

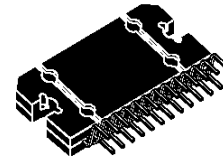
HIGH EFFICIENCY QUAD BRIDGE CAR RADIO POWER AMPLIFIER

PRODUCT PREVIEW

- HIGH OUTPUT POWER CAPABILITY
4 x 22W/4Ω @14.4V, 1KHz, 10%
- DUAL MODE OPERATING EXTERNALLY
PRESETTABLE: CONVENTIONAL CLASS A-
B MODE, HIGH EFFICIENCY MODE
- LOW EXTERNAL COMPONENTS COUNT:
 - NO BOOTSTRAP CAPACITORS
 - NO EXTERNAL COMPENSATION
 - INTERNALLY FIXED GAIN (26dB)
- CLIPPING DETECTOR
- ST-BY FUNCTION (CMOS COMPATIBLE)
- MUTE FUNCTION (CMOS COMPATIBLE)
- AUTOMUTE AT MINIMUM SUPPLY
VOLTAGE DETECTION
- LOW RADIATION

Protections:

- OUTPUT SHORT CIRCUIT
TO GND; TO V_S; ACROSS THE LOAD
- 3 STEPS OVERRATING CHIP TEMPERA-
TURE
- LOAD DUMP VOLTAGE
- FORTUITOUS OPEN GND
- LOUDSPEAKER DC CURRENT
- ESD

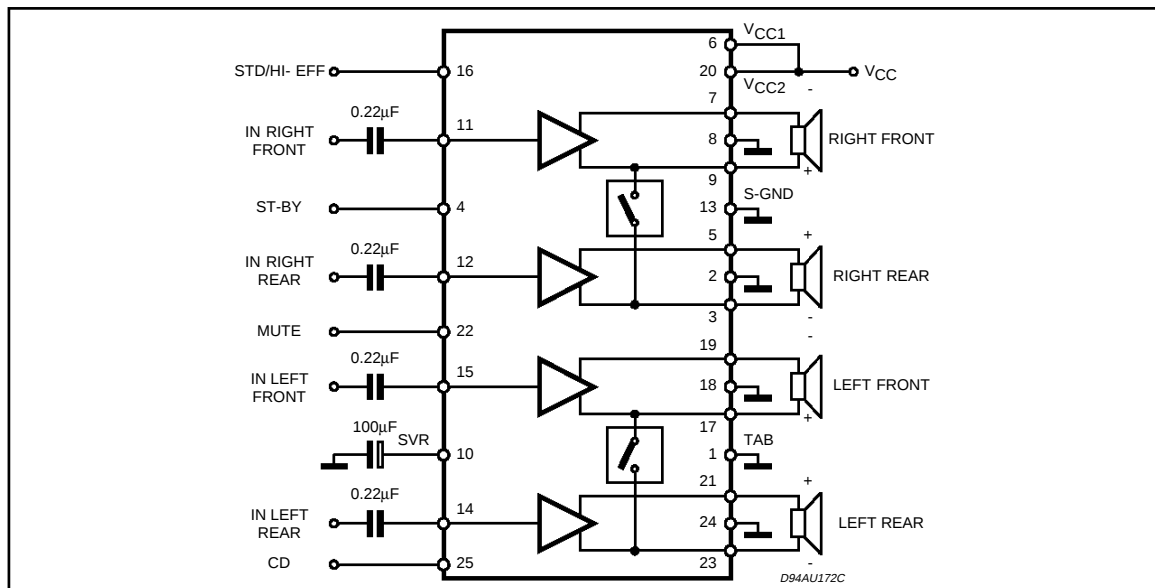
MULTIPOWER BCD TECHNOLOGY


Flexiwatt 25

DESCRIPTION

The TDA7454 is a new BCD technology QUAD BRIDGE type of car radio amplifier in Flexiwatt25 package specially intended for car radio applications.

Among the features, its superior efficiency performance coming from the internal exclusive structure, makes it the most suitable device to simplify the thermal management in high power sets. The dissipated output power under average listening condition is in fact reduced up to 50% when compared to the level provided by conventional class AB solutions.

BLOCK & APPLICATION DIAGRAM


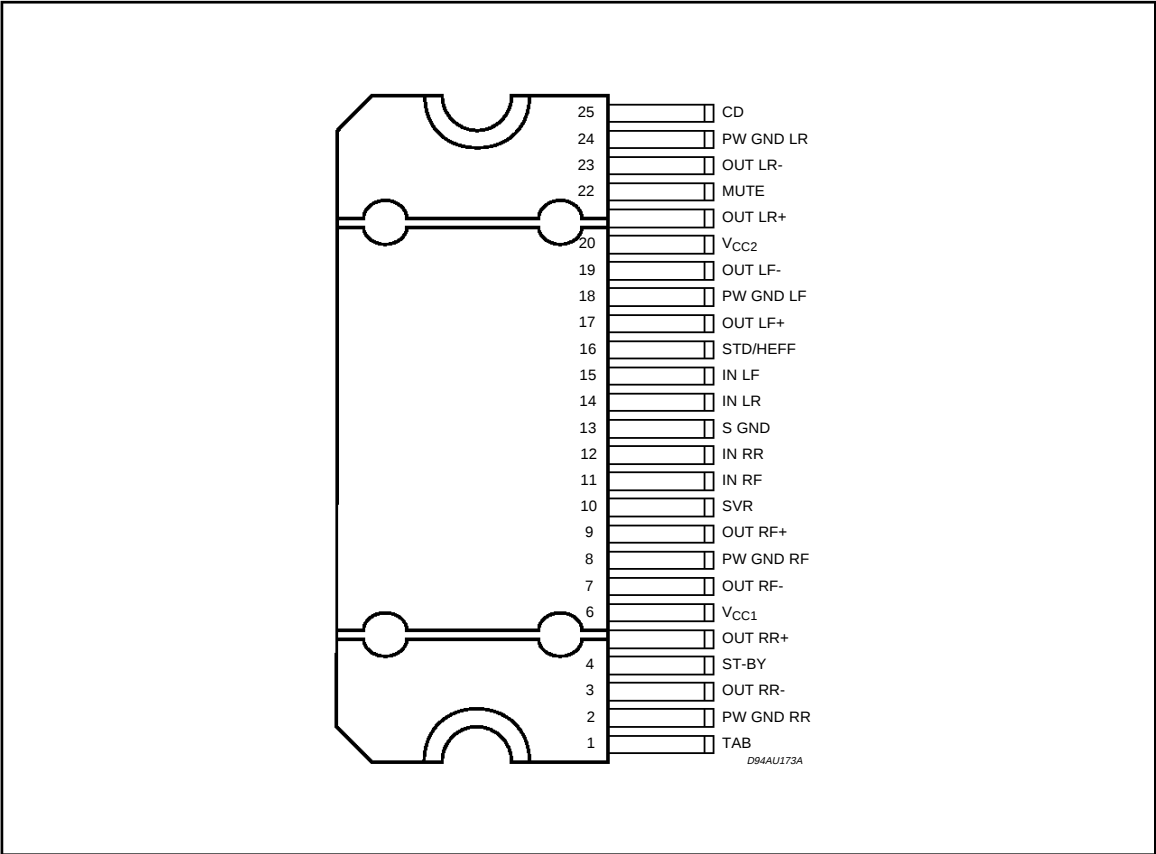
ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{op}	Operating Supply Voltage	18	V
V _S	DC Supply Voltage	28	V
V _{peak}	Peak Supply Voltage (for t = 50ms)	40	V
I _o	Output Peak Current (not repetitive t = 100μs)	4.5	A
I _o	Output Peak Current (repetitive f > 10Hz)	3.5	A
P _{tot}	Power Dissipation T _{case} = 70°C	86	W
T _{stg} , T _j	Storage and Junction Temperature	-55 to 150	°C

THERMAL DATA

Symbol	Description	Value	Unit
R _{th j-case}	Thermal Resistance Junction-case	Max 1	°C/W

PIN CONNECTION (Top view)



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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
V_S	Supply Voltage Range		8		18	V
I_d	Total Quiescent Drain Current			140		mA
P_O	Output Power	@ EIAJ		30		W
		THD = 10%		22		W
		THD = 1% : BTL MODE		18		W
THD	Total harmonic distortion	$P_O = 1W$: BTL MODE		0.03		%
		$P_O = 10W$: BTL MODE		0.03		%
		$P_O = 1W$: Hi-EFF MODE		0.03		%
C_T	Cross Talk	$f = 1KHz$		55		dB
		$f = 10KHz$		45		dB
R_{IN}	Input Impedance			15		K Ω
G_V	Voltage Gain		25	26	27	dB
ΔG_V	Voltage Gain Match				1	dB
E_{IN}	Output Noise Voltage	$R_g = 600\Omega$		100		mV
SVR	Supply Voltage Rejection	$f = 300Hz$; $V_r = 1V_{pp}$; $R_g = 0$ to 100Ω ;		50		dB
BW	Power Bandwidth	(-3dB)	75			KHz
A_{SB}	Stand-by Attenuation			100		dB
$V_{sb\ IN}$	Stand-by in Threshold				1.5	V
$V_{sb\ OUT}$	Stand-by out Threshold		3.5			V
I_{sb}	Stand-by Current Consumption				100	μA
A_M	Mute Attenuation			90		dB
$V_{M\ IN}$	Mute in Threshold				1.5	V
$V_{M\ OUT}$	Mute out Threshold		3.5			V
I_M	Mute pin Current (Sourced)	$V = 0$ to V_S $V_{S\ max} = 18V$		1		μA
	Mode Select Switch	Standard BTL Mode Op. (V_{pin16})	Open			
		High Efficiency Mode (V_{pin16})			0.5	V
CD	Clip Det. out Current (Pull up to 5V with 10K Ω)	CD off: $P_{Omin} = 10W$ CD on: THD = 5%		150	5	μA

Figure 1: Standard Test and Application Circuit.

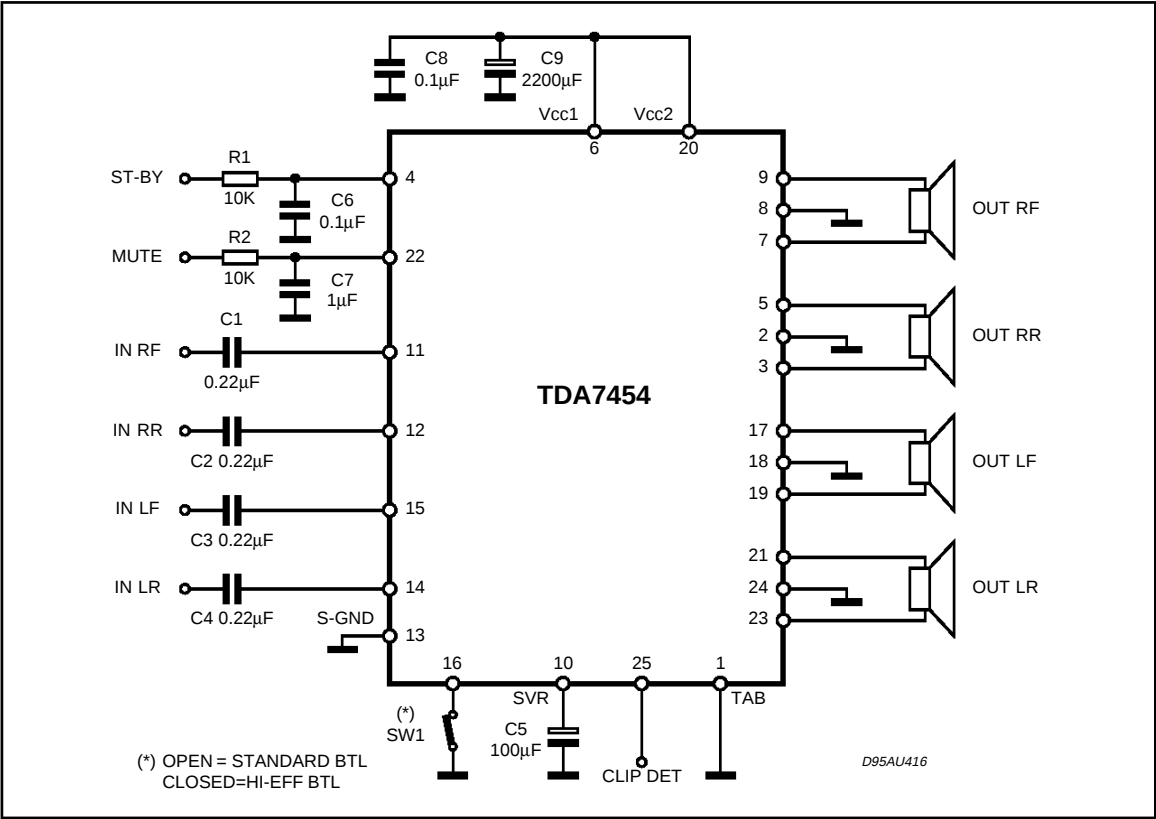
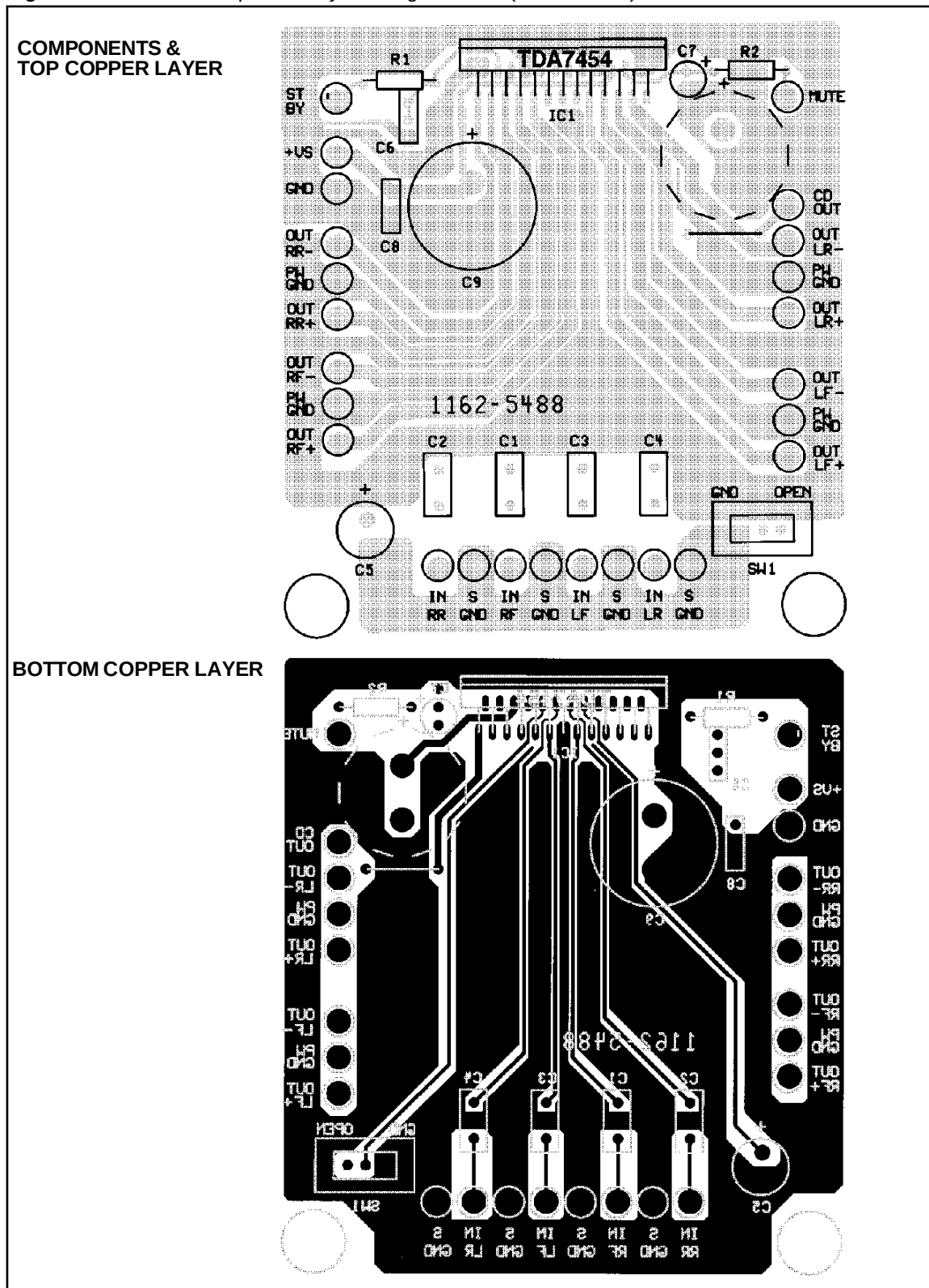


Figure 2: P.C.B. and components layout of fig. 1 circuit. (1.25 :1 scale)



MODE SELECTION TABLE OPERATION OF THE DEVICE

1) STD/HI-EFF (pin 16 = OPEN)

STANDARD QUAD BRIDGE MODE	HIGH-EFF QUAD BRIDGE MODE	STANDARD QUAD SINGLE-ENDED MODE	ST-BY MODE
Tchip (deg)			
100 150 170			

2) STD/HI-EFF (pin 16 = GND)

HIGH-EFF QUAD BRIDGE MODE	STANDARD QUAD SINGLE-ENDED MODE	ST-BY MODE
Tchip (deg)		
150 170		

1) STD/HI-EFF (pin 16 connected as shown in the figure below.

STANDARD QUAD BRIDGE MODE OR HIGH-EFF MODE (Theatsink dependent)	HIGH-EFF QUAD BRIDGE MODE	STANDARD QUAD SINGLE-ENDED MODE	ST-BY MODE
Tchip (deg)			
100 150 170			

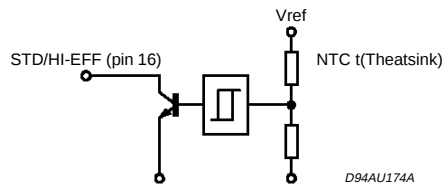


Figure 3: Quiescent Current vs. Supply Voltage

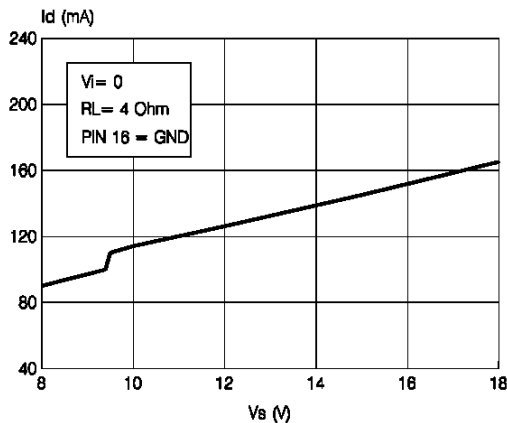


Figure 4: Output Power vs. Supply Voltage

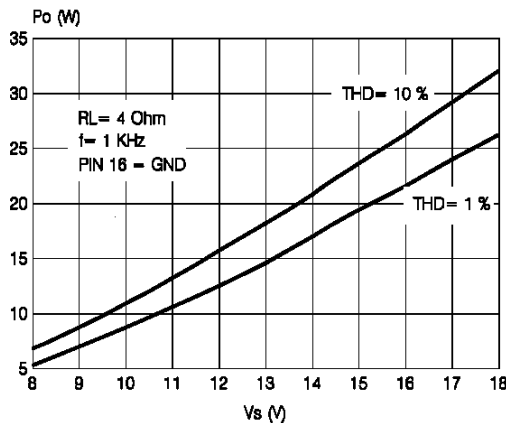
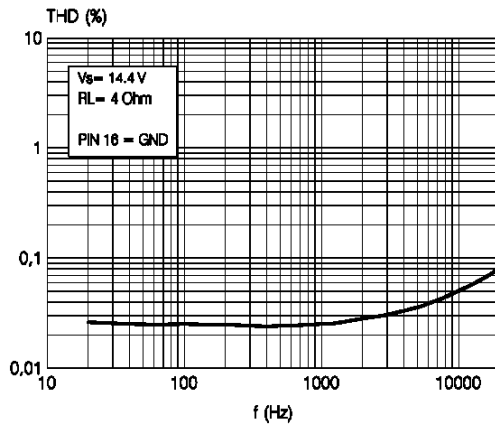
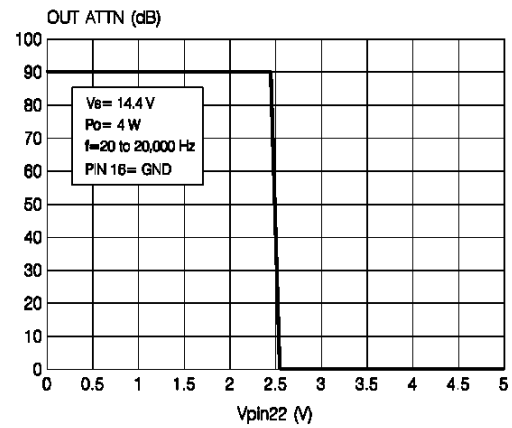
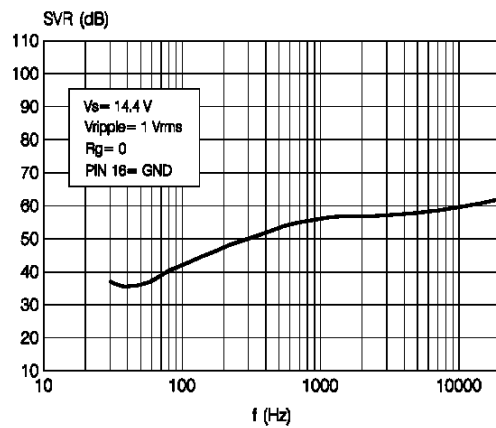
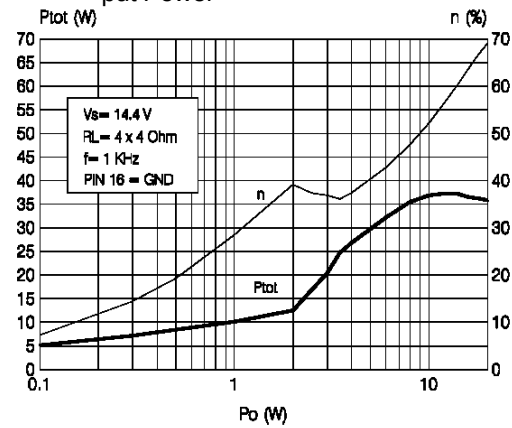
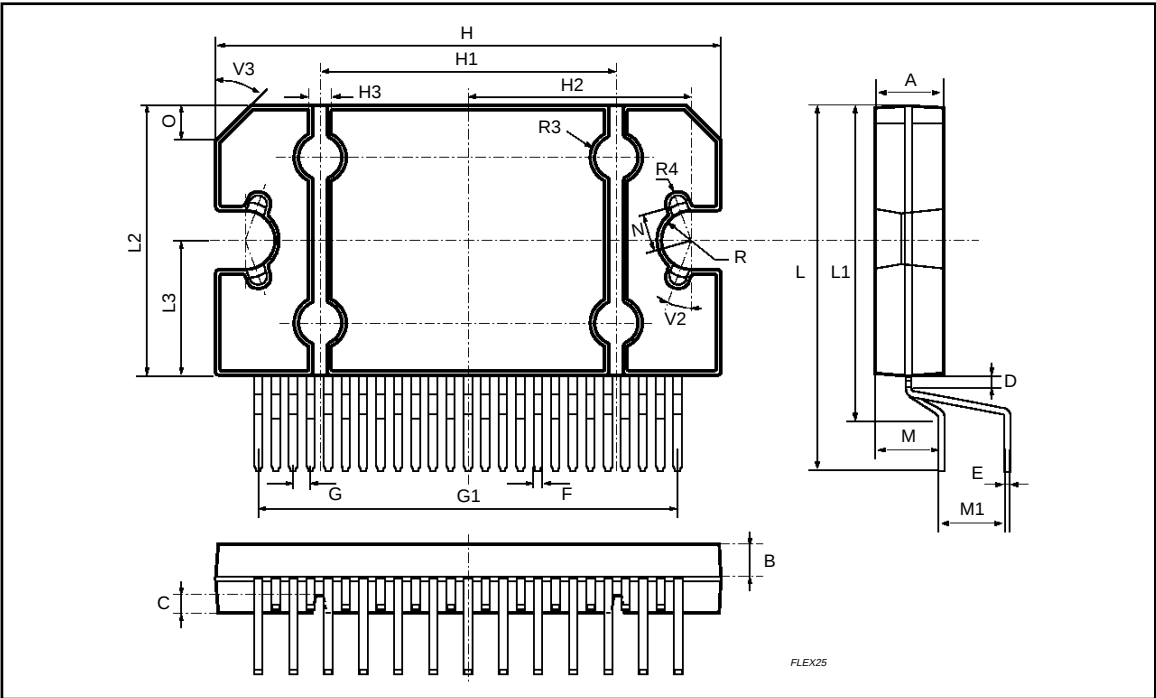


Figure 5: Distortion vs. Frequency**Figure 6:** Muting Attenuation vs. Vpin 22**Figure 7:** Supply Voltage Rejection vs. Frequency**Figure 8:** Power Dissipation & Efficiency vs. Output Power

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°					



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