



L1183B

Preliminary

CMOS IC

300mA CMOS LDO

DESCRIPTION

The UTC **L1183B** is a positive, linear regulator. One of the feature is the very low ground current typically as low as 30 μ A, and the dropout voltage is extremely low. For stable operation, the output capacitance value should be 2.2 μ F or more.

The internal circuit includes thermal shutdown and current fold-back device to prevent device failure when the circuit is operated in bad conditions.

The UTC **L1183B** is generally suitable for applications, such as instrumentation, portable electronics, wireless devices, cordless phones, PC peripherals, battery powered widgets.

FEATURES

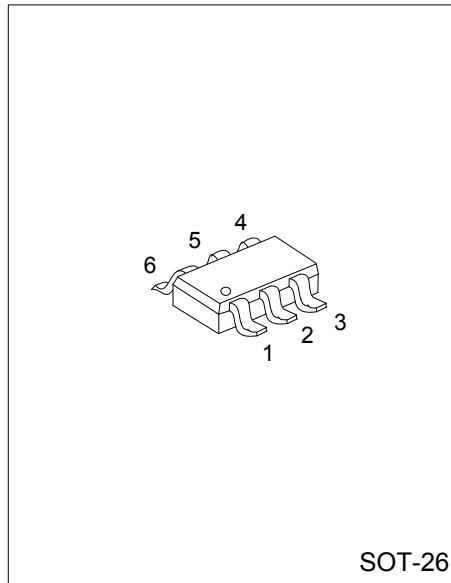
- * Very Low Dropout Voltage
- * Guaranteed Output Current: 300mA
- * Quiescent Current: 30 μ A (TYP.)
- * Typical Accuracy Within 2%
- * Over-Temperature Shutdown
- * Current Limiting
- * Short Circuit Current Fold-Back
- * Power Good Detector (6 pin version only)
- * Power-Saving Shutdown Mode
- * Adjustable Output Voltages
- * Low Temperature Coefficient
- * RoHS-Compliant Product

ORDERING INFORMATION

| Ordering Number | Package | Packing |
|------------------|---------|-----------|
| L1183BG-xx-AG6-R | SOT-26 | Tape Reel |

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

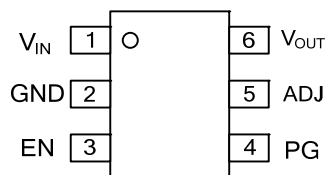
| | |
|---|--|
| <p>L1183BG-xx-AG6-R</p> <ul style="list-style-type: none"> (1) Packing Type (2) Package Type (3) Output Voltage Code (4) Halogen Free | <ul style="list-style-type: none"> (1) R: Tape Reel (2) AG6: SOT-26 (3) xx: Refer to Marking Information (4) G: Halogen Free |
|---|--|



■ MARKING INFORMATION

| PACKAGE | VOLTAGE CODE | MARKING |
|---------|--|---------|
| SOT-26 | 12 :1.2V 15 :1.5V 28 :2.8V 31 :3.1V 33 :3.3V | |

■ PIN CONFIGURATION



■ PIN DESCRIPTION

| PIN NO | PIN NAME | DESCRIPTION |
|--------|-----------|---|
| 1 | V_{IN} | Input voltage pin |
| 2 | GND | Ground connection pin |
| 3 | EN | Enable pin |
| 4 | PG | Power-Good output |
| 5 | ADJ | Feedback output voltage for adjustable device |
| 6 | V_{OUT} | LDO voltage regulator output pin |

■ ABSOLUTE MAXIMUM RATING

| PARAMETER | SYMBOL | RATINGS | UNIT |
|-------------------------------|-----------|----------------------------|------|
| Input Voltage | V_{IN} | 8 | V |
| Input, Output Voltage | | GND - 0.3 ~ $V_{IN} + 0.3$ | V |
| Output Current | I_{OUT} | $P_D / (V_{IN} - V_{OUT})$ | mA |
| Power Dissipation | P_D | 400 | mW |
| Ambient Operating Temperature | T_{OPR} | -40 ~ +85 | °C |
| Junction Temperature | T_J | -40 ~ +125 | °C |

Notes: 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.

2. Caution: Stress above the listed absolute maximum rating may cause permanent damage to the device.

■ THERMAL DATA

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---------------------|---------------|---------|------|
| Junction to Ambient | θ_{JA} | 140 | °C/W |
| Junction to Case | θ_{JC} | 280 | |

■ ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, $V_{IN}=5\text{V}$ unless otherwise specified)

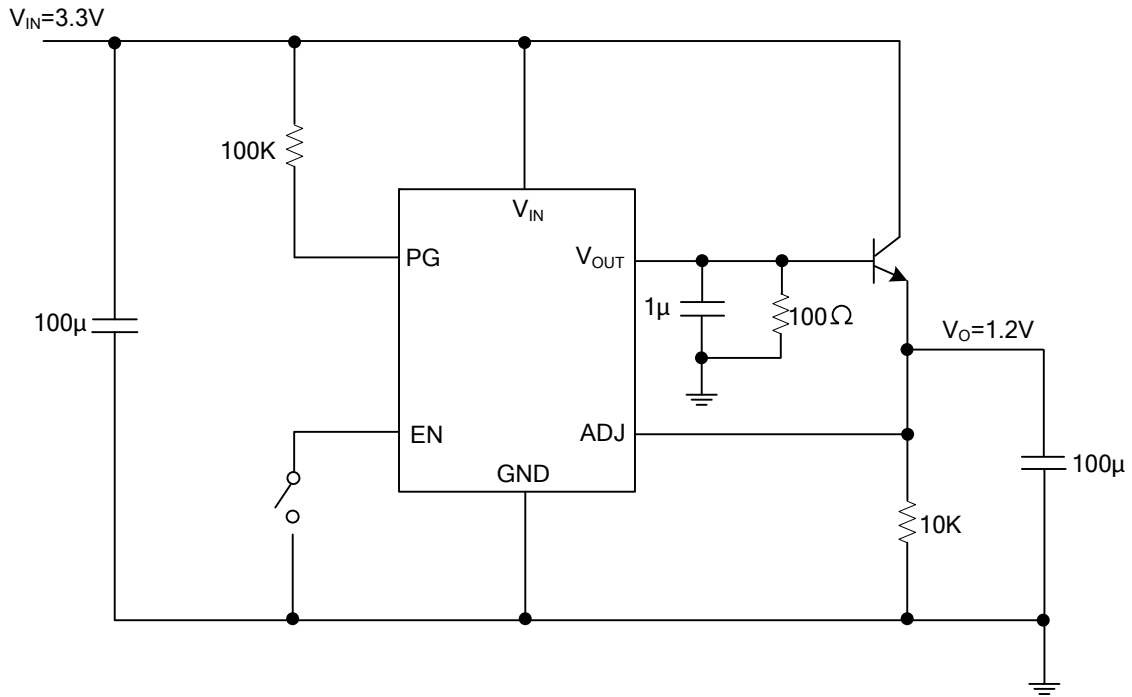
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|-------------------------------|--------------|---|--|------|----------|------------------|
| Input Voltage | V_{IN} | | Note | | 7 | V |
| Output Voltage | V_{OUT} | $I_{OUT}=1\text{mA}$ | -3 | | 3 | % |
| Dropout Voltage | V_D | $I_{OUT}=300\text{mA}$ | $1.2\text{V} \leq V_{O(NOM)} \leq 2.0\text{V}$ | | 1300 | mV |
| | | $V_{OUT}=V_{ONOM}$ | $2.0\text{V} < V_{O(NOM)} \leq 2.8\text{V}$ | | 400 | |
| | | -2.0% | $2.8\text{V} < V_{O(NOM)} < 3.8\text{V}$ | | 300 | |
| Output Current | I_{OUT} | $V_{OUT} > 1.2\text{V}$ | 300 | | | mA |
| Current Limit | I_{LIMIT} | $V_{OUT} > 1.2\text{V}$ | 300 | 450 | | mA |
| Short Circuit Current | I_{SC} | $V_{OUT} < 0.8\text{V}$ | | 150 | 300 | mA |
| Quiescent Current | I_Q | $I_{OUT}=0\text{mA}$ | | 30 | 50 | μA |
| Ground Pin Current | I_{GND} | $I_{OUT}=1\text{mA} \sim 300\text{mA}$ | | 35 | | μA |
| Line Regulation | REG_{LINE} | $I_{OUT}=5\text{mA}$ $V_{IN}=V_O+1 \sim V_O+2$ | $V_{OUT} < 2.0\text{V}$ | | 0.15 | % |
| | | | $V_{OUT} \geq 2.0\text{V}$ | 0.02 | 0.1 | % |
| Load Regulation | REG_{LOAD} | $I_{OUT}=1\text{mA} \sim 300\text{mA}$ | | 0.2 | 1 | % |
| Over Temperature Shutdown | OTS | | | 150 | | °C |
| Over Temperature Hysteresis | OTH | | | 30 | | °C |
| V_O Temperature Coefficient | TC | | | 30 | | ppm/°C |
| Power Supply Rejection | PSRR | $I_{OUT}=100\text{mA}$ $C_O=2.2\mu\text{F}$ | $f=1\text{kHz}$ | 50 | | dB |
| | | | $f=10\text{kHz}$ | 20 | | |
| | | | $f=100\text{kHz}$ | 15 | | |
| Output Voltage Noise | eN | $f=10\text{Hz} \sim 100\text{kHz}$ $I_O=10\text{mA}, C_{BYP}=0\mu\text{F}$ | | 30 | | μVrms |
| ADJ Input Bias Current | I_{ADJ} | | | 1 | | μA |
| ADJ Reference Voltage | V_{REF} | | 1.176 | 1.2 | 1.224 | V |
| EN Input Threshold | V_{EH} | $V_{IN}=2.7\text{V} \sim 7\text{V}$ | 2.0 | | V_{IN} | V |
| | V_{EL} | $V_{IN}=2.7\text{V} \sim 7\text{V}$ | 0 | | 0.4 | V |
| EN Input Bias Current | I_{EH} | $V_{EN}=V_{IN}, V_{IN}=2.7\text{V} \sim 7\text{V}$ | | | 0.1 | μA |
| | I_{EL} | $V_{EN}=0\text{V}, V_{IN}=2.7\text{V} \sim 7\text{V}$ | | | 0.5 | μA |

Note: $V_{IN(min)}=V_{OUT}+V_D$

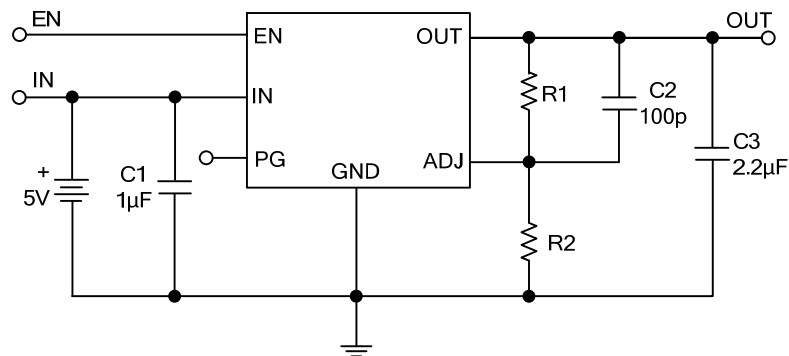
■ ELECTRICAL CHARACTERISTICS (Cont.)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|-------------------------|--------------|------------------------------------|-----|-----|-----|----------------|
| Shutdown Supply Current | I_{SD} | $V_{IN}=5V, V_O=0V, V_{EN}<V_{EL}$ | | 0.5 | 1 | μA |
| Shutdown Output Voltage | $V_{OUT,SD}$ | $I_O=35\mu A, V_{EN}<V_{EL}$ | 0 | | 0.1 | V |
| Output Under Voltage | V_{UV} | | | | 85 | % $V_{O(NOM)}$ |
| Output Over Voltage | V_{OV} | | 115 | | | % $V_{O(NOM)}$ |
| PG Leakage Current | I_{LC} | $V_{PG}=7V$ | | | 1 | μA |
| PG Voltage Rating | V_{PG} | V_O in regulation | | | 7 | V |
| PG Voltage Low | V_{OL} | $I_{SINK}=0.4mA$ | | | 0.4 | V |

■ ADVANCED APPLICATION



■ TYPICAL APPLICATION CIRCUIT



$$V_{OUT} = 1.2 (R1 + R2) / R2$$

C2 is unnecessary when $R1$ or $R2 < 20K\Omega$

PG pin is only available in the SOT-26 package option

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