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