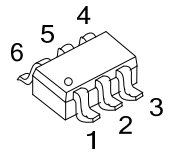
UPSL103 **Preliminary** ***LINEAR INTEGRATED CIRCUIT***

HIGH POWER FACTOR & ACCURACY CONSTANT CURRENT LED DRIVER



SOT-26

■ DESCRIPTION

The UTC **UPSL103** is a highly-integrated, low startup current, average current mode, one cycle control PFC and fixed switching frequency PWM controller. These functions enable the LED driver to easily meet the accuracy average LED current and high power factor requirements.

The UTC **UPSL103** also features a 45kHz fixed frequency oscillator, an internal 200mV precision reference, and a PWM comparator with latching logic. The accurate output LED current is achieved by an averaging current feedback loop and the LED current dimming can be easily controlled via the DIM pin. The UTC **UPSL103** also has multiple features to protect the controller from fault conditions, including Under Voltage Lockout (UVLO), Over Current Protection (OCP) and Over Voltage Protection (OVP). Additionally, to ensure the system reliability, the UTC **UPSL103** is built with the thermal protection function.

The UTC **UPSL103** improves the performance and reduces the cost of the LED driver.

■ FEATURES

* High power factor by one cycle control
* Accuracy and programmable constant current
* Low BOM cost
* Dimmable LED current by DIM
* Average current / fixed frequency control
* Gate output voltage clamp
* LED Open Protection
* LED Short Protection
* Over Current Protection
* Built-in thermal protection

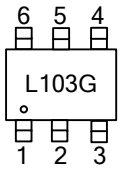
■ ORDERING INFORMATION

Ordering Number	Package	Packing
UPSL103G-AG6-R	SOT-26	Tape Reel

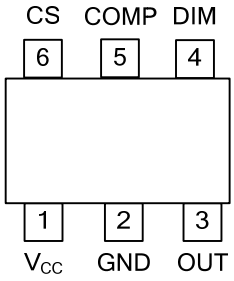
UPSL103G-AG6-R

(1)Packing Type	(1) R: Tape Reel
(2)Package Type	(2) AG6: SOT-26
(3)Green Package	(3) G: Halogen Free and Lead Free

■ MARKING



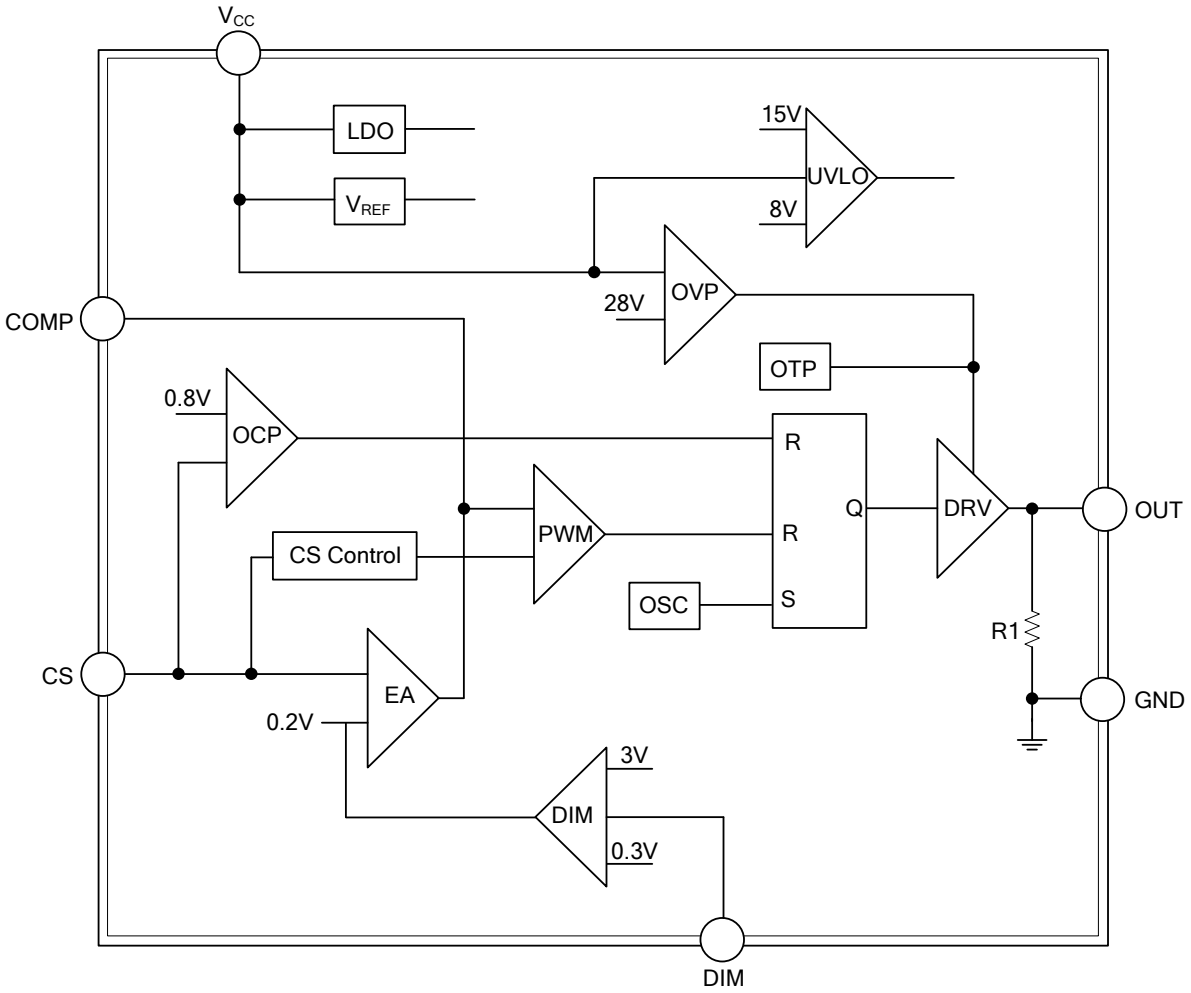
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	V_{CC}	Power supply pin of the chip.
2	GND	Ground pin of the chip.
3	OUT	Gate driver for external MOSFET switch
4	DIM	Dimming control pin by input a DC voltage
5	COMP	PWM loop compensation node
6	CS	Current sense pin, Connect to sense the MOSFET current

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	30	V
DIM, COMP, CS		-0.3~7	V
OUT		15	V
Power Dissipation (at Ambient Temperature =85°C)	P_D	250	mW
ESD Voltage Protection, Human Body Model		2	KV
ESD Voltage Protection, Machine Model		200	V
Junction Temperature	T_J	150	°C
Operating Ambient Temperature	T_{OPR}	-20~85	°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.

■ ELECTRICAL CHARACTERISTICS (V_{CC}=15.0V & T_A=+25°C, unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Startup Current	I_{ST}	V_{CC}=UVLO on - 1V		4	15	μA
Operating Current	I_{CC}	with 1nF load on OUT pin, V_{COMP}=2.5V		2	3	mA
Operating Current	I_{QC}	with 1nF load on OUT pin, Protection Tripped (OCP, OVP, SCP, OTP)		1.2	1.5	mA
UVLO(off)	V_{MIN}		7	8	9	V
UVLO(on)	V_{ST}		14	15	16	V
OVP Level on VCC Pin	V_{OVP}		26.5	28	29.5	V
OVP De-Bounce Time				40		μs
Feedback Reference Voltage	V_{FB}		0.196	0.200	0.204	V
Tran-Conductance				120		μS
Output Sink Current	I_{SINK}			12		μA
Output Source Current	I_{SOURCE}			12		μA
Input Over Voltage Protection	V_{OCP}		0.7	0.80	0.9	V
Open Loop Voltage, CS Pin Open	V_{CS}			5		V
Leading-Edge Blanking Time	T_{LEB}			410		nS
Delay to Output	T_{Delay}			100	220	nS
Switching Frequency	F_{OSC}		42	45	48	KHz
Maximum Duty	D_{MAX}		90			%
Frequency Jitter Range				+/-4		%
Temp. Stability		-40°C~ 125°C			6	%
Voltage Stability		V_{CC}=11V ~ 25V			1	%
Rising Time	T_R	Load Capacitance=1000pF		160	320	nS
Falling Time	T_F	Load Capacitance=1000pF		80	160	nS
VGATE-Clamp	V_{Clamp}	V_{CC}=25V		13.5	15	V
Saturation Threshold Voltage			3.0			V
Linear Dimming Range			0.3		3.0	V
LED Current off Threshold Voltage					0.5	V
Current Source			270	300	330	μA
OTP Trip Point	T_{SD}			150		°C
OTP Release Point	T_{ST}			130		°C
OTP Threshold Level	△T			20		°C
OTP De-Bounce Time				80		μS

■ TYPICAL APPLICATION CIRCUIT