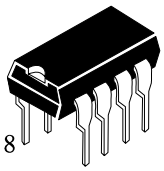
Low Power J-FET DUAL OPERATIONAL AMPLIFIERS

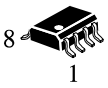
IL062

The IL062 is high speed J-FET input dual operational amplifier.
This J-FET input operational amplifier incorporates 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.

- Operation Very low power consumption: 200μA
- Wide common-mode (up to V_{CC}^{+}) and differential voltage ranges
- Low input bias and offset currents
- Output short-circuit protection
- High input impedance J-FET input stage
- Internal frequency compensation
- Latch up free operation
- High slew rate: 3.5V/s



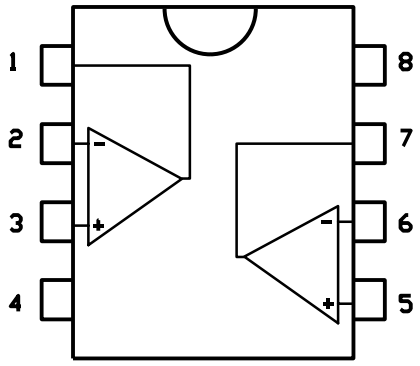
N SUFFIX
PLASTIC



D SUFFIX
SOIC

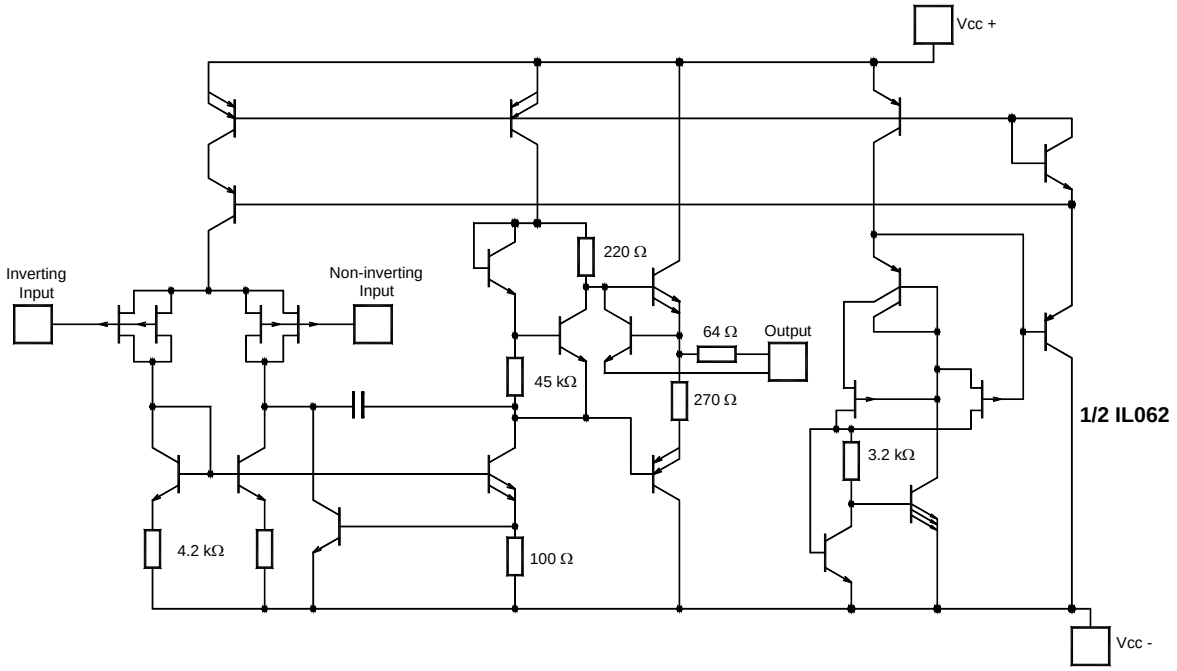
ORDERING INFORMATION
IL062N Plastic
IL062D SOIC
T_A = -40° to 85°C for package

Pin Connections (top view)



1 - Output 1
2 - Inverting input 1
3 - Non-inverting input 1
4 - V_{CC} -
5 - Non-inverting input 2
6 - Inverting input 2
7 - Output 2
8 - V_{CC} +

SCHEMATIC DIAGRAM



MAXIMUM RATING

Symbol	Parameter	IL062	Unit
V_{CC}	Supply Voltage – (note 1)	18	V
V_i	Input Voltage – (note 3)	15	V
V_{id}	Differential Input Voltage – (note 2)	30	V
P_{tot}	Power Dissipation	680	mW
	Output Short-Circuit Duration (Note 4)	Infinite	
T_{oper}	Operating Free-Air Temperature Range	-40 to +85	°C
T_{stg}	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_{CC}^+ and V_{CC}^-.
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.

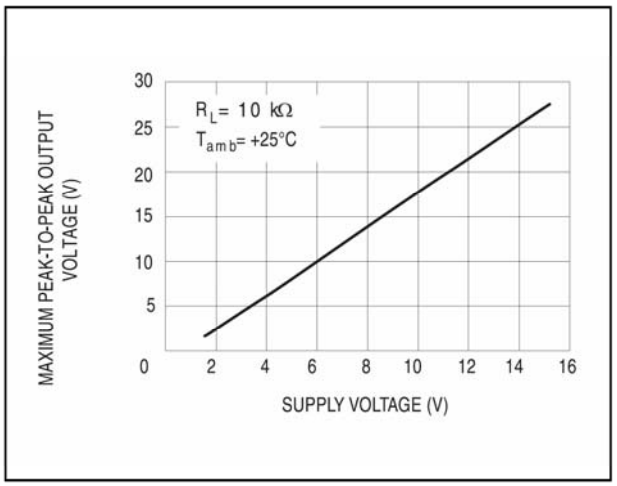
ELECTRICAL CHARACTERISTICS

V_{CC} = ± 15V, T_{AMB} = 25°C (unless otherwise specified)

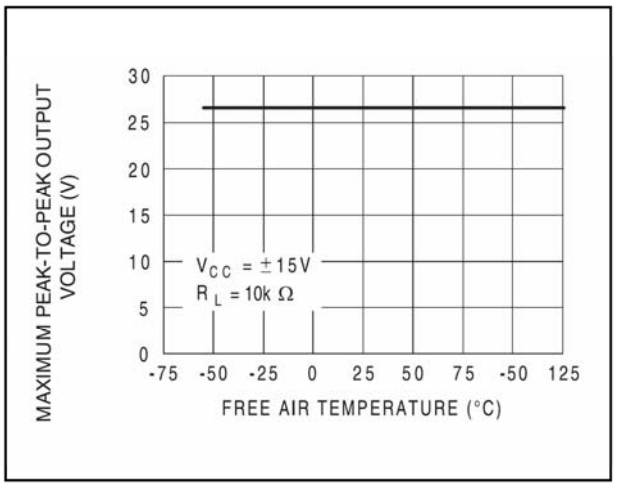
Symbol	Parameters	IL062			Unit
		Min.	Typ.	Max.	
V_{IO}	Input Offset Voltage (R_S = 50Ω) T_{amb} =25°C $T_{min.} \le T_{amb.} \le T_{max.}$		3	15 20	mV
DV_{IO}	Temperature Coefficient of Input Offset Voltage (R_S = 50Ω)		10		µV/°C
I_{IO}	Input Offset Current* T_{amb} =25°C $T_{min.} \le T_{amb.} \le T_{max.}$		5	200 5	pA nA
I_{IB}	Input Bias Current* T_{amb} =25°C $T_{min.} \le T_{amb.} \le T_{max.}$		30	400 10	pA nA
V_{ICM}	Input Common Mode Voltage Range	±11	+15 -12		V
V_{OPP}	Output Voltage Swing (R_L = 10kΩ) T_{amb} =25°C $T_{min.} \le T_{amb.} \le T_{max.}$	20 20	27		V
A_{VD}	Large Signal Voltage Gain (R_L = 10kΩ, V_O =± 10V) T_{amb} =25°C $T_{min.} \le T_{amb.} \le T_{max.}$	3 3	6		V/mV
GBP	Gain Bandwidth Product (T_{amb} =25°C, R_L = 10kΩ, C_L =100pF)		1		MHz
R_I	Input Resistance		10^{12}		Ω
CMR	Common Mode Rejection Ratio (R_S = 50Ω)	70	76		dB
SVR	Supply Voltage Rejection Ratio (R_S = 50Ω)	70	95		dB
I_{CC}	Supply Current (Per Amplifier) (T_{amb} =25°C, no load, no signal)		200	250	A
V_{O1}/V_{O2}	Channel Separation (A_V =100, T_{amb} =25°C)		120		dB
P_D	Total Power Consumption (Each Amplifier) (T_{amb} =25°C, no load, no signal)		6	7.5	mW
SR	Slew Rate (Vi = 10V, RL= 10kΩ, CL = 100pF, AV = 1)	1.5	3.5		V/µs
tr	Rise Time (Vi = 20mV, RL= 10kΩ, CL =100pF, AV = 1)		0.2		µs
KOV	Overshoot Factor (Vi = 20mV, RL= 10kΩ, CL =100pF, AV = 1) (see figure 1)		10		%
en	Equivalent input Noise Voltage (RS = 100Ω, f = 1KHz)		42		nV $\sqrt{Hz}$

* Input bias currents of a FET- input operational amplifier are normal junction reverse currents, which are temperature sensitive.
Pulse techniques must be used that will maintain the junction temperature as closes to the ambient temperature as possible.

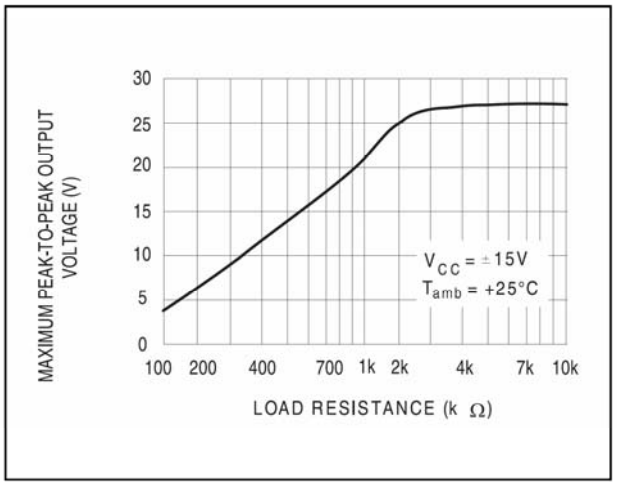
MAXIMUM PEAK-TO-PEAK OUTPUT VOLTAGE versus SUPPLY VOLTAGE



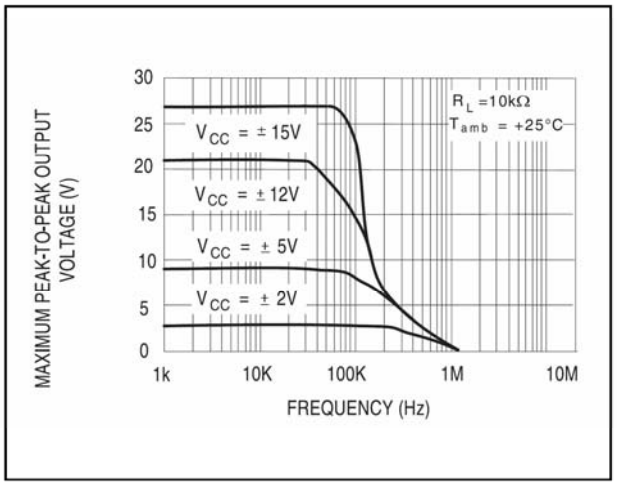
MAXIMUM PEAK-TO-PEAK OUTPUT VOLTAGE versus FREE AIR TEMP.



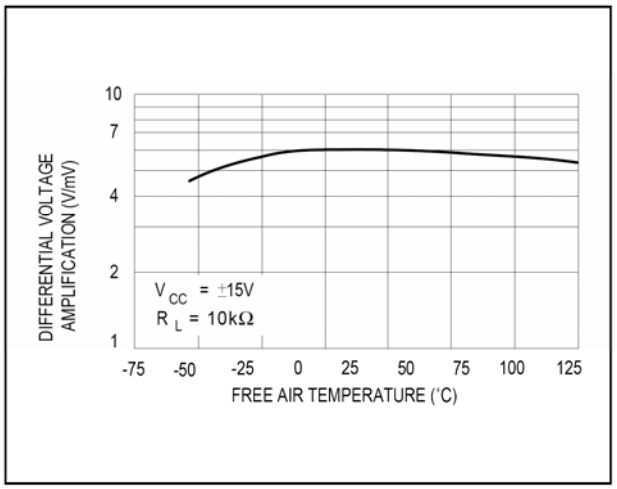
MAXIMUM PEAK-TO-PEAK OUTPUT VOLTAGE versus LOAD FREQUENCY



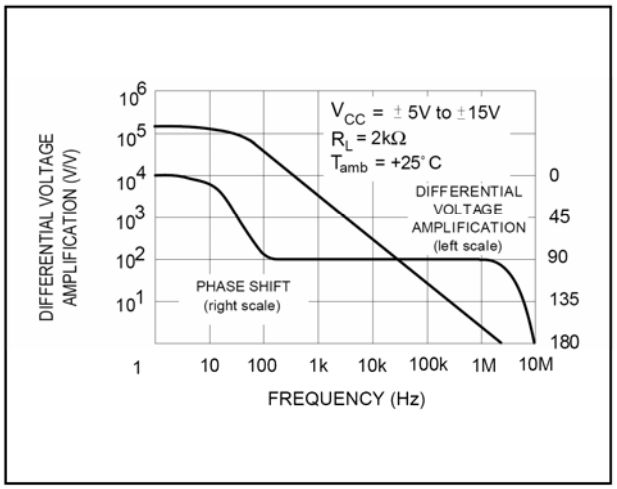
MAXIMUM PEAK-TO-PEAK OUTPUT VOLTAGE versus FREQUENCY



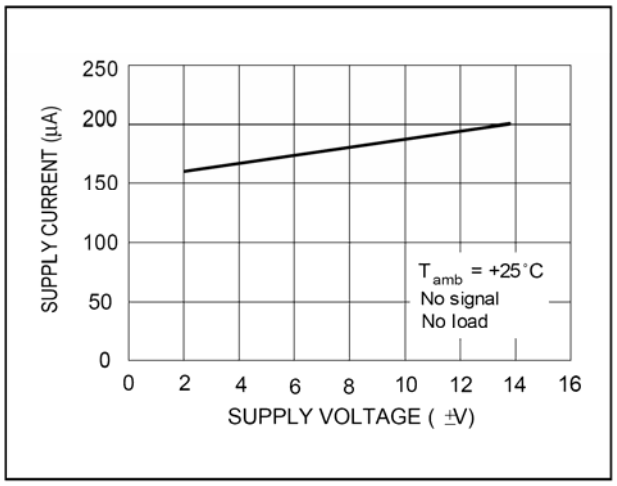
DIFFERENTIAL VOLTAGE AMPLIFICATION versus FREE AIR TEMPERATURE



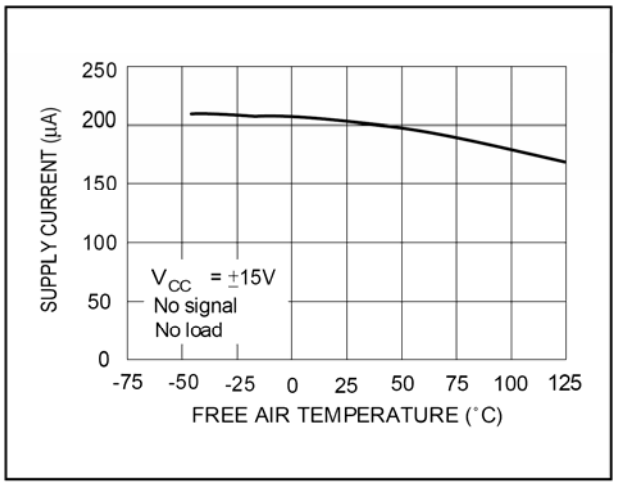
LARGE SIGNAL DIFFERENTIAL VOLTAGE AMPLIFICATION AND PHASE SHIFT versus FREQUENCY



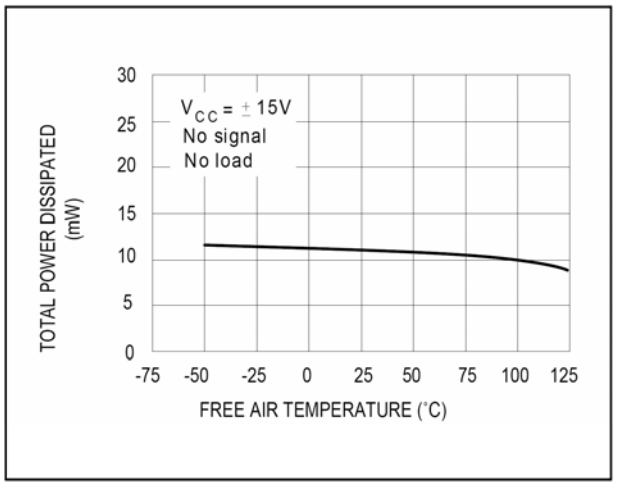
SUPPLY CURRENT PER AMPLIFIER versus SUPPLY VOLTAGE



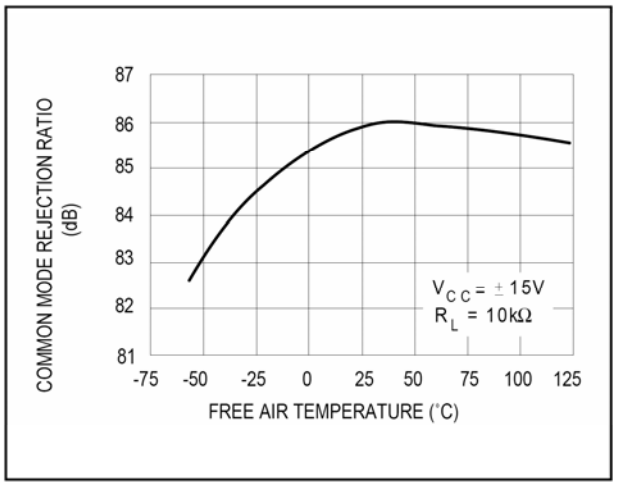
SUPPLY CURRENT PER AMPLIFIER versus FREE AIR TEMPERATURE



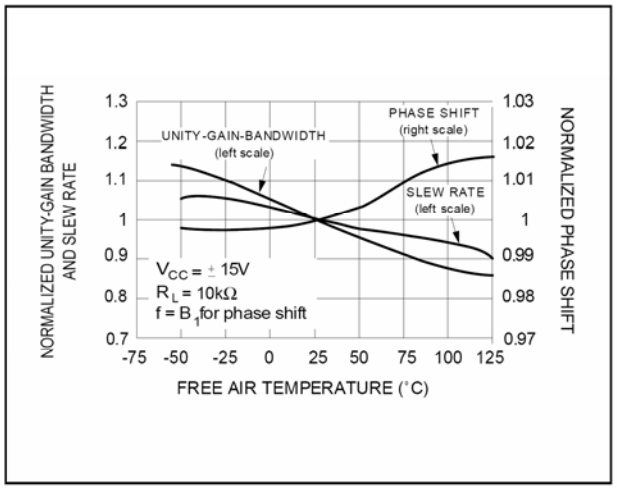
TOTAL POWER DISSIPATED versus FREE AIR TEMPERATURE



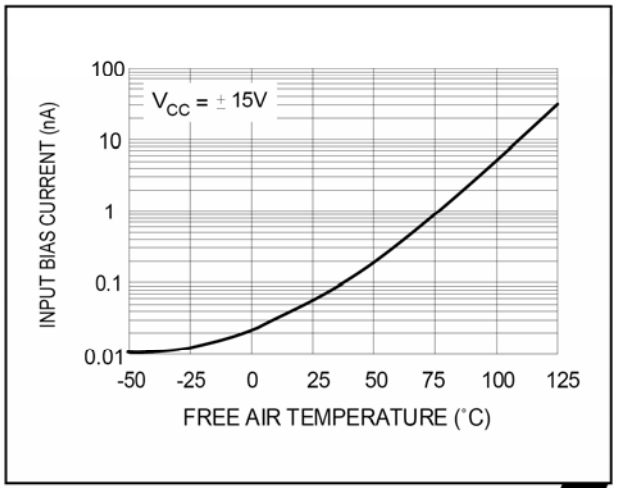
COMMON MODE REJECTION RATIO versus FREE AIR TEMPERATURE



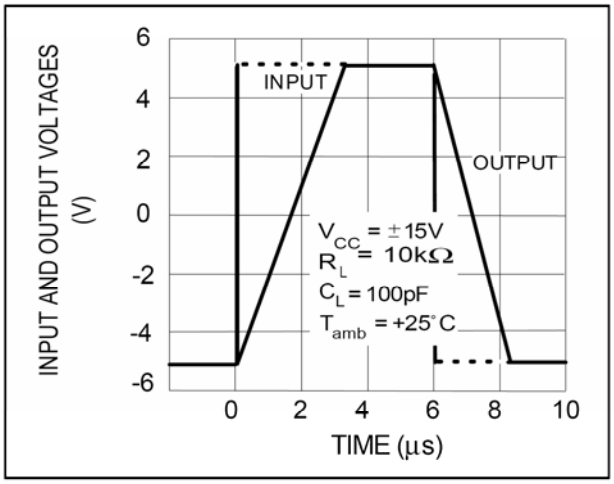
NORMALIZED UNITY GAIN BANDWIDTH SLEW RATE, AND PHASE SHIFT versus TEMPERATURE



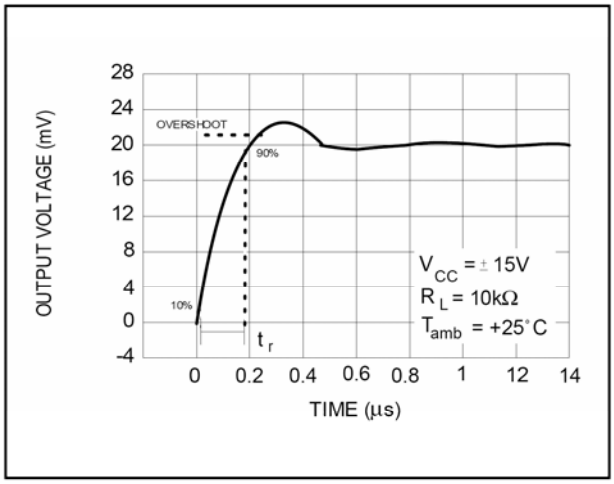
INPUT BIAS CURRENT versus FREE AIR TEMPERATURE



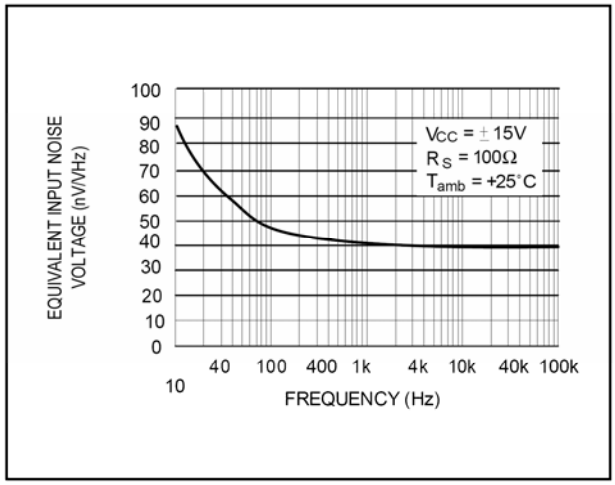
VOLTAGE FOLLOWER LARGE SIGNAL PULSE RESPONSE



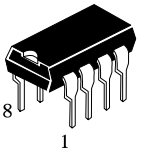
OUTPUT VOLTAGE versus ELAPSED TIME

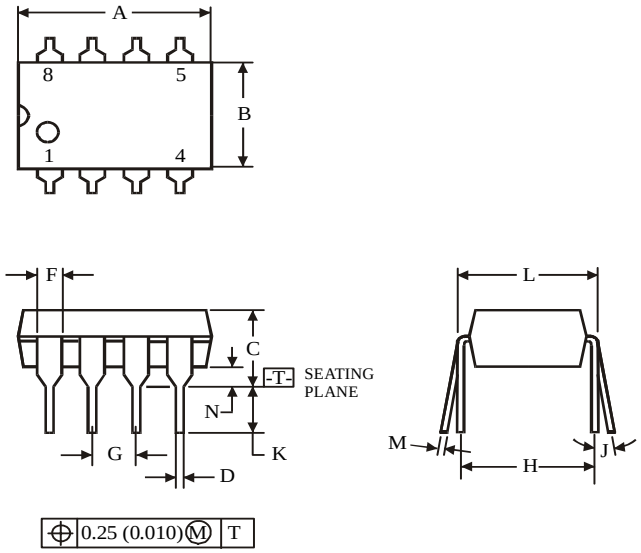


EQUIVALENT INPUT NOISE VOLTAGE versus FREQUENCY



N SUFFIX PLASTIC DIP
(MS – 001BA)



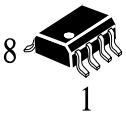


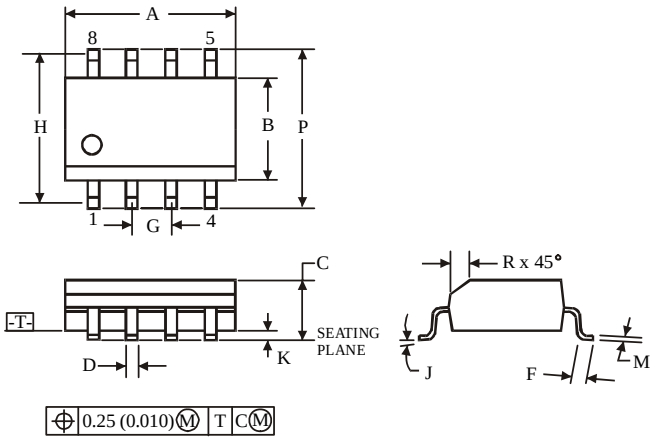
	Dimension, mm	
Symbol	**MIN**	**MAX**
A	8.51	10.16
B	6.1	7.11
C		5.33
D	0.36	0.56
F	1.14	1.78
G	2.54	
H	7.62	
J	0°	10°
K	2.92	3.81
L	7.62	8.26
M	0.2	0.36
N	0.38	

NOTES:

1. Dimensions “A”, “B” do not include mold flash or protrusions.
   Maximum mold flash or protrusions 0.25 mm (0.010) per side.

D SUFFIX SOIC
(MS - 012AA)





	Dimension, mm	
Symbol	**MIN**	**MAX**
A	4.8	5
B	3.8	4
C	1.35	1.75
D	0.33	0.51
F	0.4	1.27
G	1.27	
H	5.72	
J	0°	8°
K	0.1	0.25
M	0.19	0.25
P	5.8	6.2
R	0.25	0.5

NOTES:

1. Dimensions A and B do not include mold flash or protrusion.
2. Maximum mold flash or protrusion 0.15 mm (0.006) per side
   for A; for B – 0.25 mm (0.010) per side.