



LR18115

LINEAR INTEGRATED CIRCUIT

1.6X LINEAR FAN DRIVER WITH V_{OUT} FULLY ON CONTROL

DESCRIPTION

The UTC **LR18115** is a low output resistance 1.6X positive voltage linear fan driver with very low dropout voltage at up to 500mA. The UTC **LR18115** consists of an error amplifier, output stage, voltage divider, over temperature protection, current limiting scheme and Fully 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} . When given low, V_{OUT} can be fully turned on by $\overline{FON}$ pin. Good regulation over variation in line, load and temperature is also provided by UTC **LR18115**.

FEATURES

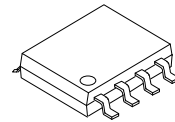
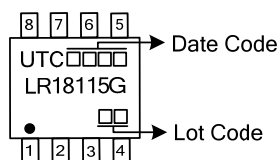
- * V_{OUT} Follows 1.6 Times of V_{SET}
- * 0.3 Ω Output Resistance @ 0.5A
- * Over Temperature Protection
- * Current Limiting Protection
- * $\overline{FON}$ Pin to Turn V_{OUT} Fully On

ORDERING INFORMATION

Ordering Number	Package	Packing
LR18115G-S08-R	SOP-8	Tape Reel

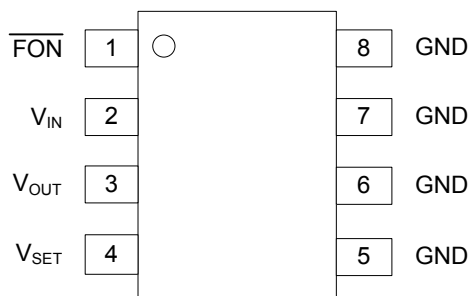
LR18115G-S08-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) S08: SOP-8 (3) G: Halogen Free and Lead Free
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MARKING



SOP-8

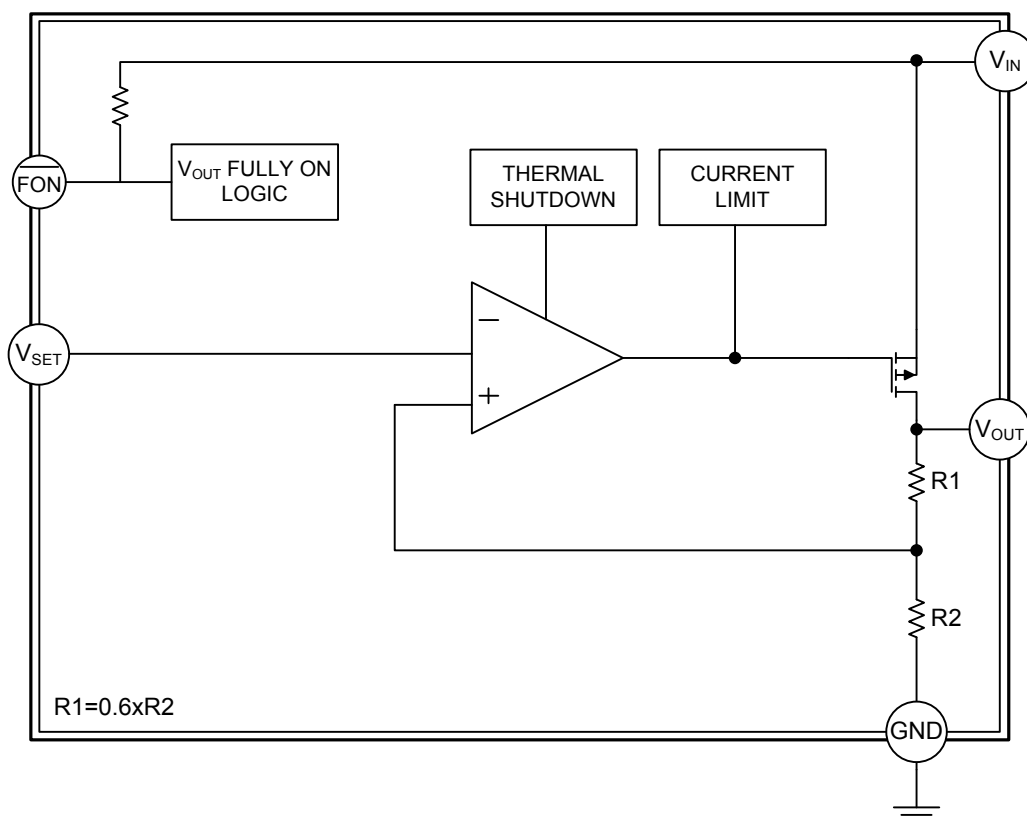
PIN CONFIGURATION



PIN DESCRIPTION

PIN NO.	NAME	DESCRIPTION
1	$\overline{\text{FON}}$	$\overline{\text{FON}}$ Input. Pulling the regulator fully on when this pin below 0.4V. Internally pulled high.
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 ($T_A=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Input Voltage	V_{IN}	-0.3 ~ +7	V
FON Input Voltage	V_{FON}	0 ~ 7	V
Power Dissipation	P_D	Internally Limited	
Junction Temperature	T_J	+150	$^{\circ}\text{C}$
Operation Temperature	T_{OPR}	-40~+85	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-65~+150	$^{\circ}\text{C}$

Note: 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.

■ THERMAL RESISTANCES CHARACTERISTICS

PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient	θ_{JA}	156	$^{\circ}\text{C}/\text{W}$
Junction to Case	θ_{JC}	39	$^{\circ}\text{C}/\text{W}$

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS
Supply Voltage	V_{CC}	4.5		6	V
Operating Temperature	T_A	-40		85	$^{\circ}\text{C}$

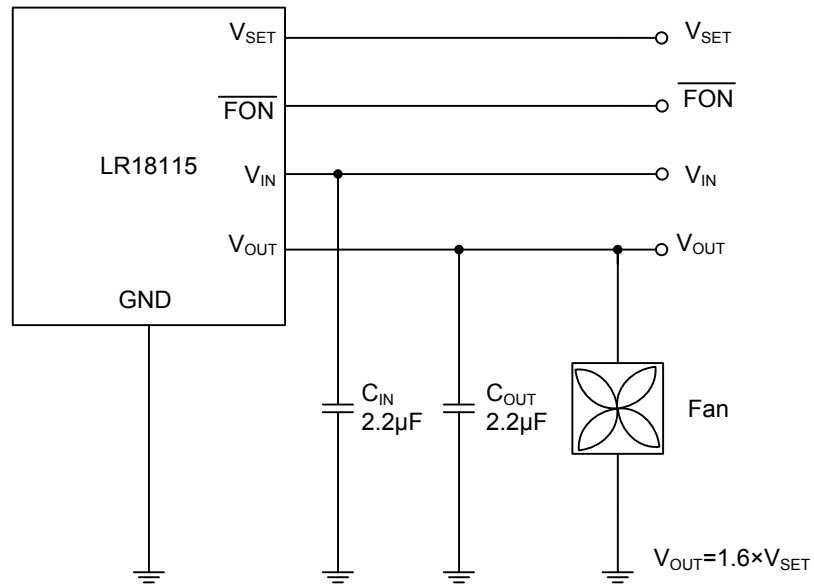
■ ELECTRICAL CHARACTERISTICS

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

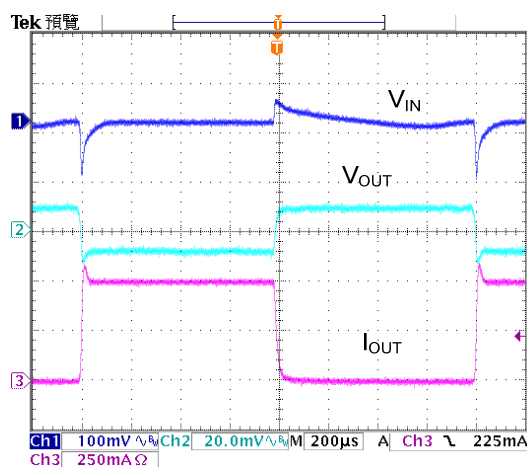
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
V_{IN}						
Supply Voltage	V_{CC}		4.5		6	V
Quiescent Current	I_Q	$\overline{FON}=0\text{V}$, $V_{OUT}=5\text{V}$			3	mA
V_{OUT}						
Output Voltage/ V_{SET} Voltage	$\frac{V_{OUT}}{V_{SET}}$	$V_{IN}=6\text{V}$, $V_{SET}=1\text{V}\sim 3.3\text{V}$	1.552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

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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