

J-FET Input Operational Amplifier

IR9082/IR9082N/IR9084/IR9084N

T-79-15

# IR9082/IR9082N/IR9084/IR9084N

## J-FET Input Operational Amplifier

### ■ Description

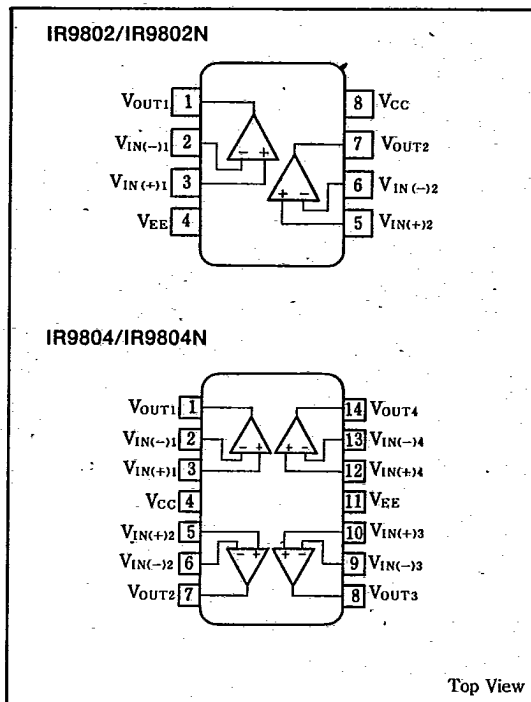
The IR9082/IR9082N/IR9084/IR9084N is an operational amplifier featured with a high slew rate, high input impedance, low input bias current and low input offset current, and its input differential amplifier is composed of J-FET pair transistors.

Thus, it can be used in a wide range of applications, such as general control equipment, medical equipment and audio equipment. Especially, it is most suitable for processing signals from a high impedance sensor.

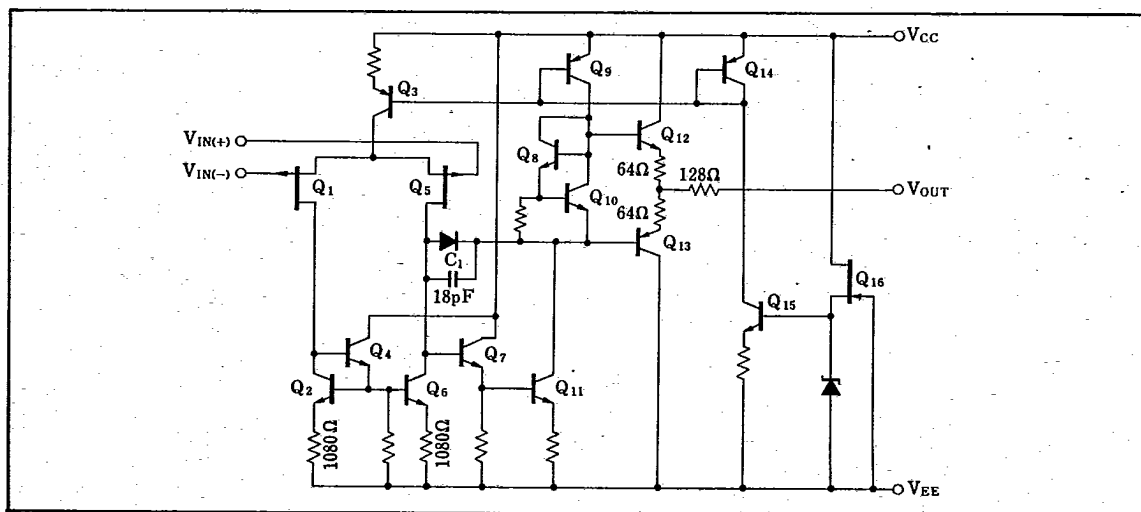
### ■ Features

1. Internal phase compensation type
2. Low input bias current 30pA (TYP.)
3. Low input offset current 5pA (TYP.)
4. High input impedance  $10^{12}\Omega$  (TYP.)
5. High slew rate  $13V/\mu s$  (TYP.)
6. Wide in-phase input voltage range
7. High voltage gain 200V/mV (TYP.)
8. 8-pin dual-in-line package (IR9082)  
8-pin small outline package (IR9082N)  
14-pin dual-in-line package (IR9084)  
14-pin small outline package (IR9084N)

### ■ Pin Connections



### ■ Equivalent Circuit



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## Absolute Maximum Ratings

(Ta=25°C)

Parameter	Symbol	Condition	Rating	Unit	
Supply voltage	V <sub>CC</sub>		+18	V	
	V <sub>EE</sub>		-18	V	
Differential input voltage	V <sub>ID</sub>	*1	±30	V	
Input voltage	V <sub>IN</sub>	*1	±15	V	
Power dissipation	P <sub>D</sub>	Ta ≤ 75°C	IR9082	450	mW
			IR9082N	290	
			IR9084	675	
			IR9084N	360	
Operating temperature	T <sub>opr</sub>		-20 ~ +75	°C	
Storage temperature	T <sub>str</sub>		-65 ~ +150	°C	

\*1 When supply voltage is within ±15V, it is equivalent to supply voltage.

## Electrical Characteristics

(V<sub>CC</sub> = +15V, V<sub>EE</sub> = -15V)

Parameter	Symbol	Condition	MIN.	TYP.	MAX.	Unit	
Input offset voltage	V <sub>IO</sub>	Ta = 25°C		3	10	mV	
		Ta = Full range	R <sub>S</sub> = 50 Ω		15		
Input offset current	I <sub>IO</sub>	Ta = 25°C *2	IR9082		5	100	pA
			IR9082N				
			IR9084 IR9084N		5	200	
		Ta = Full range *2	IR9082			3	nA
			IR9082N				
			IR9084 IR9084N			5	
Input bias current	I <sub>B</sub>	Ta = 25°C		30	400	pA	
		Ta = Full range	(Note 1)			10	nA
Input impedance	Z <sub>IN</sub>	Ta = 25°C		10 <sup>12</sup>		Ω	
Large amplitude voltage gain	A <sub>V</sub>	Ta = 25°C	R <sub>L</sub> ≥ 2kΩ,	50	200	V/mV	
		Ta = Full range	V <sub>OUT</sub> = ±10V	25			
Maximum output voltage	V <sub>OM</sub>	Ta = 25°C	R <sub>L</sub> ≥ 10kΩ	24	27	V	
		Ta = Full range		24			
In-Phase input voltage width	V <sub>ICM</sub>	Ta = 25°C		±11	±12	V	
In-phase signal rejection ratio	CMR	Ta = 25°C	R <sub>S</sub> ≤ 10kΩ	70	76	dB	
Supply voltage rejection ratio	SVR	Ta = 25°C	R <sub>S</sub> ≤ 10kΩ	70	76	dB	
Supply current	I <sub>CC</sub>	Ta = 25°C	R <sub>L</sub> = ∞ No signal	IR9082		3	mA
				IR9082N			
				IR9084		6	12
				IR9084N			
Slew rate	SR	Ta = 25°C	R <sub>L</sub> = 2kΩ, C <sub>L</sub> = 100pF A <sub>V</sub> = 1, V <sub>IN</sub> = 10V		13	V/μs	
Gain bandwidth product	f <sub>T</sub>	Ta = 25°C	A <sub>V</sub> = 1		3	MHz	
Input conversion noise voltage	V <sub>NI</sub>	Ta = 25°C	R <sub>S</sub> = 100Ω, f = 1kHz		15	nV/√Hz	
Recommended operating voltage	V <sub>CC</sub> , V <sub>EE</sub>			±5		±15	V

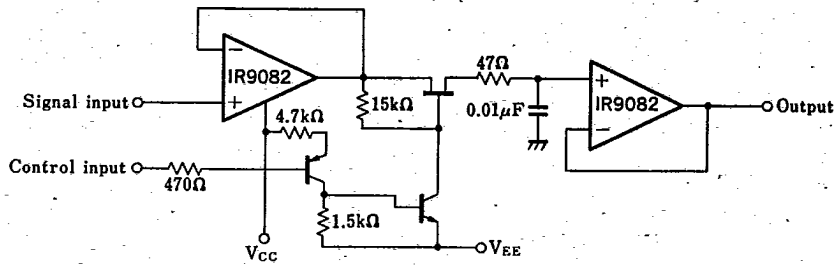
\*2 This is J-FET gate leakage current. It is necessary to maintain the connection part temperature to normal at measurement.

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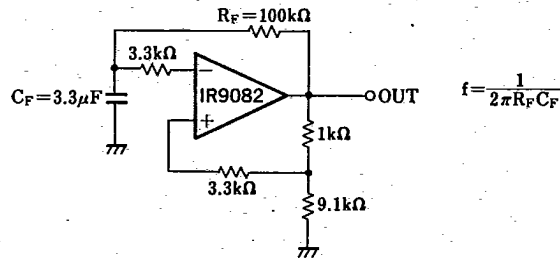
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### Application Circuit Examples

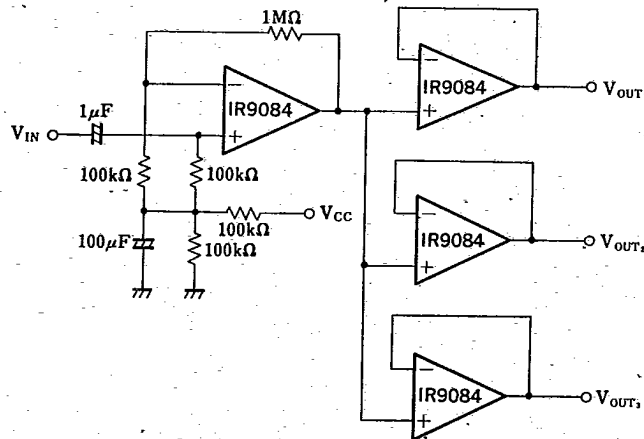
#### (1) Sample hold circuit



#### (2) Short-ripple oscillation circuit (0.5Hz)



#### (3) Audio distribution amplifier



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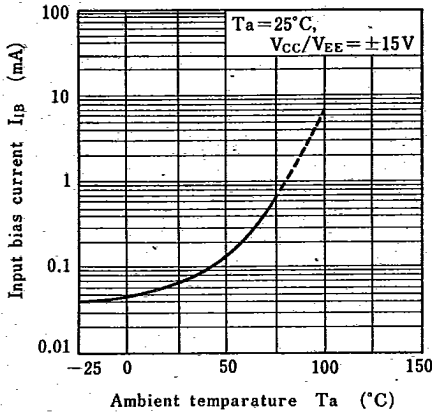
J-EET Input Operational Amplifier

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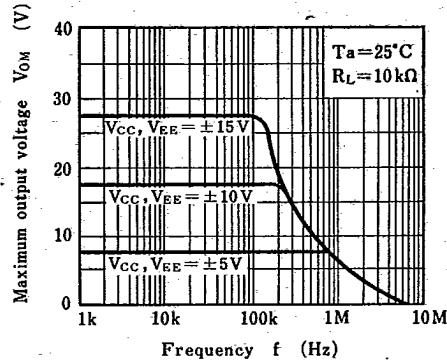
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Electrical Characteristic Curves

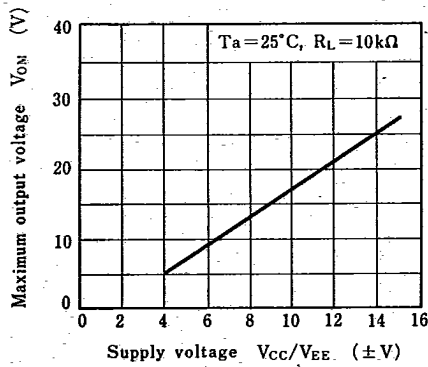
Input bias current—Temperature Characteristics



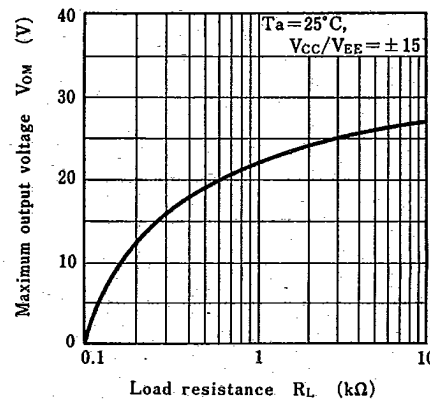
Maximum output voltage—Frequency Characteristics



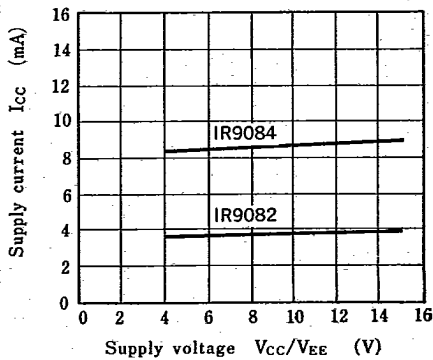
Maximum output voltage—Supply voltage Characteristics



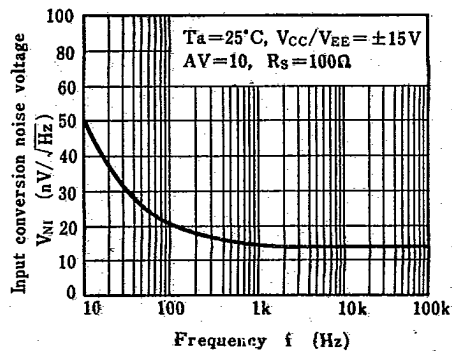
Maximum output voltage—Load resistance Characteristics



Supply current—Supply voltage Characteristics



Input conversion noise voltage—Frequency Characteristics



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