

DESCRIPTION

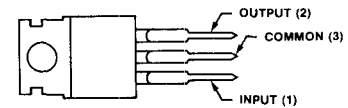
The 7800 series of monolithic Three-Terminal Positive Voltage Regulators employ internal current limiting, thermal shut-down and safe-area compensation, making them essentially indestructible. If adequate heat sinking is provided, they can deliver over 1A output current. They are intended as fixed-voltage regulators in a wide range of applications including local, on-card regulation for elimination of distribution problems associated with single point regulation. 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 as the power pass element in precision regulators.

FEATURES

- Output current in excess of 1 amp
- No external components
- Internal thermal overload protection
- Internal short circuit current limiting
- Output transistor safe-area compensation
- Available in the TO-220 and the TO-3 package
- Output voltages of 5, 6, 8, 12, 14, 15, 18, and 24 volts
- Mil std 883 A, B, C available

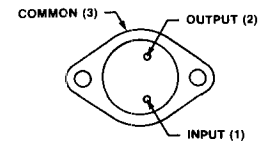
PIN CONFIGURATION

U PACKAGE (TO-220)



OUTPUT VOLTAGE	ORDER PART NO.
5V	7805CU/SA7805CU
6V	7806CU/SA7806CU
8V	7808CU/SA7808CU
12V	7812CU/SA7812CU
13.8V	7814CU/SA7814CU
15V	7815CU/SA7815CU
18V	7818CU/SA7818CU
24V	7824CU/SA7824CU

DA PACKAGE (TO-3)



OUTPUT VOLTAGE	ORDER PART NO.
5V	7805DA/SA7805CDA
6V	7806DA/SA7806CDA
8V	7808DA/SA7808CDA
12V	7812DA/SA7812CDA
13.8V	7814DA/SA7814CDA
15V	7815DA/SA7815CDA
18V	7818DA/SA7818CDA
24V	7824DA/SA7824CDA
5V	7805CDA
6V	7806CDA
8V	7808CDA
12V	7812CDA
13.8V	7814CDA
15V	7815CDA
18V	7818CDA
24V	7824CDA

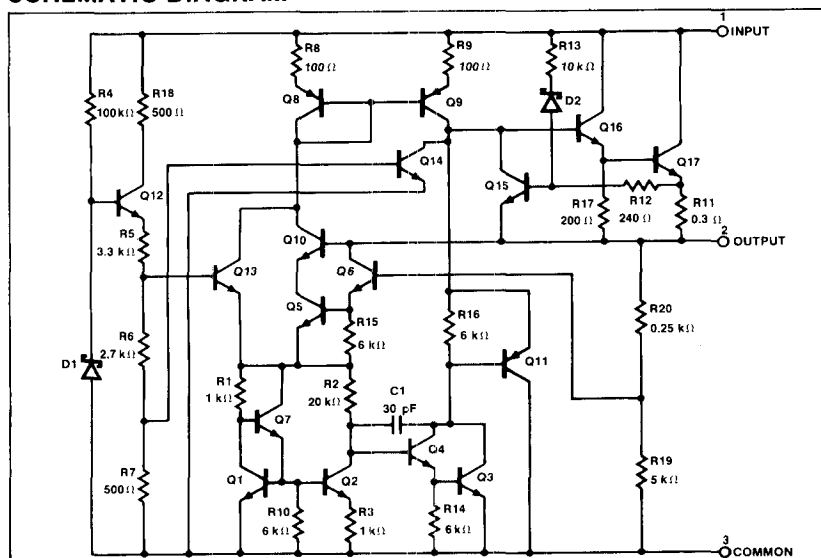
ABSOLUTE MAXIMUM RATINGS

PARAMETER	RATING	UNIT
Input voltage	35	V
5V through 12V	40	V
14V through 24V	Internally limited	
Internal power dissipation ¹	-65 to +150	°C
Storage temperature range		
Operating junction temperature range ²		
7800	-55 to +150	°C
SA7800C	-40 to +85	°C
7800C	0 to +125	°C
Lead temperature		
TO-3 package (soldering, 60 second time limit)	300	°C
TO-220 package (soldering, 60 second time limit)	230	°C

NOTES

- Thermal resistance of the packages (without a heat sink)
 Junction to case: TO-3 package 4° C/W; TO-220 package 2° C/W
 Junction to ambient: TO-3 package 35° C/W; TO-220 package 50° C/W
- Operating ambient temperature range
 7800 -55° C to +125° C
 7800C 0° C to +85° C
 SA7800C -40° C to +85° C

SCHEMATIC DIAGRAM



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DC ELECTRICAL CHARACTERISTICS $I_{OUT} = 500\text{mA}$, $C_{IN} = 0.33\mu\text{F}$, $C_{OUT} = 0.1\mu\text{F}$, $T_J = 25^\circ\text{C}$
unless otherwise specified.

PARAMETER	TEST CONDITIONS	7805 ¹			7805C ¹			UNIT
		Min	Typ	Max	Min	Typ	Max	
V _{OUT} Output voltage		$V_{IN} = 10\text{V}$ 4.8 5.0 5.2			$V_{IN} = 10\text{V}$ 4.8 5.0 5.2			V
	Over temp. ¹ , $5\text{mA} \leq I_{OUT} \leq 1.0\text{A}$, $P_D \leq 15\text{W}$	$8\text{V} \leq V_{IN} \leq 20\text{V}$ 4.65 5.35			$7\text{V} \leq V_{IN} \leq 25\text{V}$ 4.75 5.25			V
Line regulation		$7\text{V} \leq V_{IN} \leq 25\text{V}$ 3 50			$7\text{V} \leq V_{IN} \leq 25\text{V}$ 3 100			mV
		$8\text{V} \leq V_{IN} \leq 12\text{V}$ 1 25			$8\text{V} \leq V_{IN} \leq 12\text{V}$ 1 50			mV
Load regulation	$5\text{mA} \leq I_{OUT} \leq 1.5\text{A}$ $250\text{mA} \leq I_{OUT} \leq 750\text{mA}$	15 50			15 100			mV
		5 25			5 50			mV
I _{CC}		4.2 6.0			4.2 8.0			mA
ΔI _{CC}	Over temp. ¹ , with line	$8\text{V} \leq V_{IN} \leq 25\text{V}$ 0.8			$7\text{V} \leq V_{IN} \leq 25\text{V}$ 1.3			mA
	With load, $5\text{mA} \leq I_{OUT} \leq 1.0\text{A}$	0.5			0.5			mA
Output noise voltage	$10\text{Hz} \leq f \leq 100\text{kHz}$	40			40			μV
Voltage drift		20			20			mV/1000hrs.
Ripple rejection	Over temp. ¹ , $f = 120\text{Hz}$	$8\text{V} \leq V_{IN} \leq 18\text{V}$ 68 78			$8\text{V} \leq V_{IN} \leq 18\text{V}$ 62 78			dB
Dropout voltage	$I_{OUT} = 1.0\text{A}$	2.0			2.0			V
Output resistance	$f = 1\text{kHz}$	17			17			mΩ
I _{SC}		750			750			mA
Peak output current		2.2			2.2			A
V _{OUT} Output temperature drift	$I_{OUT} = 5\text{mA}$	$0^\circ\text{C} \leq T_J \leq 150^\circ\text{C}$ -1.1			$0^\circ\text{C} \leq T_J \leq 125^\circ\text{C}$ -1.1			mV/°C

DC ELECTRICAL CHARACTERISTICS (Cont'd) $I_{OUT} = 500\text{mA}$, $C_{IN} = 0.33\mu\text{F}$, $C_{OUT} = 0.1\mu\text{F}$, $T_J = 25^\circ\text{C}$
unless otherwise specified.

PARAMETER	TEST CONDITIONS	7806 ¹			7806C ¹			UNIT
		Min	Typ	Max	Min	Typ	Max	
V _{OUT} Output voltage		$V_{IN} = 11\text{V}$ 5.75 6.0 6.25			$V_{IN} = 11\text{V}$ 5.75 6.0 6.25			V
	Over temp. ¹ , $5\text{mA} \leq I_{OUT} \leq 1.0\text{A}$, $P_D \leq 15\text{W}$	$9\text{V} \leq V_{IN} \leq 21\text{V}$ 5.65 6.35			$8\text{V} \leq V_{IN} \leq 21\text{V}$ 5.7 6.3			V
Line regulation		$8\text{V} \leq V_{IN} \leq 25\text{V}$ 5 60			$8\text{V} \leq V_{IN} \leq 25\text{V}$ 5 120			mV
		$9\text{V} \leq V_{IN} \leq 13\text{V}$ 1.5 30			$9\text{V} \leq V_{IN} \leq 13\text{V}$ 1.5 60			mV
Load regulation	$5\text{mA} \leq I_{OUT} \leq 1.5\text{A}$ $250\text{mA} \leq I_{OUT} \leq 750\text{mA}$	14 60			14 120			mV
		4 30			4 60			mV
I _{CC}		4.3 6.0			4.3 8.0			mA
ΔI _{CC}	Over temp. ¹ , with line	$9\text{V} \leq V_{IN} \leq 25\text{V}$ 0.8			$8\text{V} \leq V_{IN} \leq 25\text{V}$ 1.3			mA
	With load, $5\text{mA} \leq I_{OUT} \leq 1.0\text{A}$	0.5			0.5			mA
Output noise voltage	$10\text{Hz} \leq f \leq 100\text{kHz}$	45			45			μV
Voltage drift		24			24			mV/1000hrs.
Ripple rejection	Over temp. ¹ , $f = 120\text{Hz}$	$9\text{V} \leq V_{IN} \leq 19\text{V}$ 65 75			$9\text{V} \leq V_{IN} \leq 19\text{V}$ 59 75			dB
Dropout voltage	$I_{OUT} = 1.0\text{A}$	2.0			2.0			V
Output resistance	$f = 1\text{kHz}$	19			19			mΩ
I _{SC}		550			550			mA
Peak output current		2.2			2.2			A
V _{OUT} Output temperature drift	$I_{OUT} = 5\text{mA}$	$0^\circ\text{C} \leq T_J \leq 150^\circ\text{C}$ -0.8			$0^\circ\text{C} \leq T_J \leq 125^\circ\text{C}$ -0.8			mV/°C

NOTES

- 55°C ≤ T_J ≤ 150°C for 7800
- 0°C ≤ T_J ≤ 125°C for 7800C
- 40°C ≤ T_J ≤ +125°C for SA7800C

DC ELECTRICAL CHARACTERISTICS (Cont'd) $I_{OUT} = 500\text{mA}$, $C_{IN} = 0.33\mu\text{F}$, $C_{OUT} = 0.1\mu\text{F}$, $T_J = 25^\circ\text{C}$ unless otherwise specified.

PARAMETER	TEST CONDITIONS	7808 ¹			7808C ¹			UNIT
		Min	Typ	Max	Min	Typ	Max	
V _{OUT} Output voltage	Over temp., $5\text{mA} \leq I_{OUT} \leq 1.0\text{A}$, $P_D \leq 15\text{W}$	$V_{IN} = 14\text{V}$			$V_{IN} = 14\text{V}$			V
		7.7	8.0	8.3	7.7	8.0	8.3	V
Line regulation		$10.5\text{V} \leq V_{IN} \leq 25\text{V}$			$10.5\text{V} \leq V_{IN} \leq 25\text{V}$			mV
			6	80		6	160	mV
Load regulation	$5\text{mA} \leq I_{OUT} \leq 1.5\text{A}$ $250\text{mA} \leq I_{OUT} \leq 750\text{mA}$	$11\text{V} \leq V_{IN} \leq 17\text{V}$			$11\text{V} \leq V_{IN} \leq 17\text{V}$			mV
			2	40		2	80	mV
I _{CC}			4.3	6.0		4.3	8.0	mA
ΔI _{CC}	Over temp., ¹ with line	$11.5\text{V} \leq V_{IN} \leq 25\text{V}$			$10.5\text{V} \leq V_{IN} \leq 25\text{V}$			mA
	With load, $5\text{mA} \leq I_{OUT} \leq 1.0\text{A}$			0.8			1.0	mA
Output noise voltage	$10\text{Hz} \leq f \leq 100\text{kHz}$		52			52		μV
Voltage drift				32			32	mV/1000hrs.
Ripple rejection	Over temp., ¹ $f = 120\text{Hz}$	$11.5\text{V} \leq V_{IN} \leq 21.5\text{V}$			$11.5\text{V} \leq V_{IN} \leq 21.5\text{V}$			dB
		62	72		56	72		
Dropout voltage	$I_{OUT} = 1.0\text{A}$		2.0			2.0		V
Output resistance	$f = 1\text{kHz}$		16			16		mΩ
I _{SC}			450			450		mA
Peak output current			2.2			2.2		A
V _{OUT} Output temperature drift	$I_{OUT} = 5\text{mA}$	$0^\circ\text{C} \leq T_J \leq 150^\circ\text{C}$			$0^\circ\text{C} \leq T_J \leq 125^\circ\text{C}$			mV/°C
			-0.8			-0.8		

DC ELECTRICAL CHARACTERISTICS (Cont'd) $I_{OUT} = 500\text{mA}$, $C_{IN} = 0.33\mu\text{F}$, $C_{OUT} = 0.1\mu\text{F}$, $T_J = 25^\circ\text{C}$ unless otherwise specified.

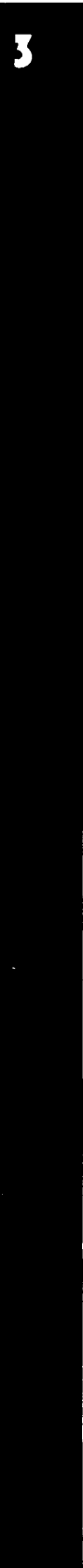
PARAMETER	TEST CONDITIONS	7812 ¹			7812C ¹			UNIT
		Min	Typ	Max	Min	Typ	Max	
V _{OUT} Output voltage	Over temp., ¹ $5\text{mA} \leq I_{OUT} \leq 1.0\text{A}$, $P_D \leq 15\text{W}$	$V_{IN} = 19\text{V}$			$V_{IN} = 19\text{V}$			V
		11.5	12.0	12.5	11.5	12.0	12.5	V
Line regulation		$15.5\text{V} \leq V_{IN} \leq 27\text{V}$			$14.5\text{V} \leq V_{IN} \leq 27\text{V}$			mV
				12.6			12.6	mV
Load regulation	$5\text{mA} \leq I_{OUT} \leq 1.5\text{A}$ $250\text{mA} \leq I_{OUT} \leq 750\text{mA}$	$14.5\text{V} \leq V_{IN} \leq 30\text{V}$			$14.5\text{V} \leq V_{IN} \leq 30\text{V}$			mV
			10	120		10	240	mV
I _{CC}		$16\text{V} \leq V_{IN} \leq 22\text{V}$			$16\text{V} \leq V_{IN} \leq 22\text{V}$			mV
			3	60		3	120	mV
ΔI _{CC}	Over temp., ¹ with line	$15\text{V} \leq V_{IN} \leq 30\text{V}$			$14.5\text{V} \leq V_{IN} \leq 30\text{V}$			mA
	With load, $5\text{mA} \leq I_{OUT} \leq 1.0\text{A}$			0.8			1.0	mA
Output noise voltage	$10\text{Hz} \leq f \leq 100\text{kHz}$		75			75		μV
Voltage drift				48			48	mV/1000hrs.
Ripple rejection	Over temp., ¹ $f = 120\text{Hz}$	$15\text{V} \leq V_{IN} \leq 25\text{V}$			$15\text{V} \leq V_{IN} \leq 25\text{V}$			dB
		61	71		55	71		
Dropout voltage	$I_{OUT} = 1.0\text{A}$		2.0			2.0		V
Output resistance	$f = 1\text{kHz}$		18			18		mΩ
I _{SC}			350			350		mA
Peak output current			2.2			2.2		A
V _{OUT} Output temperature drift	$I_{OUT} = 5\text{mA}$	$0^\circ\text{C} \leq T_J \leq 150^\circ\text{C}$			$0^\circ\text{C} \leq T_J \leq 125^\circ\text{C}$			mV/°C
			-1.0			-1.0		

DC ELECTRICAL CHARACTERISTICS (Cont'd) $I_{OUT} = 500\text{mA}$, $C_{IN} = 0.33\mu\text{F}$, $C_{OUT} = 0.1\mu\text{F}$, $T_J = 25^\circ\text{C}$ unless otherwise specified.

PARAMETER	TEST CONDITIONS	7814 ¹			7814C ¹			UNIT
		Min	Typ	Max	Min	Typ	Max	
V _{OUT} Output voltage	Over temp. ¹ $5\text{mA} \leq I_{OUT} \leq 1.0\text{A}$, $P_D \leq 15\text{W}$	$V_{IN} = 22\text{V}$ 13.3 13.8 14.3			$V_{IN} = 22\text{V}$ 13.3 13.8 14.3			V
		$17.5\text{V} \leq V_{IN} \leq 29\text{V}$ 13.15 14.45			$16.5\text{V} \leq V_{IN} \leq 29\text{V}$ 13.15 14.95			V
Line regulation		$16.5\text{V} \leq V_{IN} \leq 30\text{V}$ 10 140			$16.5\text{V} \leq V_{IN} \leq 30\text{V}$ 10 280			mV
		$19\text{V} \leq V_{IN} \leq 25\text{V}$ 3 70			$19\text{V} \leq V_{IN} \leq 25\text{V}$ 3 140			mV
Load regulation	$5\text{mA} \leq I_{OUT} \leq 1.5\text{A}$	12 140			12 280			mV
	$250\text{mA} \leq I_{OUT} \leq 750\text{mA}$	4 70			4 140			mV
I _{CC}		4.3 6.0			4.3 8.0			mA
ΔI _{CC}	Over temp. ¹ with line	$17\text{V} \leq V_{IN} \leq 30\text{V}$ 0.8			$16.5\text{V} \leq V_{IN} \leq 30\text{V}$ 1.0			mA
	With load, $5\text{mA} \leq I_{OUT} \leq 1.0\text{A}$	0.5			0.5			mA
Output noise voltage	$10\text{Hz} \leq f \leq 100\text{kHz}$	85			85			μV
Voltage drift		56			56			mV/1000hrs.
Ripple rejection	Over temp. ¹ $f = 120\text{Hz}$	$17\text{V} \leq V_{IN} \leq 27\text{V}$ 54 70			$17\text{V} \leq V_{IN} \leq 27\text{V}$ 60 70			dB
Dropout voltage	$I_{OUT} = 1.0\text{A}$	2.0			2.0			V
Output resistance	$f = 1\text{kHz}$	18			18			mΩ
I _{SC}		350			350			mA
Peak output current		2.2			2.2			A
V _{OUT} Output temperature drift	$I_{OUT} = 5\text{mA}$	$0^\circ\text{C} \leq T_J \leq 150^\circ\text{C}$ 1.0			$0^\circ\text{C} \leq T_J \leq 125^\circ\text{C}$ 1.0			mV/°C

DC ELECTRICAL CHARACTERISTICS (Cont'd) $I_{OUT} = 500\text{mA}$, $C_{IN} = 0.33\mu\text{F}$, $C_{OUT} = 0.1\mu\text{F}$, $T_J = 25^\circ\text{C}$ unless otherwise specified.

PARAMETER	TEST CONDITIONS	7815 ¹			7815C ¹			UNIT
		Min	Typ	Max	Min	Typ	Max	
V _{OUT} Output voltage	Over temp. ¹ $5\text{mA} \leq I_{OUT} \leq 1.0\text{A}$, $P_D \leq 15\text{W}$	$V_{IN} = 23\text{V}$ 14.4 15.0 15.6			$V_{IN} = 23\text{V}$ 14.4 15.0 15.6			V
		$18.5\text{V} \leq V_{IN} \leq 30\text{V}$ 14.25 15.75			$17.5\text{V} \leq V_{IN} \leq 30\text{V}$ 14.25 15.75			V
Line regulation		$17.5\text{V} \leq V_{IN} \leq 30\text{V}$ 11 150			$17.5\text{V} \leq V_{IN} \leq 30\text{V}$ 11 300			mV
		$20\text{V} \leq V_{IN} \leq 26\text{V}$ 3 75			$20\text{V} \leq V_{IN} \leq 26\text{V}$ 3 150			mV
Load regulation	$5\text{mA} \leq I_{OUT} \leq 1.5\text{A}$	12 150			12 300			mV
	$250\text{mA} \leq I_{OUT} \leq 750\text{mA}$	4 75			4 150			mV
I _{CC}		4.4 6.0			4.4 8.0			mA
ΔI _{CC}	Over temp. ¹ with line	$18.5\text{V} \leq V_{IN} \leq 30\text{V}$ 0.8			$17.5\text{V} \leq V_{IN} \leq 30\text{V}$ 1.0			mA
	With load, $5\text{mA} \leq I_{OUT} \leq 1.0\text{A}$	0.5			0.5			mA
Output noise voltage	$10\text{Hz} \leq f \leq 100\text{kHz}$	90			90			μV
Voltage drift		60			60			mV/1000hrs.
Ripple rejection	Over temp. ¹ $f = 120\text{Hz}$	$18.5\text{V} \leq V_{IN} \leq 28.5\text{V}$ 60 70			$18.5\text{V} \leq V_{IN} \leq 28.5\text{V}$ 54 70			dB
Dropout voltage	$I_{OUT} = 1.0\text{A}$	2.0			2.0			V
Output resistance	$f = 1\text{kHz}$	19			19			mΩ
I _{SC}		230			230			mA
Peak output current		2.1			2.1			A
V _{OUT} Output temperature drift	$I_{OUT} = 5\text{mA}$	$0^\circ\text{C} \leq T_J \leq 150^\circ\text{C}$ -1.0			$0^\circ\text{C} \leq T_J \leq 125^\circ\text{C}$ -1.0			mV/°C



DC ELECTRICAL CHARACTERISTICS (Cont'd) $I_{OUT} = 500\text{mA}$, $C_{IN} = 0.33\mu\text{F}$, $C_{OUT} = 0.1\mu\text{F}$, $T_J = 25^\circ\text{C}$
unless otherwise specified.

PARAMETER	TEST CONDITIONS	7818 ¹			7818C ¹			UNIT
		Min	Typ	Max	Min	Typ	Max	
V_{OUT} Output voltage	Over temp. ¹ $5\text{mA} \leq I_{OUT} \leq 1.0\text{A}$, $P_D \leq 15\text{W}$	$V_{IN} = 27\text{V}$			$V_{IN} = 27\text{V}$			V
		17.3	18.0	18.7	17.3	18.0	18.7	V
Line regulation		$22\text{V} \leq V_{IN} \leq 33\text{V}$			$21\text{V} \leq V_{IN} \leq 33\text{V}$			mV
		17.1		18.9	17.1		18.9	mV
Load regulation	$5\text{mA} \leq I_{OUT} \leq 1.5\text{A}$ $250\text{mA} \leq I_{OUT} \leq 750\text{mA}$	$21\text{V} \leq V_{IN} \leq 33\text{V}$			$21\text{V} \leq V_{IN} \leq 33\text{V}$			mV
			15	180		15	360	mV
I_{CC}		$24\text{V} \leq V_{IN} \leq 30\text{V}$			$24\text{V} \leq V_{IN} \leq 30\text{V}$			mV
			5	90		5	180	mV
ΔI_{CC}	Over temp. ¹ with line With load, $5\text{mA} \leq I_{OUT} \leq 1.0\text{A}$							mA
			12	180		12	360	mA
Output noise voltage	$10\text{Hz} \leq f \leq 100\text{kHz}$		4	90		4	180	μV
Voltage drift			4.5	6.0		4.5	8.0	mV/1000hrs.
Ripple rejection	Over temp. ¹ $f = 120\text{Hz}$	$22\text{V} \leq V_{IN} \leq 32\text{V}$			$22\text{V} \leq V_{IN} \leq 32\text{V}$			dB
Dropout voltage	$I_{OUT} = 1.0\text{A}$	59	69		53	69		V
Output resistance	$f = 1\text{kHz}$		2.0			2.0		mΩ
I_{SC}			22			22		mA
Peak output current			200			200		A
V_{OUT} Output temperature drift	$I_{OUT} = 5\text{mA}$	$0^\circ\text{C} \leq T_J \leq 150^\circ\text{C}$			$0^\circ\text{C} \leq T_J \leq 125^\circ\text{C}$			mV/°C
			-1.0			-1.0		

DC ELECTRICAL CHARACTERISTICS (Cont'd) $I_{OUT} = 500\text{mA}$, $C_{IN} = 0.33\mu\text{F}$, $C_{OUT} = 0.1\mu\text{F}$, $T_J = 25^\circ\text{C}$
unless otherwise specified.

PARAMETER	TEST CONDITIONS	7824 ¹			7824C ¹			UNIT
		Min	Typ	Max	Min	Typ	Max	
V_{OUT} Output voltage	Over temp. ¹ $5\text{mA} \leq I_{OUT} \leq 1.0\text{A}$, $P_D \leq 15\text{W}$	$V_{IN} = 33\text{V}$			$V_{IN} = 33\text{V}$			V
		23.0	24.0	25.0	23.0	24.0	25.0	V
Line regulation		$28\text{V} \leq V_{IN} \leq 38\text{V}$			$28\text{V} \leq V_{IN} \leq 38\text{V}$			mV
		22.8		25.2	22.8		25.2	mV
Load regulation	$5\text{mA} \leq I_{OUT} \leq 1.5\text{A}$ $250\text{mA} \leq I_{OUT} \leq 750\text{mA}$	$27\text{V} \leq V_{IN} \leq 38\text{V}$			$27\text{V} \leq V_{IN} \leq 38\text{V}$			mV
			18	240		18	480	mV
I_{CC}		$30\text{V} \leq V_{IN} \leq 36\text{V}$			$30\text{V} \leq V_{IN} \leq 36\text{V}$			mV
			6	120		6	240	mV
ΔI_{CC}	Over temp. ¹ with line With load, $5\text{mA} \leq I_{OUT} \leq 1.0\text{A}$							mA
			12	240		12	480	mA
Output noise voltage	$10\text{Hz} \leq f \leq 100\text{kHz}$		4	120		4	240	μV
Voltage drift			4.6	6.0		4.6	8.0	mV/1000hrs.
Ripple rejection	Over temp. ¹ $f = 120\text{Hz}$	$28\text{V} \leq V_{IN} \leq 38\text{V}$			$27\text{V} \leq V_{IN} \leq 38\text{V}$			dB
Dropout voltage	$I_{OUT} = 1.0\text{A}$	56	66		50	66		V
Output resistance	$f = 1\text{kHz}$		2.0			2.0		mΩ
I_{SC}			28			28		mA
Peak output current			150			150		A
V_{OUT} Output temperature drift	$I_{OUT} = 5\text{mA}$	$0^\circ\text{C} \leq T_J \leq 150^\circ\text{C}$			$0^\circ\text{C} \leq T_J \leq 125^\circ\text{C}$			mV/°C
			-1.5			-1.5		



DC ELECTRICAL CHARACTERISTICS (Cont'd) $I_{OUT} = 500mA$, $C_{IN} = 0.33\mu F$, $C_{OUT} = 0.1\mu F$, $T_J = 25^\circ C$ unless otherwise specified.

PARAMETER	TEST CONDITIONS	SA7805C ²			SA7806C ²			UNIT
		Min	Typ	Max	Min	Typ	Max	
V _{OUT} Output voltage	Over temp. ² ; $5mA \leq I_{OUT} \leq 1.0A$, $P_D \leq 15W$	$V_{IN} = 10V$ 4.8 5.0 5.2			$V_{IN} = 11V$ 5.75 6.0 6.25			V
		$7V \leq V_{IN} \leq 25V$ 4.65 5.35			$8V \leq V_{IN} \leq 25V$ 5.65 6.35			V
Line regulation		$7V \leq V_{IN} \leq 25V$ 3 100			$8V \leq V_{IN} \leq 25V$ 5 120			mV
		$8V \leq V_{IN} \leq 12V$ 1 50			$9V \leq V_{IN} \leq 13V$ 1.5 60			mV
Load regulation	$5mA \leq I_{OUT} \leq 1.5A$ $250mA \leq I_{OUT} \leq 750mA$	15 100			14 120			mV
		5 50			4 60			mV
I _{CC}		4.2 8.0			4.3 8.0			mA
ΔI _{CC}	Over temp. ² ; with line	$7V \leq V_{IN} \leq 25V$ 0.8			$8V \leq V_{IN} \leq 25V$ 0.8			mA
	With load, $5mA \leq I_{OUT} \leq 1.0A$	0.3			0.3			mA
Output noise voltage	$10Hz \leq f \leq 100kHz$	40			45			μV
Voltage drift		20			24			mV/1000hrs.
Ripple rejection	Over temp. ² ; $f = 120Hz$	$8V \leq V_{IN} \leq 18V$ 62 78			$9V \leq V_{IN} \leq 19V$ 59 75			dB
Dropout voltage	$I_{OUT} = 1.0A$	2.0			2.0			V
Output resistance	$f = 1kHz$	17			19			mΩ
I _{SC}		750			550			mA
Peak output current		2.2			2.2			A
V _{OUT} Output temperature drift	$0^\circ C \leq T_J \leq 125^\circ C$ $I_{OUT} = 5mA$	-1.1			-0.8			mV/°C

DC ELECTRICAL CHARACTERISTICS (Cont'd) $I_{OUT} = 500mA$, $C_{IN} = 0.33\mu F$, $C_{OUT} = 0.1\mu F$, $T_J = 25^\circ C$ unless otherwise specified.

PARAMETER	TEST CONDITIONS	SA7808C ²			SA7812C ²			UNIT
		Min	Typ	Max	Min	Typ	Max	
V _{OUT} Output voltage	Over temp. ² ; $5mA \leq I_{OUT} \leq 1.0A$, $P_D \leq 15W$	$V_{IN} = 14V$ 7.7 8.0 8.3			$V_{IN} = 19V$ 11.5 12.0 12.5			V
		$10.5V \leq V_{IN} \leq 23V$ 7.6 8.4			$14.5V \leq V_{IN} \leq 27V$ 11.4 12.6			V
Line regulation		$10.5V \leq V_{IN} \leq 25V$ 6 160			$14.5V \leq V_{IN} \leq 30V$ 10 240			mV
		$11V \leq V_{IN} \leq 17V$ 2 80			$16V \leq V_{IN} \leq 22V$ 3 120			mV
Load regulation	$5mA \leq I_{OUT} \leq 1.5A$ $250mA \leq I_{OUT} \leq 750mA$	12 160			12 240			mV
		4 80			4 120			mV
I _{CC}		4.3 8.0			4.3 8.0			mA
ΔI _{CC}	Over temp. ² ; with line	$10.5V \leq V_{IN} \leq 25V$ 0.8			$14.5V \leq V_{IN} \leq 30V$ 0.8			mA
	With load, $5mA \leq I_{OUT} \leq 1.0A$	0.3			0.3			mA
Output noise voltage	$10Hz \leq f \leq 100kHz$	52			75			μV
Voltage drift		32			48			mV/1000hrs.
Ripple rejection	Over temp. ² ; $f = 120Hz$	$11.5V \leq V_{IN} \leq 21.5V$ 56 72			$15V \leq V_{IN} \leq 25V$ 61 71			dB
Dropout voltage	$I_{OUT} = 1.0A$	2.0			2.0			V
Output resistance	$f = 1kHz$	16			18			mΩ
I _{SC}		450			350			mA
Peak output current		2.2			2.2			A
V _{OUT} Output temperature drift	$0^\circ C \leq T_J \leq 125^\circ C$ $I_{OUT} = 5mA$	-0.8			-1.0			mV/°C

DC ELECTRICAL CHARACTERISTICS (Cont'd) $I_{OUT} = 500\text{mA}$, $C_{IN} = 0.33\mu\text{F}$, $C_{OUT} = 0.1\mu\text{F}$, $T_J = 25^\circ\text{C}$ unless otherwise specified.

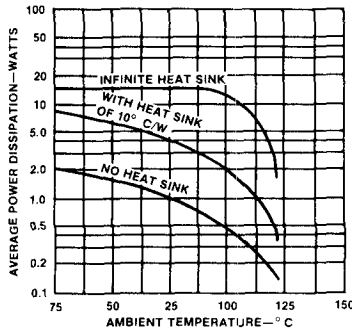
PARAMETER	TEST CONDITIONS	SA7814C ²			SA7815C ²			UNIT
		Min	Typ	Max	Min	Typ	Max	
V _{OUT} Output voltage	Over temp. ² ; $5\text{mA} \leq I_{OUT} \leq 1.0\text{A}$, $P_D \leq 15\text{W}$	$V_{IN} = 22\text{V}$ 13.3 13.8 14.3			$V_{IN} = 23\text{V}$ 14.4 15.0 15.6			V
		$16.5\text{V} \leq V_{IN} \leq 29\text{V}$ 13.15 14.95			$17.5 \leq V_{IN} \leq 30\text{V}$ 14.25 15.75			V
Line regulation		$16.5\text{V} \leq V_{IN} \leq 30\text{V}$ 10 280			$17.5\text{V} \leq V_{IN} \leq 30\text{V}$ 11 300			mV
		$19\text{V} \leq V_{IN} \leq 25\text{V}$ 3 140			$20\text{V} \leq V_{IN} \leq 26\text{V}$ 3 150			mV
Load regulation	$5\text{mA} \leq I_{OUT} \leq 1.5\text{A}$ $250\text{mA} \leq I_{OUT} \leq 750\text{mA}$	12 280			12 150			mV
		4 140			4 75			mV
I _{CC}		4.3 8.0			4.4 8.0			mA
I _{CC}	Over temp. ² ; with line With load, $5\text{mA} \leq I_{OUT} \leq 1.0\text{A}$	$16.5\text{V} \leq V_{IN} \leq 30\text{V}$ 0.8			$17.5\text{V} \leq V_{IN} \leq 30\text{V}$ 0.8			mA
		0.3			0.3			mA
Output noise voltage	$10\text{Hz} \leq f \leq 100\text{kHz}$	85			90			μV
Voltage drift		56			60			mV/1000hrs.
Ripple rejection	Over temp. ² ; $f = 120\text{Hz}$	$17\text{V} \leq V_{IN} \leq 27\text{V}$ 60 70			$18.5\text{V} \leq V_{IN} \leq 28.5\text{V}$ 60 70			dB
Dropout voltage	$I_{OUT} = 1.0\text{A}$	2.0			2.0			V
Output resistance	$f = 1\text{kHz}$	18			19			mΩ
I _{SC}		350			230			mA
Peak output current		2.2			2.1			A
V _{OUT} Output temperature drift	$0^\circ\text{C} \leq T_J \leq 125^\circ\text{C}$ $I_{OUT} = 5\text{mA}$	-1.0			-1.0			mV/°C

DC ELECTRICAL CHARACTERISTICS (Cont'd) $I_{OUT} = 500\text{mA}$, $C_{IN} = 0.33\mu\text{F}$, $C_{OUT} = 0.1\mu\text{F}$, $T_J = 25^\circ\text{C}$ unless otherwise specified.

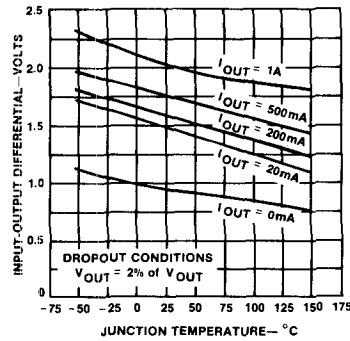
PARAMETER	TEST CONDITIONS	SA7818C ²			SA7824C ²			UNIT
		Min	Typ	Max	Min	Typ	Max	
V _{OUT} Output voltage	Over temp. ² ; $5\text{mA} \leq I_{OUT} \leq 1.0\text{A}$, $P_D \leq 15\text{W}$	$V_{IN} = 27\text{V}$ 17.3 18.0 18.7			$V_{IN} = 33\text{V}$ 23.0 24.0 25.0			V
		$21\text{V} \leq V_{IN} \leq 33\text{V}$ 17.1 18.9			$28\text{V} \leq V_{IN} \leq 38\text{V}$ 22.8 25.2			V
Line regulation		$21\text{V} \leq V_{IN} \leq 33\text{V}$ 15 360			$27\text{V} \leq V_{IN} \leq 38\text{V}$ 18 480			mV
		$24\text{V} \leq V_{IN} \leq 30\text{V}$ 5 180			$30\text{V} \leq V_{IN} \leq 36\text{V}$ 6 240			mV
Load regulation	$5\text{mA} \leq I_{OUT} \leq 1.5\text{A}$ $250\text{mA} \leq I_{OUT} \leq 750\text{mA}$	12 360			12 480			mV
		4 180			4 240			mV
I _{CC}		4.5 8.0			4.6 8.0			mA
I _{CC}	Over temp. ² ; with line With load, $5\text{mA} \leq I_{OUT} \leq 1.0\text{A}$	$21\text{V} \leq V_{IN} \leq 33\text{V}$ 0.8			$27\text{V} \leq V_{IN} \leq 38\text{V}$ 0.8			mA
		0.3			0.3			mA
Output noise voltage	$10\text{Hz} \leq f \leq 100\text{kHz}$	110			170			μV
Voltage drift		72			96			mV/1000hrs.
Ripple rejection	Over temp. ² ; $f = 120\text{Hz}$	$22\text{V} \leq V_{IN} \leq 32\text{V}$ 59 69			$27\text{V} \leq V_{IN} \leq 38\text{V}$ 56 66			dB
Dropout voltage	$I_{OUT} = 1.0\text{A}$	2.0			2.0			V
Output resistance	$f = 1\text{kHz}$	22			28			mΩ
I _{SC}		200			150			mA
Peak output current		2.1			2.1			A
V _{OUT} Output temperature drift	$0^\circ\text{C} \leq T_J \leq 125^\circ\text{C}$ $I_{OUT} = 5\text{mA}$	-1.0			-1.5			mV/°C

TYPICAL PERFORMANCE CHARACTERISTICS

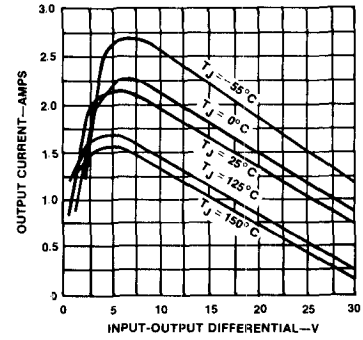
MAXIMUM AVERAGE POWER DISSIPATION AS A FUNCTION OF AMBIENT TEMPERATURE (TO-220, 7800C)



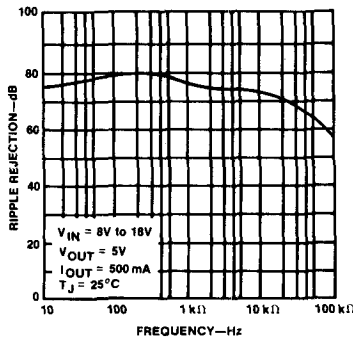
DROPOUT VOLTAGE AS A FUNCTION OF JUNCTION TEMPERATURE



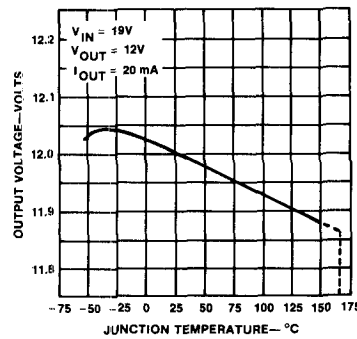
PEAK OUTPUT CURRENT AS A FUNCTION OF INPUT/OUTPUT DIFFERENTIAL VOLTAGE



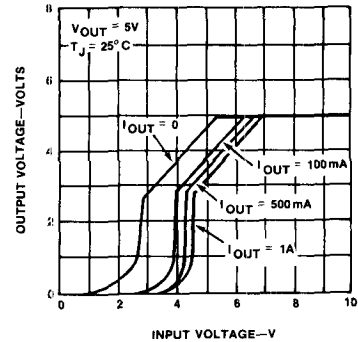
RIPPLE REJECTION AS A FUNCTION OF FREQUENCY



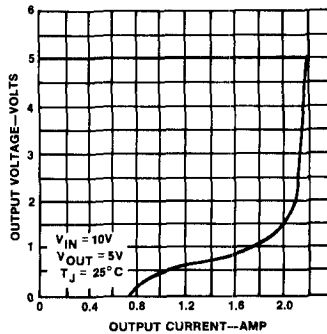
OUTPUT VOLTAGE AS A FUNCTION OF JUNCTION TEMPERATURE



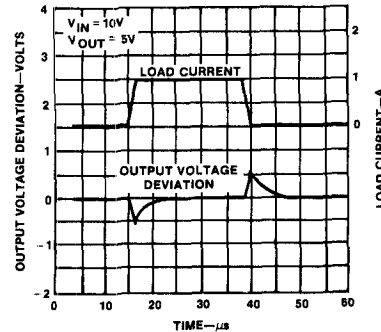
DROPOUT CHARACTERISTICS



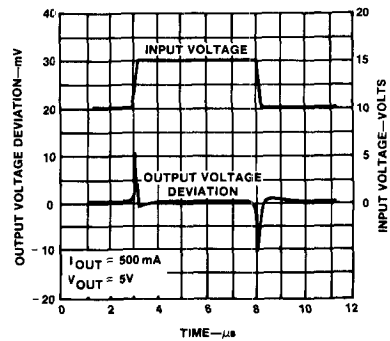
CURRENT LIMITING CHARACTERISTICS



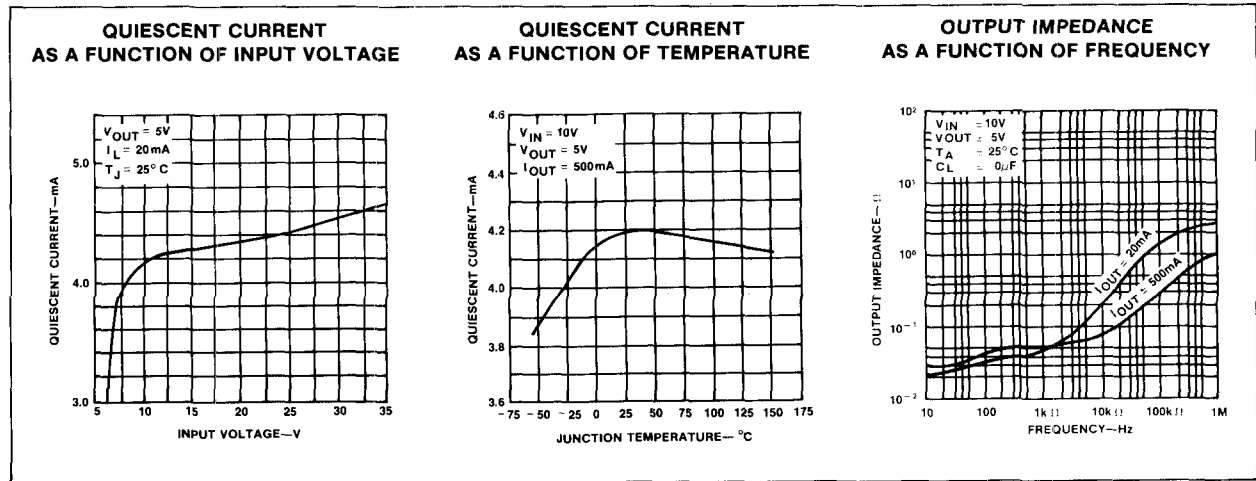
LOAD TRANSIENT RESPONSE



LINE TRANSIENT RESPONSE



TYPICAL PERFORMANCE CHARACTERISTICS (Cont'd)



EQUIVALENT TEST CIRCUITS

