勝 特 力 材 料 886-3-5753170 胜特力电子(上海) 86-21-54151736 胜特力电子(深圳) 86-755-83298787 Http://www.100y.com.tw

μΑ7800 SERIES POSITIVE-VOLTAGE REGULATORS

SLVS056E - MAY 1976 - REVISED JULY 1999

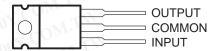
- 3-Terminal Regulators
- Output Current up to 1.5 A
- Internal Thermal-Overload Protection
- High Power-Dissipation Capability
- Internal Short-Circuit Current Limiting
- Output Transistor Safe-Area Compensation
- Direct Replacements for Fairchild μA7800 Series

description

This series fixed-voltage monolithic integrated-circuit voltage regulators is designed for a wide range of applications. These applications include on-card regulation for elimination of noise and distribution problems associated with single-point regulation. Each of these regulators can deliver up to 1.5 A of output current. The internal current-limiting and thermal-shutdown features of these regulators essentially make them immune to overload. In addition to use as fixed-voltage regulators, these devices can be used with external components to obtain adjustable output voltages and currents, and also can be used as the power-pass element in precision regulators.

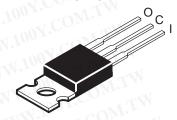
The μ A7800C series is characterized for operation over the virtual junction temperature range of 0°C to 125°C.

KC PACKAGE (TOP VIEW)

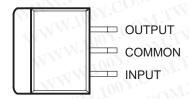


The COMMON terminal is in electrical contact with the mounting base.

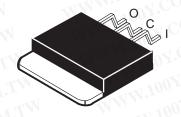
TO-220AB



(TOP VIEW)



The COMMON terminal is in electrical contact with the mounting base





Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

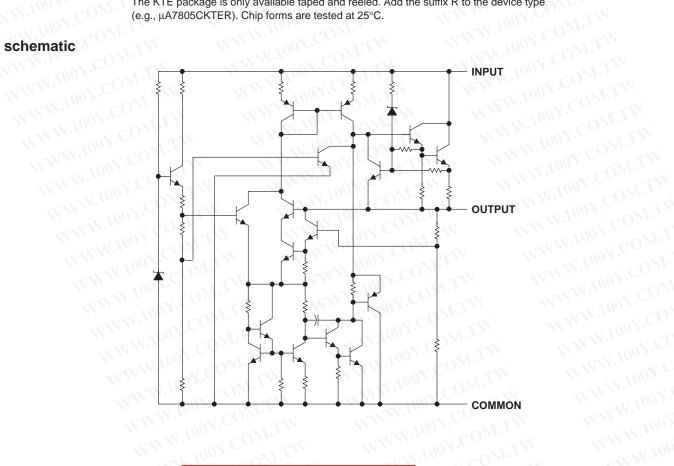


AVAILABLE OPTIONS

WWW	COM	PACKAGED	DEVICES	CLUD
WW Tj 100	VO(NOM) (V)	PLASTIC FLANGE-MOUNT (KC)	HEAT-SINK MOUNTED (KTE)	FORM (Y)
W.10	5	μΑ7805CKC	μΑ7805CKTE	μΑ7805Υ
	6	μA7806CKC	μΑ7806CKTE	μΑ7806Υ
	800	μΑ7808CKC	μΑ7808CKTE	μΑ7808Υ
	8.5	μΑ7885CKC	μΑ7885CKTE	μΑ7885Υ
0°C to 125°C	10	μΑ7810CKC	μΑ7810CKTE	μΑ7810Υ
	12	μΑ7812CKC	μΑ7812CKTE	μΑ7812Υ
	15	μΑ7815CKC	μΑ7815CKTE	μΑ7815Υ
	18	μΑ7818CKC	μΑ7818CKTE	μΑ7818Υ
	24	μΑ7824CKC	μΑ7824CKTE	μΑ7824Υ

The KTE package is only available taped and reeled. Add the suffix R to the device type (e.g., μA7805CKTER). Chip forms are tested at 25°C (e.g., μ A7805CKTER). Chip forms are tested at 25°C.

schematic



勝 特 力 材 料 886-3-5753170 胜特力电子(上海) 86-21-54151736 胜特力电子(深圳) 86-755-83298787 WWW.100Y.COM.TW Http://www. 100y. com. tw



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absolute maximum ratings over operating temperature ranges (unless otherwise noted)†

TW WW 1007.00 TW WW 11009	. M.TW	μ Α78xx	UNIT
January Jakona V. WWW. 2007.COM	μA7824C	40	V
Input voltage, V _I	All others	35]
Virtual junction temperature range, T _J	COMP	0 to 150	°C
Postugge thermal impedance () (ass Notes 4 and 2)	KC package	22	°C
Package thermal impedance, θ _{JA} (see Notes 1 and 2)	KTE package	23	
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds	· To COMP.	260	°C
Storage temperature range, T _{Stg}	N.100 CON.	-65 to 150	°C

[†] Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

- NOTES: 1. Maximum power dissipation is a function of T_J(max), θ_JA, and T_A. The maximum allowable power dissipation at any allowable ambient temperature is $P_D = (T_J(max) - T_A)/\theta_{JA}$. Operating at the absolute maximum T_J of 150°C can impact reliability. Due to variations in individual device electrical characteristics and thermal resistance, the built-in thermal overload protection may be activated at power levels slightly above or below the rated dissipation.
 - The package thermal impedance is calculated in accordance with JESD 51, except for through-hole packages, which use a trace length of zero.

recommended operating conditions

WWW.100Y.COM.TW

TW WWW. 100Y.Co. TW	MM 100X.0	MIN	MAX	UNIT
W. To. COM. WAN. WAN.	μA7805C	7	25	
	μΑ7806C	CO8	25	
	μΑ7808C	10.5	25	
	μA7885C	10.5	25	
nput voltage, V _I	μA7810C	12.5	28	V
	μA7812C	14.5	30	
	μA7815C	17.5	30	
	μA7818C	21	33	
	μA7824C	27	38	
Output current, IO	WWW WWW	1.1	1.5	Α
Operating virtual junction temperature, TJ	μA7800C series	0	125	°C



electrical characteristics at specified virtual junction temperature, V_I = 10 V, I_O = 500 mA (unless otherwise noted)

ON. TOPPANETED WWW.IG	CONTRACTOR OF THE CONTRACTOR O	TON COM	μ			
PARAMETER	TEST CONDITIONS	TJ [†] OM	MIN	TYP	MAX	UNIT
Output voltage	$I_{O} = 5 \text{ mA to 1 A}, \qquad V_{I} = 7 \text{ V to 20 V},$	25°C	4.8	5	5.2	V
Output voltage	$P_D \le 15 \text{ W}$	0°C to 125°C	4.75		5.25	V
Industrials and regulation	V _I = 7 V to 25 V	2500		3	100	mV
Input voltage regulation	V _I = 8 V to 12 V	25°C	Dir	1	50	IIIV
Ripple rejection	V _I = 8 V to 18 V, f = 120 Hz	0°C to 125°C	62	78		dB
ON COST ON WW	I _O = 5 mA to 1.5 A	0500	100	15	100	
Output voltage regulation	I _O = 250 mA to 750 mA	- 25°C	Cor	5	50	mV
Output resistance	f = 1 kHz	0°C to 125°C		0.017	J	Ω
Temperature coefficient of output voltage	I _O = 5 mA	0°C to 125°C		-1.1	-1	mV/°C
Output noise voltage	f = 10 Hz to 100 kHz	25°C	N.O.	40		μV
Dropout voltage	I _O = 1 A	25°C	ny.C	2	M	V
Bias current	COM.	25°C		4.2	8	mA
Pion outront shapes M.T.	V _I = 7 V to 25 V		100 -	COM	1.3	A
Bias current change	I _O = 5 mA to 1 A	0°C to 125°C	1007	- 01	0.5	mA
Short-circuit output current	WWW. OOV.COM TW	25°C	400	750		N mA
Peak output current	COM.	25°C	N.D	2.2	Mr.	A

T Pulse-testing techniques maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.

electrical characteristics at specified virtual junction temperature, V_I = 11 V, I_O = 500 mA (unless otherwise noted)

PARAMETER	TEST CONDITIONS	- W	μ	A7806C	Y.Co	UNIT
PARAMETER	TEST CONDITIONS	T _J †	MIN	TYP	MAX	UNIT
Output valtage	$I_{O} = 5 \text{ mA to 1 A}, \qquad V_{I} = 8 \text{ V to 21 V},$	25°C	5.75	6	6.25	OV.
Output voltage	P _D ≤ 15 W	0°C to 125°C	5.7	-331 1	6.3	
Land CONTRACTOR CONTRACTOR	V _I = 8 V to 25 V	2500	W	5	120	
Input voltage regulation	V _I = 9 V to 13 V	25°C	*1	1.5	60	mV
Ripple rejection	V _I = 9 V to 19 V, f = 120 Hz	0°C to 125°C	59	75	N.100	dB
Outrot value no nomitation at 100 %.	I _O = 5 mA to 1.5 A	0500		14	120	77.
Output voltage regulation	I _O = 250 mA to 750 mA	25°C		4	60	mV
Output resistance	f = 1 kHz	0°C to 125°C		0.019	MM·	Ω
Temperature coefficient of output voltage	I _O = 5 mA	0°C to 125°C	= T	-0.8	WW.	mV/°C
Output noise voltage	f = 10 Hz to 100 kHz	25°C		45		μV
Dropout voltage	I _O = 1 A	25°C	W	2	MAN	V
Bias current	TCOM.	25°C	TIN	4.3	8	mA
Dies sument shares	V _I = 8 V to 25 V	000 to 40500			1.3	1111
Bias current change	I _O = 5 mA to 1 A	0°C to 125°C	1.7.		0.5	mA
Short-circuit output current	WW.	25°C	VI	550	N	mA
Peak output current	TO COMP.	25°C	TAN-	2.2		Α

[†] Pulse-testing techniques maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.



electrical characteristics at specified virtual junction temperature, V_I = 14 V, I_O = 500 mA (unless otherwise noted)

DADAMETER	TEST CONDITIONS	COM- +TW	μ Α	7808C		LINUT
PARAMETER	TEST CONDITIONS	TJ [†]	MIN	TYP	MAX	UNIT
Outro ut voltage	$I_O = 5 \text{ mA to 1 A}, \qquad V_I = 10.5 \text{ V to 23 V},$	25°C	7.7	8	8.3	V
Output voltage	P _D ≤ 15 W	0°C to 125°C	7.6		8.4	V
Input voltage regulation	V _I = 10.5 V to 25 V	2500	rW	6	160	mV
Input voltage regulation	V _I = 11 V to 17 V	25°C	-XX	2	80	IIIV
Ripple rejection	V _I = 11.5 V to 21.5 V, f = 120 Hz	0°C to 125°C	55	72		dB
Control of the Contro	I _O = 5 mA to 1.5 A	0500	TIM	12	160	\/
Output voltage regulation	I _O = 250 mA to 750 mA	25°C	4		80	mV
Output resistance	f = 1 kHz	0°C to 125°C		0.016		Ω
Temperature coefficient of output voltage	I _O = 5 mA	0°C to 125°C	$o_{W,r}$	-0.8		mV/°C
Output noise voltage	f = 10 Hz to 100 kHz	25°C	T.Ma	52		μV
Dropout voltage	I _O = 1 A	25°C	Cor	2		V
Bias current	IN. Inc. CONT.	25°C	CO_{Nr}	4.3	8	mA
MODE TO THE TOTAL THE TOTA	V _I = 10.5 V to 25 V	000 +- 40500	CON	1.7	1	Λ
Bias current change	I _O = 5 mA to 1 A	0°C to 125°C	N.O.	M.T.	0.5	mA
Short-circuit output current	MM. OX.COP. TM	25°C	W.Co	450		mA
Peak output current	TAM Too COM.	25°C	N C	2.2	- W	А

TPulse-testing techniques maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.

electrical characteristics at specified virtual junction temperature, V_I = 15 V, I_O = 500 mA (unless otherwise noted)

PARAMETER	TEST CONDITIONS	- +1/1/1	μ	A7885C	, , ,	UNIT
PARAMETER	TEST CONDITIONS	TJ [†]	MIN	TYP	MAX	UNII
Output voltage 100 to	$I_O = 5 \text{ mA to 1 A}, V_I = 11 \text{ V to 23.5 V},$	25°C	8.15	8.5	8.85	V
Output voltage	P _D ≤ 15 W	0°C to 125°C	8.1	1007	8.9	V
W. COM	V _I = 10.5 V to 25 V	0500	MM	6	170	4.0
Input voltage regulation	V _I = 11 V to 17 V	25°C	TAT W	2	85	mV
Ripple rejection	V _I = 11.5 V to 21.5 V, f = 120 Hz	0°C to 125°C	54	70	-7 (dB
	I _O = 5 mA to 1.5 A	0500	M	12	170	-00
Output voltage regulation	I _O = 250 mA to 750 mA	25°C	W	4	85	mV
Output resistance	f = 1 kHz	0°C to 125°C	**	0.016	001	Ω
Temperature coefficient of output voltage	I _O = 5 mA	0°C to 125°C		-0.8	Tan	mV/°C
Output noise voltage	f = 10 Hz to 100 kHz	25°C		55	N.10	μV
Dropout voltage	I _O = 1 A	25°C		2	-11	V
Bias current	ONT.	25°C		4.3	8	mA
Disconsistation and William	V _I = 10.5 V to 25 V	000 +- 40500	«T	1	1	AST
Bias current change	I _O = 5 mA to 1 A	0°C to 125°C			0.5	mA
Short-circuit output current	CO. THE WALL	25°C	N	450	MAA.	mA
Peak output current	COMP.	25°C	TIN	2.2	WW	Α

[†] Pulse-testing techniques maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-µF capacitor across the input and a 0.1-µF capacitor across the output.



electrical characteristics at specified virtual junction temperature, $V_I = 17 \text{ V}$, $I_O = 500 \text{ mA}$ (unless otherwise noted)

ON.	CO TEST CONDITIONS	WY.COM	μ	A7810C		UNIT
PARAMETER	TEST CONDITIONS	TJ [†] OM	MIN	TYP	MAX	UNII
Output voltage	$I_{O} = 5 \text{ mA to 1 A}, \qquad V_{I} = 12.5 \text{ V to 25 V},$	25°C	9.6	10	10.4	V
Output voltage	P _D ≤ 15 W	0°C to 125°C	9.5	10	10.5	V
Industrian resilies	V _I = 12.5 V to 28 V	2590		7	200	mV
Input voltage regulation	V _I = 14 V to 20 V	25°C	Dir	2	100	IIIV
Ripple rejection	V _I = 13 V to 23 V, f = 120 Hz	0°C to 125°C	55	71		dB
ON CONTRACTOR WIN	I _O = 5 mA to 1.5 A	0500	-100Y.	12	200	\/
Output voltage regulation	I _O = 250 mA to 750 mA	25°C	Cor	4	100	mV
Output resistance	f = 1 kHz	0°C to 125°C		0.018	J	W
Temperature coefficient of output voltage	I _O = 5 mA	0°C to 125°C	- cO	<u>√-1</u>	_1	mV/°C
Output noise voltage	f = 10 Hz to 100 kHz	25°C	N.O.	70	M	μV
Dropout voltage	I _O = 1 A	25°C	nY.C	2	M	V
Bias current	COM	25°C	~ (C	4.3	8	mA
District the second T	V _I = 12.5 V to 28 V	000 to 40500	100 -	COM	1.	A
Bias current change	I _O = 5 mA to 1 A	0°C to 125°C	100%	. 01	0.5	mA
Short-circuit output current	MAN. OUT. CO.	25°C	100	400	111	ΜA
Peak output current	CONT.	25°C	N.ro	2.2	Mr.	Λ A

[†] Pulse-testing techniques maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.

electrical characteristics at specified virtual junction temperature, V_{I} = 19 V, I_{O} = 500 mA (unless otherwise noted)

DADAMETED CONT	TEST CONDITIONS	W _ +	μ Δ	7812C	Y.Co	UNIT
PARAMETER	TEST CONDITIONS	TJ [†]	MIN	TYP	MAX	UNIT
Output valtage	$I_O = 5 \text{ mA to 1 A}, \qquad V_I = 14.5 \text{ V to 27 V},$	25°C	11.5	12	12.5	OV.
Output voltage	P _D ≤ 15 W	0°C to 125°C	11.4	-3311	12.6	V
Land CONTRACTOR CONTRACTOR	V _I = 14.5 V to 30 V	0500	W	10	240	
Input voltage regulation	V _I = 16 V to 22 V	25°C	***	3	120	mV
Ripple rejection	V _I = 15 V to 25 V, f = 120 Hz	0°C to 125°C	55	71	1.700	dB
Output value as a solutation of 100 X.C.	I _O = 5 mA to 1.5 A	0500	12		240	
Output voltage regulation	I _O = 250 mA to 750 mA	25°C		4	120	mV
Output resistance	f = 1 kHz	0°C to 125°C		0.018	MAN	W
Temperature coefficient of output voltage	I _O = 5 mA	0°C to 125°C	~ T	-1	WW.	mV/°C
Output noise voltage	f = 10 Hz to 100 kHz	25°C	M	75	-111	μV
Dropout voltage	I _O = 1 A	25°C		2	MAN	V
Bias current	COM.	25°C	TIN	4.3	8	mA
Dies sument shares	V _I = 14.5 V to 30 V	COM	. 1		_1	111.10
Bias current change	I _O = 5 mA to 1 A	0°C to 125°C	1.1.11		0.5	mA
Short-circuit output current	WY.CO. TW	25°C	WILL	350	W	mA
Peak output current	TO COMP.	25°C	TAY.	2.2	<	Α

[†] Pulse-testing techniques maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.



electrical characteristics at specified virtual junction temperature, V_I = 23 V, I_O = 500 mA (unless otherwise noted)

DADAMETER	TEST CONDITIONS	CON- +TW	μ Α	7815C		UNIT
PARAMETER	TEST CONDITIONS	COTJ [†] .	MIN	TYP	MAX	UNII
Output valtage	$I_O = 5 \text{ mA to 1 A}, \qquad V_I = 17.5 \text{ V to 30 V},$	25°C	14.4	15	15.6	V
Output voltage	P _D ≤ 15 W	0°C to 125°C	14.25		15.75	V
Input voltage regulation	V _I = 17.5 V to 30 V	25°C	W	11	300	mV
Input voltage regulation	V _I = 20 V to 26 V	25°C	-XXI	3	150	mv
Ripple rejection	V _I = 18.5 V to 28.5 V, f = 120 Hz	0°C to 125°C	54	70		dB
Output valtage regulation	I _O = 5 mA to 1.5 A	2500	TIM	12	300	mV
Output voltage regulation	I _O = 250 mA to 750 mA	25°C	WT	4	150	IIIV
Output resistance	f = 1 kHz	0°C to 125°C	0	.019		W
Temperature coefficient of output voltage	I _O = 5 mA	0°C to 125°C	$O_{M:I}$	-1		mV/°C
Output noise voltage	f = 10 Hz to 100 kHz	25°C	TMO	90		μV
Dropout voltage	I _O = 1 A	25°C	Cor	2		V
Bias current	IN. In COM.	25°C	COMP.	4.4	8	mA
Rice surrent shares	V _I = 17.5 V to 30 V	0°C to 125°C	CON	1.1	1	A
Bias current change	I _O = 5 mA to 1 A	0.0 10 125.0	7.0	V.T	0.5	mA
Short-circuit output current	IMM. ON COM	25°C	OY.Co	230		mA
Peak output current	TANN TO COMP.	25°C	ov CC	2.1	CIN	Α

[†] Pulse-testing techniques maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.

electrical characteristics at specified virtual junction temperature, V_I = 27 V, I_O = 500 mA (unless otherwise noted)

PARAMETER	TEST CONDITIONS	_ +WW	μ Α78	UNIT	
PARAMETER	TEST CONDITIONS	TJ [†]	MIN T	YP MAX	UNII
Output voltage 100 1	$I_0 = 5 \text{ mA to 1 A}, V_1 = 21 \text{ V to 33 V},$	25°C	17.3	18 18.7	V
Output voltage	P _D ≤ 15 W	0°C to 125°C	17.1	18.9	V
W. COM	V _I = 21 V to 33 V	0500	MAN	15 360	mV
Input voltage regulation	V _I = 24 V to 30 V	− 25°C	TINN.	5 180	mv
Ripple rejection	V _I = 22 V to 32 V, f = 120 Hz	0°C to 125°C	53	69	dB
Outroit validade na mulatida (1)	I _O = 5 mA to 1.5 A	0500	M.	12 360	1000
Output voltage regulation	I _O = 250 mA to 750 mA	− 25°C	MM	4 180	mV
Output resistance	f = 1 kHz	0°C to 125°C	0.0	22	W
Temperature coefficient of output voltage	I _O = 5 mA	0°C to 125°C	-1	1111	mV/°C
Output noise voltage	f = 10 Hz to 100 kHz	25°C	1	10	μV
Dropout voltage	I _O = 1 A	25°C	V	2	OV
Bias current	ONT.	25°C	4	1.5 8	mA
Ding autrent shange	V _I = 21 V to 33 V	0°C to 125°C	«T	1	m A J
Bias current change	I _O = 5 mA to 1 A	0 0 10 125 0		0.5	mA
Short-circuit output current	CO. TW WWW	25°C	2	00	mA
Peak output current	COM.	25°C		2.1	Α

[†] Pulse-testing techniques maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-µF capacitor across the input and a 0.1-µF capacitor across the output.



electrical characteristics at specified virtual junction temperature, V_I = 33 V, I_O = 500 mA (unless otherwise noted)

ON. STRANGTER WW. IV	CO TEST CONDITIONS	VA'CON	μ	A7824C		
PARAMETER	TEST CONDITIONS	My TI	MIN	TYP	MAX	UNIT
Output valtage	$I_0 = 5 \text{ mA to 1 A}, \qquad V_1 = 27 \text{ V to 38 V},$	25°C	23	24	25	V
Output voltage	$P_D \le 15 \text{ W}$	0°C to 125°C	22.8		25.2	V
CO_{N}	V _I = 27 V to 38 V	2500	- 177	18	480	>/
Input voltage regulation	V _I = 30 V to 36 V	25°C	DIAT.	6	240	mV
Ripple rejection	V _I = 28 V to 38 V, f = 120 Hz	0°C to 125°C	50	66		dB
	I _O = 5 mA to 1.5 A	0500	-3/	12	480	>/
Output voltage regulation	I _O = 250 mA to 750 mA	- 25°C	COP	4	240	mV
Output resistance	f = 1 kHz	0°C to 125°C		0.028	J	W
Temperature coefficient of output voltage	I _O = 5 mA	0°C to 125°C		-1.5	-1	mV/°C
Output noise voltage	f = 10 Hz to 100 kHz	25°C	N.	170		μV
Dropout voltage	I _O = 1 A	25°C	ny.C	2		V
Bias current	COM.	25°C	ovi C	4.6	8	mA
100 - N.TW	V _I = 27 V to 38 V	000 +- 40500	100.	COM	1.	A
Bias current change	I _O = 5 mA to 1 A	- 0°C to 125°C	100%	. 01	0.5	mA
Short-circuit output current	MMM. ON COM	25°C	100	150	111	mA
Peak output current	LINW.Inc. COMP.	25°C	N.I	2.1	Mr.	«Λ A

[†] Pulse-testing techniques maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.

electrical characteristics at specified virtual junction temperature, V_I = 10 V, I_O = 500 mA, T_J = 25°C (unless otherwise noted)[†]

PARAMETER	TEST CONDITIONS	μ Α7805 Υ	UNIT
		MIN TYP MAX	
Output voltage	M. 100 . COM: 1.	5	ON.
January voltage regulation	V _I = 7 V to 25 V	31007.	mV
Input voltage regulation	V _I = 8 V to 12 V	1 1001	CIIIV
Ripple rejection	$V_{I} = 8 \text{ V to } 18 \text{ V}, \qquad \qquad f = 120 \text{ Hz}$	78	dB
Output voltage regulation	I _O = 5 mA to 1.5 A	15	mV
	I _O = 250 mA to 750 mA	5	IIIV
Output resistance	f = 1 kHz	0.017	W
Temperature coefficient of output voltage	I _O = 5 mA	-1.1	mV/°C
Output noise voltage	f = 10 Hz to 100 kHz	40	μV
Dropout voltage	I _O = 1 A	2	V
Bias current	TW WWW.	4.2	mA
Short-circuit output current	COL	750	mA
Peak output current	COM. T. CO	2.2	Α

[†] Pulse-testing techniques maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.



electrical characteristics at specified virtual junction temperature, V_I = 11 V, I_O = 500 mA, T_J = 25°C (unless otherwise noted)[†]

PARAMETER	TEST CONDITIONS	μ Α7806Υ	UNIT
		MIN TYP MAX	
Output voltage	MILM M. MITTON TONET	6	V
Input voltage regulation	V _I = 8 V to 25 V	5	mV
Input voltage regulation	V _I = 9 V to 13 V	1.5	IIIV
Ripple rejection	$V_I = 9 \text{ V to } 19 \text{ V},$ $f = 120 \text{ Hz}$	75	dB
Output voltage regulation	I _O = 5 mA to 1.5 A	14	mV
	I _O = 250 mA to 750 mA	4	
Output resistance	f = 1 kHz	0.019	W
Temperature coefficient of output voltage	I _O = 5 mA	-0.8	mV/°C
Output noise voltage	f = 10 Hz to 100 kHz	45	μV
Dropout voltage	I _O = 1 A	2	V
Bias current	ON COM TWO WAY TONY	4.3	mA
Short-circuit output current	TO COMP.	550	mA
Peak output current	N. M. Jan.	2.2	Α

[†] Pulse-testing techniques maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-µF capacitor across the input and a 0.1-µF capacitor across the output.

electrical characteristics at specified virtual junction temperature, V_I = 14 V, I_O = 500 mA, T_J = 25°C (unless otherwise noted)[†]

PARAMETER	TEST CONDITIONS	μ Α7808Υ	V
		MIN TYP MAX	UNIT
Output voltage	MILLION, CONTANT WILL	8 VI.	V
ST CONT	V _I = 10.5 V to 25 V	6	
Input voltage regulation	V _I = 11 V to 17 V	2 (0)	mV
Ripple rejection	V _I = 11.5 V to 21.5 V, f = 120 Hz	72	dB
Output voltage regulation	I _O = 5 mA to 1.5 A	12	1
	I _O = 250 mA to 750 mA	4	mV
Output resistance	f = 1 kHz	0.016	W
Temperature coefficient of output voltage	I _O = 5 mA	-0.8	mV/°C
Output noise voltage	f = 10 Hz to 100 kHz	52	μV
Dropout voltage	I _O = 1 A	2 00	V
Bias current	A COMP.	4.3	mA
Short-circuit output current	W. Too COM.	450	mA
Peak output current	IN MAIL TOOK ON THE	2.2	Α

[†] Pulse-testing techniques maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-µF capacitor across the input and a 0.1-µF capacitor across the output.



electrical characteristics at specified virtual junction temperature, $V_I = 15 \text{ V}$, $I_O = 500 \text{ mA}$, $T_J = 25^{\circ}\text{C}$ (unless otherwise noted)†

PARAMETER	TEST CONDITIONS	μ Α7885 Υ	UNIT
		MIN TYP MAX	
Output voltage	W. TW. W. TW. 100 F.	8.5	V
Input voltage regulation	V _I = 10.5 V to 25 V	6	mV
input voltage regulation	V _I = 11 V to 17 V	2	IIIV
Ripple rejection	$V_I = 11.5 \text{ V to } 21.5 \text{ V}, \qquad f = 120 \text{ Hz}$	70	dB
Output voltage regulation	I _O = 5 mA to 1.5 A	12	mV
	I _O = 250 mA to 750 mA	4	IIIV
Output resistance	f = 1 kHz	0.016	W
Temperature coefficient of output voltage	I _O = 5 mA	-0.8	mV/°C
Output noise voltage	f = 10 Hz to 100 kHz	55	μV
Dropout voltage	I _O = 1 A	2	V
Bias current	M. COM. COM	4.3	mA
Short-circuit output current	NA TOOMS COMP.	450	mA
Peak output current	1100 . CON: 1	2.2	А

[†] Pulse-testing techniques maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.

electrical characteristics at specified virtual junction temperature, V_I = 17 V, I_O = 500 mA, T_J = 25°C (unless otherwise noted)†

PARAMETER	TEST CONDITIONS	μ Α7810Y	UNIT
		MIN TYP MAX	
Output voltage	MM. 100X.CONTIN	10	V
Innutualization V. COM	V _I = 12.5 V to 28 V	777.00	mV
Input voltage regulation	V _I = 14 V to 20 V	2 C	HIV
Ripple rejection	V _I = 13 V to 23 V, f = 120 Hz	71	dB
Output voltage regulation	I _O = 5 mA to 1.5 A	12	
	I _O = 250 mA to 750 mA	4	mV
Output resistance	f = 1 kHz	0.018	7 W
Temperature coefficient of output voltage	I _O = 5 mA	-1VI.100	mV/°C
Output noise voltage	f = 10 Hz to 100 kHz	70	μV
Dropout voltage	I _O = 1 A	2	V
Bias current	AL COMP.	4.3	mA
Short-circuit output current	M. Ing. COM.	400	mA
Peak output current	THE WAY TOOK	2.2	A

[†] Pulse-testing techniques maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.



electrical characteristics at specified virtual junction temperature, V_I = 19 V, I_O = 500 mA, T_J = 25°C (unless otherwise noted)[†]

PARAMETER	TEST CONDITIONS	μ Α7812Υ	UNIT
		MIN TYP MAX	
Output voltage	M. M. Jan Too J. COMIT.	12	V
Input voltage regulation	V _I = 14.5 V to 30 V	10	>/
Input voltage regulation	V _I = 16 V to 22 V	3	mV
Ripple rejection	V _I = 15 V to 25 V, f = 120 Hz	71	dB
Output voltage regulation	I _O = 5 mA to 1.5 A	12	mV
	I _O = 250 mA to 750 mA	4	
Output resistance	f = 1 kHz	0.018	W
Temperature coefficient of output voltage	$I_O = 5 \text{ mA}$	⁻¹	mV/°C
Output noise voltage	f = 10 Hz to 100 kHz	75	μV
Dropout voltage	I _O = 1 A	2	٧
Bias current	ON COM TW WWW.	4.3	mA
Short-circuit output current	TON TONI TONI TONI TONI TONI TONI TONI T	350	mA
Peak output current	1.7102. CON: I	2.2	А

[†] Pulse-testing techniques maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-µF capacitor across the input and a 0.1-µF capacitor across the output.

electrical characteristics at specified virtual junction temperature, V_I = 23 V, I_O = 500 mA, T_J = 25°C (unless otherwise noted)[†]

PARAMETER	TEST CONDITIONS	μ Α7815Υ	UNIT
		MIN TYP MAX	
Output voltage	MILL TOOK CONTAIN WILL	15	٧
Innuit valtage requisition	V _I = 17.5 V to 30 V	11	
Input voltage regulation	V _I = 20 V to 26 V	3 COM	mV
Ripple rejection	V _I = 18.5 V to 28.5 V, f = 120 Hz	70	dB
Output voltage regulation	I _O = 5 mA to 1.5 A	12	1
	I _O = 250 mA to 750 mA	4	mV
Output resistance	f = 1 kHz	0.019	W
Temperature coefficient of output voltage	I _O = 5 mA	√-1	mV/°C
Output noise voltage	f = 10 Hz to 100 kHz	90	μV
Dropout voltage	I _O = 1 A	2 100	٧
Bias current	N TWW. TO COM.	4.4	mA
Short-circuit output current	W. Too COM.	230	mA
Peak output current	IN MILL TOOLS ON IN	2.1	Α

[†] Pulse-testing techniques maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.



electrical characteristics at specified virtual junction temperature, $V_I = 27 \text{ V}$, $I_O = 500 \text{ mA}$, $T_J = 25^{\circ}\text{C}$ (unless otherwise noted)[†]

PARAMETER	TEST CONDITIONS	μ Α7818Y	UNIT
		MIN TYP MAX	
Output voltage	W.TW W. TW.100	18	V
Input voltage regulation	V _I = 21 V to 33 V	15	mV
input voltage regulation	V _I = 24 V to 30 V	5	IIIV
Ripple rejection	$V_{I} = 22 \text{ V to } 32 \text{ V}, \qquad \qquad f = 120 \text{ Hz}$	69	dB
Output voltage regulation	I _O = 5 mA to 1.5 A	12	mV
	I _O = 250 mA to 750 mA	4	IIIV
Output resistance	f = 1 kHz	0.022	W
Temperature coefficient of output voltage	I _O = 5 mA	CON -1	mV/°C
Output noise voltage	f = 10 Hz to 100 kHz	110	μV
Dropout voltage	I _O = 1 A	2	V
Bias current	M. CON.COM	4.5	mA
Short-circuit output current	MA TONICOMP	200	mA
Peak output current	N.100 COM: 1	2.1	А

[†] Pulse-testing techniques maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-µF capacitor across the input and a 0.1-µF capacitor across the output.

electrical characteristics at specified virtual junction temperature, $V_I = 33 \text{ V}$, $I_O = 500 \text{ mA}$, $T_J = 25^{\circ}\text{C}$ (unless otherwise noted)[†]

PARAMETER	TEST CONDITIONS	μ Α7824 Υ	UNIT
		MIN TYP MAX	
Output voltage	MI 100Y. COM.TW	24	V
January of the Name of States of Contract of the States of Contract of	V _I = 27 V to 38 V	18	mV
Input voltage regulation	V _I = 30 V to 36 V	6 C	July
Ripple rejection	$V_{I} = 28 \text{ V to } 38 \text{ V}, \qquad f = 120 \text{ Hz}$	66	dB
Output voltage regulation	$I_{O} = 5 \text{ mA to } 1.5 \text{ A}$	12	mV
	I _O = 250 mA to 750 mA	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4] · · · · ·
Output resistance	f = 1 kHz	0.028	W
Temperature coefficient of output voltage	$I_O = 5 \text{ mA}$	-1.5	mV/°C
Output noise voltage	f = 10 Hz to 100 kHz	170	μV
Dropout voltage	I _O = 1 A	2	V
Bias current	W WWW.IV OV COM	4.6	mA
Short-circuit output current	N. L. M. Inn CONT.	150	mA
Peak output current	11TW 1001.	2.1	Α

[†] Pulse-testing techniques maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-µF capacitor across the input and a 0.1-µF capacitor across the output.



APPLICATION INFORMATION

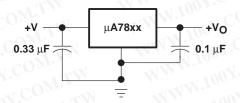


Figure 1. Fixed-Output Regulator

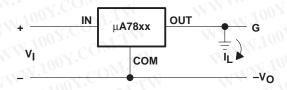
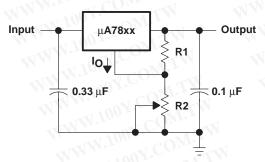


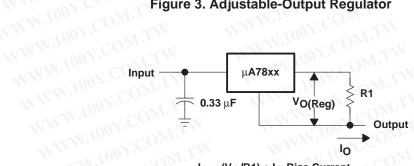
Figure 2. Positive Regulator in Negative Configuration (V_I Must Float)



NOTE A: The following formula is used when V_{XX} is the nominal output voltage (output to common) of the fixed regulator:

$$V_{O} = V_{xx} + \left(\frac{V_{xx}}{R1} + I_{Q}\right)R2$$

Figure 3. Adjustable-Output Regulator



 $I_O = (V_O/R1) + I_O$ Bias Current

Figure 4. Current Regulator

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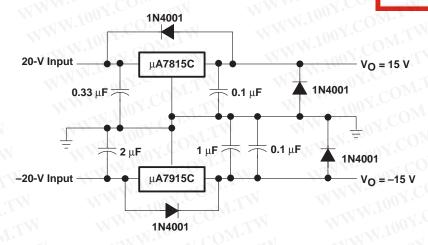


Figure 5. Regulated Dual Supply

operation with a load common to a voltage of opposite polarity

In many cases, a regulator powers a load that is not connected to ground but, instead, is connected to a voltage source of opposite polarity (e.g., operational amplifiers, level-shifting circuits, etc.). In these cases, a clamp diode should be connected to the regulator output as shown in Figure 6. This protects the regulator from output polarity reversals during startup and short-circuit operation.

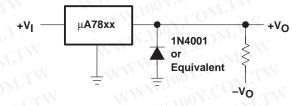


Figure 6. Output Polarity-Reversal-Protection Circuit

reverse-bias protection

Occasionally, the input voltage to the regulator can collapse faster than the output voltage. This can occur, for example, when the input supply is crowbarred during an output overvoltage condition. If the output voltage is greater than approximately 7 V, the emitter-base junction of the series-pass element (internal or external) could break down and be damaged. To prevent this, a diode shunt can be used as shown in Figure 7.

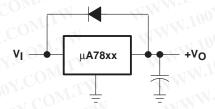


Figure 7. Reverse-Bias-Protection Circuit



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