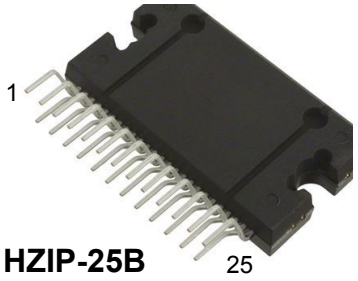
4×25W QUAD BRIDGE CAR RADIO POWER AMPLIFIER

FEATURES

- High Output Power Capability:
  - 4×25W @ V_{CC}=14.4V, R_L=4Ω, THD=10%
- Low Distortion & Output Noise
- Stand-by & Mute Function (CMOS Compatible)
- Internally Fixed Gain (26dB)
- Low External Components Count
- Output Short Circuit Protection
  - To GND
  - To V_{CC}
  - Across the Load
- Thermal Overland Protection



HZIP-25B

DESCRIPTION

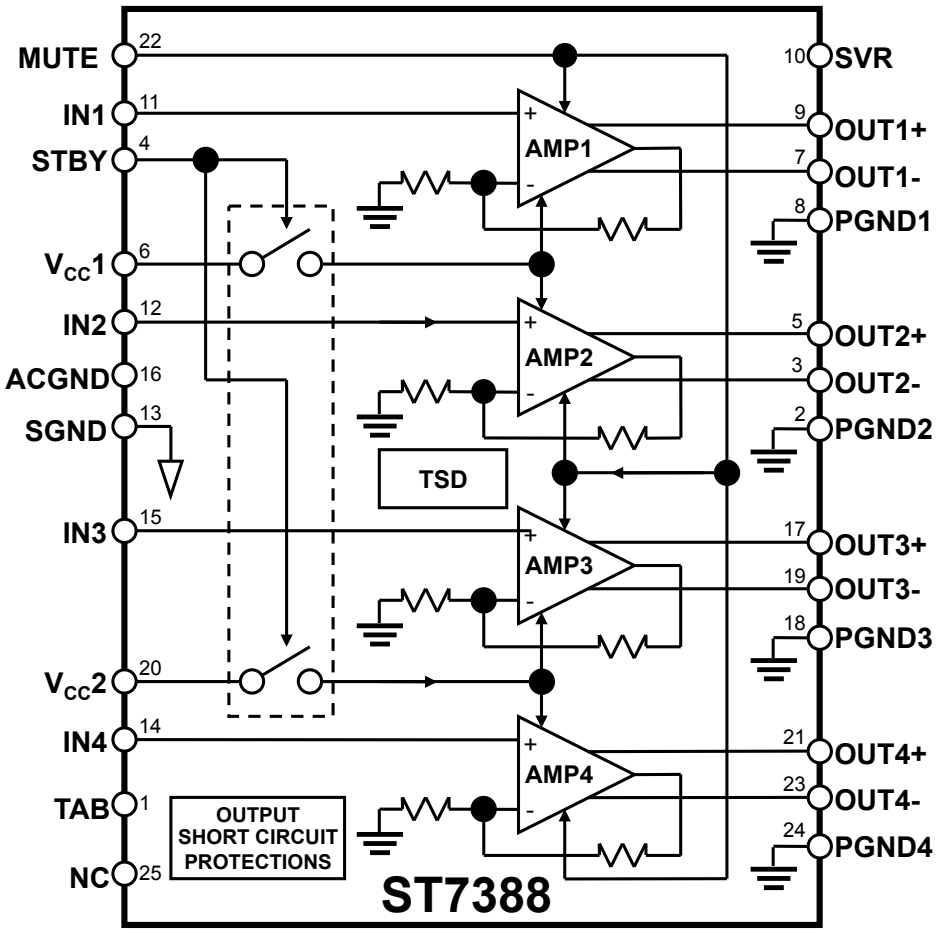
The ***STComponet*** ST7388 is a class AB audio power amplifier in HZIP-25B package designed for high end car radio applications. It will deliver 4×25W to a 4Ω load when connected to a 14.4V supply with less than 10% THD. The exclusive fully complementary structure of the output stage and the internally fixed gain guarantees the highest possible power performances with extremely reduced component count.

DEVICE SUMMARY

Ordering Code	Package Type	Shipping	Marking (1)
ST7388H25B	HZIP-25B	Tube	STC 7388 YM

Note 1: **Y**: Year code.
M: Month code.

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS (2)

T_A = 25°C, unless otherwise specified.

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	18	V
Output Peak Current (Internal Limited)	I_{op}	4.5	A
Power Dissipation T_C = 70°C	P_D	80	W
No Heat-Sink		10	
Maximum Junction Temperature	T_J	150	°C
Operating Temperature	T_{opr}	-20 ~ +75	°C
Storage Temperature Range	T_{stg}	-55 ~ +150	°C
Soldering Temperature & Time	T_{solder}	300°C, 10 sec.	

Note 2: Absolute Maximum Ratings are those values beyond which the device could be permanently damaged. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

Thermal Data

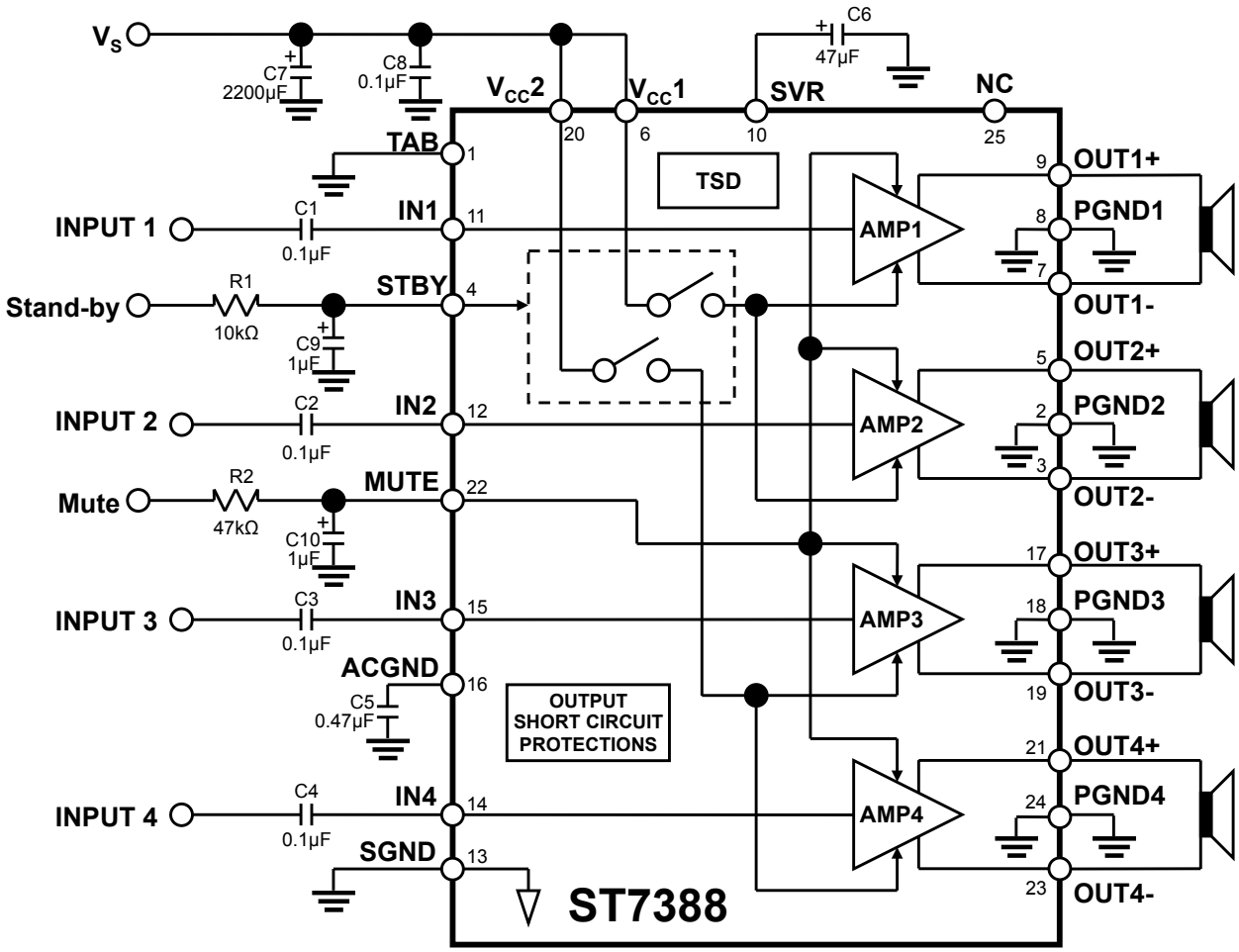
PARAMETER	SYMBOL	RATINGS	UNIT
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1	°C/W

ELECTRICAL CHARACTERISTICS

V_{CC} = 14.4V; R_L = 4Ω, R_g = 600Ω, f = 1 kHz and T_A = 25°C; Refer to the *Typical Application Circuit*, unless otherwise specified.

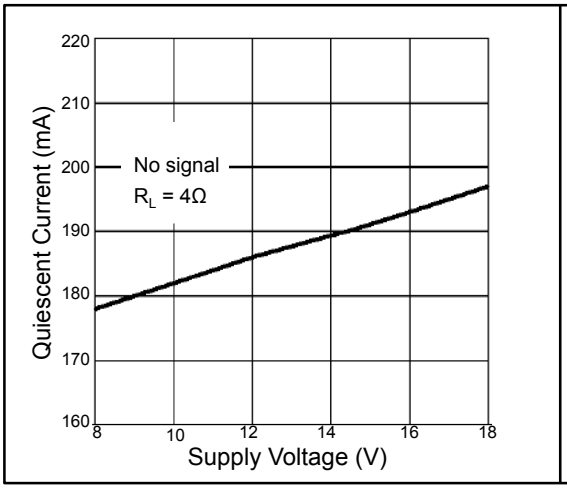
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Quiescent Current	I_{CC}		120	190	350	mA
Output Offset Voltage	V_{OS}	Play mode			±80	mV
Voltage Gain	G_V		25	26	27	dB
Output Power	P_O	THD = 10%	22	25		W
Total Harmonic Distortion	THD	P_O = 4.0W		0.04	0.15	%
Supply Voltage Rejection	SVR	V_r = 1V_{rms}, f_r = 100 Hz	50	60		dB
High Cut-Off Frequency	f_{CH}	P_O = 0.5W	100	200		kHz
Input Impedance	$\|Z_i\|$		70	100		kΩ
Output Noise	e_{NO}	BPF = 20 Hz ~ 20 kHz		70	100	μV
Cross Talk	CT	R_g = 10kΩ	60	70		dB
Stand-by Current Consumption	I_{STBY}	V_{STBY} ≤ 1.5V			50	μA
STBY Out Threshold Voltage	$V_{STBY\text{-}out}$	ST7388 is ON.	3.5			V
STBY In Threshold Voltage	$V_{STBY\text{-}in}$	ST7388 is OFF.			1.5	V
MUTE Attenuation	A_M	V_{MUTE} ≤ 1.5V, $P_{O(ref)}$ = 4W	80			dB
MUTE Out Threshold Voltage	$V_{MUTE\text{-}out}$	Play mode.	3.5			V
MUTE In Threshold Voltage	$V_{MUTE\text{-}in}$	Mute mode.			1.5	V
V_{CC} Auto-mute Threshold	$V_{AM\text{-}in}$	Mute mode, Att ≥ 80dB, $P_{O(ref)}$ = 4W			6.5	V
		Play mode, Att < 0.1dB, $P_{O(ref)}$ = 0.5W		7.6	8.5	V

TYPICAL APPLICATION CIRCUIT

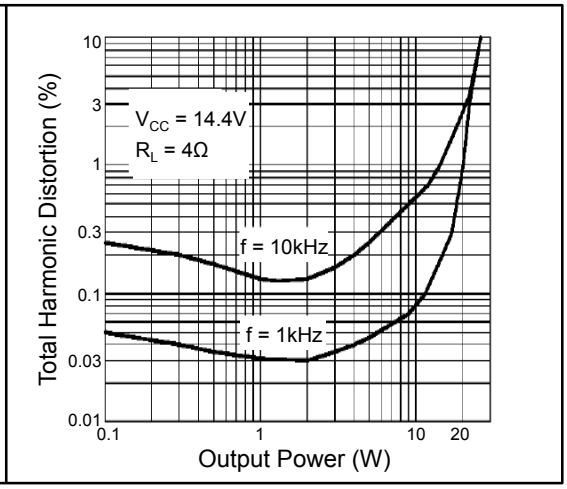


ELECTRICAL CHARACTERISTICS CURVES

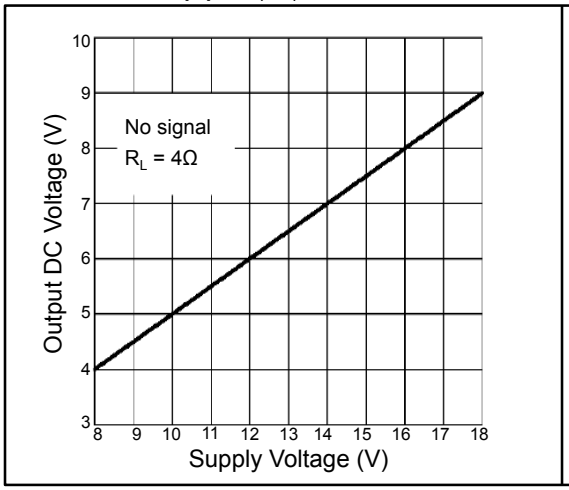
(1) I_{CC} vs. V_{CC}



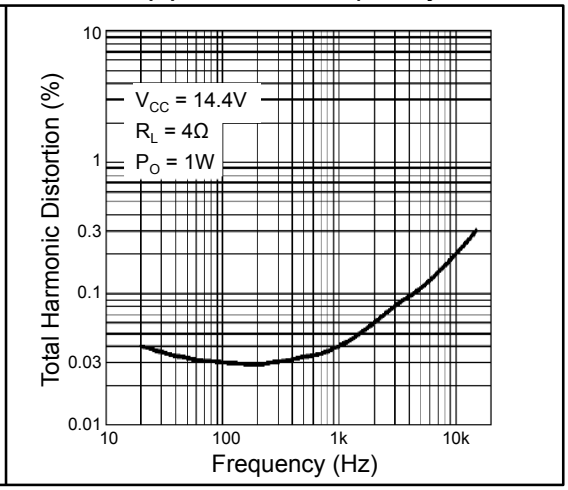
(2) THD vs. P_O



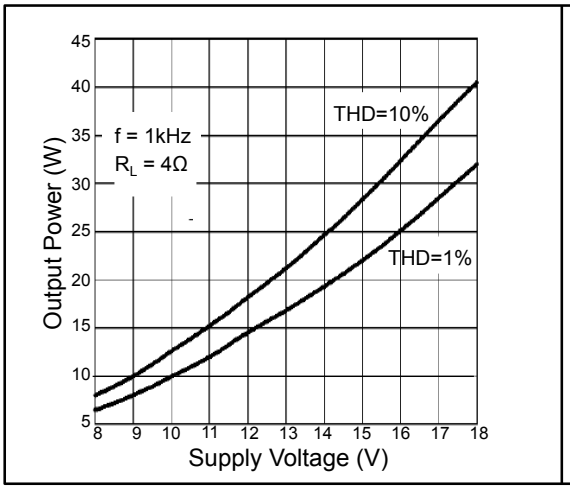
(3) $V_{O(DC)}$ vs. V_{CC}



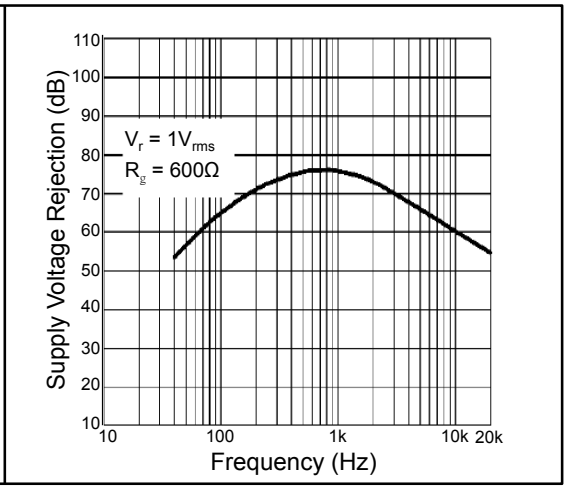
(4) THD vs. Frequency



(5) P_O vs. V_{CC}



(6) SVR vs. Frequency



APPLICATION INFORMATION

(Refer to the *Typical Application Circuit*)

SVR

Besides its contribution to the ripple rejection, the SVR capacitor governs the turn ON/OFF time sequence and, consequently, plays an essential role in the pop optimization during ON/OFF transients. To conveniently serve both needs, its minimum recommended value is 10µF.

INPUT STAGE

The ST7388's inputs are ground-compatible and can stand very high input signals ($\pm 8V_{pk}$) without any performances degradation. If the standard value for the input capacitors (0.1µF) is adopted, the low frequency cut-off will amount to 16 Hz.

STAND-BY AND MUTING

The stand-by and muting facilities are both CMOS-Compatible. If unused, a straight connection to V_{CC} of their respective pins would be admissible.

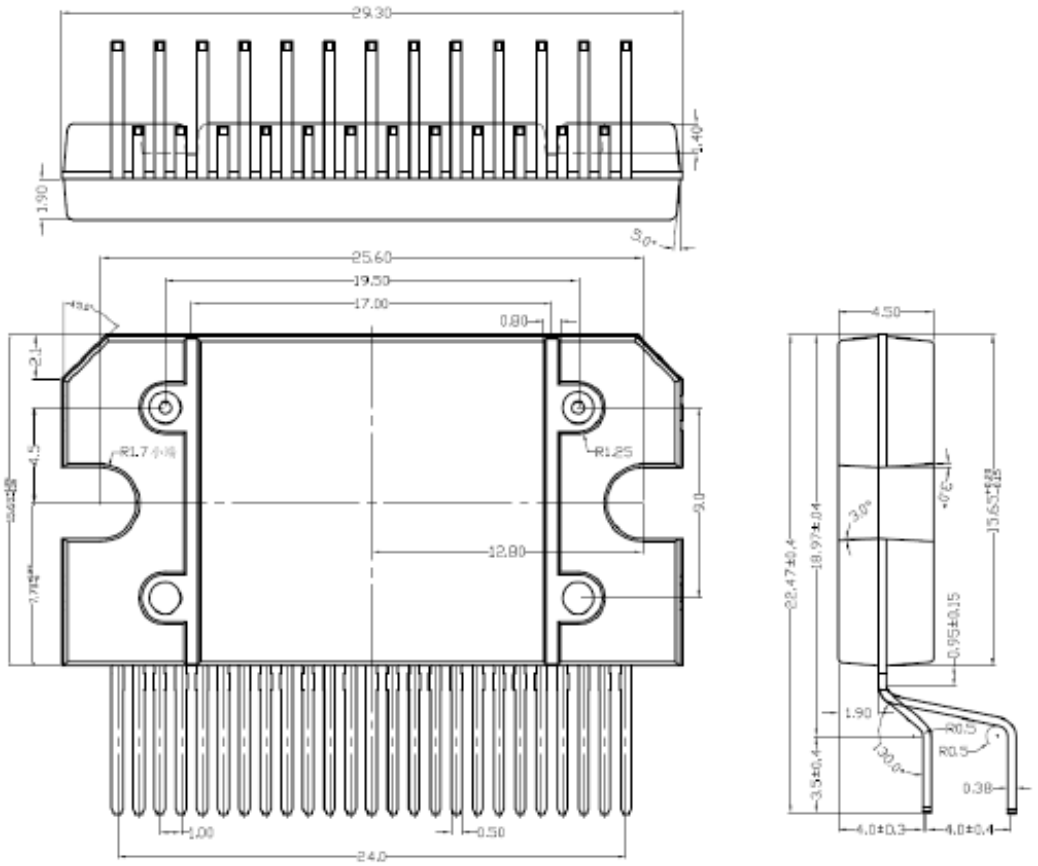
Conventional/low-power transistors can be employed to drive muting and stand-by pins in absence of true CMOS ports or microprocessors. R-C cells have always to be used in order to smooth down the transitions for preventing any audible transient noises.

Since a DC current of about 10µA normally flows out of pin 22, the maximum allowable muting-series resistance (R2) is 70kΩ, which is sufficiently high to permit a muting capacitor reasonably small (about 1µF). If R2 is higher than recommended, the involved risk will be that the voltage at pin 22 may rise to above the 1.5V threshold voltage and the device will consequently fail to turn OFF when the mute line is brought down. About the stand-by, the time constant to be assigned in order to obtain a virtually pop-free transition has to be slower than 2.5V/ms.

PACKAGE DIMENSION

HZIP-25B

Unit: Millimeters



NOTICE

Information furnished by **STComponet** is believed to be accurate and reliable. However, no responsibility is assumed for its use. Customers are responsible for their products and applications using **STComponet** components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards. **STComponet** reserves the right to make changes to their products or specification without notice. Customers are advised to obtain the latest version of relevant information to verify, before placing orders, that information being relied on is current and complete.