



P1484A

LINEAR INTEGRATED CIRCUIT

3A, 23V, 340KHZ SYNCHRONOUS RECTIFIED STEP-DOWN CONVERTER

DESCRIPTION

The UTC **P1484A** is a synchronous buck regulator. The device provides 3A of continuous load current over a wide input voltage of 5V~23V. Current mode control provides fast transient response and cycle-by-cycle current limit. An adjustable soft-start prevents inrush current at turn-on.

The UTC **P1484A** can provide low-ripple power, high efficiency, and perfect transient characteristics. The duty ratio varies linearly from 0% to 92% in the PWM control. The error amplifier circuit and soft-start circuit included in this device can prevent overshoot at startup. An enable function, an over current protect (OCP) function and short circuit protect (SCP) are also built inside, and when OCP happens, the operation frequency will be reduced.

FEATURES

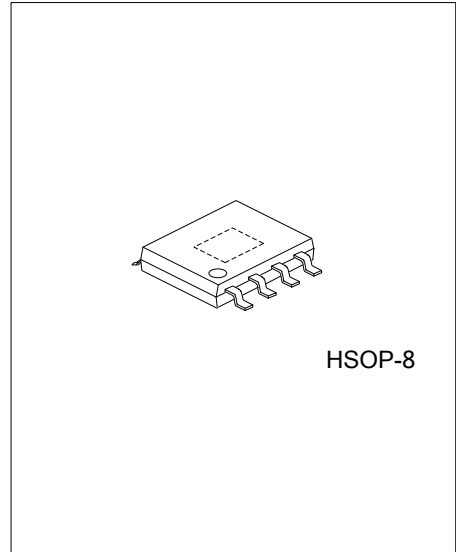
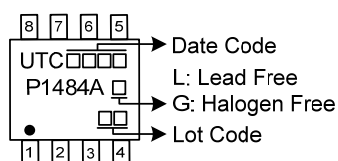
- * 3A Output Current
- * Wide 6V~23V Operating Input Range
- * Integrated Power MOSFET Switches
- * Programmable Soft-Start
- * Stable with Low ESR Ceramic Output Capacitors
- * Fixed 340KHz Frequency
- * Cycle-by-Cycle Over Current Protection

ORDERING INFORMATION

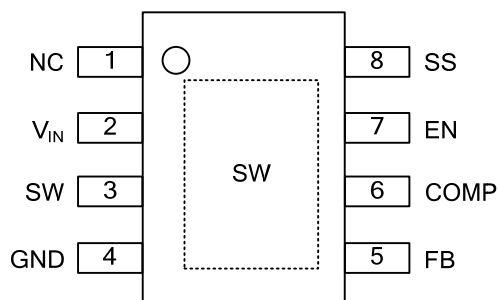
Ordering Number		Package	Packing
Lead Free	Halogen Free		
P1484AL-SH2-R	P1484AG-SH2-R	HSOP-8	Tape Reel

<p>P1484AG-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, L: Lead Free
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MARKING



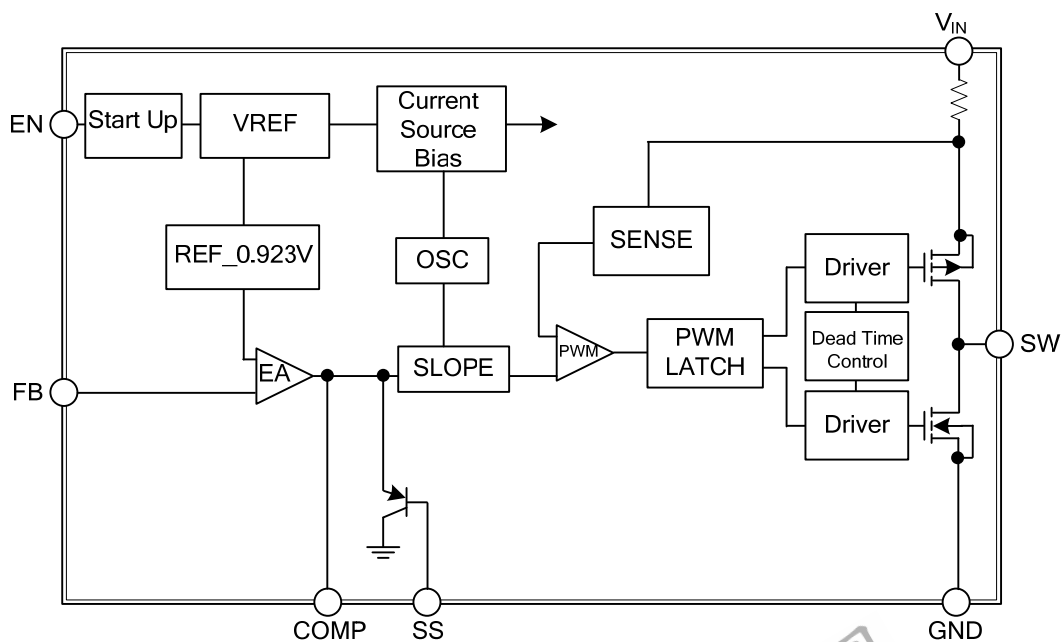
PIN CONFIGURATION



PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	NC	No Bonding
2	V _{IN}	IC power supply pin.
3	SW	Power Switching Output.
4	GND	Ground.
5	FB	Feedback Input.
6	COMP	Compensation Node.
7	EN	Enable Input.
8	SS	Soft-Start Control Input.

BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING (Note 1)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{IN}	-0.3 ~ +23	V
Switch Node Voltage	V_{SW}	25	V
All Other Pins		-0.3 ~ +6	V
Continuous Power Dissipation ($T_A=25^{\circ}\text{C}$) (Note 2)	P_D	1.4	W
Junction Temperature	T_J	+150	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-65 ~ +150	$^{\circ}\text{C}$

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. The maximum allowable power dissipation is a function of the maximum junction temperature T_J (MAX), the junction-to-ambient thermal resistance θ_{JA} , and the ambient temperature T_A . The maximum allowable continuous power dissipation at any ambient temperature is calculated by P_D (MAX) = $(T_J$ (MAX) - T_A) / θ_{JA} . Exceeding the maximum allowable power dissipation will cause excessive die temperature, and the regulator will go into thermal shutdown. Internal thermal shutdown circuitry protects the device from permanent damage.

■ THERMAL DATA

PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient	θ_{JA}	90	$^{\circ}\text{C/W}$
Junction to Case	θ_{JC}	45	$^{\circ}\text{C/W}$

Note: Measured on JESD5 1-7, 4-layer PCB.

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	RATING	UNIT
Input Voltage	V_{IN}	6 ~ 23	V
Output Voltage	V_{OUT}	0.923 ~ 18	V
Ambient Operating Temperature	T_{OPR}	-40 ~ +85	$^{\circ}\text{C}$

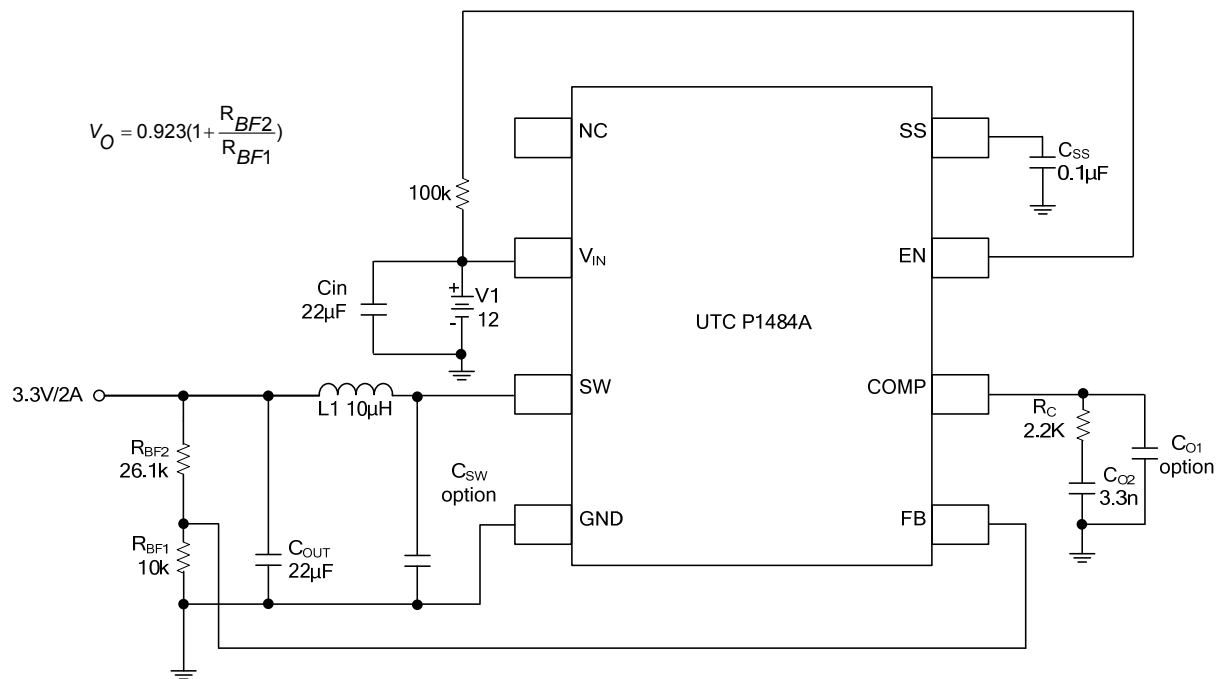
Note: The device is not guaranteed to function outside of its operating conditions.

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

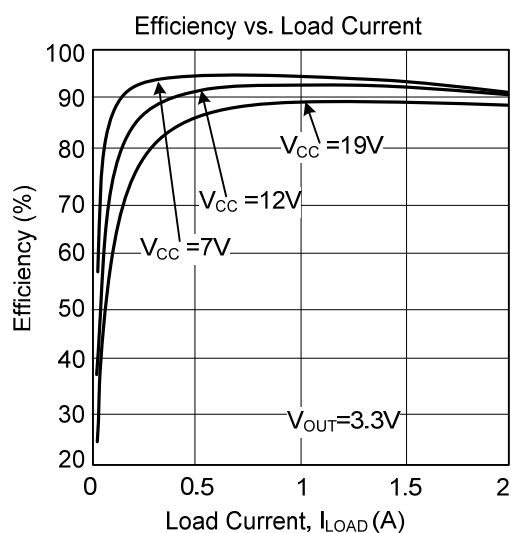
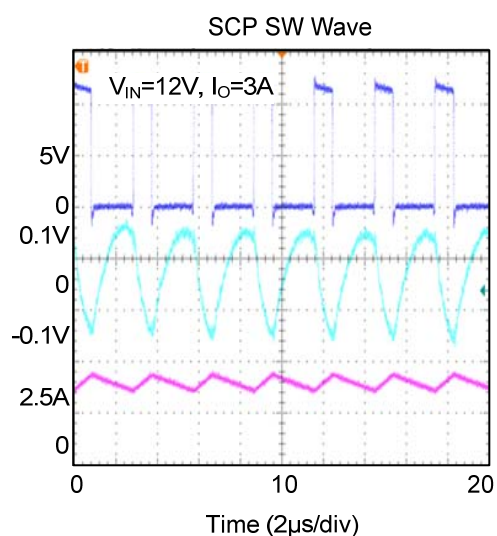
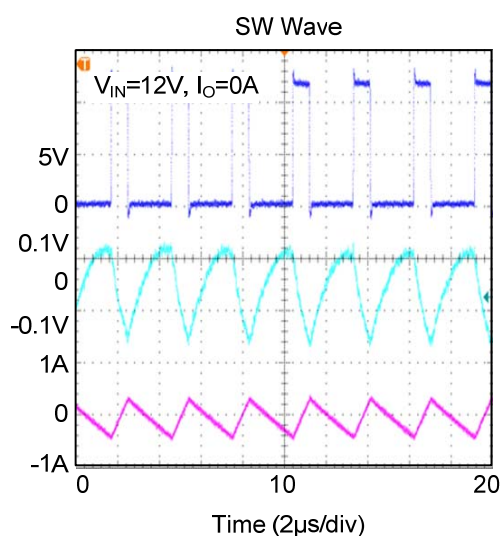
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Current		$V_{EN}=2.0\text{V}$, $V_{FB}=1.0\text{V}$		3.5	5	mA
Feedback Voltage	V_{FB}	$6\text{V} \leq V_{IN} \leq 23\text{V}$	0.900	0.923	0.946	V
High-Side Switch On Resistance (Note)	$R_{DS(ON)1}$			70		m Ω
Low-Side Switch On Resistance (Note)	$R_{DS(ON)2}$			50		m Ω
High-Side Switch Leakage Current		$V_{EN}=0\text{V}$, $V_{SW}=0\text{V}$			10	μA
Upper Switch Current Limit		Minimum Duty Cycle	3.4			A
Lower Switch Current Limit		From Drain to Source		1.1		A
COMP to Current Sense Transconductance	G_{CS}			5		A/V
Oscillation Frequency	F_{OSC1}		300	365	430	KHz
Short Circuit Oscillation Frequency	F_{OSC2}	$V_{FB}=0\text{V}$		40		KHz
Maximum Duty Cycle	D_{MAX}	$V_{FB}=1.0\text{V}$		92		%
EN Shutdown Threshold Voltage		V_{EN} Rising	0.8	1.2	2.0	V
Input Under Voltage Lockout Threshold		V_{IN} Rising		4		V
Soft-Start Current		$V_{SS}=0\text{V}$		15		μA
Thermal Shutdown (Note)				160		$^{\circ}\text{C}$

Note: Guaranteed by design, not tested.

■ TYPICAL APPLICATION CIRCUIT



TYPICAL CHARACTERISTICS



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