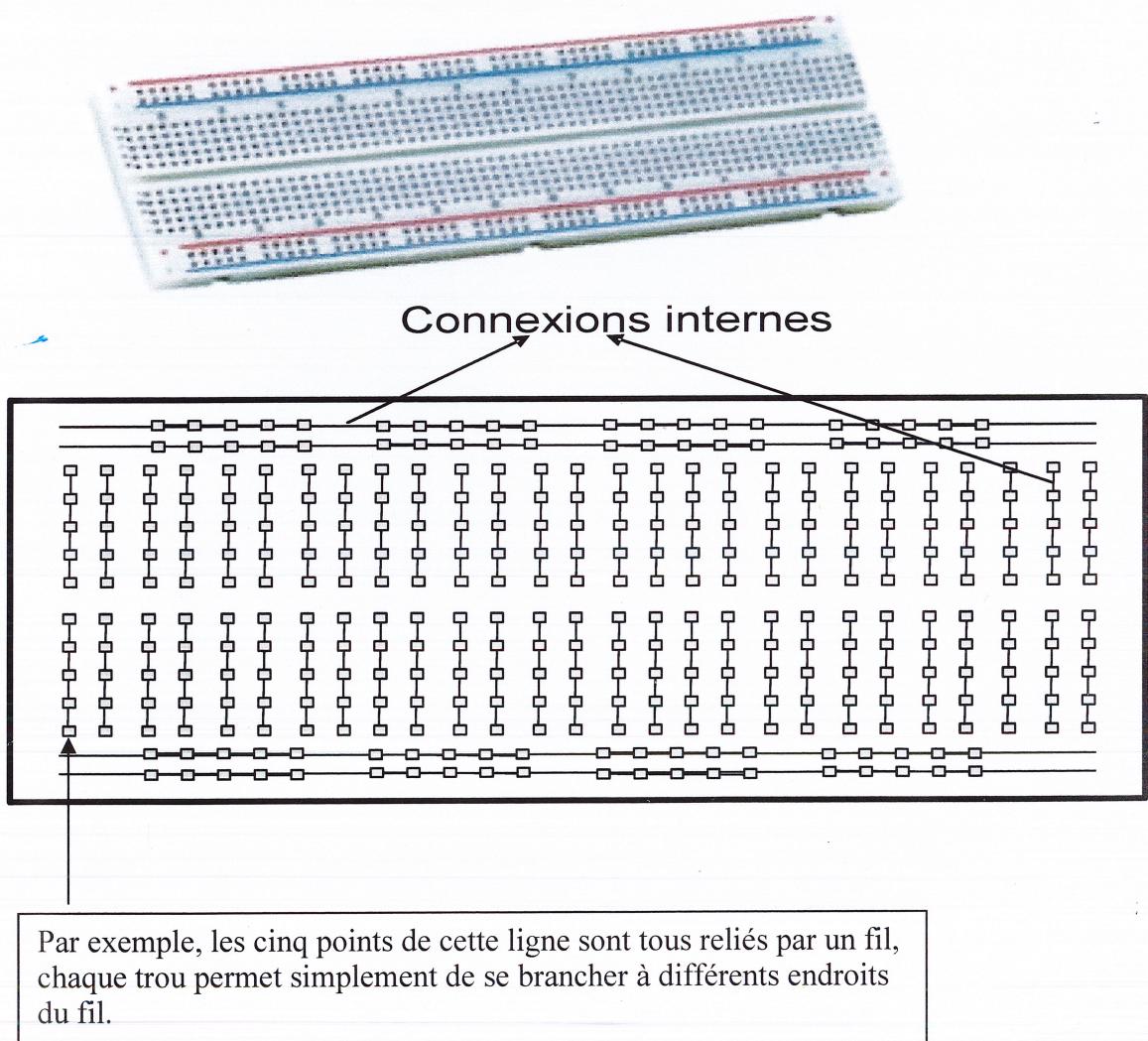


## ANNEXE 1

### Schéma des branchements internes des plaquettes de test

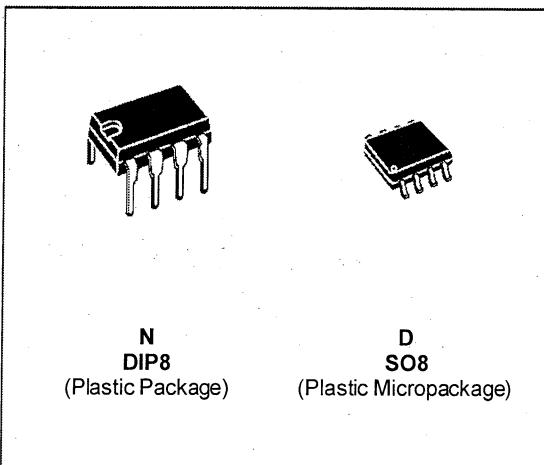




# TL071 TL071A - TL071B

## LOW NOISE J-FET SINGLE OPERATIONAL AMPLIFIERS

- WIDE COMMON-MODE (UP TO  $V_{CC}^+$ ) AND DIFFERENTIAL VOLTAGE RANGE
- LOW INPUT BIAS AND OFFSET CURRENT
- LOW NOISE  $e_n = 15\text{nV}/\sqrt{\text{Hz}}$  (typ)
- OUTPUT SHORT-CIRCUIT PROTECTION
- HIGH INPUT IMPEDANCE J-FET INPUT STAGE
- LOW HARMONIC DISTORTION : 0.01% (typ)
- INTERNAL FREQUENCY COMPENSATION
- LATCH UP FREE OPERATION
- HIGH SLEW RATE : 16V/ $\mu\text{s}$  (typ)



### DESCRIPTION

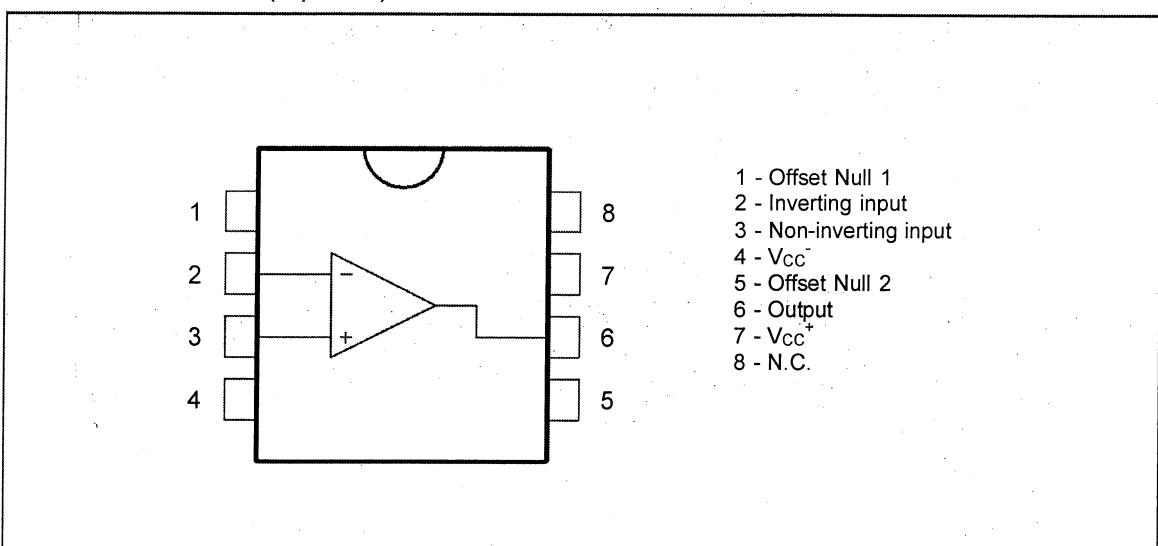
The TL071, TL071A and TL071B are high speed J-FET input single operational amplifiers incorporating well matched, high voltage J-FET and bipolar transistors in a monolithic integrated circuit.

The devices feature high slew rates, low input bias and offset currents, and low offset voltage temperature coefficient.

### ORDER CODES

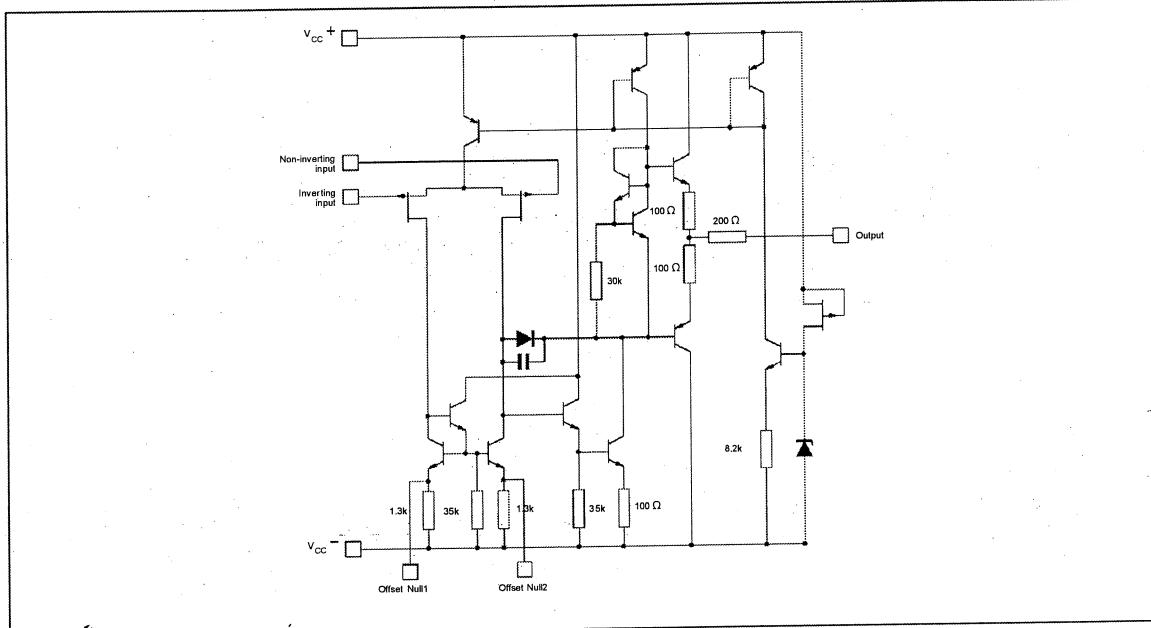
Part Number	Temperature Range		Package	
	N	D	N	D
TL071M/AM/BM	-55°C, +125°C		•	•
TL071I/AI/BI	-40°C, +105°C		•	•
TL071C/AC/BC	0°C, +70°C		•	•
Example : TL071CN				

### PIN CONNECTIONS (top view)

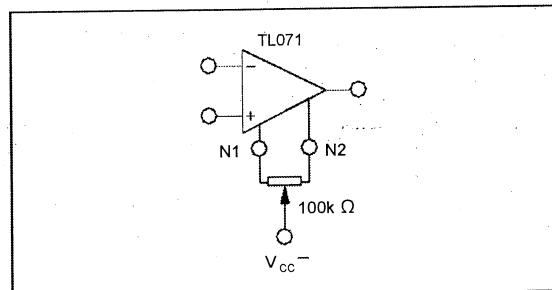


## TL071 - TL071A - TL071B

### SCHEMATIC DIAGRAM



### INPUT OFFSET VOLTAGE NULL CIRCUITS



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V <sub>CC</sub>	Supply Voltage - (note 1)	±18	V
V <sub>i</sub>	Input Voltage - (note 3)	±15	V
V <sub>id</sub>	Differential Input Voltage - (note 2)	±30	V
P <sub>tot</sub>	Power Dissipation	680	mW
	Output Short-circuit Duration - (note 4)	Infinite	
T <sub>oper</sub>	Operating Free Air Temperature Range	0 to 70 -40 to 105 -55 to 125	°C
T <sub>stg</sub>	Storage Temperature Range	-65 to 150	°C

Notes : 1. All voltage values, except differential voltage, are with respect to the zero reference level (ground) of the supply voltages where the zero reference level is the midpoint between V<sub>cc</sub><sup>+</sup> and V<sub>cc</sub><sup>-</sup>.  
 2. Differential voltages are at the non-inverting input terminal with respect to the inverting input terminal.  
 3. The magnitude of the input voltage must never exceed the magnitude of the supply voltage or 15 volts, whichever is less.  
 4. The output may be shorted to ground or to either supply. Temperature and /or supply voltages must be limited to ensure that the dissipation rating is not exceeded.

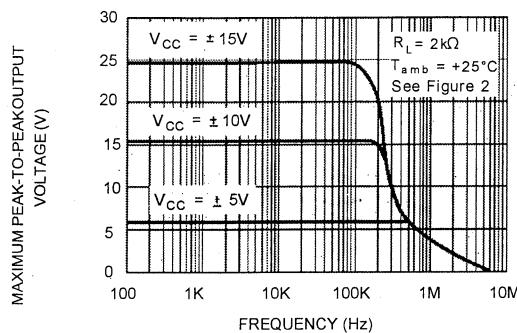
**ELECTRICAL CHARACTERISTICS**V<sub>CC</sub> = ±15V, T<sub>amb</sub> = 25°C (unless otherwise specified)

Symbol	Parameter	TL071I,M,AC,AI, AM,BC,BI,BM			TL071C			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	
V <sub>io</sub>	Input Offset Voltage (R <sub>S</sub> = 50Ω) T <sub>amb</sub> = 25°C T <sub>min.</sub> ≤ T <sub>amb</sub> ≤ T <sub>max.</sub>	TL071 TL071A TL071B TL071 TL071A TL071B	3 3 1	10 6 3 13 7 5		3	10 13	mV
DV <sub>io</sub>	Input Offset Voltage Drift		10			10		µV/°C
I <sub>io</sub>	Input Offset Current *		5	100 4		5	100 10	pA nA
I <sub>ib</sub>	Input Bias Current *		20	200 20		20	200 20	pA nA
A <sub>vd</sub>	Large Signal Voltage Gain (R <sub>L</sub> = 2kΩ, V <sub>O</sub> = ±10V) T <sub>amb</sub> = 25°C T <sub>min.</sub> ≤ T <sub>amb</sub> ≤ T <sub>max.</sub>	50 25	200		25 15	200		V/mV
SVR	Supply Voltage Rejection Ratio (R <sub>S</sub> = 50Ω) T <sub>amb</sub> = 25°C T <sub>min.</sub> ≤ T <sub>amb</sub> ≤ T <sub>max.</sub>	80 80	86		70 70	86		dB
I <sub>cc</sub>	Supply Current, no Load T <sub>amb</sub> = 25°C T <sub>min.</sub> ≤ T <sub>amb</sub> ≤ T <sub>max.</sub>		1.4	2.5 2.5		1.4	2.5 2.5	mA
V <sub>icom</sub>	Input Common Mode Voltage Range	±11	+15 -12		±11	+15 -12		V
CMR	Common Mode Rejection Ratio (R <sub>S</sub> = 50Ω) T <sub>amb</sub> = 25°C T <sub>min.</sub> ≤ T <sub>amb</sub> ≤ T <sub>max.</sub>	80 80	86		70 70	86		dB
I <sub>os</sub>	Output Short-circuit Current T <sub>amb</sub> = 25°C T <sub>min.</sub> ≤ T <sub>amb</sub> ≤ T <sub>max.</sub>	10 10	40	60 60	10 10	40	60 60	mA
±V <sub>OPP</sub>	Output Voltage Swing T <sub>amb</sub> = 25°C R <sub>L</sub> = 2kΩ R <sub>L</sub> = 10kΩ R <sub>L</sub> = 2kΩ R <sub>L</sub> = 10kΩ T <sub>min.</sub> ≤ T <sub>amb</sub> ≤ T <sub>max.</sub>	10 12 10 12	12 13.5		10 12 10 12	12 13.5		V
SR	Slew Rate (V <sub>in</sub> = 10V, R <sub>L</sub> = 2kΩ, C <sub>L</sub> = 100pF, T <sub>amb</sub> = 25°C, unity gain)	8	16		8	16		V/µs
t <sub>r</sub>	Rise Time (V <sub>in</sub> = 20mV, R <sub>L</sub> = 2kΩ, C <sub>L</sub> = 100pF, T <sub>amb</sub> = 25°C, unity gain)		0.1			0.1		µs
Kov	Overshoot (V <sub>in</sub> = 20mV, R <sub>L</sub> = 2kΩ, C <sub>L</sub> = 100pF, T <sub>amb</sub> = 25°C, unity gain)		10			10		%
GBP	Gain Bandwidth Product (f = 100kHz, T <sub>amb</sub> = 25°C, V <sub>in</sub> = 10mV, R <sub>L</sub> = 2kΩ, C <sub>L</sub> = 100pF)	2.5	4		2.5	4		MHz
R <sub>i</sub>	Input Resistance		10 <sup>12</sup>			10 <sup>12</sup>		Ω
THD	Total Harmonic Distortion (f = 1kHz, A <sub>V</sub> = 20dB, R <sub>L</sub> = 2kΩ, C <sub>L</sub> = 100pF, T <sub>amb</sub> = 25°C, V <sub>O</sub> = 2V <sub>PP</sub> )		0.01			0.01		%
e <sub>n</sub>	Equivalent Input Noise Voltage (f = 1kHz, R <sub>S</sub> = 100Ω)		15			15		nV /Hz
Øm	Phase Margin		45			45		Degrees

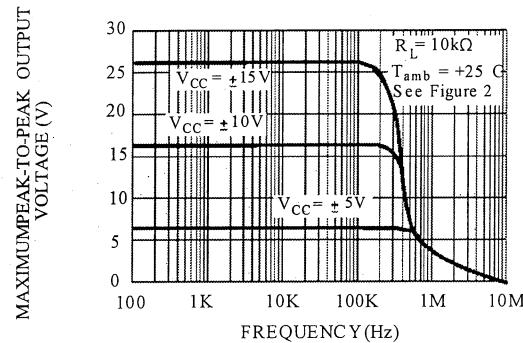
\* The input bias currents are junction leakage currents which approximately double for every 10°C increase in the junction temperature.

## TL071 - TL071A - TL071B

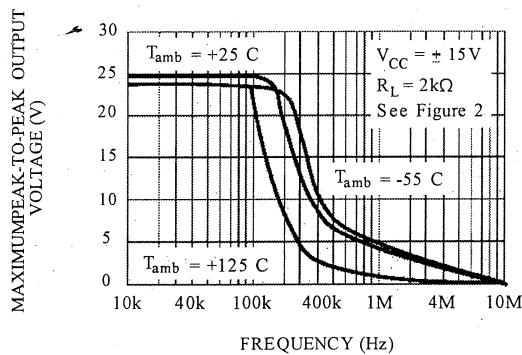
**MAXIMUM PEAK-TO-PEAK OUTPUT VOLTAGE VERSUS FREQUENCY**



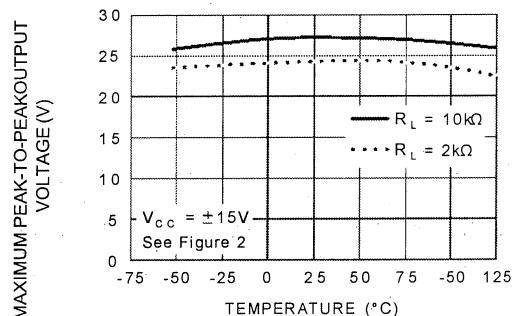
**MAXIMUM PEAK-TO-PEAK OUTPUT VOLTAGE VERSUS FREQUENCY**



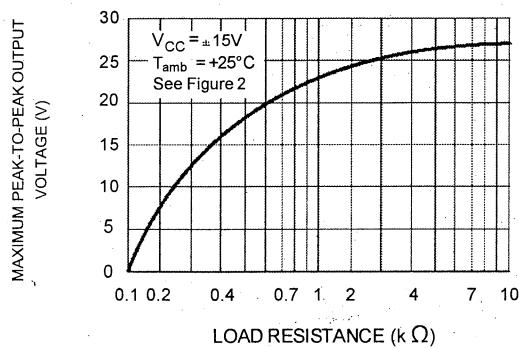
**MAXIMUM PEAK-TO-PEAK OUTPUT VOLTAGE VERSUS FREQUENCY**



**MAXIMUM PEAK-TO-PEAK OUTPUT VOLTAGE VERSUS FREE AIR TEMP.**



**MAXIMUM PEAK-TO-PEAK OUTPUT VOLTAGE VERSUS LOAD RESISTANCE**



**MAXIMUM PEAK-TO-PEAK OUTPUT VOLTAGE VERSUS SUPPLY VOLTAGE**

