

LM304 Negative Voltage Regulator

GENERAL DESCRIPTION

The LM304 precision negative voltage regulator is constructed using the Fairchild Planar epitaxial process. This device can be programmed by a single external resistor to supply any voltage from 0V to 30V from a single unregulated supply. When used with a separate floating bias supply, the 304 can provide 0.01% regulation with the output voltage limited only by the breakdown of external pass transistors.

FEATURES

- 1mV regulation with full load.
- 0.01%/V line regulation.
- 0.2mV/V ripple rejection.
- 0.3% temperature stability over full temperature range.

REFERENCE TABLE

Code	Stock No.
LM304H	35879X

LM305 Positive Voltage Regulator

GENERAL DESCRIPTION

The LM305 is a monolithic positive voltage regulator constructed using the Fairchild Planar epitaxial process. Applications for this device includes both linear and switching regulator circuits with output voltages greater than 4.5V. This device will not oscillate when confronted with varying resistive and reactive loads and will start reliably regardless of the load within the ratings of the circuit. It also features fast response to both load and line transient.

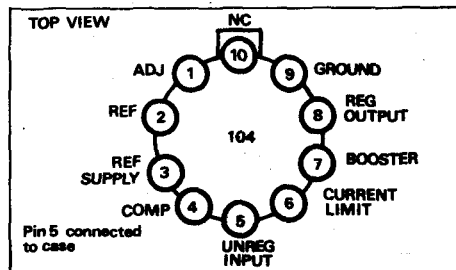
FEATURES

- Low standby current drain.
- Adjustable output voltage from 4.5V to 40V.
- High output currents exceeding 10A with external components.
- Load regulation better than 0.1%, full load with current limiting.
- DC line regulation guaranteed at 0.03%/V.
- Ripple rejection of 0.01%/V.

REFERENCE TABLE

Code	Stock No.
LM305H	35500C

CONNECTION DIAGRAM

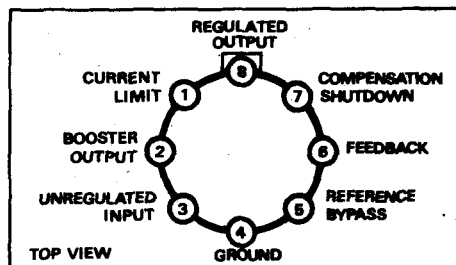


See outline drawing No. 98 for dimensions.

ABSOLUTE MAXIMUM RATINGS

Input voltage	40V
Input/output voltage differential	40V
Power dissipation	500mW
Operating temperature range	0°C to 70°C
Storage temperature range	-65°C to +150°C
Lead temperature (soldering, 10 seconds)	300°C

CONNECTION DIAGRAM



See outline drawing No. 97 for dimensions.

ABSOLUTE MAXIMUM RATINGS

Input voltage	40V
Input/output voltage differential	40V
Internal power dissipation	500mW
Operating temperature range	0°C to 70°C
Storage temperature range	-65°C to +150°C
Lead temperature (soldering, 60 seconds)	300°C

LM105 Series Positive Voltage Regulators

REFERENCE TABLE

Code	Stock No.
LM105H	19653C
LM205H	19658D
LM305H	19664H
LM305AH	306048

GENERAL DESCRIPTION

The LM105, Series are positive voltage regulators similar to the LM100, series except that an extra gain stage has been added for improved regulation. A redesign of the biasing circuitry removes any minimum load current requirement and at the same time reduces standby current drain, permitting higher voltage operation. They are direct, plug-in replacements for the LM100 series in both linear and switching regulator circuits with output voltages greater than 4.5V.

FEATURES

Output voltage adjustable from 4.5V to 40V

Output currents in excess of 10A possible by adding external transistors

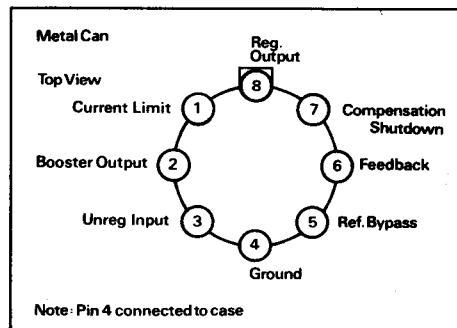
Load regulation better than 0.1%, full load with current limiting

DC line regulation guaranteed at 0.03%/V

Ripple rejection of 0.01%/V

Like the LM100 series they also feature fast response to both load and line transients, freedom from oscillations with varying resistive and reactive loads and the ability to start reliably on any load within rating. The circuits are built on a single silicon chip and are supplied in an 8-lead, TO-5 header.

CONNECTION DIAGRAM



See outline drawing No. 97 for dimensions.

ABSOLUTE MAXIMUM RATINGS

Input Voltage LM105, LM205 LM305, LM305A	50V
Input-Output Voltage Differential	40V
Power Dissipation LM105, LM205, LM305A LM305	800 mW 500 mW
Operating Temperature LM105 LM205 LM305, LM305A	0°C to 70°C -55°C to +125°C -25°C to +85°C 0°C to 70°C
Storage Temperature Range	-65°C to 150°C
Lead Temperature (soldering, 10 sec)	300°C

See next page for Electrical Characteristics

ELECTRICAL CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Input voltage range LM105, LM205, LM305A LM305		8.5 8.5		50 40	V V
Output voltage range LM105, LM205, LM305A LM305		4.5 4.5		40 30	V V
Output-input voltage differential		3.0		30	V
Load regulation LM105	$0 \leq I_o \leq 12\text{mA}$ $R_{SC} = 10\Omega, T_A = 25^\circ\text{C}$ $R_{SC} = 10\Omega, T_A = 125^\circ\text{C}$ $R_{SC} = 10\Omega, T_A = -55^\circ\text{C}$		0.02 0.03 0.03	0.05 0.1 0.1	% % %
LM205	$0 \leq I_o \leq 12\text{mA}$ $R_{SC} = 10\Omega, T_A = 25^\circ\text{C}$ $R_{SC} = 10\Omega, T_A = 85^\circ\text{C}$ $R_{SC} = 10\Omega, T_A = -25^\circ\text{C}$		0.02 0.03 0.03	0.05 0.1 0.1	% % %
LM305	$0 \leq I_o \leq 12\text{mA}$ $R_{SC} = 10\Omega, T_A = 25^\circ\text{C}$ $R_{SC} = 15\Omega, T_A = 70^\circ\text{C}$ $R_{SC} = 10\Omega, T_A = 0^\circ\text{C}$		0.02 0.03 0.03	0.05 0.1 0.1	% % %
LM305A	$0 \leq I_o \leq 45\text{mA}$ $R_{SC} = 0\Omega, T_A = 25^\circ\text{C}$ $R_{SC} = 0\Omega, T_A = 70^\circ\text{C}$ $R_{SC} = 0\Omega, T_A = 0^\circ\text{C}$		0.02 0.03 0.03	0.02 0.04 0.04	% % %
Line regulation	$V_{IN} - V_{OUT} \leq 5\text{V}$ $V_{IN} - V_{OUT} > 5\text{V}$		0.025 0.015	0.06 0.03	%/V %/V
Ripple rejection	$C_{REF} = 10\mu\text{F}, f = 120\text{Hz}$		0.003		%/V
Temperature stability LM105 LM205 LM305, LM305A	$-55^\circ\text{C} \leq T_A \leq 125^\circ\text{C}$ $-25^\circ\text{C} \leq T_A \leq 85^\circ\text{C}$ $0^\circ\text{C} \leq T_A \leq 70^\circ\text{C}$		0.3 0.3 0.3	1.0 1.0 1.0	% % %
Feedback sense voltage LM105, LM205, LM305 LM305A		1.63 1.55	1.7 1.7	1.81 1.85	V V
Output noise voltage	$10\text{Hz} \leq f \leq 10\text{kHz}$ $C_{REF} = 0$ $C_{REF} > 0.1\mu\text{F}$		0.005 0.002		% %
Current limit sense voltage LM105, LM205, LM305 LM305A	$R_{SC} = 10\Omega, T_A = 25^\circ\text{C},$ $V_{OUT} = 0\text{V}$	225 225	300 300	315 375	mV mV
Standby current drain LM105, LM205, LM305A LM305	$V_{IN} = 50\text{V}$ $V_{IN} = 40\text{V}$		0.8 0.8	2.0 2.0	mA mA
Long term stability			0.1	1.0	%

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