



## LR18113

## LINEAR INTEGRATED CIRCUIT

### 1.6X LINEAR FAN DRIVER WITH ENABLE CONTROL

#### DESCRIPTION

The UTC **LR18113** is a low output resistance 1.6X positive voltage linear fan driver with very low dropout voltage at up to 500mA. The UTC **LR18113** consists of an error amplifier, output stage, voltage divider, over temperature protection, current limiting scheme and Enable Control logic.  $V_{OUT}$  voltage follows the 1.6 times of  $V_{SET}$  voltage until it reaches  $V_{IN}$  voltage. The  $V_{SET}$  voltage must be larger than 1V to guarantee  $V_{OUT}$  1.6 times of  $V_{SET}$ . Good regulation over variation in line, load and temperature is also provided by UTC **LR18113**.

#### FEATURES

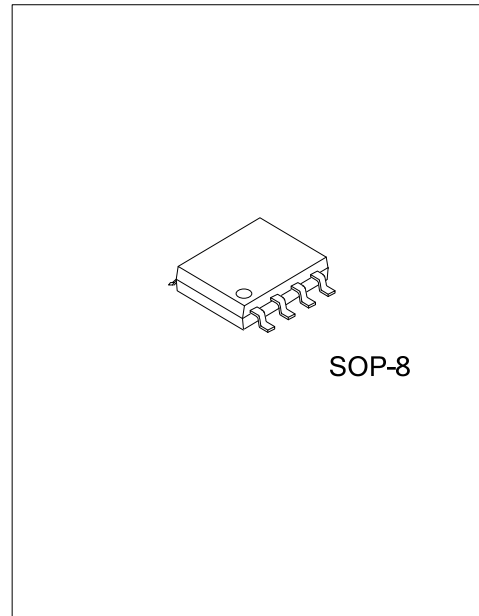
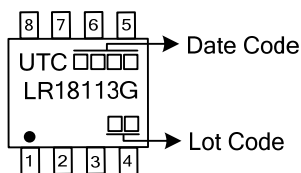
- \*  $V_{OUT}$  Follows 1.6 Times of  $V_{SET}$
- \* 0.3Ω Output Resistance @ 0.5A
- \* Over Temperature Protection
- \* Current Limiting Protection
- \* Enable control

#### ORDERING INFORMATION

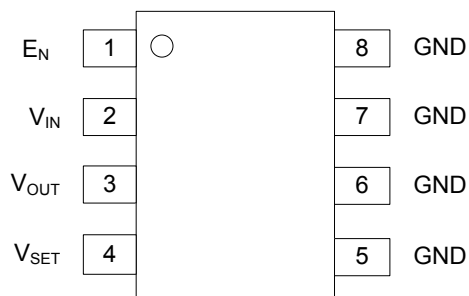
Ordering Number	Package	Packing
LR18113G-S08-R	SOP-8	Tape Reel

<p>LR18113G-S08-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) S08: SOP-8 (3) G: Halogen Free and Lead Free</p>
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#### MARKING



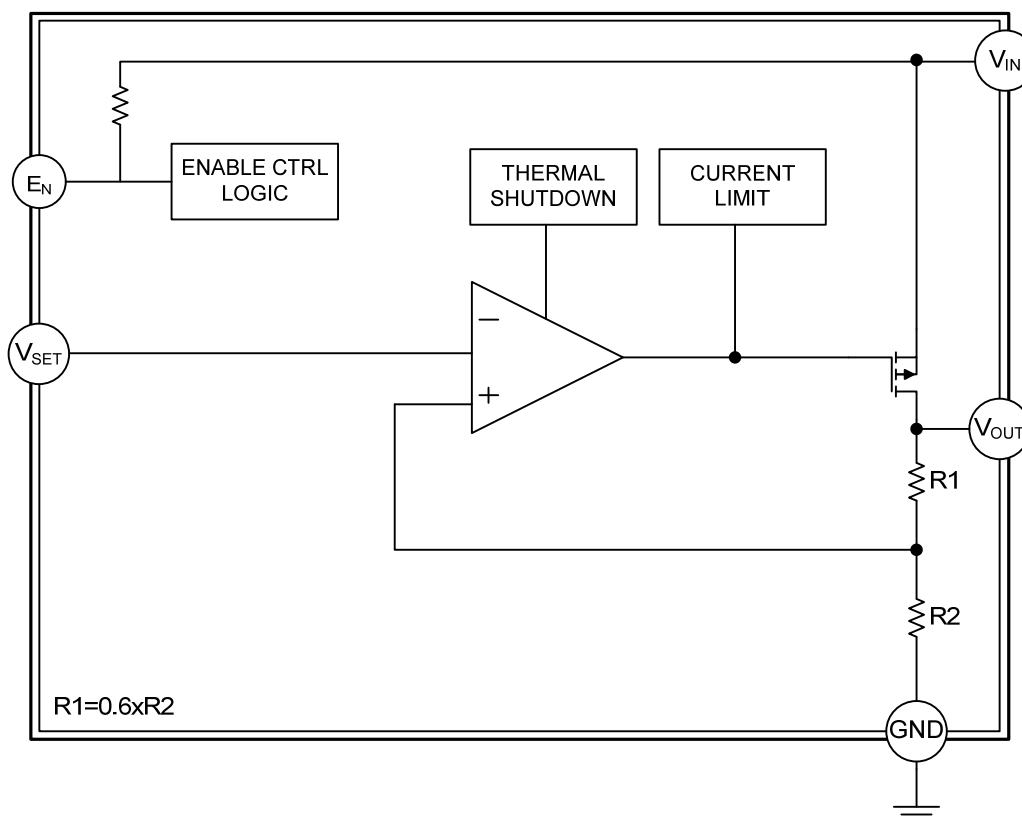
### ■ PIN CONFIGURATION



### ■ PIN DESCRIPTION

PIN NO.	NAME	DESCRIPTION
1	$E_N$	Enable Input.
2	$V_{IN}$	Supply Input.
3	$V_{OUT}$	This pin is output voltage of regulator. Its voltage is 1.6 times of $V_{SET}$ .
4	$V_{SET}$	This pin sets output voltage. Its voltage must be larger than 1V to guarantee $V_{OUT}$ 1.6 times of $V_{SET}$ .
5~8	GND	Common Ground. Use all four pins on SOP-8 device for heat sinking.

### ■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING (unless otherwise specified )

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Input Voltage	$V_{IN}$	-0.3 ~ +7	V
Enable Input Voltage	$V_{EN}$	0 ~ 7	V
Power Dissipation	$P_D$	Internally Limited	
Junction Temperature	$T_J$	+150	°C
Operation Temperature	$T_{OPR}$	-40~+85	°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	$\theta_{JA}$	156	°C/W
Junction to Case	$\theta_{JC}$	39	°C/W

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS
Supply Voltage	$V_{CC}$	4.5		6	V
Operating Temperature	$T_A$	-40		+85	°C

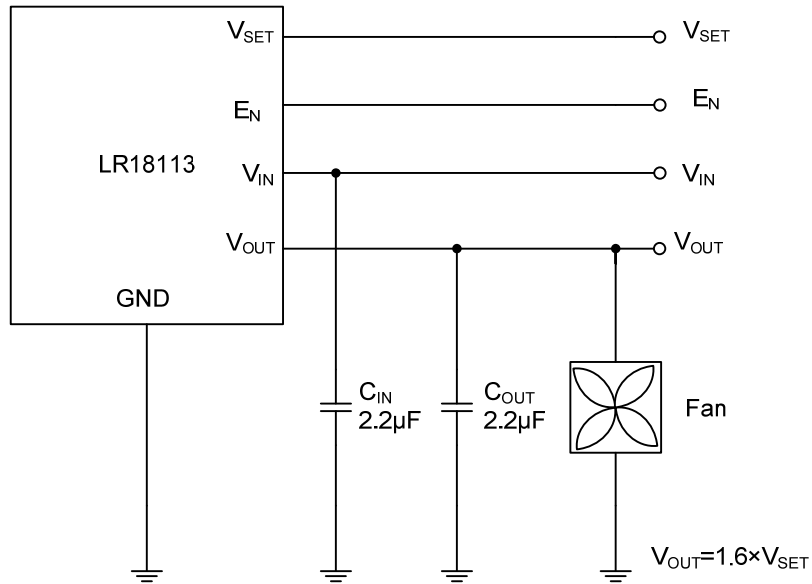
■ ELECTRICAL CHARACTERISTICS

( $V_{SET}=2V$ ,  $V_{EN}=5V$ ,  $V_{IN}=5V$ ,  $I_{OUT}=0.5A$ ,  $C_{IN}=2.2\mu F$ ,  $C_{OUT}=2.2\mu F$ ,  $T_A=T_J=25^\circ C$ , unless otherwise specified )(Note)

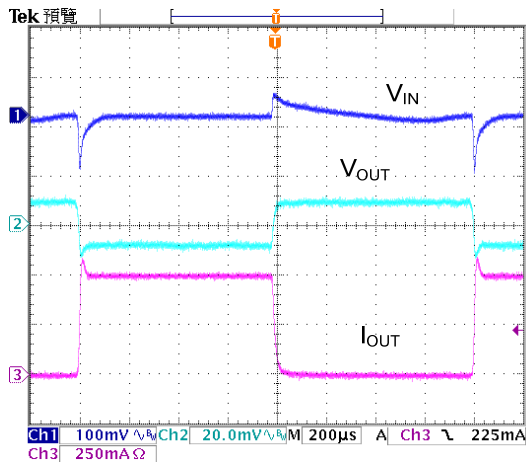
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
<b><math>V_{IN}</math></b>						
Supply Voltage	$V_{CC}$		4.5		6	V
Quiescent Current	$I_Q$	$V_{OUT}=5V$			3	mA
<b><math>V_{OUT}</math></b>						
Output Voltage/ $V_{SET}$ Voltage	$\frac{V_{OUT}}{V_{SET}}$	$V_{IN}=6V, V_{SET}=1V\sim 3.3V$	1.552	1.6	1.648	V/V
Line Regulation	$\frac{\Delta V_{OUT}}{V_{OUT}}$	$V_{IN}=4.5V$ to 6V		0.2	0.5	%
Load Regulation	$\frac{\Delta V_{OUT}}{V_{OUT}}$	$10mA \leq I_{OUT} \leq 0.5A$		0.2	0.8	%
Output Resistance	$R_{OUT}$	$I_{OUT}=0.5A, V_{SET}=3.4V$		0.2	0.3	$\Omega$
Current Limit	$I_{LIMLT}$	$V_{OUT}=0V$		1		A
<b><math>V_{SET}</math></b>						
Minimum $V_{SET}$ Voltage	$V_{SET(MIN)}$			1		V
$V_{SET}$ pin Current	$I_{SET}$			80	200	nA
<b>ENABLE</b>						
Enable Voltage	$V_{EN}$	High		1.6		V
		Low			0.4	V
EN pin Bias Current	$I_{EN}$	$V_{EN}=0V$		1.5	10	$\mu A$
<b>OVER TEMPERATURE PROTECTION</b>						
Over Temperature Shutdown	OTS			150		°C
Over Temperature Hysteresis	OTH			25		°C

Note: Low duty pulse techniques are used during test to maintain junction temperature as close to ambient as possible.

## ■ TYPICAL APPLICATION CIRCUIT



## ■ TYPICAL CHARACTERISTICS



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