



UZ1086

LINEAR INTEGRATED CIRCUIT

1.5A ADJUSTABLE/FIXED LOW DROPOUT LINEAR REGULATOR

DESCRIPTION

The UTC **UZ1086** and **UZ1086-1.8V, 2.5V, 2.85V, 3.3V** and **5V** are low dropout three-terminal regulators with 1.5A output current capability. These devices have been optimized for low voltage where transient response and minimum input voltage are critical. The 2.85V version is designed specifically to be used in Active Terminators for SCSI bus.

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 temperatures that would create excessive junction temperatures.

Unlike PNP type regulators where up to 10% of the output current is wasted as quiescent current, the quiescent current of the **UZ1086** flows into the load, increasing efficiency.

FEATURES

- *Low dropout voltage
- *Load regulation: 0.05% typical
- *Trimmed current limit
- *On-chip thermal limiting
- *Three-terminal adjustable or fixed 1.8V, 2.5V, 2.85V, 3.3V, 5V

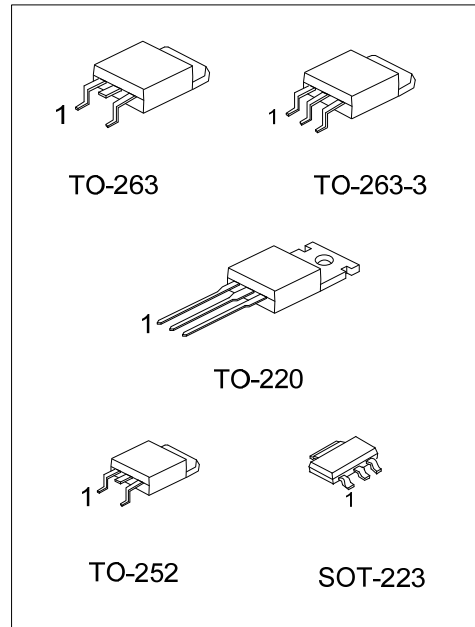
ORDERING INFORMATION

| Ordering Number | | | Package | Pin Assignment | | | Packing |
|-----------------|------------------|------------------|----------|----------------|---|---|-----------|
| Normal | Lead Free | Halogen-Free | | 1 | 2 | 3 | |
| UZ1086-xx-AA3-T | UZ1086L-xx-AA3-T | UZ1086G-xx-AA3-T | SOT-223 | A/G | O | I | Tape Reel |
| UZ1086-xx-TA3-T | UZ1086L-xx-TA3-T | UZ1086G-xx-TA3-T | TO-220 | A/G | O | I | Tube |
| UZ1086-xx-TN3-R | UZ1086L-xx-TN3-R | UZ1086G-xx-TN3-R | TO-252 | A/G | O | I | Tape Reel |
| UZ1086-xx-TN3-T | UZ1086L-xx-TN3-T | UZ1086G-xx-TN3-T | TO-252 | A/G | O | I | Tube |
| UZ1086-xx-TQ2-R | UZ1086L-xx-TQ2-R | UZ1086G-xx-TQ2-R | TO-263 | A/G | O | I | Tape Reel |
| UZ1086-xx-TQ2-T | UZ1086L-xx-TQ2-T | UZ1086G-xx-TQ2-T | TO-263 | A/G | O | I | Tube |
| UZ1086-xx-TQ3-R | UZ1086L-xx-TQ3-R | UZ1086G-xx-TQ3-R | TO-263-3 | A/G | O | I | Tape Reel |
| UZ1086-xx-TQ3-T | UZ1086L-xx-TQ3-T | UZ1086G-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)

| | | |
|-------------------------|---|--|
| <p>UZ1086L-xx-TA3-T</p> | <p>(1) Packing Type (2) Package Type (3) Output Voltage Code (4) Lead Plating</p> | <p>(1) R: Tape Reel, T: Tube (2) AA3: SOT-223, 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</p> |
|-------------------------|---|--|



Lead-free: UZ1086L-xx
Halogen-free: UZ1086G-xx

UZ1086

LINEAR INTEGRATED CIRCUIT

MARKING INFORMATION

| PACKAGE | VOLTAGE CODE | MARKING |
|--|--|---|
| TO-220 TO-252 TO-263 TO-263-3 | 18 :1.8V 25 :2.5V 2J :2.85V 33 :3.3V 50 :5.0V AD :ADJ | <p>Diagram showing marking on a TO-220 package. The marking includes 'UTC' and 'UZ1086'. Below the part number are two rows of boxes: the first row contains a LOT Code and the second row contains a Voltage Code. To the right of the package are two 'L' characters, one for Lead Free and one for Halogen Free. Below the package are three pins labeled 1, 2, and 3. A Date Code is indicated to the right of the package.</p> |
| SOT-223 | | <p>Diagram showing marking on a SOT-223 package. The marking includes 'UZ1086'. Below the part number are two rows of boxes: the first row contains a Voltage Code and the second row contains a Date Code. To the right of the package are two 'L' characters, one for Lead Free and one for Halogen Free. Below the package are three pins labeled 1, 2, and 3.</p> |

THERMAL DATA

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---------------------|---------|---------|------|
| Junction-to-Ambient | TO-252 | 12 | °C/W |
| | TO-220 | 4 | |
| | TO-263 | 4 | |
| | SOT-223 | 15 | |

■ ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | RATINGS | UNIT |
|-----------------------|-----------|------------|------|
| Input Voltage | V_{IN} | 7.5 | V |
| Junction Temperature | T_J | +125 | °C |
| Operating Temperature | T_{OPR} | 0 ~ +125 | °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.

■ ELECTRICAL CHARACTERISTICS ($V_{IN} \leq 7V$, $T_J = 25^\circ C$, unless otherwise specified.)

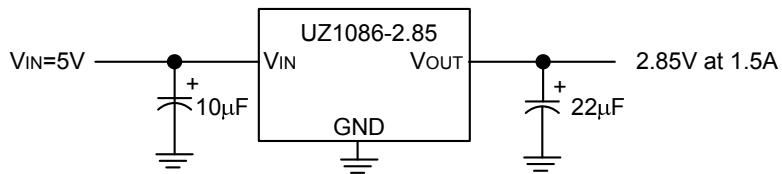
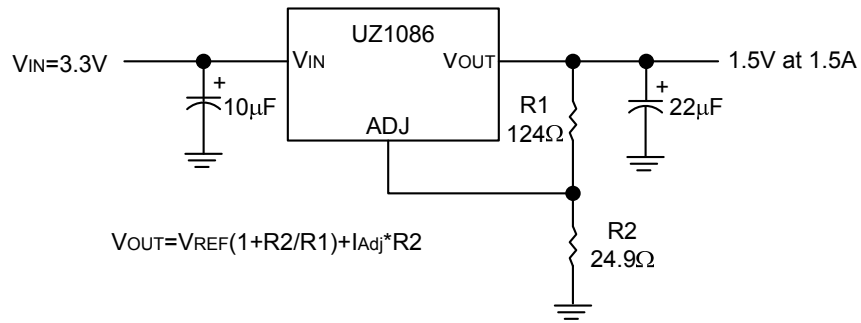
| PARAMETER | | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-----------------------------|-------------|------------------|--|-------|-------|-------|---------|
| Reference Voltage | | V_{REF} | * $1.5V \leq (V_{IN} - V_{OUT}) \leq 5.75V$ $10mA \leq I_{OUT} \leq 1A$ | 1.225 | 1.25 | 1.275 | V |
| Output Voltage | UZ1086-1.8 | V_{OUT} | * $3.3V \leq V_{IN} \leq 7V$, $10mA \leq I_{OUT} \leq 1A$ | 1.764 | 1.80 | 1.836 | V |
| | UZ1086-2.5 | | * $4V \leq V_{IN} \leq 7V$, $10mA \leq I_{OUT} \leq 1A$ | 2.450 | 2.50 | 2.550 | |
| | UZ1086-2.85 | | * $4.35V \leq V_{IN} \leq 7V$, $10mA \leq I_{OUT} \leq 1A$ | 2.793 | 2.85 | 2.907 | |
| | UZ1086-3.3 | | * $4.8V \leq V_{IN} \leq 7V$, $10mA \leq I_{OUT} \leq 1A$ | 3.234 | 3.30 | 3.366 | |
| | UZ1086-5.0 | | * $6.5V \leq V_{IN} \leq 7V$, $10mA \leq I_{OUT} \leq 1A$ | 4.900 | 5.00 | 5.100 | |
| Line Regulation (Note1,2) | | ΔV_{OUT} | * $(V_{OUT} + 1.5V) \leq V_{IN} \leq 7V$, $I_{OUT} = 10mA$ | | 0.005 | 0.2 | % |
| Load Regulation (Note1,2) | | ΔV_{OUT} | * $V_{IN} - V_{OUT} = 2V$, $10mA \leq I_{OUT} \leq 1A$ | | 0.05 | 0.5 | % |
| Dropout Voltage | | V_D | * $I_{OUT} = 1.5A$ | | 1.30 | 1.50 | V |
| Current Limit | | I_{LIMIT} | * $V_{IN} - V_{OUT} = 2V$ | 1.6 | 2 | | A |
| Adjust Pin Current | | I_{adj} | * | | 35 | 120 | μA |
| Adjust Pin Current Change | | ΔI_{adj} | * $1.5V \leq (V_{IN} - V_{OUT}) \leq 5.75V$, $10mA \leq I_{OUT} \leq 1A$ | | 0.2 | 5 | μA |
| Minimum Load Current | | $I_{O(min)}$ | * $1.5V \leq (V_{IN} - V_{OUT}) \leq 5.75V$ | | | 10 | mA |
| Quiescent Current | | I_Q | * $V_{IN} = V_{OUT} + 1.25V$ | | 4 | 13 | mA |
| Ripple Rejection | | RR | $f = 120Hz$, $C_{OUT} = 22\mu F$, Tantalum $V_{IN} - V_{OUT} = 3V$, $I_{OUT} = 1.5A$ | 60 | 72 | | dB |
| Thermal Regulation | | | $T_a = 25^\circ C$, 30ms pulse | | 0.004 | 0.02 | %/W |
| Temperature Stability | | ΔV_{OUT} | * | | 0.5 | | % |
| Long-Term Stability | | ΔV_{OUT} | $T_a = 125^\circ C$, 1000hrs | | 0.03 | 1.0 | % |
| RMS Output Noise | | V_{OUT} | $T_a = 25^\circ C$, $10Hz \leq f \leq 10kHz$ | | 0.003 | | % |
| Thermal shutdown | | | Junction Temperature | | 155 | | °C |
| Thermal Shutdown Hysteresis | | | | | 10 | | °C |

Note:

* stand for specifications which apply over the designed operating temperature range.

1. See thermal regulation specifications for changes in output voltage due to heating effects. Load and line regulation are measured at a constant junction temperature by low duty cycle pulse testing.
2. Line and load regulation are guaranteed up to the maximum power dissipation. Power dissipation is determined by input/output differential and the output current. Guaranteed maximum output power will not be available over the full input/output voltage range.

■ TYPICAL APPLICATION CIRCUIT



TYPICAL CHARACTERISTICS

Figure 1. Dropout Voltage vs. Output Current

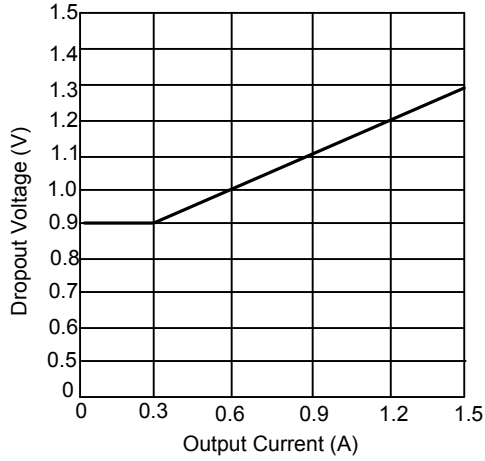


Figure 2. Load Regulation vs. Temperature

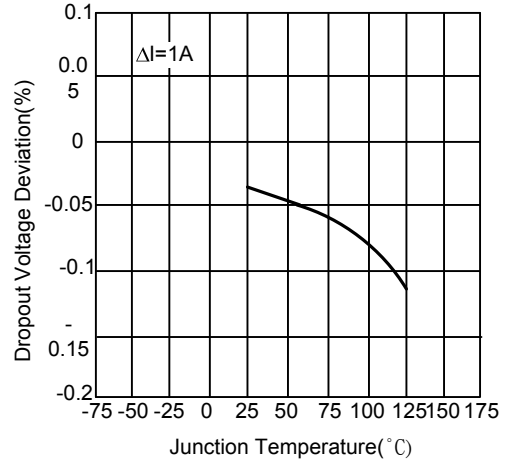


Figure 3. Reference Voltage vs. Temperature

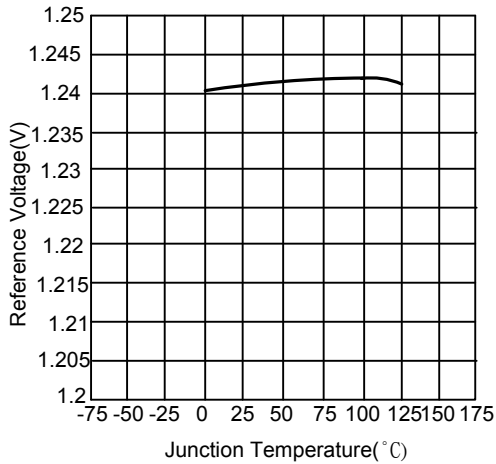


Figure 4. Output Voltage vs. Temperature

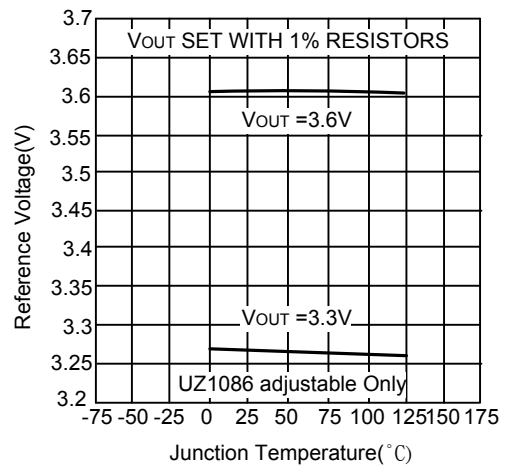


Figure 5. Minimum Load Current vs. Temperature

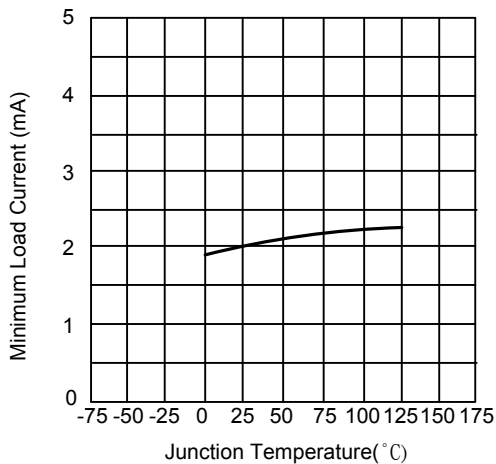
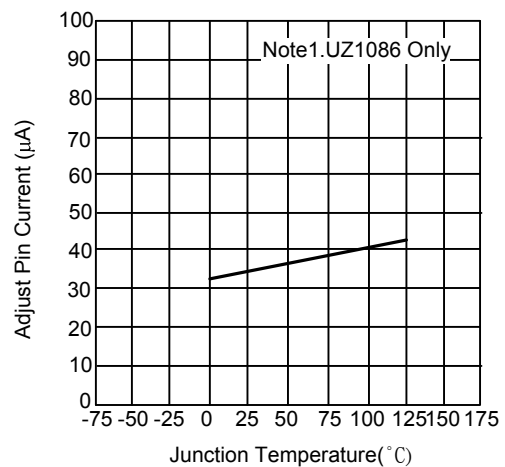
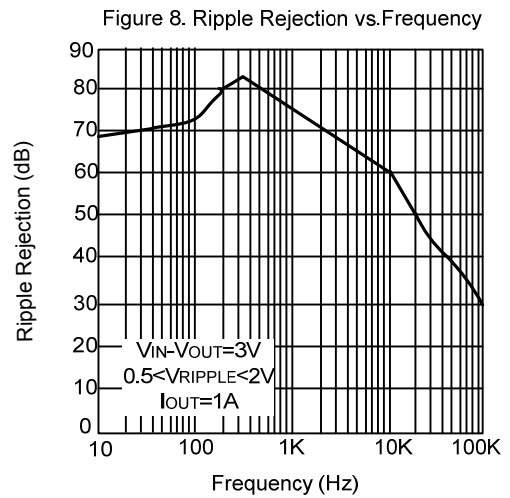
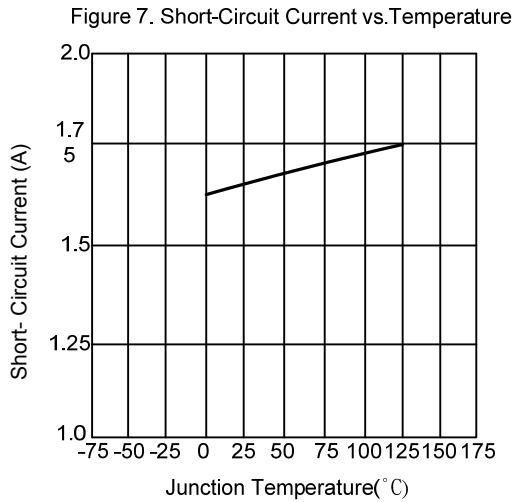


Figure 6. Adjust Pin Current vs. Temperature



■ TYPICAL CHARACTERISTICS(Cont.)



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