

TL07xx Low-Noise JFET-Input Operational Amplifiers

1 Features

- Low Power Consumption
- Wide Common-Mode and Differential Voltage Ranges
- Low Input Bias and Offset Currents
- Output Short-Circuit Protection
- Low Total Harmonic Distortion: 0.003% (Typical)
- Low Noise
 $V_n = 18 \text{ nV}/\sqrt{\text{Hz}}$ (Typical) at $f = 1 \text{ kHz}$
- High-Input Impedance: JFET Input Stage
- Internal Frequency Compensation
- Latch-Up-Free Operation
- High Slew Rate: $13 \text{ V}/\mu\text{s}$ (Typical)
- Common-Mode Input Voltage Range Includes V_{CC+}

2 Applications

- Motor Integrated Systems: UPS
- Drives and Control Solutions: AC Inverter and VF Drives
- Renewables: Solar Inverters
- Pro Audio Mixers
- DLP Front Projection System
- Oscilloscopes

3 Description

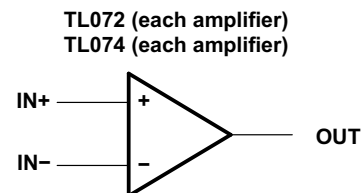
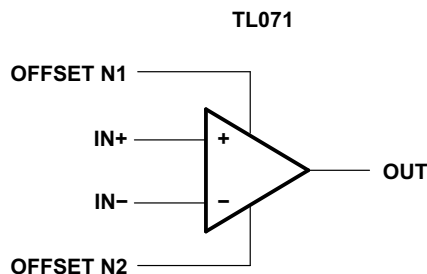
The TL07xx JFET-input operational amplifiers incorporate well-matched, high-voltage JFET and bipolar transistors in a monolithic integrated circuit. The devices feature high slew rates, low-input bias and offset currents, and low offset-voltage temperature coefficient. The low harmonic distortion and low noise make the TL07x series ideally suited for high-fidelity and audio pre-amplifier applications. The TL071 device has offset pins to support external input offset correction.

Device Information⁽¹⁾

PART NUMBER	PACKAGE	BODY SIZE (NOM)
TL07xxD	SOIC (14)	8.65 mm x 3.91 mm
	SOIC (8)	4.90 mm x 3.90 mm
TL07xxJG	CDIP (8)	9.59 mm x 6.67 mm
TL074xJ	CDIP (14)	19.56 mm x 6.92 mm
TL07xxP	PDIP (8)	9.59 mm x 6.35 mm
TL07xxPS	SO (8)	6.20 mm x 5.30 mm
TL074xN	PDIP (14)	19.3 mm x 6.35 mm
TL074xNS	SO (14)	10.30 mm x 5.30 mm
TL07xxPW	TSSOP (8)	4.40 mm x 3.00 mm
TL074xPW	TSSOP (14)	5.00 mm x 4.40 mm

(1) For all available packages, see the orderable addendum at the end of the data sheet.

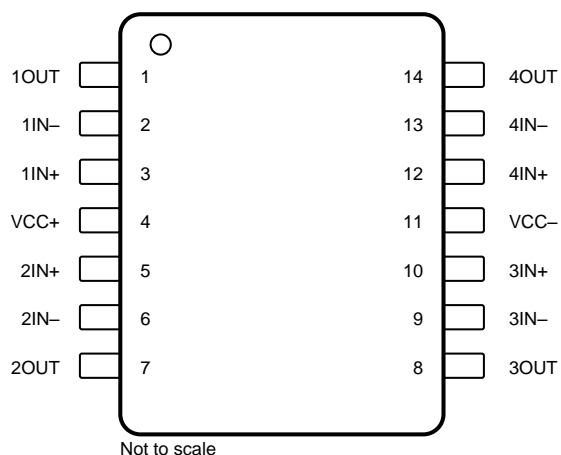
Logic Symbols



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TL074 D, N, NS, PW, J, and W Packages
 14-Pin SOIC, PDIP, SO, TSSOP, CDIP and CFP
 Top View



Pin Functions: TL074x

PIN		I/O	DESCRIPTION
NAME	NO.		
1IN–	2	I	Inverting input
1IN+	3	I	Noninverting input
1OUT	1	O	Output
2IN–	6	I	Inverting input
2IN+	5	I	Noninverting input
2OUT	7	O	Output
3IN–	9	I	Inverting input
3IN+	10	I	Noninverting input
3OUT	8	O	Output
4IN–	13	I	Inverting input
4IN+	12	I	Noninverting input
4OUT	14	O	Output
V _{CC–}	11	—	Power supply
V _{CC+}	4	—	Power supply

18 W hi-fi amplifier and 35 W driver

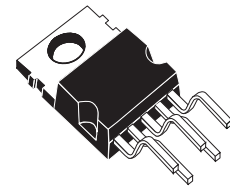
Features

- Output power 18 W at $V_S = \pm 16 \text{ V} / 4 \Omega$ with 0.5% distortion
- High output current
- Very low harmonic and crossover distortion
- Short-circuit protection
- Thermal shutdown

Description

The TDA2030A is a monolithic IC in a Pentawatt package intended for use as a low-frequency class-AB amplifier.

With $V_{S \text{ max}} = 44 \text{ V}$ it is particularly suited for more reliable applications without regulated supply and for 35 W driver circuits using low-cost complementary pairs.



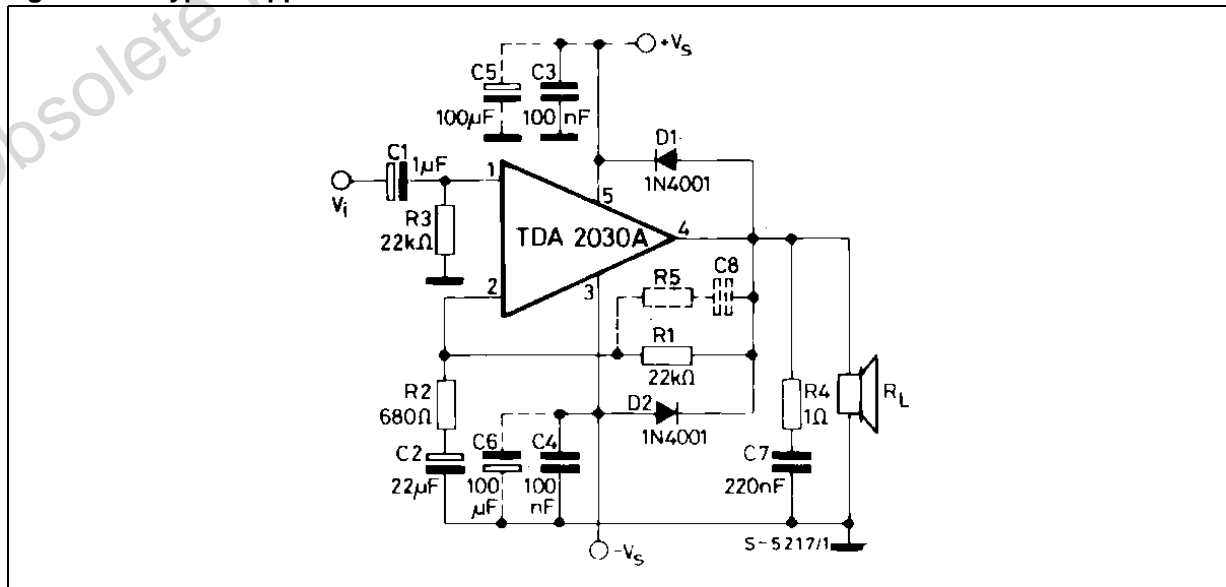
Pentawatt (vertical)

The TDA2030A provides high output current and has very low harmonic and crossover distortion. The device incorporates a short-circuit protection system comprising an arrangement for automatically limiting the dissipated power so as to keep the operating point of the output transistors within their safe operating range. A conventional thermal shutdown system is also included.

Table 1. Device summary

Order code	Package
TDA2030AV	Pentawatt (vertical)

Figure 1. Typical application



1 Device overview

Figure 2. Pin connections (top view)

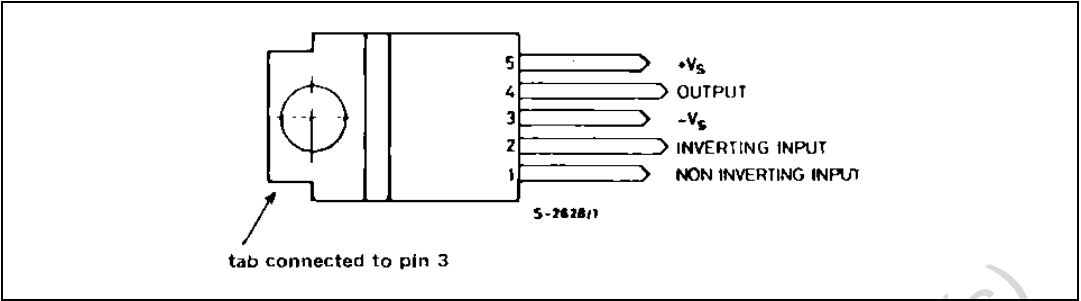


Figure 3. Test circuit

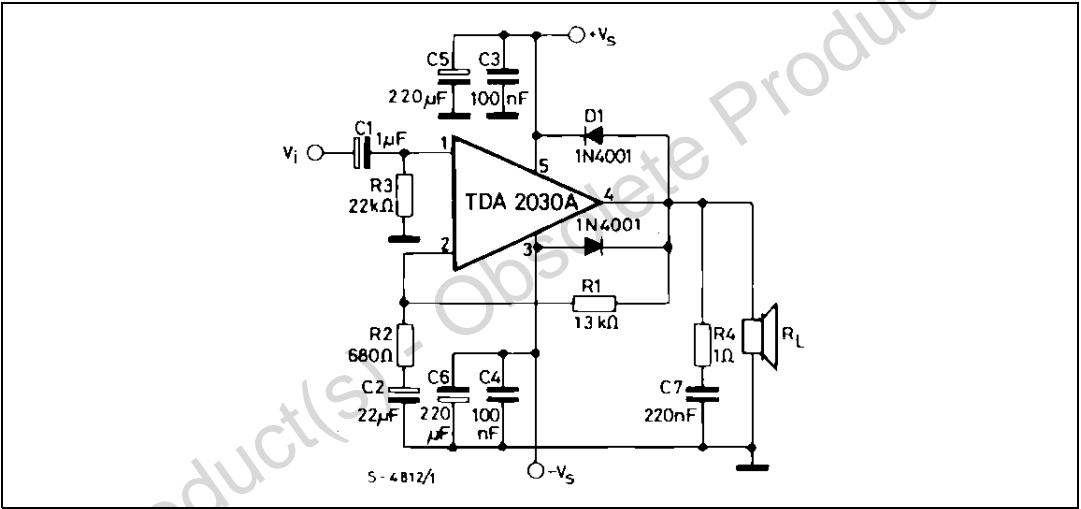


Table 2. Thermal data

Symbol	Parameter	Value	Unit
$R_{th(j-case)}$	Thermal resistance junction-case max.	3	°C/W

Table 3. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_s	Supply voltage	± 22	V
V_i	Input voltage	V_s	
V_i	Differential input voltage	± 15	V
I_o	Peak output current (internally limited)	3.5	A
P_{tot}	Total power dissipation at $T_{case} = 90\text{ °C}$	20	W
T_{stg}, T_j	Storage and junction temperature	- 40 to + 150	°C

25-watt hi-fi audio power amplifier

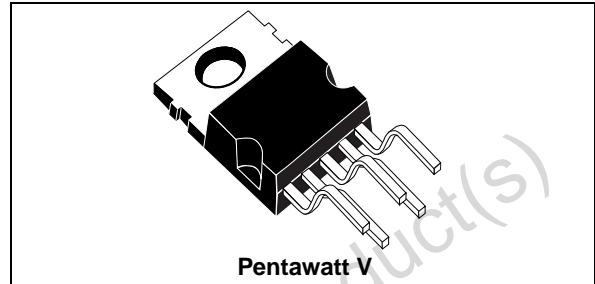
Datasheet — production data

Features

- Wide-range supply voltage, up to 40 V
- Single or split power supply
- Short-circuit protection to ground
- Thermal shutdown
- $P_O = 25 \text{ W}$ @ THD = 0.5%, $V_S = \pm 17 \text{ V}$, $R_L = 4 \Omega$
- $P_O = 30 \text{ W}$ @ THD = 10%, $V_S = \pm 17 \text{ V}$, $R_L = 4 \Omega$

Description

The TDA2040 is a monolithic integrated circuit in the Pentawatt® package, intended for use as an audio class-AB amplifier. Typically, it provides 25 W output power into 4 Ω with THD = 0.5% at $V_S = 34 \text{ V}$. The TDA2040 provides high output current and has very low harmonic and crossover distortion. Furthermore, the device incorporates a patented short-circuit protection system

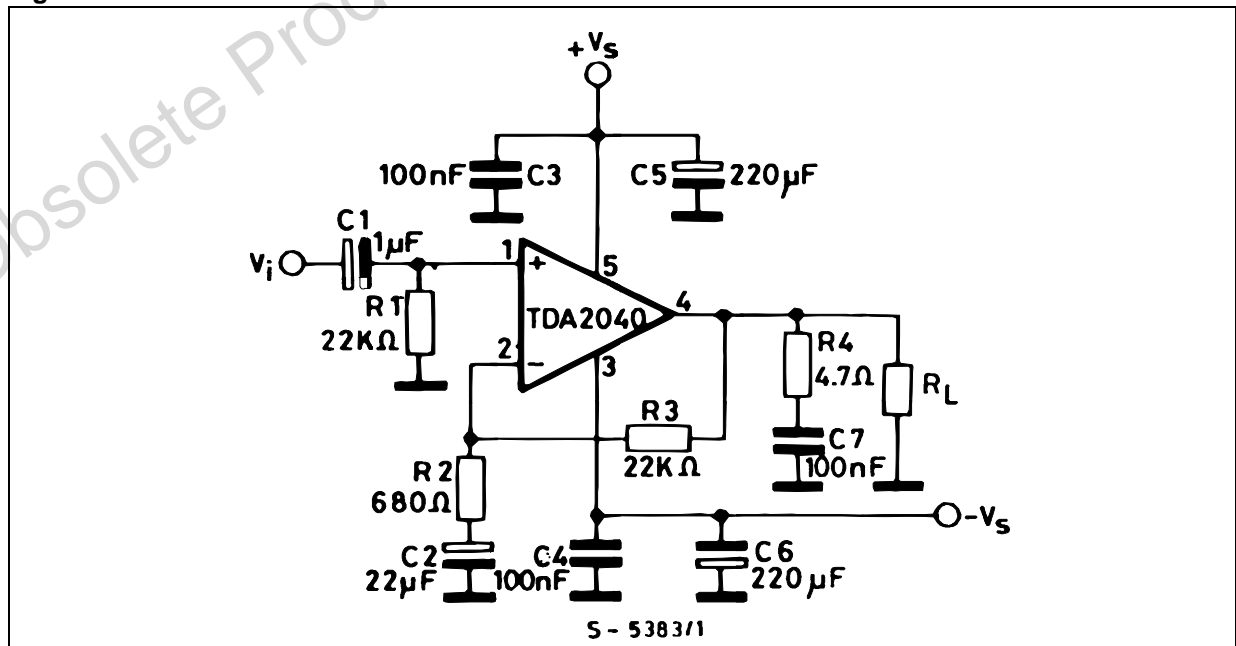


comprising an arrangement for automatically limiting the dissipated power so as to keep the operating point of the output transistors within their safe operating range. A thermal shutdown system is also included.

Table 1. Device summary

Order code	Package
TDA2040V	Pentawatt V (vertical)

Figure 1. TDA2040 test circuit



2 Electrical specifications

2.1 Absolute maximum ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V _s	Supply voltage	±20	V
V _i	Input voltage	V _s	
V _i	Differential input voltage	±15	V
I _o	Output peak current (internally limited)	4	A
P _{tot}	Power dissipation at T _{case} = 75 °C	25	W
T _{stg} , T _j	Storage and junction temperature	-40 to 150	°C
V _{ESD_HBM}	ESD maximum withstanding voltage range, test condition CDF-AEC-Q100-002- "Human body model"	±1500	V

2.2 Thermal data

Table 3. Thermal data

Symbol	Parameter	Min	Typ	Max	Unit
R _{th_j-case}	Thermal resistance junction to case	-	-	3	°C/W