



P4596

Preliminary

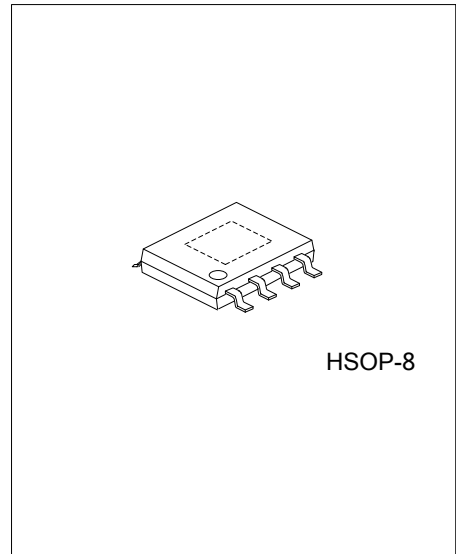
LINEAR INTEGRATED CIRCUIT

PWM CONTROL 3A STEP-DOWN CONVERTER

DESCRIPTION

The UTC **P4596** consists of 3A step-down switching regulator with PWM control which includes a reference voltage source, oscillation circuit, error amplifier, internal PMOS and etc.

The UTC **P4596** can provide low-ripple power, high efficiency, and excellent transient characteristics and an enable function, an over current protect function and a short circuit protect function are built inside. And the PWM control circuit can vary the duty ratio linearly from 100 down to 0%. This converter also includes an error amplifier circuit as well as a soft-start circuit that prevents overshoot at startup. These ICs can work as step-down switching regulators with the addition of an internal P-channel Power MOS, a coil and a diode connected externally. They provide such outstanding features: low current consumption. It is also suitable for the operation via an AC adapter because this converter can accommodate an input voltage up to 40V.



HSOP-8

FEATURES

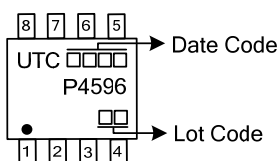
- * Input voltage : 8V~40V
- * Duty ratio : 0%~100% PWM control
- * Enable with Soft-Start function
- * Oscillation frequency can be set by outside resistance
- * Current Limit, SCP and OTP

ORDERING INFORMATION

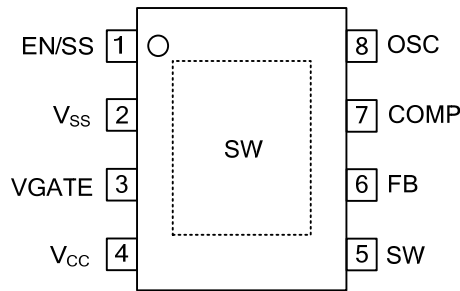
Ordering Number	Package	Packing
P4596G-SH2-R	HSOP-8	Tape Reel

<p>P4596G-SH2-R</p> <ul style="list-style-type: none"> (1)Packing Type (2)Package Type (3)Green Package 	<ul style="list-style-type: none"> (1) R: Tape Reel (2) SH2: HSOP-8 (3) G: Halogen Free and Lead Free
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MARKING



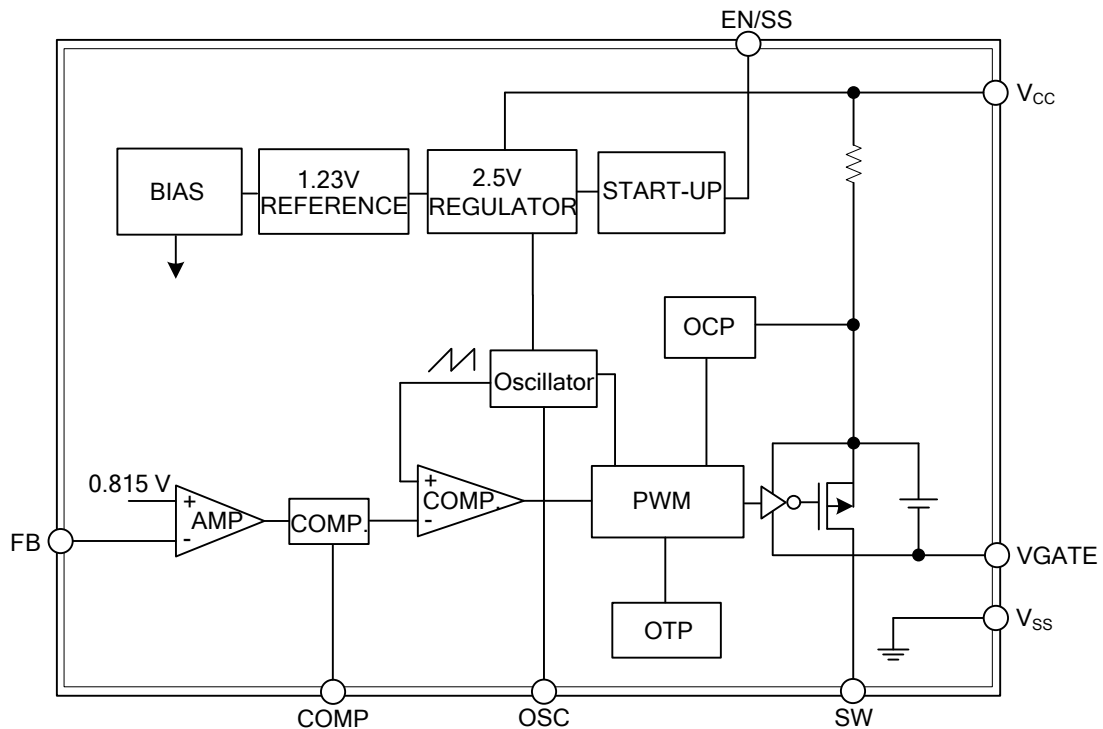
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	EN/SS	Enable and Soft-start pin
2	V _{SS}	Ground
3	VGATE	Driver GATE clamping pin.
4	V _{CC}	IC power supply pin
5	SW	Switch pin.
6	FB	Feedback voltage
7	COMP	Compensation pin
8	OSC	Frequency Set Pin.

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING ($T_A=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
VCC Pin Voltage	V_{CC}	$V_{SS}-0.3 \sim V_{SS}+40$	V
Feedback Pin Voltage	V_{FB}	$V_{SS}-0.3 \sim 6$	V
EN/SS Pin Voltage	$V_{EN/SS}$	$V_{SS}-0.3 \sim 6$	V
OSC Pin Voltage	V_{OSC}	$V_{SS}-0.3 \sim 3$	V
COMP Pin Voltage	V_{COMP}	$V_{SS}-0.3 \sim 6$	V
VGATE Pin Voltage	V_{GATE}	$V_{SS}-0.3 \sim V_{CC}$	V
Switch Pin Voltage	V_{SW}	$V_{SS} - 0.3 \sim V_{CC} + 0.3$	V
Power Dissipation	P_D	0.7	W
Operating Supply Voltage	V_{OP}	8 ~ 40	V
Junction Temperature	T_J	-40 ~ +125	$^{\circ}\text{C}$
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.

■ THERMAL DATA

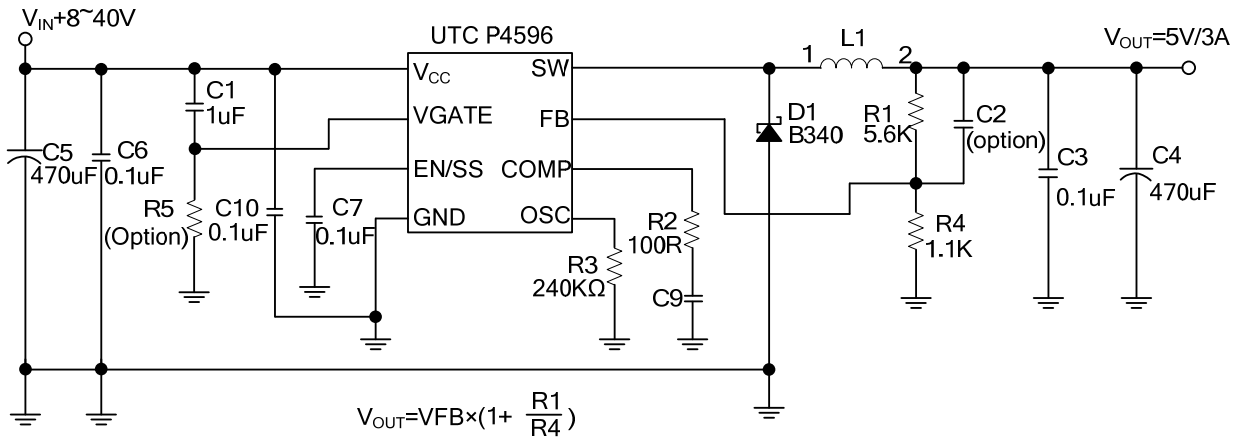
PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient	θ_{JA}	143	$^{\circ}\text{C}/\text{W}$
Junction to Case	θ_{JC}	45	$^{\circ}\text{C}/\text{W}$

Note: Surface mounted on 1 in² copper pad of FR4 board.

■ ELECTRICAL CHARACTERISTICS ($V_{CC}=12\text{V}$, $T_A=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Feedback Voltage	V_{FB}	$V_{CC}=10\text{V}\sim 30\text{V}$, $I_{OUT}=0\sim 2\text{A}$ $T_J=-20^{\circ}\text{C}\sim 125^{\circ}\text{C}$	0.800	0.815	0.830	V
Quiescent Current	I_{CCQ}	$V_{FB}=1\text{V}$		3	6	mA
Feedback Bias Current	I_{FB}	$I_{OUT}=0.1\text{A}$		0.1		μA
Shutdown Supply Current	I_{SD}	$V_{EN/SS}=0\text{V}$	10	56	300	μA
Current Limit	I_{CL}		3.5			A
Adjustable Frequency Range	F_{OSC}	$R3=240\text{K}\Omega$		200		KHz
Short Frequency	F_{OSC1}	$V_{CC}=10\text{V}\sim 30\text{V}$		50		KHz
EN/SS Pin Shutdown Logic Input Threshold Voltage	V_{ENL}				0.8	V
EN/SS Pull High Current	$I_{EN/SS}$	$V_{EN/SS}=0\text{V}$		8		μA
Internal MOSFET $R_{DS(ON)}$	$R_{DS(ON)}$	$V_{CC}=12\text{V}$, $V_{FB}=0\text{V}$		80	180	m Ω

■ TYPICAL APPLICATION CIRCUIT



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