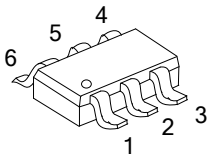
ULD3380 **Preliminary** ***LINEAR INTEGRATED CIRCUIT***

HIGH EFFICIENCY PWM BUCK LED DRIVER CONTROLLER



SOT-26

■ DESCRIPTION

The UTC **ULD3380** is a PWM mode step-down converter. By well controlling the external MOSFET and regulating a constant output current. The output duty cycle of the UTC **ULD3380** can be up to 100% for wider input voltage application.

The UTC **ULD3380** is available in a SOT-26 package.

■ FEATURES

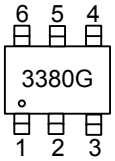
* Universal input voltage range with off-line topology
* Programmable constant LED current
* Output LED string short protection
* Output LED string open protection
* Dimmable LED current by ACTL
* OCP
* Built-in OTP

■ ORDERING INFORMATION

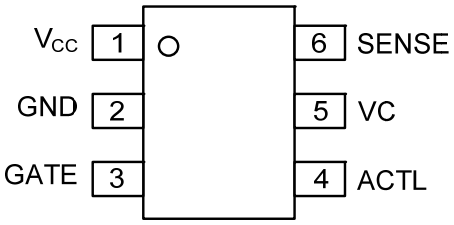
Ordering Number	Package	Packing
ULD3380G-AG6-R	SOT-26	Tape Reel

ULD3380G-AG6-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) AG6: SOT-26 (3) G: Halogen Free and Lead Free

■ MARKING



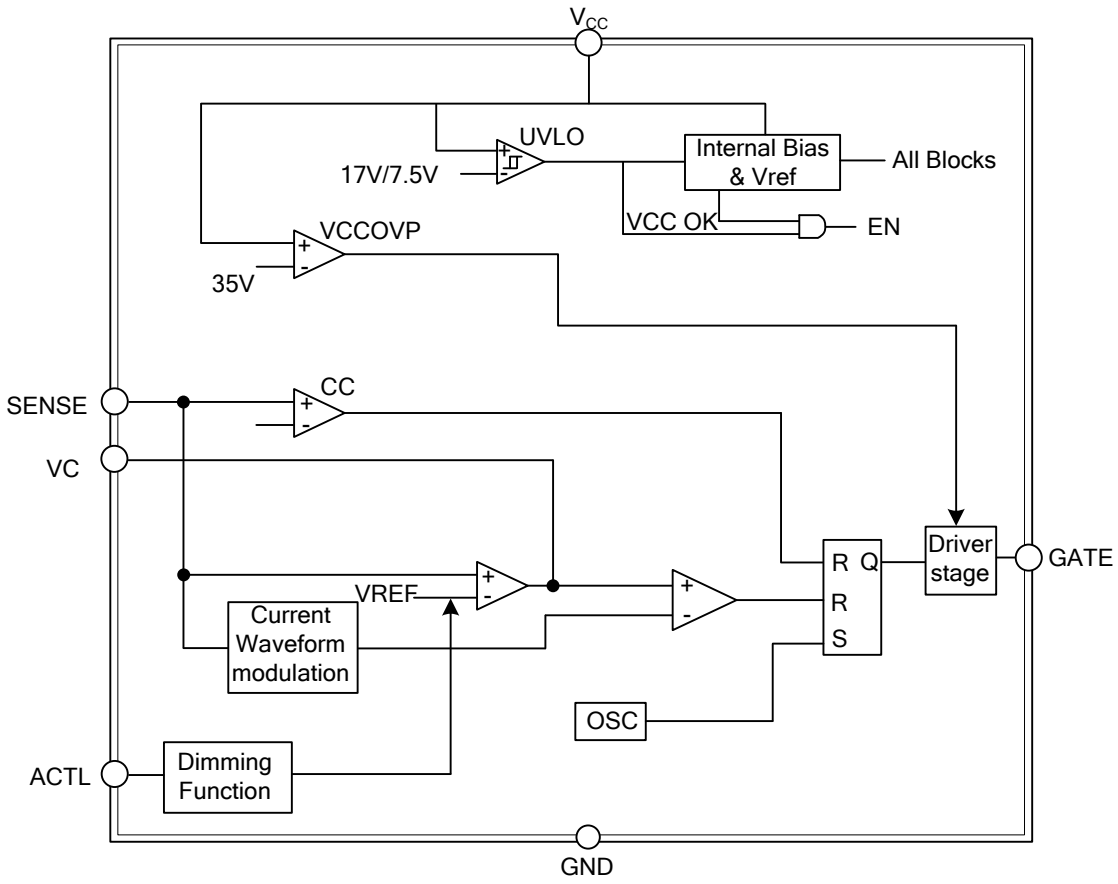
■ PIN CONFIGURATIONS



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	V_{CC}	Power supply
2	GND	Ground of the chip.
3	GATE	Gate driver for external MOSFET switch.
4	ACTL	Analog dimming control.
5	VC	Compensation pin.
6	SENSE	LED current sense input pin.

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Input Voltage	V_{CC}	40	V
GATE Voltage	V_{GATE}	14	V
ACTL Voltage (Note 2)	V_{ACTL}	8	V
VC Voltage	V_{VC}	6	V
SENSE Voltage	V_{SENSE}	-0.3 ~ 6	V
Power Dissipation (T_A=25°C)	P_D	0.392	W
Junction Temperature	T_J	+150	°C
Storage Temperature	T_{STG}	-65 ~ +150	°C

Notes: 1. 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.
2. If the ACTL pin is connected with a serial 1MΩ resistor, the maximum voltage can go up to 36V.

■ RECOMMENDED OPERATING CONDITIONS (Note)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Input Voltage	V_{CC}	17 ~ 32	V
Junction Temperature Range	T_J	-40 ~ +125	°C

Note: The device is not guaranteed to function outside its operating conditions.

■ THERMAL DATA

PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient	θ_{JA}	255	°C/W

■ ELECTRICAL CHARACTERISTICS (V_{CC}=24V_{DC}, T_A=25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Start-Up Voltage		V_{ST}		15	17	19	V
Minimum Operation Voltage After Star t-Up		$V_{IN(MIN)}$		6.0	7.5	9.0	V
Input Quiescent Current		I_{QC}	After Start-Up, V_{CC}=24V		1.65	5.0	mA
Maximum Startup Current in V_{CC} Hiccup Operation		$I_{ST(MAX)}$	Maximum I_{CC} at low end of V_{CC}		250	300	μA
Input Shutdown Current		I_{SHDN}	Before Start-Up, V_{CC}=15V		0.1	5.0	μA
Over Voltage Protection		V_{OVP}	VCC Pin	32.5	35.5	36.5	V
Current Sense Voltage		V_{SENSE}			178		mV
Switching Frequency		f_{SW}		38	47	55	kHz
Oscillator Maximum Duty Cycle		D_{MAX}	V_C=3V			100	%
Minimum Turn-On Time		$t_{ON(MIN)}$		300			ns
GATE Pin Maximum Voltage		V_{GATE}	No Load at GATE Pin	11.1	12	13.1	V
GATE Voltage High		V_{GATE_H}	I_{GATE}=-20mA	11	12	13	V
			I_{GATE}=-100μA	11.1	12	13.1	V
GATE Voltage Low		V_{GATE_L}	I_{GATE}=20mA	0.55	0.75	0.95	V
			I_{GATE}=100μA	0.3	0.5	0.7	V
GATE Drive Rise and Fall Time			1nF Load at GATE		75		ns
GATE Drive Source and Sink Peak Current			1nF Load at GATE		0.2		A
ACTL LED Dimming							
Analog Dimming ACTL Pin Input Current		I_{ACTL}				25	μA
Analog Dimming Range				0		1.3	V
Analog Dimming Threshold Voltage	High Level				1.2	1.3	V
	Low Level			0	0.1		V
VC Threshold for PWM Switch Off		V_{VC}		1.1	1.25	1.4	V
Thermal Protection							
Thermal Shutdown Temperature		T_{SD}			150		°C

■ TYPICAL APPLICATION CIRCUIT