



LR1143

LINEAR INTEGRATED CIRCUIT

HIGH PSRR, LOW DROPOUT, 400mA ADJUSTABLE LDO REGULATOR

DESCRIPTION

The UTC **LR1143** is a CMOS-based 400mA voltage regulator with low supply current, low dropout, adjustable output voltage, The device offering high PSRR and low dropout. The quiescent current is as low as 35µA, further prolonging the battery life. The UTC **LR1143** also works with low-ESR ceramic capacitors, reducing the amount of board space necessary for power applications, critical in handheld wireless devices.

The UTC **LR1143** consumes typical 0.7µA in shutdown mode. The other features include low dropout voltage, high output accuracy, current limit protection, and enable/shutdown control.

FEATURES

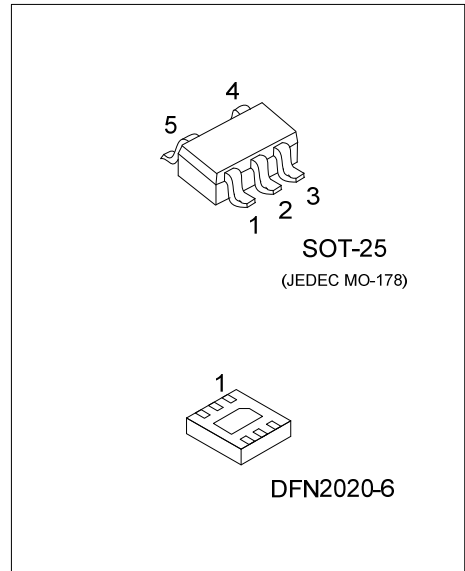
- * Wide operating voltage range : 3.0V~5.5V
- * Adjustable output voltage
- * Enable/shutdown control
- * Low-noise for RF application
- * Ultra-Fast response in line/load transient
- * Current limit protection
- * Output only 1µF capacitor required for stability
- * High power supply rejection ratio

ORDERING INFORMATION

| Ordering Number | | Package | Packing |
|-----------------------|-----------------------|-----------|-----------|
| Lead Free | Halogen Free | | |
| LR1143L-xx-AF5-R | LR1143G-xx-AF5-R | SOT-25 | Tape Reel |
| LR1143L-xx-K06-2020-R | LR1143G-xx-K06-2020-R | DFN2020-6 | Tape Reel |

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

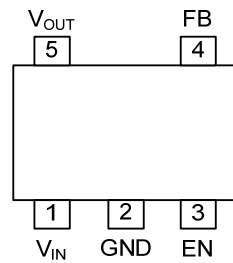
| | |
|--|---|
| <p>LR1143G-xx-AF5-R</p> <p>(1) Packing Type (2) Package Type (3) Output Voltage Code (4) Green Package</p> | <p>(1) R: Tape Reel (2) AF5: SOT-25, K06-2020: DFN2020-6 (3) xx: refer to Marking Information (4) G: Halogen Free and Lead Free, L: Lead Free</p> |
|--|---|



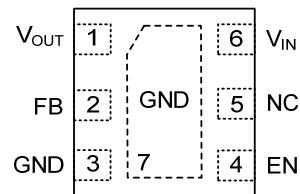
MARKING INFORMATION

| PACKAGE | VOLTAGE CODE | MARKING |
|-----------|--------------|---------|
| SOT-25 | AD: ADJ | |
| DFN2020-6 | | |

PIN CONFIGURATION



SOT-25

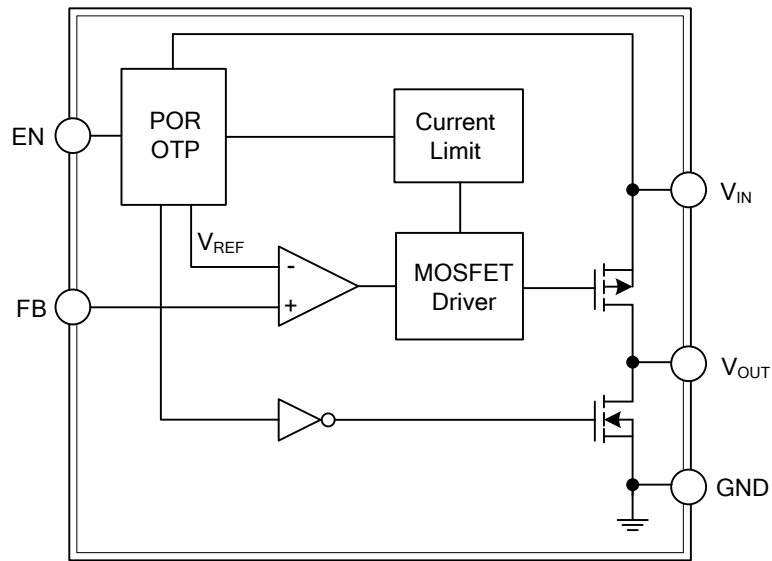


DFN2020-6
(Top View)

PIN DESCRIPTION

| PIN NO. | | PIN NAME | DESCRIPTION |
|---------|-----------|-----------|----------------------------|
| SOT-25 | DFN2020-6 | | |
| 1 | 6 | V_{IN} | Voltage Input. |
| 2 | 3, 7 | GND | Ground. |
| 3 | 4 | EN | Chip Enable (Active High). |
| 4 | 2 | FB | Output Voltage Feedback. |
| 5 | 1 | V_{OUT} | Voltage Output. |
| - | 5 | NC | No Connection |

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|--|-----------|-----------|--------------|------------------|
| Supply Input Voltage | | V_{IN} | 6 | V |
| EN Input Voltage | | | 6 | V |
| Power Dissipation ($T_A=25^\circ\text{C}$) | SOT-25 | P_D | 300 | mW |
| | DFN2020-6 | | 950 (Note 2) | mW |
| Junction Temperature | | T_J | +150 | $^\circ\text{C}$ |
| Storage Temperature | | T_{STG} | -65 ~ +150 | $^\circ\text{C}$ |

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. The data tested by surface mounted on a 2 inch² FR-4 board with 2OZ copper.

■ RECOMMENDED OPERATING CONDITIONS (Note 3)

| PARAMETER | SYMBOL | MIN | TYP | MAX | UNIT |
|---------------------------|--------|-----|-----|-----|------------------|
| Ambient Temperature Range | T_A | -20 | | +85 | $^\circ\text{C}$ |

Note: The device is not guaranteed to function outside its operating conditions.

■ THERMAL DATA

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|---------------------|-----------|---------------|---------|--------------------|
| Junction to Ambient | SOT-25 | θ_{JA} | 333 | $^\circ\text{C/W}$ |
| | DFN2020-6 | | 105 | $^\circ\text{C/W}$ |

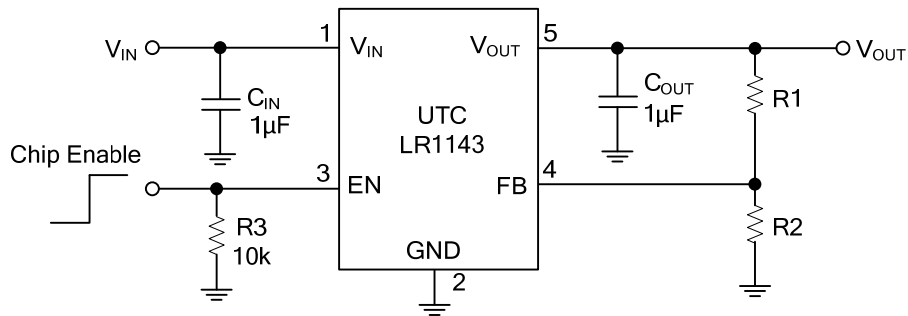
Note: θ_{JA} is measured in the natural convection at $T_A=25^\circ\text{C}$ on a low effective thermal conductivity test board of JEDEC 51-3 thermal measurement standard.

■ ELECTRICAL CHARACTERISTICS

($V_{IN}=3.7\text{V}$, $T_A=25^\circ\text{C}$, $C_{IN}=C_{OUT}=1\mu\text{F}$, $I_{OUT}=20\text{mA}$, unless otherwise specified)

| PARAMETER | | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|------------------------------|--------------------|-------------------|---|-------|-------|-------|---------------------|
| Input Voltage Range | | V_{IN} | | 3.0 | | 5.5 | V |
| Reference Voltage | | V_{REF} | | 1.188 | 1.200 | 1.212 | V |
| Quiescent Current | | I_Q | $I_{OUT}=0\text{mA}$ | | 35 | 50 | μA |
| Shutdown Current | | I_{SHDN} | $V_{EN}=0\text{V}$ | | 0.7 | 1.5 | μA |
| Current Limit | | I_{LIM} | $3.0\text{V} \leq V_{IN} < 5.5\text{V}$ | 400 | 650 | | mA |
| Dropout Voltage | | V_{DROP} | $I_{OUT}=400\text{mA}$ | | 800 | | mV |
| Load Regulation | | ΔV_{LOAD} | $1\text{mA} < I_{OUT} < 400\text{mA}$ $3.0\text{V} \leq V_{IN} < 5.5\text{V}$ | | | 1 | % |
| Line Regulation | | ΔV_{LINE} | $V_{IN}=(V_{OUT} + 0.5\text{V}) \sim 5.5\text{V}$, $I_{OUT}=1\text{mA}$ | | 0.01 | 0.2 | %/V |
| EN Threshold | Logic-Low Voltage | V_{IL} | | 0 | | 0.6 | V |
| | Logic-High Voltage | V_{IH} | | 1.6 | | 5.5 | V |
| EN Pin Current | | I_{EN} | | | 0.1 | 1 | μA |
| FB Pin Current | | I_{FB} | | | 0.1 | 1 | μA |
| Power Supply Rejection Ratio | | PSRR | $f=1\text{kHz}$, $I_{OUT}=10\text{mA}$ $f=10\text{kHz}$, $I_{OUT}=10\text{mA}$ | | 67 | | dB |
| Output Noise Voltage | | V_{ON} | $V_{OUT}=1.5\text{V}$, $C_{OUT}=1\mu\text{F}$, $I_{OUT}=0\text{mA}$ | | 30 | | μV_{RMS} |

■ TYPICAL APPLICATION CIRCUIT



$$V_{OUT} = V_{REF} \left(1 + \frac{R1}{R2}\right)$$

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