

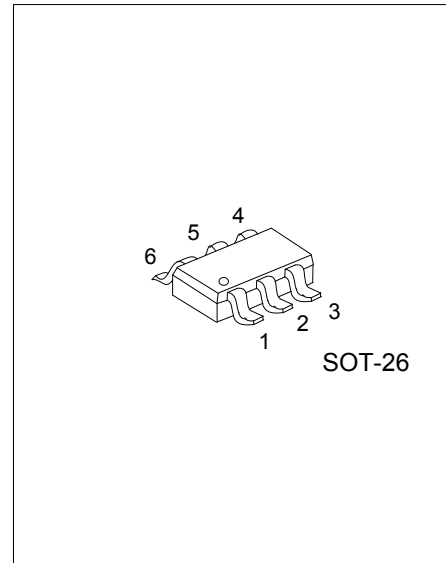


UCL5108

Advance

CMOS IC

LED DRIVER WITH AVERAGE-MODE CONSTANT CURRENT CONTROL



DESCRIPTION

The **UCL5108** is an average current mode control LED driver IC operating in a constant off-time mode. **UCL5108** does not produce a peak-to-average error, and therefore greatly improves accuracy, line and load regulation of the LED current without any need for loop compensation or high-side current sensing. The output LED current accuracy is $\pm 2\%$. The **UCL5108** can be powered from an 8.0 - 100V supply. PWM & Linear dimming input is provided that accepts an external control TTL compatible signal. The output current can be programmed by an internal 250mV reference.

FEATURES

- * Fast Average Current Control
- * Internal 8 to 100V Linear Regulator
- * Linear and PWM Dimming Capability
- * Output Short Circuit Protection with Skip Mode
- * Requires Few External Components for Operation

APPLICATIONS

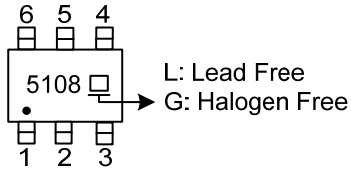
- * DC/DC or AC/DC LED Driver Applications
- * LED Street Lighting
- * Back Lighting of Flat Panel Displays
- * General Purpose Constant Current Source
- * Signage and Decorative LED Lighting
- * Chargers

ORDERING INFORMATION

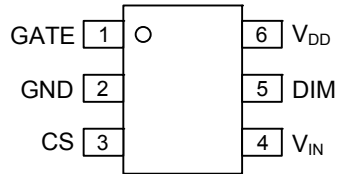
Ordering Number		Package	Packing
Lead Free	Halogen Free		
UCL5108L-AG6-R	UCL5108G-AG6-R	SOT-26	Tape Reel

<p>UCL5108G-AG6-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) AG6: SOT-26</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



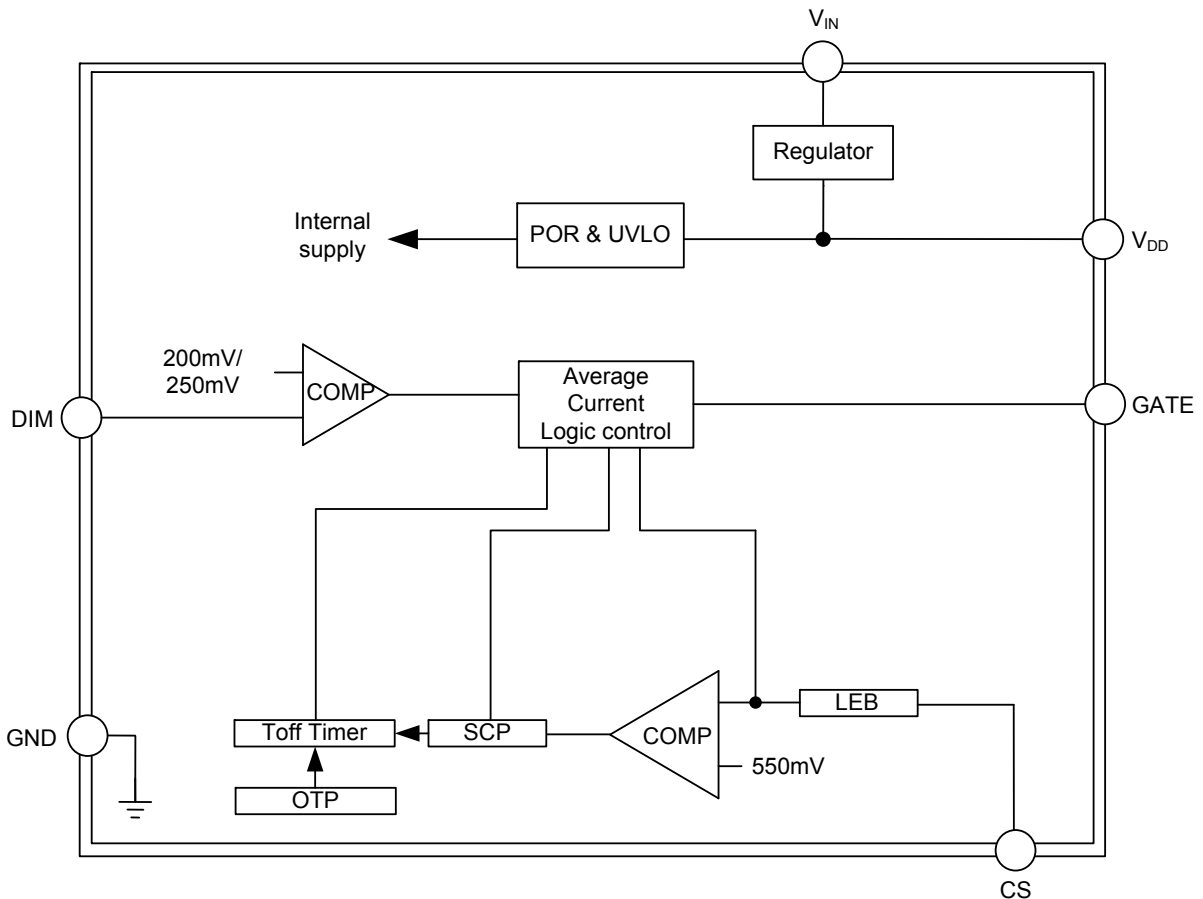
PIN CONFIGURATION



PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	GATE	This pin is the output GATE driver for an external N-channel
2	GND	Ground return for all internal circuitry
3	CS	Sense the FET current by means of an external sense resistor
4	V _{IN}	This pin is the input of an 8 - 100V linear regulator
5	DIM	This pin is the linear & PWM dimming input of the IC
6	V _{DD}	This is the power supply pin for all internal circuits

BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING ($T_A=27^\circ\text{C}$, unless otherwise specified)

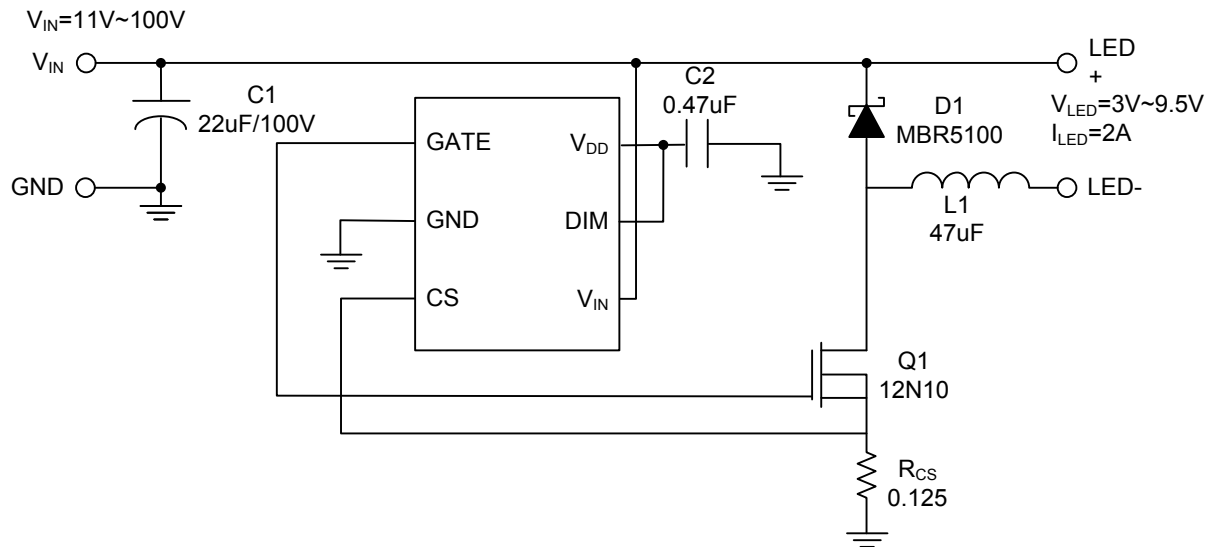
PARAMETER	SYMBOL	RATINGS	UNIT
Power Supply Voltage	V_{IN}	100	V
Junction Temperature	T_J	+150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-65 ~ +150	$^\circ\text{C}$

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 ($V_{DD}=3.3\text{V}$, $T_A=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
INTERNAL REGULATOR						
Internally Regulated Voltage	V_{DD}	$V_{IN}=8\text{V}$, $I_{DD(\text{ext})}=0$, 500pF at GATE, DIM= V_{DD}	7.25	7.5	7.75	V
Line Regulation of V_{DD}	$\Delta V_{DD,\text{line}}$	$V_{IN}=8\sim 100\text{V}$, $I_{DD(\text{ext})}=0$, 500pF at GATE, DIM= V_{DD}	0	-	1.0	V
Load Regulation of V_{DD}	$\Delta V_{DD,\text{load}}$	$I_{DD(\text{ext})}=0\sim 0.6\text{mA}$, 500pF at GATE, DIM= V_{DD}	0	-	100	mV
V_{DD} Under Voltage Lockout Threshold	UVLO	V_{DD} rising		6.3		V
V_{DD} Under Voltage Lockout Hysteresis	ΔUVLO	V_{DD} falling		500		mV
PWM DIMMING						
Pin DIM input low voltage	$V_{EN(\text{lo})}$	$V_{IN}=8\sim 100\text{V}$			0.1	V
Pin DIM input high voltage	$V_{EN(\text{hi})}$	$V_{IN}=8\sim 100\text{V}$	1.6			V
AVERAGE CURRENT SENSE LOGIC						
Current Sense Reference Voltage	V_{CS}		243	250	257	mV
DIM-to-CS Voltage Ratio	$A_{V(\text{DIM})}$			0.167		
DIM-to-CS Voltage Offset	$A_{V(\text{DIM})}$ (OFFSET)		0		10	mV
CS Threshold Temp Regulation					5	mV
DIM Input Voltage, Shutdown	$V_{\text{DIM}(\text{OFF})}$			200		mV
DIM Input Voltage, Enable	$\Delta V_{\text{DIM}(\text{OFF})}$			250		mV
Current Sense Blanking Interval	T_{BLANK}		150		320	ns
Minimum Steady-State Duty Cycle	$T_{\text{ON}(\text{min})}$				1000	ns
SHORT CIRCUIT PROTECTION						
Hiccup Threshold voltage	V_{CS}		495	550	605	mV
Current Limit Delay CS-GATE	T_{DELAY}	$\text{CS}=V_{CS} + 30\text{mV}$			150	ns
Short Circuit Hiccup Time	T_{HICCUP}		450	550	650	us
Minimum On-Time (Short Circuit)	$T_{\text{ON}(\text{min})}$	$\text{CS}=V_{DD}$			600	ns
GATE DRIVER						
GATE Sourcing Current	ISOURCE	$V_{\text{GATE}}=0\text{V}$, $V_{DD}=7.5\text{V}$	165			mA
GATE Sinking Current	ISINK	$V_{\text{GATE}}=V_{DD}$, $V_{DD}=7.5\text{V}$	165			mA
GATE Output Rise Time	tRISE	$\text{CGATE}=500\text{pF}$, $V_{DD}=7.5\text{V}$		30	50	ns
GATE Output Fall Time	tFALL	$\text{CGATE}=500\text{pF}$, $V_{DD}=7.5\text{V}$		30	50	ns
OFF-TIME						
Minimum Off Time	$t_{\text{OFF Min}}$			0.6		us
Maximum Off Time	$t_{\text{OFF Max}}$			50		us

■ TYPICAL APPLICATION CIRCUIT



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