

THOMSON SEMICONDUCTORS

78C 06193

D

LM105

LM205

LM305

T-58-11-23

ADJUSTABLE POSITIVE VOLTAGE REGULATORS

The LM105/LM205/LM305 are positive voltage regulators designed for a wide range of applications from digital power supplies to precision regulators for analog circuitry.

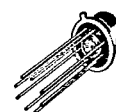
Important characteristics of these circuits are :

- Output voltage adjustable from 4.5 V to 40 V
- Output current in excess of 10 A 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

Additional features are : fast response to both load and line transients, freedom from oscillation with varying resistive or reactive loads and the ability to start reliably on any load within rating.

ADJUSTABLE POSITIVE VOLTAGE REGULATORS

CASE CB-11
(TO-99)



H SUFFIX
METAL CAN

ORDERING INFORMATION

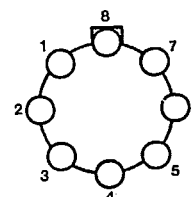
Hi-Rel versions available - See chapter 14

PART NUMBER	TEMPERATURE RANGE	PACKAGE
		H
LM105	-55°C to +125°C	•
LM205	-25°C to +85°C	•
LM305	0°C to +70°C	•

Examples : LM105H, LM205H

PIN ASSIGNMENT

(Top view)



- 1 - Current limit
- 2 - Booster output
- 3 - Unregulated input
- 4 - Ground
- 5 - Reference bypass
- 6 - Feedback
- 7 - Compensation
- 8 - Regulated output

Ref. 00105

THOMSON SEMICONDUCTORS

Sales headquarters
45, av. de l'Europe - 78140 VELIZY - FRANCE
Tel. : (3) 946 97 19 / Telex : 204780 F

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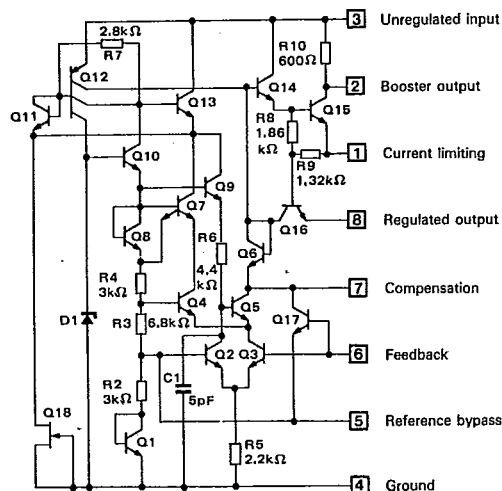
MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Input voltage	V_I	50 40	V
Input-output voltage differential	$V_I - V_O$	40	V
Internal power dissipation	P_{tot}	500	mW
Short-circuit output current	I_{OS}	25	mA
Operating free-air temperature range	T_{oper}	-55 to +125 -25 to +85 0 to +70	°C
Storage temperature range	T_{stg}	-65 to +150	°C

THERMAL CHARACTERISTICS

Rating	Symbol	Value	Unit
Maximum junction-case thermal resistance	$R_{th(j-c)}$	45	°C/W
Maximum junction-ambient thermal resistance	$R_{th(j-a)}$	150	°C/W

SCHEMATIC DIAGRAM



LM105 • LM205 • LM305

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ELECTRICAL CHARACTERISTICS

LM105 : $-55^{\circ}\text{C} \leq T_J \leq +125^{\circ}\text{C}$ LM205 : $-25^{\circ}\text{C} \leq T_J \leq +85^{\circ}\text{C}$ LM305 : $0^{\circ}\text{C} \leq T_J \leq +70^{\circ}\text{C}$

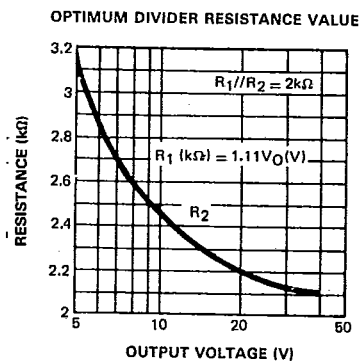
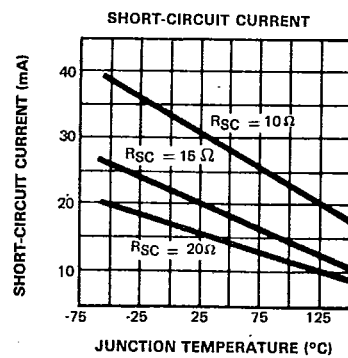
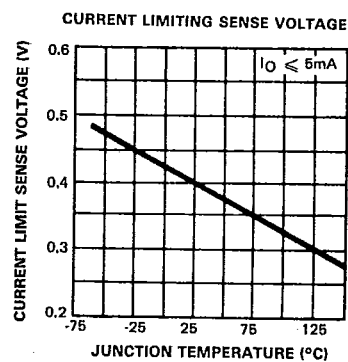
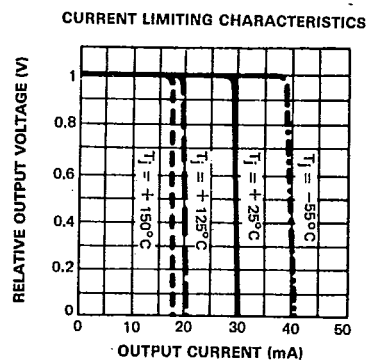
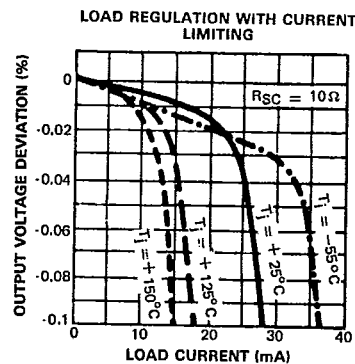
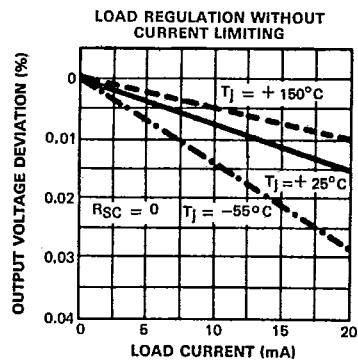
(Unless otherwise specified)

Characteristic	Symbol	LM105 - LM205			LM305			Unit
		Min	Typ	Max	Min	Typ	Max	
Input voltage range	V_I	8.5	—	50	8.5	—	40	V
Output voltage range	V_O	4.5	—	40	4.5	—	30	V
Input-output voltage differential	$V_I - V_O$	3	—	30	3	—	30	V
Line regulation $V_I - V_O \leq 5\text{ V}$ $V_I - V_O \geq$	K_V	—	0.025 0.015	0.06 0.03	—	0.025 0.015	0.06 0.03	%/V
Load regulation ($0 \leq I_O \leq 12\text{ mA}$, $R_{SC} = 10\ \Omega$) - Note 2 $T_J = +25^{\circ}\text{C}$ $T_J = T_{J(\text{min})}$ $T_J = T_{J(\text{max})}$	K_{VO}	—	0.02 0.03 0.03	0.05 0.1 0.1	—	0.02 0.03 0.03	0.05 0.1 0.1	%
Ripple rejection ($C_{ref} = 10\ \mu\text{F}$, $f = 100\text{ Hz}$)	R_{VI}	—	0.003	0.01	—	0.03	0.01	%/V
Standby current drain $V_I = 50\text{ V}$ $V_I = 40\text{ V}$	I_{IB}	— —	0.8 —	2 —	— —	0.8 —	2 —	mA
Reference voltage	V_{ref}	1.63	1.7	1.81	1.63	1.7	1.81	V
Output noise voltage ($10\text{ Hz} \leq f \leq 10\text{ kHz}$) $C_{ref} = 0$ $C_{ref} > 0.1\ \mu\text{F}$	V_{NO}	—	0.005 0.002	— —	—	0.005 0.002	— —	%
Average temperature coefficient of output voltage	αV_O	—	0.3	1	—	0.3	1	%
Long term stability	K_{VH}	—	0.1	1	—	0.1	1	%
Current limit sense voltage ($T_J = +25^{\circ}\text{C}$, $R_{SC} = 10\ \Omega$, $V_O = 0$)	V_{sense}	225	300	375	225	300	375	mV

Note 1 : These specifications apply for a junction temperature between $T_{J(\text{min})}$ and $T_{J(\text{max})}$, for input and output voltages within the ranges given, and for a divider impedance seen by the feedback terminal of $2\text{ k}\Omega$, unless otherwise specified. The load and line regulation specifications are for constant junction temperature. Temperature drift effects must be taken into account separately when the unit is operating under conditions of high dissipation.

Note 2 : The output current given, as well as the load regulation, can be increased by the addition of external transistors. The improvement factor will be roughly equal to the composite current gain of the added transistors.

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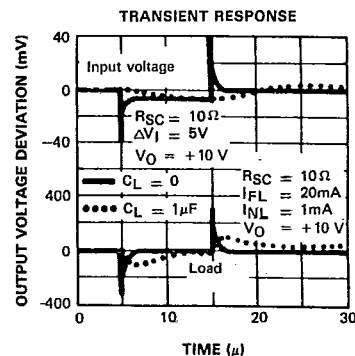
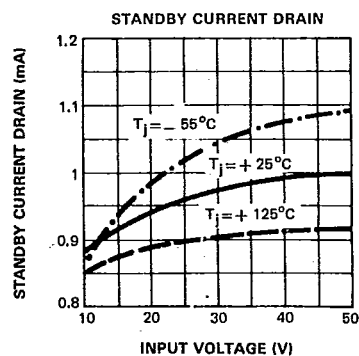
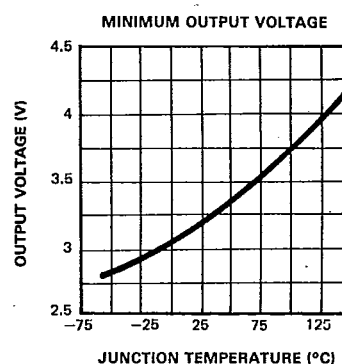
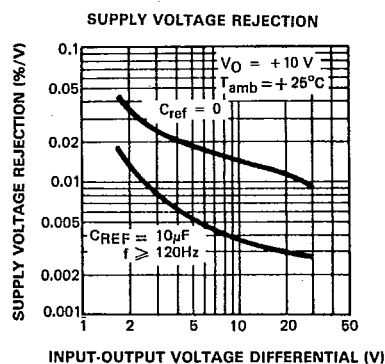
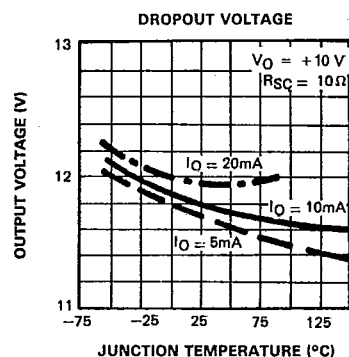
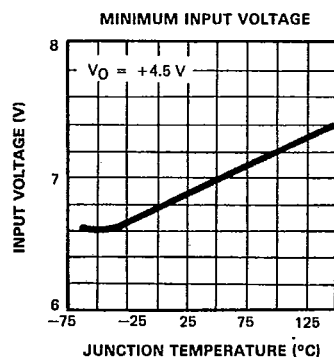
LM105 • LM205 • LM305

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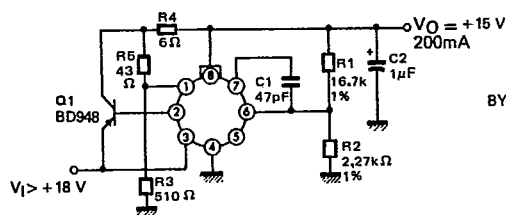
LM105 • LM205 • LM305

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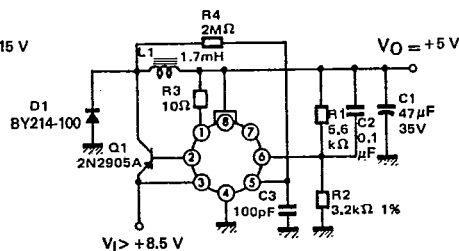
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TYPICAL APPLICATIONS

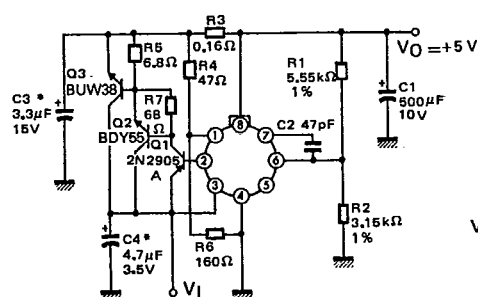
LINEAR REGULATOR WITH FOLDBACK CURRENT LIMITING



SWITCHING REGULATOR

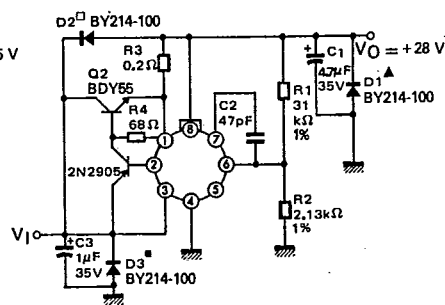


10 A REGULATOR WITH FOLDBACK CURRENT LIMITING



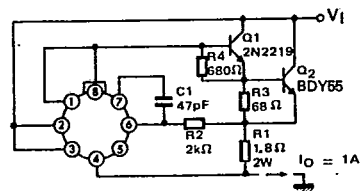
* Solid tantalum

1 A REGULATOR WITH PROTECTIVE DIODES

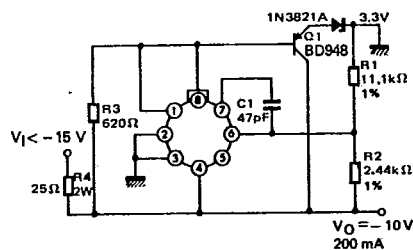


- Protects against shorted input or inductive loads on unregulated supply.
- Protects against input voltage reversal.
- ▲ Protects against output voltage reversal.

CURRENT REGULATOR



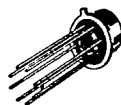
SHUNT REGULATOR (VO < 0)



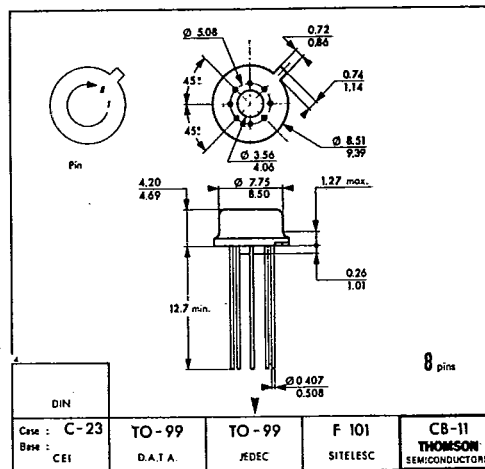
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CB-11
(TO-99)H SUFFIX
METAL CAN

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These specifications are subject to change without notice.
Please inquire with our sales offices about the availability of the different packages.

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