

LA5658



T-58-11-13

Monolithic Linear IC

Multifunction Multiple Voltage Regulator

©15158

The LA5658 is a multi-output voltage regulator intended for use in tuners and the like. It delivers 3 regulated outputs of 30V for varicap, active filter, 5.9V for microcomputer, and 15.5V for other use and contains a microcomputer reset circuit.

Use

Voltage regulator for tuners, receivers, and the like.

Features

- (1) Voltage regulator function
 - . 3-input, 3-output voltage regulator:
 - a:30V-50mA, b:15.5V-350mA, c:5.9V-100mA
 - . 15.5V output (parallel regulator) best suited for audio amp use. An external resistor can be used to adjust the maximum output current.
 - . All outputs contain an overcurrent limiter.
 - . On-chip thermal shutdown circuit.
- (2) Reset function
 - . Resettable when power is turned on/off.
 - . Reset time securing function against short break of power.
 - . An external resistor, capacitor can be used to set the reset signal pulse width.

Maximum Ratings at Ta=25°C

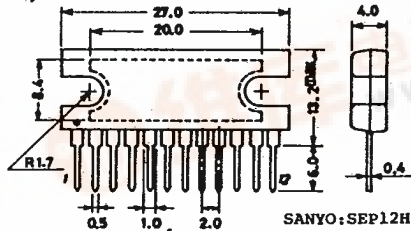
			unit
Maximum Supply Voltage	V _{IN1}	50	V
	V _{IN2,3}	35	V
Maximum Output Current	I _{OUT2}	500	mA
	I _{OUT1,3}	Internal	
Allowable Power Dissipation	P _{dmax}	Infinite heat sink	13.8 W
		IC alone	2.8 W
Operating Temperature	Topg	-30 to +80	°C
Storage Temperature	Tstg	-40 to +125	°C

Operating Conditions at Ta=25°C

			unit
Recommended Supply Voltage	V _{IN1}	35 to 48	V
	V _{IN2}	19.5 to 33	V
	V _{IN3}	9 to 33	V
Output Current	I _{OUT2}	0 to 450	mA



Case Outline 3049A-S12HIC
(unit:mm)

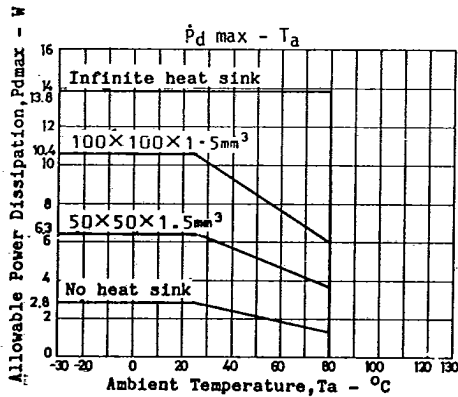


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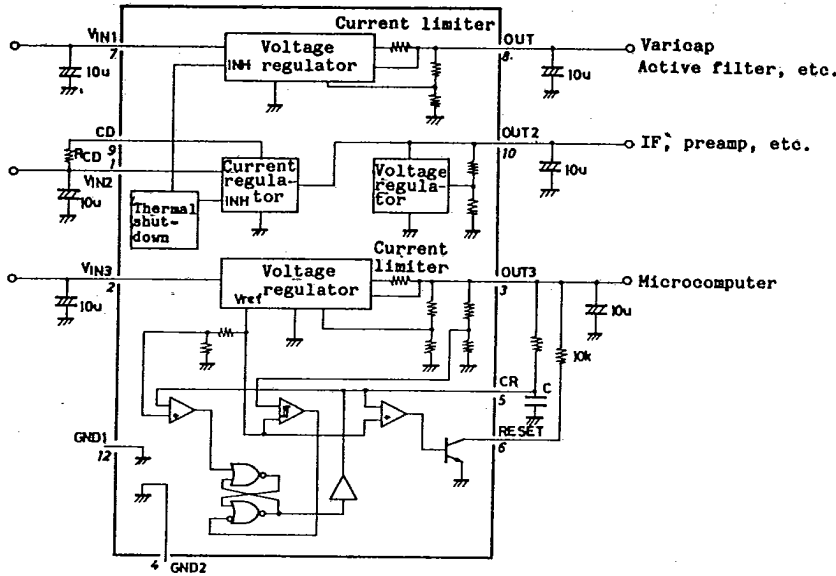


Operating Characteristics at Ta=25°C

		min	typ	max	unit
Quiescent Current	I _{IN1} V _{IN1} =40V, V _{IN2} =20V		1.2	2.0	mA
	I _{IN3} V _{IN3} =10V		3.8	5.4	mA
	I _{IN2} V _{IN2} =20V, R _{CD} =1ohm	300	350	400	mA
Constant Current	Vo1 V _{IN1} =40V, V _{IN2} =20V	27.5	30.0	32.5	V
	Vo2 V _{IN2} =20V	14.5	15.5	16.5	V
	Vo3 V _{IN3} =10V	5.5	5.9	6.3	V
Line Regulation	Vo11 35V ≤ V _{IN1} ≤ 45V		10	50	mV
	Vo12 19V ≤ V _{IN2} ≤ 27V		10	100	mV
	Vo13 9V ≤ V _{IN3} ≤ 18V		2	30	mV
Load Regulation	Vold1 0 ≤ I _o ≤ 50mA, V _{IN1} =37V, V _{IN2} =20V		6	40	mV
	Vold2 0 ≤ I _o ≤ 200mA, V _{IN2} =20V		40	200	mV
	Vold3 0 ≤ I _o ≤ 100mA, V _{IN3} =10V		15	60	mV
Ripple Rejection	Rr1 f=120Hz	50	70		dB
	Rr2 "	46	66		dB
	Rr3 "	60	75		dB
Input-Output Voltage Drop	Vdr1 I _o =20mA		1.5	2.5	V
	Vdr2 I _o =200mA		1.7	3.0	V
	Vdr3 I _o =50mA		1.6	2.5	V
Reset Detection Voltage	V _R	4.5	4.9	5.3	V
Timer Comparison Voltage	V _{C1}	1.7	2.0	2.3	V
	V _{C2}	0.1	0.2	0.3	V
Timer Input Bias Current	I _{TB}			250	nA



Equivalent Circuit Block Diagram, Pin Assignment, and Peripheral Circuit



Pin No.	Pin Name	Function
1	V _{IN2}	Input pin for 15.5V output line
2	V _{IN3}	Input pin for 5.9V output line
3	OUT3	5.9V output pin
4	GND2	GND of 5.9V regulator and reset circuit
5	CR	Reset pulse width setting pin
6	RESET	Reset signal output pin
7	V _{IN1}	Input pin for 30V output line
8	OUT1	30V output pin
9	CD	15.5V line output current setting pin. A resistor across CD and V _{IN2} is used for setting.
10	OUT2	15.5V output pin.
11	NC	
12	GND1	GND of 15.5V, 30V regulators

Note: Do not use the NC pin.

Setting of 15.5V line output current I_{OUT2}
 $I_{OUT2} = 0.35 / R_{CD} \text{ (ohm)}$ [A]

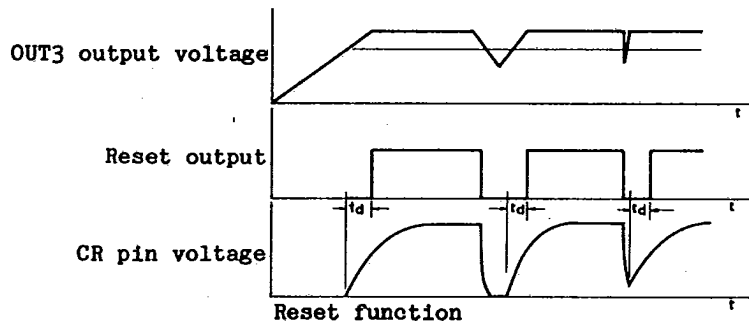
Reset function

- (1) Reset when power is turned on
 When power is applied and the voltage on the 5.9V output pin rises to be more than 4.9V_{typ}, C is charged and the reset output pin is set to "L" for a preset period of time and then set to "H".
- (2) Reset when power is turned off
 When power is turned off and the voltage on the 5.9V output pin drops to be less than 4.8V_{typ}, C is discharged rapidly and the reset output pin is set to "L".
- (3) Short break of power (Momentary drop of output)
 Even when the output voltage drops for a moment unlike when power is turned off and the output voltage drops gradually, a reset pulse width

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required for a microcomputer must be secured. When the voltage on the 5.9V output pin drops below $4.8V_{typ}$ for a moment, C is discharged for this momentary period of time, however short it may be, until the voltage of C drops below $0.2V_{typ}$. Then, C is charged, thereby securing a reset pulse width for a preset period of time.



Setting of reset pulse width

$$t_d = -CR \ln(1 - V_{c1}/V_{OUT3})$$

$$t_d \approx 0.452 CR$$