UTC UNISONIC TECHNOLOGIES CO., LTD

USL1650

Preliminary

LINEAR INTEGRATED CIRCUIT

HIGH EFFICIENCY PWM BUCK LED DRIVER CONTROLLER

DESCRIPTION

The UTC USL1650 is a PWM mode step-down converter (with a high voltage power MOSFET with SOP8 package). By well regulating a constant output current. The output duty cycle of the UTC USL1650 can be up to 100% for wider input voltage application.

The UTC USL1650 is available in a SOP-8 package.

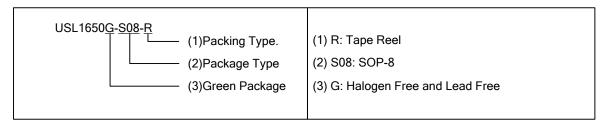
SOP-8

FEATURES

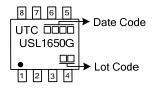
- * Universal input voltage range with off-line topology
- * Programmable constant LED current
- * Output LED string short protection
- * Output LED string open protection
- * Dimmable LED current by ACTL
- * OCP
- * Built-in OTP

ORDERING INFORMATION

Ordering Number	Package	Packing
USL1650G-S08-R	SOP-8	Tape Reel

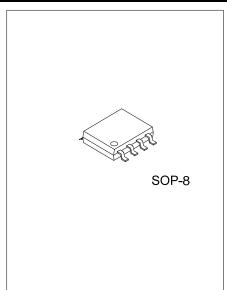


MARKING

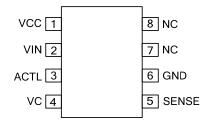


CWWW.flying1688.com www.unisonic.com.tw 1 of 4 QW-R125-029.c





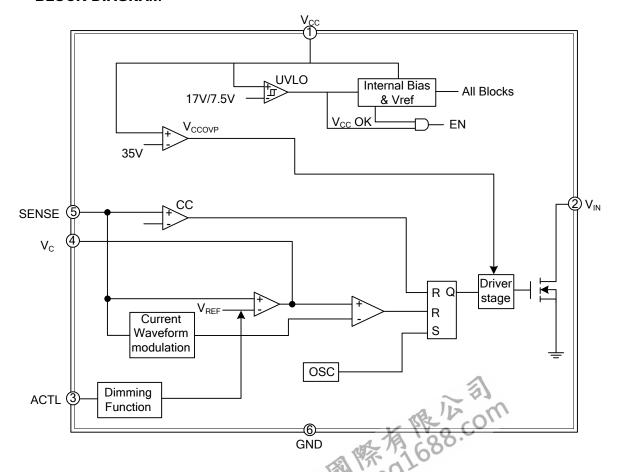
■ PIN CONFIGURATIONS



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	V _{CC}	Power supply.
2	V_{IN}	Power MOS drain.
3	ACTL	Analog dimming control.
4	V _C	Compensation pin.
5	SENSE	LED current sense input pin.
6	GND	Ground of the chip.
7, 8	NC	

■ 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 1)		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	ů
Storage Temperature		T _{STG}	-65~+150	ů

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.

RECOMMENDED OPERATING CONDITIONS (Note)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Input Voltage	Vcc	17~32	V
Junction Temperature Range	TJ	-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}	225	°C/W

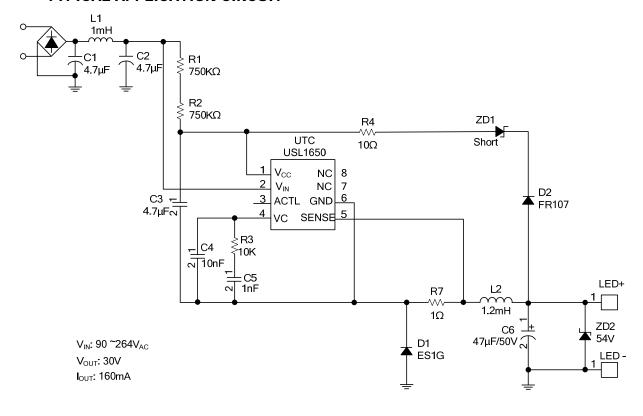
ELECTRICAL CHARACTERISTICS (V_{CC}=24V_{DC}, T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS MI		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}	I _{ST(MAX)}	Maximum I _{CC} at Low End of		250	300	μA
Hiccup Operation	1ST(MAX)	V _{CC}		200	000	μπ
Input Shutdown Current	I _{SHDN}	Before Start-Up, V _{CC} =15V		0.1	5.0	μΑ
Over Voltage Protection	V_{OVP}	V _{CC} Pin	32.5	35.5	36.5	V
Current Sense Voltage	V _{SENSE}			160		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
Power MOSFET	-		-			_
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =0.5A		11.5	15.5	Ω
Drain-Source Voltage	V_{DSS}	V _{GS} =0V	650			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =650V, V _{GS} =0V			10	μA
ACTL LED Dimming				ā.	ā.	
Analog Dimming ACTL Pin Input Current	I _{ACTL}			1	5	μΑ
Analog Dimming Range			0		1.3	V
Analog Dimming High Level		~ 3		1.2	1.3	V
Threshold Voltage Low Level		10.17	0	0.1		V
VC Threshold for PWM Switch Off	V_{VC}	K Pro CO	1.1	1.25	1.4	V
Thermal Protection		18 60°	_			
Thermal Shutdown Temperature	T _{SD}	2010	150			°C
Thermal Shutdown Temperature T _{SD} 150 °C UNISONIC TECHNOLOGIES CO., LTD 3 of 4						
UNISONIC TECHNOLOGIES CO., LTD			3 of 4			



^{2.} If the ACTL pin is connected with a serial $1M\Omega$ resistor, the maximum voltage can go up to 36V.

■ TYPICAL APPLICATION CIRCUIT



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.