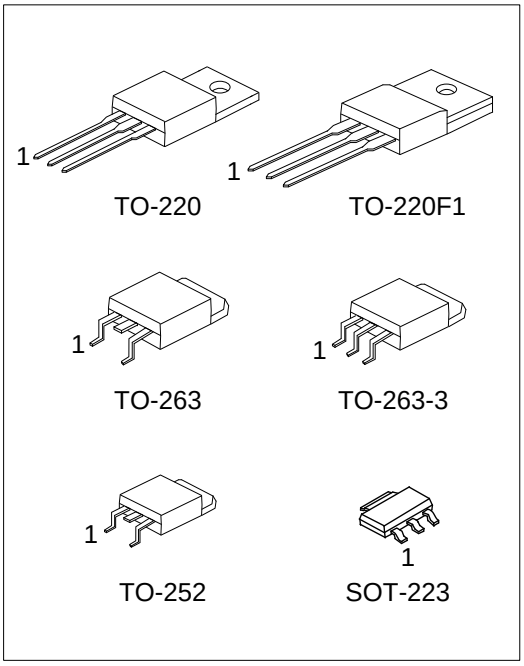
1.5A ADJUSTABLE/FIXED LOW DROPOUT LINEAR REGULATOR



■ DESCRIPTION

The UTC **UZ1086** adjustable 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.

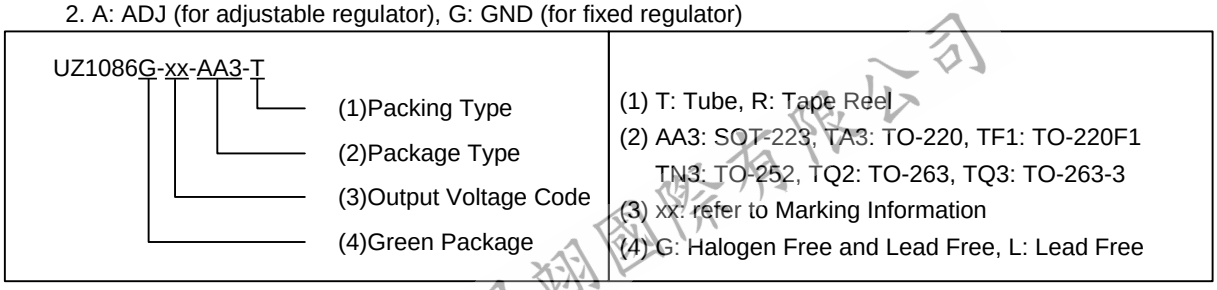
■ FEATURES

* 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-TF1-T	UZ1086G-xx-TF1-T	TO-220F1	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)



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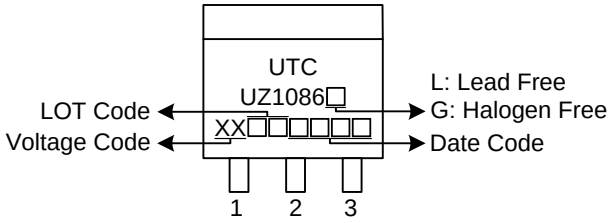
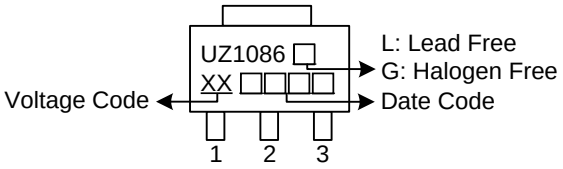
■ MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
TO-220 TO-220F1 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	
SOT-223		

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■ 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 TO-263		5	°C/W
	TO-220F1		8	°C/W
	SOT-223		15	°C/W

■ ELECTRICAL CHARACTERISTICS (V_{IN}≤7V, T_J=25°C, unless otherwise specified.)

For UZ1086-1.2V

PARAMETER	SYMBOL		TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	*	10mA≤I_{OUT}≤1A	2.8V≤V_{IN}≤7V	1.176	1.2	1.224	V
Line Regulation (Note1,2)	ΔV_{OUT}	*	(V_{OUT}+1.6V) ≤V_{IN}≤7V,I_{OUT}=10mA			0.005	0.2	%
Load Regulation (Note1,2)	ΔV_{OUT}	*	V_{IN}-V_{OUT}=2V, 10mA≤I_{OUT}≤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	μA
Adjust Pin Current Change	ΔI_{ADJ}	*	1.6V≤ (V_{IN} - V_{OUT}) ≤5.75V, 10mA≤I_{OUT}≤1A			0.2	5	μA
Minimum Load Current	$I_{O(MIN)}$	*	1.6V≤ (V_{IN} -V_{OUT}) ≤5.75V				10	mA
Quiescent Current	I_Q	*	V_{IN} =V_{OUT}+1.25V			4	13	mA
Ripple Rejection	RR		f=120Hz, C_{OUT}=22μF, Tantalum V_{IN} -V_{OUT}=3V, I_{OUT}=1.5A		60	72		dB
Thermal Regulation			T_A=25°C, 30ms pulse			0.004	0.02	%/W
Temperature Stability	ΔV_{OUT}	*				0.5		%
Long-Term Stability	ΔV_{OUT}		T_A=125°C, 1000hrs			0.03	1.0	%
RMS Output Noise	V_{OUT}		T_A=25°C, 10Hz≤f≤10kHz			0.003		%
Thermal shutdown			Junction Temperature			155		°C
Thermal Shutdown Hysteresis						10		°C

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■ ELECTRICAL CHARACTERISTICS (Cont.)

For Other Voltage

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

Notes: 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.

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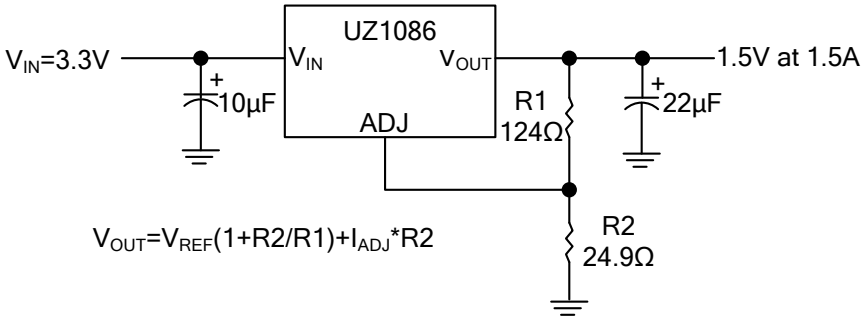
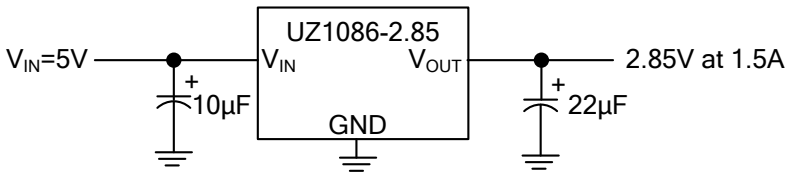
■ TYPICAL APPLICATION CIRCUIT





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■ TYPICAL CHARACTERISTICS

Fig. 1 Dropout Voltage vs. Output Current

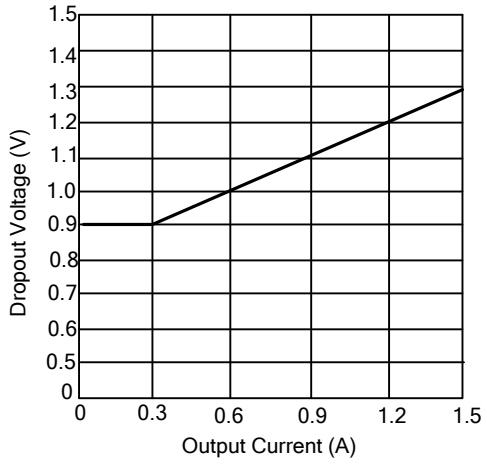


Fig. 2 Load Regulation vs. Temperature

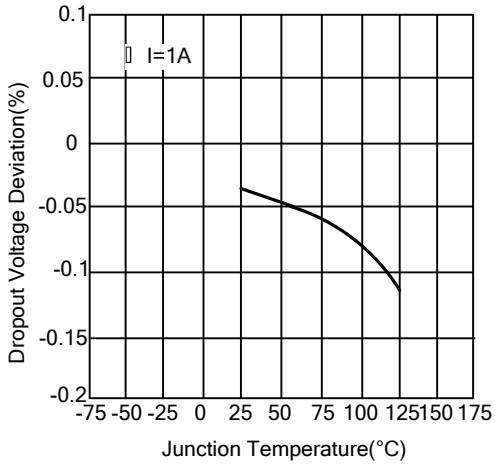


Fig. 3 Reference Voltage vs. Temperature

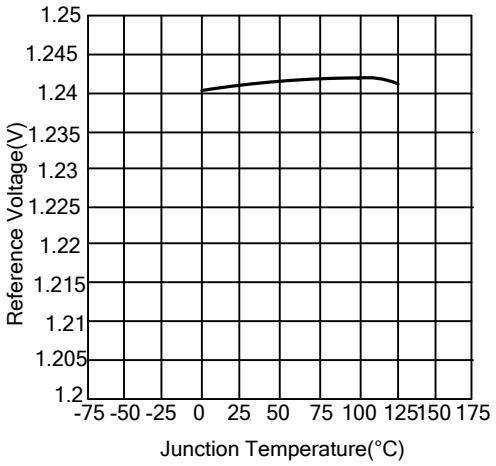


Fig. 4 Output Voltage vs. Temperature

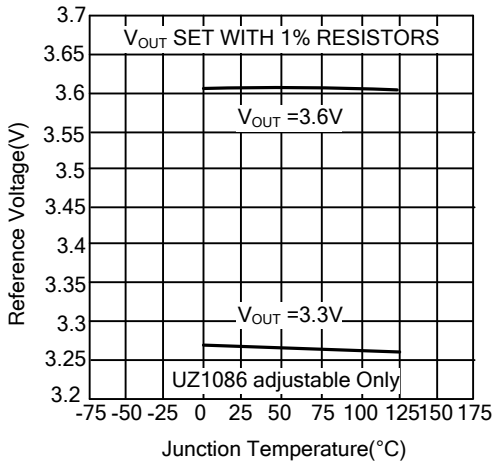


Fig. 5 Minimum Load Current vs. Temperature

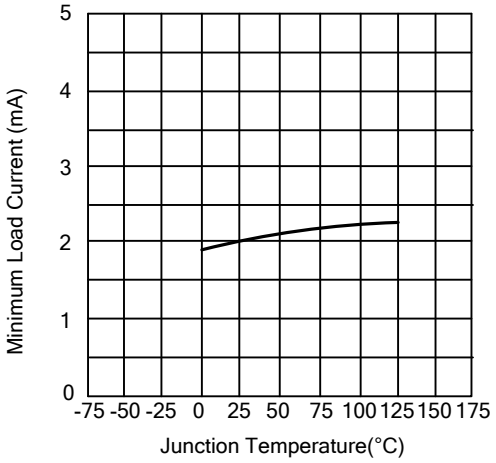
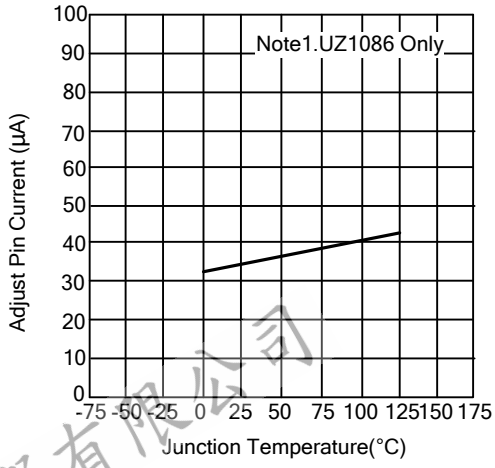


Fig. 6 Adjust Pin Current vs. Temperature



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■ TYPICAL CHARACTERISTICS (Cont.)

Fig. 7 Short-Circuit Current vs. Temperature

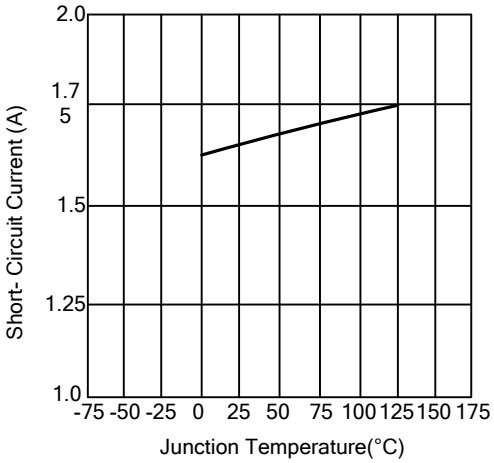
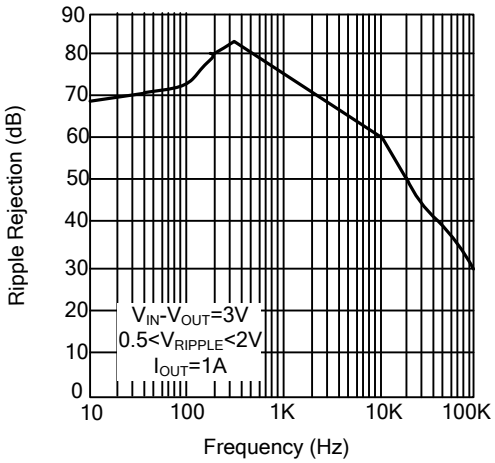


Fig. 8 Ripple Rejection vs. Frequency



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