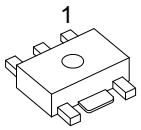
L4120

CMOS IC

40V/1.2A INTEGRATED POWER LED DRIVER



SOT-89-5

■ 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 **L4120** 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: 6V~40V
* Typical ±5% output current accuracy
* Single ADJ pin on/off and brightness control using DC voltage or PWM signal
* Internal thermal shutdown protection.
* Adjustable Constant LED Current

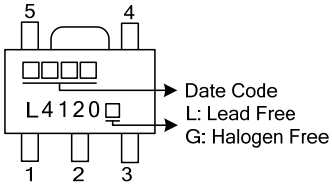
■ ORDERING INFORMATION

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

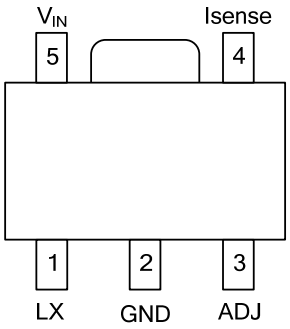
L4120G-AB5-R
(1)Packing Type
(2)Package Type
(3)Lead Free

(1) R: Tape Reel
(2) AB5: SOT-89-5
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



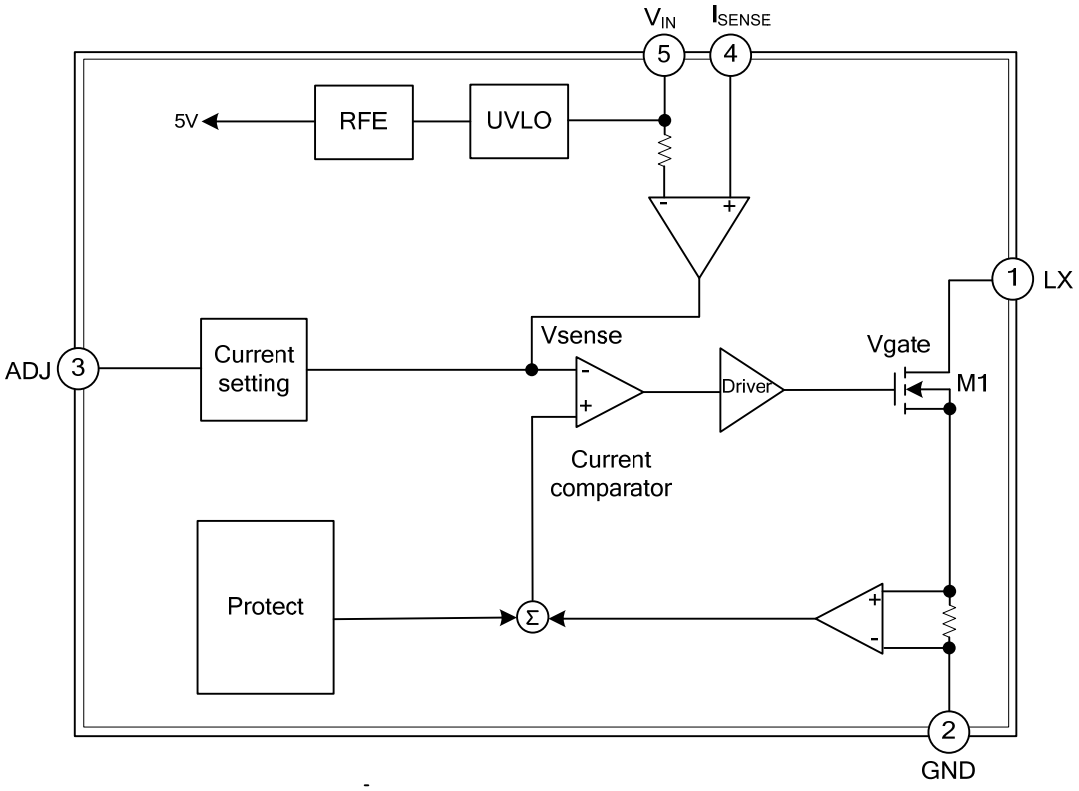
■ PIN CONFIGURATION



■ 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_{SENSE}	Current sense input
5	V_{IN}	Input voltage

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER		SYMBOL	RATINGS	UNIT
Input Voltage		V_{IN}	-0.3 ~ +40	V
I_{SENSE} Voltage	V_{IN}≥5V	V_{ISENSE}	V_{IN}+0.3 ~ V_{IN}-5	V
	V_{IN}<5V		V_{IN}+0.3 ~ -0.3	V
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_D	0.5	W
Junction Temperature		T_J	+150	°C
Operating Temperature		T_{OP}	-40 ~ +105	°C
Storage Temperature		T_{STG}	-55 ~ +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.

■ THERMAL DATA

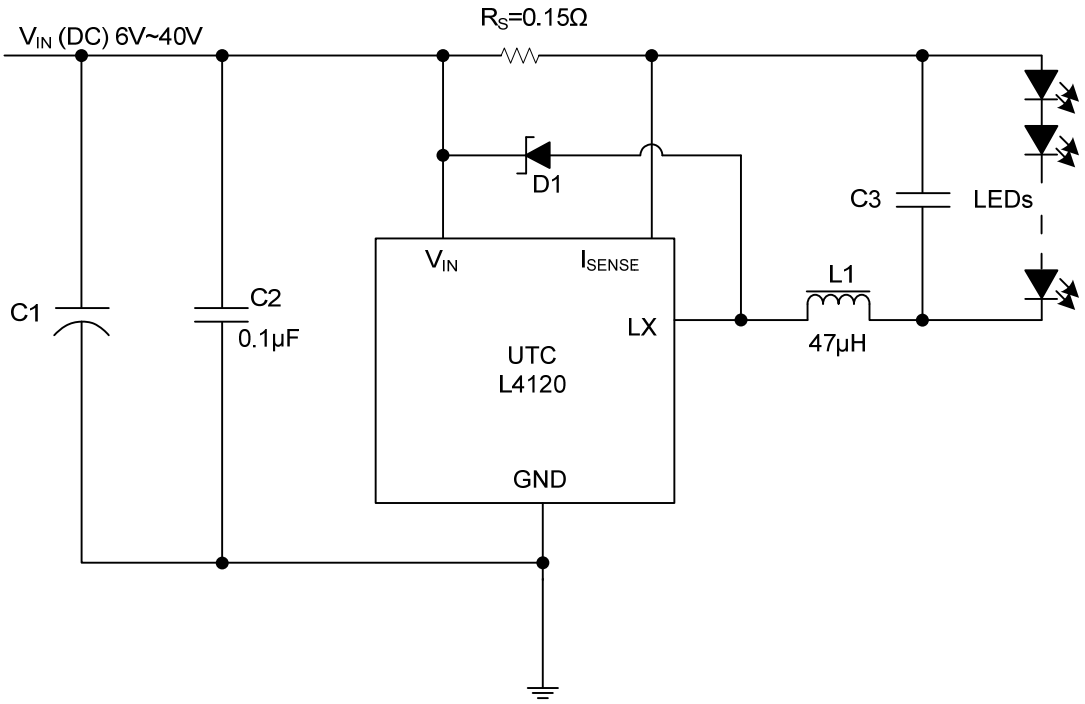
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	180	°C/W

■ ELECTRICAL CHARACTERISTICS (V_{IN}=12V, T_{AMB}=25°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	μA
Quiescent Supply Current with Output Switching	I_{INQon}	ADJ Pin Floating			1000	μA
Mean Current Sense Threshold Voltage	V_{SENSE}			115		mV
Sense Threshold Hysteresis	$V_{SENSEHYS}$			±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		KΩ
Continuous LX Switch Current	I_{LXmean}			1.2		A
LX Switch “On” Resistance	R_{LX}			0.4		Ω
LX Switch Leakage Current	$I_{LX(leak)}$				1	μA
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	Ddim	F=100Hz, V_{IN}=15V, 1LED, L=27μH		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

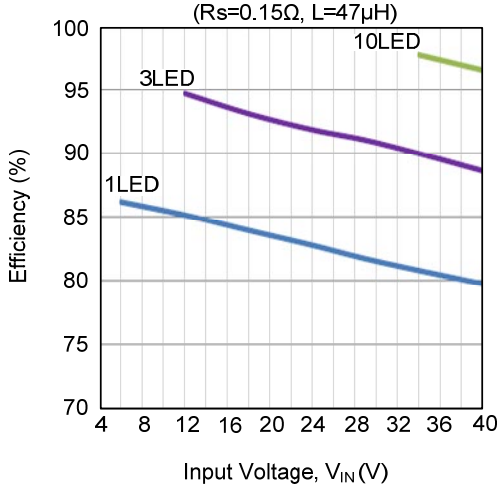
Note: Production testing of the chip is performed at 25°C. Functional operation of the chip and parameters specified are guaranteed by design, characterization and process control in other temperature.

■ TYPICAL APPLICATION CIRCUIT

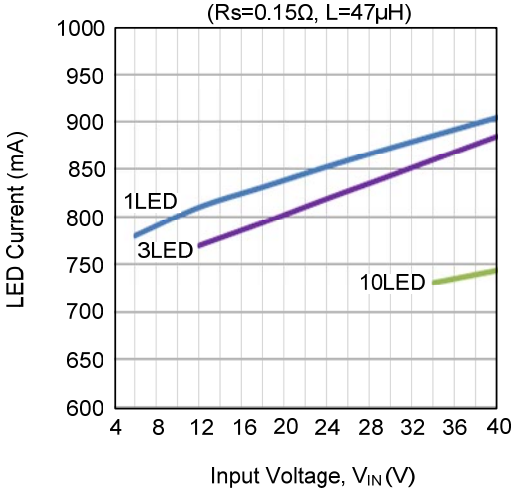


■ TYPICAL CHARACTERISTICS

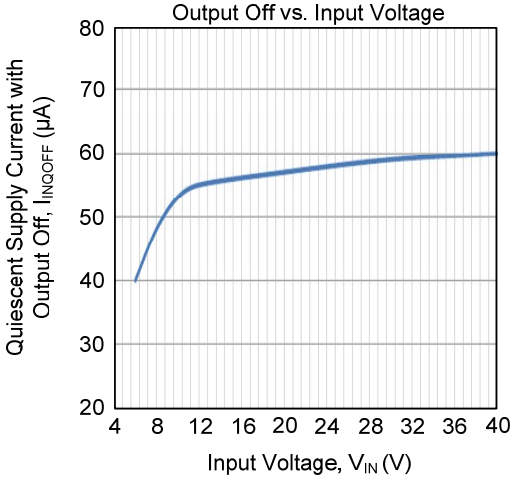
Efficiency vs. Input Voltage
(Rs=0.15Ω, L=47μH)



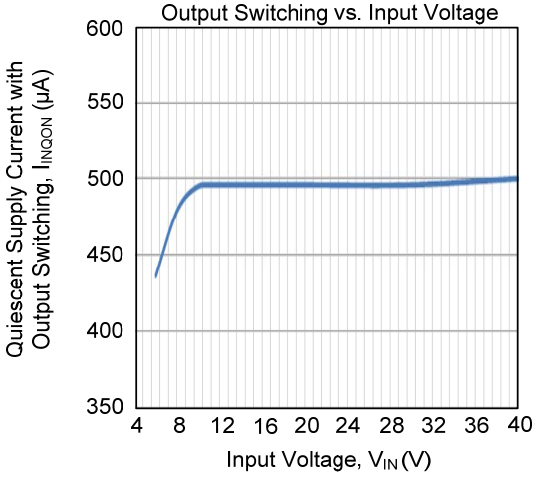
LED Current vs. Input Voltage
(Rs=0.15Ω, L=47μH)



Quiescent Supply Current with
Output Off vs. Input Voltage



Quiescent Supply Current with
Output Switching vs. Input Voltage



PWM Dimming
(V_{IN}=12V, 3LED ,47μH, R_S=0.15Ω,
f_{PWM}=1kHZ)
LED Current vs. Duty Cycle