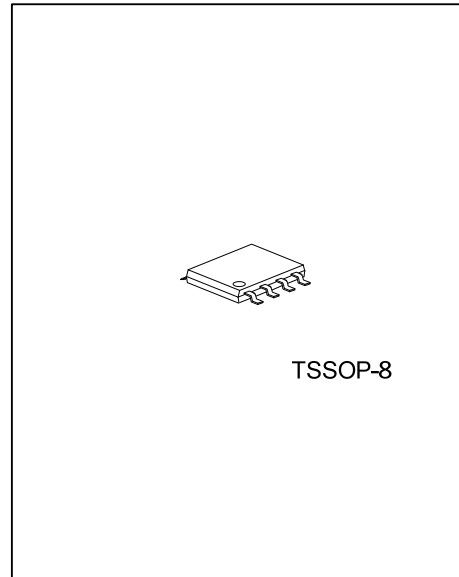




500MA HIGH EFFICIENCY BOOST REGULATOR WITH ADJUSTABLE OUTPUT, SHUTDOWN AND LOW BATTERY DETECT



■ DESCRIPTION

The **UC3555** is a micropower step-up DC/DC in 8-lead TSSOP package. It is designed for 2-cell battery powered systems such as digital cameras, cell phones and PDAs. The regulator starts-up at 1.3V and operates after the start at an input voltage as low as 1V. A Minimum off-time, variable on-time control scheme provides high efficiency over a wide range of load conditions. The combination of build-in power transistors, synchronous rectification, low battery detection and low supply current, make the **UC3555** ideal for portable applications.

■ FEATURES

- * Low power PFM step-up DC/DC
- * Low input voltage range from 1.6V to 4.5V
- * Adjustable output voltage from 3V to 5V
- * 500mA output current
- * 95% peak Efficiency
- * internal synchronous rectifier
- * Low battery detection
- * Current limited protection
- * Current Anti-Drawback protection

■ TYPICAL APPLICATIONS

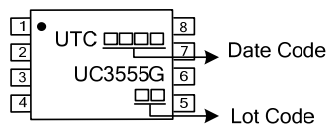
- * DSCS
- * PDAs
- * Cell phones, smart phones
- * Portable instrumentations
- * 2-3 AA/AAA cells operated devices
- * Single cell Li-Ion operated devices

■ ORDERING INFORMATION

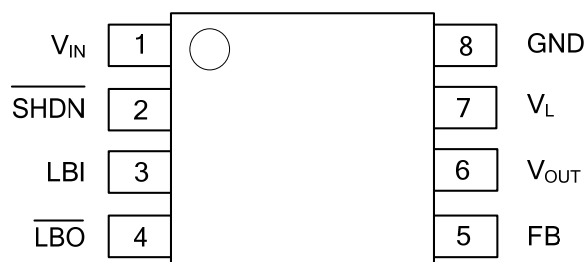
| Ordering Number | Package | Packing |
|-----------------|---------|-----------|
| UC3555G-P08-R | TSSOP-8 | Tape Reel |

| | |
|----------------------|--|
| <p>UC3555G-P08-R</p> | <p>(1) R: Tape Reel</p> <p>(2) P08: TSSOP-8</p> <p>(3) G: Halogen Free and Lead Free</p> |
|----------------------|--|

■ MARKING



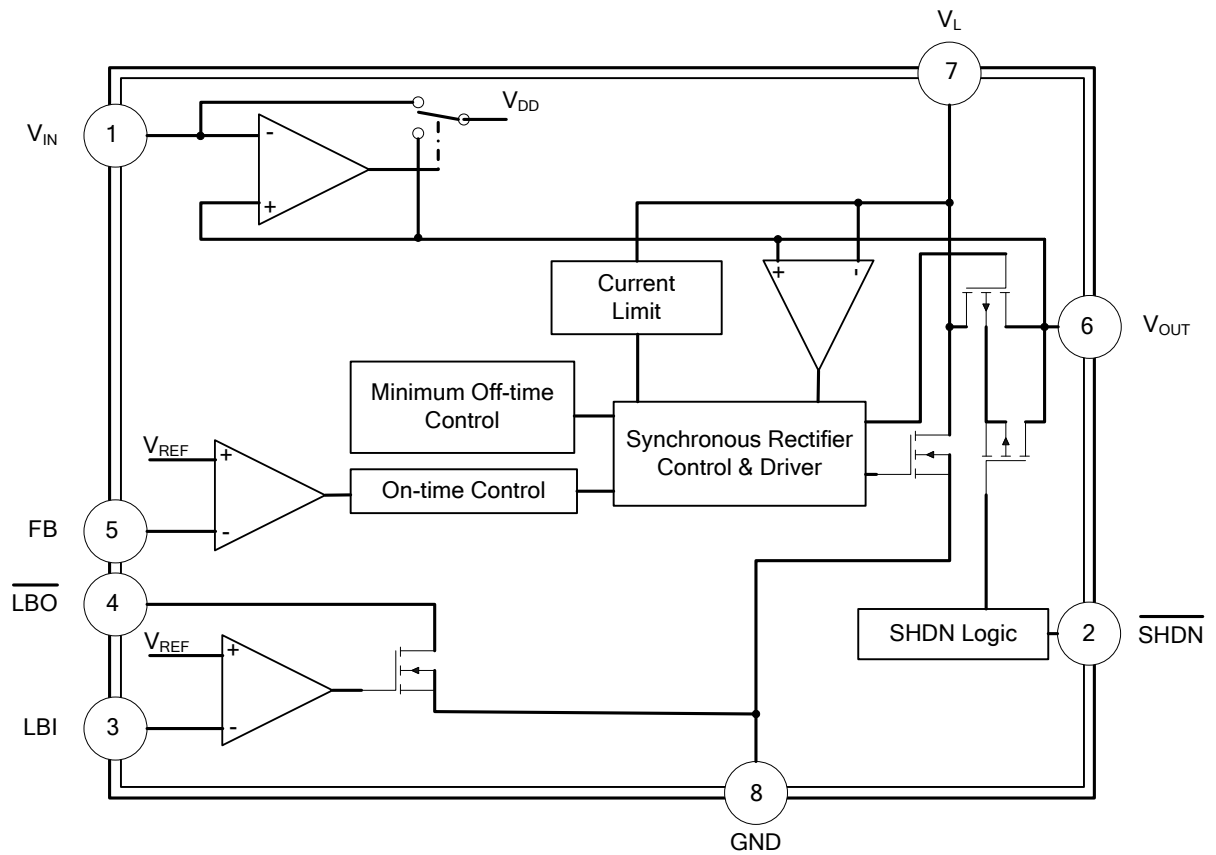
■ PIN CONFIGURATION



■ PIN DESCRIPTION

| PIN NO | SYMBOL | DESCRIPTION |
|--------|-------------------|--|
| 1 | V_{IN} | Battery Input Voltage. Supplies the IC during start-up. After the output is running, the IC draws powers from V_{OUT} . |
| 2 | \overline{SHDN} | Shut Down. Pulling this pin low shuts down the regulator, isolating the load from the input. |
| 3 | LBI | Low-Battery Input. Pulling this pin below 0.39V causes the LBO pin to go low. |
| 4 | \overline{LBO} | Low-Battery Output. This pin provides an active low signal to alert the user when the LBI voltage falls below its targeted value. The open-drain output can be used to reset a microcontroller. |
| 5 | FB | Feedback Input. For setting the output voltage. Connect this pin to the resistor divider. |
| 6 | V_{OUT} | Boost Regulator Output. Output voltage can be set to be in the 3 to 5V range. Startup at moderate load is achievable at input voltages around 1.35V |
| 7 | V_L | Boost Inductor Connection. Connect an inductor between this pin and V_{IN} . When servicing the output supply, this pin low, charging the inductor, then shuts off dumping the energy through the synchronous rectifier to the output. |
| 8 | GND | Ground Of The IC. |

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

| PARAMETER | SYMBOL | CONDITIONS | RATINGS | UNIT |
|------------------------------|------------|-----------------|----------------------|------|
| Supply Voltage | V_{OUT} | Relative to GND | -0.3 ~ +6.5 | V |
| Input Voltage | V_{IN} | | -0.3 ~ +6.5 | V |
| Switch Voltage | | V_L to GND | -0.3 ~ $V_{OUT}+0.3$ | V |
| Voltage on any other Pin | | | -0.3 ~ $V_{OUT}+0.3$ | V |
| Peak Switch Current | I_{PEAK} | | Internally Limited | |
| Output Current | I_{OUT} | | 500 | mA |
| Continuous Power Dissipation | P_D | | 525 | mW |
| Junction Temperature | T_J | | 150 | °C |
| Operating Temperature | T_{OPR} | | -65 ~ +150 | °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 | RATINGS | UNIT |
|---------------------|---------------|---------|------|
| Junction to Ambient | θ_{JA} | 124 | °C/W |

■ RECOMMENDED OPERATING RATINGS

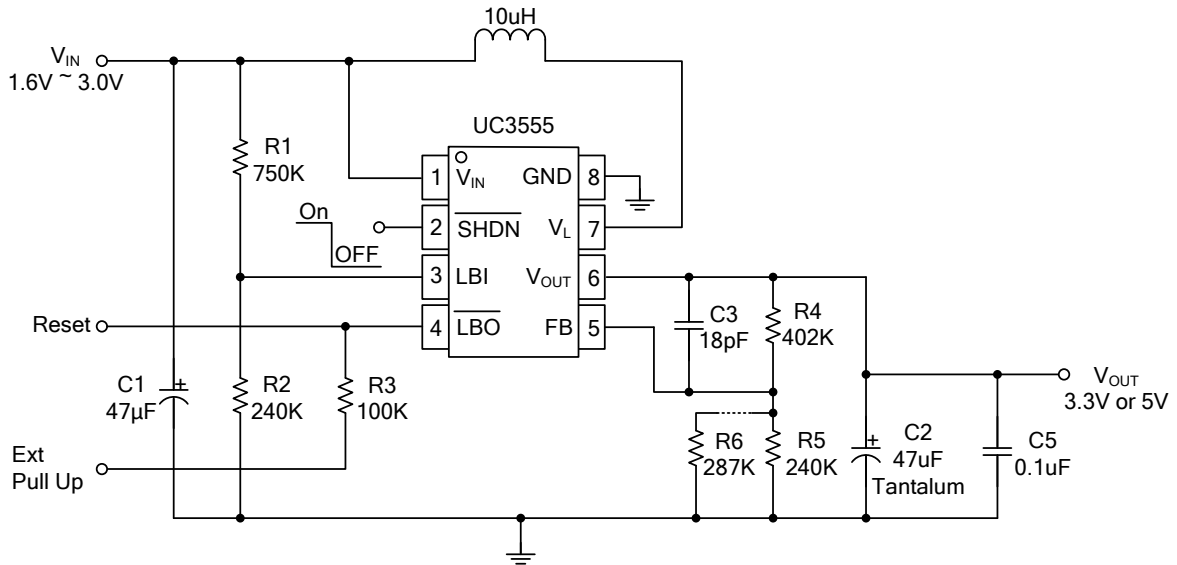
| PARAMETER | SYMBOL | RATINGS | UNIT |
|---------------------------|-----------|---------------------|------|
| V_{IN} Operating Range | V_{IN} | 1.6 ~ 0.9 V_{OUT} | °C |
| V_{OUT} Operating Range | V_{OUT} | 3.0 ~ 5.0 | °C |
| Ambient Temperature | T_A | -40 ~ +85 | °C |

■ ELECTRICAL CHARACTERISTICS

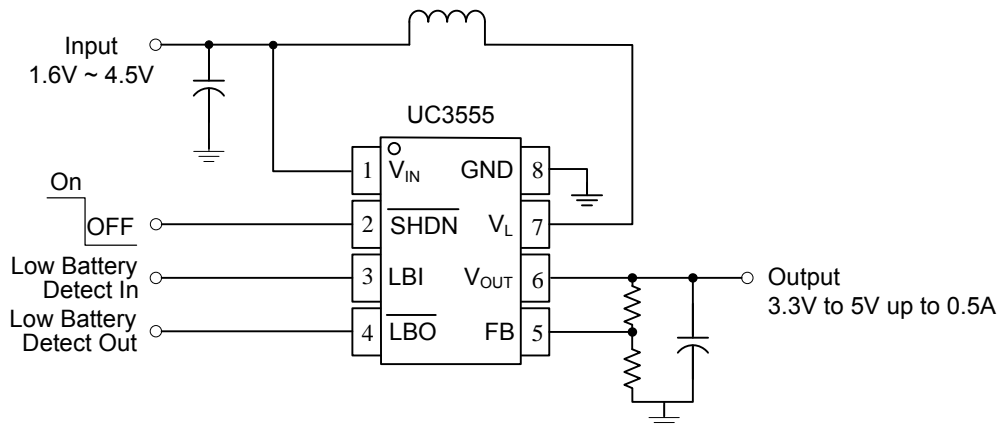
($V_{IN}=1.6V$ to $3V$, $I_{LOAD}=1mA$, $T_A=-40^{\circ}C$ to $+85^{\circ}C$. Typical value are at $T_A=25^{\circ}C$, unless otherwise specified)

| PARAMETER | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---|--|-------|-------|-------|----------|
| Start Up Voltage | $I_{LOAD}<1mA$ | | 1.35 | 1.6 | V |
| Operating Voltage | After start $I_{LOAD}=10mA$, $V_{OUT}=3.3V$ or $5V$ | | 1.0 | | V |
| Output Voltage | $V_{OUT(nom.)}=3.3V$ (note 1) | 3.15 | 3.3 | 3.45 | V |
| | $V_{OUT(nom.)}=5V$ | 4.775 | 5 | 5.225 | |
| Output Voltage Adjust Range | | 3 | | 5 | V |
| Steady State Output Current | $V_{OUT}=3.3V, V_{IN}=2.5V$ | 300 | 500 | | mA |
| | $V_{OUT}=5V, V_{IN}=2.5V$ | 200 | 330 | | |
| Pulse Width | $V_{IN}=3V$ | 0.8 | 1.4 | 2 | us |
| | $V_{IN}=2.4V$ | 1.2 | 1.7 | 2.5 | |
| | $V_{IN}=1.8V$ | 1.6 | 2.2 | 3.3 | |
| | $V_{IN}=1.6V$ | 1.7 | 2.5 | 4.0 | |
| Minimum Off-time | | | 1 | | us |
| Line Regulation | $I_{OUT}=2mA, V_{OUT}=3.3V$ | | 0.5 | 2 | % |
| | $V_{OUT}=5V$ | | 0.5 | 2 | |
| Load Regulation | 0 to 250mA, $V_{IN}=2.4V$, $V_{OUT}=3.3V$ | | 0.5 | | % |
| | 0 to 150mA, $V_{IN}=2.4V, V_{OUT}=5V$ | | 1 | | |
| Feedback Voltage(V_{FB}) | | | 1.243 | | V |
| LBI Threshold Voltage | | | 0.390 | | V |
| LBI Hysteresys | | | 25 | | mV |
| Internal NFET,PFET ON Resist | $I_{LOAD}=100mA$ | | 0.35 | | Ω |
| Power Efficiency | $I_{LOAD}=200mA, V_{IN}=3V, V_{OUT}=3.3V$ | | 95 | | % |
| Input Current in Shut Down Mode | $\overline{SHDN}=0V, V_{IN}=3V$ (Note 2) | | 8 | 50 | μA |
| Quiescent Current | $\overline{SHDN}=3V, V_{IN}=3V, V_{OUT}=3.3V$ (Note 2) | | 80 | 160 | μA |
| LBO Output Voltage Low | $V_{LBI}=0, I_{SINK}=1mA$ | | 0.2 | | V |
| \overline{SHDN} Input Threshold Voltage | $V_{IN}=3V, V_{OUT}=3.3V/5V$ | | 1.5 | | V |
| | $V_{IN}=1.6V, V_{OUT}=3.3V/5V$ | | 0.8 | | |

■ TESTING CIRCUIT



■ TYPICAL APPLICATION CIRCUIT



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