

April 2010

LM78XX/LM78XXA 3-Terminal 1A Positive Voltage Regulator

Features

- Output Current up to 1A
- Output Voltages of 5, 6, 8, 9, 10, 12, 15, 18, 24
- Thermal Overload Protection
- Short Circuit Protection
- Output Transistor Safe Operating Area Protection

勝 特 力 材 料 886-3-5753170 胜特力电子(上海) 86-21-34970699 胜特力电子(深圳) 86-755-83298787 Http://www.100y.com.tw

General Description

The LM78XX series of three terminal positive regulators are available in the TO-220 package and with several fixed output voltages, making them useful in a wide range of applications. Each type employs internal current limiting, thermal shut down and safe operating area protection, making it essentially indestructible. If adequate heat sinking is provided, they can deliver over 1A output current. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltages and currents.

Ordering Information

Product Number	Output Voltage Tolerance	Package	Operating Temperature
LM7805CT	±4%	TO-220	-40°C to +125°C
LM7806CT	W.1		MAN. TO COM.
LM7808CT	M.TV WW.100		COM.
LM7809CT	WILLIAM WILLIAM		M. 1001. COM
LM7810CT	NTW WWW		WW. 1007.C
LM7812CT	COM TW WWW		WW 1100X.Co.
LM7815CT	COM. WWY		MMM. TOON CO
LM7818CT	CONLI		WWW.In COV.CO
LM7824CT	DY.COM.TV		MW.100
LM7805ACT	±2%		0°C to +125°C
LM7806ACT	100Y.COTTW W		LM MM. 100X
LM7808ACT	ONY.COME TW		LM MM 100
LM7809ACT	1.100 COM.		TW WWW.
LM7810ACT	W.100 T COM. 1		WWW.I
LM7812ACT	W.100X.COM.TV		M.I.
LM7815ACT	100X.COM.TW		M.TW WY
LM7818ACT	WW. 100X.CO.M.TW		M.TW WWW
LM7824ACT	WWW. CONT. TW		On TAN MAN

Block Diagram

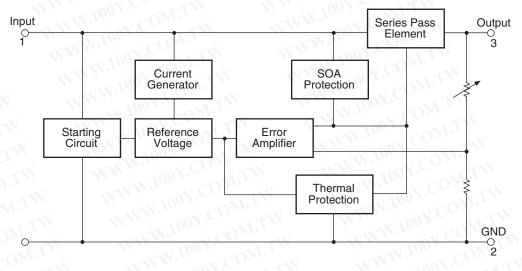


Figure 1.

Pin Assignment



Figure 2.

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Absolute Maximum Ratings

Absolute maximum ratings are those values beyond which damage to the device may occur. The datasheet specifications should be met, without exception, to ensure that the system design is reliable over its power supply, temperature, and output/input loading variables. Fairchild does not recommend operation outside datasheet specifications.

Symbol	Parar	neter	Value	Unit
VI	Input Voltage	V _O = 5V to 18V	35	V
	WWW.TOOY.COM	V _O = 24V	40	V
$R_{ heta JC}$	Thermal Resistance Junction	nal Resistance Junction-Cases (TO-220)		°C/W
$R_{\theta JA}$	Thermal Resistance Junction	on-Air (TO-220)	65	°C/W
T _{OPR}	Operating Temperature	LM78xx	-40 to +125	°C
	Range	LM78xxA	0 to +125	
T _{STG}	Storage Temperature Rang	je)	-65 to +150	°C

NW.100Y.C

Electrical Characteristics (LM7805)

Refer to the test circuits. -40°C < T_J < 125°C, I_O = 500mA, V_I = 10V, C_I = 0.1 μ F, unless otherwise specified.

Symbol	Parameter	M. I.	Conditions	Min.	Тур.	Max.	Unit
Vo	Output Voltage	T _J = +25°C	MW.Ioo	4.8	5.0	5.2	V
	MMM.1007.	$5mA \le I_O \le 3$ $V_I = 7V \text{ to } 20$	1A, P _O ≤ 15W, 0V	4.75	5.0	5.25	
Regline	Line Regulation ⁽¹⁾	$T_J = +25^{\circ}C$	V _O = 7V to 25V	1017-CA	4.0	100	mV
	WWW.too	I.COM.	V _I = 8V to 12V	OOT.C	1.6	50.0	
Regload	Load Regulation ⁽¹⁾	$T_{J} = +25^{\circ}C$	I _O = 5mA to 1.5A	-07Y.C	9.0	N 100	mV
	TWW.10	COM	I _O = 250mA to 750mA	- 10 - O.Y.	4.0	50.0	
la	Quiescent Current	$T_J = +25^{\circ}C$	WIX XIV	11.700	5.0	8.0	mA
ΔI_{Q}	Quiescent Current Change	$I_O = 5mA$ to	1A	11/100	0.03	0.5	mA
	V.TV WW	$V_1 = 7V \text{ to } 25$	5V	XX4.10	0.3	1.3	
$\Delta V_{O}/\Delta T$	Output Voltage Drift ⁽²⁾	$I_O = 5mA$	W.IN	- N.10	-0.8	W.TW	mV/°C
V _N	Output Noise Voltage	f = 10Hz to	100kHz, T _A = +25°C		42.0	ONETV	μV/V _O
RR	Ripple Rejection ⁽²⁾	f = 120Hz, V	_O = 8V to 18V	62.0	73.0	T.IV	dB
V _{DROP}	Dropout Voltage	I _O = 1A, T _J =	= +25°C	May	2.0		٧V
r _O	Output Resistance ⁽²⁾	f = 1kHz	= 1kHz		15.0	CO	mΩ
I _{SC}	Short Circuit Current	$V_{I} = 35V, T_{A}$	/ _I = 35V, T _A = +25°C		230	A'COM	mA
I _{PK}	Peak Current ⁽²⁾	$T_J = +25^{\circ}C$	COM	- 11	2.2	V.€OI	Α

Notes

- 1. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty is used.
- 2. These parameters, although guaranteed, are not 100% tested in production.

Electrical Characteristics (LM7806) (Continued)

Refer to the test circuits. -40°C < T_J < 125°C, I_O = 500mA, V_I = 11V, C_I = 0.33 μ F, C_O = 0.1 μ F, unless otherwise specified.

Symbol	Parameter	OWIT	Conditions	Min	Тур.	Max.	Unit
Vo	Output Voltage	$T_J = +25^{\circ}C$	M. 100	5.75	6.0	6.25	V
	MMM.1002	$5mA \le I_O \le 1$ $V_I = 8.0V \text{ to}$	IA, P _O ≤ 15W, 21V	5.7	6.0	6.3	
Regline	Line Regulation ⁽³⁾	$T_{J} = +25^{\circ}C$	V _I = 8V to 25V	OOF.Ce	5.0	120	mV
	N WWW.I	COM.	V _I = 9V to 13V	OTY.C	1.5	60.0	7
Regload	Load Regulation ⁽³⁾	$T_J = +25^{\circ}C$	I _O = 5mA to 1.5A	O.Y.	9.0	120	mV
	W W	100 r. CO	I _O = 250mA to 750mA	11.70	3.0	60.0	7
I _Q	Quiescent Current	$T_{J} = +25^{\circ}C$	M.TV	W 700	5.0	8.0	mA
ΔI_{Q}	Quiescent Current	$I_O = 5mA$ to	o 1A	CIV I .100	-1 CON	0.5	mA
	Change	$V_1 = 8V \text{ to } 25$	5V		03.	1.3	7
$\Delta V_{O}/\Delta T$	Output Voltage Drift ⁽⁴⁾	$I_O = 5mA$	COMITY	- TOTAL	-0.8	WE.M	mV/°C
V _N C	Output Noise Voltage	f = 10Hz to 1	100kHz, T _A = +25°C	MA	45.0	OVETV	μV/V _O
RR	Ripple Rejection ⁽⁴⁾	f = 120Hz, V	O = 8V to 18V	62.0	73.0	TIM	dB
V _{DROP}	Dropout Voltage	I _O = 1A, T _J =	: +25°C	14	2.0	COE	V
ro	Output Resistance ⁽⁴⁾	f = 1kHz		-WW	19.0	COM	mΩ
I _{SC}	Short Circuit Current	$V_I = 35V, T_A$	= +25°C	- 17/1	250	V.COM	mA
I _{PK}	Peak Current ⁽⁴⁾	$T_J = +25^{\circ}C$	Ton COM.	-	2.2	~ €O	Α

Notes:

- 3. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty is used.
- 4. These parameters, although guaranteed, are not 100% tested in production.

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Electrical Characteristics (LM7808) (Continued)

Refer to the test circuits. -40°C < T_J < 125°C, I_O = 500mA, V_I = 14V, C_I = 0.33 μ F, C_O = 0.1 μ F, unless otherwise specified.

Symbol	Parameter	W.T.	Conditions	Min.	Тур.	Max.	Unit
Vo	Output Voltage	$T_{J} = +25^{\circ}C$	M.100	7.7	8.0	8.3	٧
	MMM.100X.C	$5mA \le I_O \le 1A, P_O \le 15W,$ V _I = 10.5V to 23V		7.6	8.0	8.4	
Regline	Line Regulation ⁽⁵⁾	$T_{J} = +25^{\circ}C$	V _I = 10.5V to 25V	107-CO	5.0	160	mV
	N. M.M. 100	COM	V _I = 11.5V to 17V	ONT.C	2.0	0.08	
Regload	Load Regulation ⁽⁵⁾	$T_{J} = +25^{\circ}C$	I _O = 5mA to 1.5A	<u>-</u> 7.	10.0	(160	mV
	W 101	T COM	I _O = 250mA to 750mA	100	5.0	80.0	
IQ	Quiescent Current	$T_{J} = +25^{\circ}C$		N.700	5.0	8.0	mA
ΔI_{Q}	Quiescent Current Change	$I_O = 5mA$ to	1A	W.100	0.05	0.5	mA
	M.TW WWW	V _I = 10.5V to 25V		117.10	0.5	1.0	1
$\Delta V_{O}/\Delta T$	Output Voltage Drift ⁽⁶⁾	$I_O = 5mA$	OM.TW W	- - N.1	-0.8	MI	mV/°C
V _N C	Output Noise Voltage	f = 10Hz to	100kHz, T _A = +25°C	111	52.0	OVI.T	μV/V _O
RR	Ripple Rejection ⁽⁶⁾	f = 120Hz, V	_O = 11.5V to 21.5V	56.0	73.0	<u>-</u> 1.7	dB
V _{DROP}	Dropout Voltage	$I_O = 1A, T_J =$	= +25°C	MZN V	2.0	COZ	V
r _O	Output Resistance ⁽⁶⁾	f = 1kHz	31 100		17.0	CON	mΩ
I _{SC}	Short Circuit Current	$V_{I} = 35V, T_{A}$	= +25°C	-NV	230	4.GOD	mA
I _{PK}	Peak Current ⁽⁶⁾	$T_{J} = +25^{\circ}C$	COM		2.2	~ _ CO	Α

Notes:

- 5. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty is used.
- 6. These parameters, although guaranteed, are not 100% tested in production.

Electrical Characteristics (LM7809) (Continued)

Refer to the test circuits. -40°C < T_J < 125°C, I_O = 500mA, V_I = 15V, C_I = 0.33 μ F, C_O = 0.1 μ F, unless otherwise specified.

Symbol	Parameter	Wir .	Conditions		Тур.	Max.	Unit
Vo	Output Voltage	$T_{J} = +25^{\circ}C$	M. 100	8.65	9.0	9.35	V
	TW WWW.100X.		$5mA \le I_O \le 1A, P_O \le 15W,$ V _I = 11.5V to 24V		9.0	9.4	
Regline	Line Regulation ⁽⁷⁾	$T_J = +25^{\circ}C$	V _I = 11.5V to 25V	00¥.C¢	6.0	180	mV
	MWW.Ind. COM	I.COM.	V _I = 12V to 17V	1007.C	2.0	90.0	
Regload	Load Regulation ⁽⁷⁾	$T_J = +25^{\circ}C$	I _O = 5mA to 1.5A	<u>-07</u>	12.0	180	mV
	W W 10	or COM	I _O = 250mA to 750mA	N.To	4.0	90.0	
lQ	Quiescent Current	$T_J = +25^{\circ}C$	U.T.	W.100	5.0	8.0	mA
ΔI_{Q}	Quiescent Current Change	nt Current Change I _O = 5mA to 1A	NV+.101	707	0.5	mA	
	MIN WILL	V _I = 11.5V to 26V		W.10	W.1007 - COM.1	1.3	1
$\Delta V_{O}/\Delta T$	Output Voltage Drift ⁽⁸⁾	$I_O = 5mA$	OM.TW		0-1.0	OMITW	mV/°C
V _N	Output Noise Voltage	f = 10Hz to	100kHz, T _A = +25°C	MA	58.0	ON T	μV/V _O
RR	Ripple Rejection ⁽⁸⁾	f = 120Hz, V	_O = 13V to 23V	56.0	71.0	<u></u>	dB
V _{DROP}	Dropout Voltage	I _O = 1A, T _J =	= +25°C	A W	2.0	CO	V
ro	Output Resistance ⁽⁸⁾	f = 1kHz	= 1kHz		17.0	N'COM.	mΩ
I _{SC}	Short Circuit Current	$V_{I} = 35V, T_{A}$	/ _I = 35V, T _A = +25°C		250	N.EOD	mA
I _{PK}	Peak Current ⁽⁸⁾	$T_J = +25^{\circ}C$	OM:		2.2	~~CO	Α

Notes:

- Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty is used.
- 8. These parameters, although guaranteed, are not 100% tested in production.

Electrical Characteristics (LM7810) (Continued)

Refer to the test circuits. -40°C < T_J < 125°C, I_O = 500mA, V_I = 16V, C_I = 0.33 μ F, C_O = 0.1 μ F, unless otherwise specified.

Symbol	Parameter	W.r.	Conditions		Тур.	Max.	Unit
Vo	Output Voltage	$T_J = +25^{\circ}C$	WWW.1003	9.6	10.0	10.4	V
	WWW.100X.C		$5\text{mA} \le I_{\text{O}} \le 1\text{A}, P_{\text{O}} \le 15\text{W},$ $V_{\text{I}} = 12.5\text{V} \text{ to } 25\text{V}$		10.0	10.5	
Regline	Line Regulation ⁽⁹⁾	$T_J = +25^{\circ}C$	V _I = 12.5V to 25V	10.X ⁻	10.0	200	mV
	MM M. 100	I.COM.T	V _I = 13V to 25V	1007.	3.0	100	1
Regload	Load Regulation ⁽⁹⁾	$T_J = +25^{\circ}C$	I _O = 5mA to 1.5A	100X.	12.0	200	mV
	IN MAN.	ON.COM	I _O = 250mA to 750mA	N.180Y	4.0	400	
V. IQ	Quiescent Current	$T_J = +25^{\circ}C$	WITH WIN	7V 700	5.1	8.0	mA
ΔI_{Q}	Quiescent Current Change	$I_O = 5mA$ to	1A	WW.10	7.4	0.5	mA
	WIN WWW	V _I = 12.5V to	29V		07-	1.0	
$\Delta V_{O}/\Delta T$	Output Voltage Drift ⁽¹⁰⁾	$I_O = 5mA$	W.T.W	1 N _	-1.0	ONET	mV/°C
V _N	Output Noise Voltage	f = 10Hz to 1	00kHz, T _A = +25°C	<u> </u>	58.0	20 <u>4</u> 1.1	μV/V _O
RR	Ripple Rejection ⁽¹⁰⁾	f = 120Hz, V	O = 13V to 23V	56.0	71.0	COM!	dB
V _{DROP}	Dropout Voltage	I _O = 1A, T _J =	: +25°C	11/11	2.0		V
r _O	Output Resistance ⁽¹⁰⁾	f = 1kHz	f = 1kHz		17.0	7	mΩ
I _{SC}	Short Circuit Current	$V_1 = 35V, T_A$	V _I = 35V, T _A = +25°C		250	101:00	mA
I _{PK}	Peak Current ⁽¹⁰⁾	T _J = +25°C	100Y.COM.TW	- 1	2.2	007.	A

Notes:

- 9. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty is used.
- 10. These parameters, although guaranteed, are not 100% tested in production.

Electrical Characteristics (LM7812) (Continued)

Refer to the test circuits. -40°C < T_J < 125°C, I_O = 500mA, V_I = 19V, C_I = 0.33 μ F, C_O = 0.1 μ F, unless otherwise specified.

Symbol	Parameter	T. F.	Conditions		Тур.	Max.	Unit
Vo	Output Voltage	T _J = +25°C	M. 100 3	11.5	12.0	12.5	V
	M.M. 100X.C	$5mA \le I_O \le 1A, P_O \le 15W,$ V _I = 14.5V to 27V		11.4	12.0	12.6	
Regline	Line Regulation ⁽¹¹⁾	T _J = +25°C	V _I = 14.5V to 30V	002FCO	10.0	240	mV
	WWW.Ino	COM	V _I = 16V to 22V	ant.C	3.0	120	1
Regload	Load Regulation ⁽¹¹⁾	$T_J = +25^{\circ}C$	I _O = 5mA to 1.5A	<u>-04.0</u>	11.0	240	mV
	M. M. 100	T COM.	I _O = 250mA to 750mA	1700	5.0	120	1
I _Q	Quiescent Current	$T_J = +25^{\circ}C$	1.1.1	W.700	5.1	8.0	mA
ΔI_{Q}	Quiescent Current Change	$I_O = 5mA$ to	1A	W-100	0.1	0.5	mA
	WY.	V _I = 14.5V t	o 30V	117.10	0.5	1.0	1
$\Delta V_{O}/\Delta T$	Output Voltage Drift ⁽¹²⁾	$I_O = 5mA$	OM.TW	77 X 1	-1.0	MI	mV/°C
V _N	Output Noise Voltage	f = 10Hz to	100kHz, T _A = +25°C	N VI	76.0	ONTT	μV/V _O
RR	Ripple Rejection ⁽¹²⁾	f = 120Hz, \	/ _I = 15V to 25V	55.0	71.0	<u></u>	dB
V _{DROP}	Dropout Voltage	I _O = 1A, T _J :	= +25°C	VI-IV	2.0	COL	V
ro	Output Resistance ⁽¹²⁾	f = 1kHz	f = 1kHz		18.0	CON	mΩ
I _{sc}	Short Circuit Current	$V_{I} = 35V, T_{A}$	= +25°C	-017	230	V.GOD	mA
I _{PK}	Peak Current ⁽¹²⁾	$T_J = +25^{\circ}C$	TCOM.	-	2.2	~ ~ CO	Α

Notes:

- 11. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty is used.
- 12. These parameters, although guaranteed, are not 100% tested in production.

Electrical Characteristics (LM7815) (Continued)

Refer to the test circuits. -40°C < T_J < 125°C, I_O = 500mA, V_I = 23V, C_I = 0.33 μ F, C_O = 0.1 μ F, unless otherwise specified.

Symbol	Parameter	Wir (Conditions	Min.	Тур.	Max.	Unit
Vo	Output Voltage	$T_{J} = +25^{\circ}C$	M. 100	14.4	15.0	15.6	V
	MMM.100X.C	$5mA \le I_O \le 10$ $V_I = 17.5V \text{ to}$	1A, P _O ≤ 15W, o 30V	14.25	15.0	15.75	
Regline	Line Regulation ⁽¹³⁾	$T_{J} = +25^{\circ}C$	V _I = 17.5V to 30V	no L CO	11.0	300	mV
	N MMM. Inc.	COM	V _I = 20V to 26V	an z I.C	3.0	150	
Regload	Load Regulation ⁽¹³⁾	$T_{J} = +25^{\circ}C$	I _O = 5mA to 1.5A	<u>-</u> 77.0	12.0	300	mV
	M. M. 100	COM	I _O = 250mA to 750mA	1.10-	4.0	150	
IQ	Quiescent Current	$T_{J} = +25^{\circ}C$		W.100	5.2	8.0	mA
ΔI_{Q}	Quiescent Current Change	$I_O = 5mA$ to	1A	JW-100	-1 CON	0.5	mA
	M.TW WWW	$V_{I} = 17.5V \text{ to}$	o 30V	117.10	<u></u>	1.0	
$\Delta V_{O}/\Delta T$	Output Voltage Drift ⁽¹⁴⁾	$I_O = 5mA$	OM:TW P	$\frac{1}{\sqrt{2}}$ $\sqrt{3}$	-1.0	MEIM	mV/°C
V _N	Output Noise Voltage	f = 10Hz to	100kHz, T _A = +25°C	111	90.0	OVIT	μV/V _O
RR	Ripple Rejection ⁽¹⁴⁾	f = 120Hz, V	' _I = 18.5V to 28.5V	54.0	70.0	-71.T	dB
V _{DROP}	Dropout Voltage	$I_O = 1A, T_J =$	= +25°C	VI	2.0	CO	V
r _o	Output Resistance ⁽¹⁴⁾	f = 1kHz	31 100		19.0	$^{V}CO_{Mr}$	mΩ
I _{sc}	Short Circuit Current	$V_{I} = 35V, T_{A}$	= +25°C	-WV	250	V.GOD	mA
I _{PK}	Peak Current ⁽¹⁴⁾	$T_{J} = +25^{\circ}C$	N COM:		2.2	~ C O	Α

Notes:

- 13. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty is used.
- 14. These parameters, although guaranteed, are not 100% tested in production.

Electrical Characteristics (LM7818) (Continued)

Refer to the test circuits. -40°C < T_J < 125°C, I_O = 500mA, V_I = 27V, C_I = 0.33 μ F, C_O = 0.1 μ F, unless otherwise specified.

Symbol	Parameter	M_{II}	Conditions		Тур.	Max.	Unit
V _O	Output Voltage	T _J = +25°C	W.100	17.3	18.0	18.7	V
	M.M.M.100X.C	$5mA \le I_O \le T$ $V_I = 21V \text{ to } 3$	1A, P _O ≤ 15W, 33V	17.1	18.0	18.9	
Regline	Line Regulation ⁽¹⁵⁾	T _J = +25°C	V _I = 21V to 33V	007-CO	15.0	360	mV
	N NAMA TOO	W.Inc. COM.	V _I = 24V to 30V	OT.C	5.0	180	
Regload	Load Regulation ⁽¹⁵⁾	$T_{J} = +25^{\circ}C$	$I_O = 5$ mA to 1.5A	<u> </u>	15.0	360	mV
	WW.10	ST COM	I _O = 250mA to 750mA	1.70	5.0	180	
lQ	Quiescent Current	$T_J = +25^{\circ}C$	V.T.	W.700	5.2	8.0	mA
ΔI_{Q}	Quiescent Current Change	$I_O = 5mA$ to	1A	JW-100	-1 CON	0.5	mA
	WITH MAN	V _I = 21V to 33V		VN.10	<u></u>	1.0	
$\Delta V_{O}/\Delta T$	Output Voltage Drift ⁽¹⁶⁾	$I_O = 5mA$	-OM.TW	- - N.1	-1.0	WEIM	mV/°C
V _N	Output Noise Voltage	f = 10Hz to	100kHz, T _A = +25°C	111	110	OM.T	μV/V _O
RR	Ripple Rejection ⁽¹⁶⁾	f = 120Hz, V	' _I = 22V to 32V	53.0	69.0	<u></u>	dB
V _{DROP}	Dropout Voltage	I _O = 1A, T _J =	= +25°C	WENN I	2.0	COE	V
ro	Output Resistance ⁽¹⁶⁾	f = 1kHz	f = 1kHz		22.0	COA	mΩ
I _{SC}	Short Circuit Current	$V_{I} = 35V, T_{A}$	V _I = 35V, T _A = +25°C		250	V.COD	mA
I _{PK}	Peak Current ⁽¹⁶⁾	T _J = +25°C	OM.	-	2.2	N.EO	Α

Notes:

- 15. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty is used.
- 16. These parameters, although guaranteed, are not 100% tested in production.

Electrical Characteristics (LM7824) (Continued)

Refer to the test circuits. -40°C < T_J < 125°C, I_O = 500mA, V_I = 33V, C_I = 0.33 μ F, C_O = 0.1 μ F, unless otherwise specified.

Symbol	Parameter	Wir	Conditions		Тур.	Max.	Unit
Vo	Output Voltage	$T_{J} = +25^{\circ}C$	M. 100 3	23.0	24.0	25.0	V
	M.M.Y.100X.C.		$5mA \le I_O \le 1A, P_O \le 15W,$ $V_I = 27V \text{ to } 38V$		24.0	25.25	
Regline	Line Regulation ⁽¹⁷⁾	T _J = +25°C	V _I = 27V to 38V	007-CO	17.0	480	mV
	N NAMATION	I.COM.	V _I = 30V to 36V	ONT.C	6.0	240	1
Regload	Load Regulation ⁽¹⁷⁾	$T_{J} = +25^{\circ}C$	I _O = 5mA to 1.5A	<u>-0</u> 7.0	15.0	480	mV
	W. 10	OM.	I _O = 250mA to 750mA	1700	5.0	240	
IQ	Quiescent Current	$T_{J} = +25^{\circ}C$	V.LA.	W.700	5.2	8.0	mA
ΔI_{Q}	Quiescent Current Change	$I_O = 5mA$ to	1A	W.100	0.1	0.5	mA
	M.TW WWW	V _I = 27V to 3	V _I = 27V to 38V		0.5	1.0	1
$\Delta V_{O}/\Delta T$	Output Voltage Drift ⁽¹⁸⁾	I _O = 5mA	ON THE	- 1 1	-1.5	MILIN	mV/°C
V _N	Output Noise Voltage	f = 10Hz to	100kHz, T _A = +25°C	1117	60.0	ONTT	μV/V _O
RR	Ripple Rejection ⁽¹⁸⁾	f = 120Hz, V	' _I = 28V to 38V	50.0	67.0	<u></u>	dB
V _{DROP}	Dropout Voltage	I _O = 1A, T _J =	= +25°C	W-W	2.0	COB	V
rO	Output Resistance ⁽¹⁸⁾	f = 1kHz	31 100 2 300 2		28.0	I'COM	mΩ
I _{SC}	Short Circuit Current	$V_{I} = 35V, T_{A}$	/ _I = 35V, T _A = +25°C		230	A.GOD	mA
I _{PK} 10	Peak Current ⁽¹⁸⁾	T _J = +25°C	ON TONE	-	2.2	~ C O	Α

Notes:

- 17. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty is used.
- 18. These parameters, although guaranteed, are not 100% tested in production.

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Electrical Characteristics (LM7805A) (Continued)

Refer to the test circuits. $0^{\circ}C < T_J < 125^{\circ}C$, $I_O = 1A$, $V_I = 10V$, $C_I = 0.33 \mu F$, $C_O = 0.1 \mu F$, unless otherwise specified.

Symbol	Parameter	OM.	onditions	Min.	Тур.	Max.	Unit
Vo	Output Voltage	T _J = +25°C	MAN Joo.	4.9	5.0	5.1	V
	M.M.W.100x	$I_{O} = 5$ mA to 1A $V_{I} = 7.5$ V to 20		4.8	5.0	5.2	
Regline	Line Regulation ⁽¹⁹⁾	$V_1 = 7.5V \text{ to } 25$	V, I _O = 500mA	001-Ce	5.0	50.0	mV
	NAMAI'TO	V _I = 8V to 12V	M MMM.	1007.C	3.0	50.0	
	WWW.	$T_J = +25^{\circ}C$	V _I = 7.3V to 20V	0 <u>0</u> 7.0	5.0	50.0	
	WWW.	Too Y COM	V _I = 8V to 12V	1.10-	1.5	25.0	
Regload	Load Regulation ⁽¹⁹⁾	$T_{J} = +25^{\circ}C, I_{O}$	$T_J = +25^{\circ}\text{C}, I_O = 5\text{mA to } 1.5\text{A}$		9.0	100	mV
	$I_O = 5$ mA to 1A		W.TV	11/1-100	9.0	100	
	M.TW WW	I _O = 250mA to 750mA		OLV I .10	4.0	50.0	
00 la	Quiescent Current	$T_J = +25$ °C	WI'IN	- TN.1	5.0	6.0	mA
ΔI_{Q}	Quiescent Current	I _O = 5mA to 1A V _I = 8V to 25V, I _O = 500mA		111	7007.	0.5	mA
	Change			MA	108X.	0.8	M
	COM.	$V_{\rm I} = 7.5 \text{V to } 20 \text{V}, T_{\rm J} = +25 ^{\circ} \text{C}$		MIN	MAN	0.8	TW
$\Delta V_{O}/\Delta T$	Output Voltage Drift ⁽²⁰⁾	$I_O = 5mA$	ON.COM. TW	N W	-0.8	Con	mV/°C
V _N	Output Noise Voltage	f = 10Hz to 100	0kHz, T _A = +25°C	TNV	10.0	N.CON	μV/V _O
RR	Ripple Rejection ⁽²⁰⁾	f = 120Hz, I _O =	500mA, V _I = 8V to 18V	- N	68.0	0√.€O	dB
V _{DROP}	Dropout Voltage	I _O = 1A, T _J = +25°C		_	2.0	√7.C(V
ro	Output Resistance ⁽²⁰⁾	f = 1kHz	ATOOK. COMITY	_	17.0	100 =	mΩ
I _{SC}	Short Circuit Current	$V_1 = 35V, T_A = -$	+25°C	_	250	100,	mA
I _{PK}	Peak Current ⁽²⁰⁾	$T_{J} = +25^{\circ}C$	100Y. COM. TV	_	2.2	N.100X	A

Notes:

- 19. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty is used.
- 20. These parameters, although guaranteed, are not 100% tested in production.

Electrical Characteristics (LM7806A) (Continued)

Refer to the test circuits. $0^{\circ}\text{C} < \text{T}_{\text{J}} < 125^{\circ}\text{C}$, $\text{I}_{\text{O}} = 1\text{A}$, $\text{V}_{\text{I}} = 11\text{V}$, $\text{C}_{\text{I}} = 0.33\mu\text{F}$, $\text{C}_{\text{O}} = 0.1\mu\text{F}$, unless otherwise specified.

Symbol	Parameter	VI. I	Conditions	Min.	Тур.	Max.	Unit
Vo	Output Voltage	$T_{J} = +25^{\circ}C$	MAN TOO	5.58	6.0	6.12	V
	WWW.100X.C	$I_O = 5mA$ to $V_I = 8.6V$ to	1A, P _O ≤ 15W, 21V	5.76	6.0	6.24	
Regline	Line Regulation ⁽²¹⁾	$V_1 = 8.6V \text{ to}$	25V, I _O = 500mA	V.Co.	5.0	60.0	mV
	MMM.To	V _I = 9V to 13	BV N	W.Co.	3.0	60.0	
	M MMM. Ino	$T_{J} = +25^{\circ}C$	V _I = 8.3V to 21V	nn ý .C	5.0	60.0	
	W.100	COM.	V _I = 9V to 13V	~ ~ 7 . C	1.5	30.0	
Regload	Load Regulation ⁽²¹⁾	ad Regulation ⁽²¹⁾ $T_J = +25^{\circ}C$, $I_O = 5\text{mA}$ to 1.5A		100	9.0	100	mV
	TW WY.1	I _O = 5mA to 1A		1.100	9.0	100	
	I.TW WW	I _O = 250mA	to 750mA	W.700	5.0	50.0	
00 la	Quiescent Current	$T_J = +25^{\circ}C$	OM.TW WIT	100	4.3	6.0	mA
ΔI_{Q}	Quiescent Current Change	I _O = 5mA to 1A		- - 10	07-	0.5	mA
	OM WW	V _I = 19V to 25V, I _O = 500mA			007.0	0.8	
	COM.	$V_{I} = 8.5V \text{ to } 21V, T_{J} = +25^{\circ}C$		N. M.	100 Y.	0.8	M
$\Delta V_{O}/\Delta T$	Output Voltage Drift ⁽²²⁾	$I_O = 5mA$	Y.COM.	WAN	-0.8	COB	mV/°C
V _N	Output Noise Voltage	f = 10Hz to 1	100kHz, T _A = +25°C	TW	10.0	$^{\Gamma}C_{\mathcal{O}_{2d}}$	μV/V _O
RR	Ripple Rejection ⁽²²⁾	f = 120Hz, I _C	$_{0} = 500 \text{mA}, V_{I} = 9 \text{V to } 19 \text{V}$	-TV	65.0	V.EO	dB
V _{DROP}	Dropout Voltage	I _O = 1A, T _J = +25°C			2.0	~~CC	٧
r _O	Output Resistance ⁽²²⁾	f = 1kHz		-//	17.0	00 ≥ C	mΩ
I _{SC}	Short Circuit Current	$V_{I} = 35V, T_{A}$	V _I = 35V, T _A = +25°C		250	1007.	mA
I _{PK}	Peak Current ⁽²²⁾	$T_J = +25^{\circ}C$	TIOOY. ONLTW	_	2.2	700,7	Α

Notes:

- 21. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty is used.
- 22. These parameters, although guaranteed, are not 100% tested in production.

Electrical Characteristics (LM7808A) (Continued)

Refer to the test circuits. $0^{\circ}C < T_J < 125^{\circ}C$, $I_O = 1A$, $V_I = 14V$, $C_I = 0.33 \mu F$, $C_O = 0.1 \mu F$, unless otherwise specified.

Symbol	Parameter	Co	onditions	Min.	Тур.	Max.	Unit
Vo	Output Voltage	$T_J = +25^{\circ}C$		7.84	8.0	8.16	V
	WWW.1007.C		$I_O = 5mA \text{ to } 1A, P_O \le 15W,$ $V_I = 10.6V \text{ to } 23V$		8.0	8.3	
Regline	Line Regulation ⁽²³⁾	$V_{I} = 10.6V \text{ to}$	25V, I _O = 500mA	00 7.Cc	6.0	80.0	mV
	MWW.100	$V_{I} = 11V \text{ to } 17$	7V	10TY.C	3.0	80.0	1
	M MMM. Inc.	$T_{J} = +25^{\circ}C$	V _I = 10.4V to 23V	- <u> </u>	6.0	80.0	1
	W.100	A COM.	V _I = 11V to 17V	N.10	2.0	40.0	1
Regload	Load Regulation ⁽²³⁾	$T_J = +25^{\circ}C, I_C$	o = 5mA to 1.5A	11.700	12.0	100	mV
	TW WY	I _O = 5mA to 1A		N/H-100	12.0	100	1
	WILL MALL	I _O = 250mA to 750mA		-1-W.10	5.0	50.0	
I _Q	Quiescent Current	$T_J = +25^{\circ}C$	T _J = +25°C		5.0	6.0	mA
ΔI_Q	Quiescent Current Change	$I_O = 5mA \text{ to } 1$	A	M 1/2	1001.	0.5	mA
	ON. TW WY	V _I = 11V to 25V, I _O = 500mA		MAIN	1100Y	0.8	
	COM.	$V_I = 10.6V \text{ to } 23V, T_J = +25^{\circ}C$		A+W	1707	0.8	TW
$\Delta V_{O}/\Delta T$	Output Voltage Drift ⁽²⁴⁾	$I_O = 5mA$	I.COM.	4/1/	-0.8	Y.COM.	mV/°C
V_N	Output Noise Voltage	f = 10Hz to 10	$OOkHz$, $T_A = +25^{\circ}C$	-111	10.0	ON.COD	μV/V _O
RR	Ripple Rejection ⁽²⁴⁾	f = 120Hz, I _O = 500mA, V _I = 11.5V to 21.5V		- 1	62.0	001 <u>-</u> CO	dB
V _{DROP}	Dropout Voltage	I _O = 1A, T _J = +25°C		_ ~	2.0	1007	V.T
r _O	Output Resistance ⁽²⁴⁾	f = 1kHz		_	18.0	100Y.	mΩ
I _{SC}	Short Circuit Current	V _I = 35V, T _A =	: +25°C	N -	250	1707	mA
I _{PK}	Peak Current ⁽²⁴⁾	T _J = +25°C	N. TON COM.	W -	2.2	4.200	Α

Notes:

- 23. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty is used.
- 24. These parameters, although guaranteed, are not 100% tested in production.

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Electrical Characteristics (LM7809A) (Continued)

Refer to the test circuits. $0^{\circ}C < T_J < 125^{\circ}C$, $I_O = 1A$, $V_I = 15V$, $C_I = 0.33 \mu F$, $C_O = 0.1 \mu F$, unless otherwise specified.

Symbol	Parameter	T. T.	Conditions	Min.	Тур.	Max.	Units
Vo	Output Voltage	T _J = +25°C	M.M.100	8.82	9.0	9.16	V
	WWW.1007.C		$I_O = 5$ mA to 1A, $P_O \le 15$ W, $V_I = 11.2$ V to 24V		8.65 9.0	9.35	
Regline	Line Regulation ⁽²⁵⁾	V _I = 11.7V to	o 25V, I _O = 500mA	100.7	6.0	90.0	mV
	WW 1007	V _I = 12.5V to	o 19V	1007	4.0	45.0	
	M MM M. 100	T _J = +25°C	V _I = 11.5V to 24V	W.1007.	6.0	90.0	
	LM MMM.	ON.COM	V _I = 12.5V to 19V	W.1007	2.0	45.0	
Regload	Load Regulation ⁽²⁵⁾	$T_J = +25^{\circ}C,$	$I_{O} = 5 \text{mA to } 1.5 \text{A}$	100	12.0	100	mV
	CONTANT WWW.		I _O = 5mA to 1A		12.0	100	
	MIW WWW	I _O = 250mA to 750mA		- TV.1	5.0	50.0	
l _Q	Quiescent Current	T _J = +25°C		W	5.0	6.0	mA
ΔI_Q	Quiescent Current Change	I _O = 5mA to 1A		W.A.	100Y	0.5	mA
	COM	V _I = 12V to 25V, I _O = 500mA		N	N 1807	0.8	LM
	COM. V	$V_I = 11.7V \text{ to } 25V, T_J = +25^{\circ}C$		TI A	7 700	0.8	TW
$\Delta V_{O}/\Delta T$	Output Voltage Drift ⁽²⁶⁾	$I_O = 5mA$	OY.COM.TW	-1/1	-1.0	7	mV/°C
V _N	Output Noise Voltage	f = 10Hz to	100kHz, T _A = +25°C	- 1	10.0	101-	μV/V _O
RR	Ripple Rejection ⁽²⁶⁾	f = 120Hz, I _O = 500mA, V _I = 12V to 22V		- 1	62.0	100X.	dB
V _{DROP}	Dropout Voltage	I _O = 1A, T _J = +25°C		N -	2.0	1 <u>00</u> 1	V
ro	Output Resistance ⁽²⁶⁾	f = 1kHz		- W	17.0	100°	mΩ
I _{SC}	Short Circuit Current	V _I = 35V, T _A = +25°C		TVI-	250	100	mA
I _{PK}	Peak Current ⁽²⁶⁾	T _J = +25°C	WW.In. COM	Total	2.2	MAT	A

Notes:

^{25.} Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty is used.

^{26.} These parameters, although guaranteed, are not 100% tested in production.

Electrical Characteristics (LM7810A) (Continued)

Refer to the test circuits. $0^{\circ}\text{C} < \text{T}_{\text{J}} < 125^{\circ}\text{C}$, $\text{I}_{\text{O}} = 1\text{A}$, $\text{V}_{\text{I}} = 16\text{V}$, $\text{C}_{\text{I}} = 0.33\mu\text{F}$, $\text{C}_{\text{O}} = 0.1\mu\text{F}$, unless otherwise specified.

Symbol	Parameter	OM. Co	onditions	Min.	Тур.	Max.	Units
Vo	Output Voltage	$T_J = +25^{\circ}C$	M. 100	9.8	10.0	10.2	V
	MMM.100x	$I_O = 5mA \text{ to } 1A$ $V_I = 12.8V \text{ to } 25$		9.6	10.0	10.4	
Regline	Line Regulation ⁽²⁷⁾	$V_{\rm I} = 12.8 \text{V to } 26$	6V, I _O = 500mA	007.C	8.0	100	mV
	MMM.To	$V_{I} = 13V \text{ to } 20V$	M MMM.	1017.C	4.0	N 50.0	1
	W WWW.	$T_J = +25^{\circ}C$	V _I = 12.5V to 25V	<u>-007</u>	8.0	100	1
	WWW	Jon T. COM	V _I = 13V to 20V	1.70	3.0	50.0	
Regload	Load Regulation ⁽²⁷⁾	$T_J = +25^{\circ}C, I_O =$	= 5mA to 1.5A	M.700	12.0	100	mV
	TW WY	$I_O = 5mA \text{ to } 1A$	W.TV	NATION	12.0	100	
	VIIN MAI	$I_{O} = 250 \text{mA to } 7$	I _O = 250mA to 750mA		5.0	50.0	
IQ	Quiescent Current	T _J = +25°C	WI.IN	- -	5.0	6.0	mA
ΔI_{Q}	Quiescent Current	I _O = 5mA to 1A		N 1-	1007.	0.5	mA
	Change	V _I = 12.8V to 25V, I _O = 500mA		MA	11007.	0.8	TV .
	COM	$V_I = 13V \text{ to } 26V, T_J = +25^{\circ}C$		1411	17107	0.5	TW
$\Delta V_{O}/\Delta T$	Output Voltage Drift ⁽²⁸⁾	$I_O = 5mA$	N.COM.	4/1/	-1.0	VCO_{2n}	mV/°C
V _N	Output Noise Voltage	f = 10Hz to 100	kHz, T _A = +25°C	-11	10.0	V.COD	μV/V _O
RR	Ripple Rejection ⁽²⁸⁾	f = 120Hz, I _O =	500mA, V _I = 14V to 24V		62.0	OV-CO	dB
V _{DROP}	Dropout Voltage	I _O = 1A, T _J = +25°C		-	2.0	00 ≥ C	V
r _O	Output Resistance ⁽²⁸⁾	f = 1kHz		-	17.0	1007.	mΩ
I _{SC}	Short Circuit Current	V _I = 35V, T _A = +	25°C	_	250	1.100	mA
I _{PK}	Peak Current ⁽²⁸⁾	T _J = +25°C	T.100Y.C.M.T	_	2.2	N 7507	A

Notes:

- 27. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty is used.
- 28. These parameters, although guaranteed, are not 100% tested in production.

Electrical Characteristics (LM7812A) (Continued)

Refer to the test circuits. $0^{\circ}C < T_J < 125^{\circ}C$, $I_O = 1A$, $V_I = 19V$, $C_I = 0.33 \mu F$, $C_O = 0.1 \mu F$, unless otherwise specified.

Symbol	Parameter	C	onditions	Min.	Тур.	Max.	Units
V _O	Output Voltage	$T_{J} = +25^{\circ}C$	11/W.100	11.75	12.0	12.25	V
	WWW.1007.C	$I_O = 5$ mA to $V_I = 14.8$ V to	1A, P _O ≤ 15W, o 27V	11.5	12.0	12.5	
Regline	Line Regulation ⁽²⁹⁾	V _I = 14.8V to	30V, I _O = 500mA	100¥.C	10.0	120	mV
	WWW.Ioo	V _I = 16V to 2	22V	1011 Y.C	4.0	120	
	M MANNING	$T_{J} = +25^{\circ}C$	V _I = 14.5V to 27V	- ZOX	10.0	120	
	WWW.100	T COM.	V _I = 16V to 22V	W.700	3.0	60.0	
Regload	Load Regulation ⁽²⁹⁾	$T_{J} = +25^{\circ}C,$	$I_O = 5$ mA to 1.5A	11/1 700	12.0	100	mV
	TW NY	I _O = 5mA to 1A		WY-100	12.0	100	
	LTW WWW	I _O = 250mA to 750mA		W.10	5.0	50.0	
o l _Q	Quiescent Current	$T_{J} = +25^{\circ}C$	M.TW	T.V	5.1	6.0	mA
ΔI_{Q}	Quiescent Current Change	$I_O = 5mA$ to	1A	11 1	1007.	0.5	mA
	OM. TW WW	V _I = 14V to 27V, I _O = 500mA		1/2/	1100 Y.	0.8	V
	COMP	$V_1 = 15V \text{ to } 30V, T_J = +25^{\circ}C$		AW	100V	0.8	[W]
$\Delta V_{O}/\Delta T$	Output Voltage Drift ⁽³⁰⁾	$I_O = 5mA$	I.COM	W	-1.0	V.Con.	mV/°C
V_N	Output Noise Voltage	f = 10Hz to 1	$100 \text{kHz}, T_A = +25 ^{\circ}\text{C}$	- 177	10.0	N.COM	μV/V _O
RR	Ripple Rejection ⁽³⁰⁾	f = 120Hz, I _O = 500mA, V _I = 14V to 24V		- 1	60.0	001 .C O	dB
V _{DROP}	Dropout Voltage	I _O = 1A, T _J = +25°C		1	2.0	1007	V
r _O	Output Resistance ⁽³⁰⁾	f = 1kHz		_	18.0	1007.	mΩ
I _{SC}	Short Circuit Current	V _I = 35V, T _A	= +25°C	W -	250	100Y	mA
I _{PK}	Peak Current ⁽³⁰⁾	$T_J = +25^{\circ}C$	M. TO COM.	-W-	2.2	400	Α

Note:

- 29. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty is used.
- 30. These parameters, although guaranteed, are not 100% tested in production.

Electrical Characteristics (LM7815A) (Continued)

Refer to the test circuits. $0^{\circ}C < T_J < 125^{\circ}C$, $I_O = 1A$, $V_I = 23V$, $C_I = 0.33 \mu F$, $C_O = 0.1 \mu F$, unless otherwise specified.

Symbol	Parameter	V. C	onditions	Min.	Тур.	Max.	Units
Vo	Output Voltage	$T_{J} = +25^{\circ}C$		14.75	15.0	15.3	V
	WWW.100Y.C	$I_O = 5\text{mA to}$ $V_I = 17.7\text{V to}$	1A, P _O ≤ 15W, o 30V	14.4	15.0	15.6	
Regline	Line Regulation ⁽³¹⁾	V _I = 17.4V t	o 30V, I _O = 500mA	100-1.C	10.0	150	mV
	WWW.Too	V _I = 20V to	26V	100X.C	5.0	N 150	1
	N MMM.Ino	T _J = +25°C	$V_I = 17.5V \text{ to } 30V$	-01	11.0	150	
	WW.100	COM.	V _I = 20V to 26V	11.700	3.0	75.0	
Regload	Load Regulation ⁽³¹⁾	T _J = +25°C,	$I_O = 5$ mA to 1.5A	111700	12.0	100	mV
	TW WY.	I _O = 5mA to 1A		W/4.10	12.0	100	
	LTW WW.	I _O = 250mA to 750mA		-W-W.10	5.0	50.0	
I _Q	Quiescent Current	T _J = +25°C	OM.TW		5.2	6.0	mA
ΔI_{Q}	Quiescent Current Change	$I_O = 5mA to$	1A	M.A.	1001.	0.5	mA
	ON. WW	$V_I = 17.5V \text{ to } 30V, I_O = 500\text{mA}$		MIN	1100Y	0.8	W
	COMPANY	$V_I = 17.5V$ to 30V, $T_J = +25^{\circ}C$		AW	1003	0.8	TW
$\Delta V_{O}/\Delta T$	Output Voltage Drift ⁽³²⁾	$I_O = 5mA$	Y.COM	71/1	-1.0	N.Coz.	mV/°C
V _N	Output Noise Voltage	f = 10Hz to	100kHz, T _A = +25°C	- 11	10.0	V.CO	μV/V _O
RR	Ripple Rejection ⁽³²⁾	f = 120Hz, I _O = 500mA, V _I = 18.5V to 28.5V		- 4	58.0	001-CO	dB
V _{DROP}	Dropout Voltage	I _O = 1A, T _J = +25°C		_	2.0	1007.	V
r _O	Output Resistance ⁽³²⁾	f = 1kHz		N _	19.0	1 100 Y.	mΩ
I _{SC}	Short Circuit Current	$V_{I} = 35V, T_{A}$	= +25°C	W -	250	1001	mA
I _{PK}	Peak Current ⁽³²⁾	T _J = +25°C	M. To COM	~VI-	2.2	7.5	Α

Notes:

- 31. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty is used.
- 32. These parameters, although guaranteed, are not 100% tested in production.

Electrical Characteristics (LM7818A) (Continued)

Refer to the test circuits. $0^{\circ}C < T_J < 125^{\circ}C$, $I_O = 1A$, $V_I = 27V$, $C_I = 0.33 \mu F$, $C_O = 0.1 \mu F$, unless otherwise specified.

Symbol	Parameter	C	onditions	Min.	Тур.	Max.	Units
Vo	Output Voltage	$T_J = +25^{\circ}C$	$T_{J} = +25^{\circ}C$		18.0	18.36	V
	MMM.100X.C	$I_O = 5mA \text{ to}$ $V_I = 21V \text{ to} 3$	1A, P _O ≤ 15W, 33V	17.3	18.0	18.7	
Regline	Line Regulation ⁽³³⁾	$V_1 = 21V \text{ to } 3$	33V, I _O = 500mA	"00₹"Co	15.0	180	mV
	WWW.Too	$V_1 = 21V \text{ to } 3$	33V	100-X.C	5.0	180	1
	M MMM.Ino	$T_{J} = +25^{\circ}C$	V _I = 20.6V to 33V	<u>- 201</u>	15.0	√ 180	
	WWW.100	COM.	V _I = 24V to 30V	N.12	5.0	90.0	
Regload	Load Regulation ⁽³³⁾	$T_{J} = +25^{\circ}C,$	I _O = 5mA to 1.5A	11.100	15.0	100	mV
	TW WY.1	I _O = 5mA to 1A		MITON	15.0	100	1
	LTW WW.	I _O = 250mA to 750mA		W 10	7.0	50.0	1
l _Q	Quiescent Current	$T_{J} = +25^{\circ}C$	W.IN V		5.2	6.0	mA
ΔI_{Q}	Quiescent Current Change	$I_O = 5mA$ to	1A	M 11 -	1007	0.5	mA
	OWN WW	V _I = 12V to 33V, I _O = 500mA		MA	100 Y.C	0.8	
	COM.	$V_I = 12V \text{ to } 33V, T_J = +25^{\circ}C$		NEWA	1001	0.8	M
$\Delta V_{O}/\Delta T$	Output Voltage Drift ⁽³⁴⁾	$I_O = 5mA$	Y.COM. TW	WW	-1.0	CO	mV/°C
V _N	Output Noise Voltage	f = 10Hz to	100kHz, T _A = +25°C	-011	10.0	N.COM	μV/V _O
RR	Ripple Rejection ⁽³⁴⁾	f = 120Hz, I _O = 500mA, V _I = 22V to 32V		- 11	57.0	10√.€O	dB
V _{DROP}	Dropout Voltage	I _O = 1A, T _J = +25°C		- 1	2.0	007.	V
r _O	Output Resistance ⁽³⁴⁾	f = 1kHz		_	19.0	100-Y.C	mΩ
I _{SC}	Short Circuit Current	$V_{I} = 35V, T_{A}$	= +25°C	N -	250	100Y.	mA
I _{PK}	Peak Current ⁽³⁴⁾	$T_J = +25^{\circ}C$	M. T. COM.	W -	2.2	7007	Α

Notes:

- 33. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty is used.
- 34. These parameters, although guaranteed, are not 100% tested in production.

Electrical Characteristics (LM7824A) (Continued)

Refer to the test circuits. $0^{\circ}C < T_J < 125^{\circ}C$, $I_O = 1A$, $V_I = 33V$, $C_I = 0.33 \mu F$, $C_O = 0.1 \mu F$, unless otherwise specified.

Symbol	Parameter	Co	onditions	Min.	Тур.	Max.	Units
Vo	Output Voltage	$T_J = +25^{\circ}C$	M. 100	23.5	24.0	24.5	V
	MAM.100X.C	$I_0 = 5mA \text{ to } 1.0$ $V_1 = 27.3V \text{ to } 3.0$		23.0	24.0	25.0	
Regline	Line Regulation ⁽³⁵⁾	$V_1 = 27V \text{ to } 38$	sV, I _O = 500mA	OY.CO	18.0	240	mV
	WWW.Ioo	$V_1 = 21V \text{ to } 33$	SV VV	OUNTCO	6.0	240	
	N NAMA TOO	T _J = +25°C	V _I = 26.7V to 38V	ON C	18.0	240	
	WW.100	A COM.	V _I = 30V to 36V	<u>-</u> 77.0	6.0	120	
Regload	Load Regulation ⁽³⁵⁾	$T_{J} = +25^{\circ}C, I_{C}$	= 5mA to 1.5A	1.100	15.0	100	mV
	IN WY	I _O = 5mA to 1A		W.700.	15.0	100	
	TW WWW	I _O = 250mA to	750mA	M-100	7.0	50.0	
O la	Quiescent Current	$T_J = +25^{\circ}C$	W.IM M.	VIV.10	5.2	6.0	mA
ΔI_{Q}	Quiescent Current Change	$I_O = 5$ mA to 1.	A	- - 1	00.7	0.5	mA
	OM. TAN MAN	V _I = 27.3V to 38V, I _O = 500mA		1111	1007.0	0.8	
	ON. WY	$V_I = 27.3V \text{ to } 38V, T_J = +25^{\circ}C$		MAIN	· 100 Y.	0.8	W
$\Delta V_{O}/\Delta T$	Output Voltage Drift ⁽³⁶⁾	I _O = 5mA	COMPLETA	WANA	-1.5	CO_{N}	mV/°C
V_N	Output Noise Voltage	f = 10Hz to 10	$0kHz, T_{A} = +25^{\circ}C$	WW	10.0	$^{VC}O_{M_{s}}$	μV/V _O
RR	Ripple Rejection ⁽³⁶⁾	f = 120Hz, I _O = 500mA, V _I = 28V to 38V		-111	54.0	A'GOD	dB
V _{DROP}	Dropout Voltage	I _O = 1A, T _J = +25°C		- 1/1	2.0	001	V
r _O	Output Resistance ⁽³⁶⁾	f = 1kHz		- <	20.0	1007.C	mΩ
I _{SC}	Short Circuit Current	V _I = 35V, T _A =	+25°C	_	250	100 Y.	mA
I _{PK}	Peak Current ⁽³⁶⁾	T _J = +25°C	. CONT.	N -	2.2	Yo r	Α

Notes:

- 35. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty is used.
- 36. These parameters, although guaranteed, are not 100% tested in production.

Typical Performance Characteristics

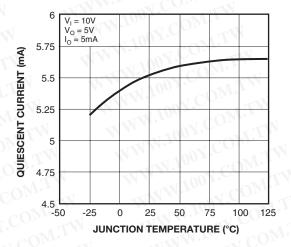


Figure 3. Quiescent Current

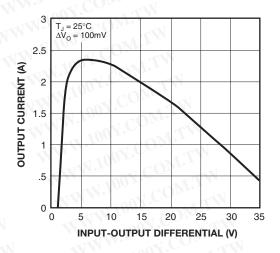


Figure 4. Peak Output Current

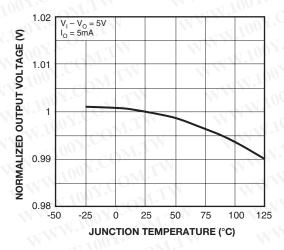


Figure 5. Output Voltage

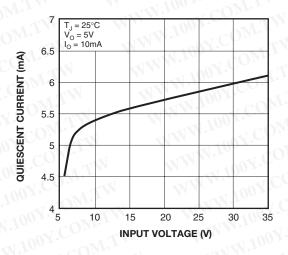


Figure 6. Quiescent Current

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Typical Applications

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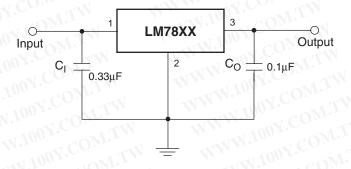


Figure 7. DC Parameters

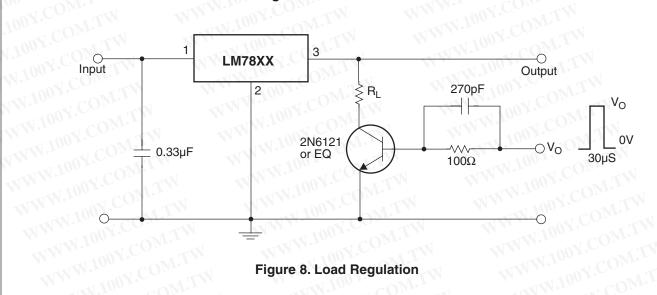
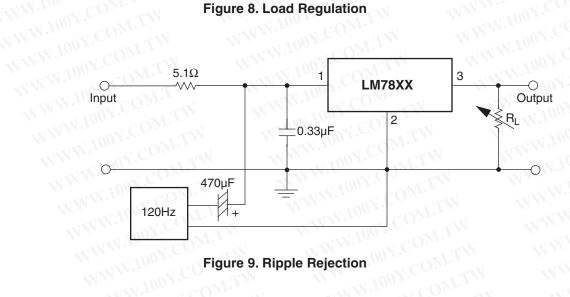


Figure 8. Load Regulation



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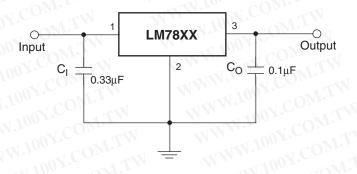
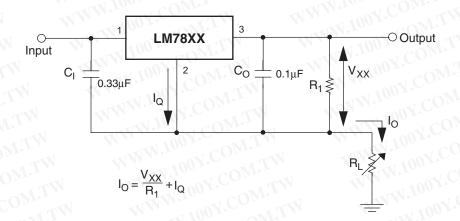


Figure 10. Fixed Output Regulator



Notes:

- 1. To specify an output voltage, substitute voltage value for "XX." A common ground is required between the input and the output voltage. The input voltage must remain typically 2.0V above the output voltage even during the low point on the input ripple voltage.
- 2. C_I is required if regulator is located an appreciable distance from power supply filter.
- 3. CO improves stability and transient response.

Figure 11.

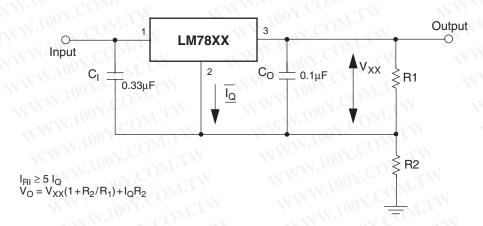


Figure 12. Circuit for Increasing Output Voltage

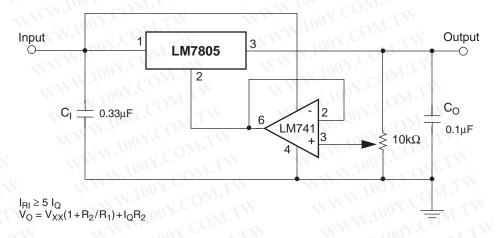


Figure 13. Adjustable Output Regulator (7V to 30V)

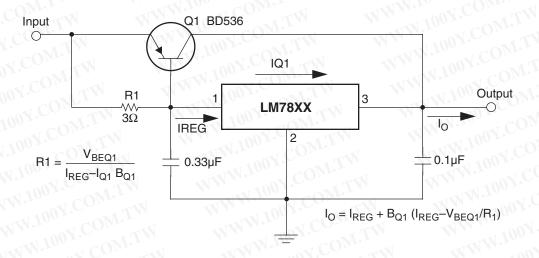


Figure 14. High Current Voltage Regulator

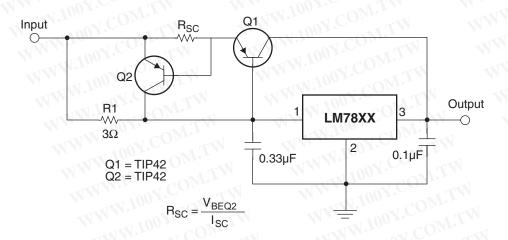


Figure 15. High Output Current with Short Circuit Protection

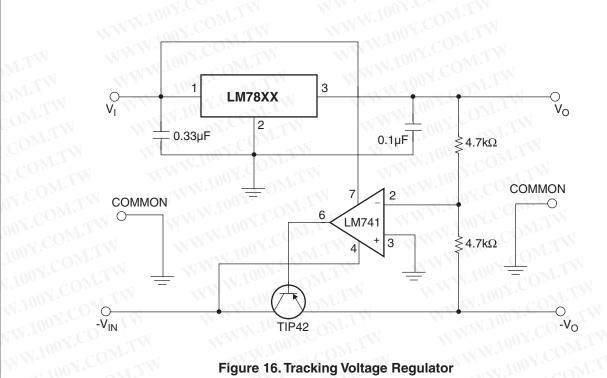


Figure 16. Tracking Voltage Regulator

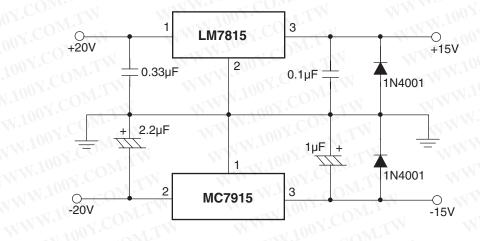


Figure 17. Split Power Supply (±15V - 1A)

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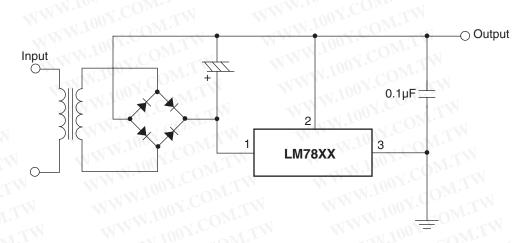


Figure 18. Negative Output Voltage Circuit

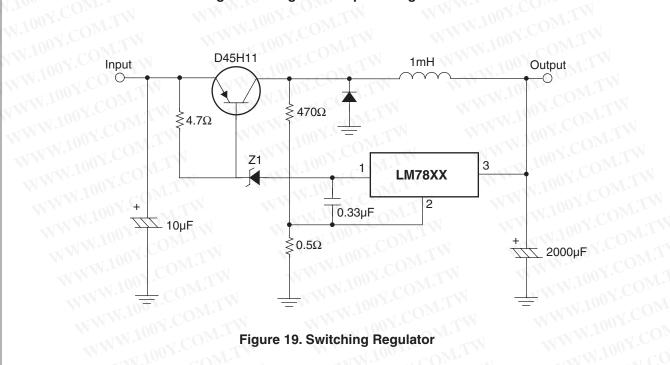


Figure 19. Switching Regulator

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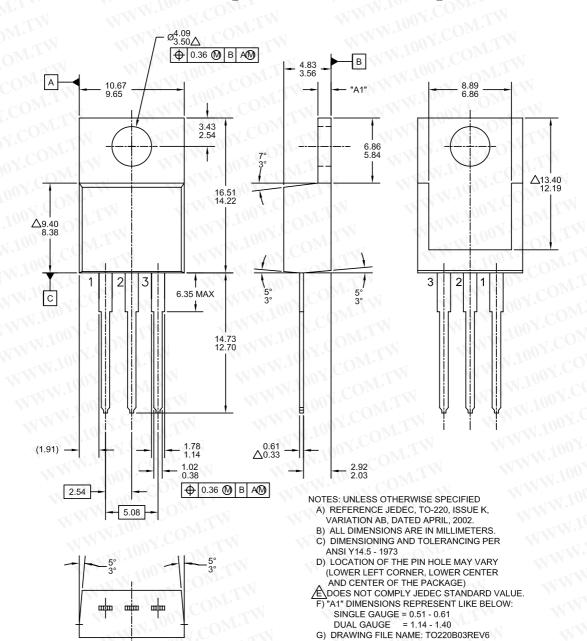
Mechanical Dimensions

Dimensions in millimeters

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