SGS-THOMSON MICROELECTRONICS

TDA7383

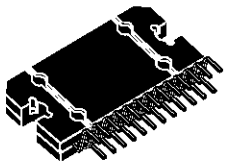
4 x 22W FOUR BRIDGE CHANNELS CAR RADIO AMPLIFIER

PRODUCT PREVIEW

- HIGH OUTPUT POWER CAPABILITY:
  4 x 30W max./4Ω EIAJ
  4 x 22W/4Ω @ 14.4V, 1KHz, 10%
  4 x 18.5W/4Ω @ 13.2V, 1KHz, 10%
- CLIPPING DETECTOR
- LOW DISTORTION
- LOW OUTPUT NOISE
- ST-BY FUNCTION
- MUTE FUNCTION
- AUTOMUTE AT MIN. SUPPLY VOLTAGE DETECTION
- DIAGNOSTICS FACILITY FOR:
  – CLIPPING
  – OUT TO GND SHORT
  – OUT TO V_S SHORT
  – THERMAL SHUTDOWN
- LOW EXTERNAL COMPONENT COUNT:
  – INTERNALLY FIXED GAIN (32dB)
  – NO EXTERNAL COMPENSATION
  – NO BOOTSTRAP CAPACITORS

PROTECTIONS:

- OUTPUT SHORT CIRCUIT TO GND, TO V_S, ACROSS THE LOAD
- VERY INDUCTIVE LOADS
- OVERRATING CHIP TEMPERATURE WITH SOFT THERMAL LIMITER
- LOAD DUMP VOLTAGE
- FORTUITOUS OPEN GND
- REVERSED BATTERY
- ESD PROTECTION



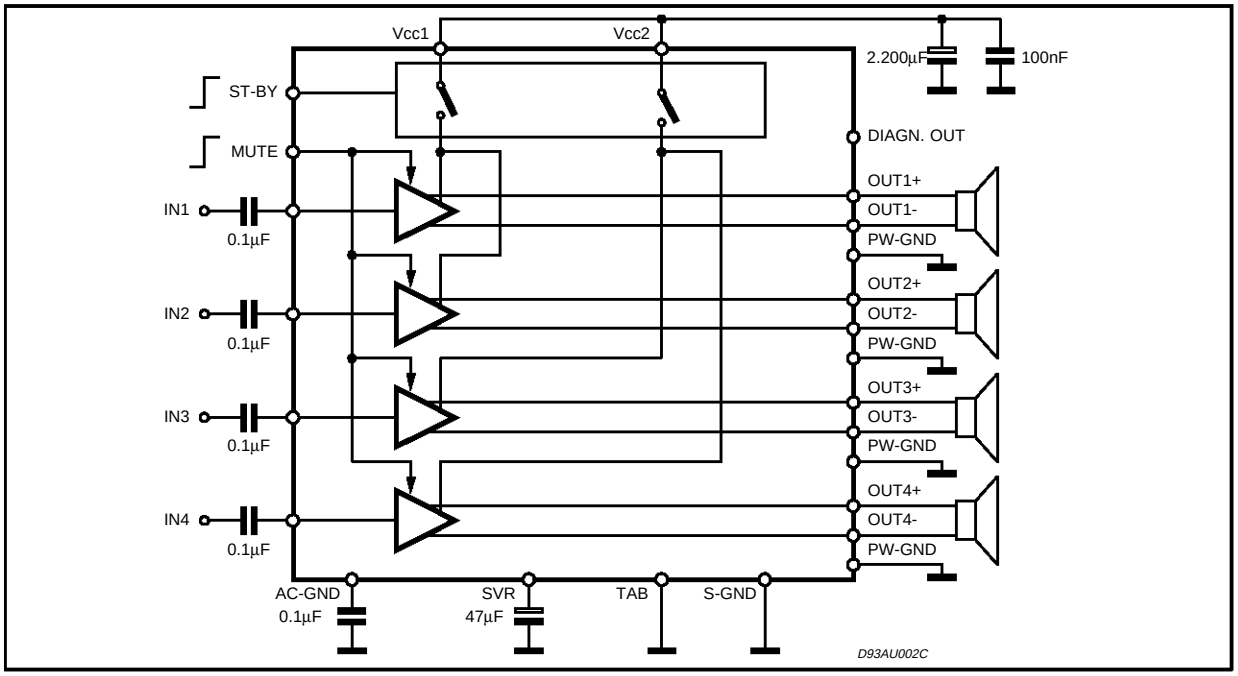
FLEXIWATT25

ORDERING NUMBER: TDA7383

DESCRIPTION

The TDA7383 is a new technology class AB Audio Power Amplifier in Flexiwatt 25 package designed for high end car radio applications.

BLOCK AND APPLICATION DIAGRAM



DESCRIPTION (continued)

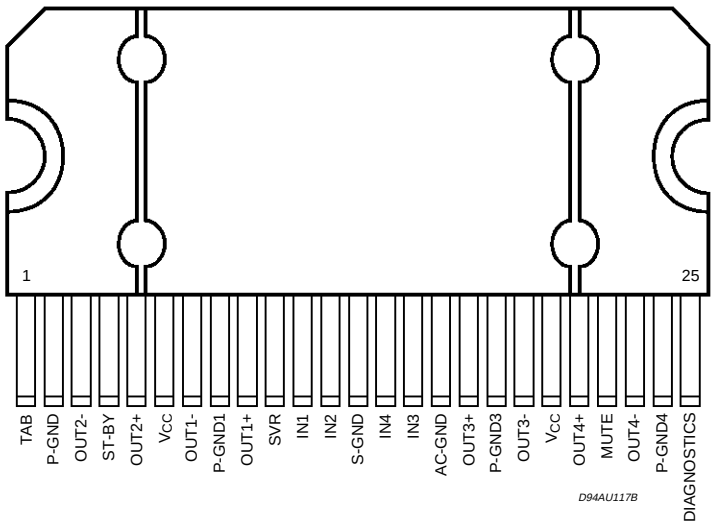
Thanks to the fully complementary PNP/NPN output configuration the TDA7383 allows a rail to rail output voltage swing with no need of bootstrap capacitors. The extremely reduced components count allows very compact sets.

The on-board clipping detector simplifies gain compression operations. The fault diagnostics makes it possible to detect mistakes during Car-Radio assembly and wiring in the car.

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, (T_{case} = 70°C)	80	W
T_j	Junction Temperature	150	°C
T_{stg}	Storage Temperature	– 55 to 150	°C

PIN CONNECTION (Top view)



THERMAL DATA

Symbol	Parameter		Value	Unit
$R_{th\ j\text{-}case}$	Thermal Resistance Junction to Case	Max.	1	°C/W

ELECTRICAL CHARACTERISTICS (V_S = 14.4V; f = 1KHz; R_L = 4Ω; T_{amb} = 25°C; Refer to the Test and application circuit (fig.1), unless otherwise specified.)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
I_{q1}	Quiescent Current			180		mA
V_{OS}	Output Offset Voltage				200	mV
G_v	Voltage Gain		31	32	33	dB
P_o	Output Power	THD = 10% THD = 1% THD = 10%; V_S = 14V THD = 5%; V_S = 14V THD = 1%; V_S = 14V THD = 10%; V_S = 13.2V THD = 1%; V_S = 13.2V	18	22 18 21 19 17 18.5 15		W W W W W W W
$P_{o\ max}$	Max. Output Power	EIAJ RULES		30		W
THD	Distortion	P_o = 1W			0.3	%
e_{No}	Output Noise	"A" Weighted Bw = 20Hz to 20KHz		75 100	 150	μV μV
SVR	Supply Voltage Rejection	f = 100Hz	50	60		dB
f_{cl}	Low Cut-Off Frequency			20		Hz
f_{ch}	High Cut-Off Frequency		75			KHz
R_i	Input Impedance		70	100		KΩ
C_T	Cross Talk	f = 1KHz	50	70		dB
I_{SB}	St-By Current Consumption	St-By = LOW			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
A_M	Mute Attenuation	V_O = 1Vrms	70	90		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
$I_{m\ (L)}$	Muting Pin Current	V_{MUTE} = 1.5V (Source Current)	10	13	16	μA
I_{CDOFF}	Clipping Detector "OFF" Output Average Current	THD = 1% (*)		100		μA
I_{CDON}	Clipping Detector "ON" Output Average Current	THD = 5% (*)		190		μA

(*) Diagnostics output pulled-up to 5V with 10KΩ series resistor.

Figure 1: Standard Test and Application Circuit

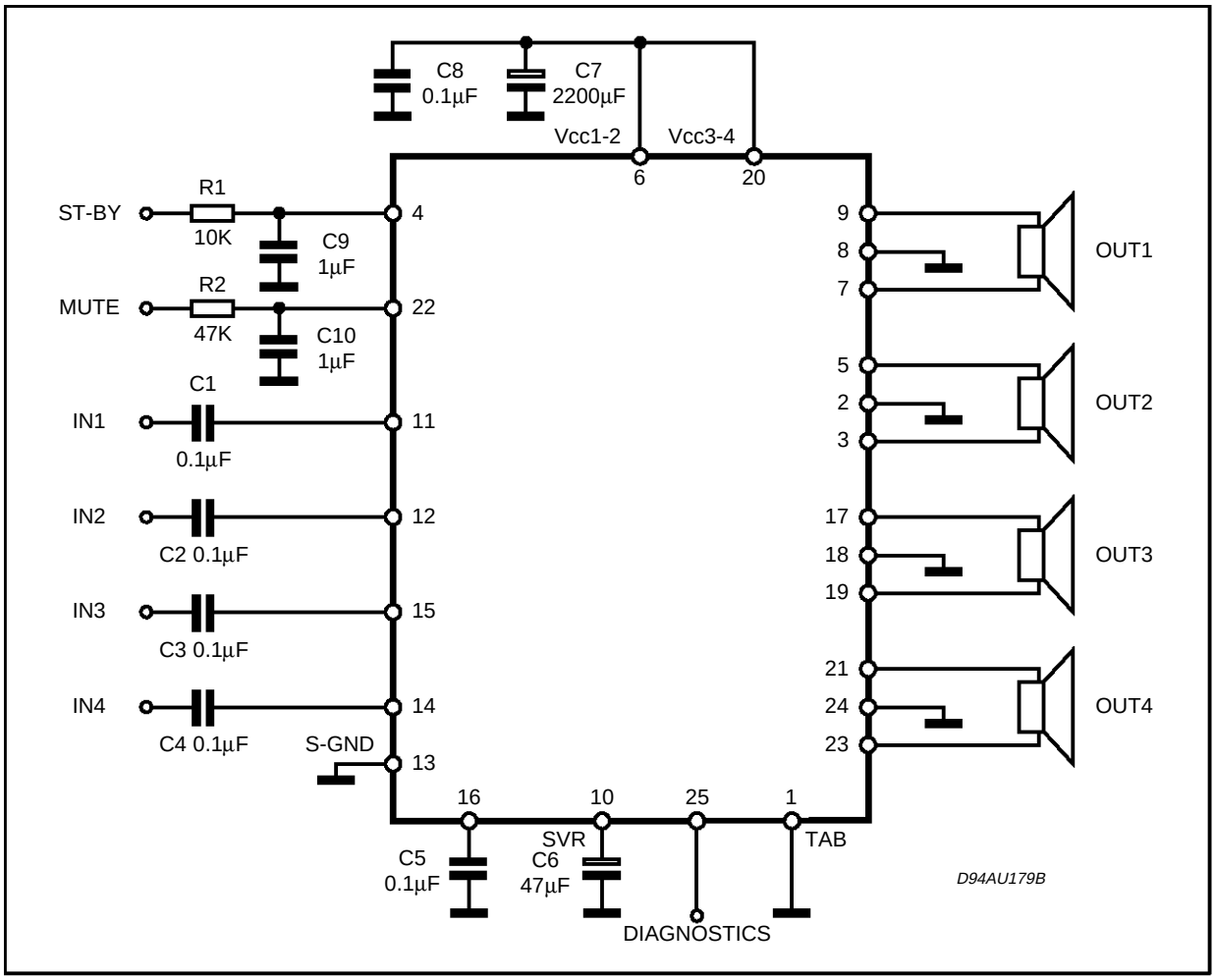
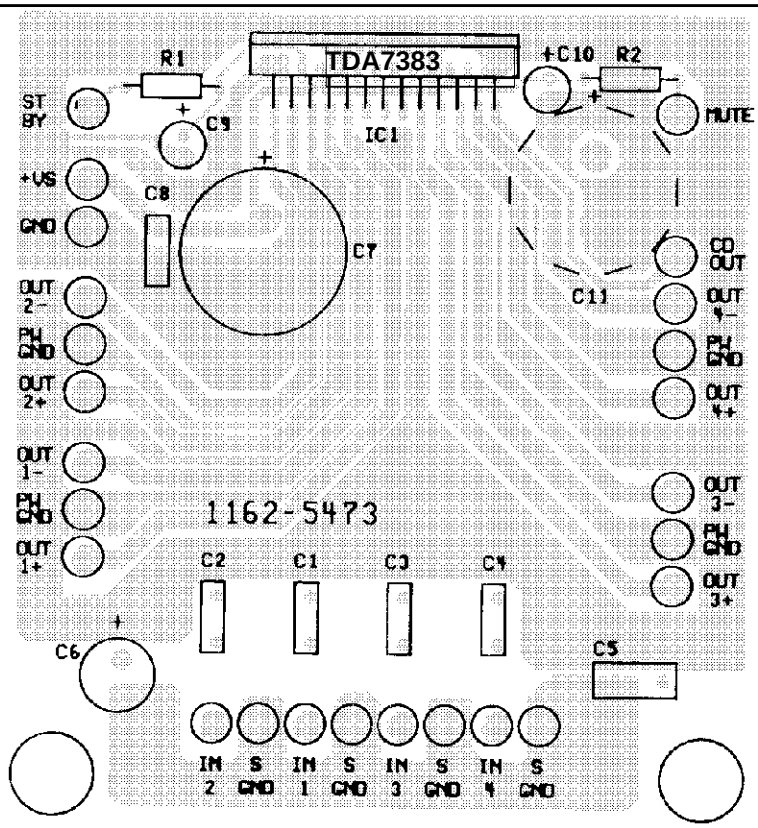
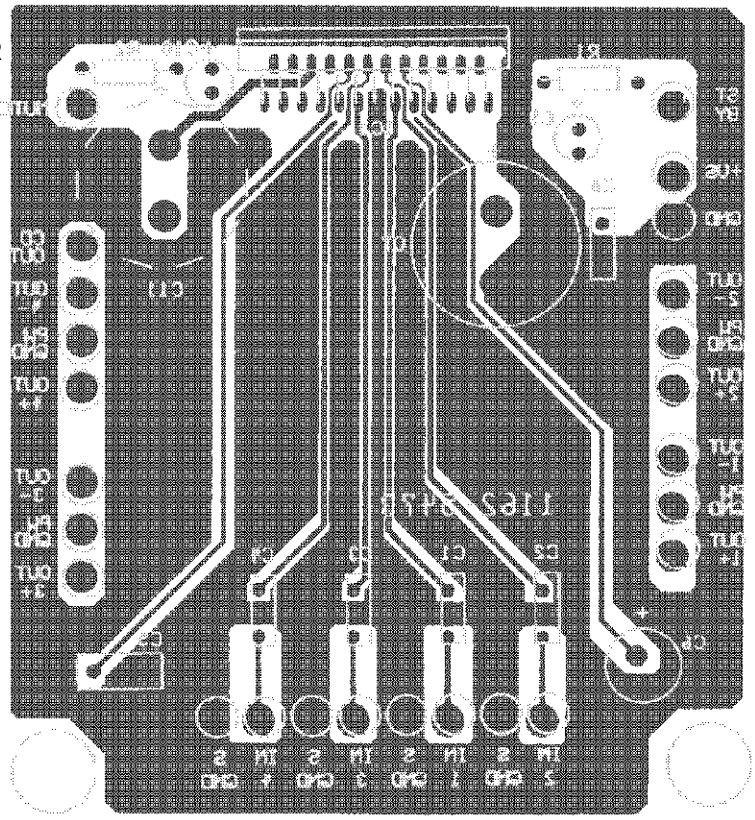


Figure 2: P.C.B. and component layout of the figure 1 (1:1 scale)

COMPONENTS & TOP COPPER LAYER



BOTTOM COPPER LAYER



FLEXIWATT25 PACKAGE MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.45		4.65	0.175		0.183
B	1.80	1.90	2.00	0.070	0.074	0.079
C		1.40			0.055	
D	0.75	0.90	1.05	0.029	0.035	0.041
E	0.37	0.39	0.42	0.014	0.015	0.016
F			0.57			0.022
G	0.80	1.00	1.20	0.031	0.040	0.047
G1	23.75	24.00	24.25	0.935	0.945	0.955
H	28.90	29.23	29.30	1.138	1.150	1.153
H1		17.00			0.669	
H2		12.80			0.503	
H3		0.80			0.031	
L	21.57	21.97	22.37	0.849	0.865	0.880
L1	18.57	18.97	19.37	0.731	0.786	0.762
L2	15.50	15.70	15.90	0.610	0.618	0.626
L3	7.70	7.85	7.95	0.303	0.309	0.313
M	3.70	4.00	4.30	0.145	0.157	0.169
M1	3.60	4.00	4.40	0.142	0.157	0.173
N		2.20			0.086	
O		2			0.079	
R		1.70			0.067	
R4		0.50			0.019	
V2	20°					
V3	45°