# UNISONIC TECHNOLOGIES CO., LTD

## **UZ1085**

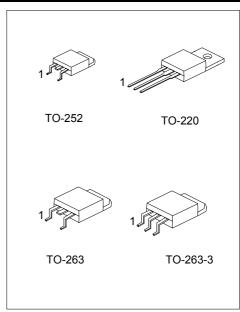
#### LINEAR INTEGRATED CIRCUIT

# 3A ADJUSTABLE/FIXED LOW DROPOUT LINEAR REGULATOR

#### **DESCRIPTION**

The 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.



\*Pb-free plating product number: UZ1085L-xx

#### **FEATURES**

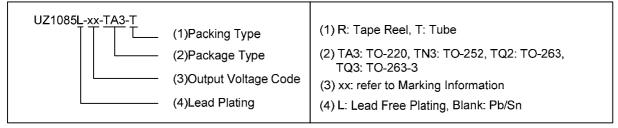
- \*Fast transient response
- \*Low dropout voltage at up to 3A
- \*Load regulation:0.05% typical
- \*Trimmed current limit
- \*On-chip thermal limiting

#### ORDERING INFORMATION

Order Number		Dookogo	Pin Assignment			Dooking	
Normal	Lead Free Plating	Package	1	2	3	Packing	
UZ1085-xx-TA3-T	UZ1085L-xx-TA3-T	TO-220	A/G	0	I	Tube	
UZ1085-xx-TN3-R	UZ1085L-xx-TN3-R	TO-252	A/G	0	I	Tape Reel	
UZ1085-xx-TN3-T	UZ1085L-xx-TN3-T	TO-252	A/G	0	I	Tube	
UZ1085-xx-TQ2-R	UZ1085L-xx-TQ2-R	TO-263	A/G	0	I	Tape Reel	
UZ1085-xx-TQ2-T	UZ1085L-xx-TQ2-T	TO-263	A/G	0	ı	Tube	
UZ1085-xx-TQ3-R	UZ1085L-xx-TQ3-R	TO-263-3	A/G	0	Ī	Tape Reel	
UZ1085-xx-TQ3-T	UZ1085L-xx-TQ3-T	TO-263-3	A/G	0	I	Tube	

Note: 1. xx: Output Voltage, refer to Marking Information.

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



### ■ MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
TO-220 TO-252 TO-263 TO-263-3	15 :1.5V 18 :1.8V 25 :2.5V 33 :3.3V 50 :5.0V AD :ADJ	VOLTAGE CODE   UTC  UZ1085  DATE CODE  1 2 3

### ■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT		
	TO-252		12		
Thermal Resistance Junction-Case	TO-220	$\Theta_{JC}$	4	°C/W	
	TO-263		4		

## ■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	$V_{IN}$	18	V
(V <sub>IN</sub> – V <sub>OUT</sub> ) * I <sub>OUT</sub>		See Figure 1	
Junction Temperature	$T_J$	+125	
Operating Temperature	$T_{OPR}$	-20 ~ +85	
Storage Temperature	$T_{STG}$	-40 ~ +150	

- Note 1. 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.
  - 2. The device is guaranteed to meet performance specification within 0 ~+70 operating temperature range and assured by design from -20 ~+85 .
- ELECTRICAL CHARACTERISTICS (Ta=25 , C<sub>OUT</sub>=22 µ F, unless otherwise specified.)

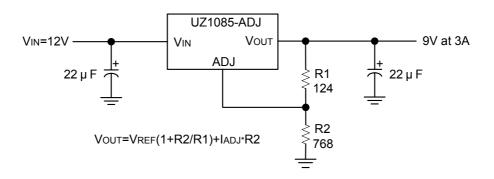
#### For UZ1085-ADJ(Adjustable)

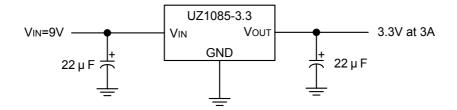
SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{REF}$	1.5V (V <sub>IN</sub> – V <sub>OUT</sub> ) 8.25V 10mA I <sub>OUT</sub> 3A	1.225	1.25	1.275	٧
$\Delta V_{OUT}$	(V <sub>OUT</sub> +1.5V) V <sub>IN</sub> 12V, I <sub>OUT</sub> =10mA		0.005	0.2	%
$\Delta V_{OUT}$	$(V_{IN} - V_{OUT})=3V$ , 10mA $I_{OUT}$ 3A		0.05	0.5	%
$V_D$	V <sub>REF</sub> %=1%, I <sub>OUT</sub> =3A		1.30	1.40	>
I <sub>LIMIT</sub>	(V <sub>IN</sub> -V <sub>OUT</sub> )=2V	3.1	4		Α
ladj			35	120	μΑ
∆ladj	1.5V (V <sub>IN</sub> – V <sub>OUT</sub> ) 12V, 10mA I <sub>OUT</sub> 3A		0.2	5	μΑ
I <sub>O(MIN)</sub>	1.5V (V <sub>IN</sub> -V <sub>OUT</sub> ) 12V			10	mA
ΙQ	V <sub>IN</sub> =12V		4	13	mA
RR	f=120Hz,Tantalum,(V <sub>IN</sub> –V <sub>OUT</sub> )=3V I <sub>OUT</sub> =3A	60	72		dB
	Ta=25 ,30ms pulse		0.004	0.02	%/W
$\Delta V_{OUT}$			0.5		%
$\Delta V_{OUT}$	Ta=125 , 1000hr		0.03	1.0	%
eN	Ta=25 ,10Hz f 10kHz		0.003		%
			150		°C
	V <sub>REF</sub> ΔV <sub>OUT</sub> V <sub>D</sub> I <sub>LIMIT</sub> Iadj ΔIadj I <sub>O(MIN)</sub> I <sub>Q</sub> RR ΔV <sub>OUT</sub>	V <sub>REF</sub> 1.5V (V <sub>IN</sub> - V <sub>OUT</sub> ) 8.25V  10mA I <sub>OUT</sub> 3A  ΔV <sub>OUT</sub> (V <sub>OUT</sub> +1.5V) V <sub>IN</sub> 12V, I <sub>IOUT</sub> =10mA  ΔV <sub>OUT</sub> (V <sub>IN</sub> - V <sub>OUT</sub> )=3V, 10mA I <sub>OUT</sub> 3A  V <sub>D</sub> V <sub>REF</sub> %=1%, I <sub>OUT</sub> =3A  I <sub>LIMIT</sub> (V <sub>IN</sub> -V <sub>OUT</sub> )=2V  Iadj  ΔIadj  1.5V (V <sub>IN</sub> - V <sub>OUT</sub> ) 12V , 10mA I <sub>OUT</sub> 3A  I <sub>O(MIN)</sub> 1.5V (V <sub>IN</sub> -V <sub>OUT</sub> ) 12V  I <sub>Q</sub> V <sub>IN</sub> =12V  RR  f=120Hz,Tantalum,(V <sub>IN</sub> -V <sub>OUT</sub> )=3V   I <sub>OUT</sub> =3A  Ta=25 ,30ms pulse  ΔV <sub>OUT</sub> ΔV <sub>OUT</sub> ΔV <sub>OUT</sub> Τa=125 , 1000hr	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	V <sub>REF</sub> 1.5V (V <sub>IN</sub> - V <sub>OUT</sub> ) 8.25V 10mA I <sub>OUT</sub> 3A         1.225         1.25           ΔV <sub>OUT</sub> (V <sub>OUT</sub> +1.5V) V <sub>IN</sub> 12V, I <sub>OUT</sub> =10mA         0.005           ΔV <sub>OUT</sub> (V <sub>IN</sub> - V <sub>OUT</sub> )=3V, 10mA I <sub>OUT</sub> 3A         0.05           V <sub>D</sub> V <sub>REF</sub> %=1%, I <sub>OUT</sub> =3A         1.30           I <sub>LIMIT</sub> (V <sub>IN</sub> -V <sub>OUT</sub> )=2V         3.1         4           Iadj         35           ΔIadj         1.5V (V <sub>IN</sub> - V <sub>OUT</sub> ) 12V , 10mA I <sub>OUT</sub> 3A         0.2           I <sub>O(MIN)</sub> 1.5V (V <sub>IN</sub> -V <sub>OUT</sub> ) 12V         4           I <sub>Q</sub> V <sub>IN</sub> =12V         4           RR         f=120Hz,Tantalum,(V <sub>IN</sub> -V <sub>OUT</sub> )=3V I <sub>OUT</sub> =3V I <sub>OUT</sub> =3A         60         72           RR         Ta=25 ,30ms pulse         0.004           ΔV <sub>OUT</sub> Ta=125 , 1000hr         0.03           eN         Ta=25 ,10Hz f 10kHz         0.003	VREF       1.5V (V <sub>IN</sub> - V <sub>OUT</sub> ) 8.25V         10mA I <sub>OUT</sub> 3A       1.225       1.25       1.275         ΔV <sub>OUT</sub> (V <sub>OUT</sub> +1.5V) V <sub>IN</sub> 12V, I <sub>OUT</sub> = 10mA       0.005       0.2         ΔV <sub>OUT</sub> (V <sub>IN</sub> - V <sub>OUT</sub> ) = 3V, 10mA I <sub>OUT</sub> 3A       0.05       0.5         V <sub>D</sub> V <sub>REF</sub> %=1%, I <sub>OUT</sub> =3A       1.30       1.40         I <sub>LIMIT</sub> (V <sub>IN</sub> -V <sub>OUT</sub> ) = 2V       3.1       4         Iadj       35       120         Δladj       1.5V (V <sub>IN</sub> - V <sub>OUT</sub> ) 12V, 10mA I <sub>OUT</sub> 3A       0.2       5         I <sub>O(MIN)</sub> 1.5V (V <sub>IN</sub> -V <sub>OUT</sub> ) 12V       10       10         I <sub>Q</sub> V <sub>IN</sub> =12V       4       13         RR       f=120Hz,Tantalum,(V <sub>IN</sub> -V <sub>OUT</sub> )=3V I <sub>OUT</sub> =3A       60       72         RR       Ta=25 ,30ms pulse       0.004 0.02         ΔV <sub>OUT</sub> Ta=125 ,1000hr       0.5         AV <sub>OUT</sub> Ta=25 ,10Hz f 10kHz       0.003

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

PARAMETER		SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
	UZ1085-15		3.0V V <sub>IN</sub> 8.5V, 10mA I <sub>OUT</sub> 3A	1.470	1.5	1.530	V
	UZ1085-18		3.3V V <sub>IN</sub> 8.8V, 10mA I <sub>OUT</sub> 3A	1.764	1.8	1.830	
Output Voltage	UZ1085-25		4.0V V <sub>IN</sub> 9.5V, 10mA I <sub>OUT</sub> 3A	2.450	2.5	2.550	
	UZ1085-33		4.8V V <sub>IN</sub> 10.3V, 10mA I <sub>OUT</sub> 3A	3.234	3.3	3.366	
	UZ1085-50		6.5V V <sub>IN</sub> 12V, 10mA I <sub>OUT</sub> 3A	4.900	5.0	5.100	
Line Regulation		$\Delta V_{OUT}$	(V <sub>OUT</sub> +1.5V) V <sub>IN</sub> 12V,I <sub>OUT</sub> =10mA		0.005	0.2	%
Load Regulation		$\Delta V_{OUT}$	$(V_{IN} - V_{OUT})=3V$ , 10mA $I_{OUT}$ 3A		0.05	0.5	%
Dropout Voltage		$V_D$	V <sub>REF</sub> %=1%, I <sub>OUT</sub> =3A		1.30	1.40	٧
Current Limit		I <sub>LIMIT</sub>	$(V_{IN}-V_{OUT})=2V$	3.1	4		Α
Minimum Load Current		I <sub>O(MIN)</sub>	1.5V (V <sub>IN</sub> -V <sub>OUT</sub> ) 12V			10	mA
Quiescent Current		IQ	V <sub>IN</sub> =12V		4	13	mA
Ripple Rejection		RR	f=120Hz, Tantalum,	60	72		dB
		KK	$(V_{IN} - V_{OUT})=3V, I_{OUT}=3A$	60	12		uB
Thermal Regulation			Ta=25 ,30ms pulse		0.004	0.02	%/W
Temperature Stability		$\Delta V_{OUT}$	Ta=125 , 1000hr		0.5		%
Long-Term Stability		$\Delta V_{OUT}$			0.03	1.0	%
Output Noise(% of V <sub>OUT</sub> )		eN	Ta=25 ,10Hz f 10kHz		0.003		%
Thermal shutdown					150		°C

#### ■ TYPICAL APPLICATION CIRCUIT





#### ■ TYPICAL CHARACTERISTICS

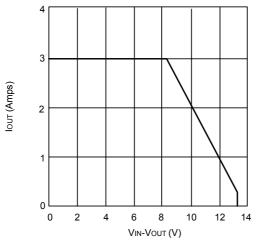


Figure 1. Absolute Maximum Sate Operating Area

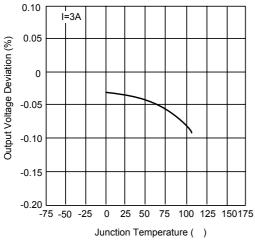


Figure 3. Load Regulation vs.Temperature

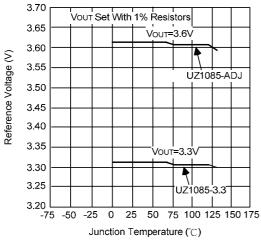


Figure 5. Output Voltage vs. Temperature

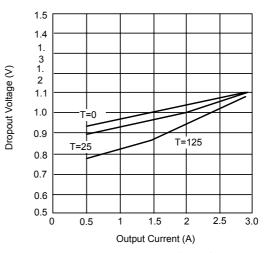


Figure 2. Dropout Voltage vs.Output Current

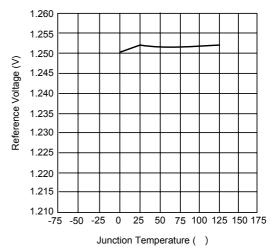


Figure 4. Reference Voltage vs.Temperature

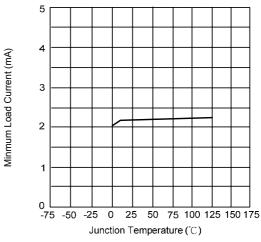


Figure 6. Minimum Load Current vs. Temperature

### ■ TYPICAL CHARACTERISTICS(Cont.)

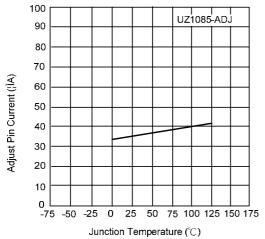


Figure 7. Adjust Pin Current vs. Temperature

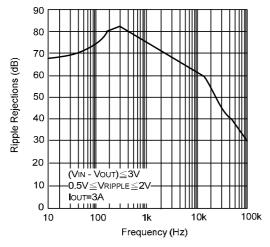


Figure 9. Ripple Rejection vs.Frequency

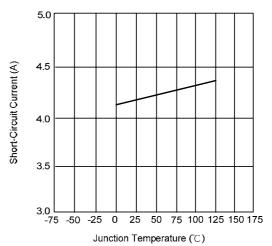


Figure 8. Short-Circuit Current vs.Temperature

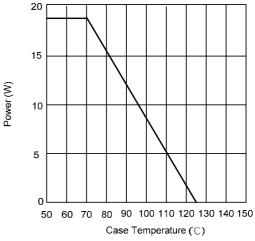


Figure 10. Maximum Power Dissipation

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