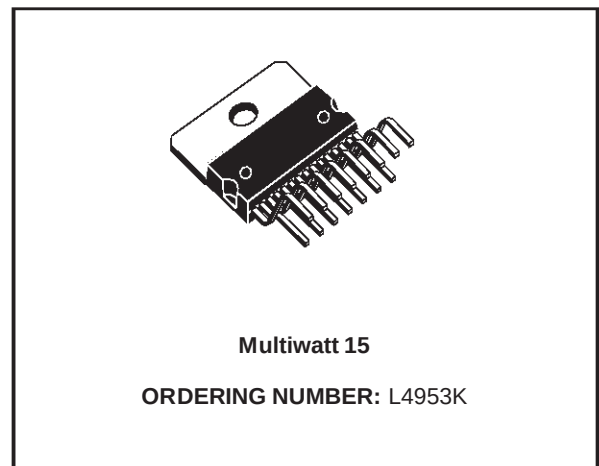


MULTIFUNCTION VOLTAGE REGULATOR FOR CAR RADIO

- 3 OUTPUTS:
8.25V (500mA); 5V (1A); 5V (100mA) STANDBY
- OUT1 (8.25V) AND OUT2 (5V) WITH INDEPENDENT ENABLE CONTROL FOR STANDBY MODE
- 1.5A HIGH SIDE DRIVER WITH CLAMPED OUTPUT (16V)
- LOGIC OUTPUT FOR:
 - SUPPLY UNDERVOLTAGE (LVW)
 - OVERVOLTAGE (FAULT)
 - THERMAL PROTECTION (FAULT)
- RESET FUNCTION
- IGNITION COMPARATOR
- REVERSE BATTERY AND LOAD DUMP PROTECTION
- THERMAL SHUTDOWN



DESCRIPTION

The L4953K contains a triple voltage regulator and a power switch.

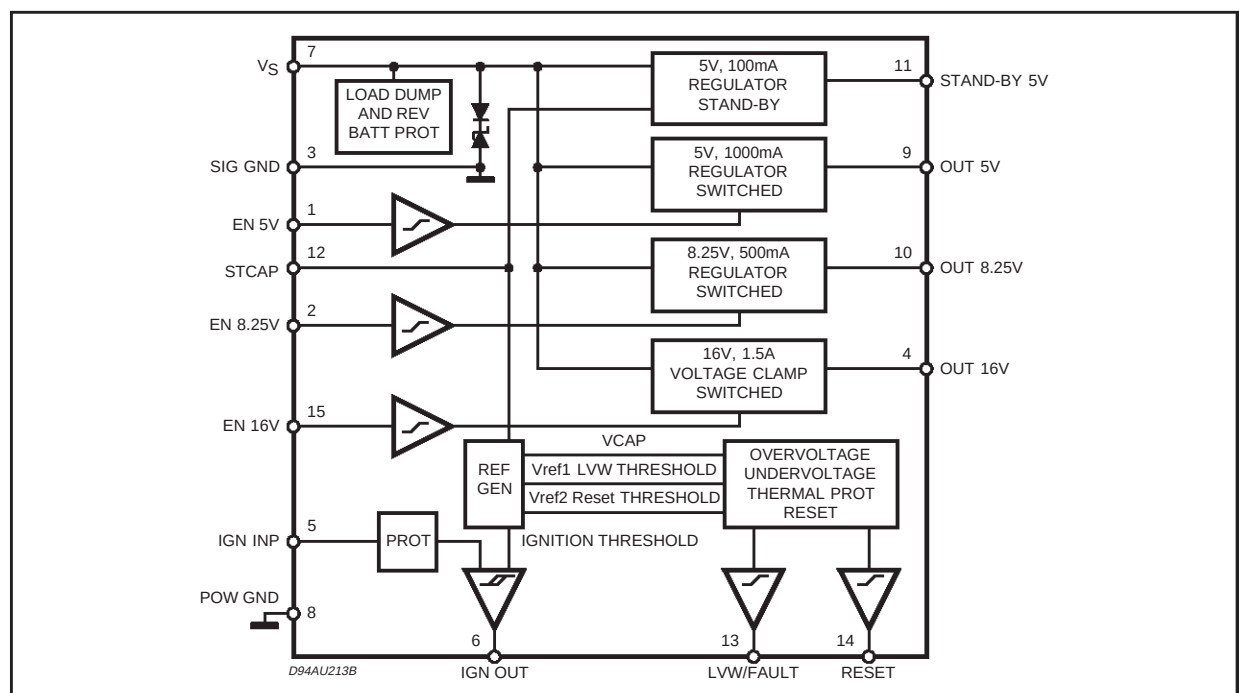
The IC includes a monitoring circuit to warn if a

low voltage or no voltage condition is occurring.

In stand-by output is active as long as possible even when in thermal shutdown or any other fault conditions.

The STCAP pin allows the use of a reserve supply capacitor that will hold enough energy for the 5V Stand-by line to allow the μ P to store data.

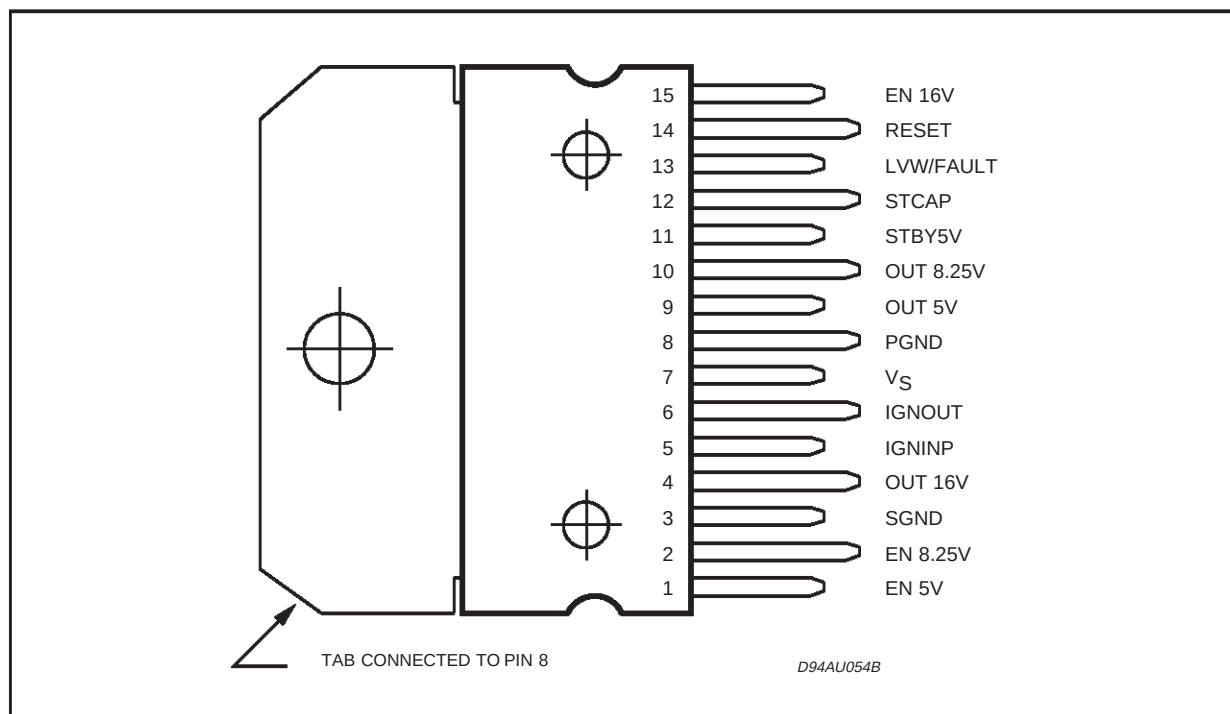
BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{SDC}	DC Operating Supply Voltage	–14 to 28	V
V_{STR}	Transient Supply Voltage	50	V
I_o	Output Current	internally limited	
T_{op}	Operating Temperature Range	–40 to 85	°C
T_{stg}	Storage Temperature	–55 to 150	°C

PIN CONNECTION (Top view)



THERMAL DATA

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

ELECTRICAL CHARACTERISTICS ($V_S = 14V$, $T_{amb} = 25^{\circ}C$, unless otherwise specified.)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
V_S	Operating Supply Voltage		11		18	V
En	Output Noise Voltage	Any reg. supply, $f = 100Hz$ to $200KHz$		200	400	μV
T_{shud}	Thermal Shutdown Junction Temperature			155		$^{\circ}C$

5V STAND-BY OUTPUT VOLTAGE

V_{5st-by}	Stand-by Output Voltage	$I_{Load} = 5mA$	4.75	5	5.25	V
ΔV_{line}	Line Regulation	$11V < V_S < 16V$		5	50	mV
ΔV_{load}	Load Regulation	$5mA < I_{out} < 100mA$		45	150	mV
$V_{dropout}$	Dropout Voltage	$I_{out} = 100mA$, $V_S = 5.5V$		0.2	0.6	V
I_{qst-by}	Quiescent Current @ Stand-by	$I_{Load} = 5mA$		0.3	0.5	mA

5V/1000mA SWITCHED OUTPUT VOLTAGE

V_{out5}	5V Output Voltage	no load	4.75	5	5.25	V
ΔV_{line}	Line Regulation	$7V < V_S < 18V$		5	50	mV
ΔV_{load}	Load Regulation	$5mA < I_{out} < 1A$		12	50	mV
$V_{dropout}$	Dropout Voltage	$I_{out} = 1A$, $V_S = 5.5V$		1	1.5	V
I_q	Quiescent Current	$75mA < I_{out} < 1A$		30	100	mA
SWon	Switch ON		3.5			V
SW off	Switch OFF				1.5	V
SW hyst	Switch Hysteresis		100	200	350	mV
R_{in}	Input Impedance		25	40	50	$K\Omega$

8.25V/500mA SWITCHED OUTPUT VOLTAGE

V_{out}	8.25V Output Voltage	no load	7.9	8.25	8.6	V
ΔV_{line}	Line Regulation	$11V < V_S < 18V$		5	50	mV
ΔV_{load}	Load Regulation	$I_{out} = 500mA$		12	50	mV
$V_{dropout}$	Dropout Voltage	$I_{out} = 500mA$, $5.5V < V_S < 8.8V$		0.4	0.9	V
I_q	Quiescent Current	$I_{out} = 500mA$		10	25	mA
SVR	Supply Voltage Rejection	$f = 100Hz$ $f = 10KHz$	55 40	75		dB
SWon	Switch ON		3.5			V
SW off	Switch OFF				1.5	V
SW hyst	Switch Hysteresis		100	200	350	mV
R_{in}	Input Impedance		25	40	50	$K\Omega$

HIGH SIDE DRIVER WITH CLAMPED OUTPUT (16V)

V_{out16}	Max. Output Voltage	$V_S = 18V$	15		16.2	V
I_O	Output Continuous Current	$V_S = 15V$	1.5			A
$V_{dropout}$	Dropout Voltage	$I_{out} = 1A$, $6V < V_S < 15V$		0.4	0.9	V
SWon	Switch ON		3.5			V
SW off	Switch OFF				1.5	V
SW hyst	Switch Hysteresis		100	200	350	mV
R_{in}	Input Impedance		25	40	50	$K\Omega$

ELECTRICAL CHARACTERISTICS (continued)LVW/FAULT (referred to V_S)

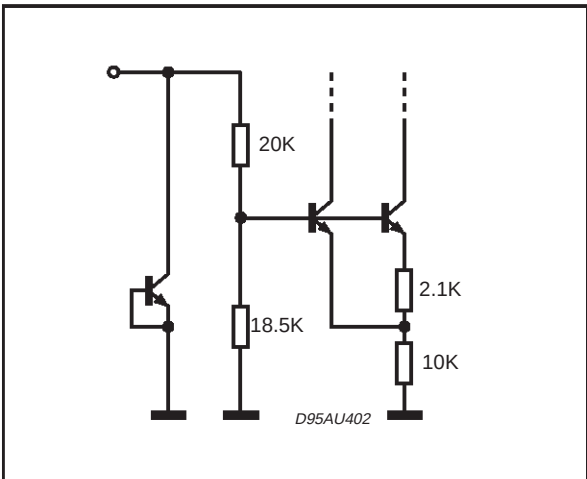
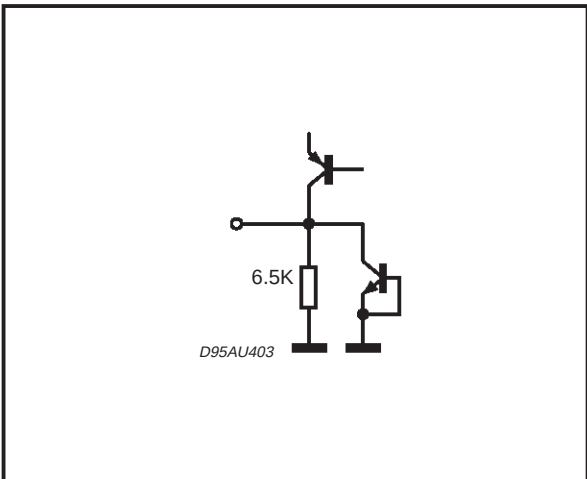
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
THON _{LVW}	LVW ON Threshold		8.55	9.00	9.45	V
THOFF _{LVW}	LVW OFF Threshold		8.75	9.20	9.65	V
Δ (LVW-out 8.25)	LVW- $V_{out\ 8.25}$		0.5	0.65		V
HYST	Threshold Hysteresis		50	200	350	mV
OUT _{LVW}	LVW Output Voltage				1.5	V
I_{leak}	Leakage Current				50	μ A

RESET (referred to 5V st-by)

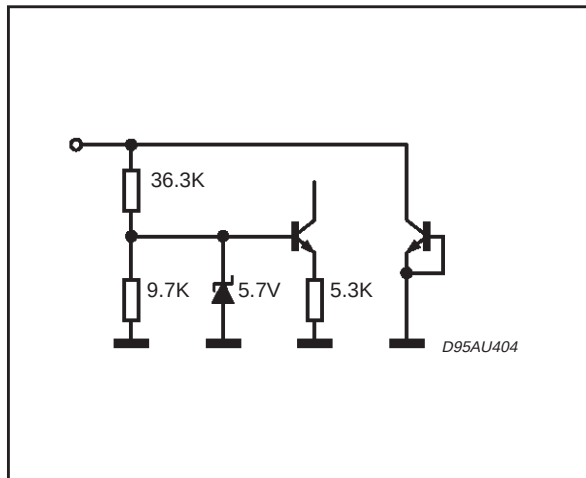
THON _{reset}	Reset ON Threshold		3.6	3.8	4	V
THOFF _{reset}	Reset OFF Threshold		3.8	4	4.2	V
HYST _{reset}	Reset Threshold Hysteresis		50	100	250	mV
OUT _{reset}	Reset Output Voltage				1.5	V
I_{leak}	Reset Leakage Current				50	μ A

IGNITION

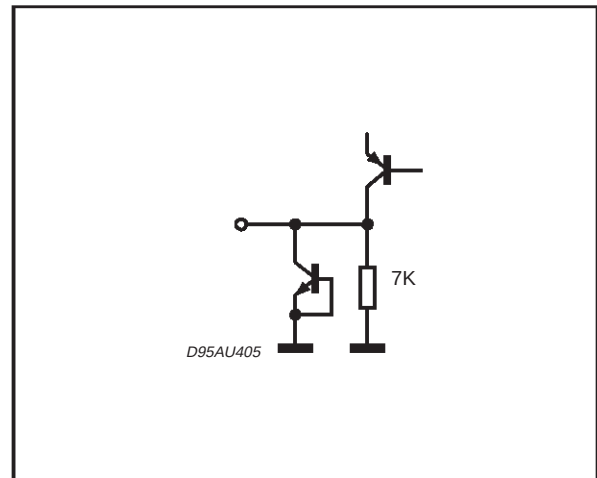
TH _{ign}	Ign Comparator Positive Threshold		5.5	6.5	7.5	V
HYST _{ign}	Ign Comparator Threshold Hysteresis		100	300	500	mV
IGN _{high}	Ignition Comparator Output High		3.5		Vst-by	V

CIRCUIT CONFIGURATION - PIN EQUIVALENT CIRCUITS**PIN 1: EN 5V****PIN 2: EN 8.25V****PIN 4: OUT 16V**

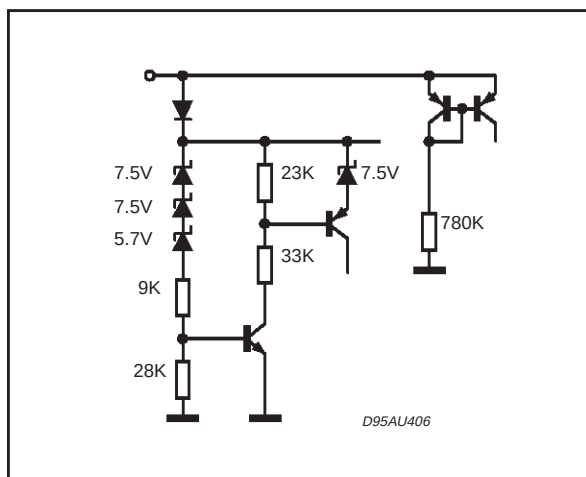
PIN 5: ING INP



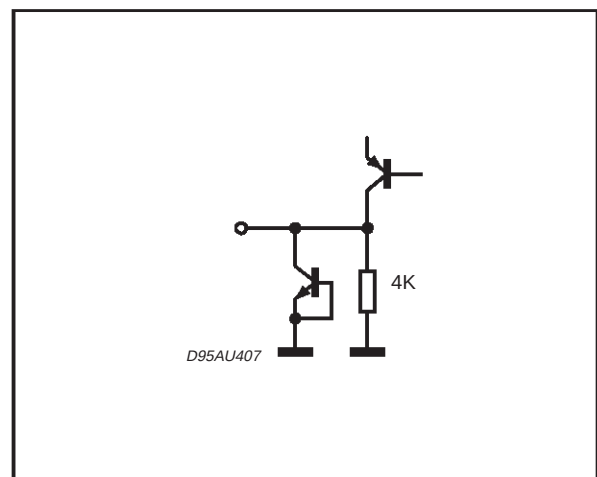
PIN 6: IGN OUT



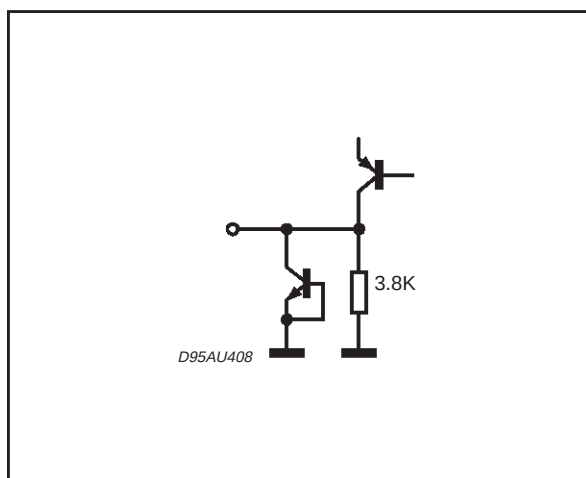
PIN 7: VS



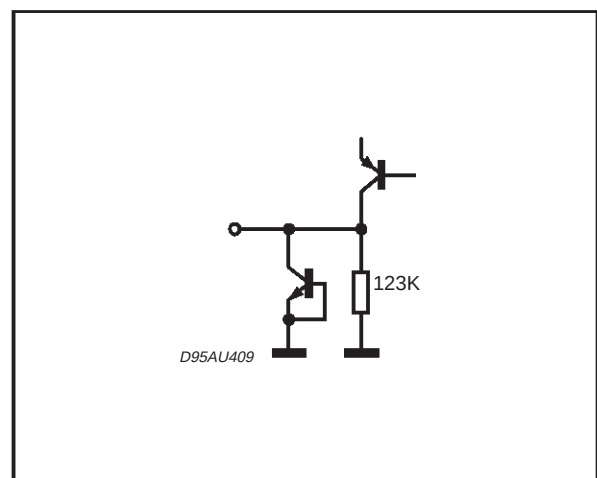
PIN 9: OUT 5V



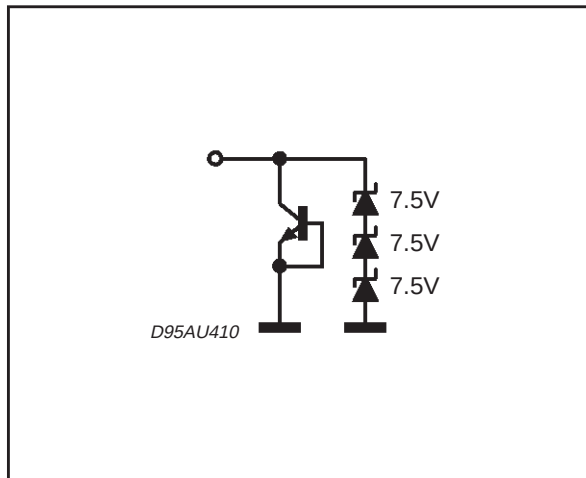
PIN 10: OUT 8.25V



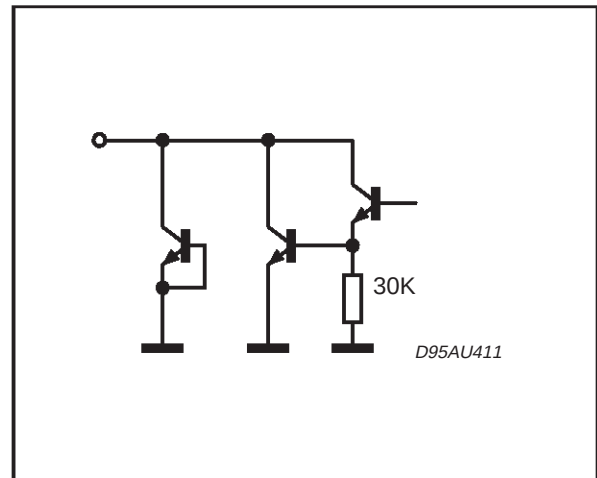
PIN 11: STAND-BY 5V



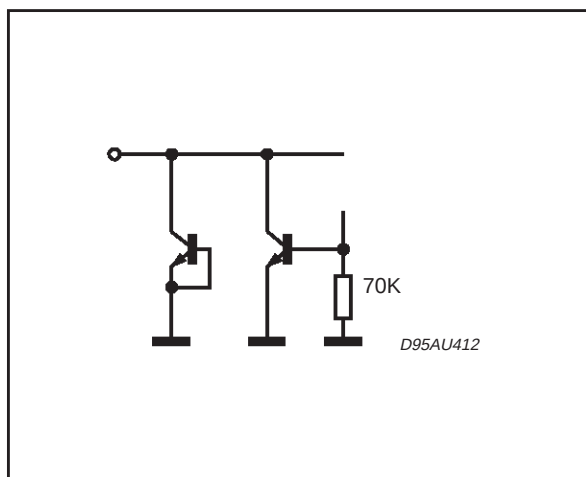
PIN 12: ST-CAP



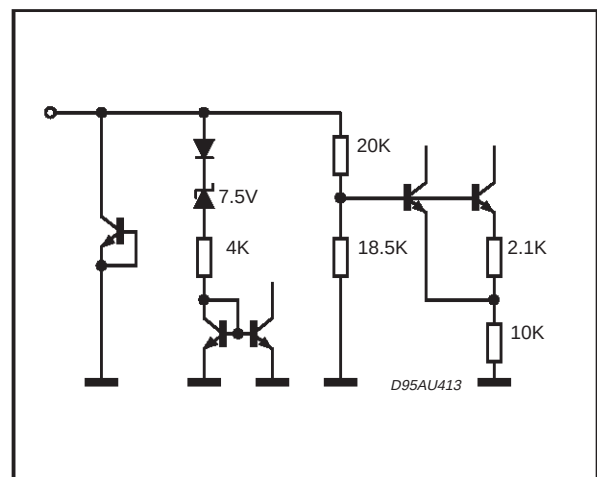
PIN 13: LVW / FAULT



PIN 14: RESET

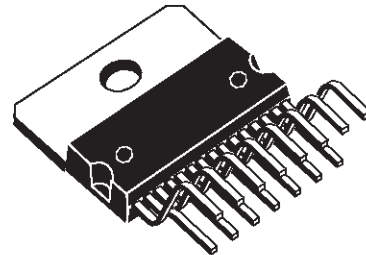


PIN 15: EN 16V

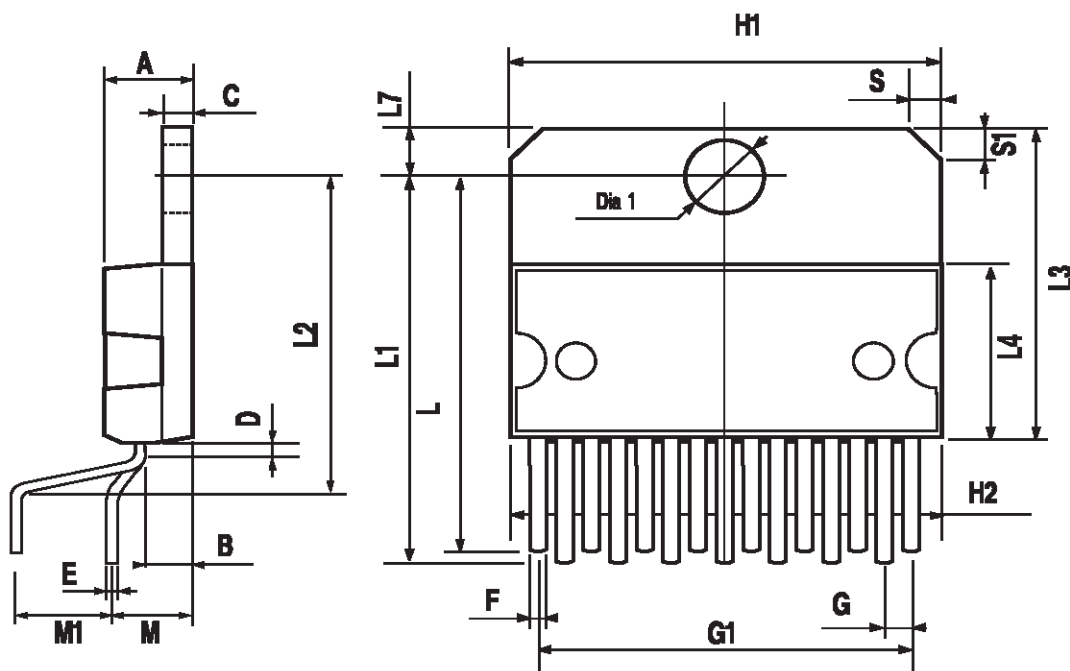


DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			5			0.197
B			2.65			0.104
C			1.6			0.063
D		1			0.039	
E	0.49		0.55	0.019		0.022
F	0.66		0.75	0.026		0.030
G	1.02	1.27	1.52	0.040	0.050	0.060
G1	17.53	17.78	18.03	0.690	0.700	0.710
H1	19.6			0.772		
H2			20.2			0.795
L	21.9	22.2	22.5	0.862	0.874	0.886
L1	21.7	22.1	22.5	0.854	0.870	0.886
L2	17.65		18.1	0.695		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	4.63	5.08	5.53	0.182	0.200	0.218
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



Multiwatt15 V



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

© 2000 STMicroelectronics – Printed in Italy – All Rights Reserved

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - China - Finland - France - Germany - Hong Kong - India - Italy - Japan - Malaysia - Malta - Morocco -
Singapore - Spain - Sweden - Switzerland - United Kingdom - U.S.A.

<http://www.st.com>