

**SANYO**

No. 5180

**STK405-090**

**2ch AF Power Amplifier (Split Power Supply)**  
**50W + 50W min, THD = 10%**

## Overview

The STK405-090, a member of the STK405-000 series, is a low-cost, 2-channel audio power amplifier hybrid IC that is ideal for a wide range of stereo sets. It has dedicated  $6\Omega$  output drive, in contrast with the STK401-000 series which supports  $6\Omega/3\Omega$  output drive.

## Features

- Class B amplifiers
- Output load impedance  $R_L = 6\Omega$  support
- EIAJ-output compatible ( $f = 1\text{kHz}$ , THD = 10%)
- Low supply switching shock noise
- Pin assignment grouped into individual blocks of inputs, outputs and supply lines to minimize the adverse effects of pattern layout on operating characteristics
- External bootstrap circuit not necessary
- Standby operation possible using external circuit
- Voltage gain  $V_G = 26\text{dB}$  for easy gain distribution within the set
- Member of 10W/ch to 80W/ch pin-compatible series

## Series Organization

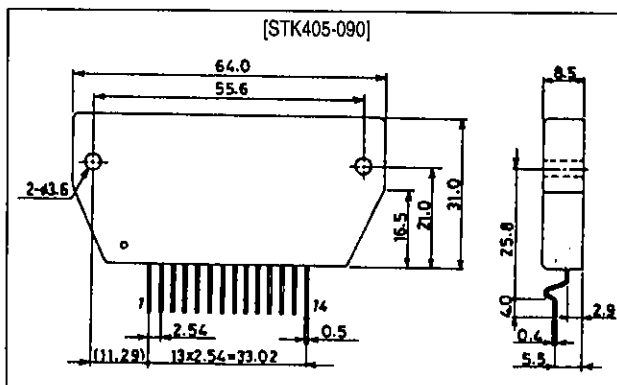
The following devices form a series with differing output capacity. Some of the following devices are under development. Contact your Sanyo sales representative if you require more detailed information.

Type No.	Output power	Supply voltage [V]	
		$V_{CC\text{ max}}$	$V_{CC}$
STK405-010	10W + 10W	$\pm 26.0$	$\pm 14.0$
STK405-030	20W + 20W	$\pm 30.5$	$\pm 18.5$
STK405-050	30W + 30W	$\pm 34.5$	$\pm 22.0$
STK405-070	40W + 40W	$\pm 39.0$	$\pm 25.0$
STK405-090	50W + 50W	$\pm 42.0$	$\pm 26.5$
STK405-100	60W + 60W	$\pm 45.0$	$\pm 29.0$
STK405-110	70W + 70W	$\pm 50.0$	$\pm 31.0$
STK405-120	80W + 80W	$\pm 52.5$	$\pm 33.0$

## Package Dimensions

unit: mm

4158



## Specifications

### Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC \text{ max}}$		$\pm 42$	V
Thermal resistance	$\theta_{j-c}$	Per power transistor	2.7	$^\circ\text{C/W}$
Junction temperature	$T_J$		150	$^\circ\text{C}$
Operating substrate temperature	$T_c$		125	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-30 to +125	$^\circ\text{C}$
Available time for load short-circuit	$t_s$	$V_{CC} = \pm 26.5\text{V}$ , $R_L = 6\Omega$ , $f = 50\text{Hz}$ , $P_O = 50\text{W}$	1	s

### Operating Characteristics at $T_a = 25^\circ\text{C}$ , $R_L = 6\Omega$ (noninductive load), $R_g = 600\Omega$ , $V_G = 26\text{dB}$

Parameter	Symbol	Conditions	min	typ	max	Unit
Quiescent current	$I_{CCO}$	$V_{CC} = \pm 34.0\text{V}$ , no load	-	12	20	mA
Output power	$P_O$	$V_{CC} = \pm 26.5\text{V}$ , $f = 1\text{kHz}$ , $\text{THD} = 10.0\%$	50	-	-	W
Total harmonic distortion	THD	$V_{CC} = \pm 26.5\text{V}$ , $f = 1\text{kHz}$ , $P_O = 5.0\text{W}$	-	0.04	0.1	%
Frequency response	$f_L, f_H$	$V_{CC} = \pm 26.5\text{V}$ , $P_O = 1.0\text{W}$ , $_{-3}^{+0}\text{dB}$	-	20 to 50k	-	Hz
Input impedance	$r_i$	$V_{CC} = \pm 26.5\text{V}$ , $f = 1\text{kHz}$ , $P_O = 1.0\text{W}$	-	55	-	$\text{k}\Omega$
Output noise voltage	$V_{NO}$	$V_{CC} = \pm 34.0\text{V}$ , $R_g = 10\text{k}\Omega$	-	-	1.2	mVrms
Neutral voltage	$V_N$	$V_{CC} = \pm 34.0\text{V}$	-100	0	+100	mV

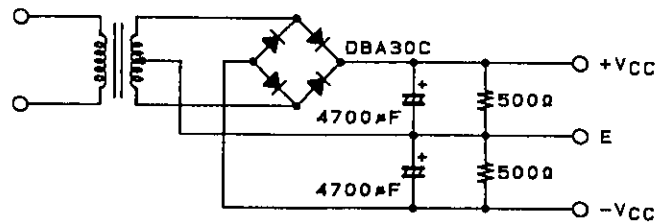
**Notes.**

All tests are measured using a regulated voltage supply unless otherwise specified.

Available time for load short-circuit and output noise voltage are measured using the transformer supply specified below.

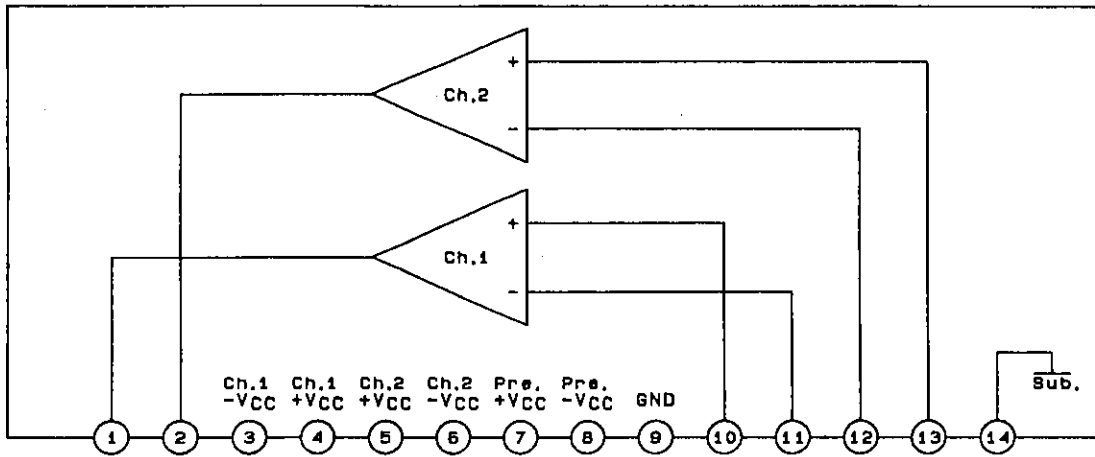
The output noise voltage is the peak value of an average-reading meter with an rms value scale (VTVM). A regulated AC supply (50Hz) should be used to eliminate the effects of AC primary line flicker noise.

### Specified Transformer Supply (RP-25 or Equivalent)



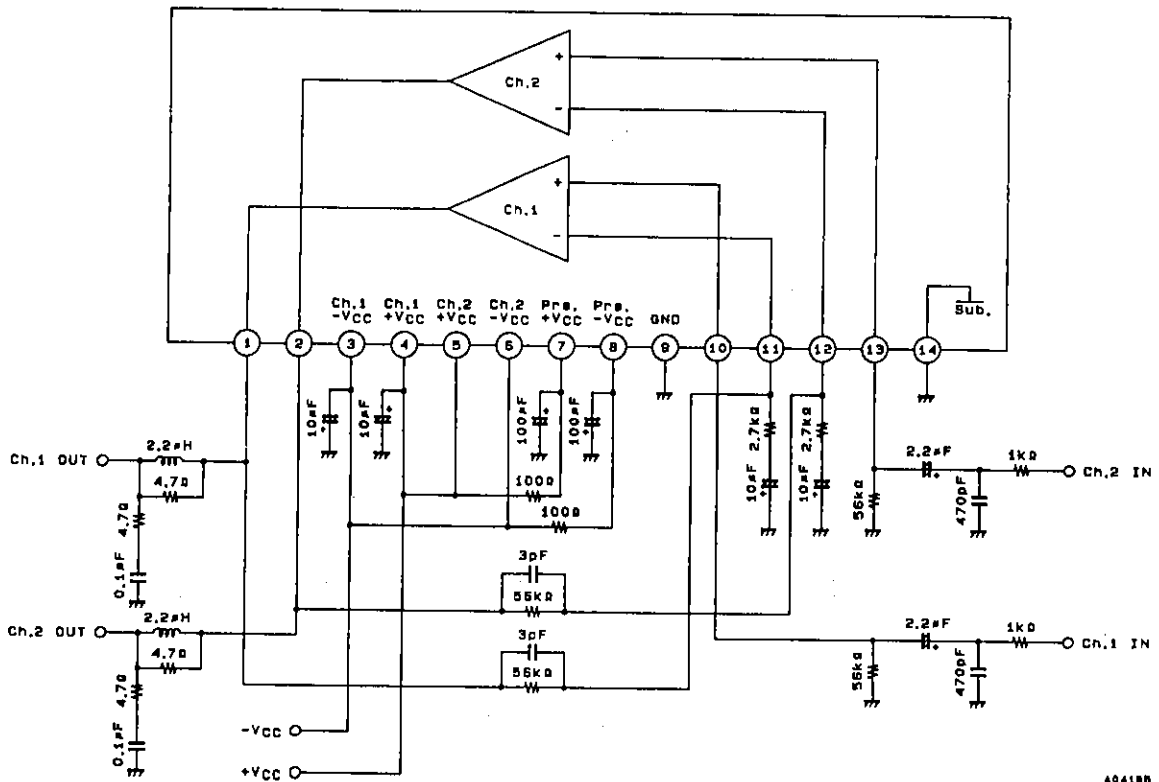
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Block Diagram



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Test Circuit



A0418D

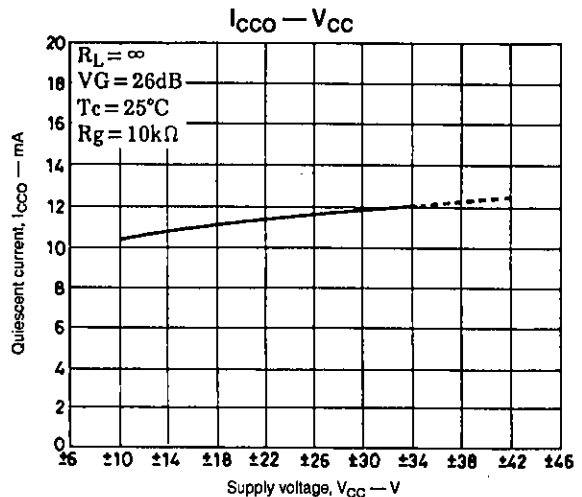
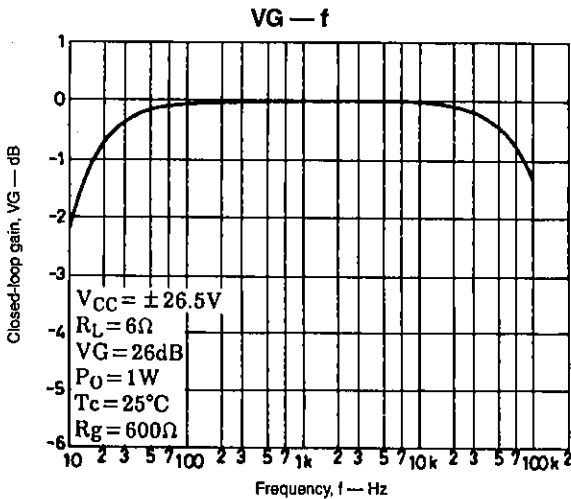
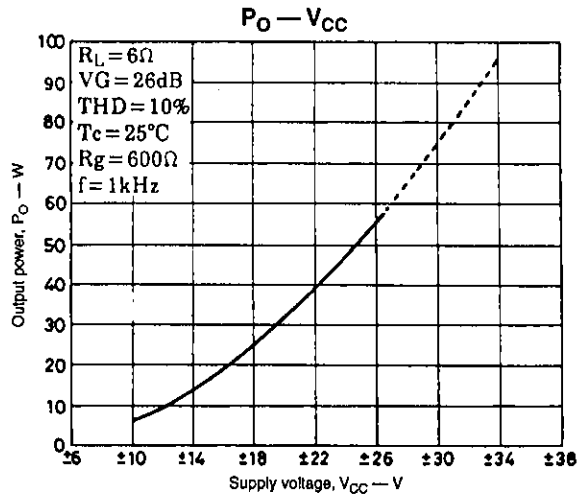
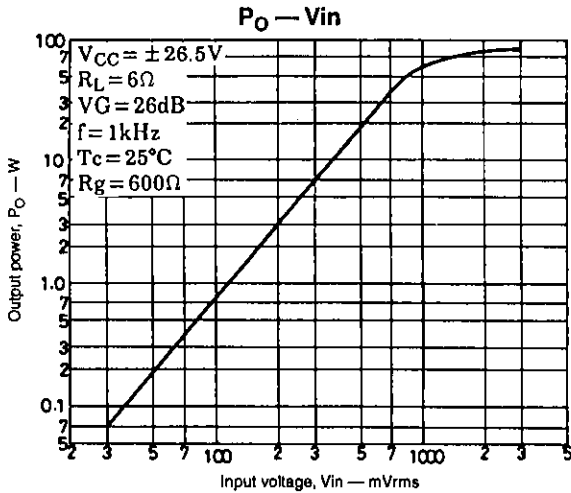
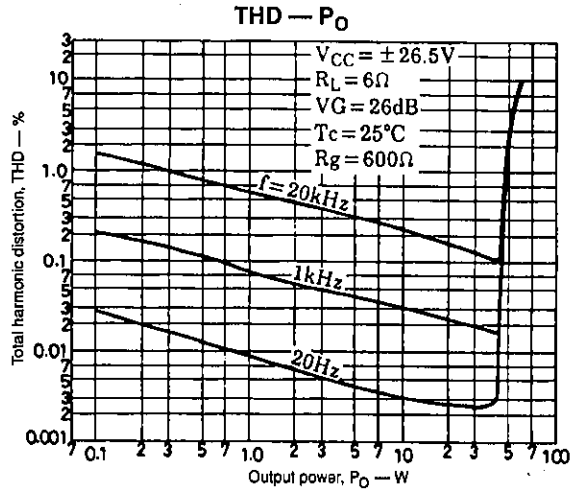
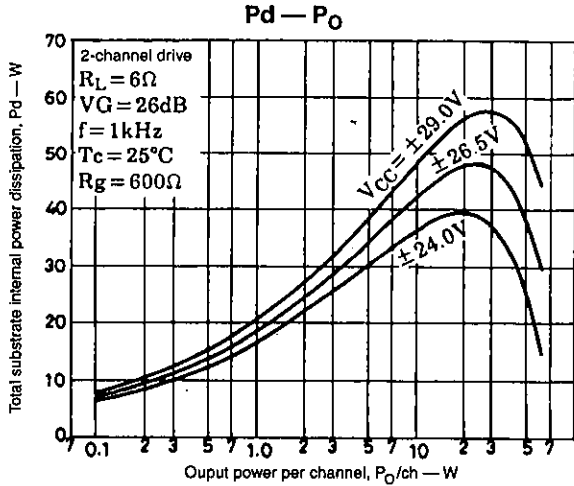


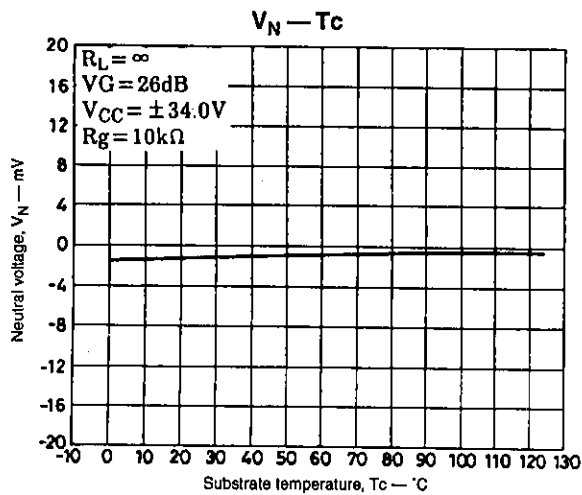
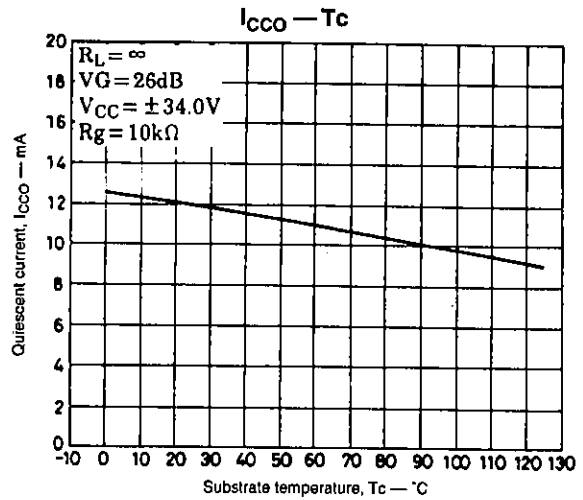
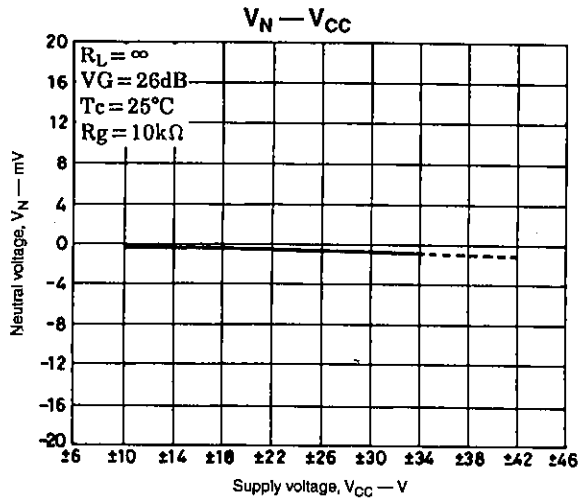
From expression (1):  $\theta_{c-a} < (125 - 50)/34.5 < 2.17$

From expression (2):  $\theta_{c-a} < (150 - 50)/34.5 - 2.7/4 < 2.22$

Therefore, to satisfy both expressions, the required heat-sink must have a thermal resistance less than  $2.17^{\circ}\text{C}/\text{W}$ .

This heatsink design example is based on a constant-voltage supply, and should be verified within your specific set environment.





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