



## UZ1086

## LINEAR INTEGRATED CIRCUIT

### 1.5A ADJUSTABLE/FIXED LOW DROPOUT LINEAR REGULATOR

#### DESCRIPTION

The UTC **UZ1086** and **UZ1086**-1.2V, 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 1.2V, 1.8V, 2.5V, 2.85V, 3.3V, 5V

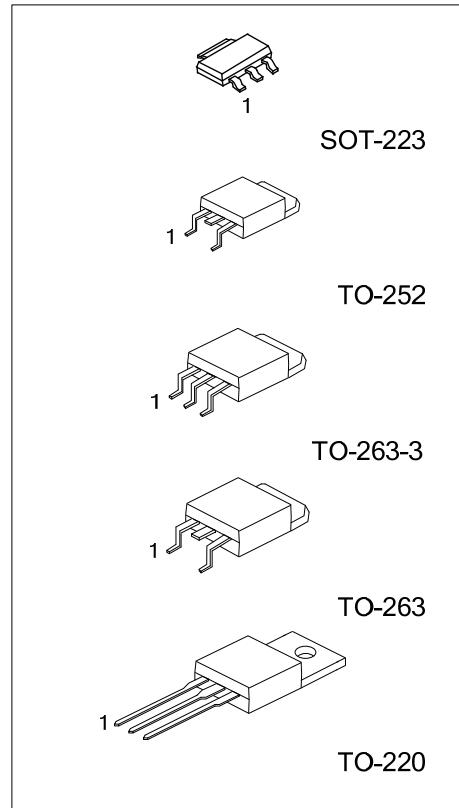
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen-Free		1	2	3	
UZ1086L-xx-AA3-R	UZ1086G-xx-AA3-R	SOT-223	A/G	O	I	Tape Reel
UZ1086L-xx-TA3-T	UZ1086G-xx-TA3-T	TO-220	A/G	O	I	Tube
UZ1086L-xx-TN3-R	UZ1086G-xx-TN3-R	TO-252	A/G	O	I	Tape Reel
UZ1086L-xx-TN3-T	UZ1086G-xx-TN3-T	TO-252	A/G	O	I	Tube
UZ1086L-xx-TQ2-R	UZ1086G-xx-TQ2-R	TO-263	A/G	O	I	Tape Reel
UZ1086L-xx-TQ2-T	UZ1086G-xx-TQ2-T	TO-263	A/G	O	I	Tube
UZ1086L-xx-TQ3-R	UZ1086G-xx-TQ3-R	TO-263-3	A/G	O	I	Tape Reel
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-AA3-T</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) AA3: SOT-223, TA3: TO-220, TN3: TO-252, TQ2: TO-263, TQ3: TO-263-3</p> <p>(3) xx: refer to Marking Information</p> <p>(4) L: Lead Free, G: Halogen Free</p>
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### MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
TO-220 TO-252 TO-263 TO-263-3	12 : 1.2V 18 : 1.8V 25 : 2.5V 2J : 2.85V 33 : 3.3V 50 : 5.0V AD : ADJ	<p>             UTC              UZ1086              LOT Code              Voltage Code              L: Lead Free              G: Halogen Free              Date Code              1 2 3           </p>
SOT-223		<p>             UZ1086              Voltage Code              L: Lead Free              G: Halogen Free              Date Code              1 2 3           </p>

### ■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	$V_{IN}$	7.5	V
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 Case	TO-252	12	°C/W
	TO-220	4	°C/W
	TO-263	4	°C/W
	SOT-223	15	°C/W

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

For UZ1086-1.2V

PARAMETER	SYMBOL		TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	$V_{OUT}$	*	$10mA \leq I_{OUT} \leq 1A$   $2.8V \leq V_{IN} \leq 7V$	1.176	1.2	1.224	V
Line Regulation (Note1,2)	$\Delta V_{OUT}$	*	$(V_{OUT} + 1.6V) \leq V_{IN} \leq 7V, I_{OUT} = 10mA$		0.005	0.2	%
Load Regulation (Note1,2)	$\Delta V_{OUT}$	*	$V_{IN} - V_{OUT} = 2V, 10mA \leq I_{OUT} \leq 1A$		0.05	0.5	%
Dropout Voltage	$V_D$	*	$I_{OUT} = 1.5A$		1.4	1.6	V
Current Limit	$I_{LIMIT}$	*	$V_{IN} - V_{OUT} = 2V$	1.6	2		A
Adjust Pin Current	$I_{ADJ}$	*			35	120	$\mu A$
Adjust Pin Current Change	$\Delta I_{ADJ}$	*	$1.6V \leq (V_{IN} - V_{OUT}) \leq 5.75V,$ $10mA \leq I_{OUT} \leq 1A$		0.2	5	$\mu A$
Minimum Load Current	$I_{O(MIN)}$	*	$1.6V \leq (V_{IN} - V_{OUT}) \leq 5.75V$			10	mA
Quiescent Current	$I_Q$	*	$V_{IN} = V_{OUT} + 1.25V$		4	13	mA
Ripple Rejection	RR		$f = 120Hz, C_{OUT} = 22\mu F, \text{Tantalum}$ $V_{IN} - V_{OUT} = 3V, I_{OUT} = 1.5A$	60	72		dB
Thermal Regulation			$T_A = 25^\circ C, 30ms \text{ pulse}$		0.004	0.02	%/W
Temperature Stability	$\Delta V_{OUT}$	*			0.5		%
Long-Term Stability	$\Delta V_{OUT}$		$T_A = 125^\circ C, 1000hrs$		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

### ■ ELECTRICAL CHARACTERISTICS(Cont.)

For Other Voltage

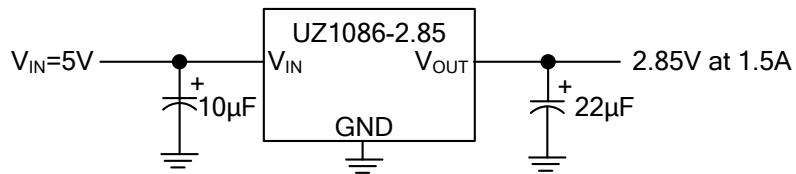
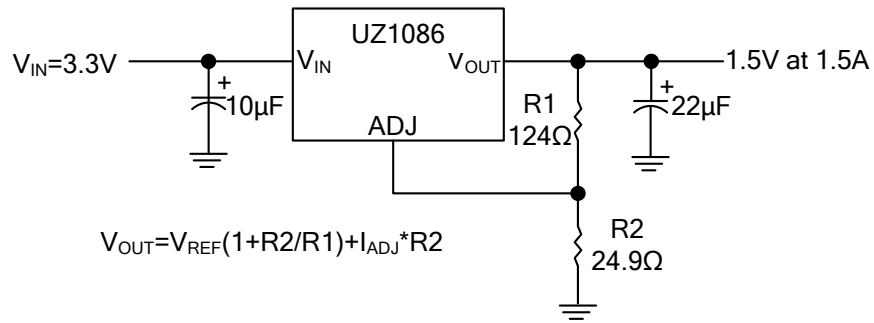
PARAMETER		SYMBOL		TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT		
Reference Voltage		$V_{REF}$	*	$1.5V \leq (V_{IN} - V_{OUT}) \leq 5.75V$ $10mA \leq I_{OUT} \leq 1A$	1.225	1.25	1.275	V		
Output Voltage	UZ1086-1.8	$V_{OUT}$	*	$10mA \leq I_{OUT} \leq 1A$		$3.3V \leq V_{IN} \leq 7V$	1.764	1.80	1.836	V
	UZ1086-2.5		*			$4V \leq V_{IN} \leq 7V$	2.450	2.50	2.550	V
	UZ1086-2.85		*			$4.35V \leq V_{IN} \leq 7V$	2.793	2.85	2.907	V
	UZ1086-3.3		*			$4.8V \leq V_{IN} \leq 7V$	3.234	3.30	3.366	V
	UZ1086-5.0					$6.5V \leq V_{IN} \leq 7V$	4.900	5.00	5.100	V
Line Regulation (Note1,2)		$\Delta V_{OUT}$	*	$(V_{OUT} + 1.5V) \leq V_{IN} \leq 7V, I_{OUT} = 10mA$		0.005	0.2	%		
Load Regulation (Note1,2)		$\Delta V_{OUT}$	*	$V_{IN} - V_{OUT} = 2V, 10mA \leq I_{OUT} \leq 1A$		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	$\mu A$		
Adjust Pin Current Change		$\Delta I_{ADJ}$	*	$1.5V \leq (V_{IN} - V_{OUT}) \leq 5.75V,$ $10mA \leq I_{OUT} \leq 1A$		0.2	5	$\mu A$		
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		$f = 120Hz, C_{OUT} = 22\mu F, \text{Tantalum}$ $V_{IN} - V_{OUT} = 3V, I_{OUT} = 1.5A$	60	72		dB		
Thermal Regulation				$T_A = 25^\circ C, 30ms \text{ pulse}$		0.004	0.02	%/W		
Temperature Stability		$\Delta V_{OUT}$	*			0.5		%		
Long-Term Stability		$\Delta V_{OUT}$		$T_A = 125^\circ C, 1000hrs$		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		$^\circ C$		
Thermal Shutdown Hysteresis						10		$^\circ C$		

Note: 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.

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

■ TYPICAL APPLICATION CIRCUIT



## TYPICAL CHARACTERISTICS

Fig. 1 Dropout Voltage vs. Output Current

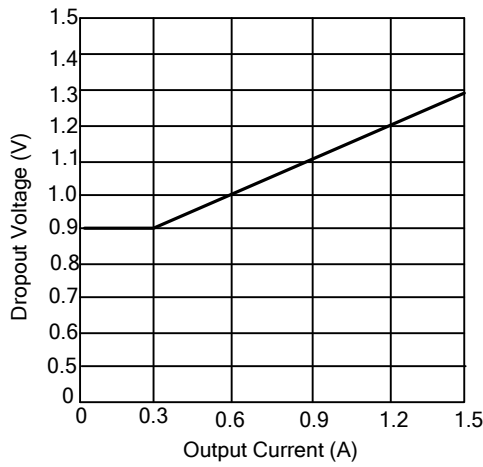


Fig. 2 Load Regulation vs. Temperature

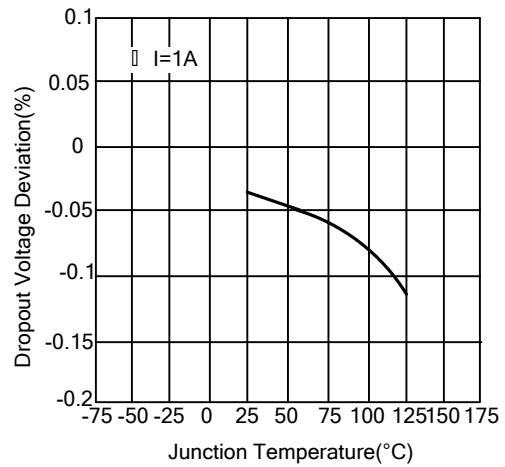


Fig. 3 Reference Voltage vs. Temperature

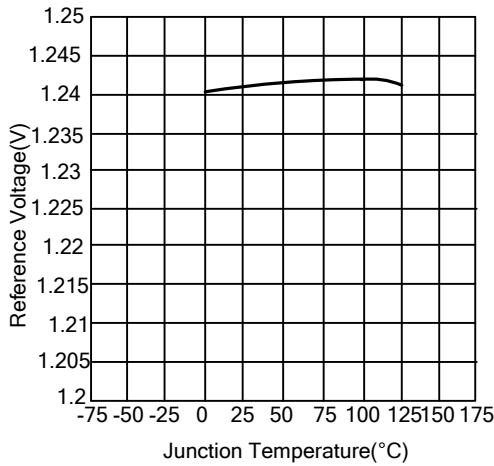


Fig. 4 Output Voltage vs. Temperature

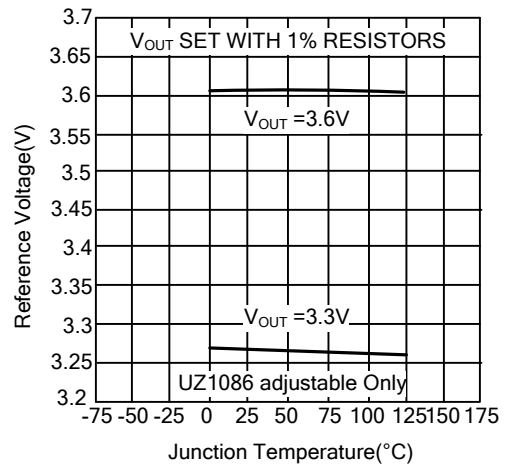


Fig. 5 Minimum Load Current vs. Temperature

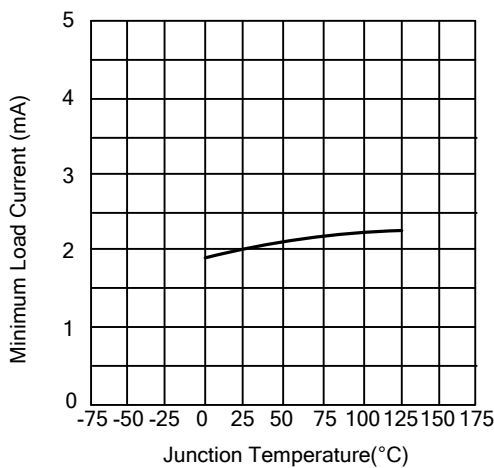
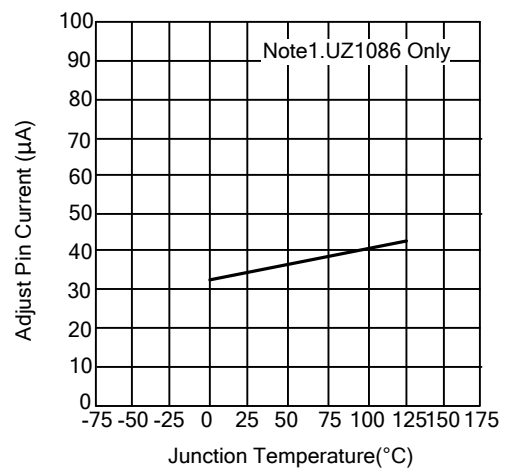
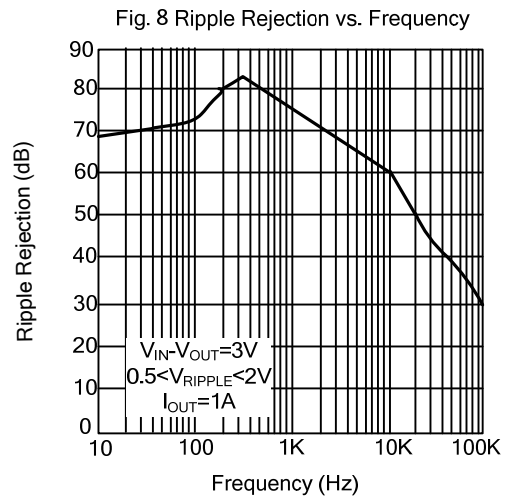
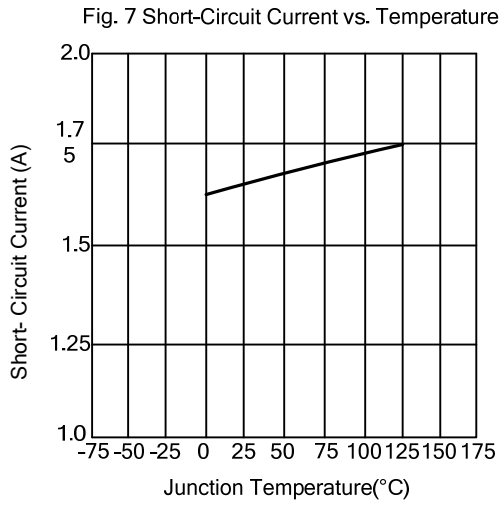


Fig. 6 Adjust Pin Current vs. Temperature



■ TYPICAL CHARACTERISTICS(Cont.)



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