



USR1021

Preliminary

LINEAR INTEGRATED CIRCUIT

3A SYNCHRONOUS BUCK REGULATOR

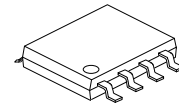
DESCRIPTION

The UTC **USR1021** is a high efficiency, 3A synchronous buck regulator. The UTC **USR1021** works from a 6V to 18V input voltage range, and provides up to 3A of continuous output current with an output voltage adjustable down to 0.8V.

The UTC **USR1021** comes in an SOP-8 packages and is rated over a -40°C~+85°C ambient temperature range.

FEATURES

- * 6V~18V operating input voltage range
- * High efficiency
- * Internal soft start
- * 1.5% initial output accuracy
- * Output voltage adjustable to 0.8V
- * 3A continuous output current
- * Cycle-by-cycle current limit
- * 500kHz PWM operation
- * Thermal shutdown
- * Short-circuit protection



SOP-8

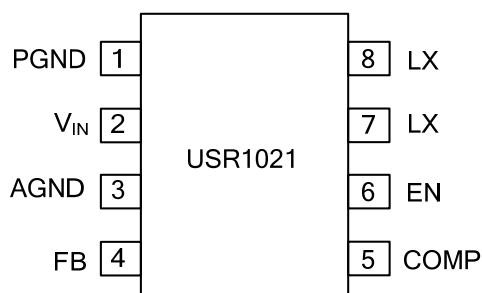
ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
USR1021L-S08-R	USR1021G-S08-R	SOP-8	Tape Reel
USR1021L-S08-T	USR1021G-S08-T	SOP-8	Tube

Note: xx: Output Voltage, refer to Marking Information.

USR1021L-S08-R	(1)Packing Type (2)Package Type (3)Halogen Free	(1) R: Tape Reel, T: Tube (2) S08: SOP-8 (3) L: Lead Free, G: Halogen Free
----------------	---	--

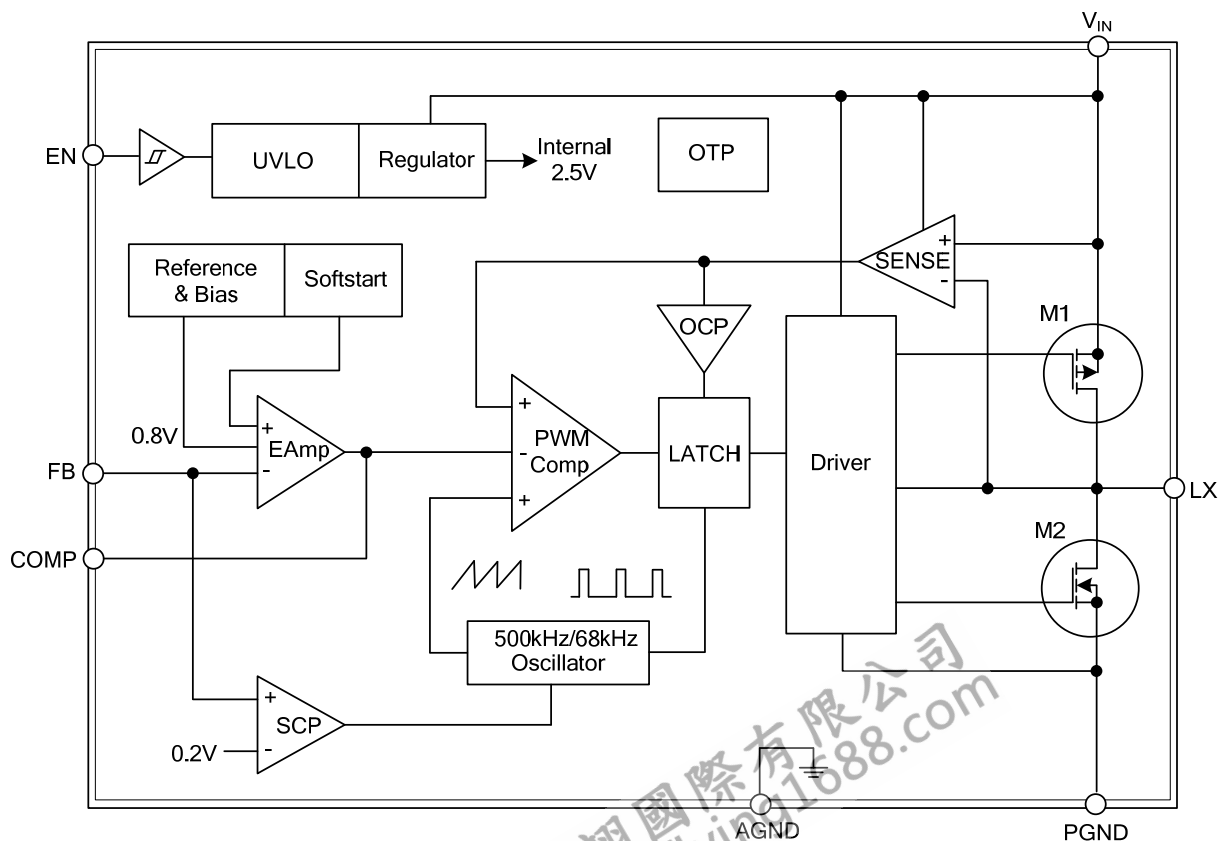
PIN CONFIGURATION



PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	PGND	Power ground
2	V _{IN}	Supply voltage input
3	AGND	Reference connectio for controller section
4	FB	Feedback voltage
5	COMP	Compensation pin
6	EN	Enable pin
7, 8	LX	Switch pin

BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{IN}	18	V
LX to AGND		$-0.7 \sim V_{IN} + 0.3$	V
EN to AGND		$-0.3 \sim V_{IN} + 0.3$	V
FB to AGND		$-0.3 \sim 6.0$	V
COMP to AGND		$-0.3 \sim 6.0$	V
PGND to AGND		$-0.3 \sim +0.3$	V
Junction Temperature	T_J	+150	°C
Storage Temperature	T_{STG}	$-65 \sim +150$	°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.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient (Note 2)	θ_{JA}	87	°C/W

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{IN}	6~18	V
Output Voltage Range		$0.8 \sim V_{IN}$	V
Ambient Temperature	T_A	$-40 \sim +85$	°C

■ ELECTRICAL CHARACTERISTICS

($T_A = 25^\circ\text{C}$, $V_{IN} = V_{EN} = 12\text{V}$, $V_{OUT} = 3.3\text{V}$, unless otherwise specified) (Note 3)

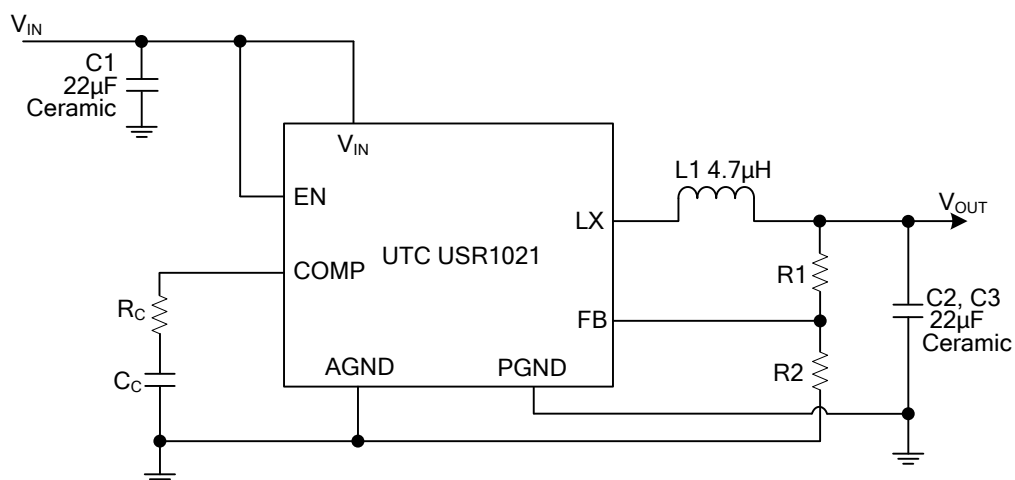
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{IN}		6		18	V
Supply Current (Quiescent)	I_{IN}	$I_{OUT} = 0$, $V_{FB} = 1.2\text{V}$, $V_{EN} > 2\text{V}$		3.5	5	mA
Shutdown Supply Current	I_{OFF}	$V_{EN} = 0\text{V}$		1	10	μA
Feedback Voltage	V_{FB}	$T_A = 25^\circ\text{C}$	0.788	0.8	0.812	V
Load Regulation				0.5		%
Line Regulation				1		%
Feedback Voltage Input Current	I_{FB}				200	nA
EN Input Threshold	V_{EN}	Off Threshold			0.6	V
		On Threshold	2			V
SS Time		$C_{SS} = 16\text{nF}$		2		ms
MODULATOR						
Frequency	f_O		400	500	600	kHz
Maximum Duty Cycle	D_{MAX}		85			%
Controllable Minimum On Time	T_{MIN}				150	ns
Current Sense Transconductance				7		A/V
Error Amplifier Transconductance				180		μA/V
PROTECTION						
Current Limit	I_{LIMIT}		3.5	4.5		A
Over-Temperature Shutdown Limit		T_J Rising		150		°C
		T_J Falling		100		°C

Notes: 1. Devices are inherently ESD sensitive, handling precautions are required. Human body model rating: 1.5 kΩ in series with 100pF.

2. The value of θ_{JA} is measured with the device mounted on a 1-in² FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$. The value in any given application depends on the user's specific board design.

3. Specification in BOLD indicate an ambient temperature range of $-40^\circ\text{C} \sim +85^\circ\text{C}$. These specifications are guaranteed by design.

■ 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.