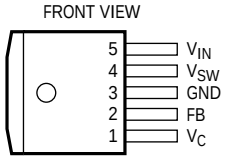
## ABSOLUTE MAXIMUM RATINGS

Supply Voltage ..... 30V
Switch Output Voltage ..... 60V
Feedback Pin Voltage (Transient, 1ms) ..... ±15V
Operating Junction Temperature Range
  Operating ..... 0°C to 125°C
  Short-Circuit ..... 0°C to 140°C
Storage Temperature Range ..... –65°C to 150°C
Lead Temperature (Soldering, 10 sec) ..... 300°C

## PACKAGE/ORDER INFORMATION

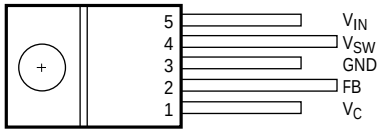



Q PACKAGE
5-LEAD DD

$T_{JMAX}$ = 125°C, $\theta_{JC}$ = 2°C/W, $\theta_{JA}$ = See Notes 5 and 6

ORDER PART NUMBER

LT1268CQ
LT1268BCQ




T PACKAGE
5-LEAD TO-220

$T_{JMAX}$ = 125°C, $\theta_{JC}$ = 2°C/W, $\theta_{JA}$ = 50°C/W

ORDER PART NUMBER

LT1268CT
LT1268BCT

Consult factory for Industrial and Military parts

## ELECTRICAL CHARACTERISTICS

**$V_{IN}$ = 15V, $V_C$ = 0.5V, $V_{FB}$ = $V_{REF}$, switch pin open, unless otherwise noted.**

| SYMBOL | PARAMETER | CONDITIONS | | MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|---|---|
| $V_{REF}$ | Reference Voltage Measured at Feedback Pin (Note 4) | LT1268B | <br>● | 1.235<br>1.224 | 1.244<br>1.244 | 1.253<br>1.264 | V<br>V |
| | Reference Voltage | LT1268 | <br>● | 1.224<br>1.214 | 1.244<br>1.244 | 1.264<br>1.274 | V<br>V |
| $I_B$ | Feedback Input Current | $V_{FB}$ = $V_{REF}$ | <br>● | | 350 | 750<br>1100 | nA<br>nA |
| $g_m$ | Error Amplifier Transconductance | $\Delta I_C$ = ±25µA | <br>● | 3000<br>2400 | 4400 | 6000<br>7000 | µmho<br>µmho |
| | Error Amplifier Source or Sink Current | $V_C$ = 1.5V | <br>● | 150<br>120 | 200 | 350<br>400 | µA<br>µA |
| | Error Amplifier Clamp Voltage | Hi Clamp, $V_{FB}$ = 1V<br>Lo Clamp, $V_{FB}$ = 1.5V | | 1.80<br>0.25 | <br>0.38 | 2.30<br>0.52 | V<br>V |
| | Reference Voltage Line Regulation | 3V ≤ $V_{IN}$ ≤ $V_{MAX}$, $V_C$ = 0.8V | ● | | | 0.03 | %/V |
| $A_V$ | Error Amplifier Voltage Gain | 0.9V ≤ $V_C$ ≤ 1.4V | | 500 | 800 | | V/V |
| | Minimum Input Voltage | | ● | | 2.8 | 3.0 | V |
| $I_Q$ | Supply Current | 3V ≤ $V_{IN}$ ≤ $V_{MAX}$, $V_C$ = 0.6V | | | 7 | 10 | mA |
| | Control Pin Threshold | Duty Cycle = 0 | <br>● | 0.7<br>0.5 | 0.9 | 1.08<br>1.25 | V<br>V |
| BV | Output Switch Breakdown Voltage | 3V ≤ $V_{IN}$ ≤ $V_{MAX}$, $I_{SW}$ = 1.5mA | ● | 60 | 75 | | V |
| $V_{SAT}$ | Output Switch-ON Resistance (Note 1, 3) | $T_J$ ≤ 100°C<br>$T_J$ ≤ 125°C | | | 0.12 | 0.18<br>0.22 | Ω<br>Ω |
| | Control Voltage to Switch Current Transconductance | | | | 12 | | A/V |
| $I_{LIM}$ | Switch Current Limit (Note 3, 6) | Duty Cycle = 50%, $T_J$ ≤ 100°C<br>Duty Cycle = 65%, $T_J$ ≤ 100°C | ●<br>● | 7.50<br>6.50 | | 15<br>14 | A<br>A |

## ELECTRICAL CHARACTERISTICS

**$V_{IN}$ = 15V, $V_C$ = 0.5V, $V_{FB}$ = $V_{REF}$, switch pin open, unless otherwise noted.**

| SYMBOL | PARAMETER | CONDITIONS | | MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|---|---|
| $\frac{\Delta I_{IN}}{\Delta I_{SW}}$ | Supply Current Increase During Switch-ON Time | | | | 25 | 45 | mA/A |
| f | Switching Frequency | | | 120 | 150 | 180 | kHz |
| | | | ● | 120 | | 180 | kHz |
| $DC_{MAX}$ | Maximum Switch Duty Cycle | | | 65 | 85 | 92 | % |
| | Shutdown Mode Supply Current | $3V \le V_{IN} \le V_{MAX}$, $V_C$ = 0.05V | | | 100 | 500 | µA |
| | Shutdown Mode Threshold Voltage | $3V \le V_{IN} \le V_{MAX}$ | | 100 | 150 | 250 | mV |
| | | | ● | 50 | | 300 | mV |

The ● denotes specifications which apply over the full operating temperature range.

**Note 1:** Measured with $V_C$ in hi clamp, $V_{FB}$ = 0.8V.

**Note 2:** For duty cycles (DC) between 50% and 65%, minimum guaranteed switch current is given by $I_{LIM}$ = 6.25 (1.7 – DC).

**Note 3:** Minimum current limit is reduced by 0.5A at 125°C. 100°C test limits are guaranteed by correlation to 125°C tests.

**Note 4:** LT1268B reference voltage is specified at ±9mV to guarantee ±1% output voltage accuracy when 0.1% external resistors are used to set output voltage. To maintain output accuracy under load, load current should be taken from the case and the ground pin should be connected separately to output ground. See AN19 for details.

**Note 5:** The Q package is intended for surface mount without a separate heat sink. See graph for thermal resistance as a function of the mounting area. This curve assumes no other heat dissipators adjacent to package.

**Note 6:** Maximum switch current may be limited by package power dissipation, especially for the surface mount (Q) package. This package has a thermal resistance of 20°C/W to 50°C/W (see graph). The following formula will allow an estimate of maximum continuous switch current as a function of power loss and duty cycle. See AN19 for more details.

$$I_{MAX} = \sqrt{\frac{P}{R_{SW} \times DC}}$$

P = Power dissipation due to switch current

$R_{SW}$ = Switch-ON resistance ≈ 0.15Ω

DC = Switch duty cycle

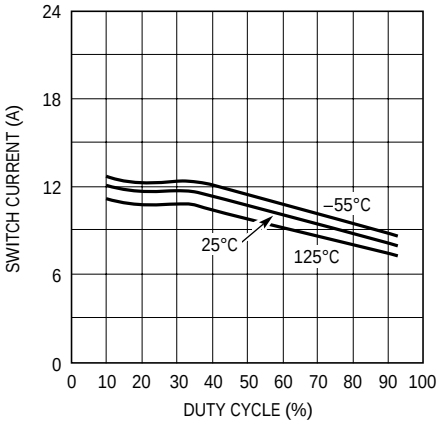
In a typical application where thermal resistance is 30°C/W, maximum power might be limited to 2W and power allocated to switch loss is 1.5W. For a duty cycle of 40%, this yields

$$I_{MAX} = \sqrt{\frac{1.5}{0.15 \times 0.4}} = 5A$$

Obviously, a combination of high thermal resistance and high duty cycle may restrict switch current to a value well below the 7.5A electrical limit.

## TYPICAL PERFORMANCE CHARACTERISTICS

**Switch Current Limit vs Duty Cycle**

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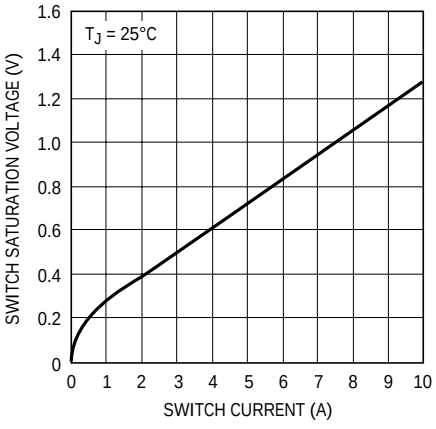
**Switch Saturation Voltage**

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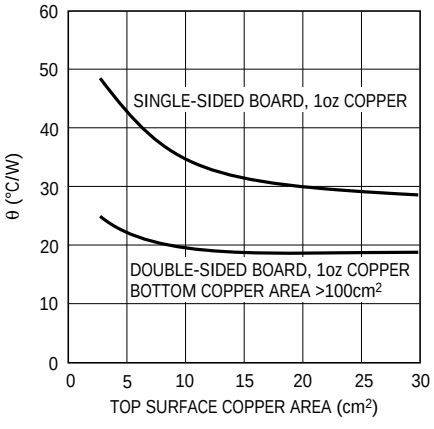
**Q Package Thermal Resistance**

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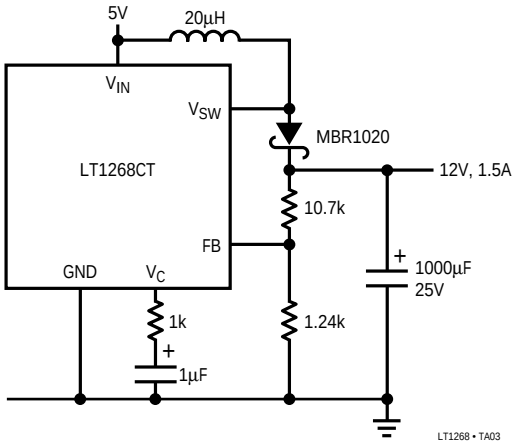
## TYPICAL APPLICATION

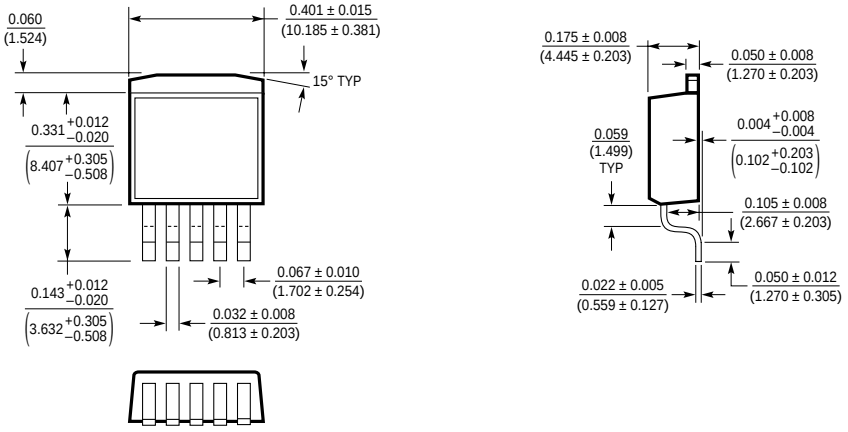
**Boost Converter (5V TO 12V)**



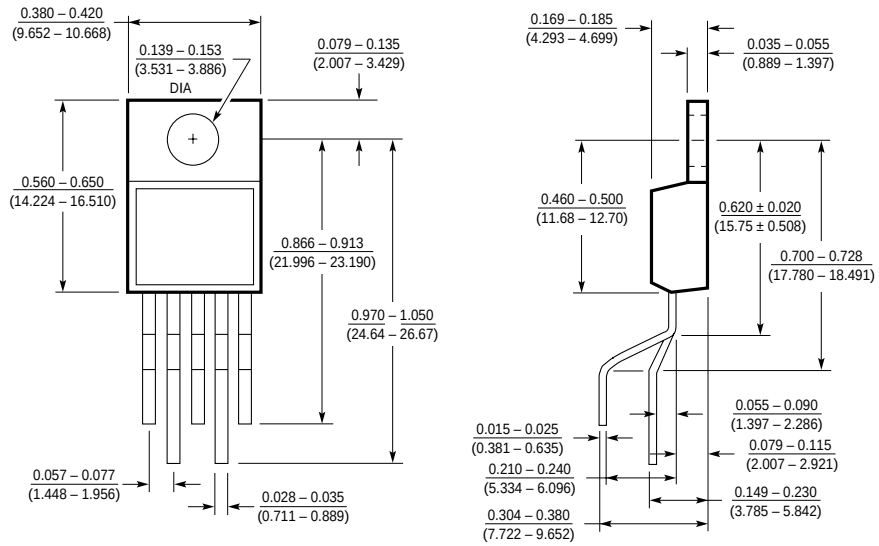

## PACKAGE DESCRIPTION

**Dimensions in inches (millimeters) unless otherwise noted.**

**Q Package**
**5-Lead DD**




**T Package**
**5-Lead TO-220**





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