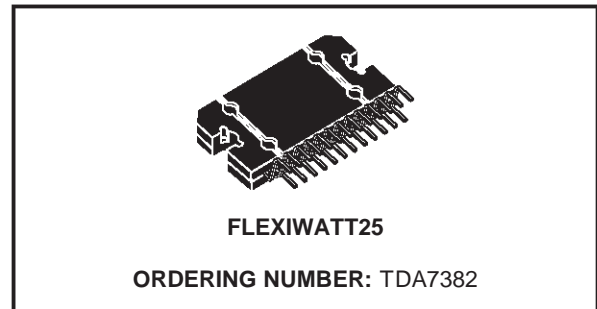


4 x 22W FOUR BRIDGE CHANNELS CAR RADIO AMPLIFIER

- 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 (THD = 10%)
- LOW DISTORTION
- LOW OUTPUT NOISE
- ST-BY FUNCTION
- MUTE FUNCTION
- AUTOMUTE AT MIN. SUPPLY VOLTAGE DETECTION
- LOW EXTERNAL COMPONENT COUNT:
 - INTERNALLY FIXED GAIN (26dB)
 - 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

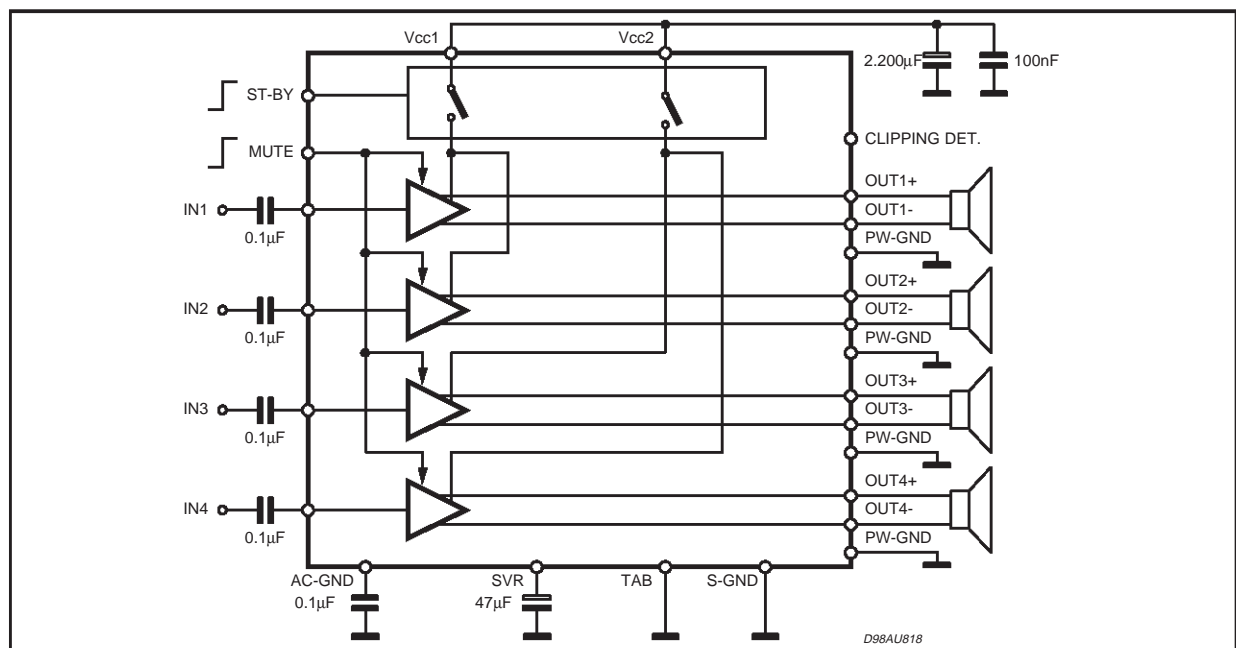


- REVERSED BATTERY
- ESD PROTECTION

DESCRIPTION

The TDA7382 is a new technology class AB Audio Power Amplifier in Flexiwatt 25 package designed for high end car radio applications. Thanks to the fully complementary PNP/NPN output configuration the TDA7382 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.

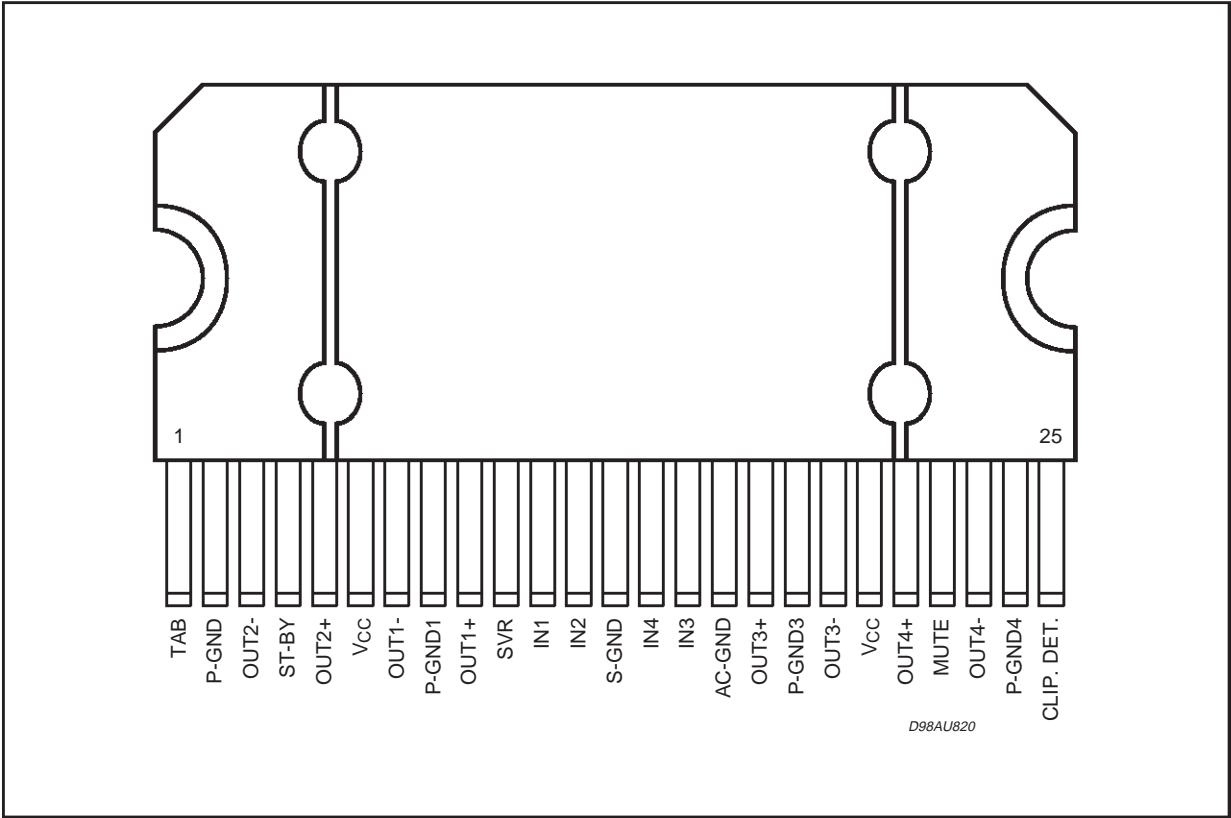
BLOCK AND APPLICATION DIAGRAM



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 ($t = 100\mu s$)	4.5	A
		5.5	A
P_{tot}	Power dissipation, ($T_{case} = 70^{\circ}C$)	80	W
T_j	Junction Temperature	150	$^{\circ}C$
T_{stg}	Storage Temperature	- 55 to 150	$^{\circ}C$

PIN CONNECTION (Top view)



THERMAL DATA

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

ELECTRICAL CHARACTERISTICS ($V_S = 14.4V$; $f = 1KHz$; $R_g = 600\Omega$; $R_L = 4\Omega$; $T_{amb} = 25^\circ C$;
Refer to the Test and application circuit (fig.1), unless otherwise specified.)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
I_{q1}	Quiescent Current		85	180	300	mA
V_{OS}	Output Offset Voltage				100	mV
G_v	Voltage Gain		25	26	27	dB
P_o	Output Power	THD = 10%	20	22		W
		THD = 1%	16.5	18		W
		THD = 10%; $V_S = 13.5V$	17	20		W
		THD = 10%; $V_S = 14V$	19	21		W
		THD = 5%; $V_S = 14V$	17	19		W
		THD = 1%; $V_S = 14V$	16	17		W
		THD = 10%; $V_S = 13.2V$	17	18.5		W
		THD = 1%; $V_S = 13.2V$	14	15		W
$P_{o\ max}$	Max. Output Power	EIAJ RULES	27.5	30		W
THD	Distortion	$P_o = 4W$		0.04	0.3	%
e_{No}	Output Noise	"A" Weighted Bw = 20Hz to 20KHz		50 65	120 150	μV μV
SVR	Supply Voltage Rejection	$f = 100Hz$	50	65		dB
f_{cl}	Low Cut-Off Frequency			20		Hz
f_{ch}	High Cut-Off Frequency		75			KHz
R_i	Input Impedance		60	100	130	$K\Omega$
C_T	Cross Talk	$f = 1KHz$	50	70		dB
I_{SB}	St-By Current Consumption	St-By = LOW		20	50	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	$V_O = 1V_{rms}$	80	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)	5	13	16	μA
CDL	Clipping Detection THD Level		5	10	15	%

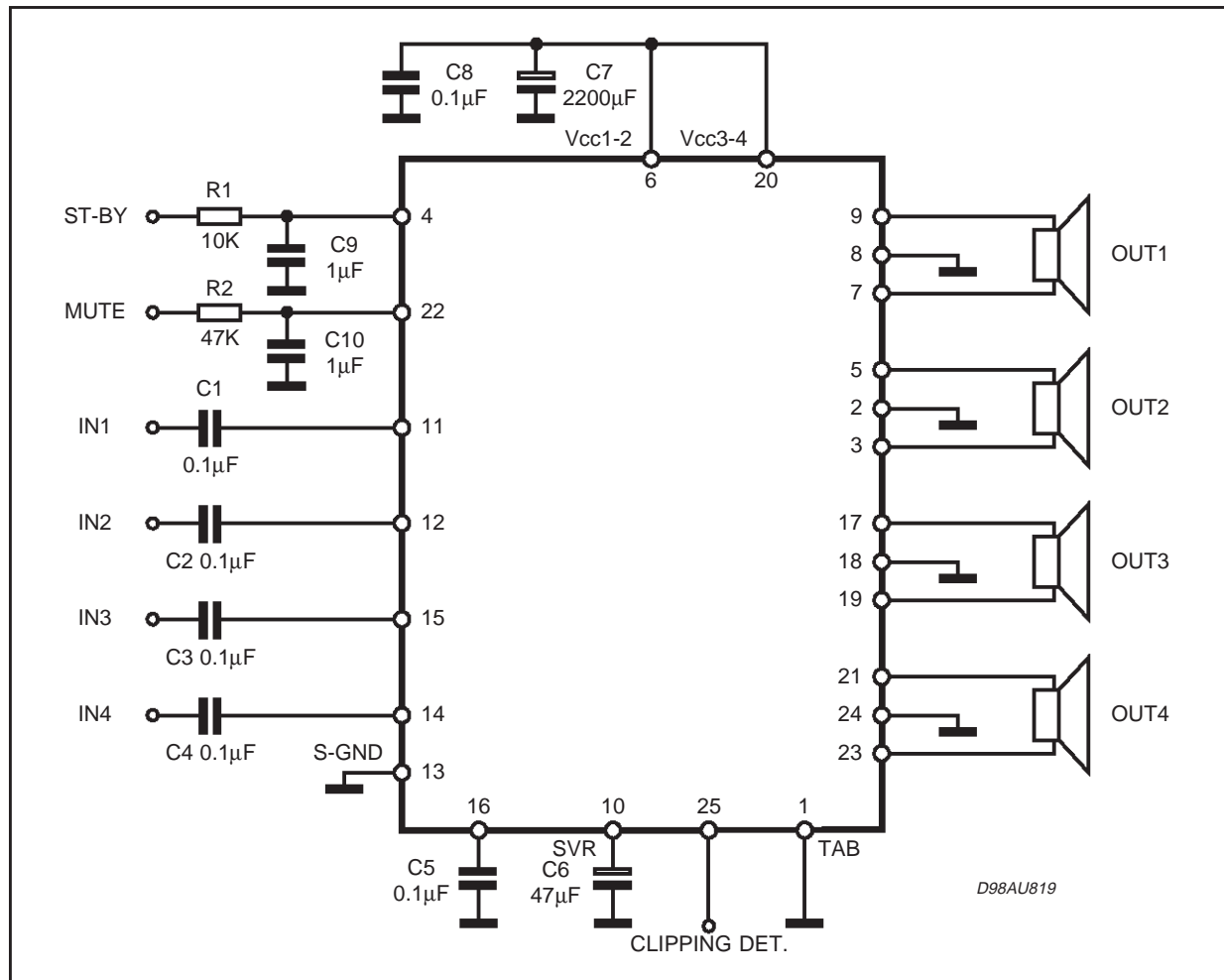
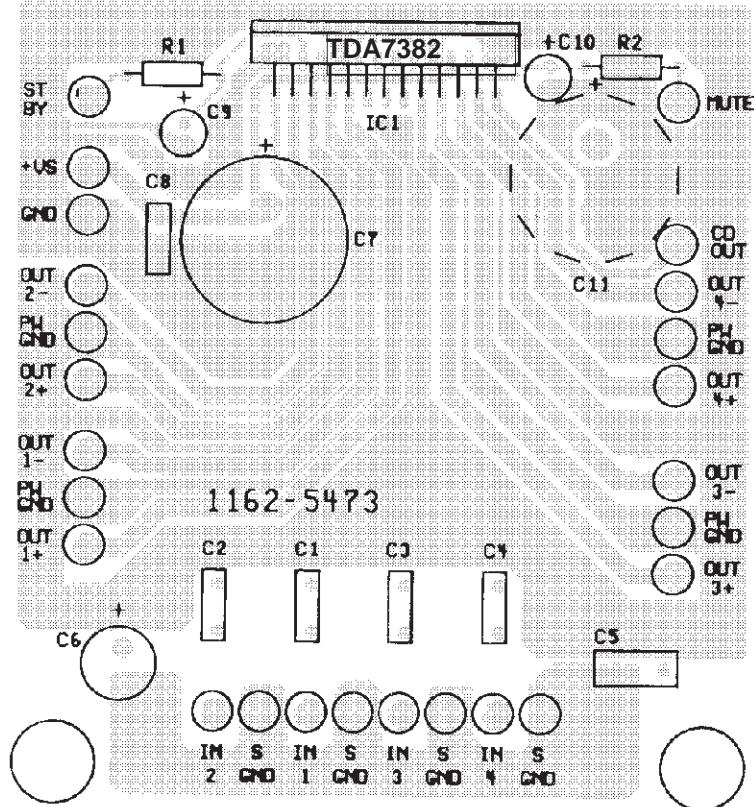
Figure 1: Standard Test and Application Circuit

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

COMPONENTS &
TOP COPPER LAYER

BOTTOM COPPER LAYER

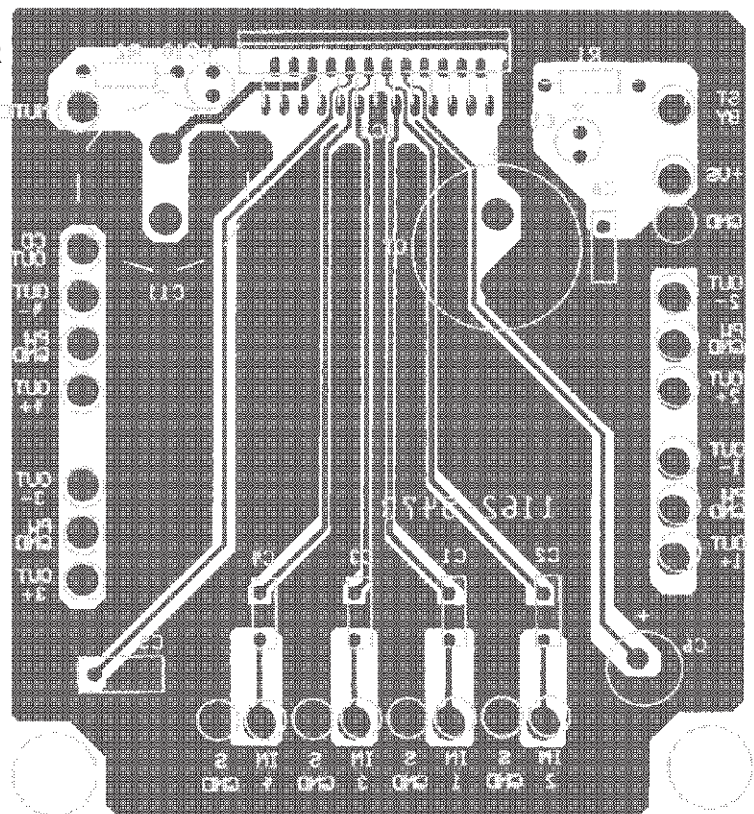
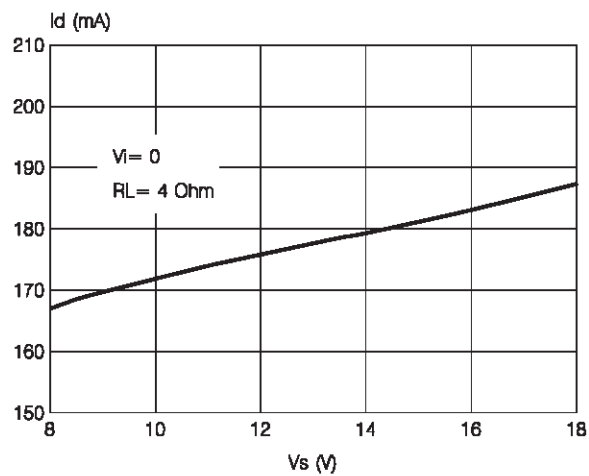
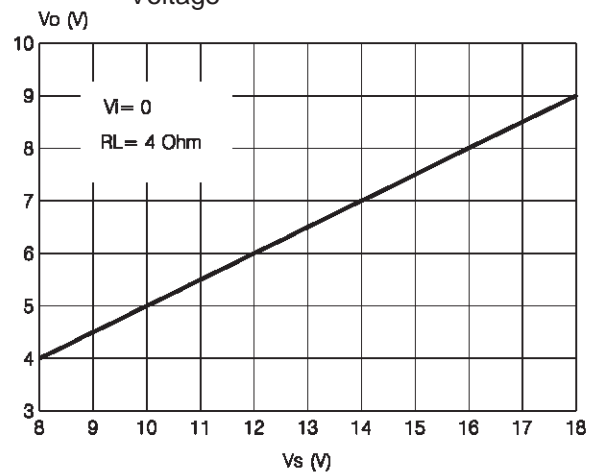
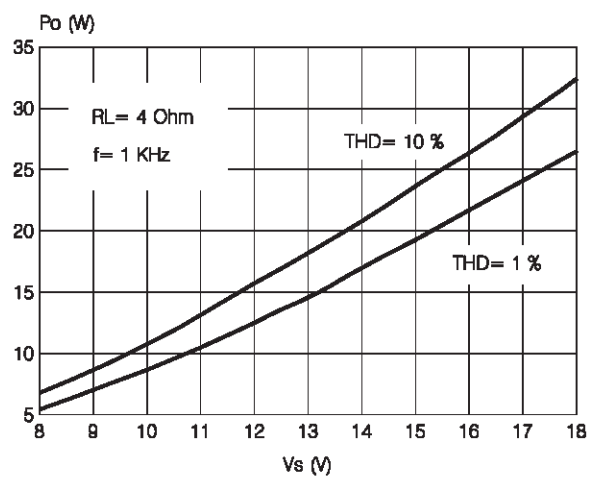
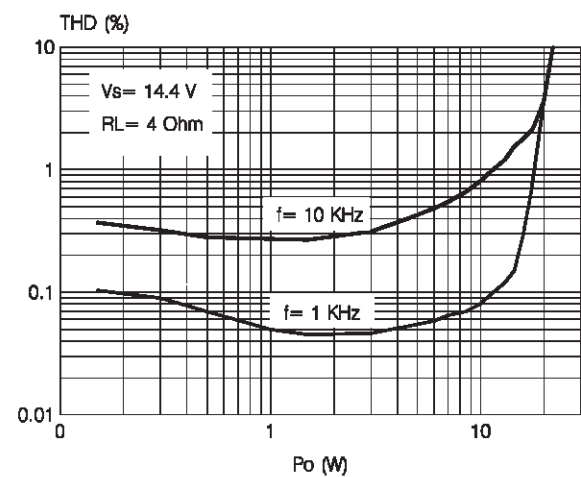
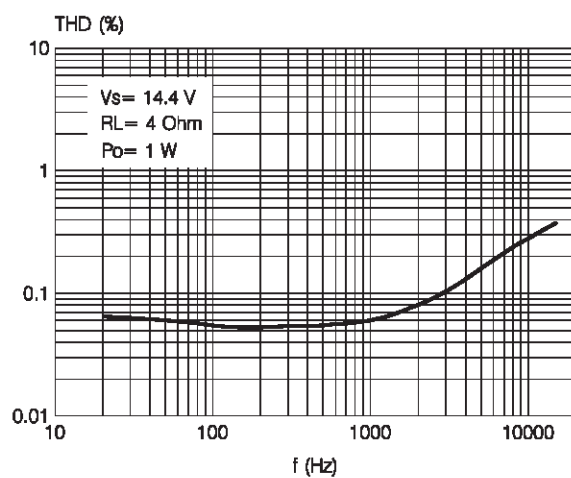
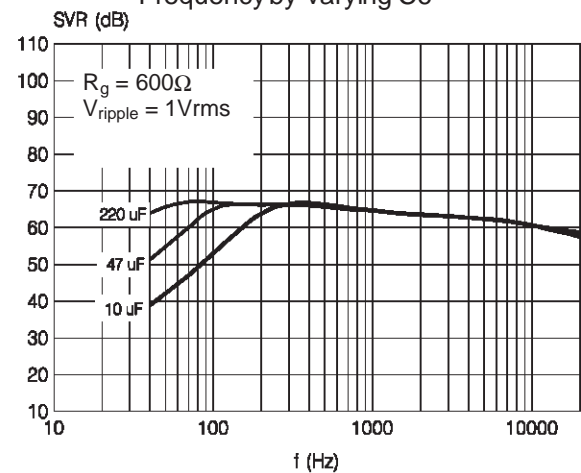


Figure 3: Quiescent Current vs. Supply Voltage**Figure 4:** Quiescent Output Voltage vs. Supply Voltage**Figure 5:** Output Power vs. Supply Voltage**Figure 6:** Distortion vs. Output Power**Figure 7:** Distortion vs. Frequency.**Figure 8:** Supply Voltage Rejection vs. Frequency by varying C6

signed in order to obtain a virtually pop-free transition has to be slower than 2.5V/ms.

CLIPPING DETECTOR

The **CLIPPING DETECTOR** acts in a way to output a signal as soon as one or more outputs reach or trespass a typical THD level of 10%.

As a result, the clipping-related signal at pin 25 takes the form of pulses, which are synchronized with each single clipping event in the music program. Applications making use of this facility usually operate a filtering/integration of the pulses train through passive R-C networks and realize a volume (or tone bass) stepping down in association with microprocessor-driven audioprocessors. The maximum load that pin 25 can sustain is

1K Ω .

Due to its operating principles, the clipping detector has to be viewed mainly as a power-dependent feature rather than frequency-dependent. This means that clipping state causing THD = 10% typ. will be immediately signaled out whenever a fixed power level is reached, regardless of the audio frequency.

In other words, this feature offers the means to counteract the extremely sound-damaging effects of heavy clipping, caused by a sudden increase of odd order harmonics and appearance of serious intermodulation phenomena.

Figure 12: Diagnostics circuit.

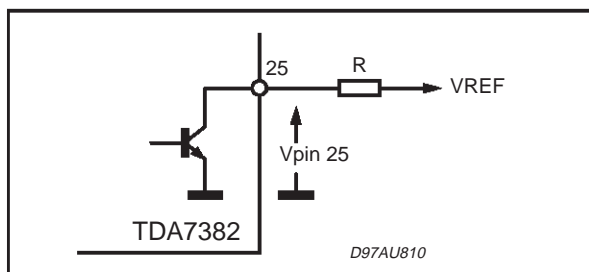


Figure 13: Clipping Detection Waveforms.

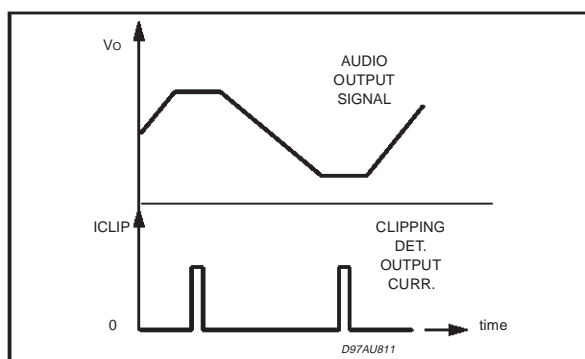
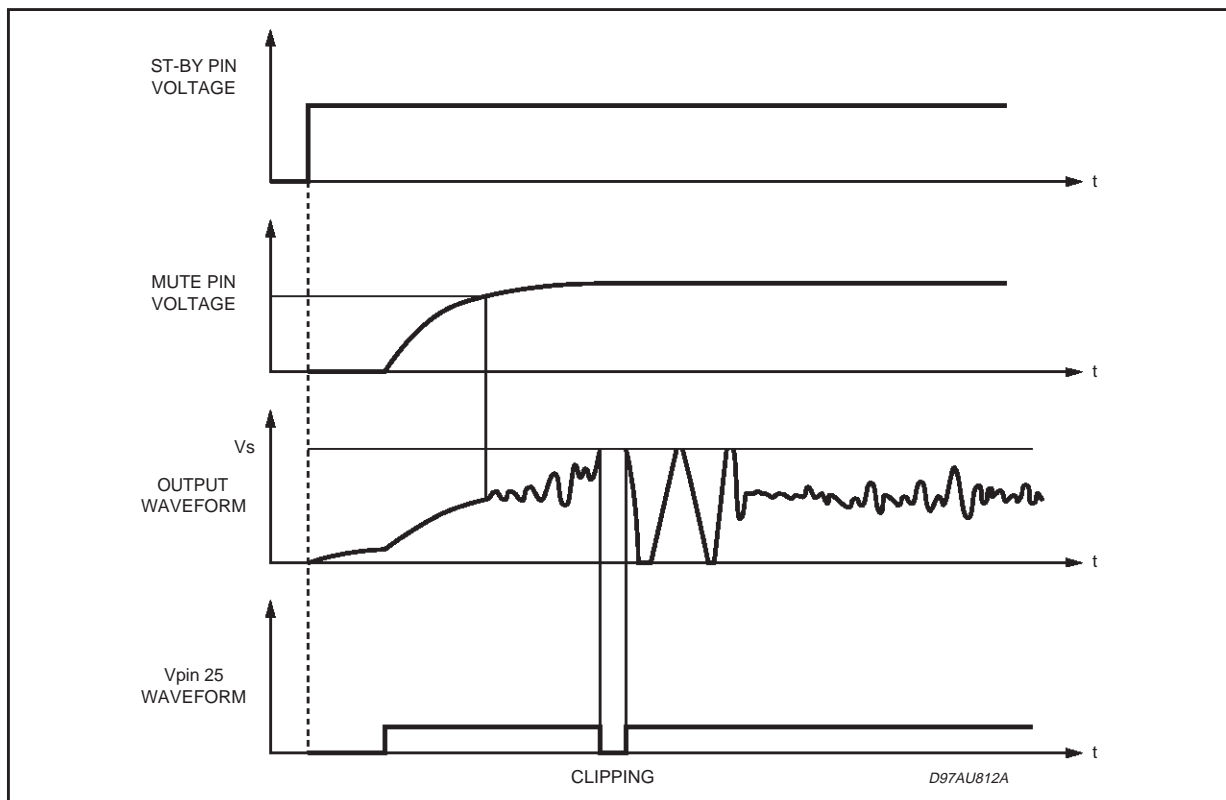


Figure 14: Diagnostics Waveforms.

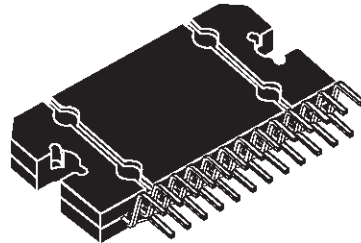


DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.45	4.50	4.65	0.175	0.177	0.183
B	1.80	1.90	2.00	0.070	0.074	0.079
C		1.40			0.055	
D	0.75	0.90	1.05	0.029	0.035	0.041
E	0.37	0.39	0.42	0.014	0.015	0.016
F (1)			0.57			0.022
G	0.80	1.00	1.20	0.031	0.040	0.047
G1	23.75	24.00	24.25	0.935	0.945	0.955
H (2)	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 (2)	22.07	22.47	22.87	0.869	0.884	0.904
L1	18.57	18.97	19.37	0.731	0.747	0.762
L2 (2)	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
L4		5			0.197	
L5		3.5			0.138	
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	
R1		0.5			0.02	
R2		0.3			0.12	
R3		1.25			0.049	
R4		0.50			0.019	
V			5° (Typ.)			
V1			3° (Typ.)			
V2			20° (Typ.)			
V3			45° (Typ.)			

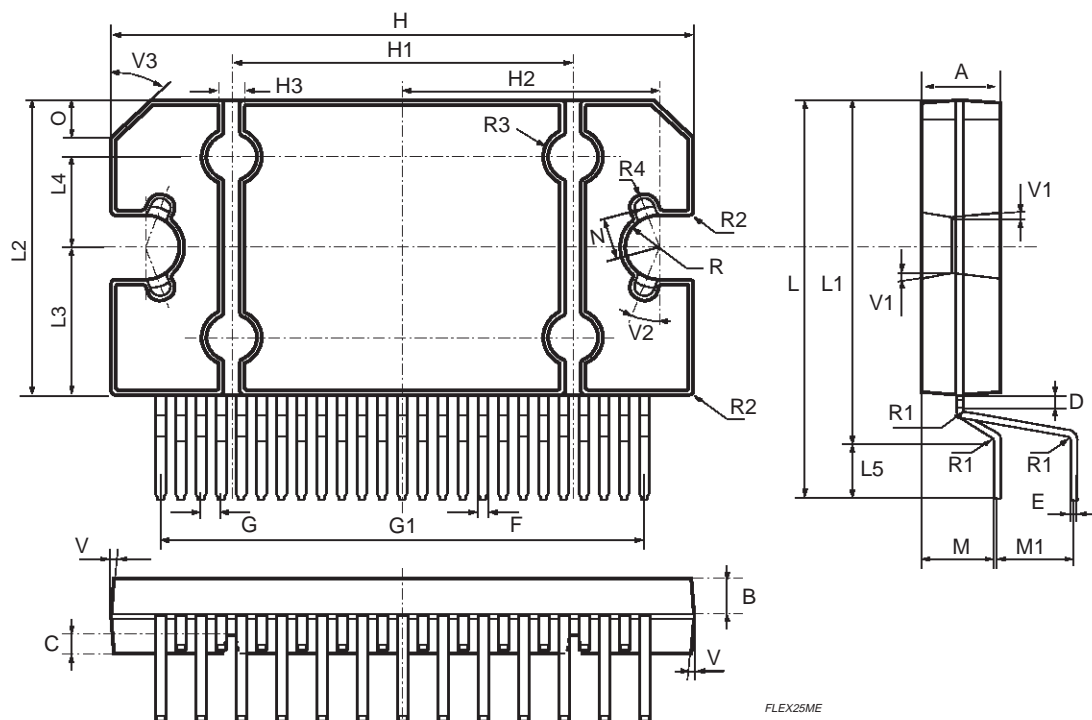
(1): dam-bar protusion not included

(2): molding protusion included

OUTLINE AND MECHANICAL DATA



Flexiwatt25



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