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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.

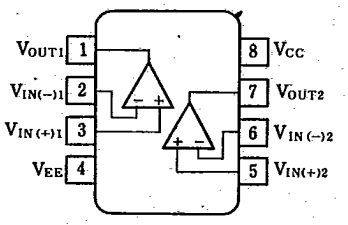
Thus, it can be used in a wide range of applications, such as general control equipment, medical equipment and audio equipment. Especially, it is most suitable for processing signals from a high impedance sensor.

■ Features

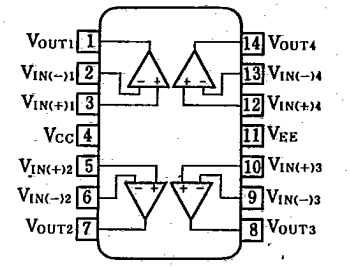
1. Internal phase compensation type
2. Low input bias current 30pA (TYP.)
3. Low input offset current 5pA (TYP.)
4. High input impedance $10^{12}\Omega$(TYP.)
5. High slew rate 13V/μs (TYP.)
6. Wide in-phase input voltage range
7. High voltage gain 200V/mV (TYP.)
8. 8-pin dual-in-line package (IR9082)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

■ Pin Connections

IR9802/IR9802N

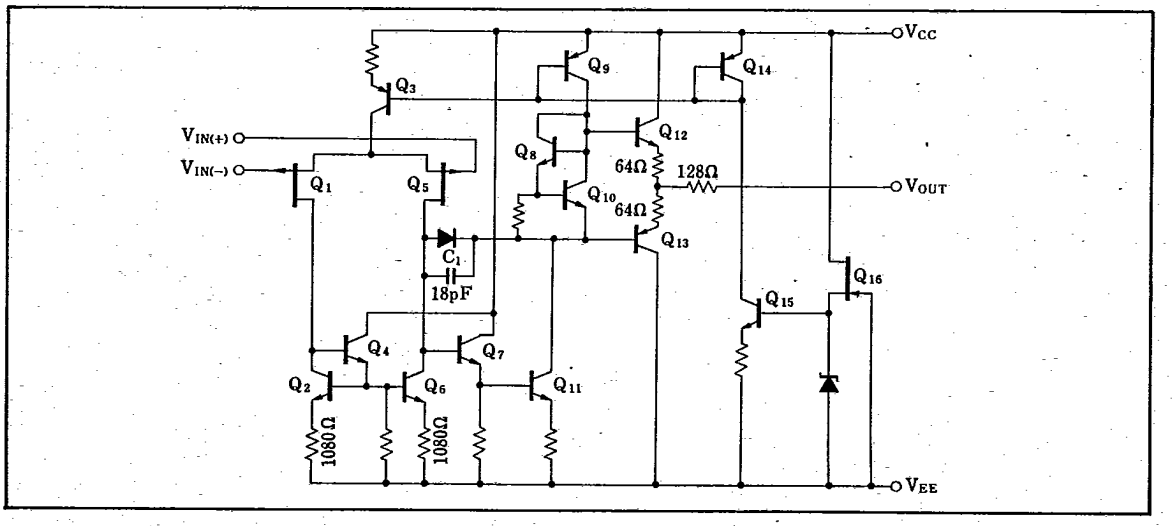


IR9804/IR9804N



Top View

■ Equivalent Circuit



■ Absolute Maximum Ratings

(Ta=25℃)

Parameter	Symbol	Condition		Rating	Unit
Supply voltage	V_{CC}			+18	V
	V_{EE}			−18	V
Differential input voltage	V_{ID}	*1		±30	V
Input voltage	V_{IN}	*1		±15	V
Power dissipation	P_D	Ta≦75℃	IR9082	450	mW
			IR9082N	290	
			IR9084	675	
			IR9084N	360	
Operating temperature	T_{opr}			−20～+75	℃
Storage temperature	T_{stg}			−55～+150	℃

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

■ Electrical Characteristics

(V_{CC}=+15V, V_{EE}=−15V)

Parameter	Symbol	Condition		MIN.	TYP.	MAX.	Unit
Input offset voltage	V_{IO}	Ta=25℃	R_S=50Ω		3	10	mV
		Ta=Full range				15	
Input offset current	I_{IO}	Ta=25℃ *2	IR9082 IR9082N		5	100	pA
			IR9084 IR9084N		5	200	
		Ta=Full range *2	IR9082 IR9082N			3	nA
			IR9084 IR9084N			5	
Input bias current	I_B	Ta=25℃	(Note 1)		30	400	pA
		Ta=Full range				10	nA
Input impedance	Z_{IN}	Ta=25℃			10^{12}		Ω
Large amplitude voltage gain	A_V	Ta=25℃	R_L≧2kΩ, V_{OUT}=±10V	50	200		V/mV
		Ta=Full range		25			
Maximum output voltage	V_{OM}	Ta=25℃	R_L≧10kΩ	24	27		V
		Ta=Full range		24			
In-Phase input voltage width	V_{ICM}	Ta=25℃		±11	±12		V
In-phase signal rejection ratio	CMR	Ta=25℃	R_S≦10kΩ	70	76		dB
Supply voltage rejection ratio	SVR	Ta=25℃	R_S≦10kΩ	70	76		dB
Supply current	I_{CC}	Ta=25℃	R_L=∞ No signal IR9082 IR9082N		3	6	mA
			R_L=∞ No signal IR9084 IR9084N		6	12	
Slew rate	SR	Ta=25℃	R_L=2kΩ, C_L=100pF A_V=1, V_{IN}=10V		13		V/μs
Gain bandwidth product	f_T	Ta=25℃	A_V=1		3		MHz
Input conversion noise voltage	V_{NI}	Ta=25℃	R_S=100Ω, f=1kHz		15		nV/√Hz
Recommended operating voltage	V_{CC}, V_{EE}			±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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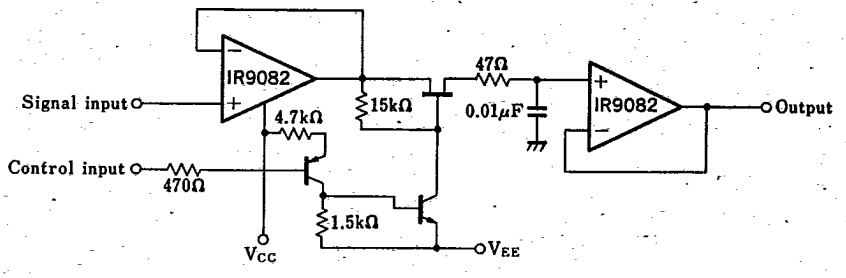
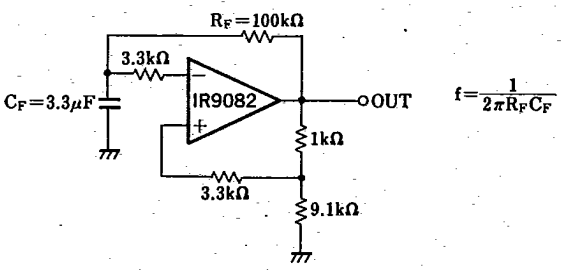
■ Application Circuit Examples

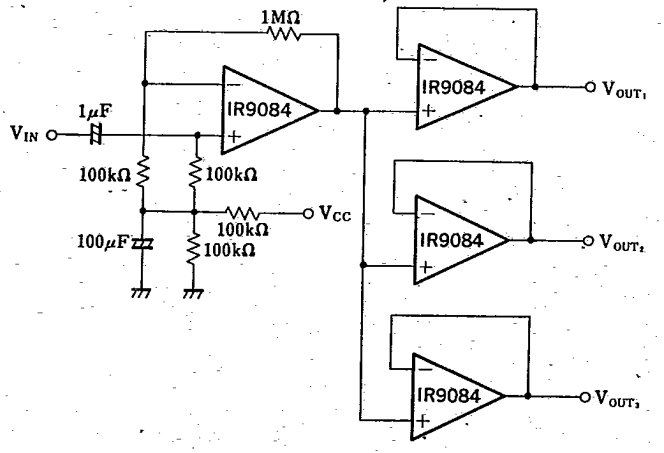
(1) Sample hold circuit



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



(3) Audio distribution amplifier



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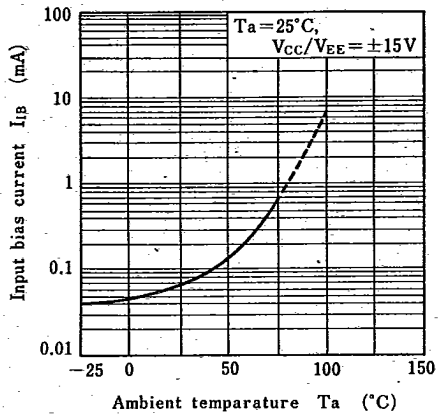
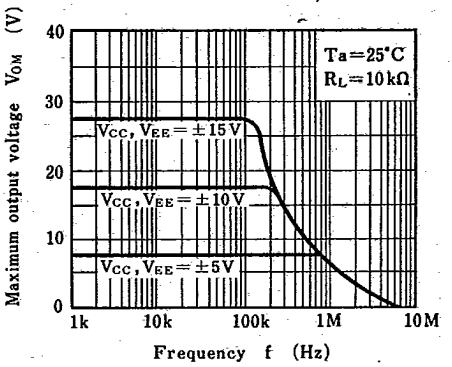
Electrical Characteristic Curves

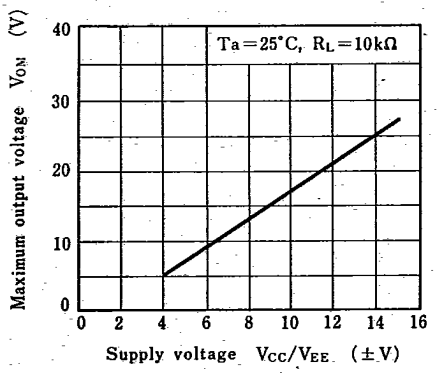
Input bias current—Temperature Characteristics



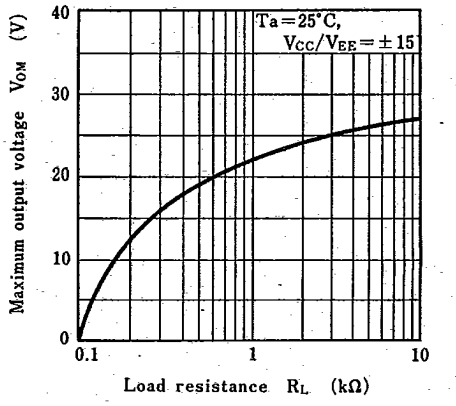
Maximum output voltage—Frequency Characteristics



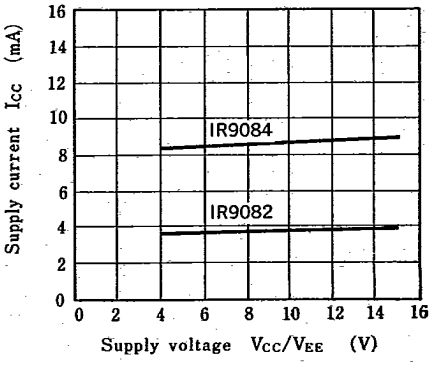
Maximum output voltage—Supply voltage Characteristics



Maximum output voltage —Load resistance Characteristics



Supply current—Supply voltage Characteristics



Input conversion noise voltage —Frequency Characteristics