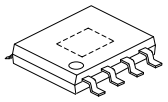
P1583

LINEAR INTEGRATED CIRCUIT

380KHz, 2.5A STEP-DOWN SWITCHING REGULATOR



HSOP-8

■ DESCRIPTION

The UTC **P1583** is a fixed 380kHz frequency, current mode, PWM controller. It achieves 2.5A continuous output current over a wide input supply range with excellent load and line regulation. Equipped with an external compensation pin, this device offers user flexibility in determining loop dynamic.

The UTC **P1583** integrates controls, monitoring and protection functions into a single 8-pin package to provide a low cost and perfect power solution. The device provides maximum 24V operating input voltage.

An internal 1.245V reference provides low output voltage down to 1.245V for further applications. An internal soft-start prevents the output voltage from overshoot as well as limiting the input current. The controller's over-current protection monitors the output current by using the voltage drop across a current sensing resistor. Additional under voltage protections monitor the voltage on FB pin for short-circuit protections.

The UTC **P1583** provides fast transient respond and requires very few external devices for operation.

■ FEATURES

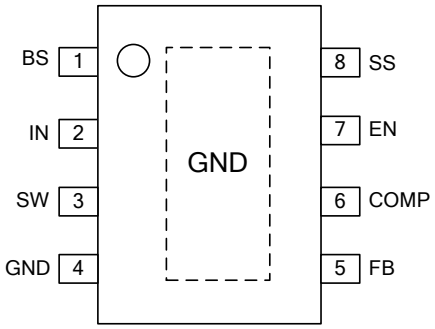
* 2.5A output current
* 380kHz frequency of operation
* 15μA shutdown supply current
* Output adjustable from 1.245 to 21V
* Frequency foldback at short circuit
* Thermal shutdown

■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
P1583L-SH2-R	P1583G-SH2-R	HSOP-8	Tape Reel

P1583G-SH2-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) SH2: HSOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free

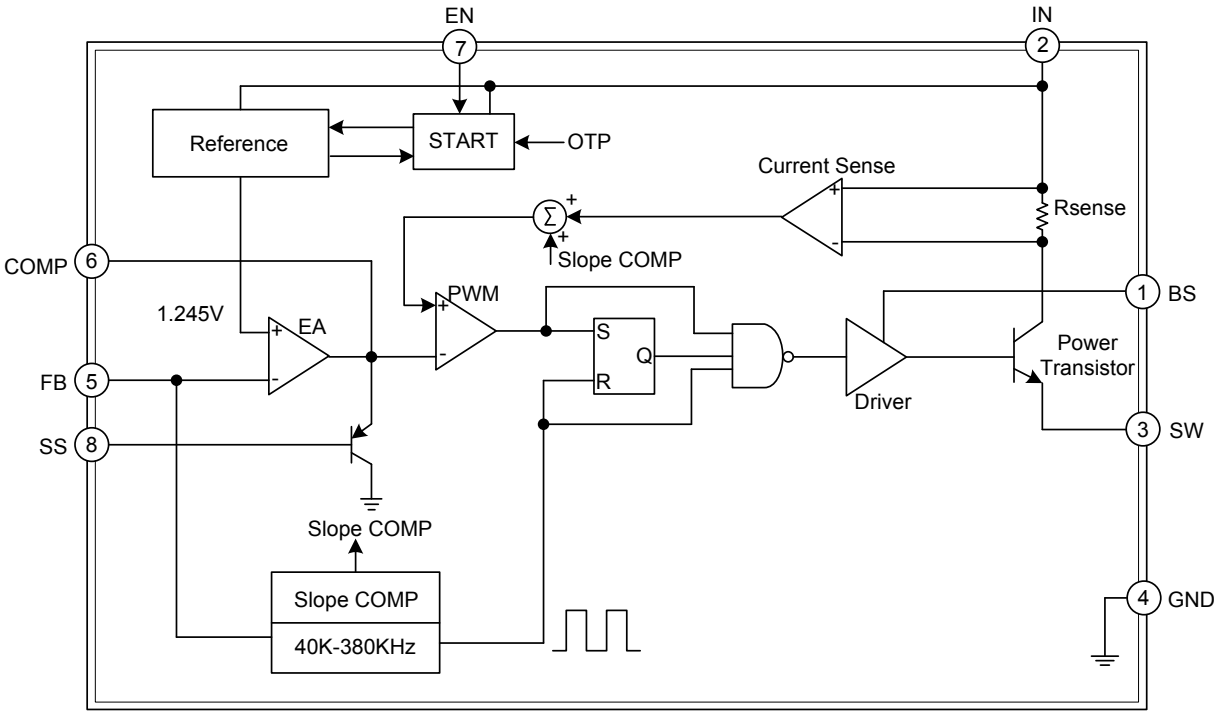
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	BS	Supply pin to the power transistor driver.
2	IN	Power supply pin.
3	SW	Power switch output pin.
4	GND	Ground pin.
5	FB	The output voltage feedback pin. It is also the inverting input of the error amplifier.
6	COMP	Compensation pin.
7	EN	Regulator On/Off control pin.
8	SS	Soft start control input.

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{IN}	28	V
Switch Voltage	V_{SW}	V_{IN}	V
Feedback Voltage	V_{FB}	6	V
Enable/UVLO Voltage	V_{EN}	6	V
Comp Voltage	V_{COMP}	6	V
Junction Temperature	T_J	+150	°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.

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	24	V
Ambient Operating Temperature	T_A	-40 ~ +125	°C

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

■ PACKAGE THERMAL CHARACTERISTICS

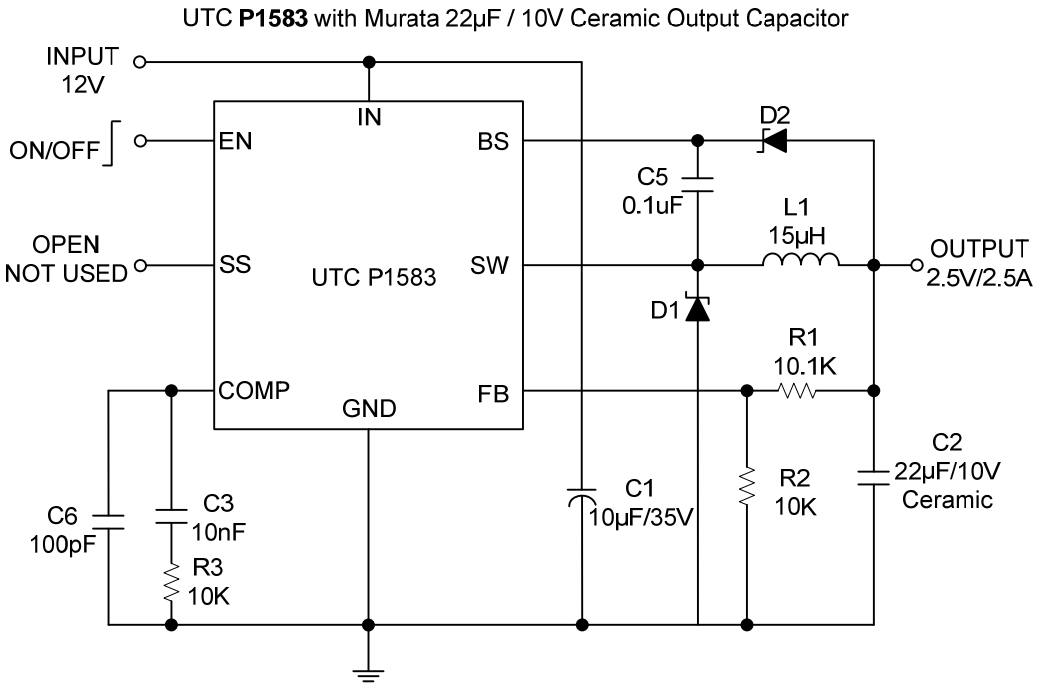
PARAMETER	SYMBOL	RATINGS	UNIT
Thermal Resistance	θ_{JA}	105	°C/W
Thermal Resistance	θ_{JC}	50	°C/W

Note: Measured on approximately 1” square of 1 oz. Copper surrounding device leads.

■ ELECTRICAL CHARACTERISTICS (V_{IN}=12V, T_A=25°C, , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Feedback Voltage	V_{FB}		1.215	1.245	1.275	V
Upper Switch Leakage	I_{LEAK}	V_{EN}=0V, V_{SW} =0V		0	10	μA
Current Limit	I_{LIMIT}			4.0		A
Current Limit Gain. Output Current to Comp Pin Voltage				2.5		A/V
Oscillator Frequency	F_{OSC}		342	380	418	KH_Z
Short Circuit Frequency	F_{OSC_SHORT}	V_{FB}=0V	20	40		KH_Z
Maximum Duty Cycle	D_{MAX}	V_{FB}=1.0V	90	95		%
Minimum Duty Cycle	D_{MIN}	V_{FB}=1.5V			0	%
Enable Threshold	V_{EN}	I_{CC}>100μA		1.0	1.3	V
Enable Pull Up Current	I_{UP}	V_{EN}=0V		0.7		μA
Under Voltage Lockout Threshold Rising				1.2		V
Supply Current (Shutdown)	I_{SD}	V_{EN}≤0.4V		15	36	μA
Supply Current (Quiescent)	I_Q	V_{EN}≥2.6V; V_{FB}=1.4V		1.5	2	mA
Thermal Shutdown				150		°C

■ TYPICAL APPLICATION CIRCUIT



■ LOW VIN APPLICATION CIRCUIT