Ordering number: EN 1958A

Monolithic Linear IC

No.1958A

LA6083D

J-FET Input Dual Operational Amplifier

The LA6083D is a J-FET input dual operational amplifier. Application areas include general-purpose control equipment, measuring equipment (very low current measurement, long-integrating circuit, sample & hold circuit, impedance converter, etc.).

Features

- High slew rate
- High input impedance
- Low input bias current
- Low input offset current
- No phase compensation required
- With offset null pins

Maximum Ratings at Ta=25°C

			unit
Maximum Supply Voltage	V_{CC}/V_{EE}	±18	V
Differential Input Voltage	V_{ID}	±30	V
Common-Mode Input Voltage	V_{IN} (Note)	±15	V
Allowable Power Dissipation	Pd max	720	mW
Operating Temperature	Topr	-30 to +85	°C
Storage Temperature	Tstg	-55 to +125	°C

(Note) Allowable in the range of supply voltage. The above value is for V_{CC}=+15V, V_{EE}=-15V.

Operating Characteristics at Ta=25°C, V_{CC}=+15, V_{EE}=-15V

			min	typ	max	unit
Input Offset Voltage	V_{IO}	R_S=50ohms		5.0	15.0	mV
Input Offset Current	I_{IO}			5	200	pA
Input Bias Current	I_B			30	400	pA
Common-Mode Input Voltage Range	V_{ICM}		±10			V
Common-Mode Rejection Ratio	CMR		70	76		dB
Large Amplitude Voltage Gain	VG	$R_L \geq$2kohms, Vo=±10V	25	200		V/mV
Maximum Output Voltage	Vopp1	$R_L \geq$10kohms	±12	±13.5		V
	Vopp2	$R_L \geq$2kohms	±10	±12		V

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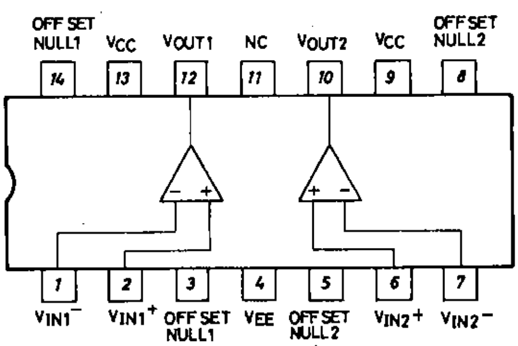
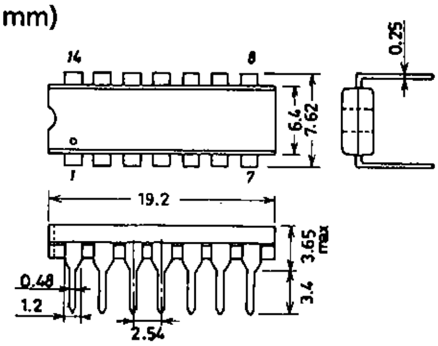
Pin Assignment



Package Dimensions 3003A-D14IC
(unit : mm)



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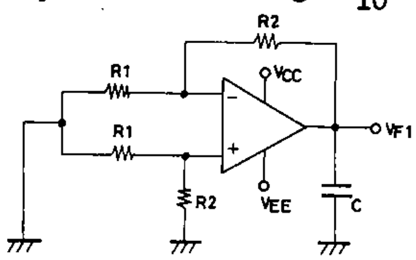
			min	typ	max	unit
Supply Voltage Rejection Ratio	SVR		70	76		dB
Supply Current	I_{CC}	$R_L=\infty$		4	5.6	mA
Gain-Bandwidth Product	f_T	$A_V=1$		3		MHz
Equivalent Input Noise Voltage	V_{NI}	R_S=100ohms, f=10Hz to 10kHz		4		uVrms
Input Resistance	r_i			10^{12}		ohm
Channel Separation	ch sep			120		dB
Slew Rate	S·R	R_L=2kohms, C_L=100pF, $A_V=1$, V_{IN}=10V		13		V/us

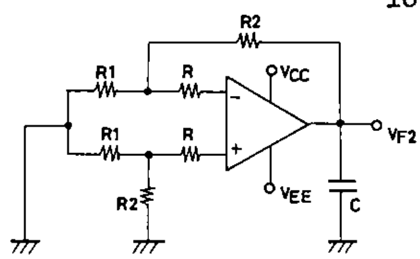
Test Circuits

1. Input Offset Voltage V_{IO}



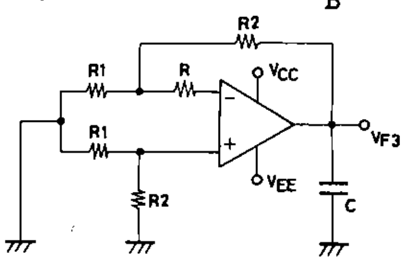
$$V_{IO}=\frac{V_{F1}}{1+R2/R1}$$

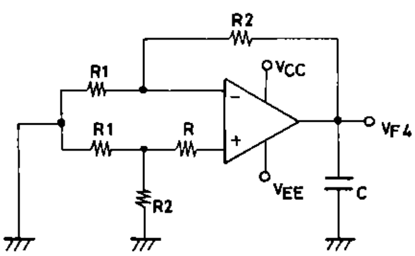
2. Input Offset Current I_{IO}



$$I_{IO}=\frac{V_{F2}-V_{F1}}{R(1+R2/R1)}$$

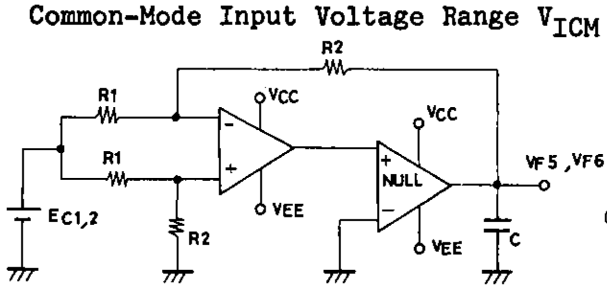
3. Input Bias Current I_B





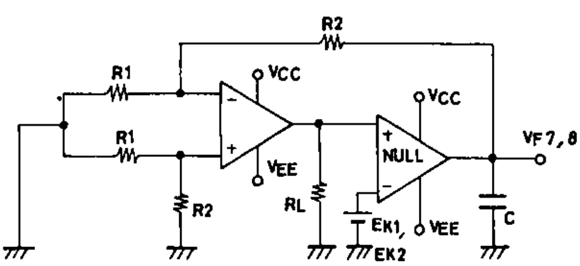
$$I_B=\frac{V_{F4}-V_{F3}}{2R(1+R2/R1)}$$

4. Common-Mode Rejection Ratio CMR
Common-Mode Input Voltage Range V_{ICM}



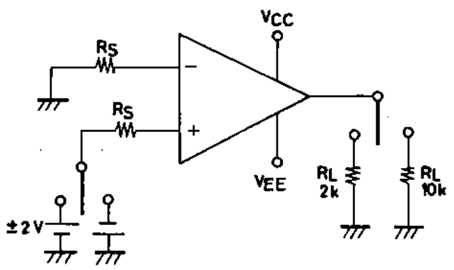
$$CMR=20\log\left|\frac{(E_{C1}-E_{C2})(1+R2/R1)}{V_{F5}-V_{F6}}\right|$$

5. Voltage Gain VG

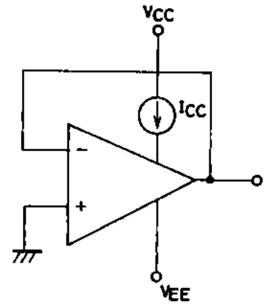


$$VG=\frac{(E_{K1}-E_{K2})(1+R2/R1)}{V_{F8}-V_{F7}}$$

6. Maximum Output Voltage Vopp

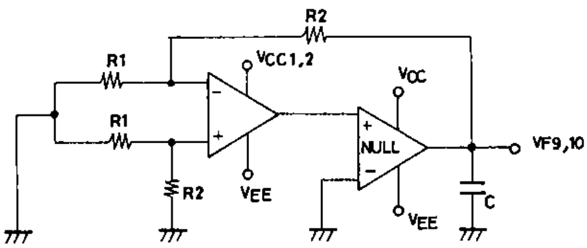


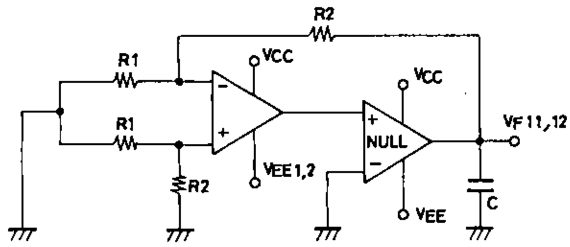
7. Supply Current I_{CC}



Unit (resistance: Ω)

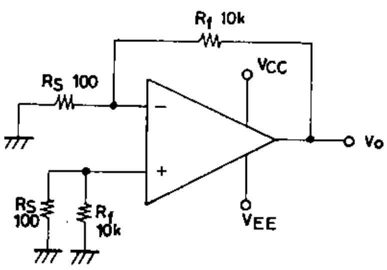
8. Supply Voltage Rejection Ratio SVR





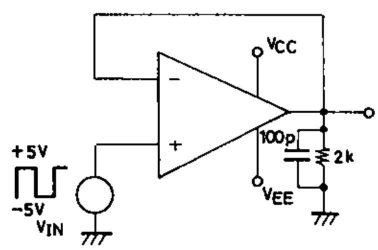
$$SVR(+) = 20\log\left|\frac{(1+R2/R1)(V_{CC1}-V_{CC2})}{V_{F9}-V_{F10}}\right| \qquad SVR(-) = 20\log\left|\frac{(1+R2/R1)(V_{EE1}-V_{EE2})}{V_{F11}-V_{F12}}\right|$$

9. Equivalent Input Noise Voltage V_{NI}



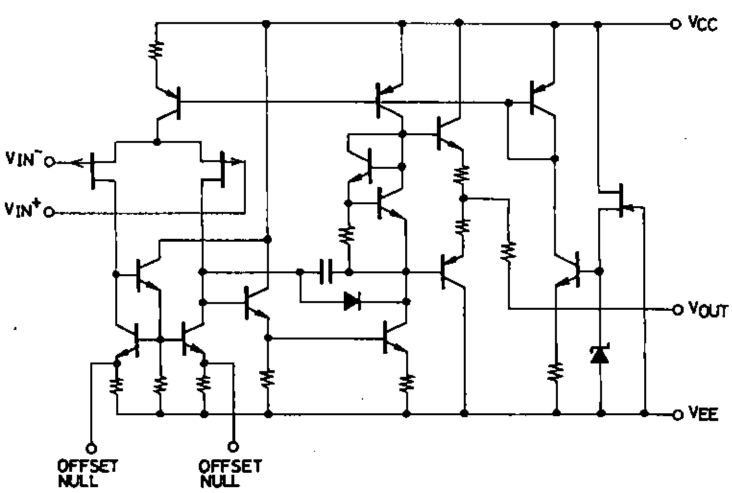
$$V_{NI} = \frac{V_O}{100}$$

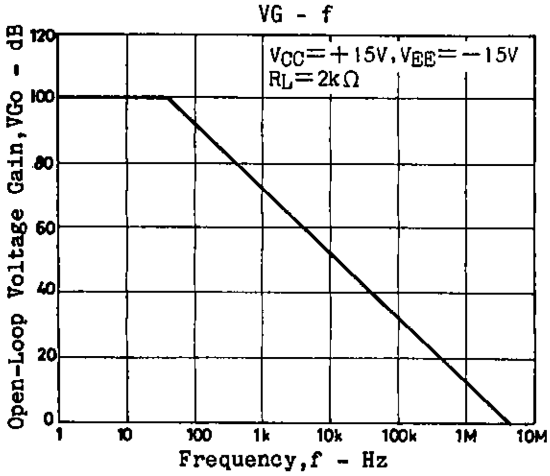
10. Slew Rate SR

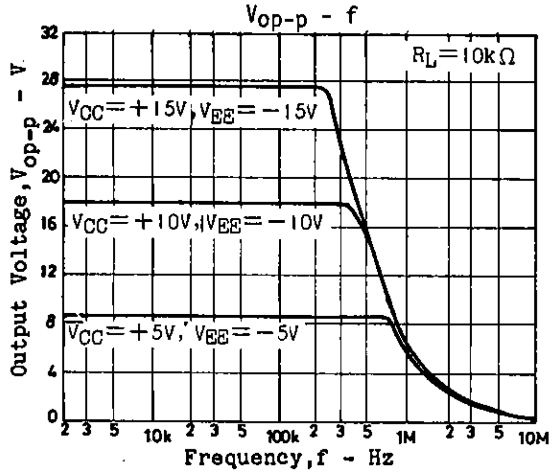


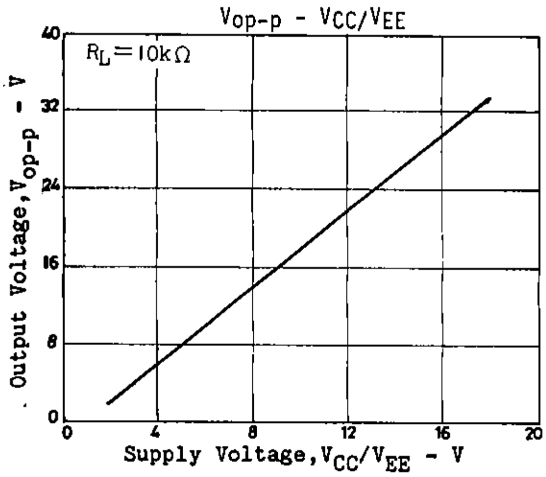
Unit (resistance: Ω capacitance: F)

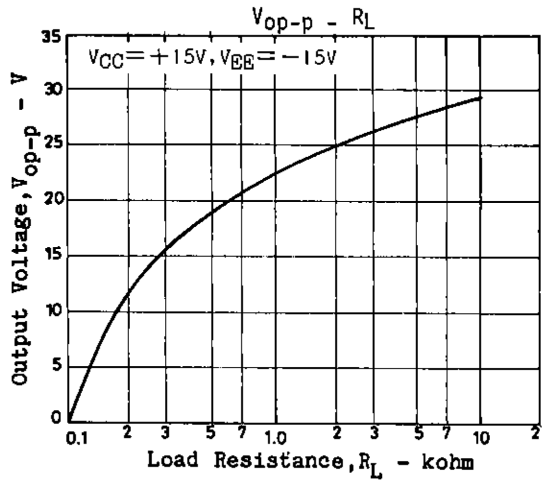
Equivalent Circuit

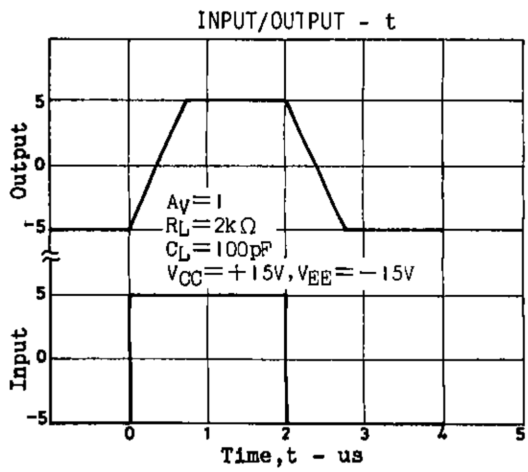


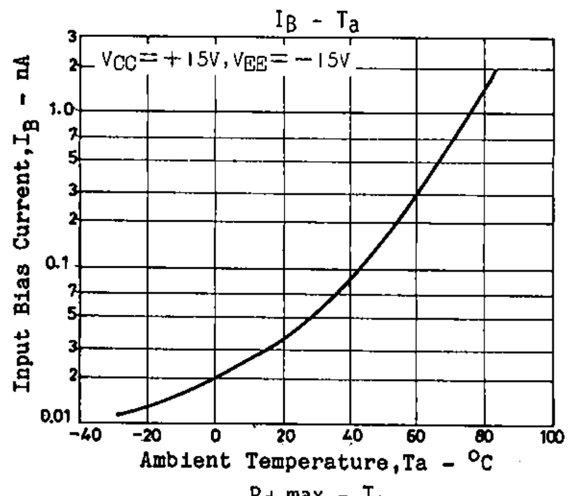

VG - f
V_{CC}=+15V, V_{EE}=−15V
R_L=2kΩ
Open-Loop Voltage Gain, VGo - dB
Frequency, f - Hz
120
100
80
60
40
20
0
1
10
100
1k
10k
100k
1M
10M

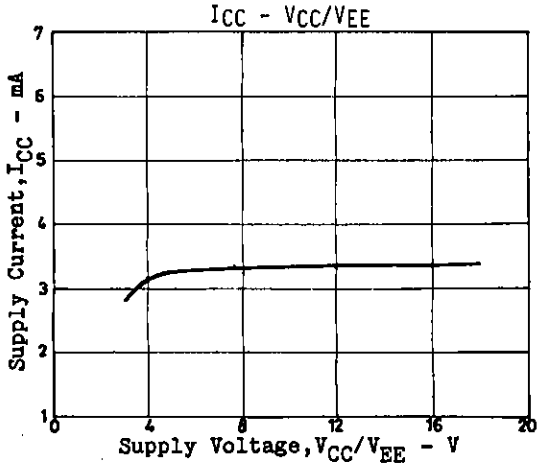

V_{op-p} - f
R_L=10kΩ
V_{CC}=+15V, V_{EE}=−15V
V_{CC}=+10V, V_{EE}=−10V
V_{CC}=+5V, V_{EE}=−5V
Output Voltage, V_{op-p} - V
Frequency, f - Hz
32
28
24
20
16
12
8
4
0
10k
100k
1M
10M

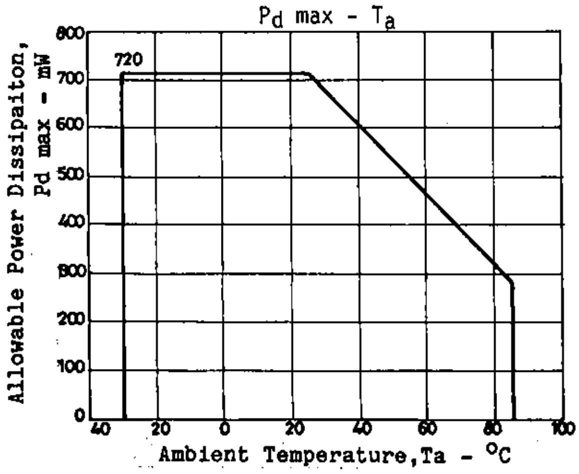

V_{op-p} - V_{CC}/V_{EE}
R_L=10kΩ
Output Voltage, V_{op-p} - V
Supply Voltage, V_{CC}/V_{EE} - V
40
32
24
16
8
0
4
8
12
16
20


V_{op-p} - R_L
V_{CC}=+15V, V_{EE}=−15V
Output Voltage, V_{op-p} - V
Load Resistance, R_L - kohm
35
30
25
20
15
10
5
0
0.1
1.0
10

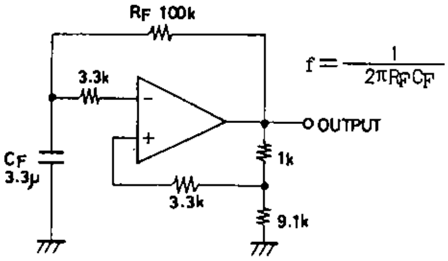

INPUT/OUTPUT - t
A_V=1
R_L=2kΩ
C_L=100pF
V_{CC}=+15V, V_{EE}=−15V
Output
Input
Time, t - us
5
0
−5
0
1
2
3
4
5


I_B - T_a
V_{CC}=+15V, V_{EE}=−15V
Input Bias Current, I_B - nA
Ambient Temperature, Ta - °C
1.0
0.1
0.01
−40
−20
0
20
40
60
80
100

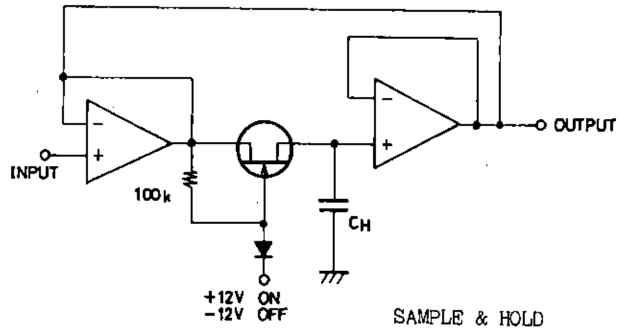

I_{CC} - V_{CC}/V_{EE}
Supply Current, I_{CC} - mA
Supply Voltage, V_{CC}/V_{EE} - V
7
6
5
4
3
2
1
0
4
8
12
16
20


P_d max - T_a
720
Allowable Power Dissipaiton, Pd max - mW
Ambient Temperature, Ta - °C
800
700
600
500
400
300
200
100
0
40
20
0
20
40
60
80
100

Sample Application Circuits



0.5Hz SQUARE · WAVE OCSILLATOR



SAMPLE & HOLD

Unit (resistance:Ω capacitance:F)

Voltage offset adjust circuit