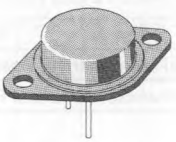
SGS-THOMSON
MICROELECTRONICS

LM209
LM309

THREE-TERMINAL 5-VOLT REGULATORS

- FIXED VOLTAGE REGULATOR REQUIRES NO EXTERNAL COMPONENT FOR ADJUSTING
- CAN PROVIDE OTHER VALUES OF REGULATED VOLTAGES ABOVE 5V USING SEPARATE, BIAS RESISTORS
- SPECIFIED TO BE COMPATIBLE, WORST CASE, WITH TTL AND DTL



TO-3

DESCRIPTION

The LM209 and LM309 are 5V regulators. They are designed for local regulation on digital logic cards.

The available output current is greater than 1A.

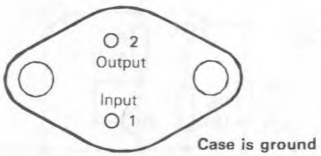
These regulators are essentially blow-out proof. Current limiting is included and thermal shut down is provided to keep the ICs from overheating. If internal dissipation becomes too great, the regulator will shut down to prevent excessive heating.

ORDER CODES

Part Number	Temperature Range
LM209	– 25°C to + 150°C
LM309	0°C to + 125°C

PIN CONNECTION (bottom view)

TO-3



Case is ground

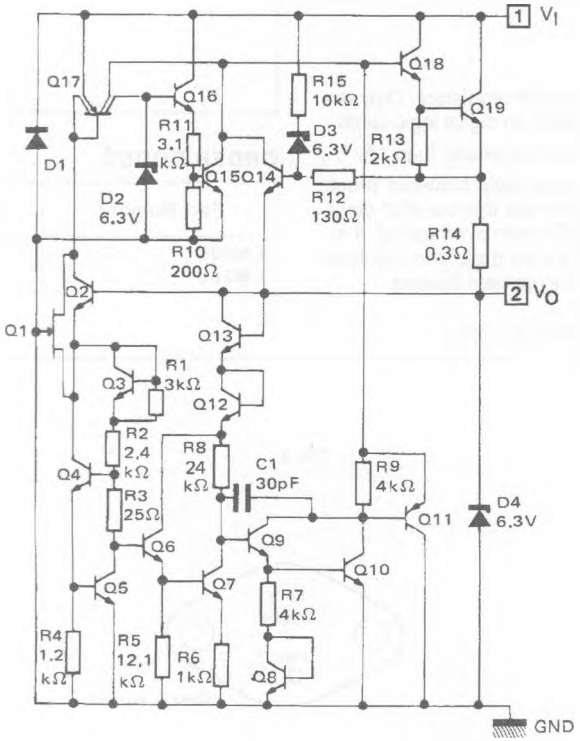
ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter		Value	Unit
V_I	Input Voltage		35	V
P_D	Internal Power Dissipation		Internally Limited	W
I_{OS}	Short-circuit Output Current		Internally Limited	A
T_{oper}	Operating Free-air Temperature Range	LM209 LM309	− 25 to + 150 0 to + 125	°C
T_{stg}	Storage Temperature Range		− 65 to + 150	°C

THERMAL CHARACTERISTICS

Symbol	Parameter	Min.	Typ.	Max.	Unit
$R_{th(j-c)}$	Junction-case Thermal Resistance			4	°C/W
$R_{th(j-a)}$	Junction-ambient Thermal Resistance		35		°C/W

SCHEMATIC DIAGRAM



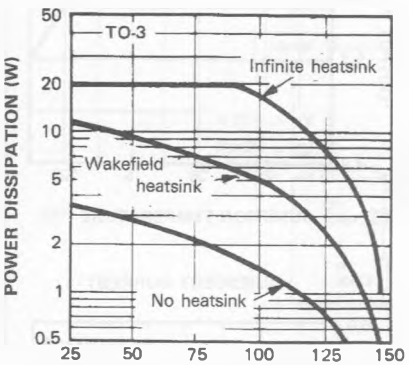
Case	V_I	V_O	GND
TO-3	1	2	Case

ELECTRICAL CHARACTERISTICS

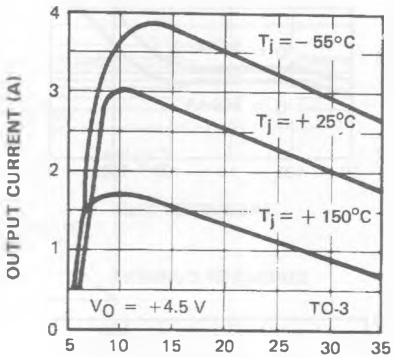
LM209 : $-25°C \leq T_j \leq +150°C$
LM309 : $0°C \leq T_j \leq +150°C$
$V_I = +10V$, $I_O = 0.5A$
(unless otherwise specified)

Symbol	Parameter	LM209			LM309			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	
V_O	Output Voltage Range $T_j = +25°C$ $T_{min} \leq T_{amb} \leq T_{max}$ $+7V \leq V_I \leq +25V$, $5mA \leq I_O \leq 1A$, $P < 20W$	4.7 4.6	5.05	5.3 5.4	4.8 4.75	5.05	5.2 5.25	V
K_{VI}	Line Regulation ($+7V \leq V_I \leq +25V$, $T_j = +25°C$)		4	50		4	50	mV
K_{VO}	Load Regulation ($T_j = +25°C$) $5mA \leq I_O \leq 1.5A$		 50	 100		 50	 100	mV
I_{IB}	Quiescent Current ($+7V \leq V_I \leq +25V$)		5.2	10		5.2	10	mA
ΔI_{IB}	Quiescent Current Deviation $+7V \leq V_I \leq +25V$ $5mA \leq I_O \leq 1A$ CB-19			 0.5 0.8			 0.5 0.8	mA
V_{NO}	Output Noise Voltage ($T_{amb} = +25°C$, $10Hz \leq f \leq 100kHz$)			40			40	μV
K_{VH}	Long Term Stability			10			20	mV

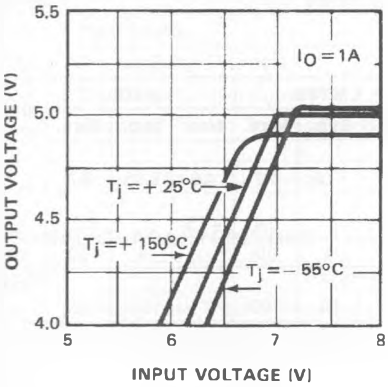
MAXIMUM AVERAGE POWER DISSIPATION



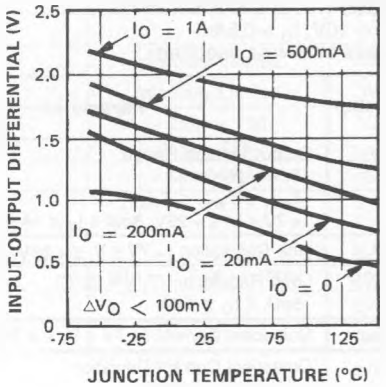
PEAK OUTPUT CURRENT



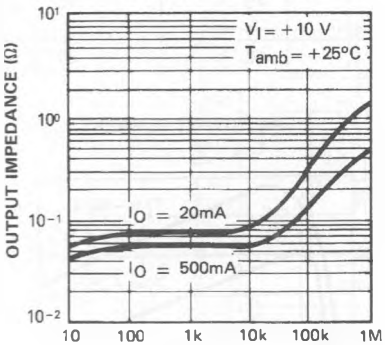
DROPOUT CHARACTERISTICS



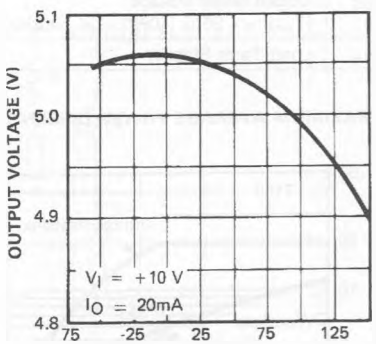
DROPOUT VOLTAGE



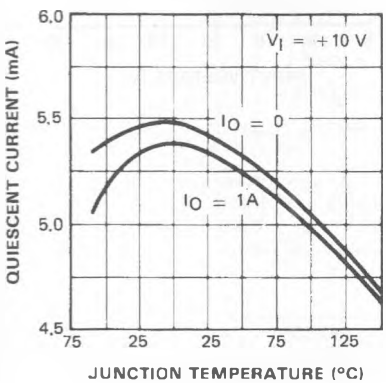
OUTPUT IMPEDANCE



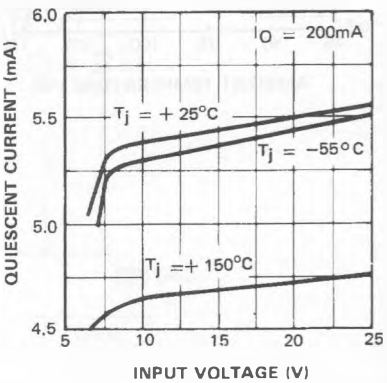
OUTPUT VOLTAGE

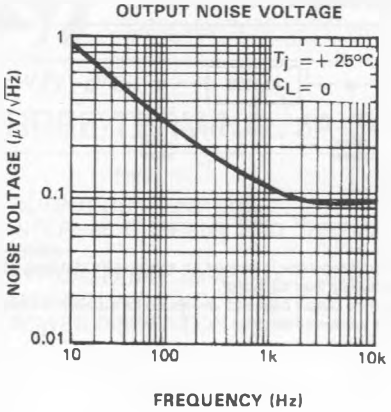


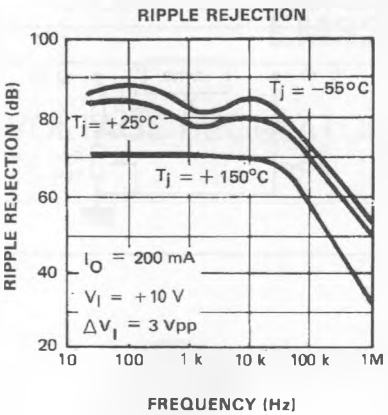
QUIESCENT CURRENT



QUIESCENT CURRENT

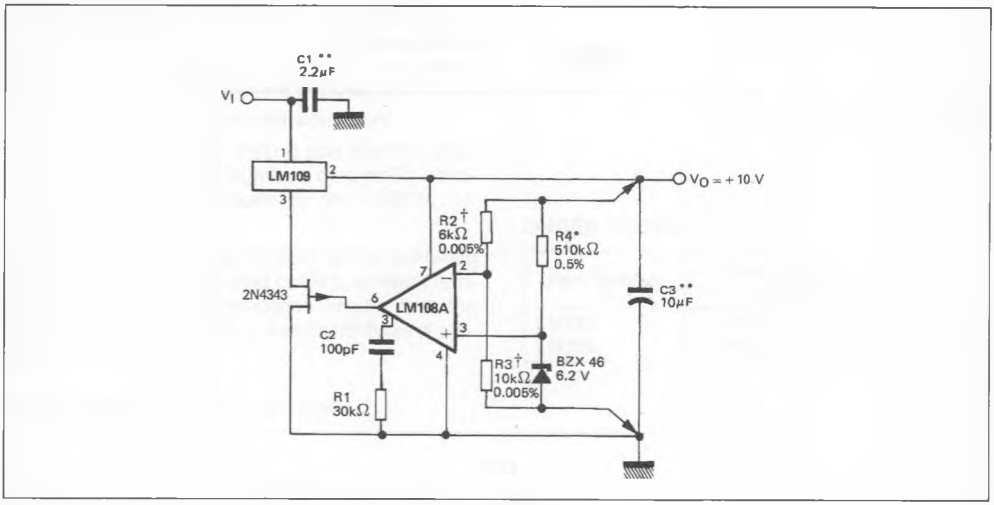






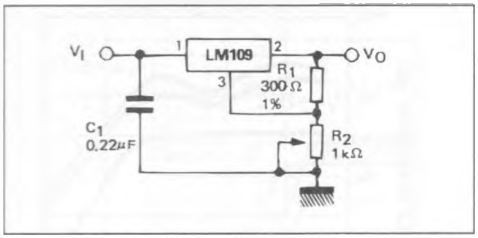
TYPICAL APPLICATION

✡ HIGH STABILITY REGULATOR

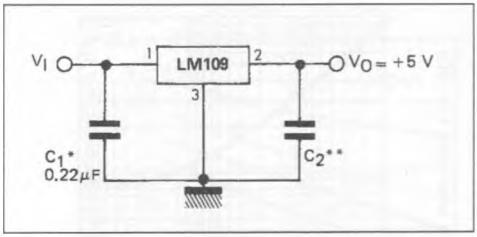


✡ Regulation better than 0.01% load, line and temperature can be obtained.
* Determines zener current. May be adjusted to minimize thermal drift.
** Solid tantalum.
† High stability resistors.

ADJUSTABLE OUTPUT REGULATOR



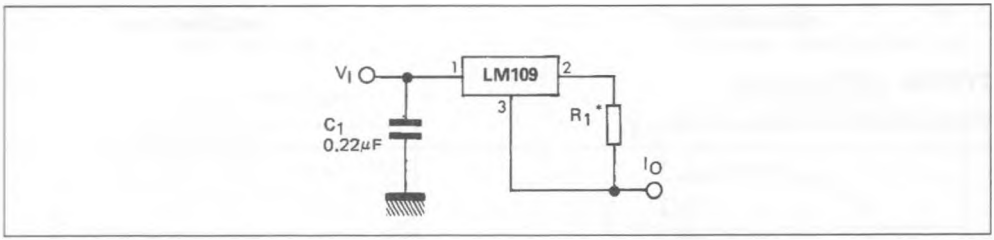
FIXED 5V REGULATOR



* Required if regulator is located an appreciable distance from power supply filter capacitor.

** Although no output capacitor is needed for stability, it does improve transient response.

CURRENT REGULATOR



* Determines output current.