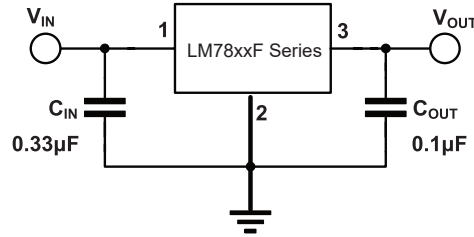


Linear Voltage Regulator

3 Terminal

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RoHS
Compliant



Fixed Output Voltage Regulator

Features

- Internal Current Limit
- Output Transistor SOA Protection
- Short Circuit Protection
- Thermal Shutdown Protection

Specification

- Output Current : Up to 1.5A at $T_J = 25^\circ\text{C}$
- Available in Fixed : 5V, 6.0V, 8V, 9V, 12V and 15V
- Output Voltage Tolerance : $\pm 3\%$ at $T_J = 25^\circ\text{C}$, $\pm 5\%$ over the Operating T_J
- Line Regulation : 4mV to 12mV (Typ.) at $T_J = 25^\circ\text{C}$
- Load Regulation : 9mV to 14mV (Typ.) at $T_J = 25^\circ\text{C}$
- Dropout Voltage : 2V@1A ($V_{OUT} = 5.0\text{V}$)
- Power Supply Rejection Ratio : $>55\text{dB}@120\text{Hz}$ ($V_{OUT} = 5.0\text{V}$)
- Operating Junction Temperature : -40°C to 125°C

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit	
Maximum Input Voltage	V_i	35	V	
Maximum Power Dissipation	P_D	1.53	W	
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	5.5	°C/W	
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	64.3		
Electrostatic Discharge	Human body model	$V_{ESD-HBM}$	2000	V
	Machine model	V_{ESD-MM}	200	
Operating Junction Temperature	T_{opr}	-40 to 125	°C	
Maximum Junction Temperature	T_J	-55 to 150		
Storage Temperature Range	T_{stg}	-65 to 150		

Note : Absolute maximum ratings are those values beyond which damage to the device may occur. Functional operation under these condition is not implied.

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Linear Voltage Regulator

3 Terminal

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Electrical Characteristics LM7805F ($V_{IN} = 10V$, $I_{OUT} = 500mA$, $C_{IN} = 0.33\mu F$, $C_{OUT} = 0.1\mu F$, $T_J = 25^\circ C$, unless otherwise specified)

Parameter Name	Symbol	Test Conditions	Min	Typ	Max	Unit		
Output voltage	V_{OUT}	$T_J = 25^\circ C$	4.85	5	5.15	V		
		$I_{OUT} = 5mA$ to 1A, $V_{IN} = 7$ to 20V, $T_J = 0$ to $125^\circ C$	4.75		5.25			
Line regulation	ΔV_{OUT}	$V_{IN} = 7$ to 25V	--	4	100	mV		
		$V_{IN} = 8$ to 12V		1.6	50			
Load regulation	ΔV_{OUT}	$I_{OUT} = 5mA$ to 1.5A		9	100			
		$I_{OUT} = 250$ to 750mA		4	50			
Quiescent current	I_Q	$T_J = 25^\circ C$		5	8	mA		
Quiescent current change	ΔI_Q	$I_{OUT} = 5mA$ to 1A		0.03	0.5			
		$V_{IN} = 7$ to 25V		0.3	1.3			
Output voltage drift	$\Delta V_{OUT}/\Delta T$	$I_{OUT} = 5mA$		-1.1	--		mV/ $^\circ C$	
Output noise voltage	V_N	$f = 10$ to 100k Hz		42			μV	
Ripple rejection	RR	$f = 120Hz$, $V_{IN} = 8$ to 18V		62			73	dB
Dropout voltage	V_D	$I_{OUT} = 1A$	--	2			--	V
Output resistance	R_{OUT}	$f = 1kHz$		10				m Ω
Short circuit current	I_{SC}			230				mA
Peak current	I_{PK}			2.2				A

LM7809F ($V_{IN} = 16V$, $I_{OUT} = 500mA$, $C_{IN} = 0.33\mu F$, $C_{OUT} = 0.1\mu F$, $T_J = 25^\circ C$, unless otherwise specified)

Parameter Name	Symbol	Test Conditions	Min	Typ	Max	Unit		
Output voltage	V_{OUT}	$T_J = 25^\circ C$	8.73	9	9.27	V		
		$I_{OUT} = 5mA$ to 1A, $V_{IN} = 11.5$ to 24V, $T_J = 0$ to $125^\circ C$	8.55		9.45			
Line regulation	ΔV_{OUT}	$V_{IN} = 11.5$ to 27V	--	7	180	mV		
		$V_{IN} = 13$ to 19V		2	90			
Load regulation	ΔV_{OUT}	$I_{OUT} = 5mA$ to 1.5A		12	180			
		$I_{OUT} = 250$ to 750mA		4	90			
Quiescent current	I_Q	$T_J = 25^\circ C$		4	8	mA		
Quiescent current change	ΔI_Q	$I_{OUT} = 5mA$ to 1A			0.5			
		$V_{IN} = 11.5$ to 27V			1			
Output voltage drift	$\Delta V_{OUT}/\Delta T$	$I_{OUT} = 5mA$		-1	--		mV/ $^\circ C$	
Output noise voltage	V_N	$f = 10$ to 100k Hz		60			μV	
Ripple rejection	RR	$f = 120Hz$, $V_{IN} = 12$ to 22V		55			70	dB
Dropout voltage(8)	V_D	$I_{OUT} = 1A$	--	2			--	V
Output resistance	R_{OUT}	$f = 1kHz$		18				m Ω
Short circuit current	I_{SC}			400				mA
Peak current	I_{PK}			2.2				A

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3 Terminal

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LM7812F ($V_{IN} = 19V$, $I_{OUT} = 500mA$, $C_{IN} = 0.33\mu F$, $C_{OUT} = 0.1\mu F$, $T_J = 25^\circ C$, unless otherwise specified)

Parameter Name	Symbol	Test Conditions	Min	Typ	Max	Unit
Output voltage	V_{OUT}	$T_J = 25^\circ C$	11.64	12	12.36	V
		$I_{OUT} = 5mA$ to 1A, $V_{IN} = 14.5$ to 27V, $T_J = 0$ to 125°C	11.4		12.6	
Line regulation	ΔV_{OUT}	$V_{IN} = 14.5$ to 30V	--	12	240	mV
		$V_{IN} = 16$ to 22V		4	120	
Load regulation	ΔV_{OUT}	$I_{OUT} = 5mA$ to 1.5A		10	240	
		$I_{OUT} = 250$ to 750mA		3	120	
Quiescent current	I_Q	$T_J = 25^\circ C$		4	8	mA
Quiescent current change	ΔI_Q	$I_{OUT} = 5mA$ to 1A			0.5	
		$V_{IN} = 14.5$ to 30V		1		
Output voltage drift	$\Delta V_{OUT}/\Delta T$	$I_{OUT} = 5mA$		-1	mV/°C	
Output noise voltage	V_N	$f = 10$ to 100kHz		75		μV
Ripple rejection	RR	$f = 120Hz$, $V_{IN} = 15$ to 25V	55	71	dB	
Dropout voltage(8)	V_D	$I_{OUT} = 1A$	--	2	--	V
Output resistance	R_{OUT}	$f = 1kHz$		18		mΩ
Short circuit current	I_{SC}			350		mA
Peak current	I_{PK}			2.2		A

LM7815F ($V_{IN} = 19V$, $I_{OUT} = 500mA$, $C_{IN} = 0.33\mu F$, $C_{OUT} = 0.1\mu F$, $T_J = 25^\circ C$, unless otherwise specified)

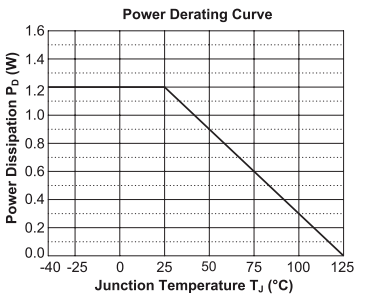
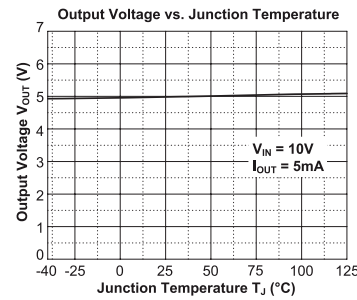
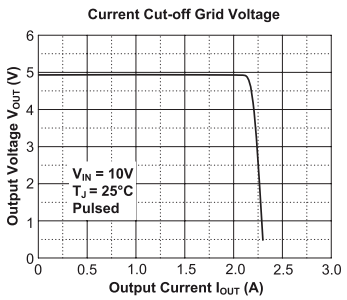
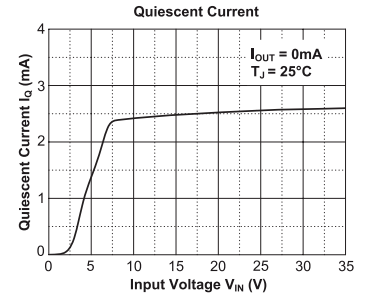
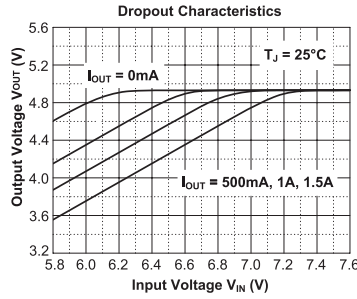
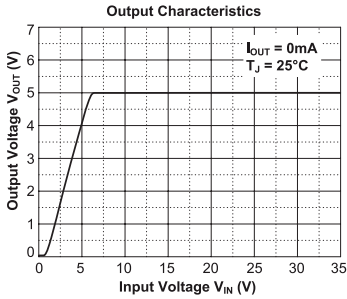
Parameter Name	Symbol	Test Conditions	Min	Typ	Max	Unit
Output voltage	V_{OUT}	$T_J = 25^\circ C$	14.55	15	15.45	V
		$I_{OUT} = 5mA$ to 1A, $V_{IN} = 18.5$ to 30V, $T_J = 0$ to 125°C	14.25		15.75	
Line regulation	ΔV_{OUT}	$V_{IN} = 17.5$ to 30V	--	15	300	mV
		$V_{IN} = 20$ to 26V		5	150	
Load regulation	ΔV_{OUT}	$I_{OUT} = 5mA$ to 1.5A		10	240	
		$I_{OUT} = 250$ to 750mA		3	120	
Quiescent current	I_Q	$T_J = 25^\circ C$		4	8	mA
Quiescent current change	ΔI_Q	$I_{OUT} = 5mA$ to 1A			0.5	
		$V_{IN} = 17.5$ to 30V		1		
Output voltage drift	$\Delta V_{OUT}/\Delta T$	$I_{OUT} = 5mA$		-1	mV/°C	
Output noise voltage	V_N	$f = 10$ to 100kHz		90	μV	
Ripple rejection	RR	$f = 120Hz$, $V_{IN} = 15$ to 25V	55	--	dB	
Dropout voltage(8)	V_D	$I_{OUT} = 1A$	--	2	--	V
Output resistance	R_{OUT}	$f = 1kHz$		19		mΩ
Short circuit current	I_{SC}			350		mA
Peak current	I_{PK}			2.2		A

Linear Voltage Regulator

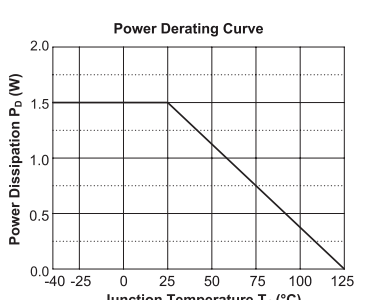
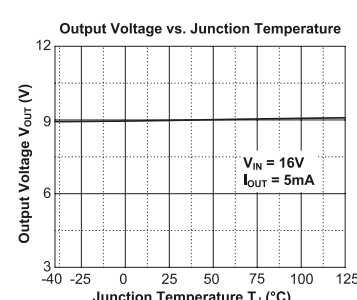
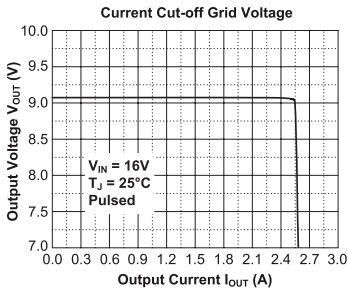
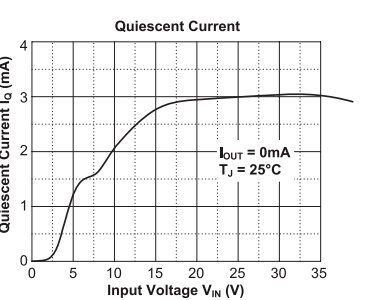
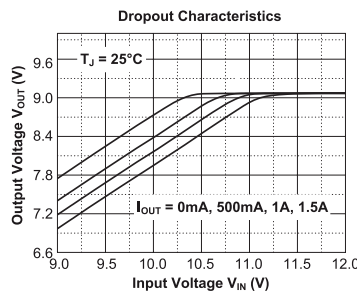
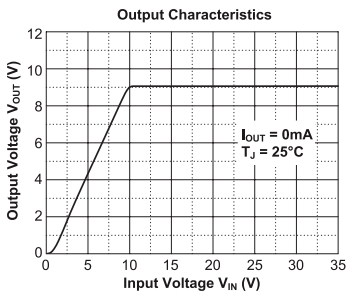
3 Terminal

Typical Characteristics

LM7805F ($V_{OUT}= 5V$, $C_{IN} = 0.33\mu F$, $C_{OUT} = 0.1\mu F$, $T_J = 25^\circ C$, unless otherwise specified)



LM7809F ($V_{OUT}= 9V$, $C_{IN} = 0.33\mu F$, $C_{OUT} = 0.1\mu F$, $T_J = 25^\circ C$, unless otherwise specified)

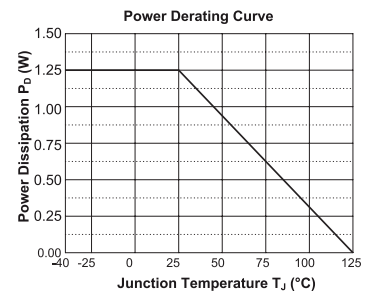
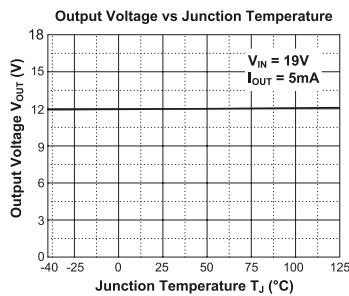
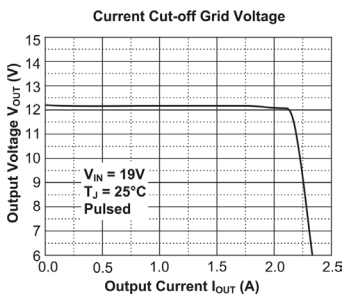
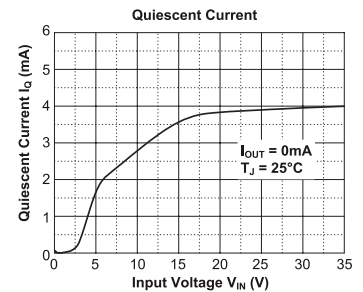
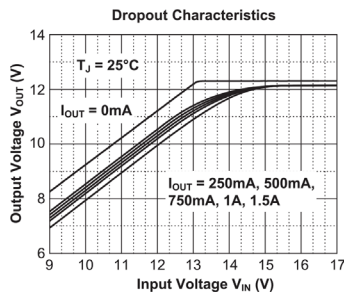
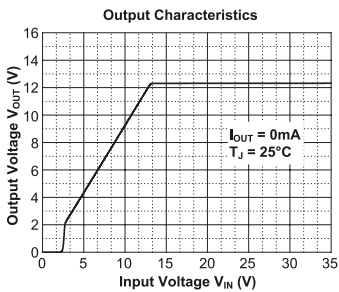


Linear Voltage Regulator

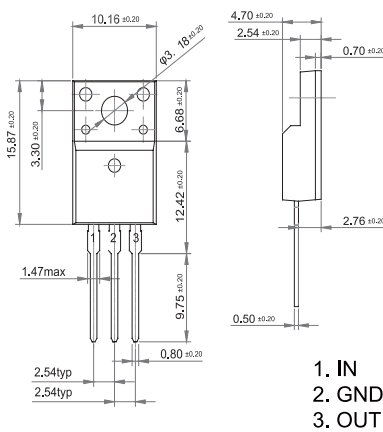
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LM7812F ($V_{OUT} = 12V, C_{IN} = 0.33\mu F, C_{OUT} = 0.1\mu F, T_J = 25^\circ C$, unless otherwise specified)



Diagram



Part Number Table

Description	Part Number
Linear Voltage Regulator, Fixed, 5V, 1.5A, TO-220F	LM7805F
Linear Voltage Regulator, Fixed, 9V, 1.5A, TO-220F	LM7809F
Linear Voltage Regulator, Fixed, 12V, 1.5A, TO-220F	LM7812F
Linear Voltage Regulator, Fixed, 15V, 1.5A, TO-220F	LM7815F

Dimensions : Millimetres

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