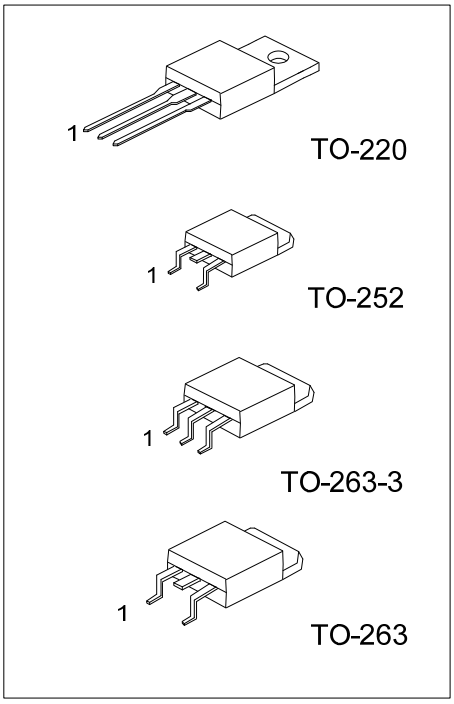
# 3A ADJUSTABLE/FIXED LOW DROPOUT LINEAR REGULATOR




Lead-free: UZ1085L-xx
Halogen-free: UZ1085G-xx

## ■ DESCRIPTION

The UTC **UZ1085-xx** series are low dropout three-terminal regulators with 3A output current capability. These devices have been optimized for low voltage applications including VTT bus termination, where transient response and minimum input voltage are critical.

Current limit is trimmed to ensure specified output current and controlled short-circuit current. On-chip thermal limiting provides protection against any combination of overload and ambient temperature that would create excessive junction temperatures.

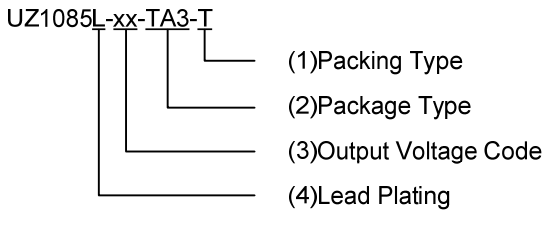
## ■ FEATURES

*Fast transient response
*Low dropout voltage at up to 3A
*Load regulation:0.05% typical
*Trimmed current limit
*On-chip thermal limiting

## ■ ORDERING INFORMATION

| Ordering Number | | | Package | Pin Assignment | | | Packing |
|---|---|---|---|---|---|---|---|
| Normal | Lead Free | Halogen Free | | 1 | 2 | 3 | |
| UZ1085-xx-TA3-T | UZ1085L-xx-TA3-T | UZ1085G-xx-TA3-T | TO-220 | A/G | O | I | Tube |
| UZ1085-xx-TN3-R | UZ1085L-xx-TN3-R | UZ1085G-xx-TN3-R | TO-252 | A/G | O | I | Tape Reel |
| UZ1085-xx-TQ2-R | UZ1085L-xx-TQ2-R | UZ1085G-xx-TQ2-R | TO-263 | A/G | O | I | Tape Reel |
| UZ1085-xx-TQ2-T | UZ1085L-xx-TQ2-T | UZ1085G-xx-TQ2-T | TO-263 | A/G | O | I | Tube |
| UZ1085-xx-TQ3-R | UZ1085L-xx-TQ3-R | UZ1085G-xx-TQ3-R | TO-263-3 | A/G | O | I | Tape Reel |
| UZ1085-xx-TQ3-T | UZ1085L-xx-TQ3-T | UZ1085G-xx-TQ3-T | TO-263-3 | A/G | O | I | Tube |

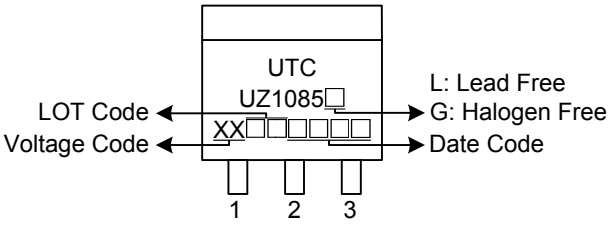
Note: 1. xx: Output Voltage, refer to Marking Information.
2. A: ADJ (for adjustable regulator), G: GND (for fixed regulator), O: $V_{OUT}$, I: $V_{IN}$




(1) R: Tape Reel, T: Tube
(2) TA3: TO-220, TN3: TO-252, TQ2: TO-263, TQ3: TO-263-3
(3) xx: refer to Marking Information
(4) G: Halogen Free, L: Lead Free, Blank: Pb/Sn


Copyright © 2009 Unisonic Technologies Co., Ltd

## ■ MARKING INFORMATION

| PACKAGE | VOLTAGE CODE | MARKING |
|---|---|---|
| TO-220<br>TO-252<br>TO-263<br>TO-263-3 | 15 :1.5V<br>18 :1.8V<br>25 :2.5V<br>33 :3.3V<br>50 :5.0V<br>AD:ADJ |  |

## ■ ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---|---|---|---|
| Input Voltage | $V_{IN}$ | 18 | V |
| $(V_{IN} - V_{OUT}) \times I_{OUT}$ | | See Figure 1 | |
| Junction Temperature | $T_J$ | +125 | °C |
| Operating Temperature | $T_{OPR}$ | -40 ~ +85 | °C |
| Storage Temperature | $T_{STG}$ | -40 ~ +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 | TO-252 | $\theta_{JA}$ | 118 | °C/W |
| | TO-220 | | 62 | °C/W |
| | TO-263 | | 62 | °C/W |
| Junction to Case | TO-252 | $\theta_{JC}$ | 12 | °C/W |
| | TO-220 | | 4 | °C/W |
| | TO-263 | | 4 | °C/W |

## ■ ELECTRICAL CHARACTERISTICS (Ta=25°C, $C_{OUT}$=22μF, unless otherwise specified.)

**For UZ1085-ADJ (Adjustable)**

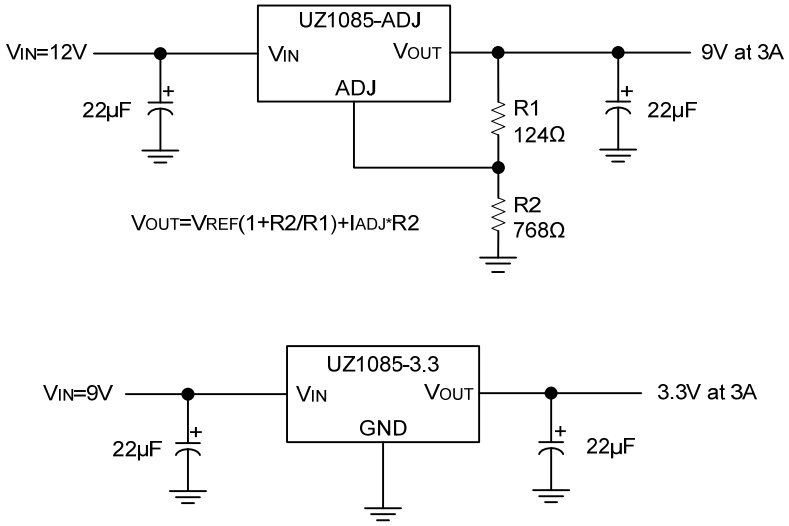
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| Reference Voltage | $V_{REF}$ | 1.5V≤$(V_{IN} - V_{OUT})$ ≤8.25V<br>10mA≤$I_{OUT}$≤3A | 1.225 | 1.25 | 1.275 | V |
| Line Regulation | $\triangle V_{OUT}$ | $(V_{OUT}$ +1.5V) ≤$V_{IN}$≤12V,<br>$I_{OUT}$=10mA | | 0.005 | 0.2 | % |
| Load Regulation | $\triangle V_{OUT}$ | $(V_{IN} - V_{OUT})$=3V, 10mA≤$I_{OUT}$≤3A | | 0.05 | 0.5 | % |
| Dropout Voltage | $V_D$ | $\triangle V_{REF}$%=1%, $I_{OUT}$=3A | | 1.30 | 1.40 | V |
| Current Limit | $I_{LIMIT}$ | $(V_{IN}-V_{OUT})$=2V | 3.1 | 4 | | A |
| Adjust Pin Current | Iadj | | | 35 | 120 | μA |
| Adjust Pin Current Change | △Iadj | 1.5V≤ $(V_{IN} - V_{OUT})$ ≤12V<br>10mA≤$I_{OUT}$≤3A | | 0.2 | 5 | μA |
| Minimum Load Current | $I_{O(MIN)}$ | 1.5V≤ $(V_{IN}-V_{OUT})$ ≤12V | | | 10 | mA |
| Quiescent Current | $I_Q$ | $V_{IN}$=12V | | 4 | 13 | mA |
| Ripple Rejection | RR | f=120Hz,Tantalum,$(V_{IN}–V_{OUT})$=3V<br>$I_{OUT}$=3A | 60 | 72 | | dB |
| Thermal Regulation | | Ta=25°C,30ms pulse | | 0.004 | 0.02 | %/W |
| Temperature Stability | $\Delta V_{OUT}$ | | | 0.5 | | % |
| Long-Term Stability | $\Delta V_{OUT}$ | Ta=125°C, 1000hr | | 0.03 | 1.0 | % |
| Output Noise(% of $V_{OUT}$) | eN | Ta=25°C,10Hz≤f≤10kHz | | 0.003 | | % |
| Thermal Shutdown | | | | 150 | | °C |

## ■ ELECTRICAL CHARACTERISTICS

**For UZ1085-xx (Fixed Voltage)**

| PARAMETER | | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|---|
| Output Voltage | UZ1085-15 | $V_{OUT}$ | $3.0V \le V_{IN} \le 8.5V$, $10mA \le I_{OUT} \le 3A$ | 1.470 | 1.5 | 1.530 | V |
| | UZ1085-18 | | $3.3V \le V_{IN} \le 8.8V$, $10mA \le I_{OUT} \le 3A$ | 1.764 | 1.8 | 1.830 | V |
| | UZ1085-25 | | $4.0V \le V_{IN} \le 9.5V$, $10mA \le I_{OUT} \le 3A$ | 2.450 | 2.5 | 2.550 | V |
| | UZ1085-33 | | $4.8V \le V_{IN} \le 10.3V$, $10mA \le I_{OUT} \le 3A$ | 3.234 | 3.3 | 3.366 | V |
| | UZ1085-50 | | $6.5V \le V_{IN} \le 12V$, $10mA \le I_{OUT} \le 3A$ | 4.900 | 5.0 | 5.100 | V |
| Line Regulation | | $\triangle V_{OUT}$ | $(V_{OUT} + 1.5V) \le V_{IN} \le 12V$, $I_{OUT}=10mA$ | | 0.005 | 0.2 | % |
| Load Regulation | | $\triangle V_{OUT}$ | $(V_{IN} - V_{OUT})=3V$, $10mA \leqq I_{OUT} \le 3A$ | | 0.05 | 0.5 | % |
| Dropout Voltage | | $V_D$ | $\triangle V_{REF}\%=1\%$, $I_{OUT}=3A$ | | 1.30 | 1.40 | V |
| Current Limit | | $I_{LIMIT}$ | $(V_{IN}-V_{OUT})=2V$ | 3.1 | 4 | | A |
| Minimum Load Current | | $I_{O(MIN)}$ | $1.5V \le (V_{IN}-V_{OUT}) \le 12V$ | | | 10 | mA |
| Quiescent Current | | $I_Q$ | $V_{IN}=12V$ | | 4 | 13 | mA |
| Ripple Rejection | | RR | f=120Hz, Tantalum<br>$(V_{IN}-V_{OUT})=3V$, $I_{OUT}=3A$ | 60 | 72 | | dB |
| Thermal Regulation | | | Ta=25°C,30ms pulse | | 0.004 | 0.02 | %/W |
| Temperature Stability | | $\triangle V_{OUT}$ | Ta=125°C, 1000hr | | 0.5 | | % |
| Long-Term Stability | | $\triangle V_{OUT}$ | | | 0.03 | 1.0 | % |
| Output Noise(% of $V_{OUT}$) | | eN | Ta=25°C,10Hz≤f≤10kHz | | 0.003 | | % |
| Thermal shutdown | | | | | 150 | | °C |

## ■ TYPICAL APPLICATION CIRCUIT



## ■ TYPICAL CHARACTERISTICS

Figure 1. Absolute Maximum Sate Operating Area

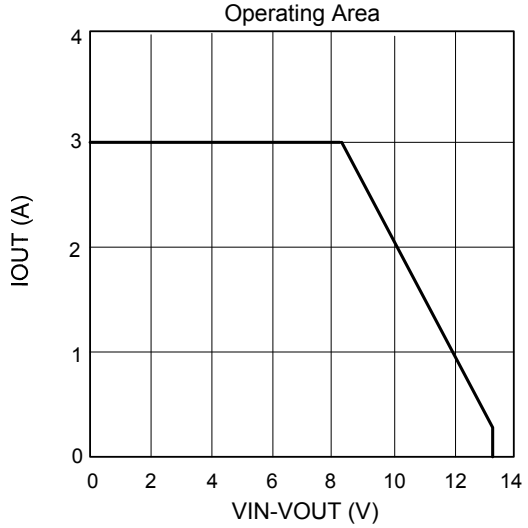



Figure 2. Dropout Voltage vs.Output Current

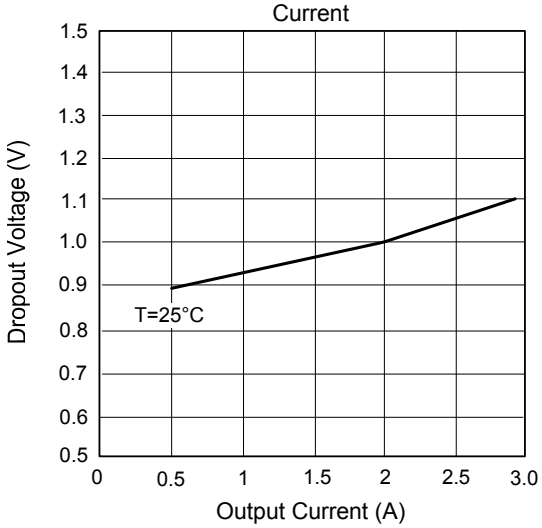



Figure 3. Load Regulation vs. Temperature

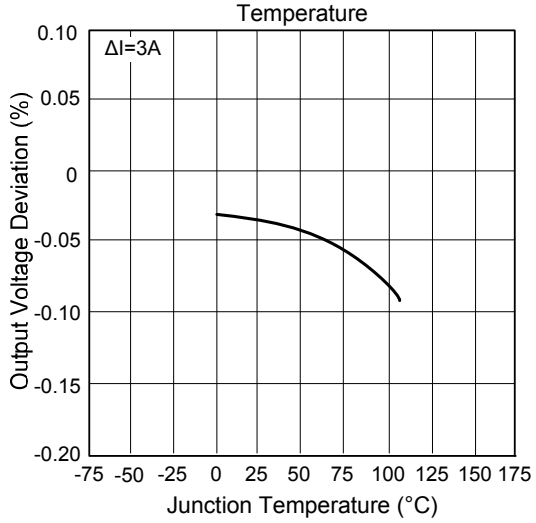



Figure 4. Reference Voltage vs. Temperature

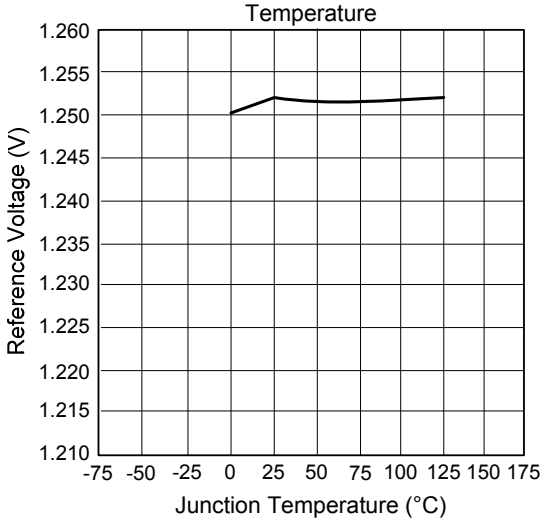



Figure 5. Output Voltage vs.Temperature

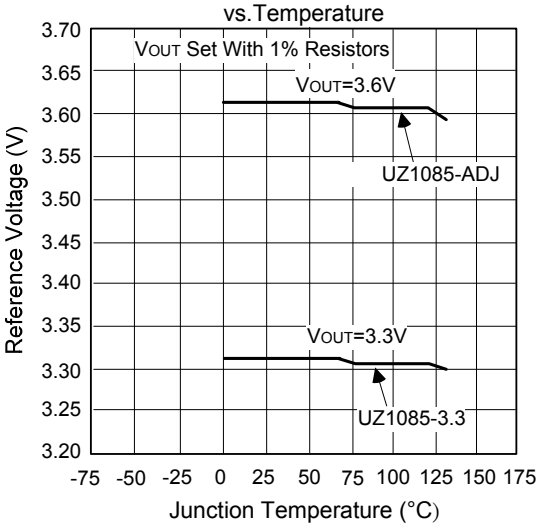
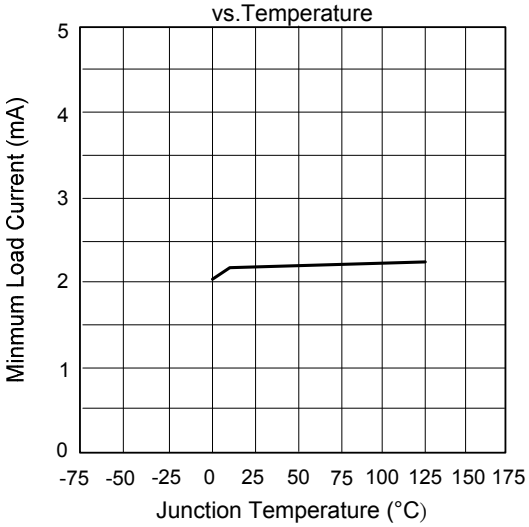



Figure 6. Minimum Load Current vs.Temperature



## ■ TYPICAL CHARACTERISTICS(Cont.)

Figure 7. Adjust Pin Current vs.Temperature

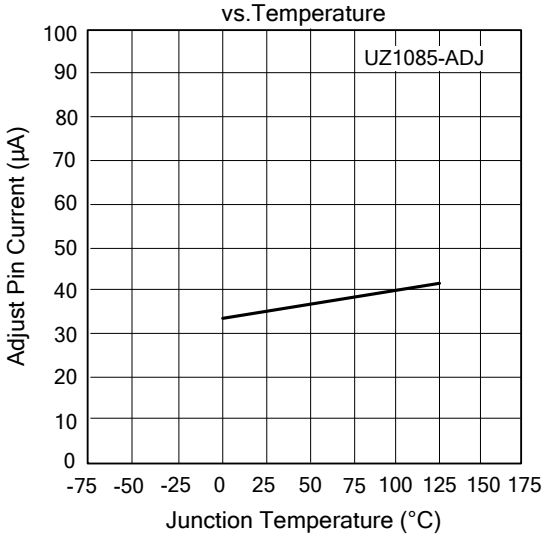



Figure 8. Short-Circuit Current vs.Temperature

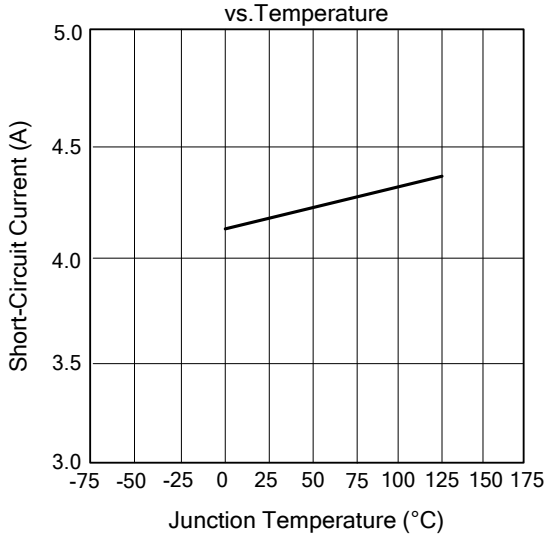



Figure 9. Ripple Rejection vs.Frequency

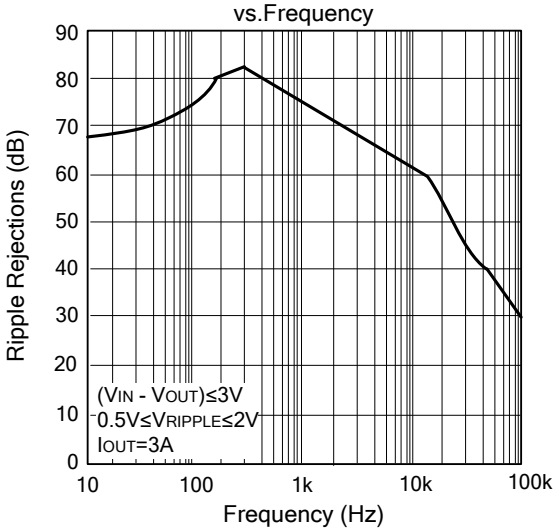
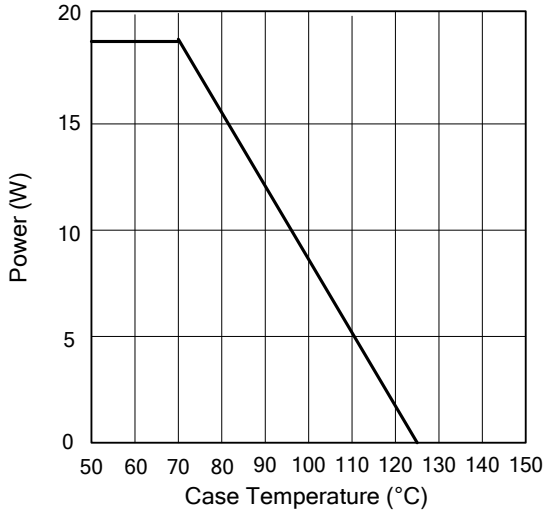



Figure 10. Maximum Power Dissipation




UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.