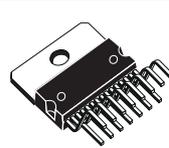


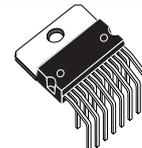
## 100V - 100W DMOS AUDIO AMPLIFIER WITH MUTE/ST-BY

- VERY HIGH OPERATING VOLTAGE RANGE ( $\pm 40V$ )
- DMOS POWER STAGE
- HIGH OUTPUT POWER (UP TO 100W MUSIC POWER)
- MUTING/STAND-BY FUNCTIONS
- NO SWITCH ON/OFF NOISE
- NO BOUCHEROT CELLS
- VERY LOW DISTORTION
- VERY LOW NOISE
- SHORT CIRCUIT PROTECTION
- THERMAL SHUTDOWN

### MULTIPOWER BCD TECHNOLOGY



Multiwatt15V



Multiwatt15H

#### ORDERING NUMBERS:

TDA7294V

TDA7294HS

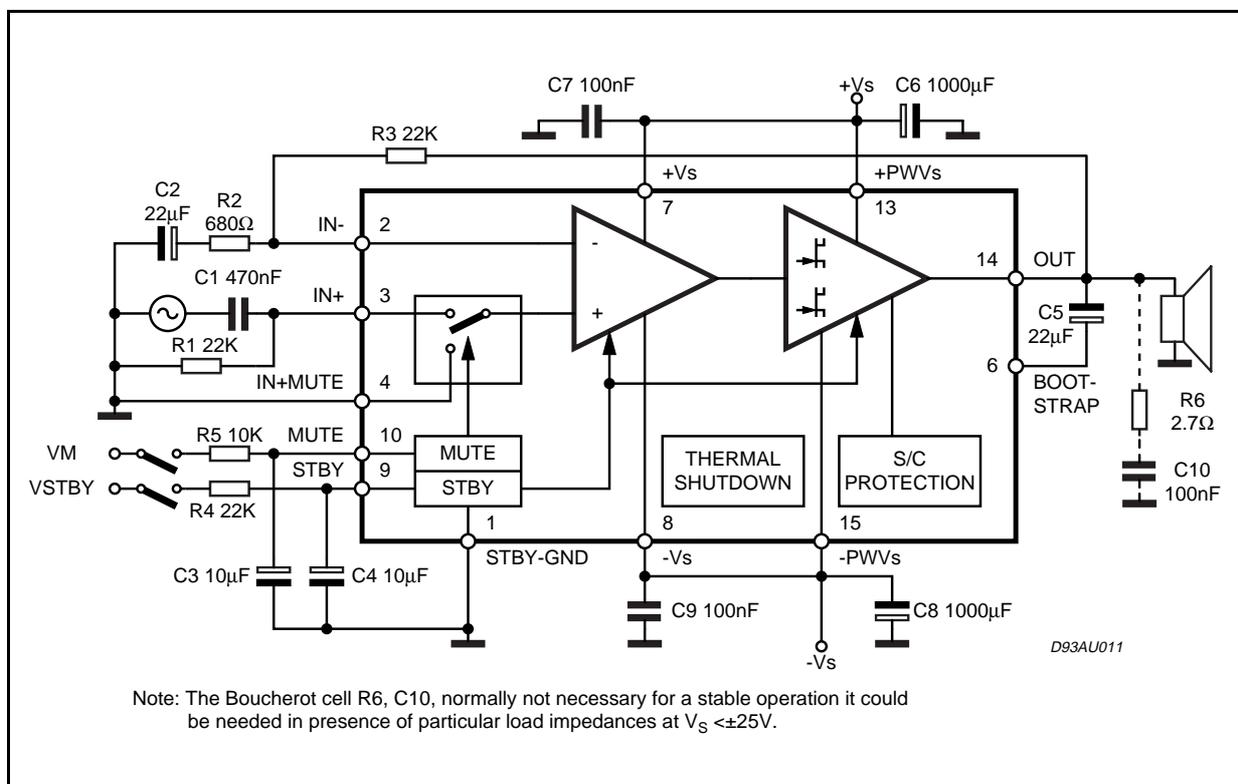
### DESCRIPTION

The TDA7294 is a monolithic integrated circuit in Multiwatt15 package, intended for use as audio class AB amplifier in Hi-Fi field applications (Home Stereo, self powered loudspeakers, Top-class TV). Thanks to the wide voltage range and

to the high out current capability it is able to supply the highest power into both 4 $\Omega$  and 8 $\Omega$  loads even in presence of poor supply regulation, with high Supply Voltage Rejection.

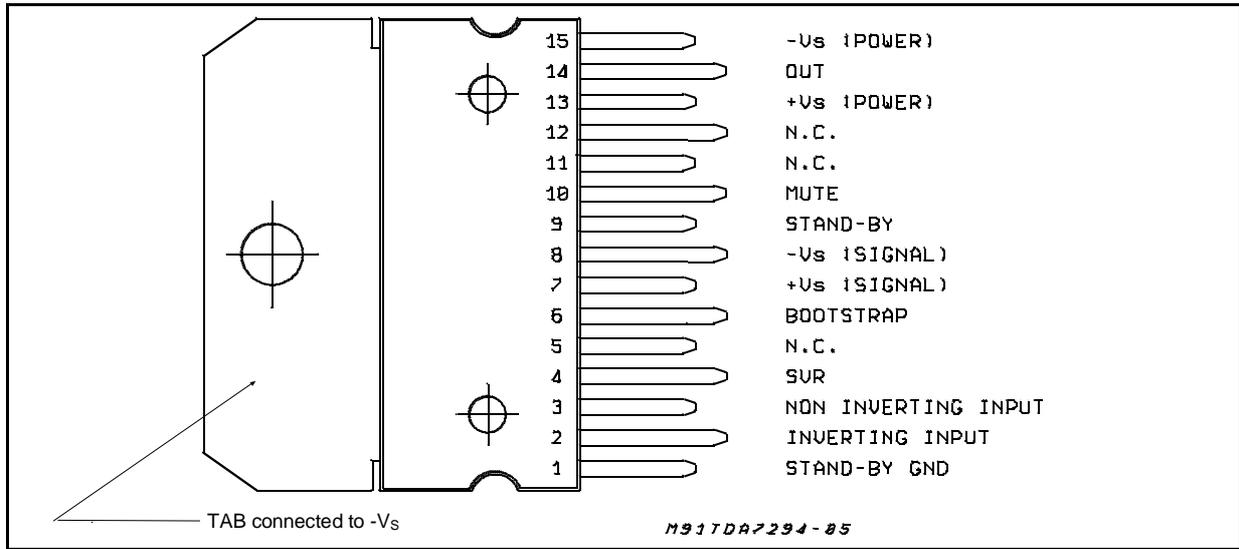
The built in muting function with turn on delay simplifies the remote operation avoiding switching on-off noises.

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

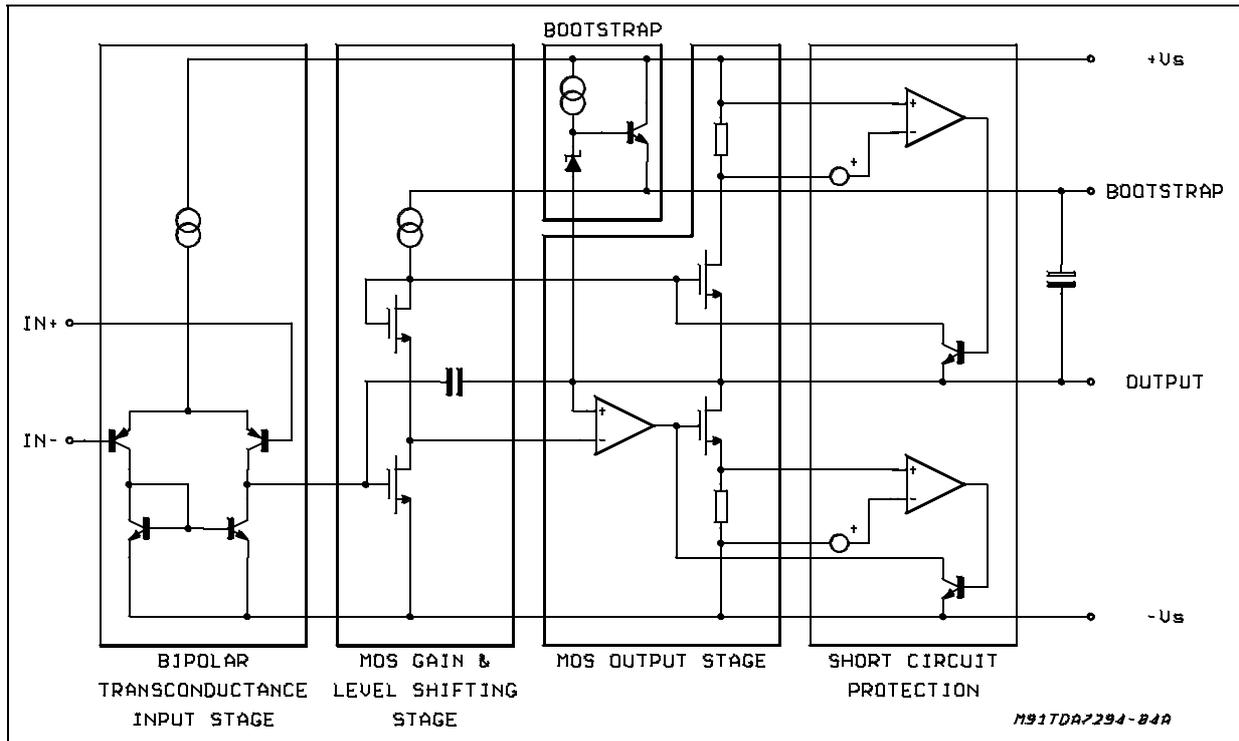


# TDA7294

## PIN CONNECTION (Top view)



## BLOCK DIAGRAM



## ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_s$	Supply Voltage (No Signal)	$\pm 50$	V
$I_o$	Output Peak Current	10	A
$P_{tot}$	Power Dissipation $T_{case} = 70^\circ C$	50	W
$T_{op}$	Operating Ambient Temperature Range	0 to 70	$^\circ C$
$T_{stg}, T_j$	Storage and Junction Temperature	150	$^\circ C$

## THERMAL DATA

Symbol	Description	Value	Unit
$R_{th\ j-case}$	Thermal Resistance Junction-case	Max 1.5	°C/W

**ELECTRICAL CHARACTERISTICS** (Refer to the Test Circuit  $V_S = \pm 35V$ ,  $R_L = 8\Omega$ ,  $G_V = 30dB$ ;  $R_g = 50\ \Omega$ ;  $T_{amb} = 25^\circ C$ ,  $f = 1\ kHz$ ; unless otherwise specified.

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$V_S$	Supply Range		$\pm 10$		$\pm 40$	V
$I_q$	Quiescent Current		20	30	65	mA
$I_b$	Input Bias Current				500	nA
$V_{OS}$	Input Offset Voltage				$\pm 10$	mV
$I_{OS}$	Input Offset Current				$\pm 100$	nA
$P_O$	RMS Continuous Output Power	d = 0.5%: $V_S = \pm 35V$ , $R_L = 8\Omega$ $V_S = \pm 31V$ , $R_L = 6\Omega$ $V_S = \pm 27V$ , $R_L = 4\Omega$	60 60 60	70 70 70		W W W
	Music Power (RMS) IEC268.3 RULES - $\Delta t = 1s$ (*)	d = 10% $R_L = 8\Omega$ ; $V_S = \pm 38V$ $R_L = 6\Omega$ ; $V_S = \pm 33V$ $R_L = 4\Omega$ ; $V_S = \pm 29V$ (***)		100 100 100		W W W
d	Total Harmonic Distortion (**)	$P_O = 5W$ ; $f = 1kHz$ $P_O = 0.1$ to $50W$ ; $f = 20Hz$ to $20kHz$		0.005	0.1	% %
		$V_S = \pm 27V$ , $R_L = 4\Omega$ : $P_O = 5W$ ; $f = 1kHz$ $P_O = 0.1$ to $50W$ ; $f = 20Hz$ to $20kHz$		0.01	0.1	% %
SR	Slew Rate		7	10		V/ $\mu s$
$G_V$	Open Loop Voltage Gain			80		dB
$G_V$	Closed Loop Voltage Gain		24	30	40	dB
$e_N$	Total Input Noise	A = curve $f = 20Hz$ to $20kHz$		1 2	5	$\mu V$ $\mu V$
$f_L, f_H$	Frequency Response (-3dB)	$P_O = 1W$	20Hz to 20kHz			
$R_i$	Input Resistance		100			k $\Omega$
SVR	Supply Voltage Rejection	$f = 100Hz$ ; $V_{ripple} = 0.5V_{rms}$	60	75		dB
$T_S$	Thermal Shutdown			145		°C
<b>STAND-BY FUNCTION (Ref: <math>-V_S</math> or GND)</b>						
$V_{ST\ on}$	Stand-by on Threshold				1.5	V
$V_{ST\ off}$	Stand-by off Threshold		3.5			V
$ATT_{st-by}$	Stand-by Attenuation		70	90		dB
$I_{q\ st-by}$	Quiescent Current @ Stand-by			1	3	mA
<b>MUTE FUNCTION (Ref: <math>-V_S</math> or GND)</b>						
$V_{Mon}$	Mute on Threshold				1.5	V
$V_{Moff}$	Mute off Threshold		3.5			V
$ATT_{mute}$	Mute Attenuation		60	80		dB

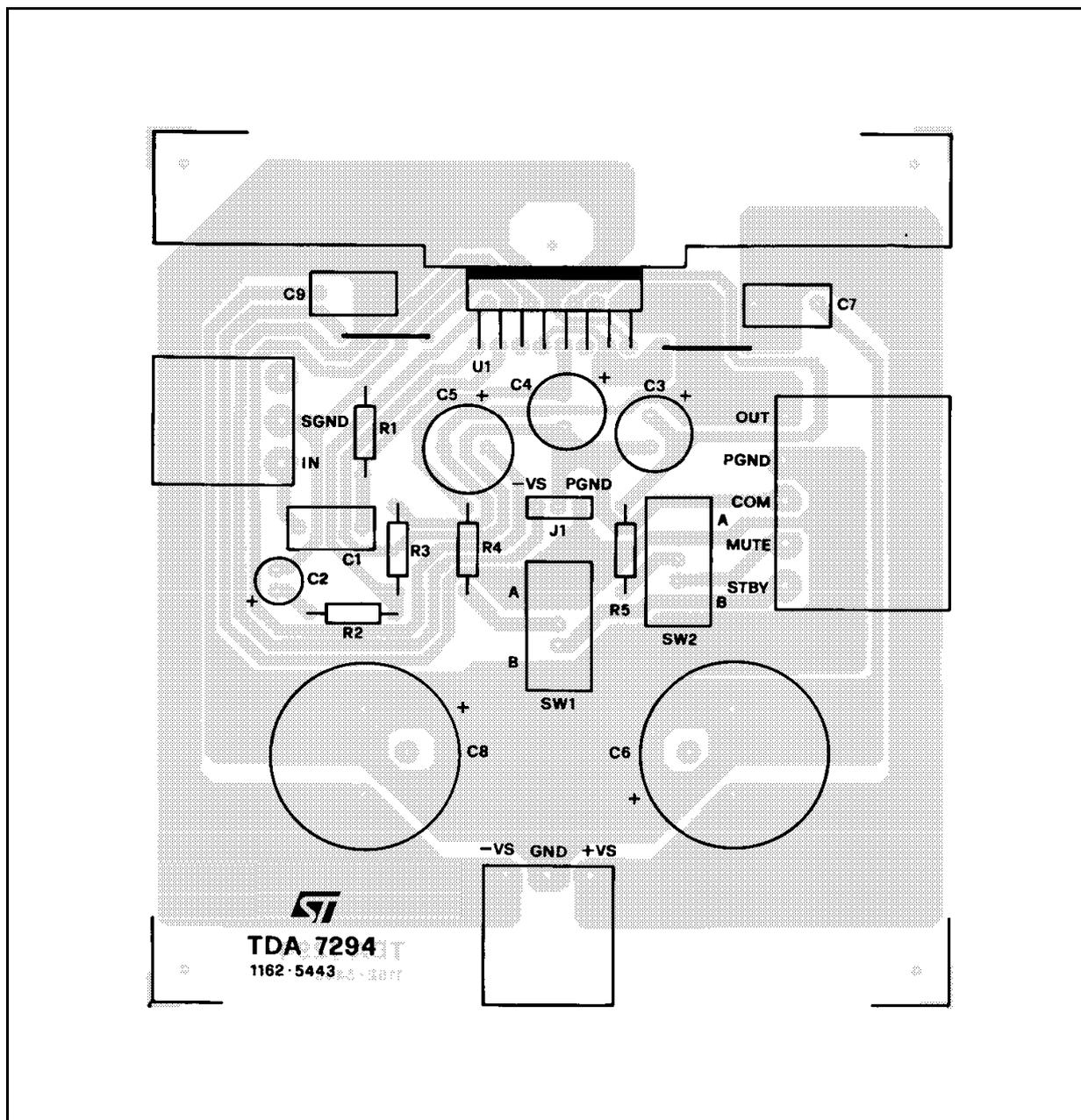
**Note (\*):****MUSIC POWER CONCEPT**

MUSIC POWER is the maximal power which the amplifier is capable of producing across the rated load resistance (regardless of non linearity) 1 sec after the application of a sinusoidal input signal of frequency 1KHz.

**Note (\*\*):** Tested with optimized Application Board (see fig. 2)

**Note (\*\*\*):** Limited by the max. allowable current.

Figure 2: P.C.B. and components layout of the circuit of figure 1. (1:1 scale)



**Note:**

The Stand-by and Mute functions can be referred either to GND or -VS.  
 On the P.C.B. is possible to set both the configuration through the jumper J1.

**APPLICATION SUGGESTIONS** (see Test and Application Circuits of the Fig. 1)

The recommended values of the external components are those shown on the application circuit of Figure 1. Different values can be used; the following table can help the designer.

COMPONENTS	SUGGESTED VALUE	PURPOSE	LARGER THAN SUGGESTED	SMALLER THAN SUGGESTED
R1 (*)	22k	INPUT RESISTANCE	INCREASE INPUT IMPEDANCE	DECREASE INPUT IMPEDANCE
R2	680Ω	CLOSED LOOP GAIN SET TO 30dB (**)	DECREASE OF GAIN	INCREASE OF GAIN
R3 (*)	22k		INCREASE OF GAIN	DECREASE OF GAIN
R4	22k	ST-BY TIME CONSTANT	LARGER ST-BY ON/OFF TIME	SMALLER ST-BY ON/OFF TIME; POP NOISE
R5	10k	MUTE TIME CONSTANT	LARGER MUTE ON/OFF TIME	SMALLER MUTE ON/OFF TIME
C1	0.47μF	INPUT DC DECOUPLING		HIGHER LOW FREQUENCY CUTOFF
C2	22μF	FEEDBACK DC DECOUPLING		HIGHER LOW FREQUENCY CUTOFF
C3	10μF	MUTE TIME CONSTANT	LARGER MUTE ON/OFF TIME	SMALLER MUTE ON/OFF TIME
C4	10μF	ST-BY TIME CONSTANT	LARGER ST-BY ON/OFF TIME	SMALLER ST-BY ON/OFF TIME; POP NOISE
C5	22μF	BOOTSTRAPPING		SIGNAL DEGRADATION AT LOW FREQUENCY
C6, C8	1000μF	SUPPLY VOLTAGE BYPASS		DANGER OF OSCILLATION
C7, C9	0.1μF	SUPPLY VOLTAGE BYPASS		DANGER OF OSCILLATION

(\*) R1 = R3 FOR POP OPTIMIZATION

(\*\*) CLOSED LOOP GAIN HAS TO BE  $\geq 24$ dB