

## 2 x 30W DUAL BRIDGE CAR RADIO AMPLIFIER

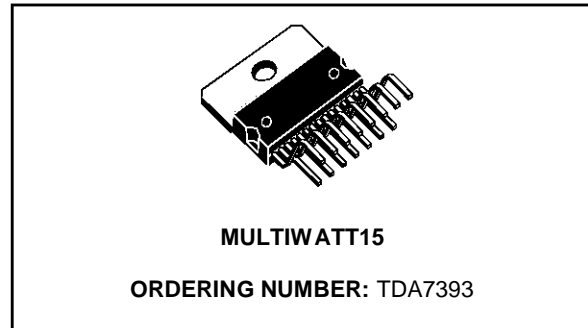
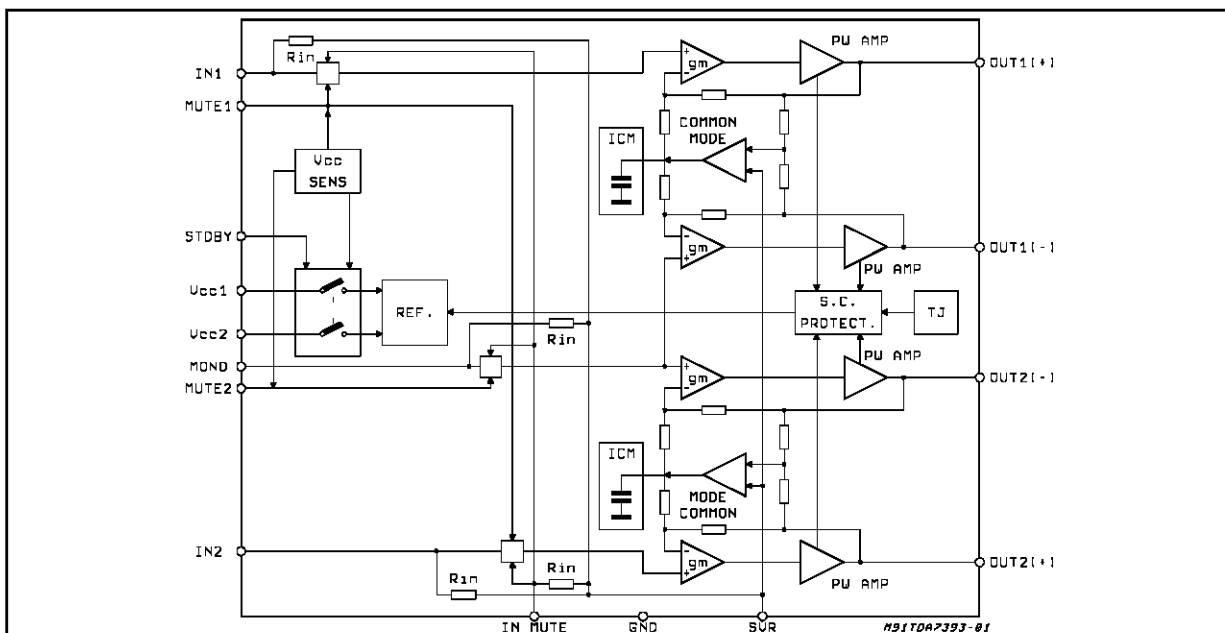
PRODUCT PREVIEW

- HIGH OUTPUT POWER CAPABILITY:
  - 2 x 30W max./4Ω @ 13.2V, 1KHz
  - 2 x 22W typ./4Ω @ 14.4V, 1KHz, 10%
  - 2 x 19W typ./4Ω @ 13.2V, 1KHz, 10%
  - 2 x 28W typ./2Ω @ 14.4V, 1KHz, 10%
  - 2 x 25W typ./2Ω @ 13.2V, 1KHz, 10%
- LOW DISTORTION
- LOW OUTPUT NOISE
- ST-BY FUNCTION
- MUTE FUNCTION
- AUTO-MUTE AT MIN. SUPPLY VOLTAGE DETECTION
- LOW EXTERNAL COMPONENT COUNT
  - INTERNALLY FIXED GAIN (32dB)
  - NO EXTERNAL COMPENSATION
  - NO BOOTSTRAP CAPACITORS
- ADDITIONAL MONO INPUT

### PROTECTIONS:

- OUTPUT AC/DC SHORT CIRCUIT TO GND AND TO V<sub>S</sub>
- VERY INDUCTIVE LOADS
- OVERRATING CHIP TEMPERATURE WITH SOFT THERMAL LIMITER
- LOAD DUMP VOLTAGE

### BLOCK DIAGRAM



- FORTUITOUS OPEN GND
- REVERSE BATTERY
- ESD PROTECTION

### DESCRIPTION

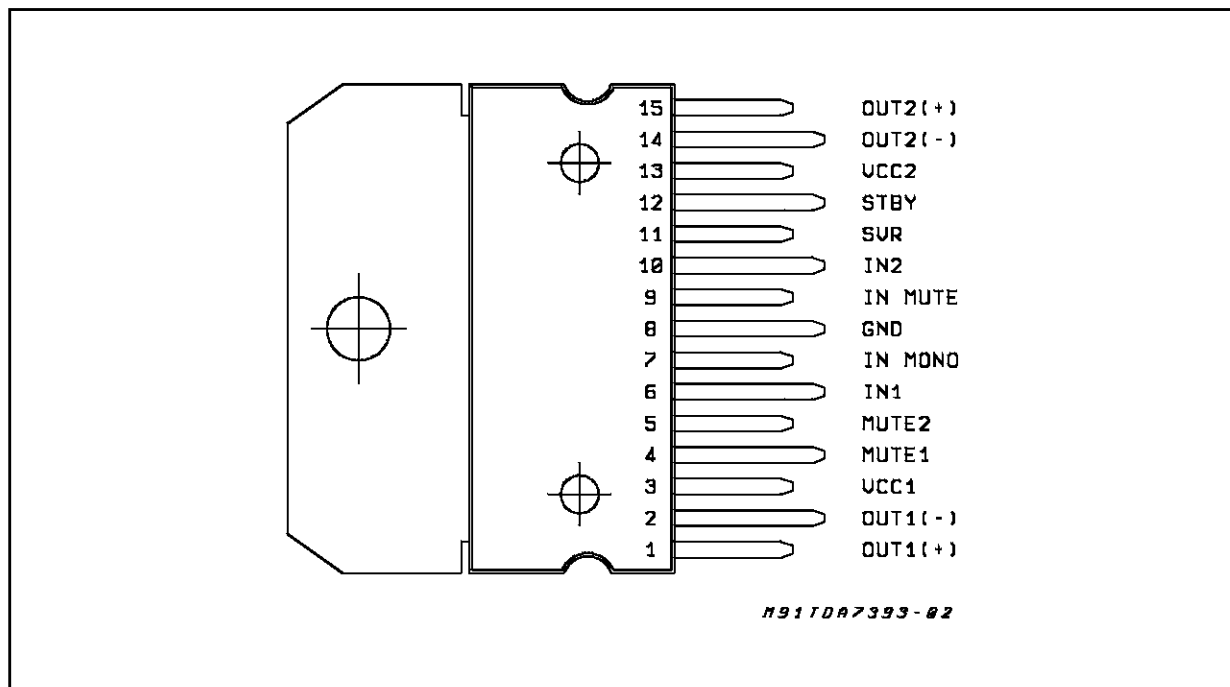
The TDA7393 is a new technology class AB Audio Power Amplifier in Multiwatt15 package designed for high end car radio applications. Thanks to the fully complementary PNP/NPN output configuration the high power performances of the TDA7393 are obtained without bootstrap capacitors. The extremely reduced components count allows very compact sets.

# TDA7393

## ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{CC}$	Operating Supply Voltage	18	V
$V_{CC(DC)}$	DC Supply Voltage	28	V
$V_{CC(pk)}$	Peak Supply Voltage (t = 50ms)	50	V
$I_O$	Output Peak Current:		
	Repetitive (Duty Cycle 10% at f = 10Hz) Non Repetitive (t = 100 $\mu$ s)	4.5 5.5	A A
$P_{tot}$	Power dissipation, Tcase = 75°C (see derating curve)	50	W
$T_j$	Junction Temperature	150	°C
$T_{op}$	Operating Ambient Temperature	- 40 to 85	°C
$T_{stg}$	Storage Temperature	- 55 to 150	°C

## PIN CONNECTION (Top view)



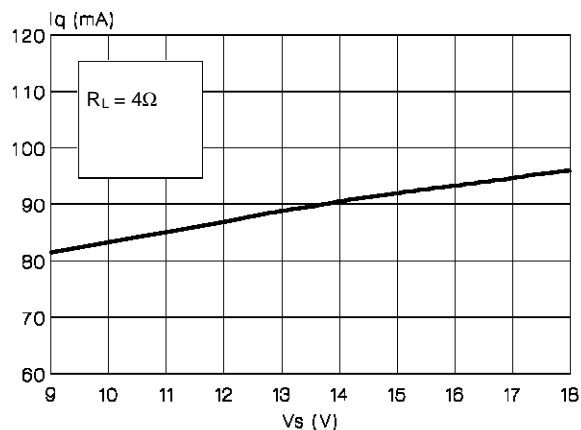
## THERMAL DATA

Symbol	Parameter	Value	Unit
$R_{th j-case}$	Thermal Resistance Junction to Case	Max. 1.5	°C/W

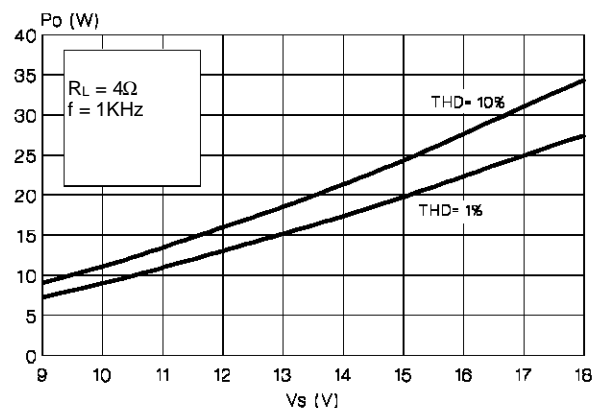
**ELECTRICAL CHARACTERISTICS** ( $V_S = 13.2V$ ;  $f = 1KHz$ ;  $R_g = 600\Omega$ ;  $R_L = 4\Omega$ ;  $T_{amb} = 25^\circ C$ ;  
Refer to the application circuit, unless otherwise specified.)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$I_{q1}$	Quiescent Current			90	180	mA
$V_{OS}$	Output Offset Voltage				150	mV
$G_v$	Voltage Gain		30.5	32	33.5	dB
$P_o$	Output Power	THD = 10%; $V_S = 14.4V$ THD = 10% THD = 1% THD = 10%; $R_L = 2\Omega$ THD = 10%; $V_S = 14.4V$ ; $R_L = 2\Omega$	17	22 19 16 25 28		W W W W W
$P_{o\ max}$	Max. Output Power	EIAJ RULES; $V_S = 13.7V$		30		W
THD	Distortion	$P_o = 0.1$ to $8W$		0.08	0.3	%
$e_{No}$	Output Noise	$Bw = 20Hz$ to $20KHz$			0.3	mVrms
SVR	Supply Voltage Rejection	$f = 100Hz$ (stereo)		60		dB
$f_L$	Low Cut-Off Frequency			10		Hz
$f_H$	High Cut-Off Frequency			300		KHz
$R_i$	Input Impedance		10	15	20	K $\Omega$
$C_T$	Cross Talk	$f = 1KHz$	50	65		dB
$I_{SB}$	St-By Current Consumption				100	$\mu A$
$V_{SB\ out}$	St-By OUT Threshold Voltage	Amp. ON	3.5			V
$V_{SB\ IN}$	St-By IN Threshold Voltage	Amp. OFF			1.5	V
$V_{SB}$	Supply Dependent St-By Threshold	St-By = H, $V_S$ reducing/increasing		7.5	8.3	V
$A_M$	Mute Attenuation	$V_O = 1V_{rms}$		75		dB
$V_{M\ out}$	Mute OUT Threshold Voltage	Amp. Play	3.5			V
$V_{M\ in}$	Mute IN Threshold Voltage	Amp. Mute			1.5	V
$V_M$	Supply Dependent Mute Threshold	Mute = IN, $V_S$ reducing/increasing		8.5	9.3	V
$I_m (L)$	Muting Pin Current	$V_{MUTE} = 1.5V$ (Sourced Current)	6	10	14	$\mu A$
$I_m (H)$	Muting Pin Current	$V_{MUTE} = 3.5V$ (Sourced Current)	6	10	14	$\mu A$

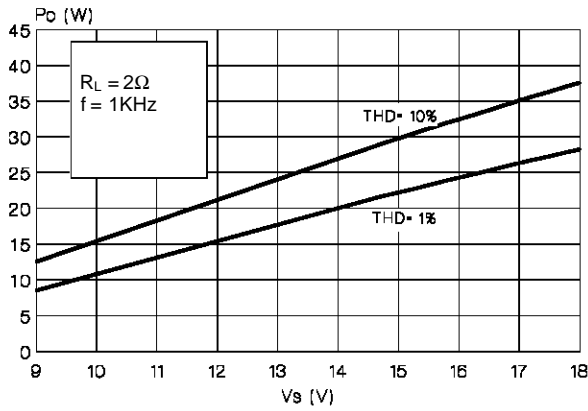
**Figure 1:** Quiescent Current vs. Supply Voltage



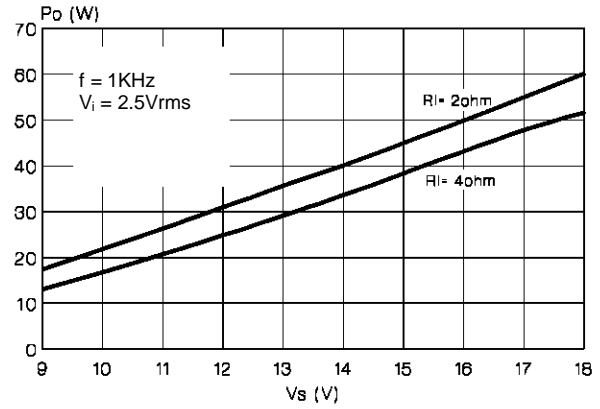
**Figure 2:** Output Power vs. Supply Voltage



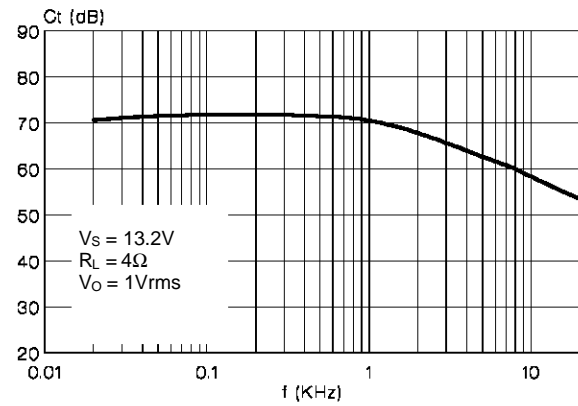
**Figure 3: Output Power vs Supply Voltage**



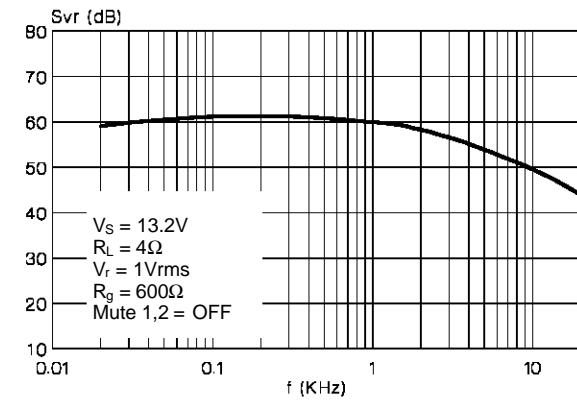
**Figure 4: EIAJ Power vs. Supply Voltage**



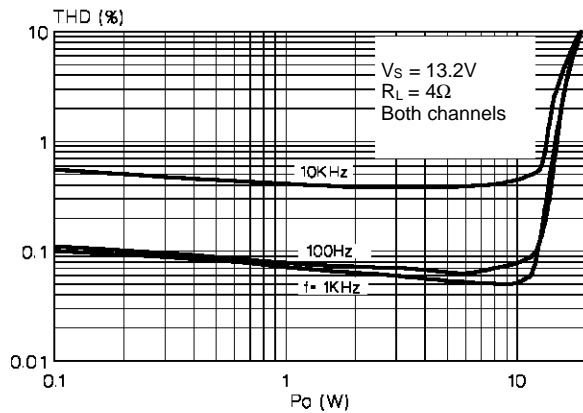
**Figure 5: Cross-Talk vs. Frequency**



**Figure 6: SVR vs. Frequency**



**Figure 7: Distortion vs. Frequency**



**Figure 8: Distortion vs. Frequency**

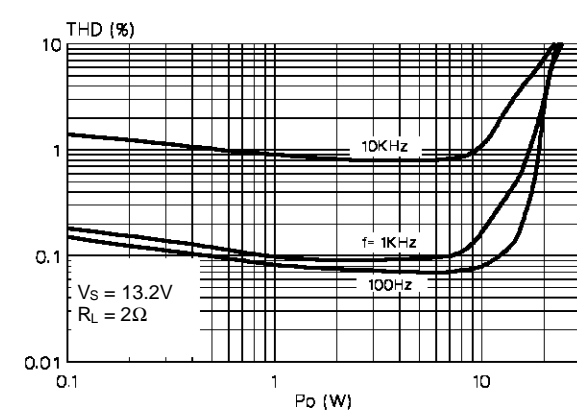


Figure 9: Block Diagram of Mute Circuit

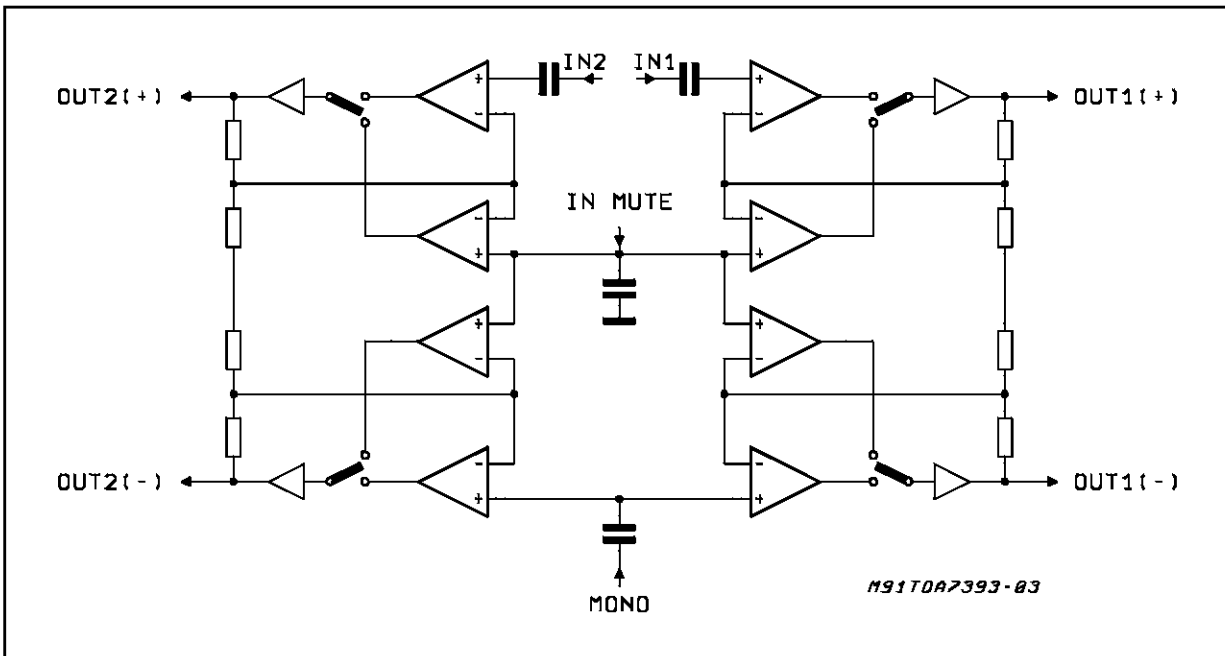


Figure 10: Explanatory Waveforms Of Mute Circuit

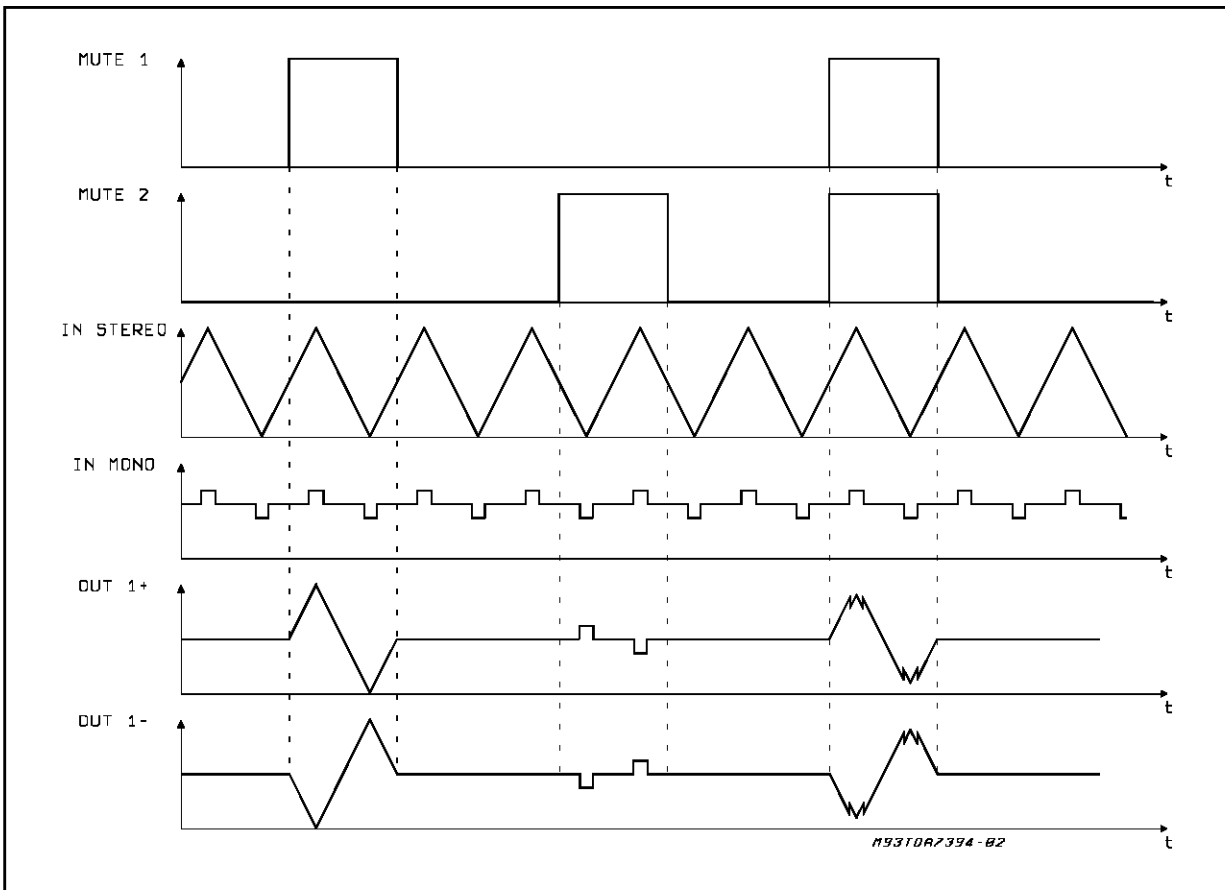


Figure 11: Application Circuit

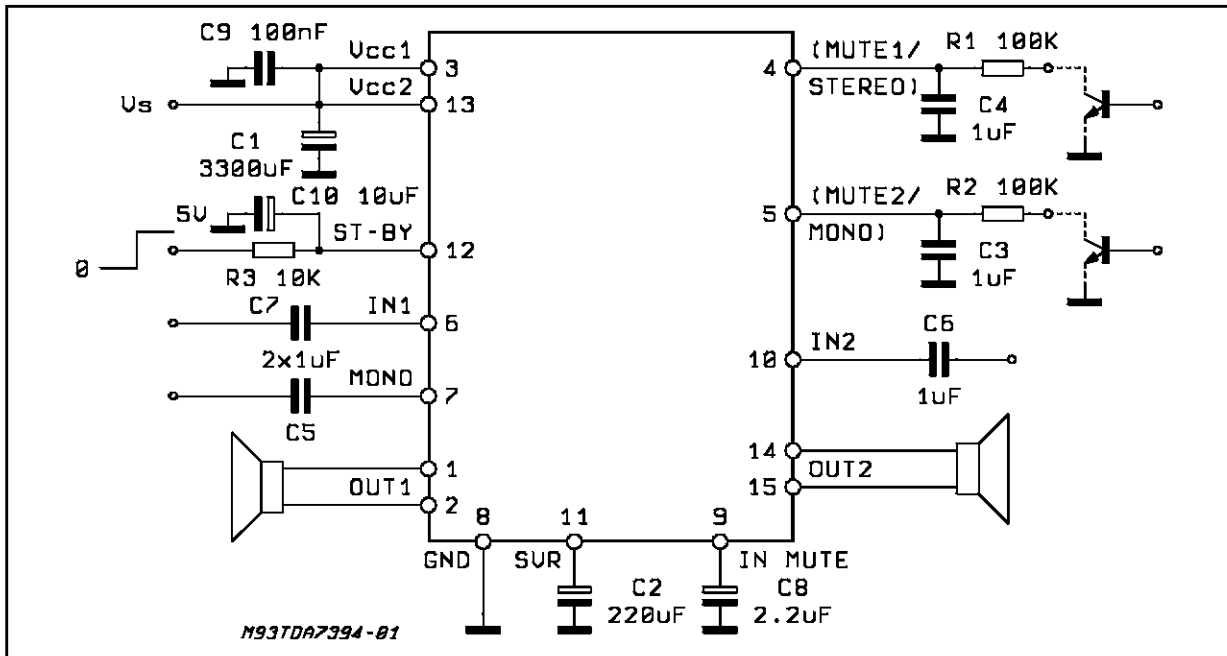


Figure 12: P.C. Board and Component Layout of the fig. 11 (1:1 scale)

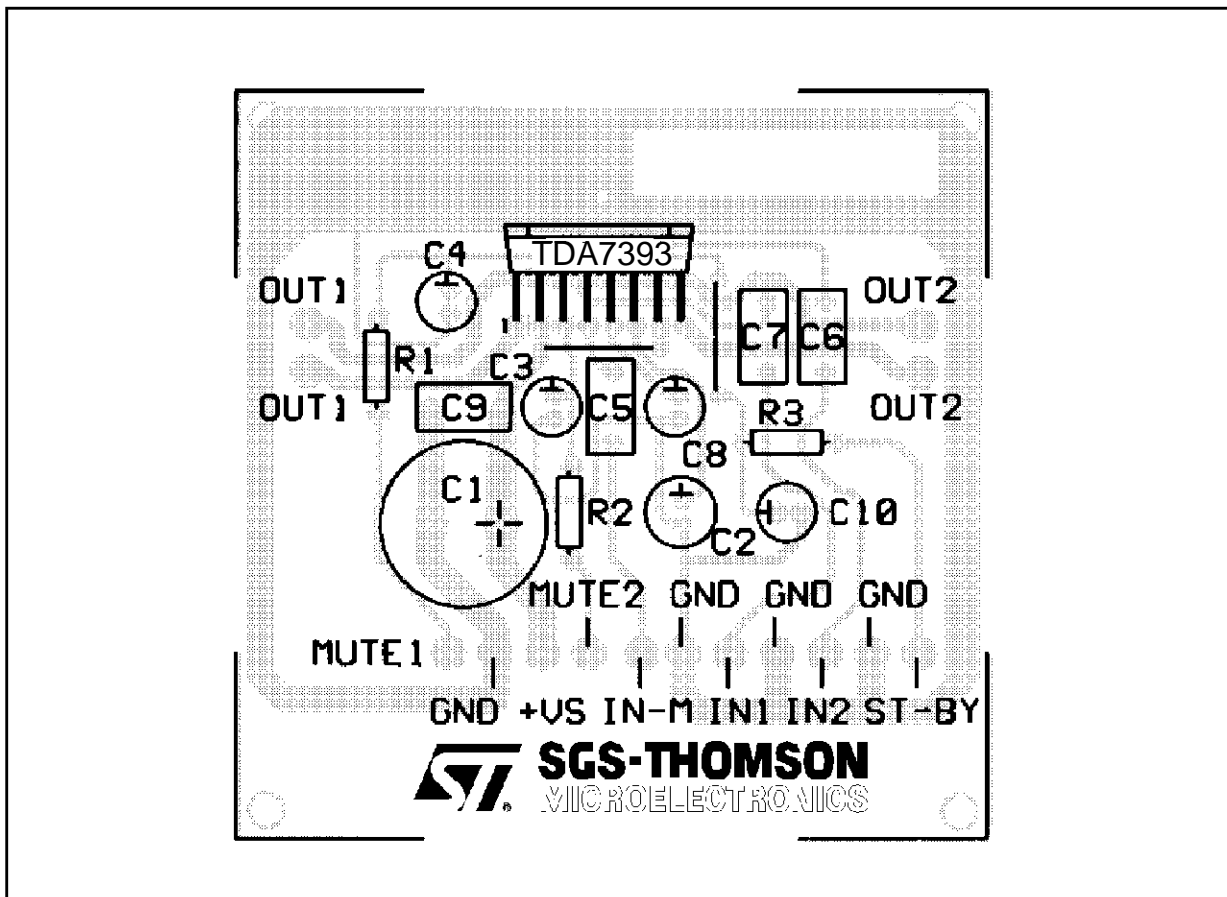
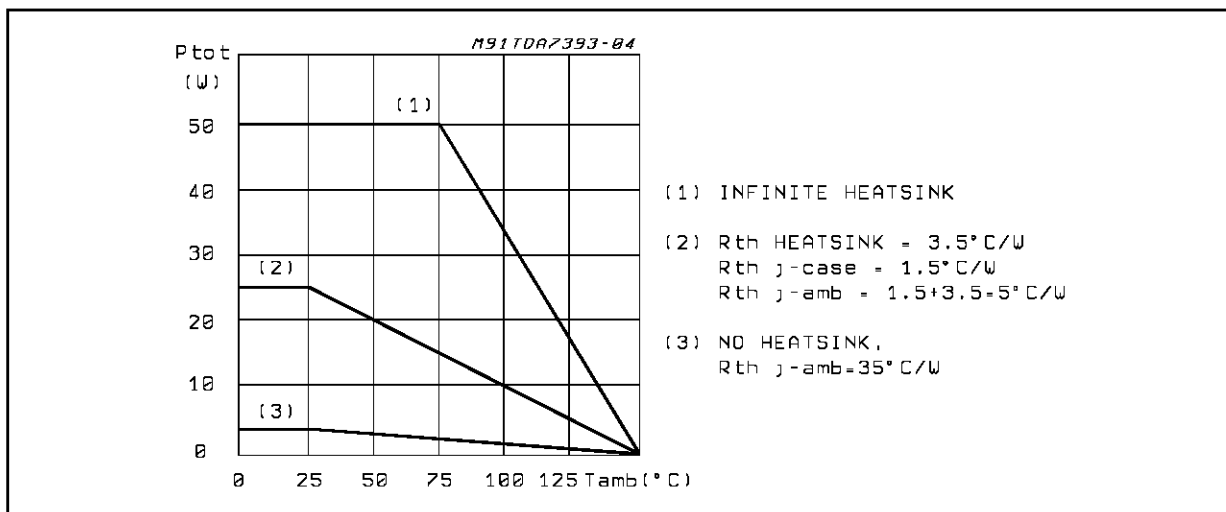
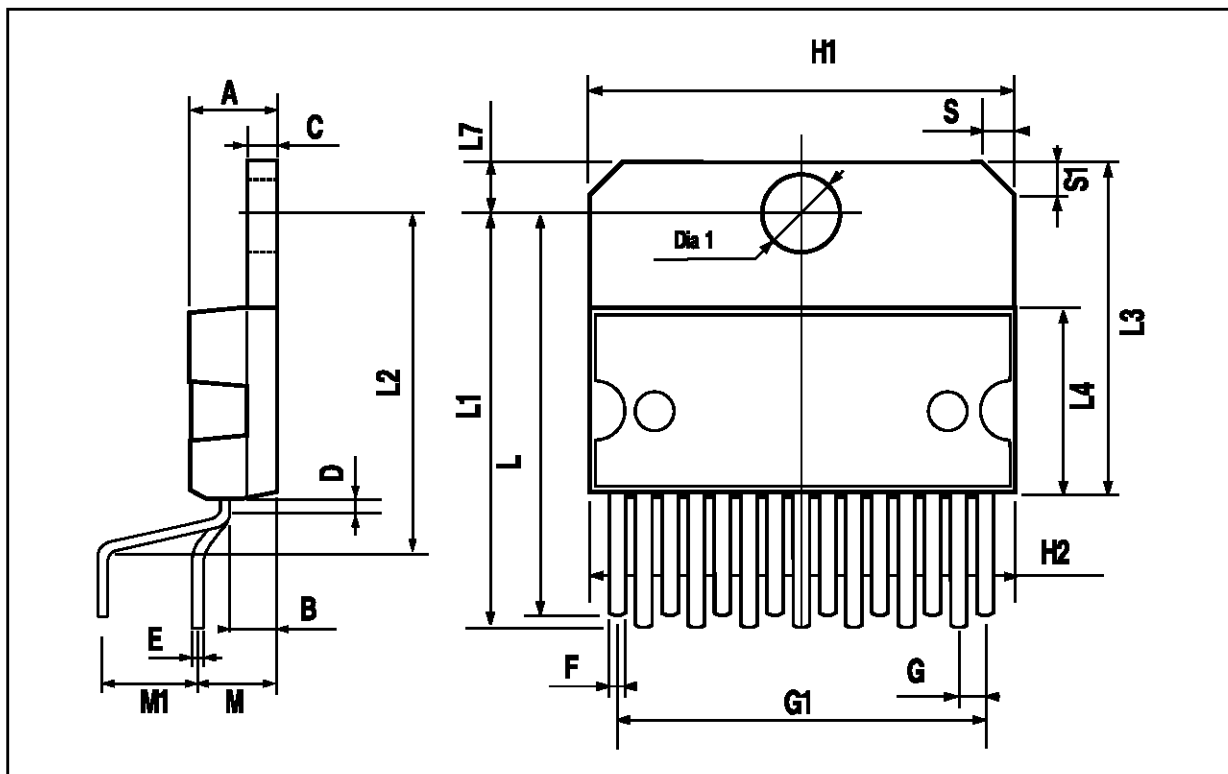


Figure 13: Power Dissipation Derating Curve



MULTIWATT15 PACKAGE MECHANICAL DATA

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	1.14	1.27	1.4	0.045	0.050	0.055
G1	17.57	17.78	17.91	0.692	0.700	0.705
H1	19.6			0.772		
H2			20.2			0.795
L	22.1		22.6	0.870		0.890
L1	22		22.5	0.866		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	4.2	4.3	4.6	0.165	0.169	0.181
M1	4.5	5.08	5.3	0.177	0.200	0.209
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



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