Ordering number : ENN7248

Thick-Film Hybrid IC

STK412-040

Two-Channel Shift Power Supply Audio Power Amplifier ICs 120W + 120 W

Overview

The STK412-000 series are class H audio power amplifier hybrid ICs that feature a built-in shift power supply circuit. These ICs provide high efficiency audio power amplification by controlling (switching) the supply voltage supplied to the power transistors according to the detected level of the input audio signal.

Features

- Pin compatible IC series that covers power ratings from 50 W × 2 channels to 180 W × 2 channels at 0.7 or 0.8% THD, 20 Hz to 20 kHz. This allows the use of a common PCB for all output classes.
- The pin arrangement is also unified with that of the three-channel STK413-000 series. This means that PCBs designed for three-channel models can also be used for two-channel models.
- Miniature package
  - — 50 W/ch to 120 W/ch (THD = 0.8%, f = 20 Hz to 20 kHz): 64 × 36.5× 8.5 mm*
  - — 150 W/ch to 180 W/ch (THD = 0.7%, f = 20 Hz to 20 kHz): 78 × 44× 9 mm*

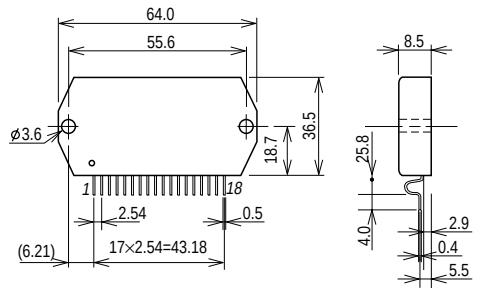
  * Not including the IC pins.
- Allowable load shorted time: 0.3 s

Package Dimensions

unit: mm

4196-SIP18

[STK412-040]



SANYO: SIP18

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Series Organization

These products are organized into a series based on their output power.

Parameter	Type No.							
	STK412-090	STK412-000	STK412-010	STK412-020	STK412-030	STK412-040	STK412-150	STK412-170
Output (20 Hz to 20 kHz) [THD]	50 W + 50 W [0.8 %]	60 W + 60 W [0.8 %]	70 W + 70 W [0.8 %]	80 W +80 W [0.8 %]	100 W + 100 W [0.8 %]	120 W + 120 W [0.8 %]	150 W + 150 W [0.7 %]	180 W + 180 W [0.7 %]
Maximum supply voltage, V_H (No signal)	±60 V	±65 V	±69 V	±73 V	±80 V	±84 V	±95 V	±95 V
Maximum supply voltage, V_L (No signal)	±41 V	±42 V	±44 V	±45 V	±46 V	±51 V	±61 V	±60 V
Recommended supply voltage, V_H	±37 V	±39 V	±43 V	±45 V	±51 V	±54 V	±57 V	±54 V
Recommended supply voltage, V_L	±27 V	±29 V	±30 V	±32 V	±34 V	±36 V	±38 V	±37 V
Recommended load impedance	8 Ω						6 Ω	4 Ω
Package	64 mm × 36.5 mm × 8.5 mm						78 mm × 44 mm × 9 mm	

Specifications

Maximum Ratings at Ta = 25°C

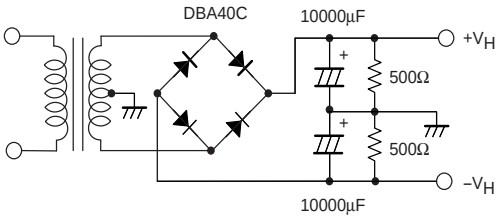
Parameter	Symbol	Conditions	Ratings	Unit
V_H: Maximum supply voltage 1 (no signal)	V_H max(1)		±84	V
V_H: Maximum supply voltage 2 (signal present)	V_H max(2)	R_L = 8, 6 Ω	±78	V
V_H: Maximum supply voltage 3 (signal present)	V_H max(3)	R_L = 4 Ω	±60	V
V_L: Maximum supply voltage 1 (no signal)	V_L max(1)		±51	V
V_L: Maximum supply voltage 2 (signal present)	V_L max(2)	R_L = 8, 6 Ω	±48	V
V_L: Maximum supply voltage 3 (signal present)	V_L max(3)	R_L = 4 Ω	±36	V
V_H-V_L: Maximum supply voltage *4	V_{H-L} max	No load	60	V
Thermal resistance	θj-c	Per power transistor	1.6	°C/W
Junction temperature	Tj max	Both the Tjmax and Tcmax conditions must be met.	150	°C
Operating IC substrate temperature	Tc max		125	°C
Storage temperature	Tstg		–30 to +125	°C
Allowable load shorted time *3	ts	V_H = ±54 V, V_L = ±36 V, R_L = 8 Ω, f = 50 Hz, P_O = 120 W, one channel operating	0.3	s

Operating Characteristics at Ta = 25°C, R_L = 8 Ω, Rg = 600 Ω, VG = 40 dB, V_Z = 15 V, R_L must be a non-inductive load.

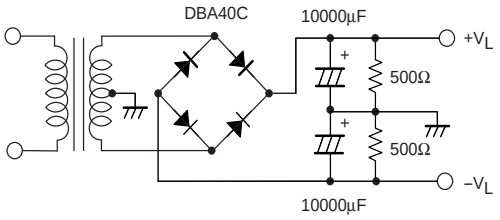
Parameter	Symbol	Test conditions *1					Standard value			Unit
		V_{CC} (V)	f (Hz)	P_O (W)	THD (%)		min	typ	max	
Output power	P_O (1)	V_H = ±54 V_L = ±36	20 to 20 k		0.8		120			W
	P_O (2)	V_H = ±43 V_L = ±29	1 k		0.8	R_L = 4 Ω		120		W
Total harmonic distortion	THD	V_H = ±54 V_L = ±36	20 to 20 k	120				0.4		%
Frequency characteristics	f_L, f_H	V_H = ±54 V_L = ±36		1.0		+0 –3 dB	20 to 50 k			Hz
Input impedance	ri	V_H = ±54 V_L = ±36	1 k	1.0				55		kΩ
Output noise voltage *2	V_{NO}	V_H = ±65 V_L = ±40				Rg = 2.2 kΩ			1.0	mVrms
Quiescent current	I_{CCO}	V_H = ±65				No load			30	mA
		V_L = ±40				No load			100	mA
Midpoint voltage	V_N	V_H = ±65 V_L = ±40					–70	0	+70	mV

Notes: *1. Unless otherwise specified, a constant-voltage power supply must be used during inspection.
*2. The output noise voltage rating gives the peak value read by an averaging VTVM. However, to eliminate the influence of flicker noise from the AC primary side line, use an AC stabilized power supply (50 Hz).

*3. Use the transformer power supply specified in the figure below for allowable load shorted time and output noise voltage measurements.
*4. Design circuits so that ($|V_H|$ - $|V_L|$) is always less than 40 V when switching the power supply with the load connected.
*5. Set up the V_L power supply with an offset voltage at power supply switching (V_L - L_O) of about 8 V as an initial target.

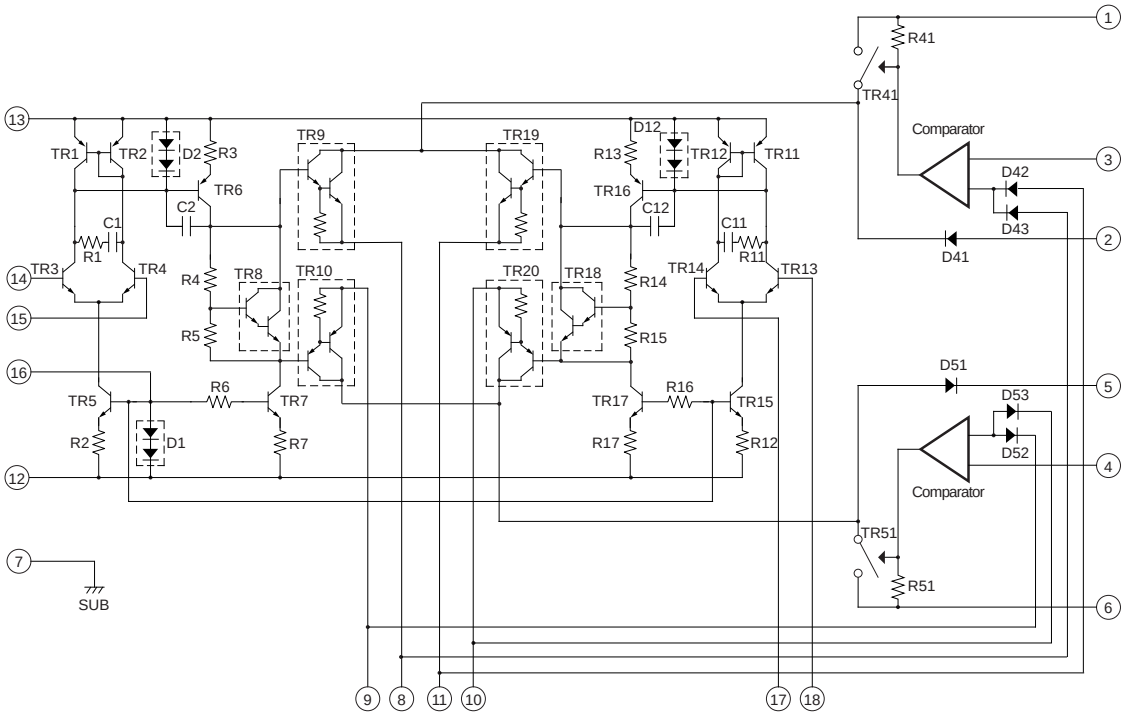


Specified Transformer Power Supply (MG-250 equivalent)



Specified Transformer Power Supply (MG-200 equivalent)

Internal Equivalent Circuit



Sample Application Circuit