

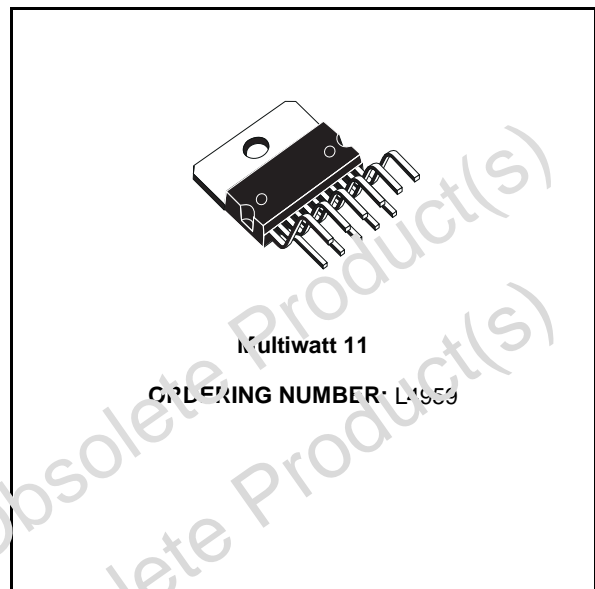


## MULTIFUNCTION VOLTAGE REGULATOR FOR HOME AUDIO

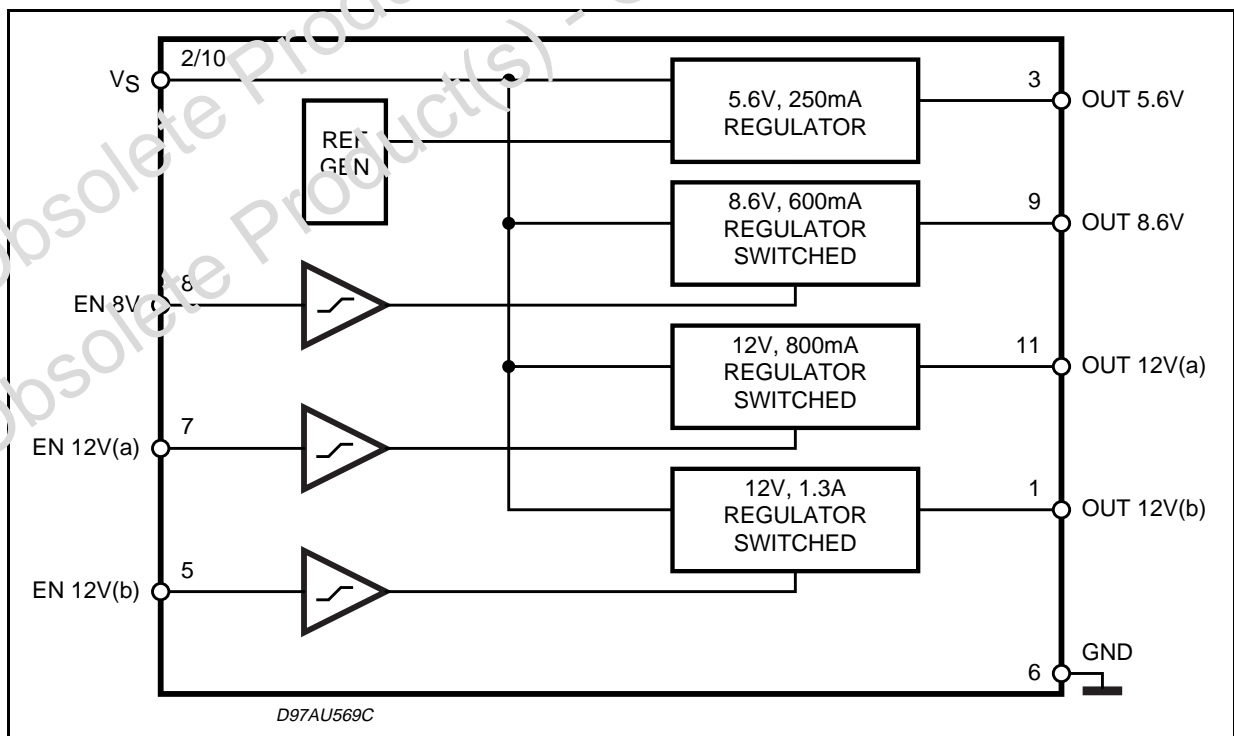
- 4 OUTPUTS:  
12V (1.3A); 12V (0.8A); 8.6V (0.6A); 5.6V (0.25A) STANDBY
- OUT1 12V(a), OUT2 12V(b) AND OUT3 8.6V WITH INDEPENDENT ENABLE CONTROL FOR STAND-BY MODE
- SHORT-CIRCUIT PROTECTION TO GROUND
- THERMAL SHUTDOWN

### DESCRIPTION

The L4959 is a monolithic Multifunction Voltage Regulator, designed mainly for supplying Home Audio systems. The L4959 contains one unswitched linear 5.6V regulator for Micro, two switched regulators 8.6V and 12V, suitable to feed CD or CD players and LED, Signal Process. An additional 12V regulator for Solenoid Motor an CD\_TRAY Driven is also available.



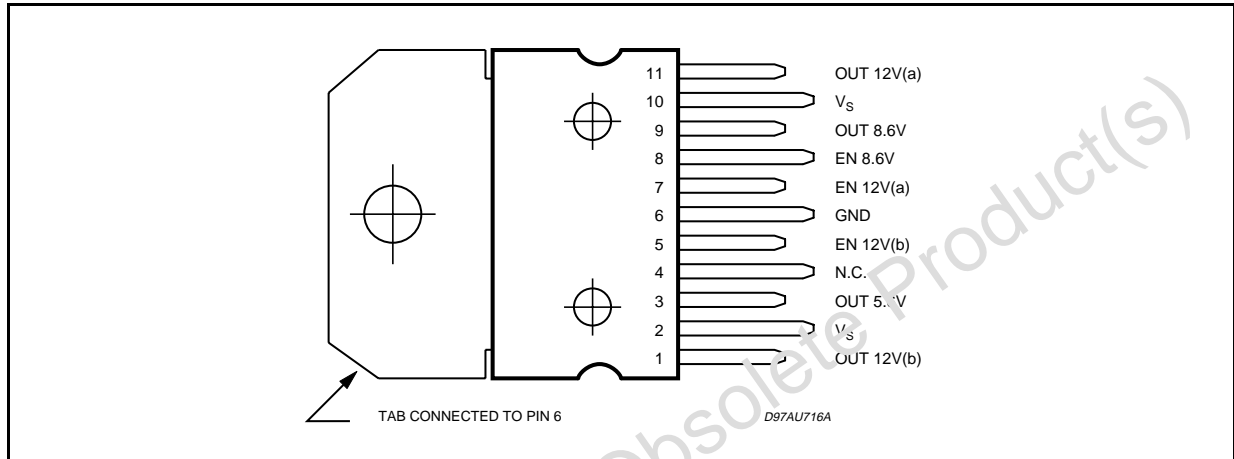
### BLOCK DIAGRAM



**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Value	Unit
$V_S$	DC Supply Voltage	35	V
$I_O$	Output Current	internally limited	
$T_{op}$	Operating Temperature Range	0 to +70	°C
$T_{stg}$	Storage Temperature	-40 to 150	°C

**PIN CONNECTION (Top view)**



**PIN DESCRIPTION**

Pin	Pins	Description
1	OUT 12V (b)	12V/1.3A SWITCHED OUTPUT VOLTAGE
2	$V_S$	Supply Voltage
3	OUT 5.6V	5.6V/250mA OUTPUT VOLTAGE
4	N.C.	not connected
5	EN 12V (b)	Enable 12V/1.3A SWITCHED OUTPUT VOLTAGE
6	GND	Ground
7	EN 12V (a)	Enable 12V/0.8A SWITCHED OUTPUT VOLTAGE
8	EN 8.6V	Enable 8.6V/0.6A SWITCHED OUTPUT VOLTAGE
9	OUT 8.6V	8.6V/0.6A SWITCHED OUTPUT VOLTAGE
10	$V_S$	Supply Voltage
11	OUT 12V (a)	12V/0.8A SWITCHED OUTPUT VOLTAGE

**QUICK REFERENCE DATA**

Symbol	Parameter	Test Condition	Typ.	Unit
$V_{out\ 5V}$	5V Output Voltage	$I_O = 125mA$	5.6	V
		$14.4V < V_S < 21.6V$ $5mA < I < 0.25A$	5.6	V
$V_{out\ 8V}$	8.6V Output Voltage	$I_O = 300mA$	8.6	V
		$14.4V < V_S < 21.6V$ $5mA < I < 0.6A$	8.6	V
$V_{out\ 12Va}$	12V Output Voltage	$I_{out} = 400mA$	12	V
		$14.4V < V_S < 21.6V$ $5mA < I < 0.8A$	12	V
$V_{out\ 12Vb}$	12V Output Voltage	$I_{out} = 650mA$	12	V
		$14.4V < V_S < 21.6V$ $5mA < I < 1.3A$	12	V

## THERMAL DATA

Symbol	Parameter	Value	Unit
$R_{th\ j-case}$	Thermal Resistance Junction-case	2	$^{\circ}C/W$

ELECTRICAL CHARACTERISTICS ( $V_S = 18V$ ,  $T_{case} = 25^{\circ}C$ , unless otherwise specified.)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$V_S$	Operating Supply Voltage	no load	15	22	30	V
		loaded (*)	14.4	18	21.6	V
$E_n$	Output Noise Voltage	Any reg. supply, $f = 100Hz$ to $20KHz$		200	400	$\mu V$
$I_q$	Quiescent Current			8		mA

## 5.6V/250mA OUTPUT VOLTAGE

$V_{out\ 5V}$	5V Output Voltage	$I_O = 125mA$	5.45		5.9	V
		$14.4V < V_S < 21.6V$ $5mA < I < 0.25$	5.40		6	V
$\Delta V_{line}$	Line Regulation	$14.4V < V_S < 21.6V$		5	50	mV
$\Delta V_{load}$	Load Regulation	$5mA < I_O < 250mA$		50	150	mV
$V_{dropout}$	Dropout Voltage	$I_{out} = 250mA$		2.05	2.7	V
$I_{lim}$	Current Limit	$V_S = 21.6V$	250	325		mA

## 8.6V/0.6A SWITCHED OUTPUT VOLTAGE

$V_{out\ 8V}$	8.6V Output Voltage	$I_O = 300mA$	8.4		9.1	V
		$14.4V < V_S < 21.6V$ $5mA < I < 0.6A$	8.3		9.2	V
$\Delta V_{line}$	Line Regulation	$14.4V < V_S < 21.6V$		5	50	mV
$\Delta V_{load}$	Load Regulation	$5mA < I_O < 0.6A$		50	350	mV
$V_{dropout}$	Dropout Voltage	$I_{out} = 0.6A$		2.05	2.7	V
$I_{lim}$	Current Limit	$V_S = 21.6V$	0.6	0.8		A
SW on	Switch ON			2.31	3.5	V
SW off	Switch OFF		1.5	2.11		V
SW hyst	Switch Hysteresis			200		mV

## 12V/0.8A SWITCHED OUTPUT VOLTAGE

$V_{out12Va}$	12V Output Voltage	$I_{out} = 400mA$	11.7		12.7	V
		$14.4V < V_S < 21.6V$ $5mA < I < 0.8A$	11.6		12.8	V
$\Delta V_{line}$	Line Regulation	$14.4V < V_S < 21.6V$		10	50	mV
$\Delta V_{load}$	Load Regulation	$5mA < I_O < 0.8A$		100	350	mV
$V_{dropout}$	Dropout Voltage	$I_{out} = 0.8A$		2.13	2.7	V
$I_{lim}$	Current Limit	$V_S = 21.6V$	0.8	1.1		A
SVR	Supply Voltage Rejection	$f = 100Hz$ $f = 10KHz$	55 40	75		dB
SW on	Switch ON			2.31	3.5	V
SW off	Switch OFF		1.5	2.11		V
SW hyst	Switch Hysteresis			200		mV

## 12V/1.3A SWITCHED OUTPUT VOLTAGE

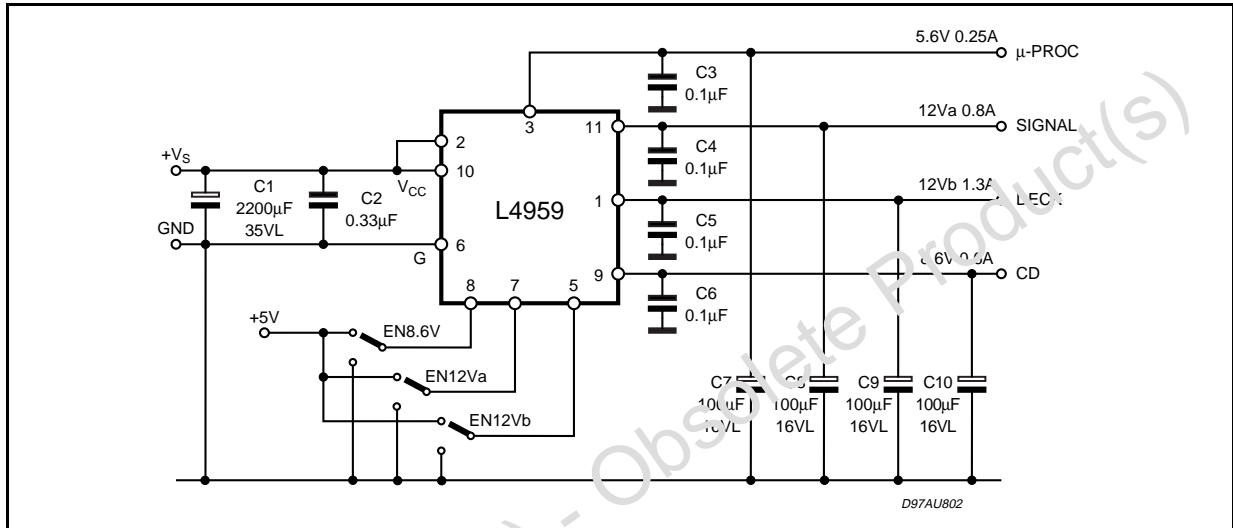
$V_{out12Vb}$	12V Output Voltage	$I_{out} = 650mA$	11.6		12.6	V
		$14.4V < V_S < 21.6V$ $5mA < I < 1.3A$	11.5		12.7	V
$\Delta V_{line}$	Line Regulation	$14.4V < V_S < 21.6V$		10	50	mV
$\Delta V_{load}$	Load Regulation	$5mA < I_O < 1.3A$		200	450	mV
$V_{dropout}$	Dropout Voltage	$I_{out} = 1.3A$		2.15	2.7	V
$I_{lim}$	Current Limit	$V_S = 21.6V$	1.3	1.7		A

**ELECTRICAL CHARACTERISTICS** (continued)

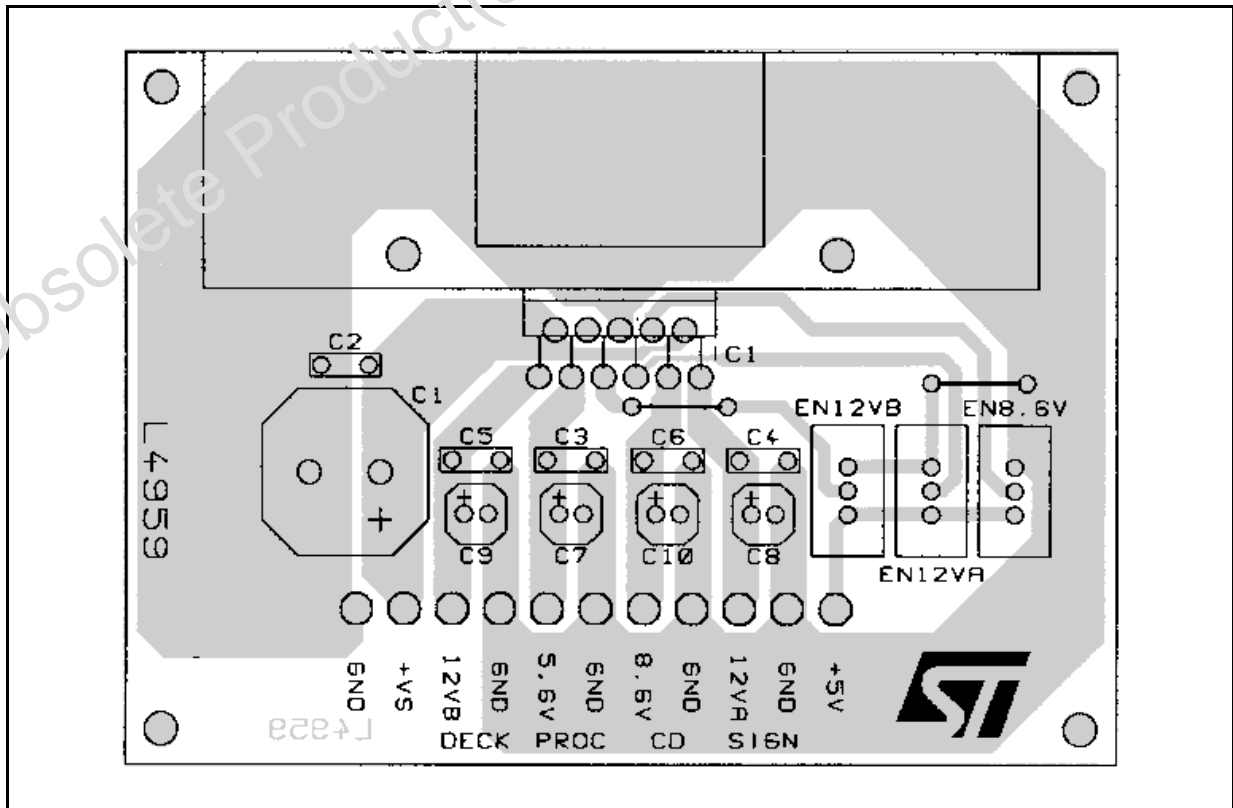
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
SVR	Supply Voltage Rejection	f = 100Hz f = 10KHz	55 40	75		dB
SWon	Switch ON			2.31	3.5	V
SW off	Switch OFF		1.5	2.11		V
SW hyst	Switch Hysteresis			200		mV

(\*) The max value is limited by the power dissipation

**Figure 1:** Application and Test Circuit.

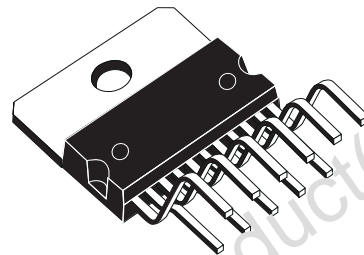


**Figure 2:** PCB and Components layout of the Figure 1.

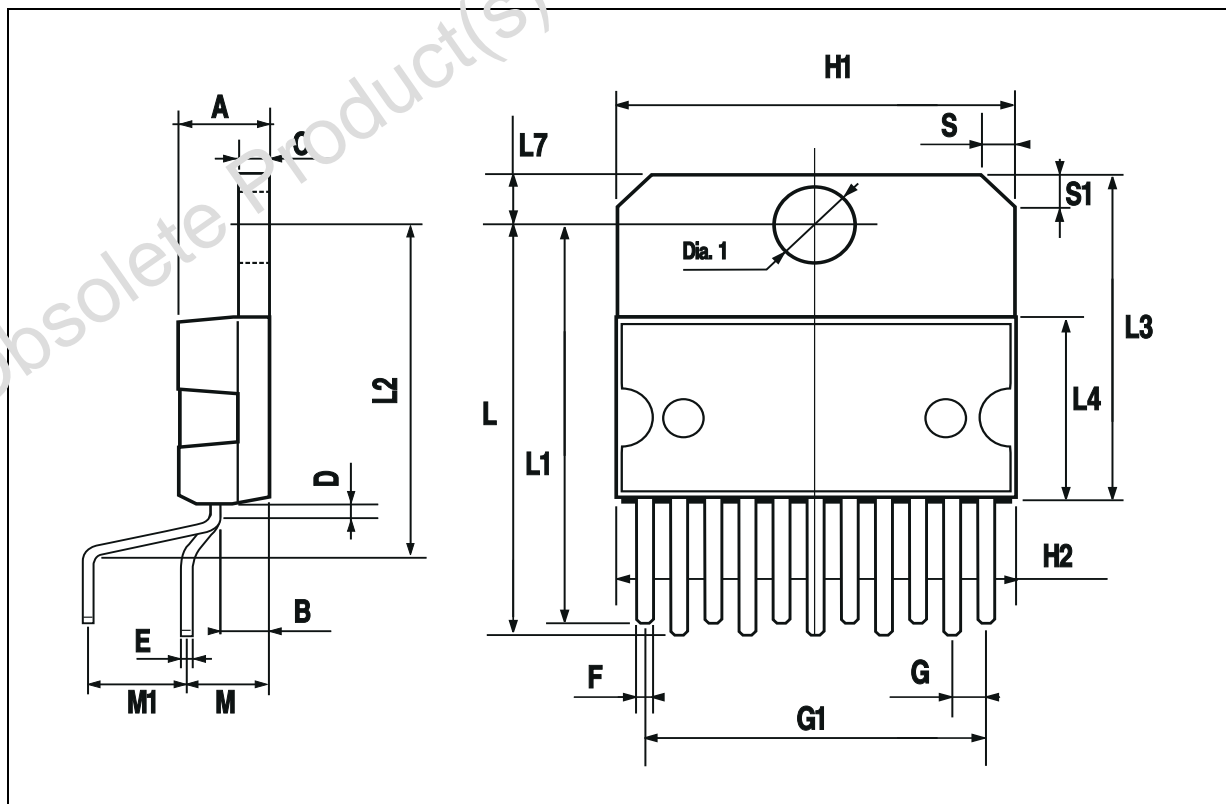


DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			5			0.197
B			2.65			0.104
C			1.6			0.063
D		1			0.039	
E	0.49		0.55	0.019		0.022
F	0.88		0.95	0.035		0.037
G	1.45	1.7	1.95	0.057	0.067	0.077
G1	16.75	17	17.25	0.659	0.669	0.679
H1	19.6			0.772		
H2			20.2			0.795
L	21.9	22.2	22.5	0.862	0.874	0.886
L1	21.7	22.1	22.5	0.854	0.87	0.886
L2	17.4		18.1	0.685		0.713
L3	17.25	17.5	17.75	0.679	0.689	0.699
L4	10.3	10.7	10.9	0.406	0.421	0.429
L7	2.65		2.9	0.104		0.114
M	4.25	4.55	4.85	0.167	0.179	0.191
M1	4.73	5.08	5.43	0.186	0.200	0.214
S	1.9		2.6	0.075		0.102
S1	1.9		2.6	0.075		0.102
Dia1	3.65		3.85	0.144		0.152

## OUTLINE AND MECHANICAL DATA



**Multiwatt11 V**



Obsolete Product(s) - Obsolete Product(s)

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specification mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics

© 1999 STMicroelectronics – Printed in Italy – All Rights Reserved

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - Canada - China - France - Germany - Italy - Japan - Korea - Malaysia - Malta - Mexico - Morocco - The Netherlands - Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.

<http://www.st.com>