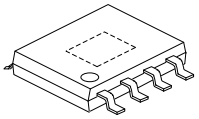
3 A SYNCHRONOUS BUCK REGULATOR



HSOP-8

■ DESCRIPTION

The UTC **USR1051** is a high efficiency, 3A synchronous buck regulator. The UTC **USR1051** works from 5V to 23V input voltage range, and provides up to 3A of continuous output current with an output voltage adjustable down to 0.8V.

The UTC **USR1051** comes in an exposed pad HSOP-8 package and is rated over a -40°C~+85°C operating ambient temperature range.

■ FEATURES

* Synchronous Buck
* 5V~23V operating input voltage range
* High efficiency
* Internal soft start
* Output voltage adjustable to 0.8V
* 3A continuous output current
* Cycle-by-cycle current limit
* 400kHz PWM operation
* Pre-bias start-up
* Thermal shutdown
* Short-circuit protection
* Exposed pad HSOP-8 package

■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
USR1051L-SH2-T	USR1051G-SH2-T	HSOP-8	Tube
USR1051L-SH2-R	USR1051G-SH2-R	HSOP-8	Tape Reel

USR1051L-HS2-T

(1)Packing Type

(2)Package Type

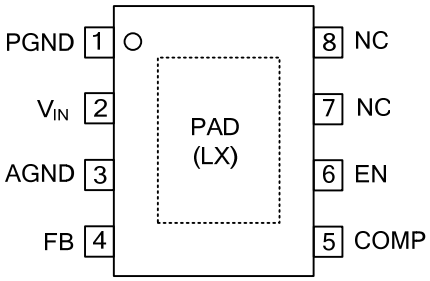
(3)Halogen Free

(1) T: Tube, R: Tape Reel

(2) HS2: HSOP-8

(3) L: Lead Free, G: Halogen Free

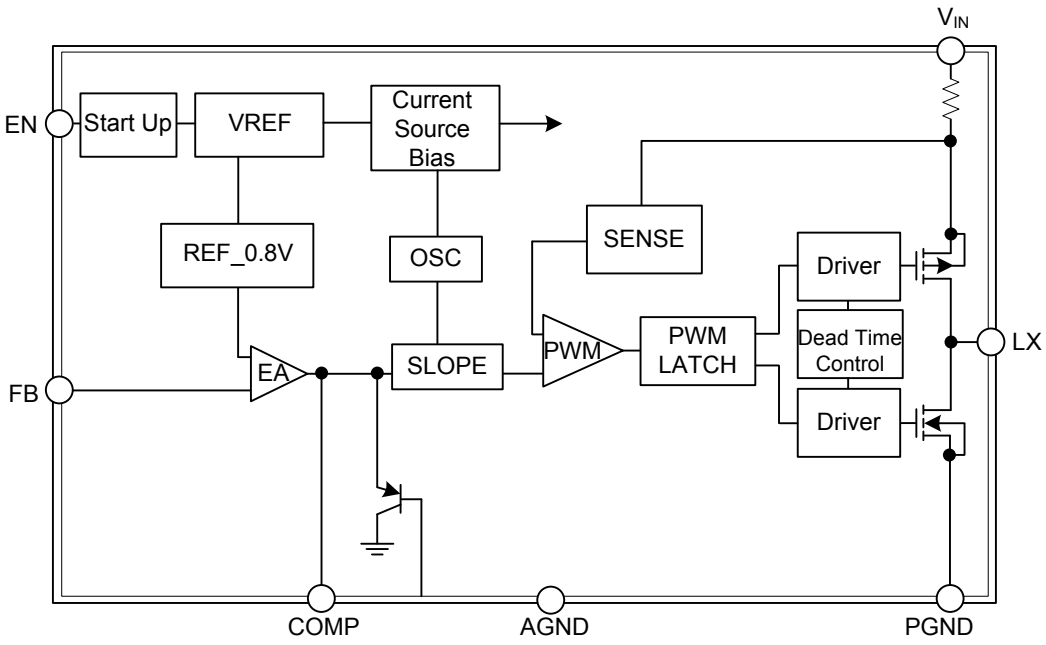
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	PGND	Power ground
2	V_{IN}	Supply voltage input
3	AGND	Analog ground
4	FB	Feedback input
5	COMP	External loop compensation pin
6	EN	Enable pin
7	NC	No Connect Pin.
8	NC	No Connect Pin.
Exposed pad	LX	Switching node

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{IN}	23	V
LX to AGND		-0.7~V_{IN}+0.3	V
LX to AGND (20ns)		-5~22	V
EN to AGND		-0.3~V_{IN}+0.3	V
FB, SS, COMP to AGND		-0.3~6.0	V
PGND to AGND		-0.3~+0.3	V
Ambient Temperature	T_A	-40~+85	°C
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.

■ THERMAL DATA

PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient (Note 2)	θ_{JA}	50	°C/W

■ RECOMMENDED OPERATING CONDIIONS

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{IN}	5~23	V
Output Voltage	V_{OUT}	0.8~0.85×V_{IN}	V

■ ELECTRICAL CHARACTERISTICS (Note 3)

(T_A=25°C, V_{IN}=V_{EN}=12V, V_{OUT}=3.3V, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{IN}		5		23	V
Supply Current (Quiescent)	I_{IN}	I_{OUT}=0, V_{FB}=1.2V, V_{EN}>2V		3.5	5	mA
Shutdown Supply Current	I_{OFF}	V_{EN}=0V		1	10	μA
Feedback Voltage	V_{FB}	T_A=25 °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}=16nF		2		ms
MODULATOR						
Frequency	f_O		380	450	550	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			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-in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°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°C~+85°C. These specifications are guaranteed by design.

■ TYPICAL APPLICATION CIRCUIT