

LM105 Series Positive Voltage Regulators

REFERENCE TABLE

Codé	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

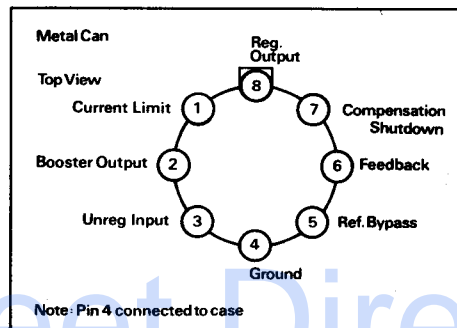
Load regulation better than 0.1%, full load with current limiting

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	$0 < I_o < 12\text{mA}$ $R_{SC} = 10\Omega, T_A = 25^\circ\text{C}$ $R_{SC} = 10\Omega, T_A = 125^\circ\text{C}$ $R_{SC} = 10\Omega, T_A = -55^\circ\text{C}$		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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