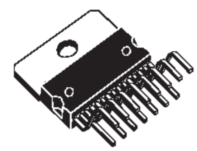
TDA7393

2 x 32W DUAL BRIDGE CAR RADIO AMPLIFIER

- HIGH OUTPUT POWER CAPABILITY:
  2 x 35W max./4Ω
  2 x 32W EIAJ/4Ω
  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_S
- VERY INDUCTIVE LOADS
- OVERRATING CHIP TEMPERATURE WITH SOFT THERMAL LIMITER
- LOAD DUMP VOLTAGE
- FORTUITOUS OPEN GND
- REVERSE BATTERY
- ESD PROTECTION



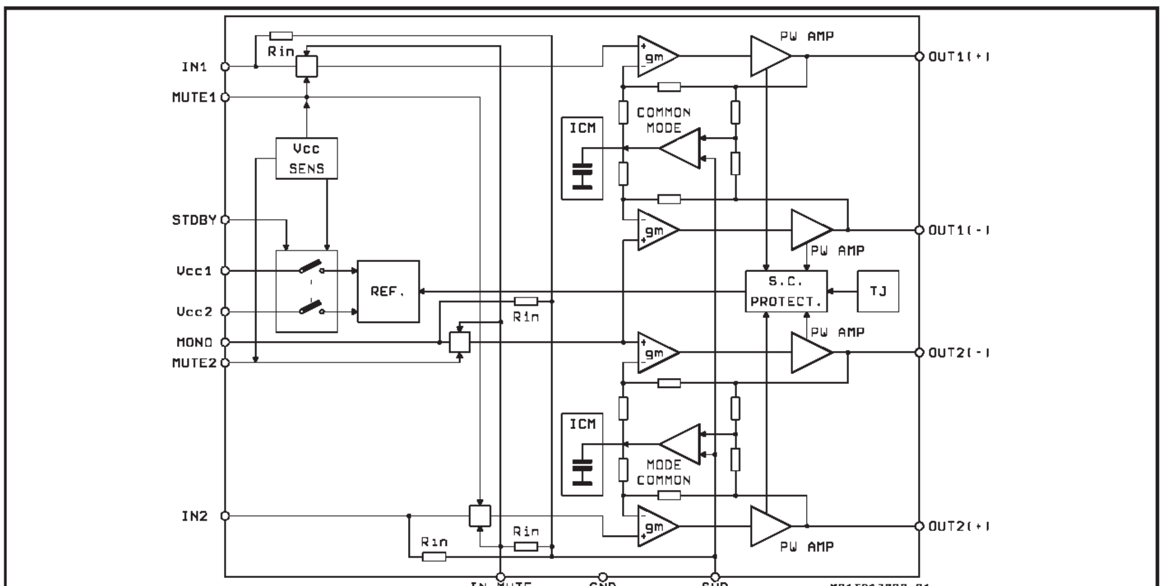
MULTIWATT15

ORDERING NUMBER: TDA7393

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

BLOCK DIAGRAM

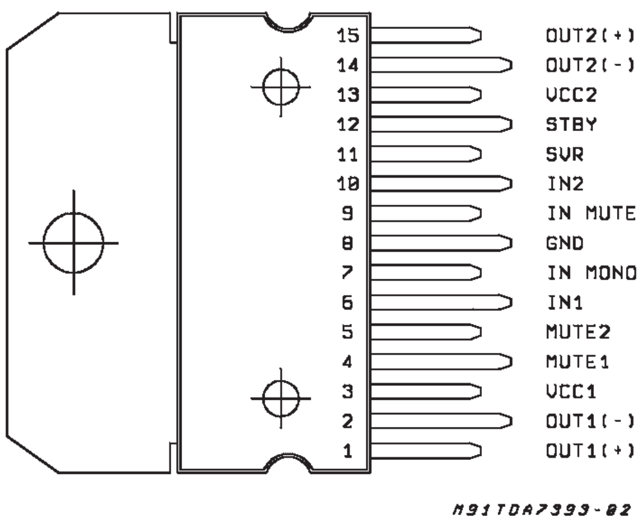


ABSOLUTE MAXIMUM RATINGS

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 = 100µs)	 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

allows very compact sets.

PIN CONNECTION (Top view)



THERMAL DATA

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

ELECTRICAL CHARACTERISTICS (V_S = 13.2V; f = 1KHz; R_g = 600Ω; R_L = 4Ω; T_{amb} = 25°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 = 2Ω THD = 10%; V_S = 14.4V; R_L = 2Ω	 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	KΩ
C_T	Cross Talk	f = 1KHz	50	65		dB
I_{SB}	St-By Current Consumption				100	µA
$V_{SB\ out}$	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 = 1Vrms		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	µA
$I_{m\ (H)}$	Muting Pin Current	VMUTE = 3.5V (Sourced Current)	6	10	14	µA

Figure 1: Quiescent Current vs. Supply Voltage

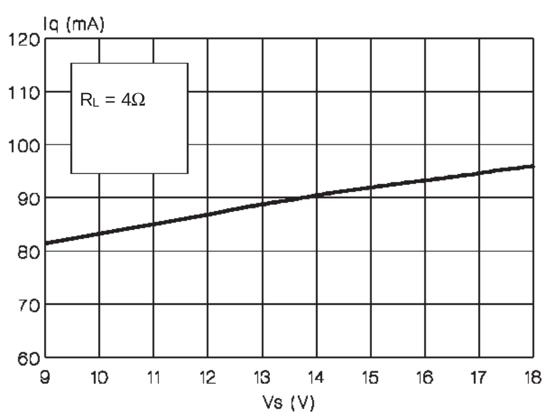
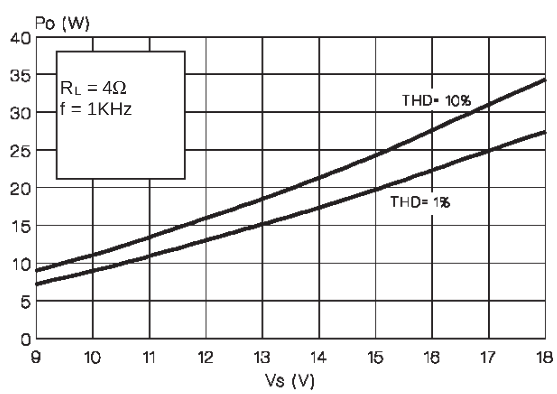


Figure 2: Output Power vs. Supply Voltage



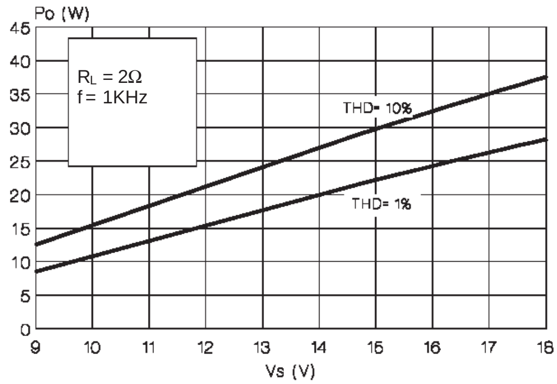


Figure 3: Output Power vs Supply Voltage

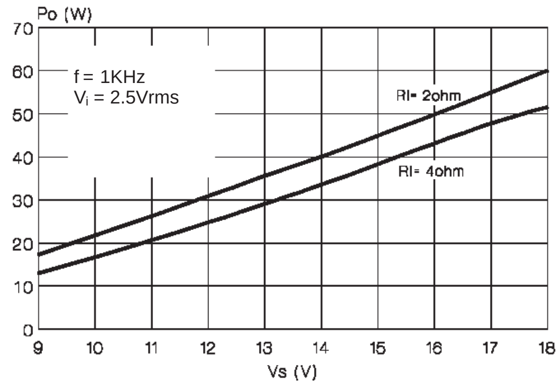


Figure 4: EIAJ Power vs. Supply Voltage

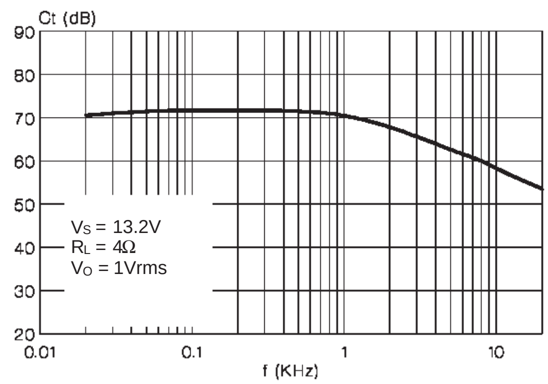


Figure 5: Cross-Talk vs. Frequency

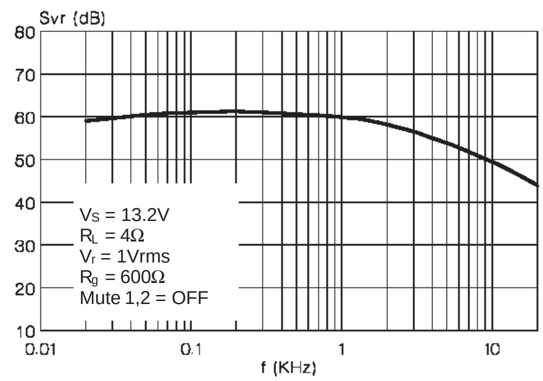


Figure 6: SVR vs. Frequency

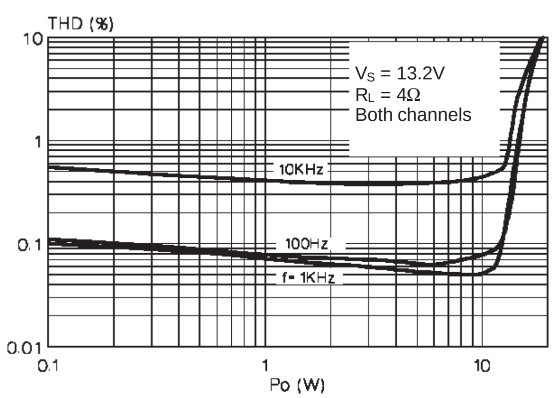


Figure 7: Distortion vs. Frequency

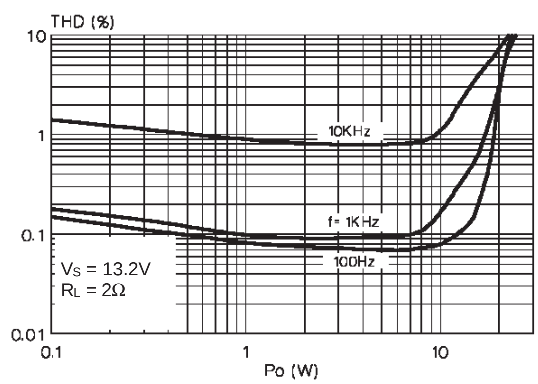


Figure 8: Distortion vs. Frequency

Figure 9: Block Diagram of Mute Circuit

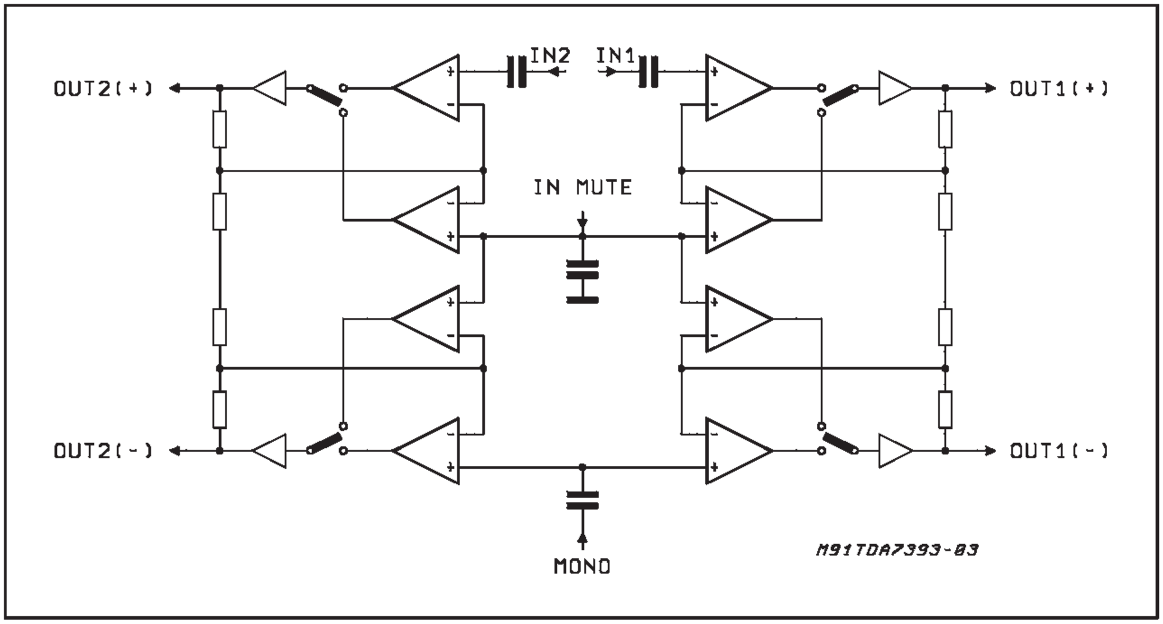


Figure 10: Explanatory Waveforms Of Mute Circuit

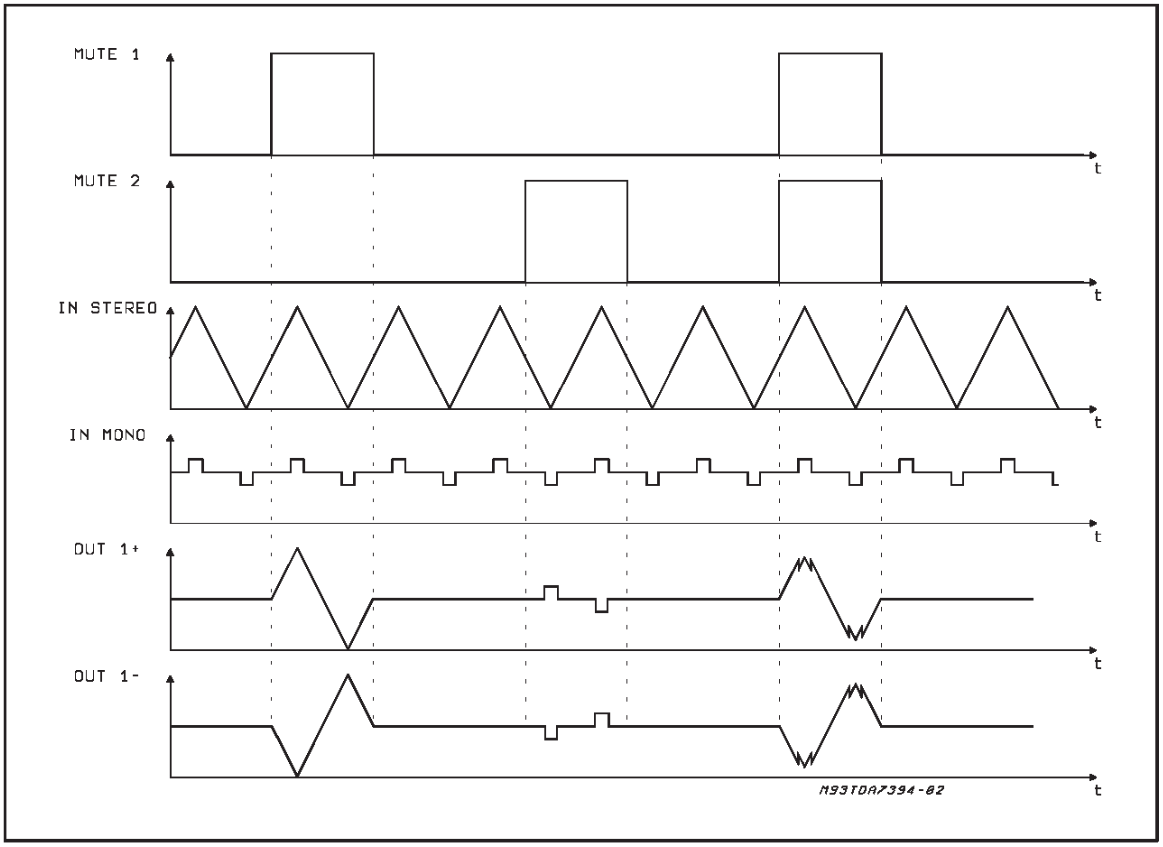


Figure 11: Application Circuit

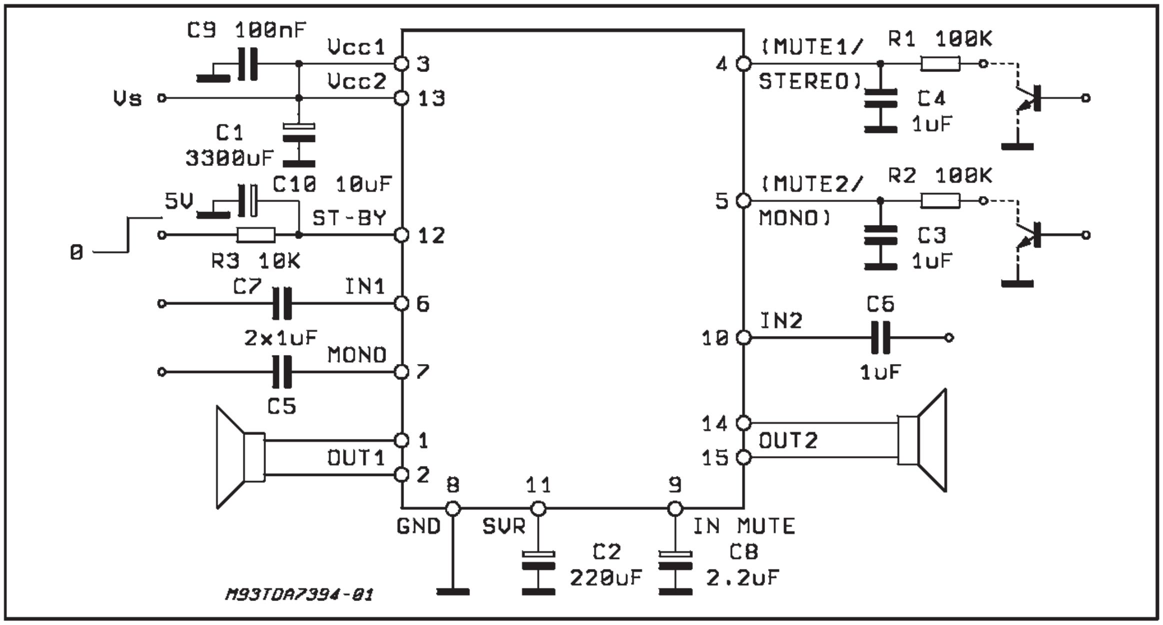


Figure 12: P.C. Board and Component Layout of the fig. 11 (1:1 scale)

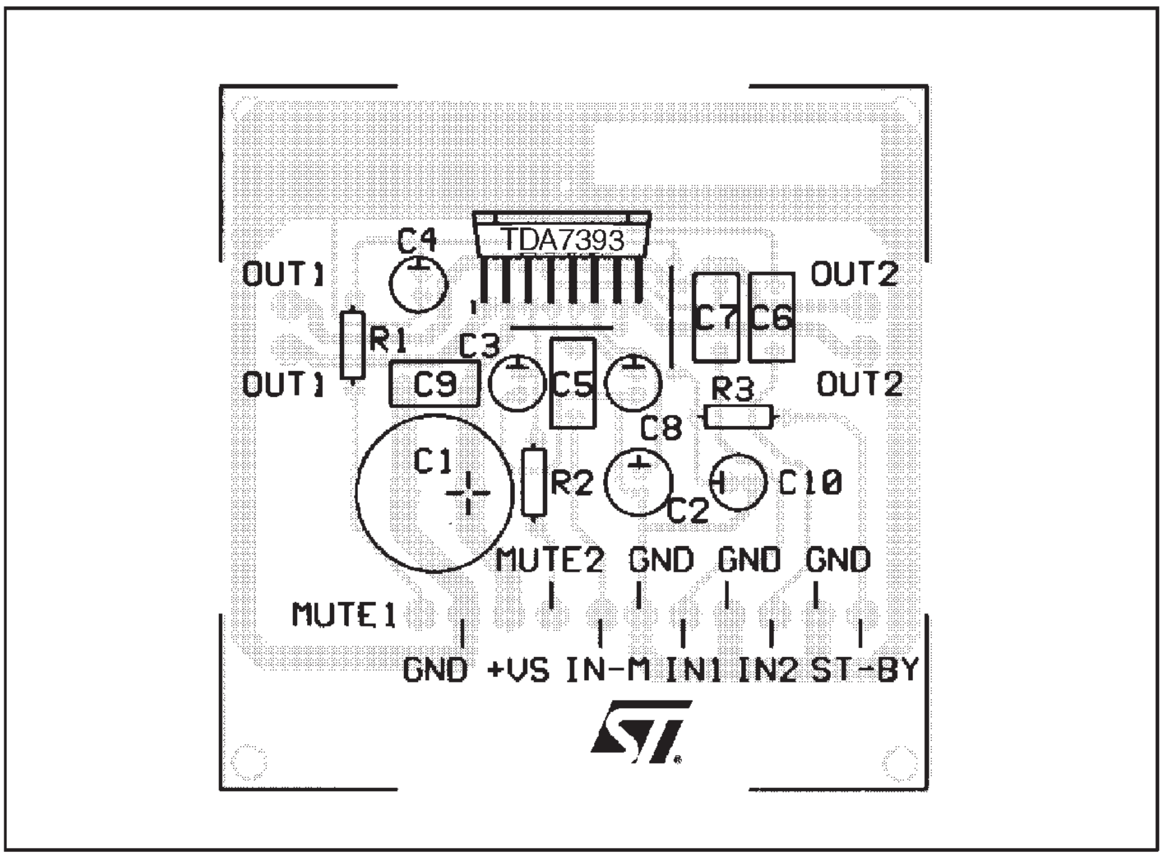
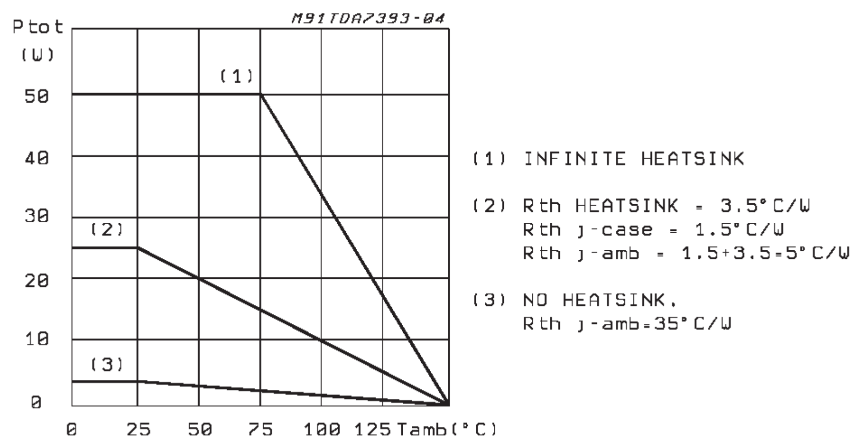


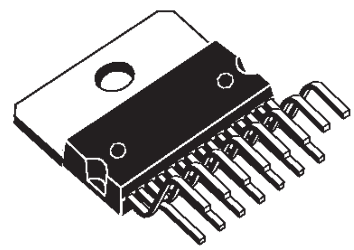
Figure 13: Power Dissipation Derating Curve



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	1.02	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