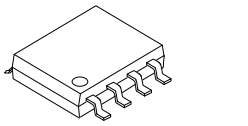
SR2803 *LINEAR INTEGRATED CIRCUIT*

330KHZ, 3A SYNCHRONOUS BUCK CONTROLLER



SOP-8

■ DESCRIPTION

The UTC **SR2803** is a synchronous buck regulator. The device provides 3A of continuous load current over a wide input voltage of 4V~28V. Current mode control provides fast transient response and cycle by cycle current limit. Integrates soft start, and shutdown mode.

The UTC **SR2803** 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 build inside, and when OCP happens, the operation frequency will be reduced.

■ FEATURES

* Input voltage varies from 4V ~ 28V
* Output voltage varies from 0.8V to V_{CC}
* Duty ratio varies from 0% to 92% PWM control
* With 330kHz typical oscillation frequency
* Thermal shutdown and SCP function and soft-start, current limit, enable function
* Low ESR output capacitor(Multi-layer chip capacitor) application
* Halogen Free

■ ORDERING INFORMATION

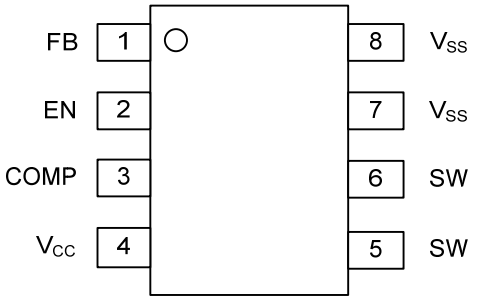
Ordering Number		Package	Packing
Lead Free	Halogen Free		
SR2803L-S08-R	SR2803G-S08-R	SOP-8	Tape Reel

SR2803L-S08-R

(1) Packing Type
(2) Package Type
(3) Lead Free

(1) R: Tape Reel
(2) S08: SOP-8
(3) G: Halogen Free, L: Lead Free

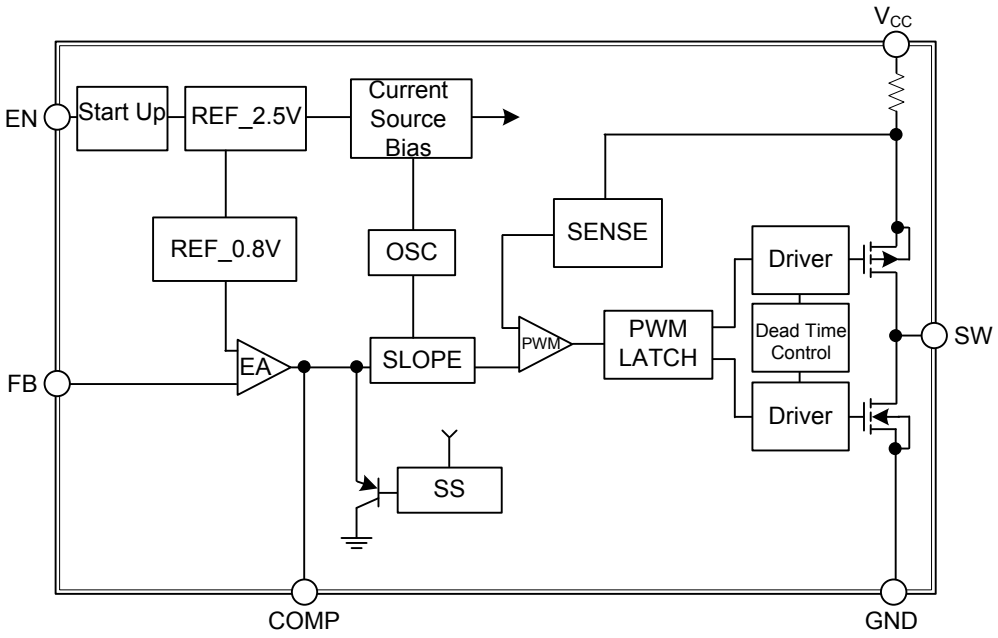
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	FB	Feedback pin
2	EN	Power-off pin H: normal operation (Step-down) L: Step-down operation stopped (All circuits deactivated)
3	COMP	Compensation pin
4	V_{CC}	IC power supply pin
5	SW	Switch pin. Connect external inductor here.
6	SW	Switch pin. Connect external inductor here.
7	V_{SS}	GND pin
8	V_{SS}	GND pin

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
V_{CC} Pin Voltage	V_{CC}	V_{SS} -0.3 ~V_{SS} +28	V
Feedback Pin Voltage	V_{FB}	V_{SS} -0.3 ~ V_{CC}	V
ON/OFF Pin Voltage	V_{EN}	V_{SS} - 0.3 ~ V_{CC}+ 0.3	V
Switch Pin Voltage	V_{SW}	V_{SS} - 0.3 ~ V_{CC}+ 0.3	V
Operating Supply Voltage	V_{OP}	+4 ~ 28	V
Power Dissipation	P_D	Internally limited	
Storage Temperature	T_{STG}	-40 ~ +150	°C
Operating Temperature	T_{OPR}	-20 ~ +125	°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	θ_{JA}	70	°C/W
Junction to Case	θ_{JC}	25	°C/W

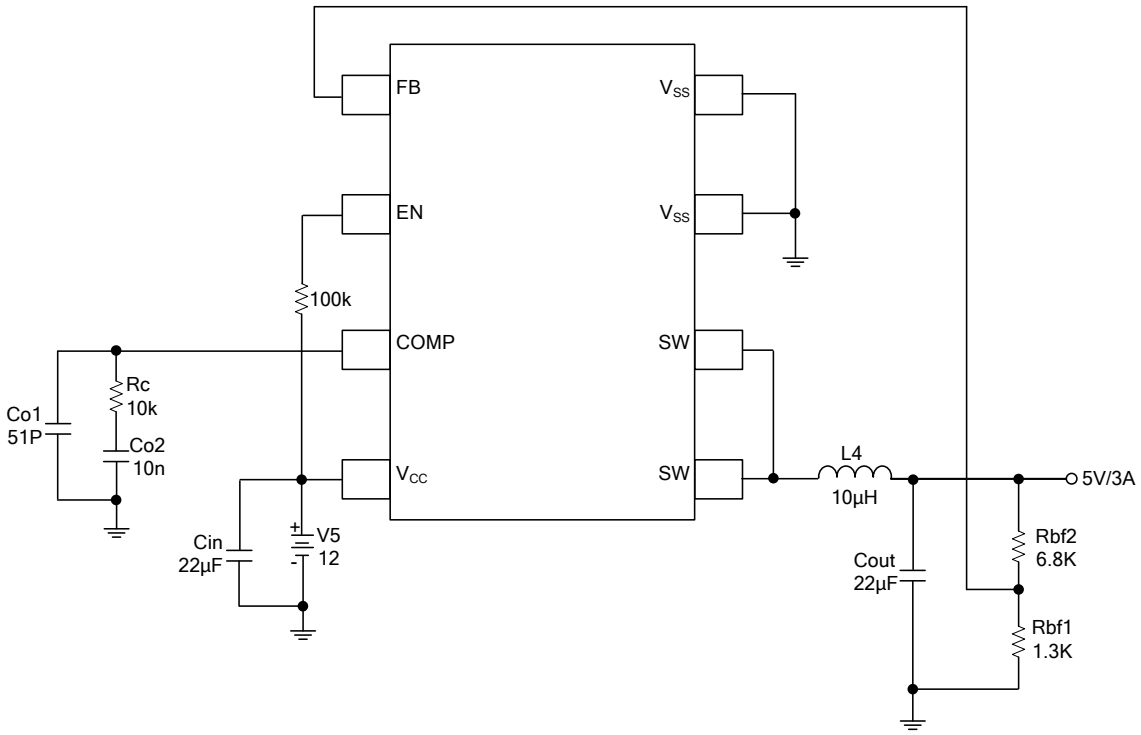
Note: θ_{JA} is measured with the PCB copper area(need connect to SW pins) of approximately 1 in2(Multi-layer)

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Feedback Voltage	V_{FB}	I_{OUT}=0.2A	0.784	0.80	0.816	V
Feedback Bias Current	$I_{FB(BIAS)}$	I_{OUT}=0.1A		0.1	0.5	μA
Switch Current	I_{SW}	Pear current, No outside circuit V_{FB}=0V Force driver on	3.5			A
Standby Current	I_{STN-BY}	V_{EN}=0V No outside circuit V_{FB}=0V Force driver on		2	10	μA
Quiescent Current	I_Q	V_{FB}=1.2V Force driver off		3	5	mA
Oscillation Frequency	f_{OSC}	Measure waveform at SW Pin	260	330	400	KHz
Frequency of Current Limit or Short Circuit Protect	f_{OSC1}	Measure waveform at SW Pin	20	40		KHz
Line Regulation	$\frac{\Delta V_{OUT}}{V_{OUT}}$	V_{CC}=5V-28V, I_{OUT}=0.2A		0.4		%
Load Regulation	$\frac{\Delta V_{OUT}}{V_{OUT}}$	I_{OUT}=0.2A-3A		0.3		%
EN Pin Input Current	I_{SH}	V_{EN}=2.5V(ON)		5		μA
	I_{SL}	V_{EN}=0.3V(OFF)		0		μA
Soft-Start Time	T_{SS}		0.3	3.5	8	ms
Internal MOSFET $R_{DS(ON)}$	$R_{DS(ON)}$	High-side Switch, I_{SW}=1A		70		mΩ
		low-side Switch, I_{SW}=1A		50		mΩ
EN Pin Logic input threshold voltage	V_{SH}	High(regulator ON)	1.6			V
	V_{SL}	Low(regulator OFF)			0.8	V
Thermal shutdown Temp	TSD			150		°C

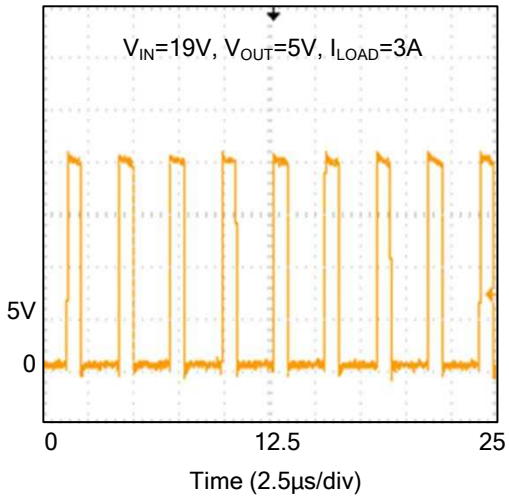
■ TYPICAL APPLICATION CIRCUIT

MLCC

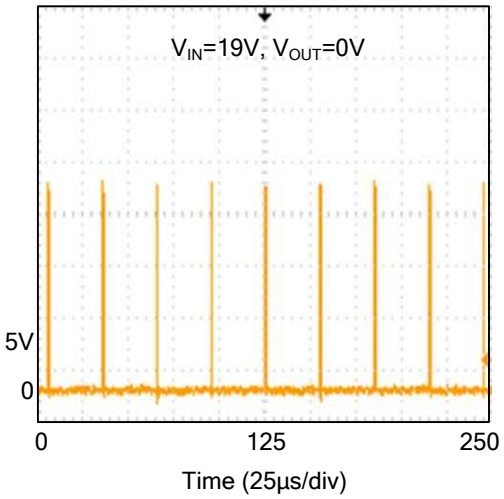


■ TYPICAL CHARACTERISTICS

Short Protect SW Wave



Short Protect SW Wave



Efficiency vs. Load Current