

Low Noise JFET Input Dual Operational Amplifiers

Description

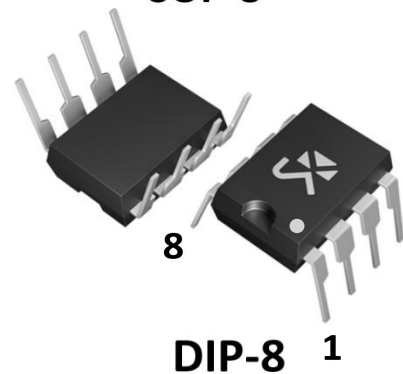
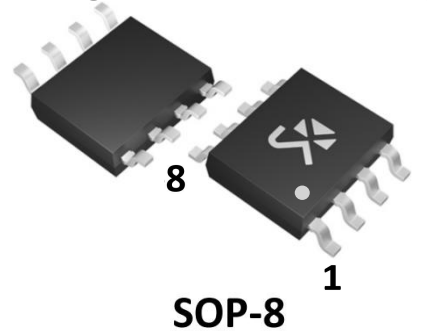
TL072 is a low-noise JFET input dual operational amplifier composed of high-voltage JFETs and bipolar transistors. It features a high slew rate, low input bias current, low input offset current, and a low offset voltage temperature coefficient.

TL072 is available in DIP-8 and SOP-8 package types.

Features

- Low power consumption: 1.4mA/ch
- Low input bias current: 200pA
- Low input offset current: 50pA
- Low noise
- High input impedance
- Low distortion: approximately 0.01%
- High slew rate: 13V/ μ S
- High gain bandwidth product: 3MHz

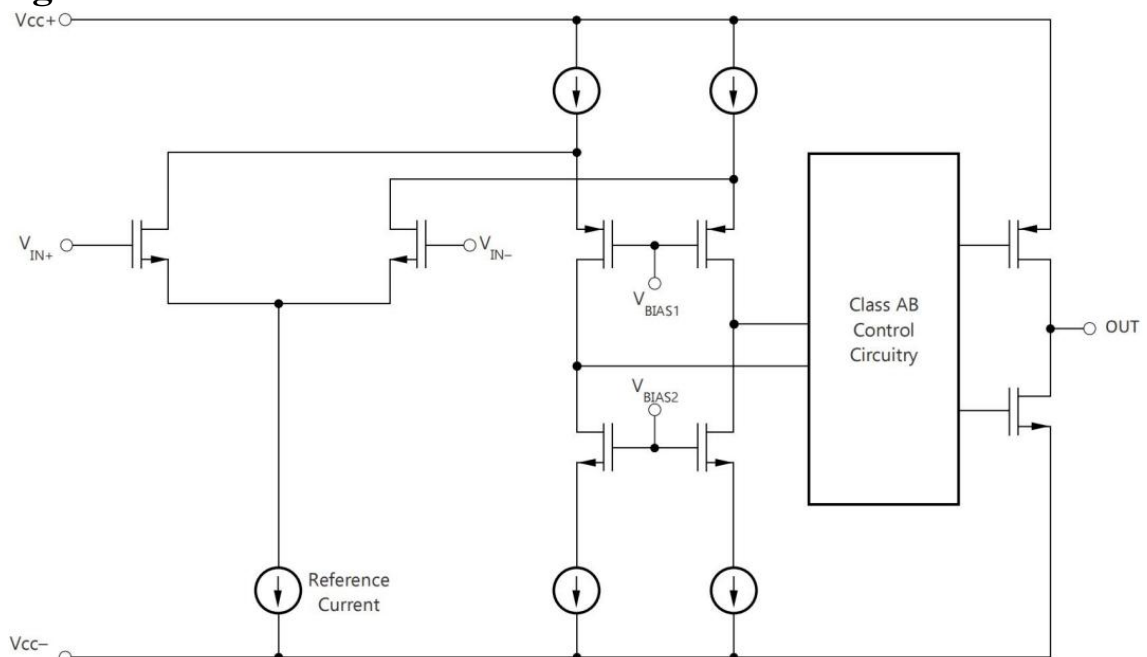
Package Outline Drawing



Applications

- Solar energy systems
- Motor drivers
- Single-phase UPS
- Professional audio mixers
- Battery testing equipment

Block Diagram



Ordering Information

Type	Marking	Package
TL072-H8	TL072	DIP-8
TL072-P8	TL072	SOP-8

Pin Description

Pin Number	Pin Name	I/O	Description	Pin Configuration Diagram
1	1OUT	O	Channel 1 Output	
2	1IN-	I	Channel 1 Inverting Input	
3	1IN+	I	Channel 1 Non-Inverting Input	
4	V _{CC} -	P	Negative Power Supply	
5	2IN+	I	Channel 2 Non-Inverting Input	
6	2IN-	I	Channel 2 Inverting Input	
7	2OUT	O	Channel 2 Output	
8	V _{CC} +	P	Positive Power Supply	

Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Supply Voltage	V _{CC}	±18	V
Input Voltage	V _I	±15	V
Differential Input Voltage	V _{ID}	±30	V
Maximum Operating Junction Temperature	T _J	150	°C
Storage Temperature	T _{STG}	-65~+150	°C
Lead Temperature(Soldering , 10 s)	T _W	260	°C

Recommended Operating Conditions(T_A=25°C unless otherwise noted)

Parameter	Symbol	Min	Max	Unit
Positive Power Supply	V _{CC} +	+5	+15	V
Negative Power Supply	V _{CC} -	-5	-15	V
Common Mode Input Voltage	V _{CM}	(V _{CC} -)+4	(V _{CC} +) -4	V
Operating Temperature Range	T _A	-20	+85	°C
Operating Junction Temperature	T _J	-20	+125	°C

Electrical Characteristics ($T_A=25^{\circ}\text{C}$, $V_{CC+}=15\text{V}$, $V_{CC-}=-15\text{V}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Supply Current(per channel)	I_{CC}	$V_O=0\text{V}, R_L=\infty$	-	1.4	2.8	mA
Input Offset Voltage	V_{IO}	$V_O=0\text{V}$	-	± 2	± 6	mV
Input Offset Current	I_{IO}	$V_O=0\text{V}$	-	± 50	-	pA
Input Bias Current	I_B	$V_O=0\text{V}$	-	± 200	-	pA
Input Common-mode Voltage	V_{ICM}		± 11	-	-	V
Output Voltage swing	V_{OM}	$R_L=10\text{K}\Omega$	± 12	± 13.5	-	V
		$R_L=2\text{K}\Omega$	± 10	± 12	-	
Output Short-circuit Current	I_{SC}	$V_O=0\text{V}$	± 40	± 60	± 80	mA
Open-Loop Voltage Gain	A_{OL}	$V_O=\pm 10\text{V}, R_L<2\text{K}\Omega$	-	100	-	V/mV
Common Mode Rejection Ratio	CMRR		-	95	-	dB
Power Supply Rejection Ratio	PSRR		-	100	-	dB
Gain Bandwidth Product	GBWP		-	3	-	MHz
Slew Rate	S_R		8	13	-	V/uS
Input Impedance	R_I		-	10^{12}	-	Ω

Typical Applications

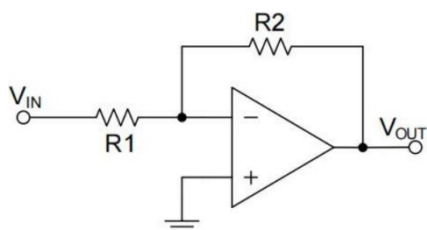


Figure 1. Inverting Amplifier

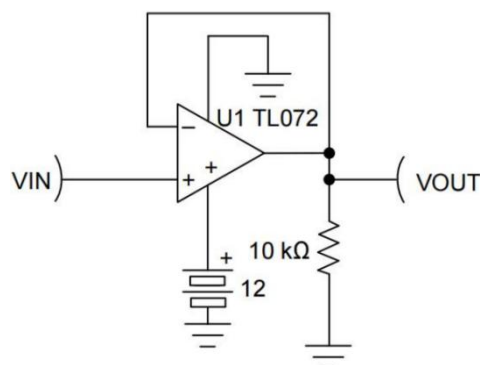


Figure 2. Single Supply Unity Gain Amplifier

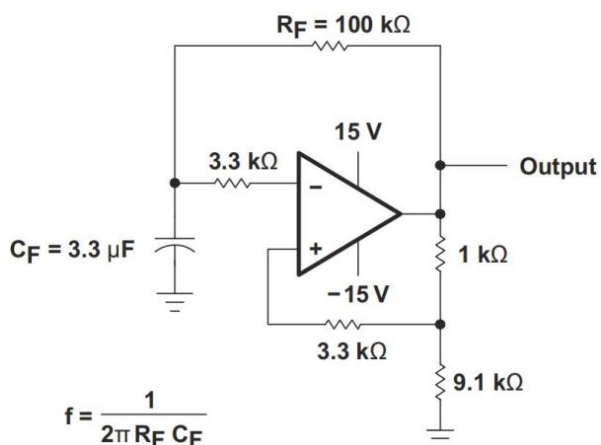


Figure 3. 0.5Hz Square Wave Oscillator

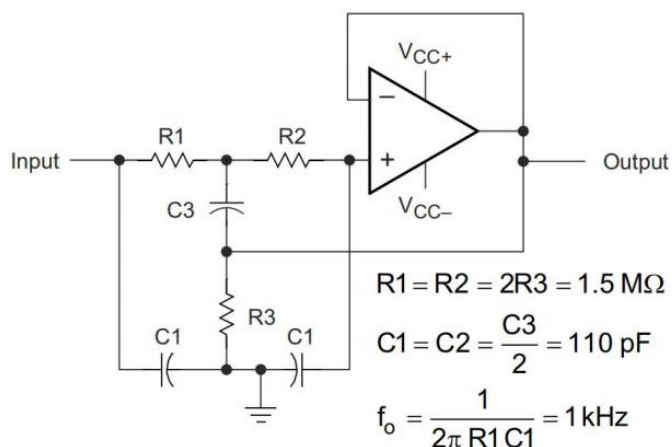


Figure 4. High Q Notch Filter

Typical Characteristics

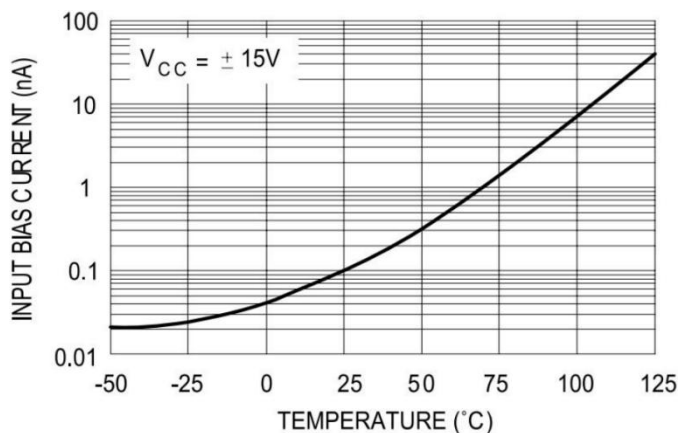


Fig 5. Input Bias Current vs. Ambient Temperature

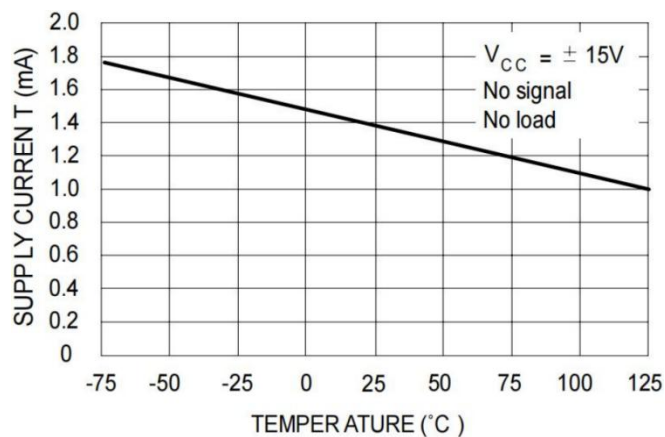


Fig 6. Supply Current vs. Ambient Temperature(per Channel)

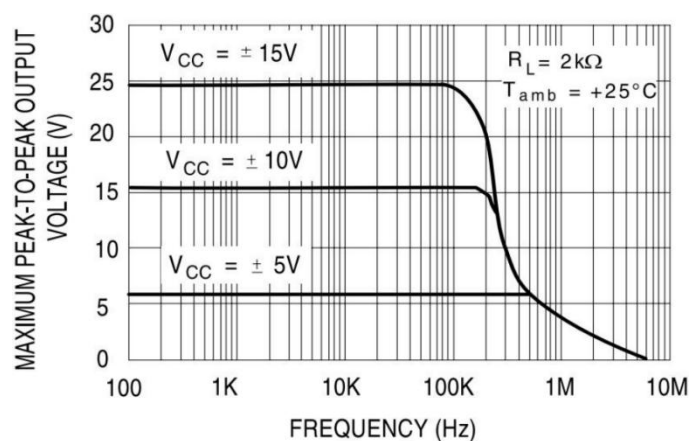


Fig 7. Maximum Output Voltage Swing vs. Frequency($R_L=2K\Omega$)

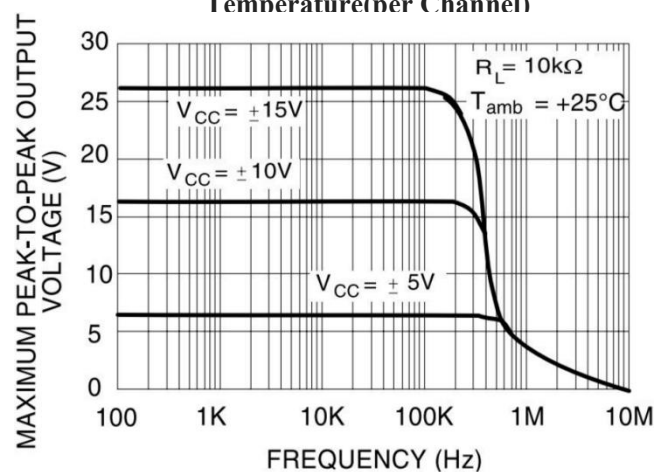


Fig 8. Maximum Output Voltage Swing vs. Frequency($R_L=10K\Omega$)

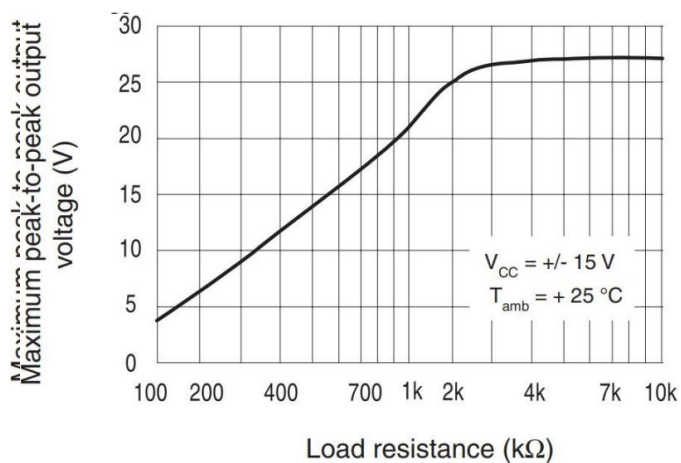


Fig 9. Maximum Output Voltage swing vs. Load Resistance

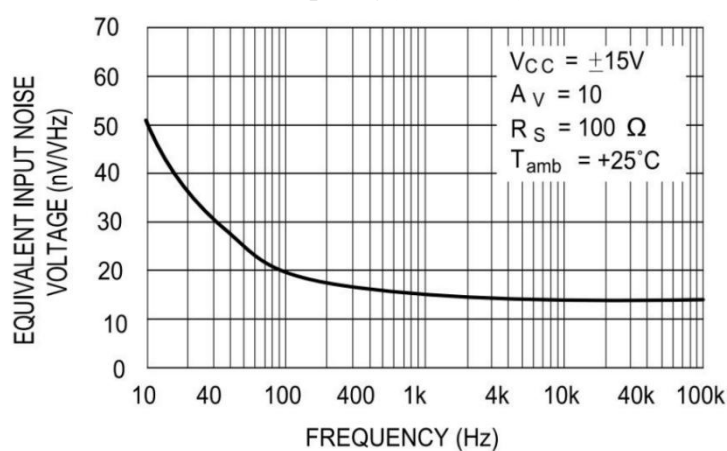
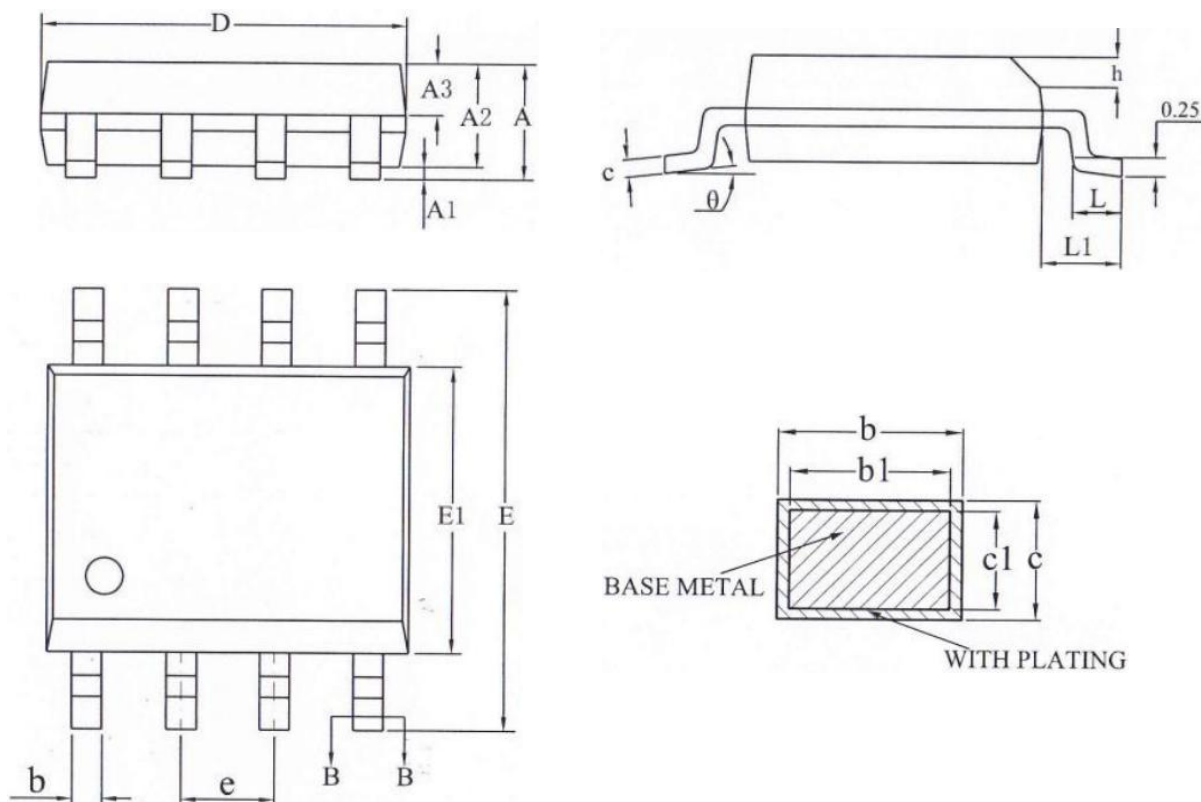


Fig 10. Input Noise Voltage vs. Frequency

Package Information

SOP-8

Dimensions in mm

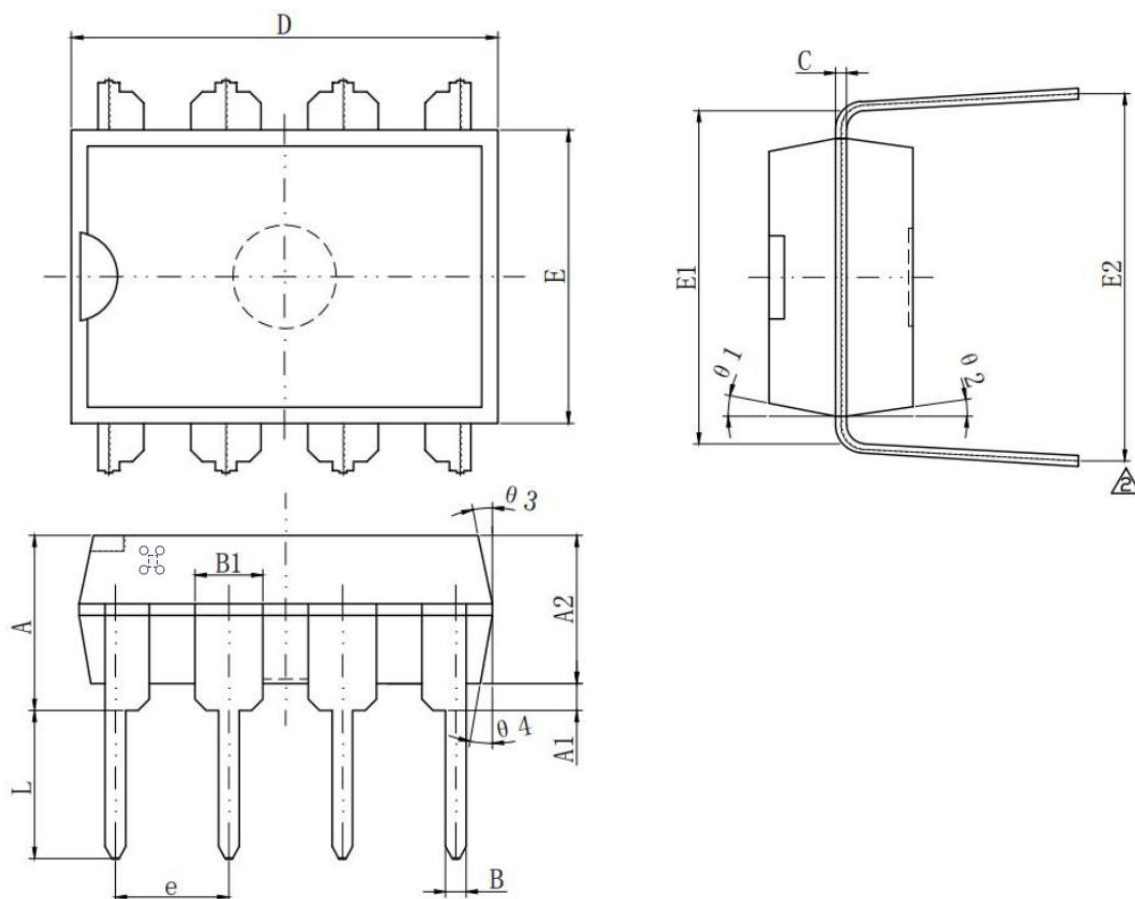


Symbol	Dimensions In Millimeters			Symbol	Dimensions In Millimeters		
	Min	Nom	Max		Min	Nom	Max
A	-	-	1.75	D	4.80	4.90	5.00
A1	0.10	-	0.225	E	5.80	6.00	6.20
A2	1.30	1.40	1.50	E1	3.80	3.90	4.00
A3	0.60	0.65	0.70	e	1.27 BSC		
b	0.39	-	0.47	h	0.25	-	0.50
b1	0.38	0.41	0.44	L	0.50	-	0.80
c	0.20	-	0.24	L1	1.05 (REF)		
c1	0.19	0.20	0.21	θ	0°	-	8°

Package Information

DIP-8

Dimensions in mm



Symbol	Dimensions In Millimeters			Symbol	Dimensions In Millimeters		
	Min	Nom	Max		Min	Nom	Max
A	3.75	3.90	4.15	E1	7.35	7.62	7.85
A1	0.60	-	-	E2	8.00	8.40	8.80
A2	3.15	3.30	3.40	e	2.54 (BSC)		
B	0.38	0.46	0.56	L	3.00	3.30	3.60
B1	1.52 (BSC)			$\theta 1$	10°	-	14°
C	0.20	0.25	0.34	$\theta 2$	8°	-	12°
D	9.00	9.25	9.40	$\theta 3$	10°	-	14°
E	6.20	6.35	6.50	$\theta 4$	8°	-	12°

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