

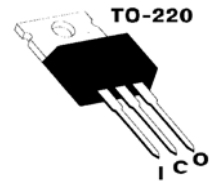
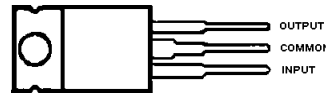
Description

This series of fixed-negative-voltage monolithic integrated-circuit voltage regulators is designed to complement Series MIK7800 in 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 amperes of output current. The internal current limiting and thermal shutdown features of these regulators make them essentially 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 current and also as the power pass element in precision regulators.

Features

- 3-Terminal Regulators
- Output Current Up to 1.5 A
- No External Components
- Internal Thermal Overload Protection
- High Power Dissipation Capability
- Internal Short-Circuit Current Limiting
- Output Transistor Safe Area Compensation

Package information



Package TO-220
(top view)

Typical application data 1.5 A regulator

When using a negative regulator, bypass capacitors are a must on both the input and output. Recommended values are 2 μF on the input and 1 μF on the output. It is considered good practice to include a 0.1 μF capacitor on the output to improve the transient response (Fig. 1). These capacitors may mylar, ceramic, or tantalum, provided that they have good high frequency characteristics.

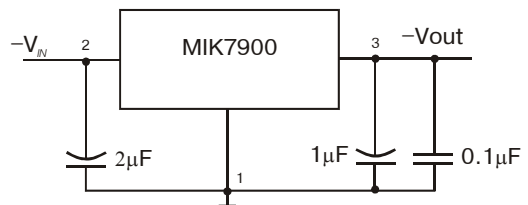


Figure 1. Negative Regulator

Absolute maximum ratings

over operating temperature range (unless otherwise noted)

Parameter	Maximum	Units	
Input voltage	MIK7924	-40	V
	All others	-35	
Continuous total dissipation at 25 °C free-air temperature	2	W	
Continuous total dissipation at (or below) 25 °C case temperature	15		
Operating free-air, case, or virtual junctions temperature range	0 to 150	°C	
Storage temperature range	-65 to 150		
Lead temperature 3.2 mm (1/8 inch) from case for 10 seconds	260		

Recommended operating conditions

Parameter	Min	Max	Units
Input voltage V_I	MIK7905	-7	V
	MIK7906	-8	
	MIK7908	-10.5	
	MIK7912	-14.5	
	MIK7915	-17.5	
	MIK7918	-21	
	MIK7924	-27	
Output current, I_O		1.5	A
Operating virtual junction temperature, T_J	0	125	°C

Device Selection Guide

Device	Output Voltage
MIK7905	-5V
MIK7906	-6V
MIK7908	-8V
MIK7912	-12V
MIK7915	-15V
MIK7918	-18V
MIK7924	-24V

Electrical characteristics MIK7905

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

Parameter	Test Conditions*	MIK7905			Units
		Min	Typ	Max	
Output voltage**	25°C	-4.8	-5	-5.2	V
	$I_O = 5mA$ to 1A, $V_I = -7V$ to -20V, $P \leq 15W$ 0°C to 125°C	-4.75	-5	-5.25	
Input regulation	25°C	$V_I = -7V$ to -25V	12.5	50	mV
		$V_I = -8V$ to -12V	4	15	
Ripple rejection	$V_I = -8V$ to -18V, $f = 120Hz$ 0°C to 125°C	54	60		dB
Output regulation	25°C	$I_O = 5mA$ to 1.5A	15	100	mV
		$I_O = 250mA$ to 750mA	5	50	
Temperature coefficient of output voltage	$I_O = 5mA$ 0°C to 125°C		-0.4		mV/°C
Output noise voltage	$f = 10 Hz$ to 100 KHz 25°C		125		µV
Dropout voltage	$I_O = 1A$ 25°C		1.1		V
Bias current	25°C		1.5	2	mA
Bias current change	$V_I = -7V$ to -25V 0°C to 125°C		0.15	0.5	
		$I_O = 5mA$ to 1A		0.08	
Peak output current	25°C		2.1		A

Electrical characteristics MIK7906

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

Parameter	Test Conditions*	MIK7906			Units
		Min	Typ	Max	
Output voltage**	25°C	-5.75	-6	-6.25	V
	$I_O = 5mA$ to 1A, $V_I = -8V$ to -21V, $P \leq 15W$ 0°C to 125°C	-5.7	-6	-6.3	
Input regulation	25°C	$V_I = -8V$ to -25V	12.5	120	mV
		$V_I = -9V$ to -13V	4	60	
Ripple rejection	$V_I = -9V$ to -19V, $f = 120Hz$ 0°C to 125°C	54	60		dB
Output regulation	25°C	$I_O = 5mA$ to 1.5A	15	120	mV
		$I_O = 250mA$ to 750mA	5	60	
Temperature coefficient of output voltage	$I_O = 5mA$ 0°C to 125°C		-0.4		mV/°C
Output noise voltage	$f = 10 Hz$ to 100 KHz 25°C		150		µV
Dropout voltage	$I_O = 1A$ 25°C		1.1		V
Bias current	25°C		1.5	2	mA
Bias current change	$V_I = -8V$ to -25V 0°C to 125°C		0.15	1.3	
		$I_O = 5mA$ to 1A		0.08	
Peak output current	25°C		2.1		A

* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately.

** This specification applies only for dc power dissipation permitted by absolute maximum ratings.

Electrical characteristics MIK7908

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

Parameter	Test Conditions*	MIK7908			Units	
		Min	Typ	Max		
Output voltage**	25°C	-7.7	-8	-8.3	V	
	$I_O = 5mA$ to 1A, $V_I = -10.5V$ to -23V, $P \leq 15W$	0°C to 125°C	-7.6	-8		-8.4
Input regulation	$V_I = -10.5V$ to -25V	25°C		12.5	160	mV
	$V_I = -11V$ to -17V			4	80	
Ripple rejection	$V_I = -11.5V$ to -21.5V, $f = 120Hz$	0°C to 125°C	54	60		dB
Output regulation	$I_O = 5mA$ to 1.5A	25°C		15	160	mV
	$I_O = 250mA$ to 750mA			5	80	
Temperature coefficient of output voltage	$I_O = 5mA$	0°C to 125°C		-0.6		mV/°C
Output noise voltage	$f = 10Hz$ to 100 KHz	25°C		200		µV
Dropout voltage	$I_O = 1A$	25°C		1.1		V
Bias current		25°C		1.5	2	mA
Bias current change	$V_I = -10.5V$ to -25V	0°C to 125°C		0.15	1	
	$I_O = 5mA$ to 1A			0.08	0.5	
Peak output current		25°C		2.1		A

Electrical characteristics MIK7912

Electrical characteristics at specified virtual junction temperature, $V_I = -19V$, $I_O = 500mA$ (unless otherwise noted)

Parameter	Test Conditions*	MIK7912			Units	
		Min	Typ	Max		
Output voltage**	25°C	-11.5	-12	-12.5	V	
	$I_O = 5mA$ to 1A, $V_I = -14.5V$ to -27V, $P \leq 15W$	0°C to 125°C	-11.4	-12		-12.6
Input regulation	$V_I = -14.5V$ to -30V	25°C		5	80	mV
	$V_I = -16V$ to -22V			3	30	
Ripple rejection	$V_I = -15V$ to -25V, $f = 120Hz$	0°C to 125°C	54	60		dB
Output regulation	$I_O = 5mA$ to 1.5A	25°C		15	200	mV
	$I_O = 250mA$ to 750mA			5	75	
Temperature coefficient of output voltage	$I_O = 5mA$	0°C to 125°C		-0.8		mV/°C
Output noise voltage	$f = 10 Hz$ to 100 KHz	25°C		300		µV
Dropout voltage	$I_O = 1A$	25°C		1.1		V
Bias current		25°C		2	3	mA
Bias current change	$V_I = -14.5V$ to -30V	0°C to 125°C		0.04	0.5	
	$I_O = 5mA$ to 1A			0.06	0.5	
Peak output current		25°C		2.1		A

* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately.

** This specification applies only for dc power dissipation permitted by absolute maximum ratings.

Electrical characteristics MIK7915

1.5 A Negative Voltage Regulator

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

Parameter	Test Conditions*	MIK7915			Units
		Min	Typ	Max	
Output voltage**	25°C	-14.4	-15	-15.6	V
	$I_O = 5mA$ to 1A, $V_I = -17.5V$ to -30V, $P \leq 15W$	-14.25	-15	-15.75	
Input regulation	$V_I = -17.5V$ to -30V		5	100	mV
	$V_I = -20V$ to -26V		3	50	
Ripple rejection	$V_I = -18.5V$ to -28.5V, $f = 120Hz$	54	60		dB
Output regulation	$I_O = 5mA$ to 1.5A		15	200	mV
	$I_O = 250mA$ to 750mA		5	75	
Temperature coefficient of output voltage	$I_O = 5mA$		-1		mV/°C
Output noise voltage	$f = 10 Hz$ to 100 KHz		375		µV
Dropout voltage	$I_O = 1A$		1.1		V
Bias current			2	3	mA
Bias current change	$V_I = -17.5V$ to -30V		0.04	0.5	
	$I_O = 5mA$ to 1A		0.06	0.5	
Peak output current			2.1		A

Electrical characteristics MIK7918

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

Parameter	Test Conditions*	MIK7918			Units
		Min	Typ	Max	
Output voltage**	25°C	-17.3	-18	-18.7	V
	$I_O = 5mA$ to 1A, $V_I = -21V$ to -33V, $P \leq 15W$	-17.1	-18	-18.9	
Input regulation	$V_I = -21V$ to -33V		5	360	mV
	$V_I = -24V$ to -30V		3	180	
Ripple rejection	$V_I = -22V$ to -32V, $f = 120Hz$	54	60		dB
Output regulation	$I_O = 5mA$ to 1.5A		30	360	mV
	$I_O = 250mA$ to 750mA		10	180	
Temperature coefficient of output voltage	$I_O = 5mA$		-1.0		mV/°C
Output noise voltage	$f = 10Hz$ to 100 KHz		450		µV
Dropout voltage	$I_O = 1A$		1.1		V
Bias current			2	3	mA
Bias current change	$V_I = -21V$ to -33V		0.04	1	
	$I_O = 5mA$ to 1A		0.06	0.5	
Peak output current			2.1		A

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Electrical characteristics MIK7924

Electrical characteristics at specified virtual junction temperature, $V_i = -33V$, $I_o = 500mA$ (unless otherwise noted)

Parameter	Test Conditions*	MIK7924			Units
		Min	Typ	Max	
Output voltage**	25°C	-23	-24	-25	V
	$I_o = 5mA$ to 1A, $V_i = -27V$ to -38V, $P \leq 15W$ 0°C to 125°C	-22.8	-24	-25.2	
Input regulation	$V_i = -27V$ to -38V 25°C		5	480	mV
	$V_i = -30V$ to -36V		3	240	
Ripple rejection	$V_i = -28V$ to -38V, $f = 120Hz$ 0°C to 125°C	54	60		dB
Output regulation	$I_o = 5mA$ to 1.5A 25°C		85	480	mV
	$I_o = 250mA$ to 750mA		25	240	
Temperature coefficient of output voltage	$I_o = 5mA$ 0°C to 125°C		-1		mV/°C
Output noise voltage	$f = 10Hz$ to 100 KHz 25°C		600		µV
Dropout voltage	$I_o = 1A$ 25°C		1.1		V
Bias current	25°C		2	3	mA
Bias current change	$V_i = -27V$ to -38V 0°C to 125°C		0.04	1	
	$I_o = 5mA$ to 1A		0.06	0.5	
Peak output current	25°C		2.1		A

* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately.

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