



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

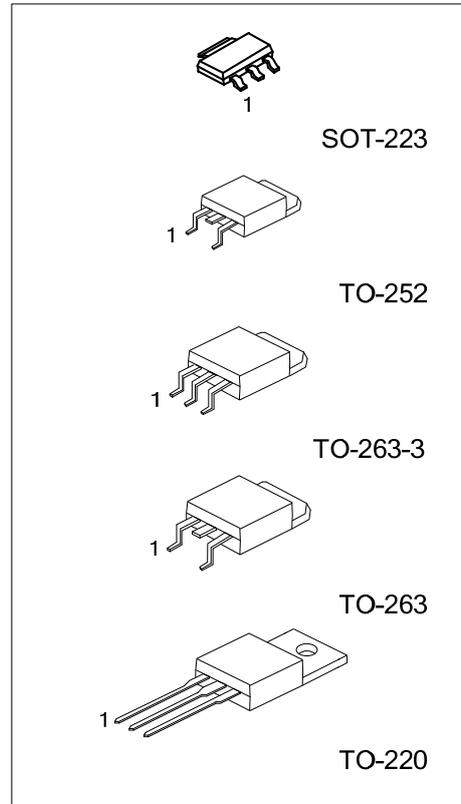
ORDERING INFORMATION

Ordering Number			Package	Pin Assignment			Packing
Normal	Lead Free	Halogen-Free		1	2	3	
UZ1086-xx-AA3-R	UZ1086L-xx-AA3-R	UZ1086G-xx-AA3-R	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-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.

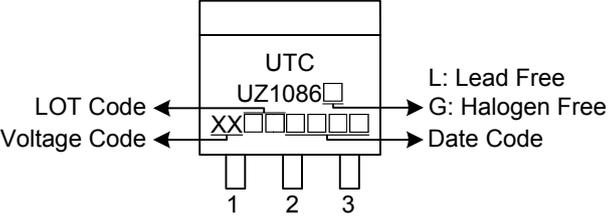
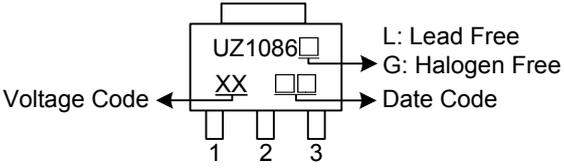
2. A: ADJ (for adjustable regulator), G: GND (for fixed regulator)

<p>UZ1086L-xx-AA3-R</p>	<p>(1) R: Tape Reel, T: Tube</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) G: Halogen Free, L: Lead Free, Blank: Pb/Sn</p>
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Lead-free: UZ1086L-xx
Halogen-free: UZ1086G-xx

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>The diagram shows a TO-220 package with three pins labeled 1, 2, and 3. The marking area contains the text 'UTC' at the top, 'UZ1086' in the middle, and 'XX' followed by four small squares below. Arrows point from the 'XX' to 'LOT Code', from the first square to 'Voltage Code', from the second square to 'L: Lead Free', from the third square to 'G: Halogen Free', and from the fourth square to 'Date Code'.</p>
SOT-223	(Same as above)	 <p>The diagram shows a SOT-223 package with three pins labeled 1, 2, and 3. The marking area contains 'UZ1086' at the top, 'XX' followed by two small squares below. Arrows point from the 'XX' to 'Voltage Code', from the first square to 'L: Lead Free', from the second square to 'G: Halogen Free', and from the third square to 'Date Code'.</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	θ_{JC}	12	°C/W
	TO-220		4	°C/W
	TO-263		4	°C/W
	SOT-223		15	°C/W

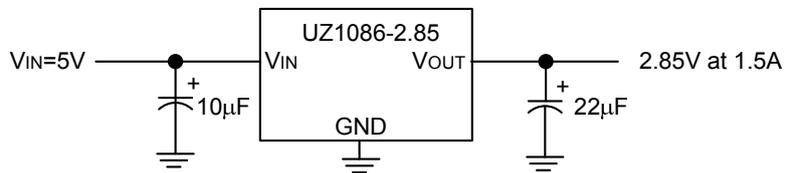
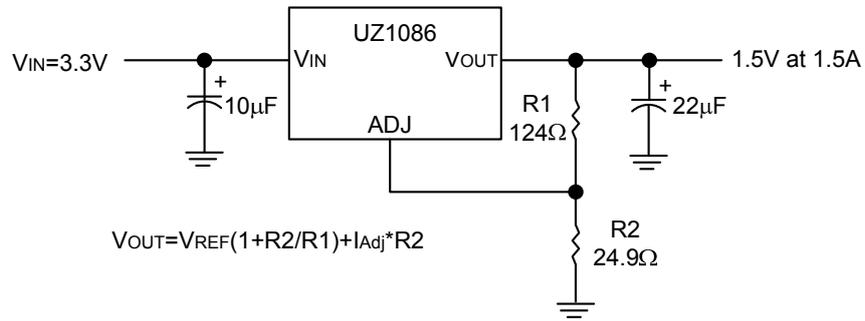
■ ELECTRICAL CHARACTERISTICS ($V_{IN} \leq 7V$, $T_J = 25^\circ C$, unless otherwise specified.)

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	*	$10mA \leq I_{OUT} \leq 1A$	$3.3V \leq V_{IN} \leq 7V$	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)	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		$f = 120Hz, C_{OUT} = 22\mu F, \text{Tantalum}$ $V_{IN} - V_{OUT} = 3V, I_{OUT} = 1.5A$	60	72		dB		
Thermal Regulation			$T_a = 25^\circ C, 30ms \text{ pulse}$		0.004	0.02	%/W		
Temperature Stability	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

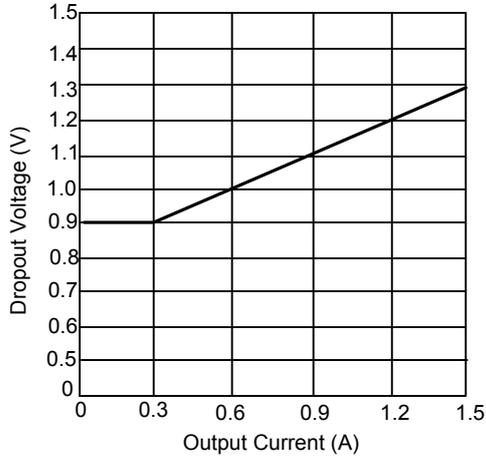


Figure 2. Load Regulation vs. Temperature

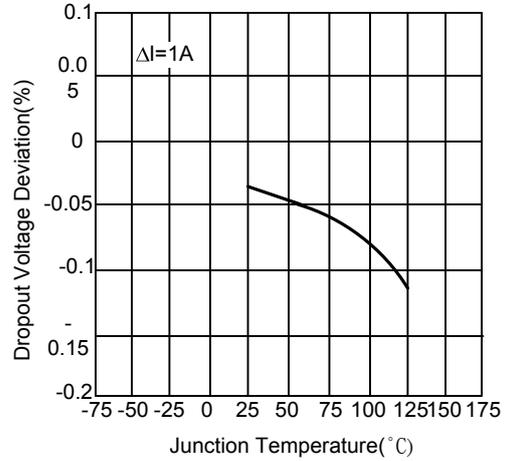


Figure 3. Reference Voltage vs. Temperature

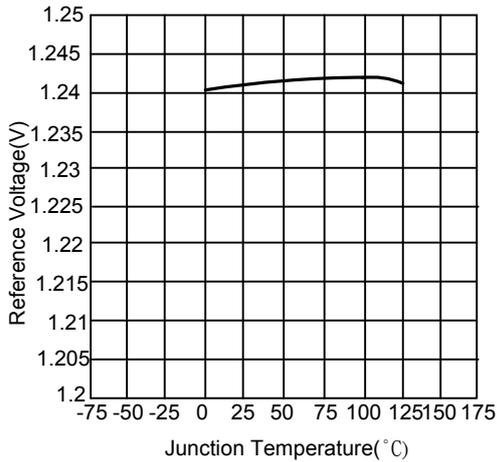


Figure 4. Output Voltage vs. Temperature

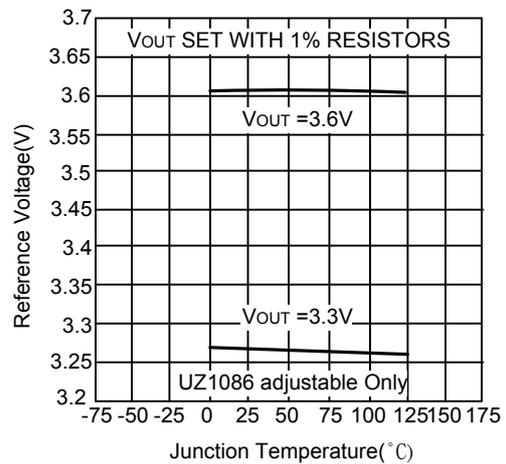


Figure 5. Minimum Load Current vs. Temperature

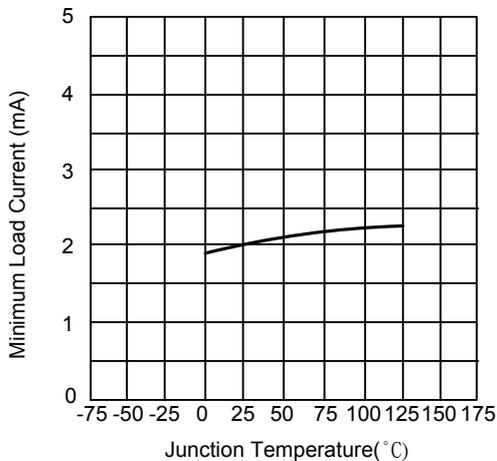
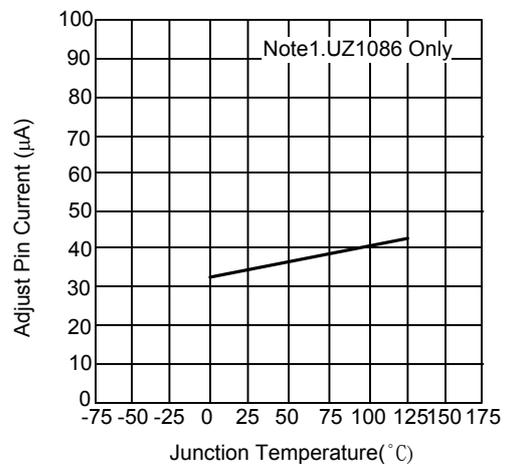
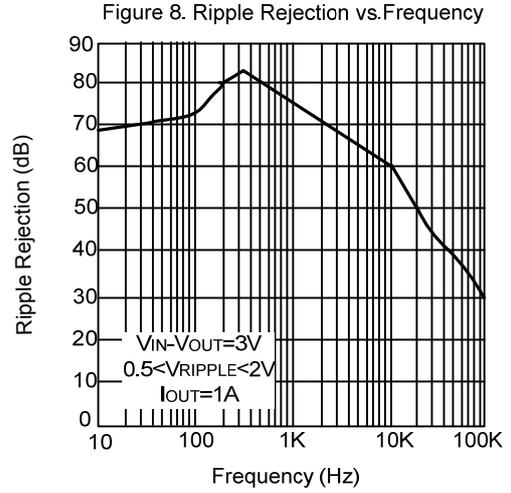
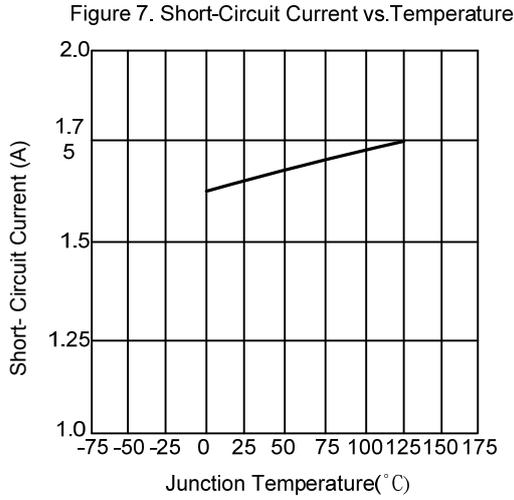


Figure 6. Adjust Pin Current vs. Temperature



■ TYPICAL CHARACTERISTICS(Cont.)



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