



DESCRIPTION

The A2410 is a 10W/ch efficient, Class D audio amplifier. The high efficiency of the A2410, 88%, eliminates the need for external heat sink when playing music.

The A2410 has short-circuit protection and thermal protection includes an auto-recovery feature.

The A2410 is available in PTSSOP28 package.

ORDERING INFORMATION

Package Type	Part Number	
PTSSOP28	TMXP28	A2410TMXP28U
SPQ: 70pcs/Tube		A2410TMXP28VU
Note	V: Halogen free Package U: Tube	
AiT provides all RoHS products		

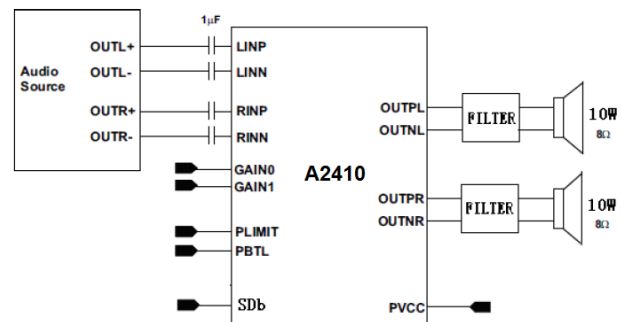
FEATURES

- 10W/ch into an 8Ω loads at 10% THD+N from a 12V supply.
- Four selectable, fixed gain setting.
- Wide supply voltage range: 4V~12V.
- 88% efficient at $R_L=8\Omega$, THD+N=10%.
- Short-circuit protection and thermal protection.
- Available in PTSSOP28 package

APPLICATION

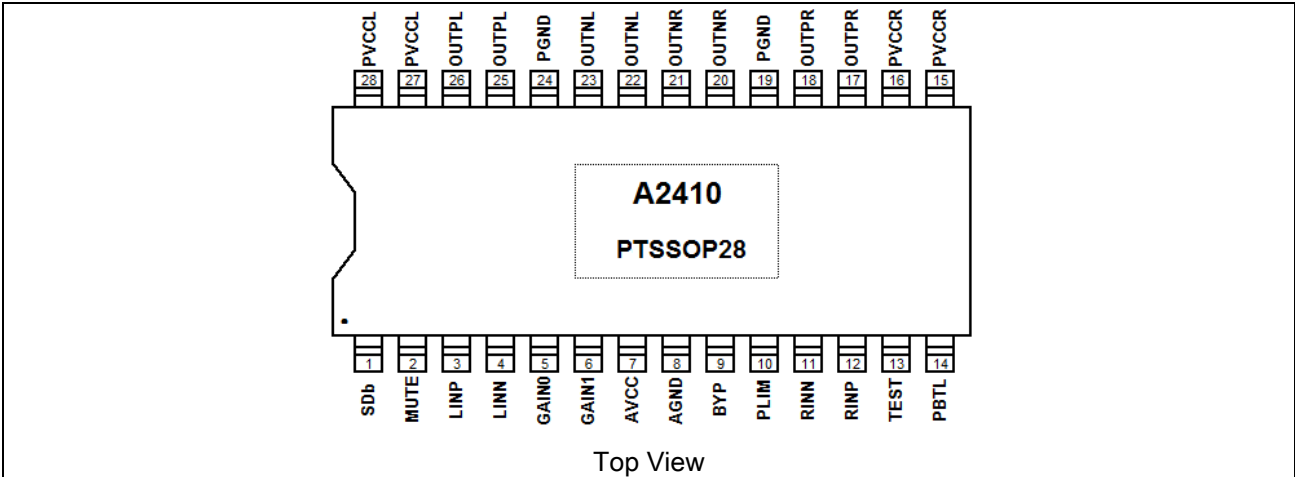
- Consumer Audio Equipment

TYPICAL APPLICATION





PIN DESCRIPTION



Top View

Pin #	Symbol	I/O	Function
1	SDb	I	Shutdown mode input, SDb=LOW: enters shutdown mode, SDb=HIGH enables the amplifier. 300k pull-down resistor is built in.
2	MUTE	I	Mute pin
3	LINP	I	Positive input signal for L channel
4	LINN	I	Negative input signal for L channel
5	GAIN0	I	Gain select least significant bit
6	GAIN1	I	Gain select most significant bit
7	AV _{CC}	P	Analog power supply pin
8	AGND	-	Analog signal ground
9	BYP	I	Bypass capacitor pin
10	PLIM	I	Power limit level adjust. Connect a resistor divider from AV _{CC} to AGND to set power limit. Floating for no power limit.
11	RINN	I	Negative input signal for R channel
12	RINP	I	Positive input signal for R channel
13	TEST	I	Test pin
14	PBTL	I	Parallel BTL mode switch. H for Parallel.
15, 16	PVCCR	P	Power supply for R channel H-bridge.
17, 18	OUTPR	O	Class-D H-bridge positive output for R channel
19, 24	PGND	-	Power ground for H-bridges
20, 21	OUTNR	O	Class-D H-bridge negative output for R channel
22, 23	OUTNL	O	Class-D H-bridge negative output for L channel
25, 26	OUTPL	O	Class-D H-bridge positive output for L channel
27, 28	PVCCCL	P	Power supply for L channel H-bridge.



ABSOLUTE MAXIMUM RATINGS

Supply Voltage	-0.3V~14V
T _J , Operating Junction Temperature Range	-40°C~125°C
T _A , Operating Free-Air Temperature Range	-40°C~85°C
T _{STG} , Storage Temperature Range	-55°C~150°C

Stress beyond above listed "Absolute Maximum Ratings" may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

ELECTRICAL CHARACTERISTICS

T_A=25°C, V_{DD}=12V, R_L=8Ω, unless otherwise noted

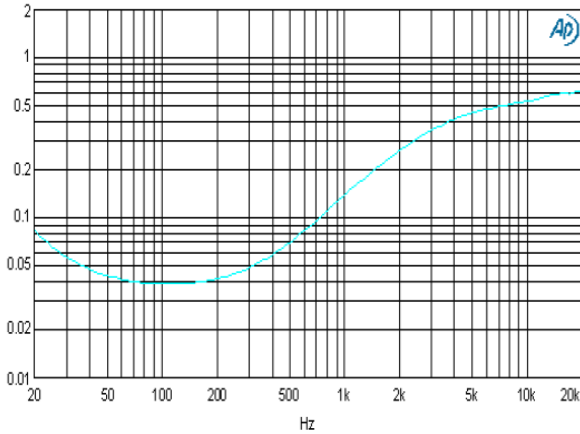
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Supply Voltage	V _{DD}		4	12	13	V	
Quiescent Current	I _{CC}	No load	-	25	-	mA	
Shutdown Current	I _{SD}	V _{DD} =4V to 12V	-	70	-	uA	
Output Power	P _O	THD+N=10% , f=1kHz, R _L =8Ω	-	10	-	W	
Voltage Gain	A _v	Gain<1:0>=00	-	20	-	dB	
		Gain<1:0>=01	-	26	-		
		Gain<1:0>=10	-	32	-		
		Gain<1:0>=11	-	36	-		
Total Harmonic Distortion	THD+N	V _{DD} =12V,P _O =5W, R _L =8Ω , f=1kHz	-	0.14	-	%	
Turn on time	ton		-	120	-	ms	
Switching Frequency	f _{SW}	V _{DD} =4V to 12V	-	300	-	kHz	
Drain-source on-state Resistance	R _{DS(ON)}	V _{CC} =12V, I _O =500mA	High side	-	460	-	mΩ
			Low side	-	380	-	
Signal-to-noise Ratio	SNR	Maximum output at THD+N <1%, f=1kHz, Gain = 20dB, A-weighted	-	95	-	dB	
Crosstalk		Gain = 20dB, f = 1 kHz	-	94	-	dB	
Output Integrated Noise	V _n	20Hz to 22kHz, A-weighted filter	-	126	-	uV	



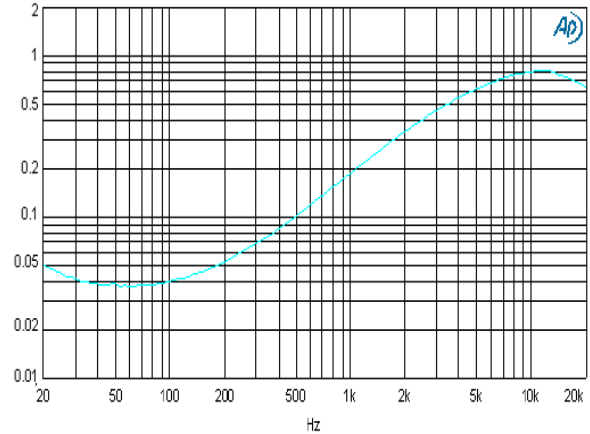
TYPICAL PERFORMANCE CHARACTERISTICS

f=1kHz, unless otherwise noted

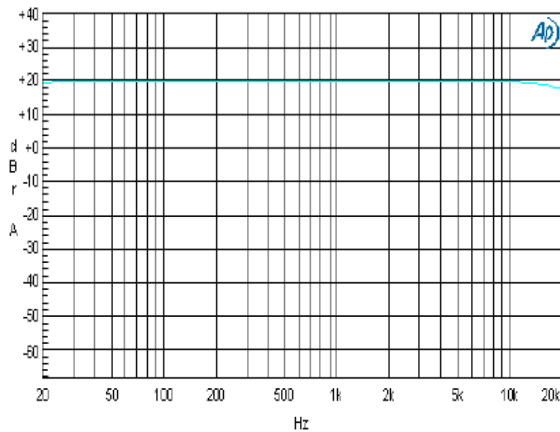
1. THDN_F@12V 8Ω 5W



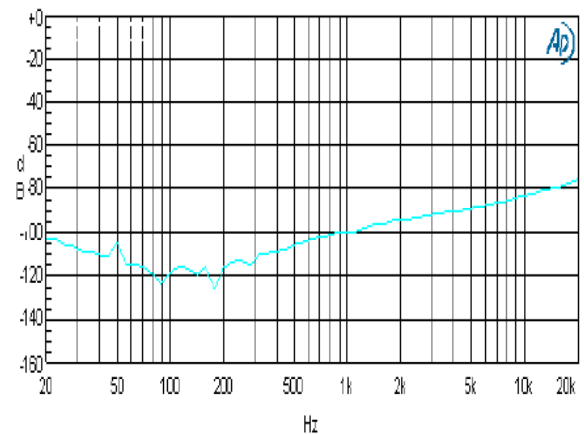
2. THDN_F@9V 4Ω 3W



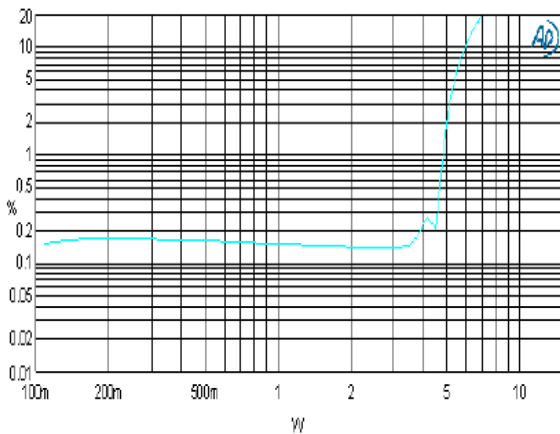
3. GAIN_F@12V 8Ω



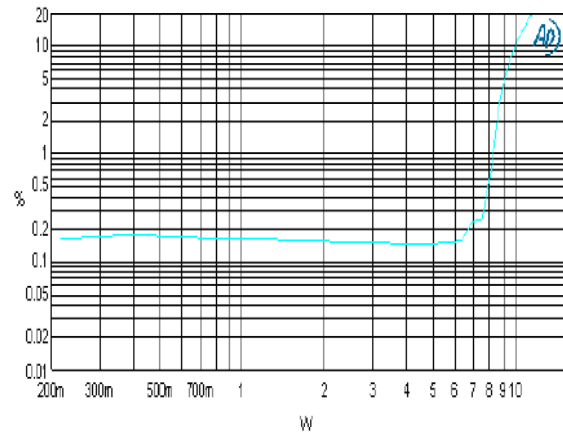
4. XTK_F@12V 8Ω



5. THDN_PO@9V 4Ω

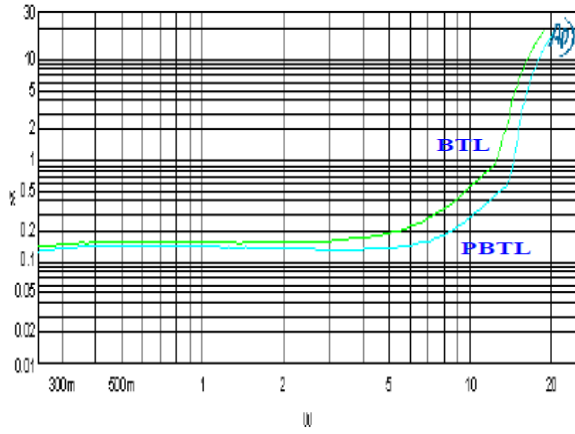


6. THDN_PO@12V 8Ω

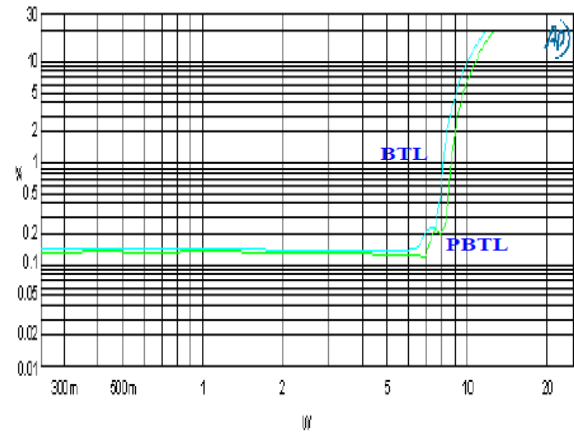




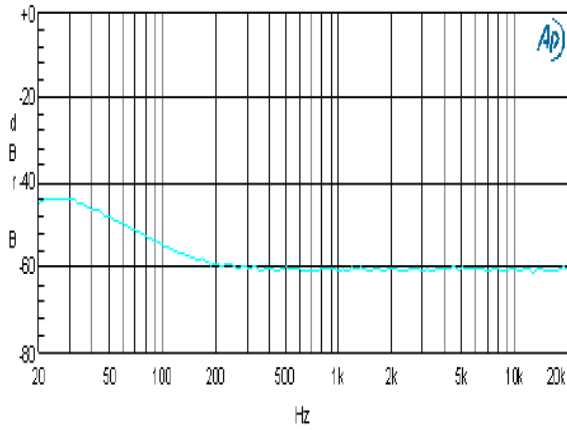
7. PBTL@12V 4Ω



8. PBTL@12V 8Ω

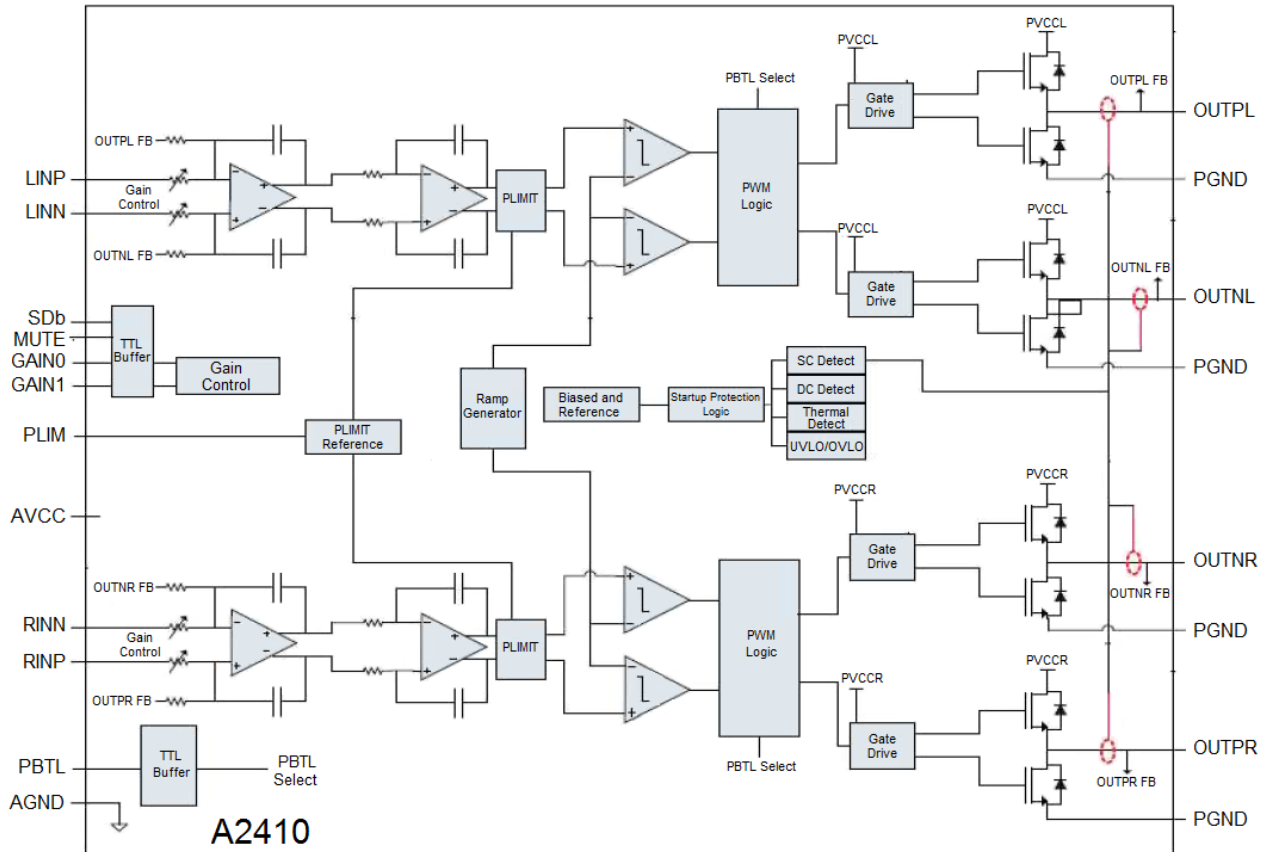


9. PSRR_F@12V 8Ω





BLOCK DIAGRAM





DETAILED INFORMATION

Shutdown Operation

The A2410 supports shutdown mode. The SDb input terminal should be held high during normal operation when the amplifier is in use. Pulling SDb low to enter shutdown mode.

PBTL Select

A2410 offers the feature of parallel BTL operation with two outputs of each channel connected directly. If the PBTL pin is tied high, the positive and negative outputs of each channel (left and right) are synchronized and phase.

To operate in this PBTL mode, apply the input signal to the Right input and place the speaker between the Left and Right outputs. Connect the positive and negative output together for best efficiency.

PLIMIT Function

The voltage at pin "PLIMIT" can be used to limit the power to levels below that which is possible on supply rail. Add a resistor divider from AV_{CC} to ground to set the voltage at the PLIMIT pin.

PLIMIT typical values :

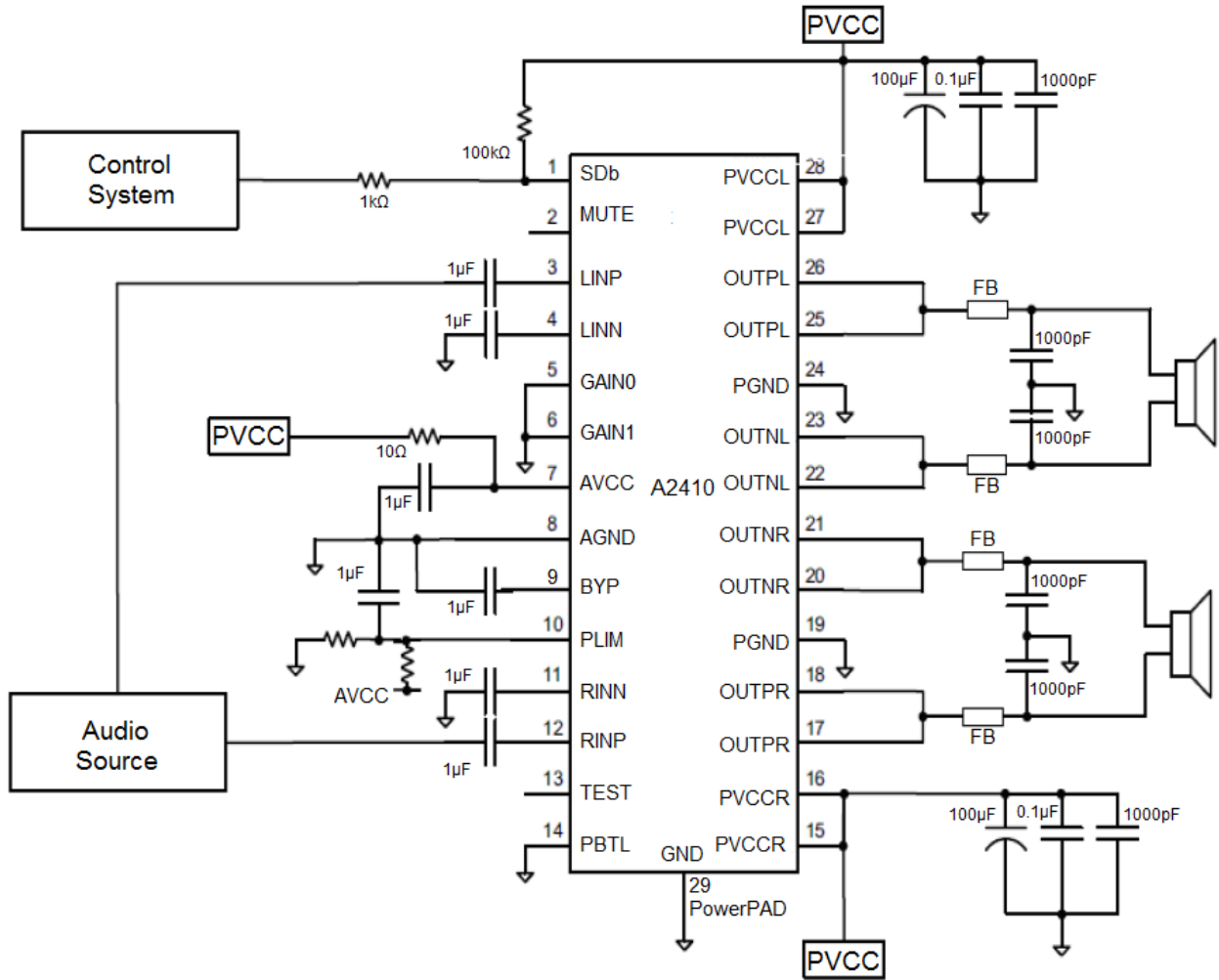
Test condition	PLIMIT Voltage(V)	Output Power(W)	Output Voltage Amplitude(Vp-p)
PV _{CC} =12V, V _{IN} =1.1Vrms, R _L =8Ω, Gain=20dB	4	10.38	22.9
PV _{CC} =12V, V _{IN} =1.1Vrms, R _L =8Ω, Gain=20dB	3	9.4	22.7
PV _{CC} =12V, V _{IN} =1.1Vrms, R _L =8Ω, Gain=20dB	2.5	6.7	17.8
PV _{CC} =12V, V _{IN} =1.1Vrms, R _L =8Ω, Gain=20dB	2	4.6	14.6
PV _{CC} =12V, V _{IN} =1.1Vrms, R _L =8Ω, Gain=20dB	1.5	3	13.6
PV _{CC} =12V, V _{IN} =1.1Vrms, R _L =8Ω, Gain=20dB	1	2.2	13.6

Short Circuit Protection

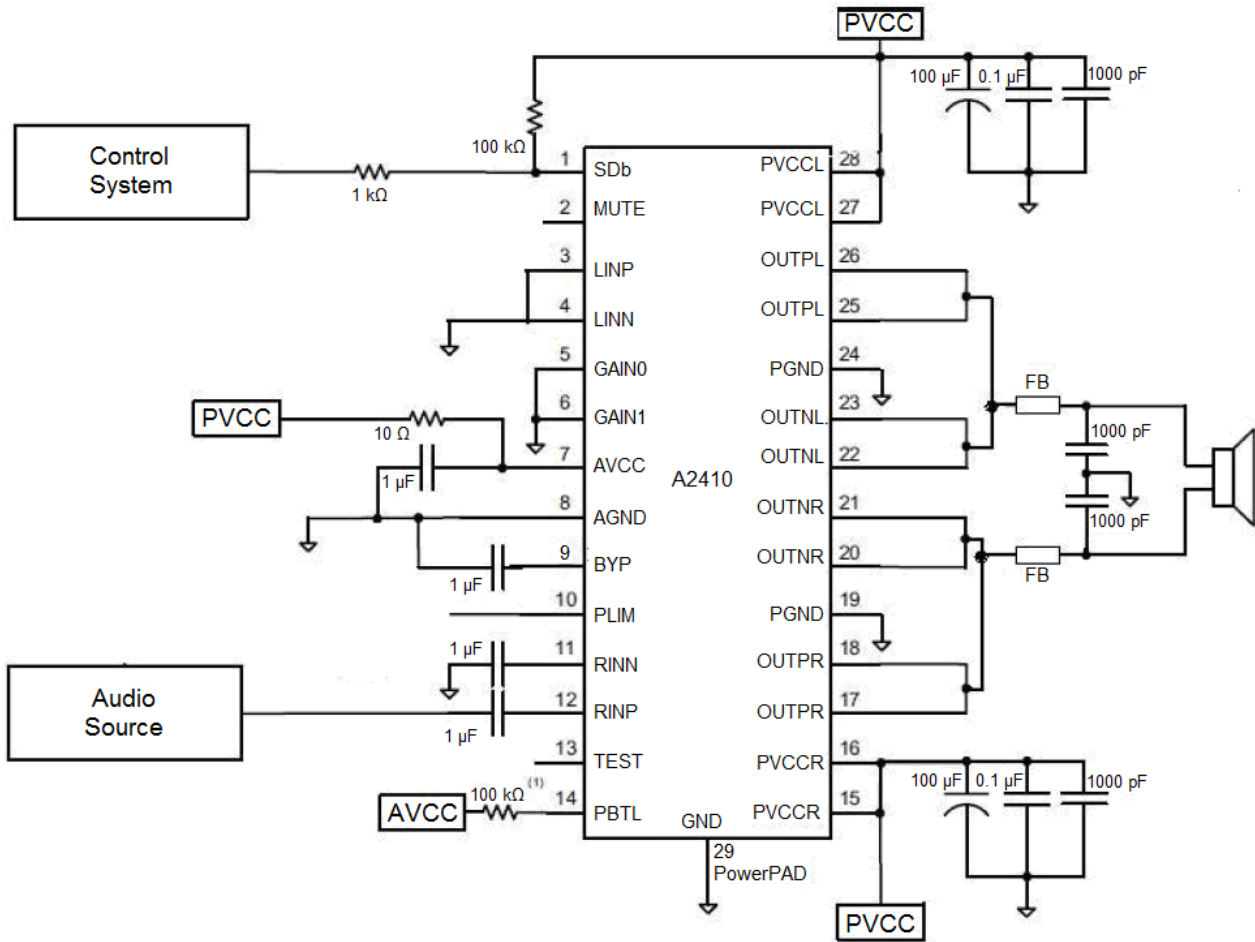
The A2410 has short-circuit protection circuitry on the outputs to prevent damage to the device during output-to-output shorts. The short-circuit protection includes an auto-recovery feature.



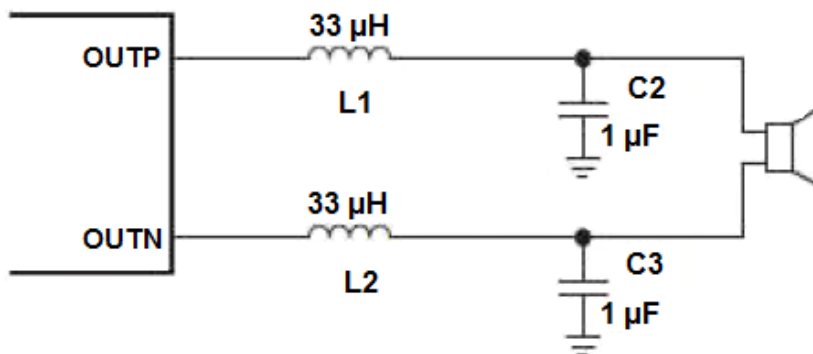
Application Information



Stereo Class-D Amplifier with BTL Output and Single-Ended inputs with power Limiting



Stereo Class-D Amplifier with PBTL Output and Single-Ended input

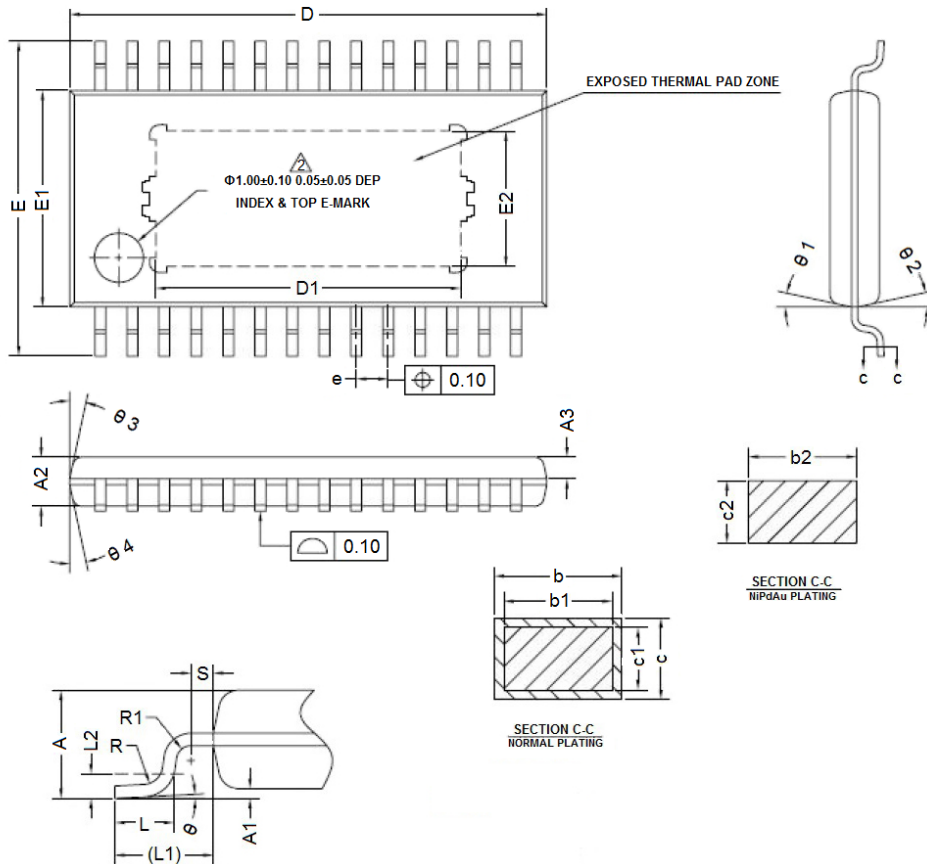


Typical LC Output filter



PACKAGE INFORMATION

Dimension in PTSSOP28 (Unit: mm)



Symbol	Min	Max	Symbol	Min	Max
A	-	1.20	E2	2.75REF	
A1	0.05	0.15	e	0.55	0.75
A2	0.90	1.10	L	0.45	0.75
A3	0.34	0.54	L1	1.00REF	
b	0.20	0.29	L2	0.25BSC	
b1	0.19	0.25	R	0.09	-
b2	0.19	0.25	R1	0.09	-
c	0.13	0.18	S	0.20	-
c1	0.12	0.14	θ	0°	8°
c2	0.12	0.14	θ_1	10°	14°
D	9.60	9.80	θ_2	10°	14°
D1	6.20REF		θ_3	10°	14°
E	6.20	6.60	θ_4	10°	14°
E1	4.30	4.50			

NOTES: 1. ALL DIMENSIONS REFER TO JEDEC STANDARD MO-153 AET, DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS.
2. 'D1' AND 'E2' ARE VARIABLES DEPENDING ON DIE PAD SIZES.



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