



# TDA2320

## PREAMPLIFIER FOR INFRARED REMOTE CONTROL SYSTEMS

- WIDE SUPPLY VOLTAGE RANGE: 4 TO 20V
- SINGLE OR SPLIT SUPPLY OPERATION
- VERY LOW CURRENT CONSUMPTION:  
0.8mA
- VERY LOW DISTORTION: 0.03% TYPICA

### DESCRIPTION

The TDA2320 is a monolithic integrated circuit in Dip package especially designed to amplify the IR signal in remote controlled TV or radio sets. It directly interfaces the digital control circuitry.

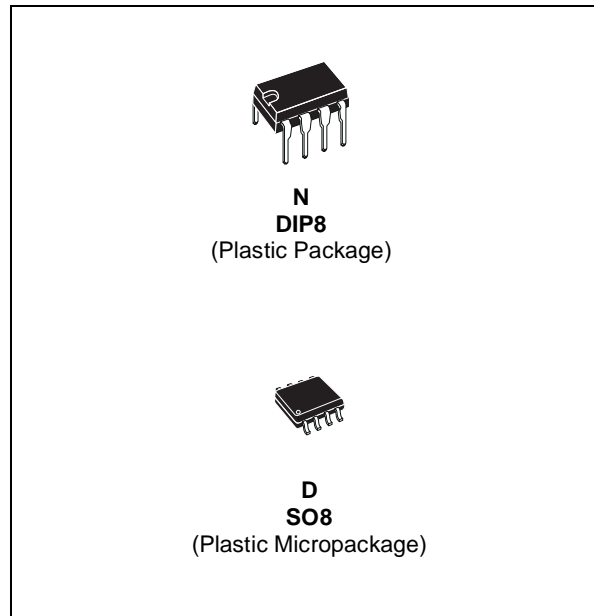
The TDA2320 incorporates a two-stage amplifier with excellent sensitivity and high noise immunity. It can work with a single 5V supply voltage and flash or carrier transmission modes as provided for example by the M709A/M710A/MOS transmitters.

The TDA2320 is particularly intended to be used in conjunction with the M104 and M206 + M3870 remote control receivers.

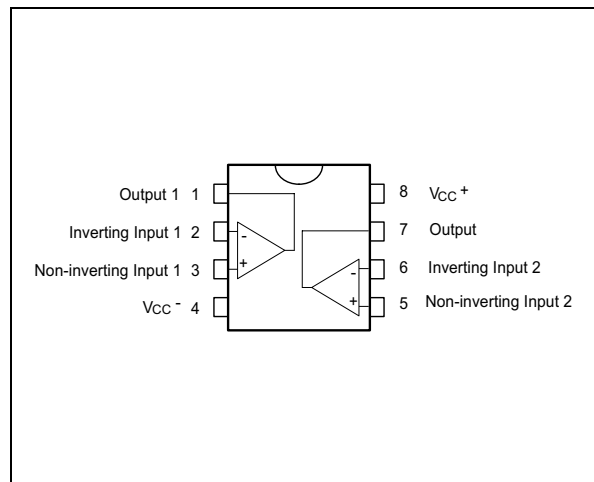
### ORDER CODE

Part Number	Temperature Range	Package	
		N	D
TDA2320	-40°C, +105°C	•	•
<b>Example</b> : TDA2320N			

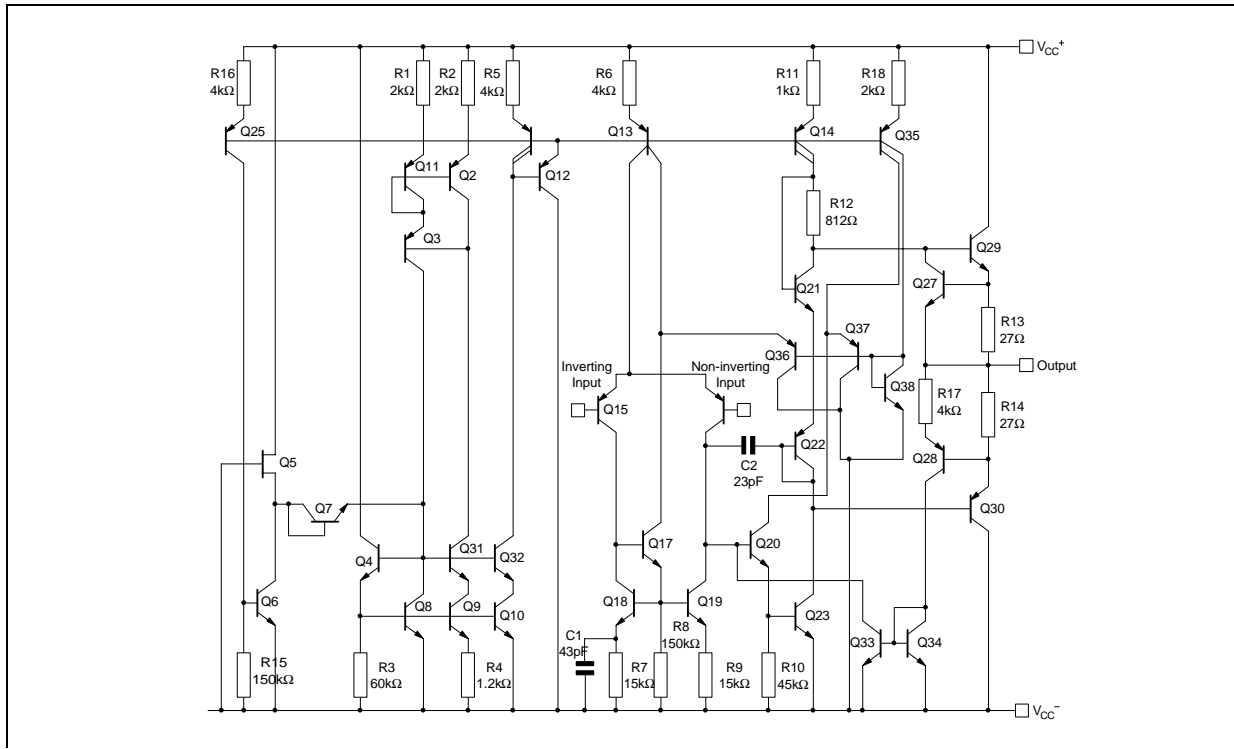
N = Dual in Line Package (DIP)



### PIN CONNECTIONS (top view)



**SCHEMATIC DIAGRAM (1/2 TDA2320)**



**ABSOLUTE MAXIMUM RATINGS**

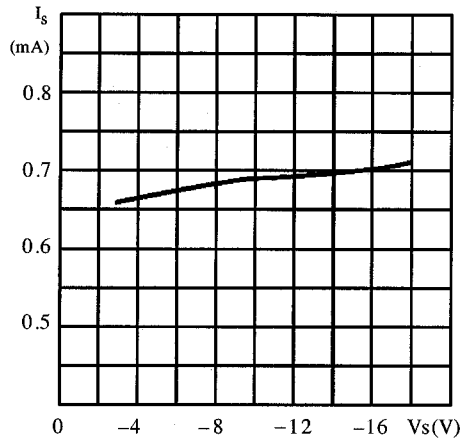
Symbol	Parameter	Value	Unit
$V_{CC}$	Supply Voltage	20	V
$P_{tot}$	Total Power Dissipation at $T_{amb} = 70^{\circ}C$ <sup>1)</sup>	400	mW
$T_{stg}, T_j$	Storage and Junction Temperature	-40 to 150	$^{\circ}C$

1. Power dissipation must be considered to ensure maximum junction temperature ( $T_j$ ) is not exceeded.

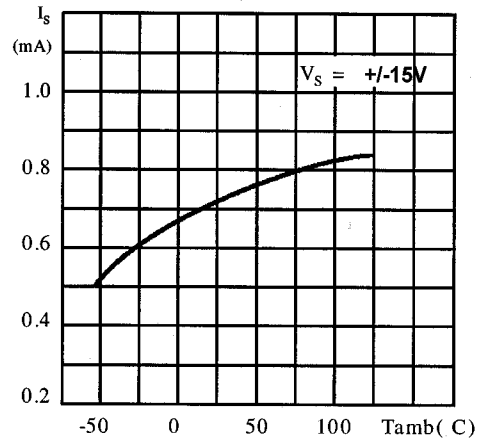
**ELECTRICAL CHARACTERISTICS** $V_{CC} = 5V$ ,  $T_{amb} = 25^{\circ}C$  (unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit
$V_{CC}$	Supply Voltage	4		20	V
$I_{CC}$	Supply Current $V_{CC} = 20V$		0.8	2	mA
$I_{ib}$	Input Bias Current		100	500	nA
$V_{io}$	Input Offset Voltage $R_s \leq 10k\Omega$		0.5		mV
$I_{io}$	Input Offset Current		15		nA
$A_{vd}$	Large Signal Voltage Gain $f = 1kHz$ $f = 100kHz$	64	70 30		dB
$V_{opp}$	DC Output Voltage Swing		2.5		V
GBP	Gain-bandwidth Product $f = 200kHz$	1.5	3		MHz
SR	Slew Rate $R_L = 2k\Omega$		1.5		V/ $\mu$ s
$e_n$	Equivalent Input Noise Voltage $f = 40kHz$ $R_s = 10k\Omega$		20		$\frac{nV}{\sqrt{Hz}}$
PSRR	Power Supply Rejection Ratio $f = 100Hz$		80		dB

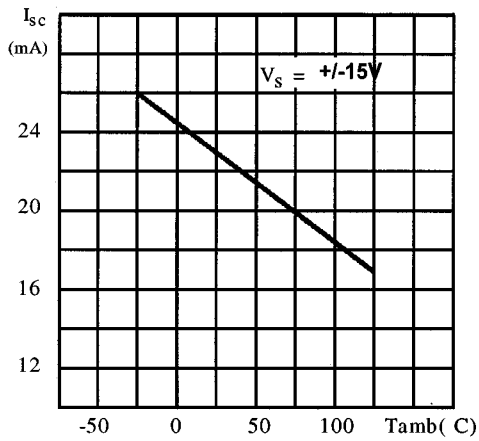
**Figure 1 :** Supply Current versus Supply Voltage



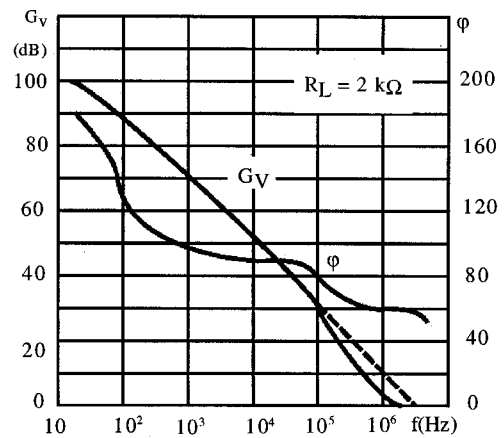
**Figure 2 :** Supply Current versus Ambient Temperature



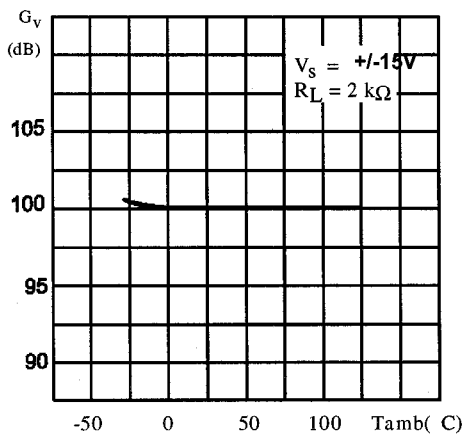
**Figure 3 :** Output Short Circuit Current versus Ambient Temperature



**Figure 4 :** Open Loop Frequency and Phase Response



**Figure 5 :** Output Loop Gain versus Ambient Temperature



**Figure 6 :** Supply Voltage Rejection versus Frequency

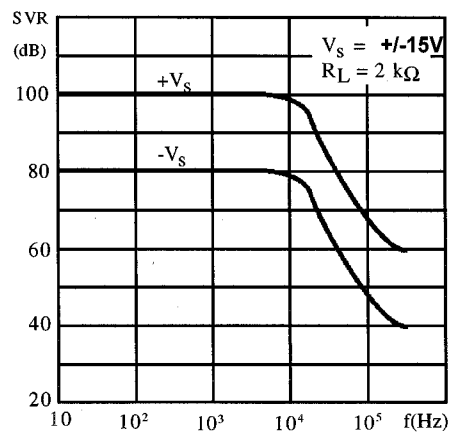


Figure 7 : Large Signal Frequency Response

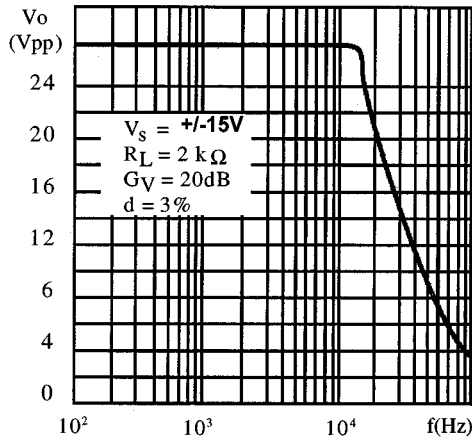


Figure 8 : Output Voltage Swing versus Load Resistance

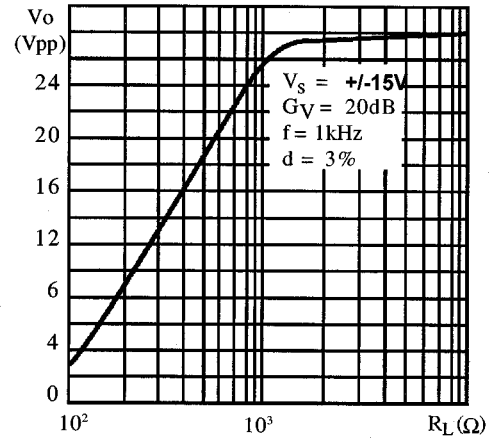


Figure 9 : Total Input Noise versus Frequency

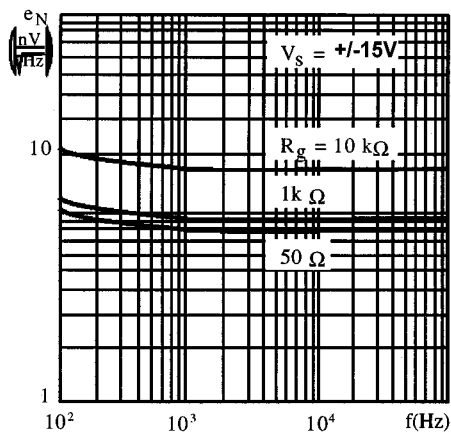


Figure 10 : Amplitude Response

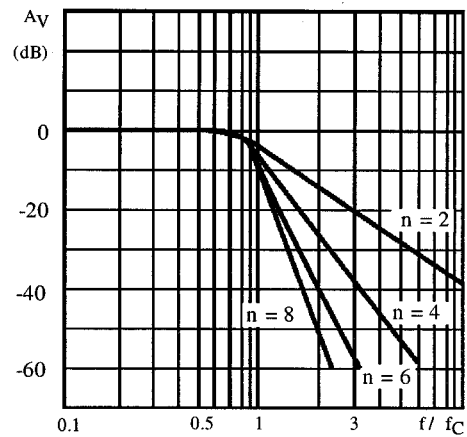


Figure 11 : Amplitude Response ( $\pm 1dB$  ripple)

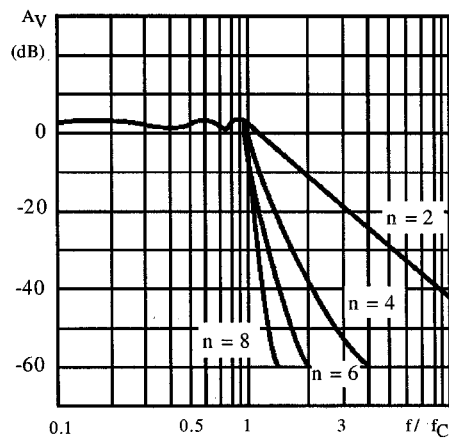


Figure 12 : Filter Configuration

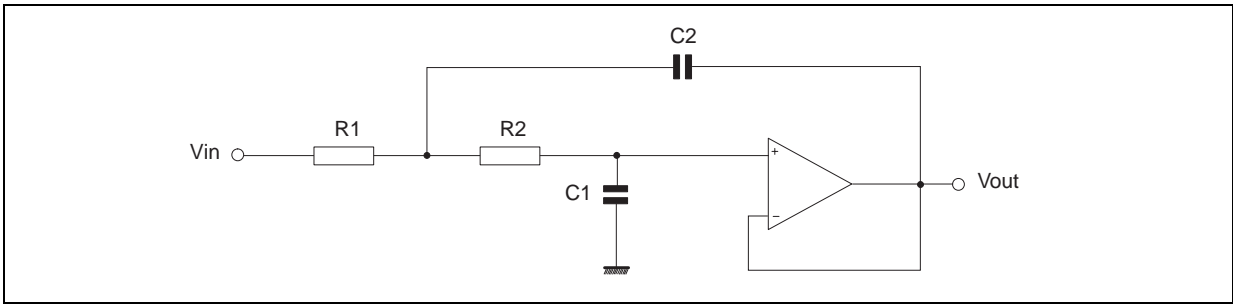


Figure 13 : 5th Order Low-pass Filter (Butterworth) with Unity Gain configuration

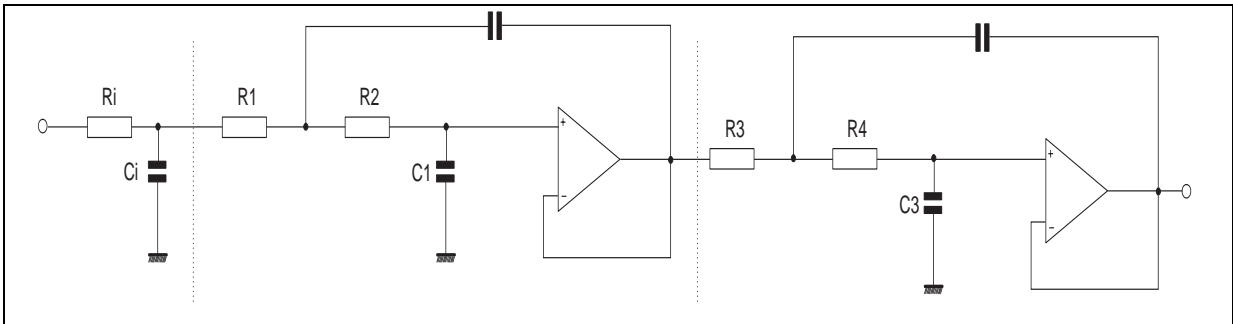
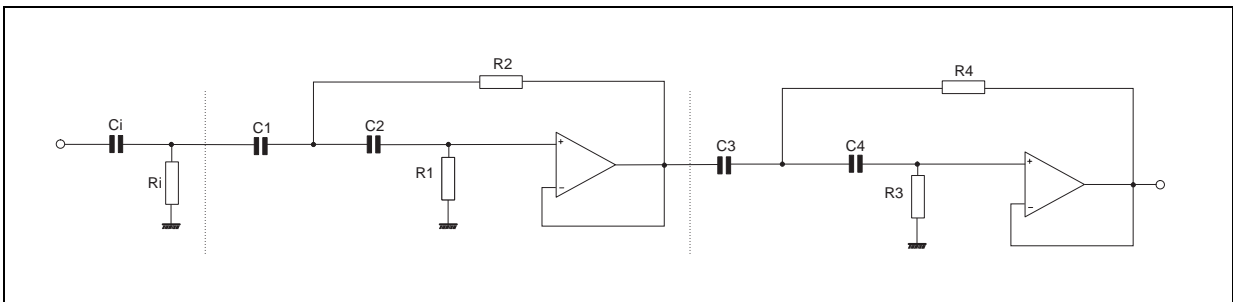
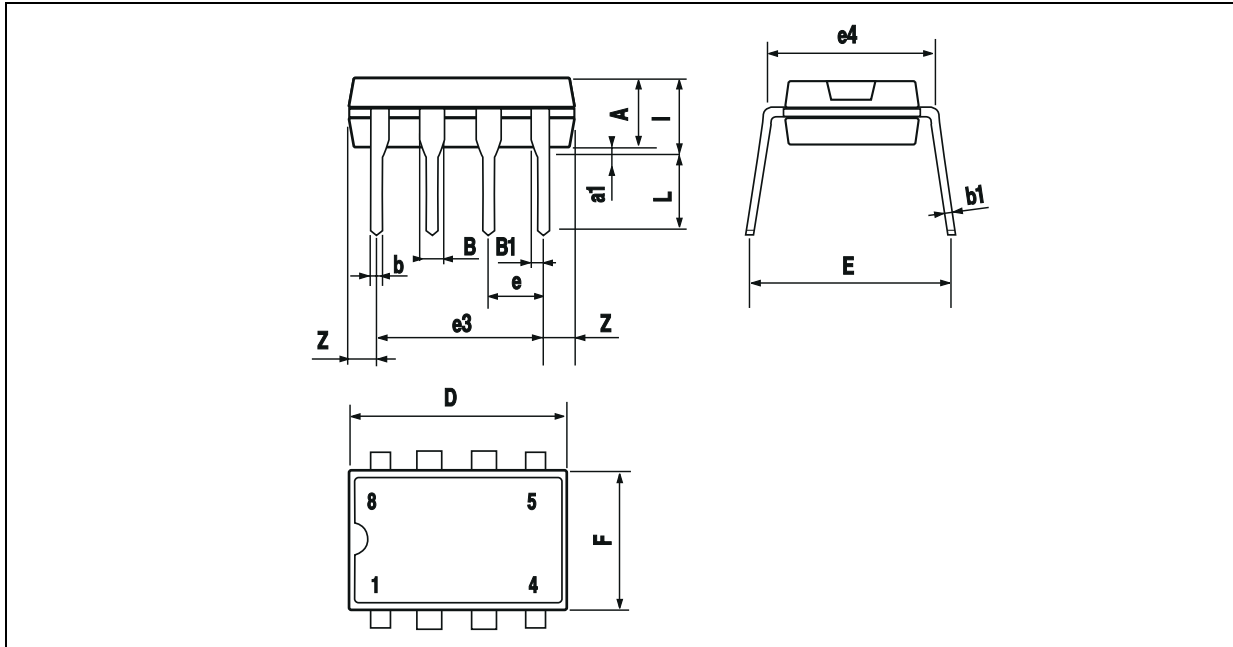


Figure 14 : 5th Order High-pass Filter (Butterworth) with Unity Gain configuration

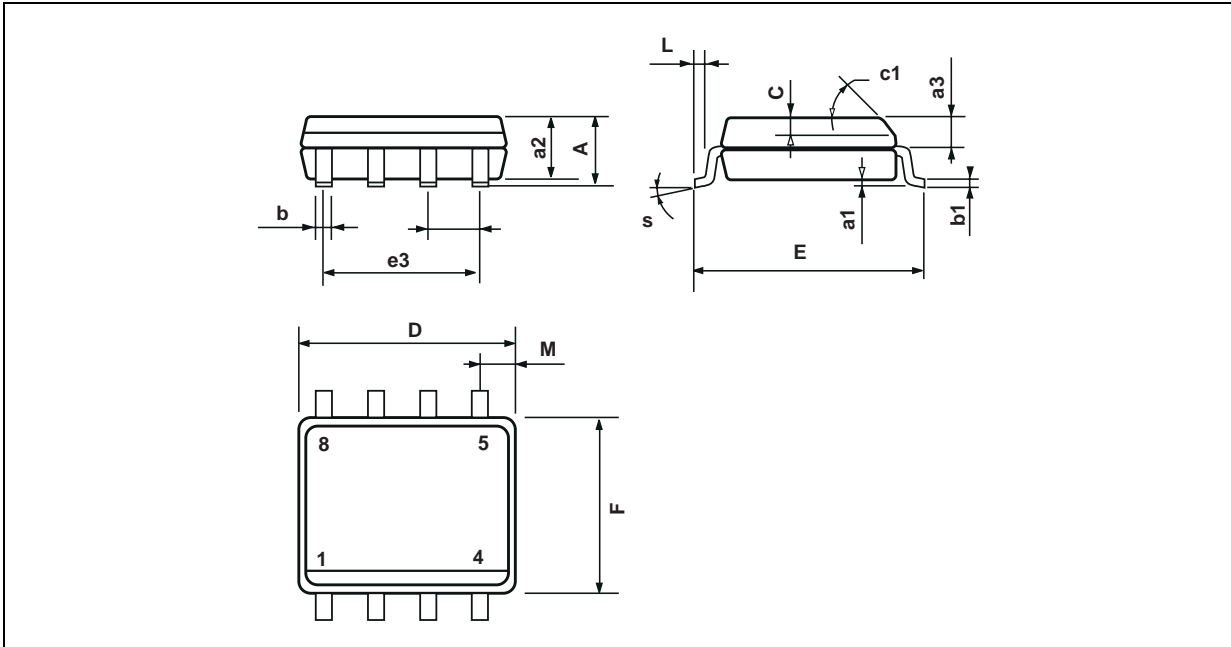


**PACKAGE MECHANICAL DATA**  
8 PINS - PLASTIC DIP



Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A		3.32			0.131	
a1	0.51			0.020		
B	1.15		1.65	0.045		0.065
b	0.356		0.55	0.014		0.022
b1	0.204		0.304	0.008		0.012
D			10.92			0.430
E	7.95		9.75	0.313		0.384
e		2.54			0.100	
e3		7.62			0.300	
e4		7.62			0.300	
F			6.6			0.260
i			5.08			0.200
L	3.18		3.81	0.125		0.150
Z			1.52			0.060

**PACKAGE MECHANICAL DATA**  
**8 PINS - PLASTIC MICROPACKAGE (SO)**



Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			1.75			0.069
a1	0.1		0.25	0.004		0.010
a2			1.65			0.065
a3	0.65		0.85	0.026		0.033
b	0.35		0.48	0.014		0.019
b1	0.19		0.25	0.007		0.010
C	0.25		0.5	0.010		0.020
c1	45° (typ.)					
D	4.8		5.0	0.189		0.197
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		3.81			0.150	
F	3.8		4.0	0.150		0.157
L	0.4		1.27	0.016		0.050
M			0.6			0.024
S	8° (max.)					

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