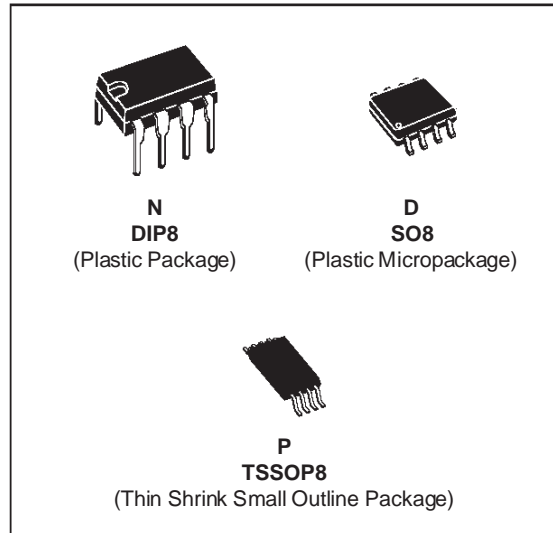




# MC4558

## WIDE BANDWIDTH DUAL BIPOLAR OPERATIONAL AMPLIFIERS

- INTERNALLY COMPENSATED
- SHORT-CIRCUIT PROTECTION
- GAIN AND PHASE MATCH BETWEEN AMPLIFIERS
- LOW POWER CONSUMPTION
- PIN TO PIN COMPATIBLE WITH MC1458/LM358
- GAIN BANDWIDTH PRODUCT (at 100kHz) 5.5MHz



### DESCRIPTION

The MC4558 is a high performance monolithic dual operational amplifier.

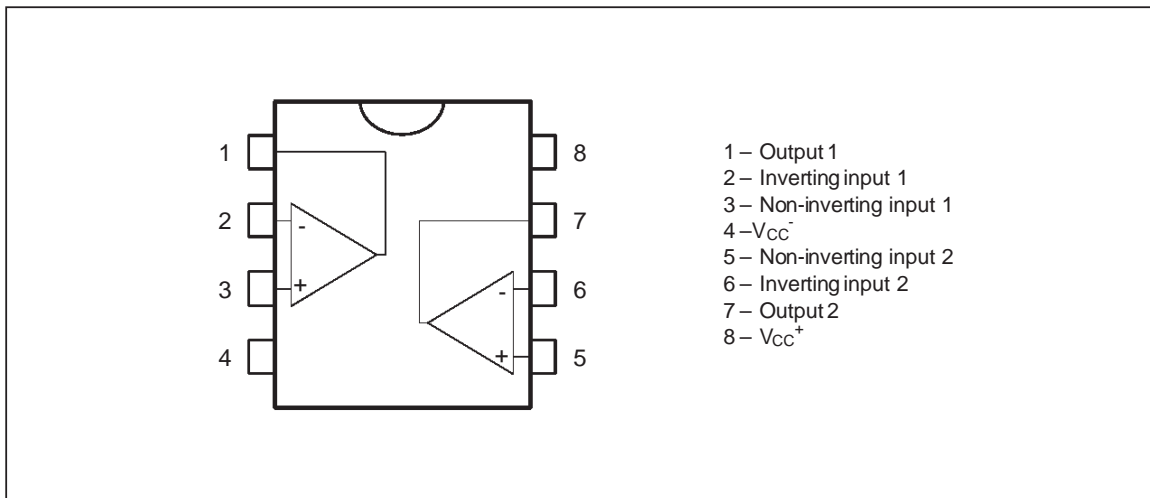
The circuit combines all the outstanding features of the MC1458 and, in addition, possesses three times the unity gain bandwidth of the industry standard.

### ORDER CODES

Part Number	Temperature Range	Package		
		N	D	P
MC4558C	0°C, +70°C	•	•	•
MC4558I	-40°C, +105°C	•	•	•

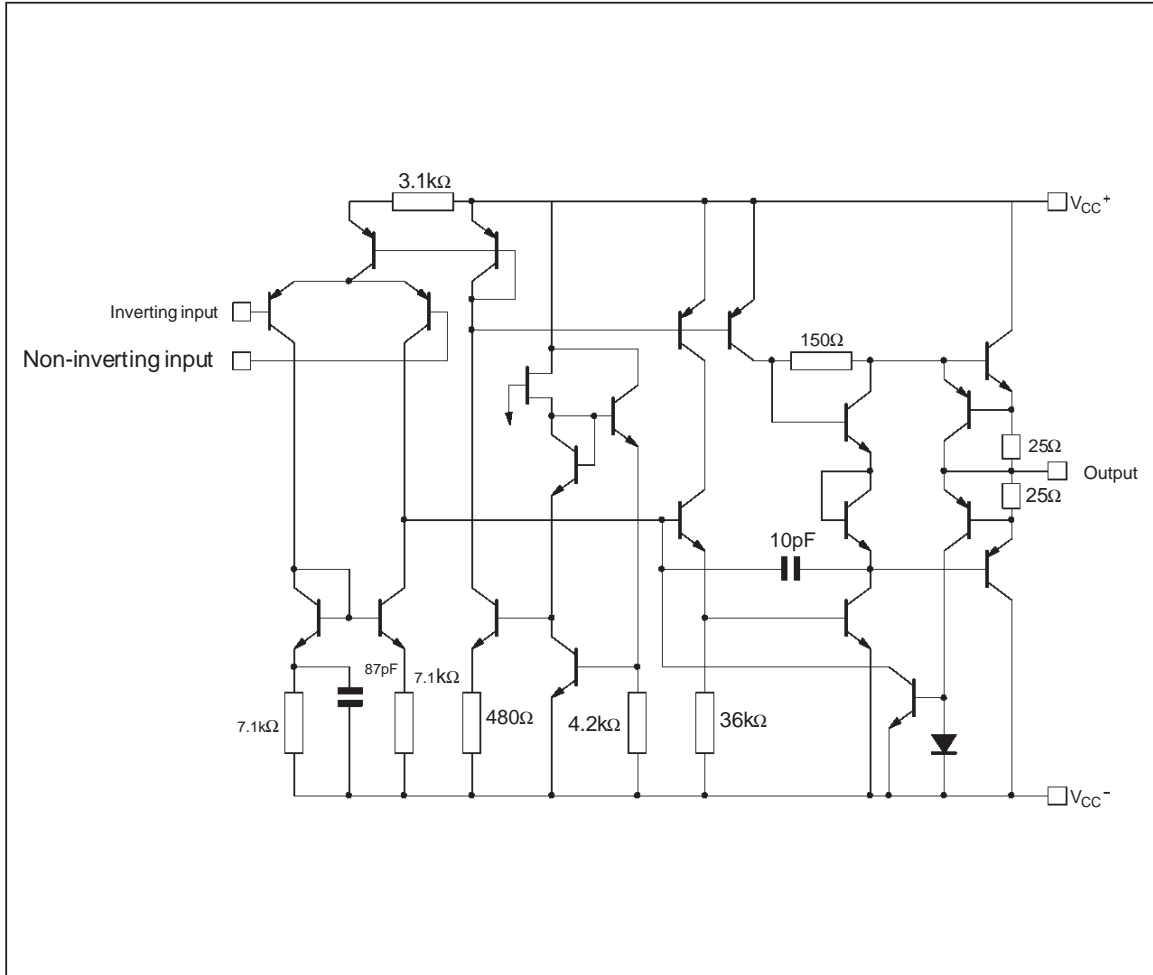
**Example** : MC4558CN

### PIN CONNECTIONS (top view)



# MC4558

## SCHEMATIC DIAGRAM (1/2 MC4558)



### ABSOLUTE MAXIMUM RATINGS

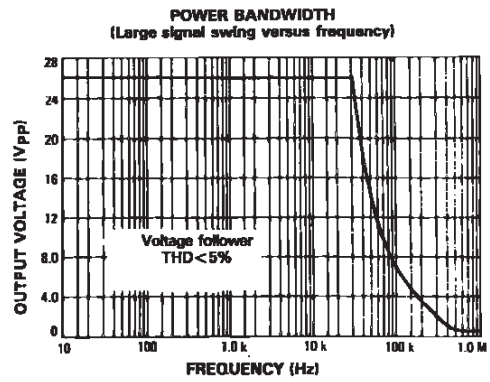
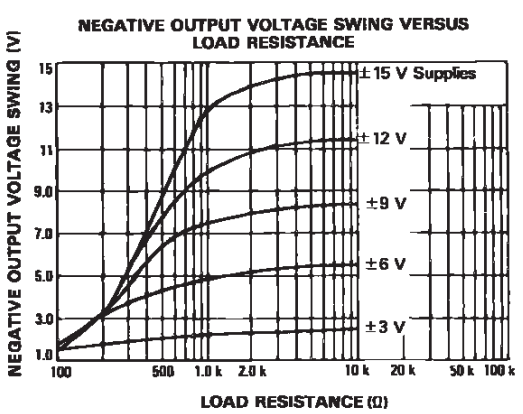
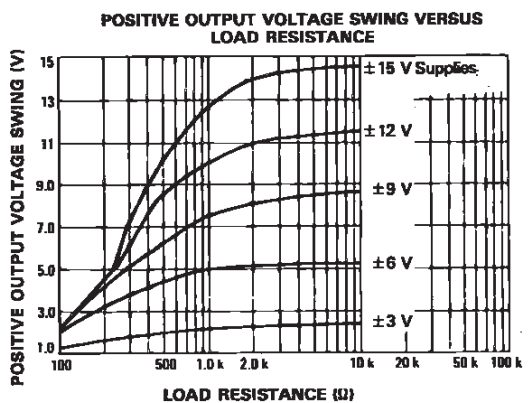
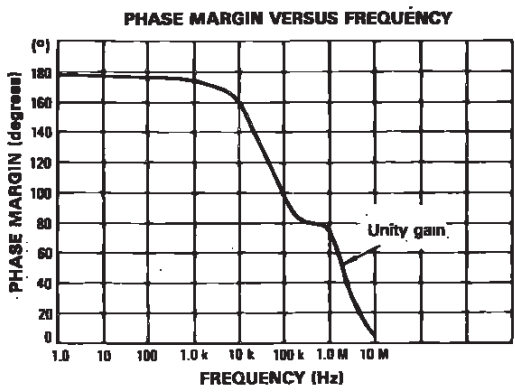
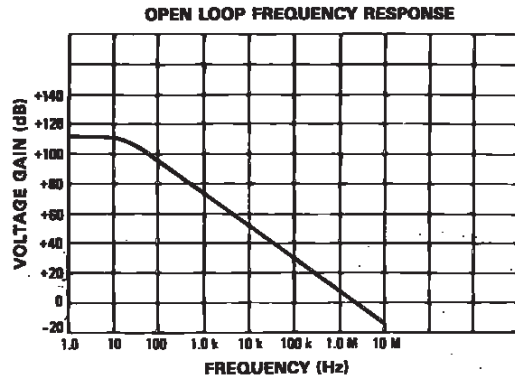
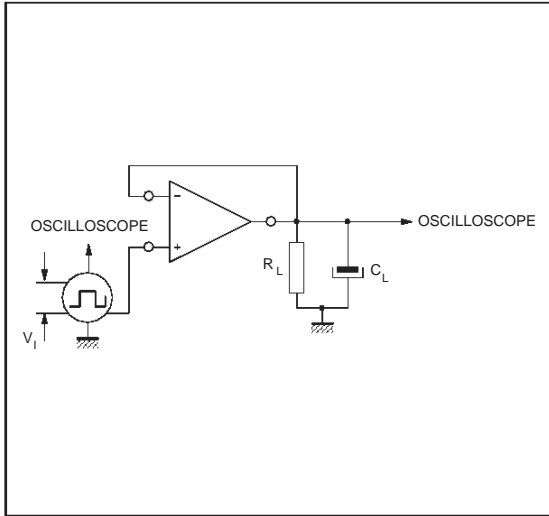
Symbol	Parameter	MC4558I	MC4558C	Unit
$V_{CC}$	Supply Voltage	$\pm 22$	$\pm 22$	V
$V_i$	Input Voltage	$\pm 15$	$\pm 15$	V
$V_{id}$	Differential Input Voltage	$\pm 30$	$\pm 30$	V
$P_{tot}$	Power Dissipation	680	680	mW
	Output Short-circuit Duration	Infinite		
$T_{oper}$	Operating Free-air Temperature Range	-40 to +105	0 to +70	$^{\circ}\text{C}$
$T_{stg}$	Storage Temperature Range	-65 to +150	-65 to +150	$^{\circ}\text{C}$

## ELECTRICAL CHARACTERISTICS

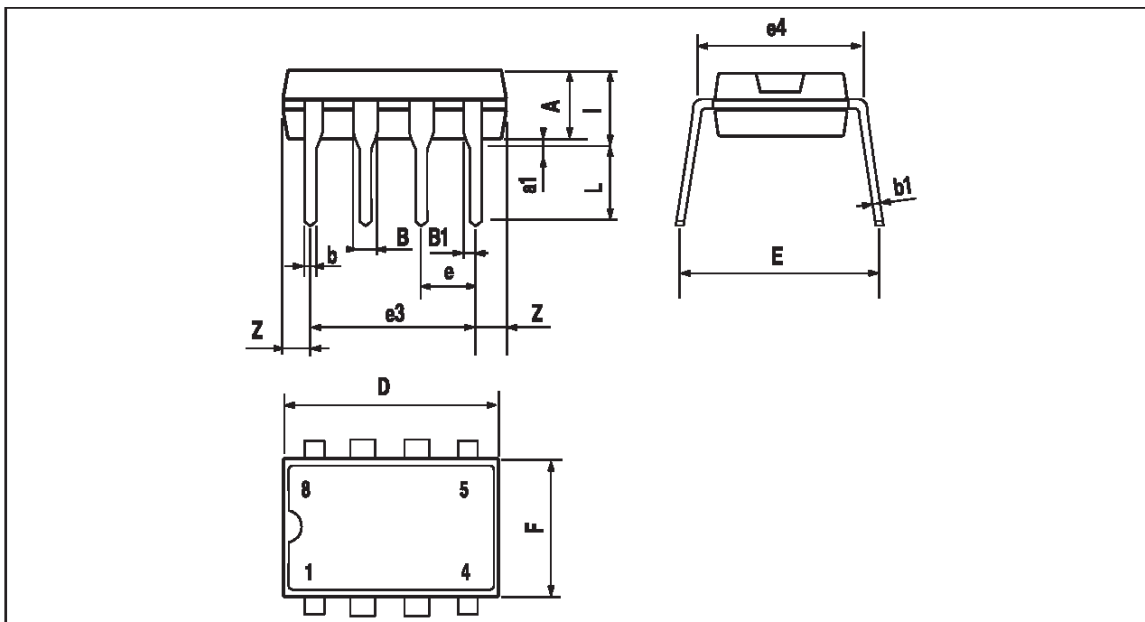
V<sub>CC</sub> = ±15V, T<sub>amb</sub> = 25°C (unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit
V <sub>io</sub>	Input Offset Voltage (R <sub>S</sub> ≤ 10 kΩ) T <sub>amb</sub> = 25°C T <sub>min.</sub> ≤ T <sub>amb</sub> ≤ T <sub>max.</sub>		1	5 6	mV
I <sub>io</sub>	Input Offset Current T <sub>amb</sub> = 25°C T <sub>min.</sub> ≤ T <sub>amb</sub> ≤ T <sub>max.</sub>		20	100 200	nA
I <sub>ib</sub>	Input Bias Current T <sub>amb</sub> = 25°C T <sub>min.</sub> ≤ T <sub>amb</sub> ≤ T <sub>max.</sub>		50	400 500	nA
A <sub>vd</sub>	Large Signal Voltage Gain (V <sub>O</sub> = ±10V, R <sub>L</sub> = 2kΩ) T <sub>amb</sub> = 25°C T <sub>min.</sub> ≤ T <sub>amb</sub> ≤ T <sub>max.</sub>	50 25	200		V/mV
SVR	Supply Voltage Rejection Ratio (R <sub>S</sub> ≤ 10kΩ) T <sub>amb</sub> = 25°C T <sub>min.</sub> ≤ T <sub>amb</sub> ≤ T <sub>max.</sub>	77 77	90		dB
I <sub>CC</sub>	Supply Current, all Amp, no Load T <sub>amb</sub> = 25°C T <sub>min.</sub> ≤ T <sub>amb</sub> ≤ T <sub>max.</sub>		2.3	4.5 6	mA
V <sub>icm</sub>	Input Common Mode Voltage Range T <sub>amb</sub> = 25°C T <sub>min.</sub> ≤ T <sub>amb</sub> ≤ T <sub>max.</sub>	±12 ±12			V
CMR	Common-mode Rejection Ratio (R <sub>S</sub> ≤ 10kΩ) T <sub>amb</sub> = 25°C T <sub>min.</sub> ≤ T <sub>amb</sub> ≤ T <sub>max.</sub>	70 70	90		dB
I <sub>os</sub>	Output Short-circuit Current	10	20	40	mA
V <sub>o</sub>	Output Voltage Swing T <sub>amb</sub> = 25°C T <sub>min.</sub> ≤ T <sub>amb</sub> ≤ T <sub>max.</sub>	±12 ±10 ±12 ±10	±14 ±13		V
SR	Slew Rate (V <sub>I</sub> = ±10V, R <sub>L</sub> = 2kΩ, C <sub>L</sub> = 100pF, T <sub>amb</sub> = 25°C, unity gain)	1.5	2.2		V/μs
t <sub>r</sub>	Rise Time (V <sub>I</sub> = ±20mV, R <sub>L</sub> = 2kΩ, C <sub>L</sub> = 100pF, T <sub>amb</sub> = 25°C, unity gain)		0.3		μs
K <sub>OV</sub>	Overshoot (V <sub>I</sub> = ±20 mV, R <sub>L</sub> = 2kΩ, C <sub>L</sub> = 100pF, T <sub>amb</sub> = 25°C, unity gain)		15		%
R <sub>i</sub>	Input Resistance	0.3	2		MΩ
C <sub>i</sub>	Input Capacitance		1.4		pF
R <sub>o</sub>	Output Resistance		75		Ω
B	Unity Gain Bandwidth		2.8		MHz
GBP	Gain Bandwidth Product (V <sub>I</sub> = 10mV, R <sub>L</sub> = 2kΩ, C <sub>L</sub> = 100pF, f = 100kHz, T <sub>amb</sub> = 25°C)		5.5		MHz
THD	Total Harmonic Distortion (f = 1kHz, A <sub>v</sub> = 20dB, R <sub>L</sub> = 2kΩ, V <sub>o</sub> = 2V <sub>pp</sub> , C <sub>L</sub> = 100pF, T <sub>amb</sub> = 25°C)		0.008		%
e <sub>n</sub>	Equivalent Input Noise Voltage (f = 1kHz, R <sub>s</sub> = 100Ω)		12		$\frac{nV}{\sqrt{Hz}}$
V <sub>O1</sub> /V <sub>O2</sub>	Channel Separation		120		dB

TRANSIENT RESPONSE TEST CIRCUIT



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



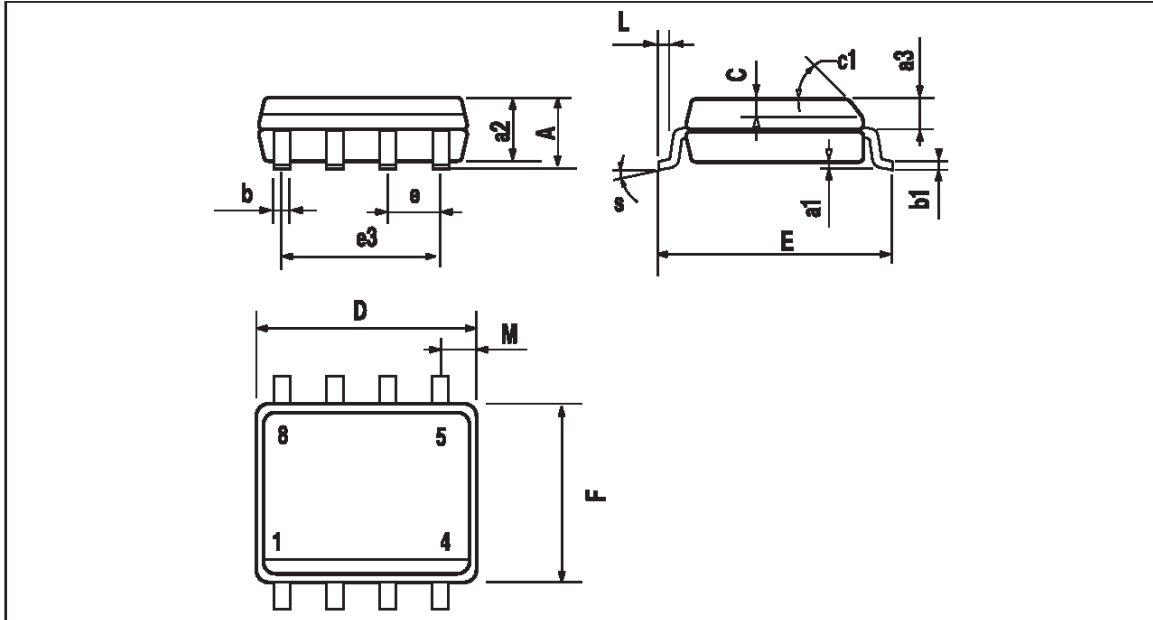
PIM-DIP8.EPS

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

DIP8.TEL

# MC4558

## PACKAGE MECHANICAL DATA 8 PINS – PLASTIC MICROPACKAGE (SO)

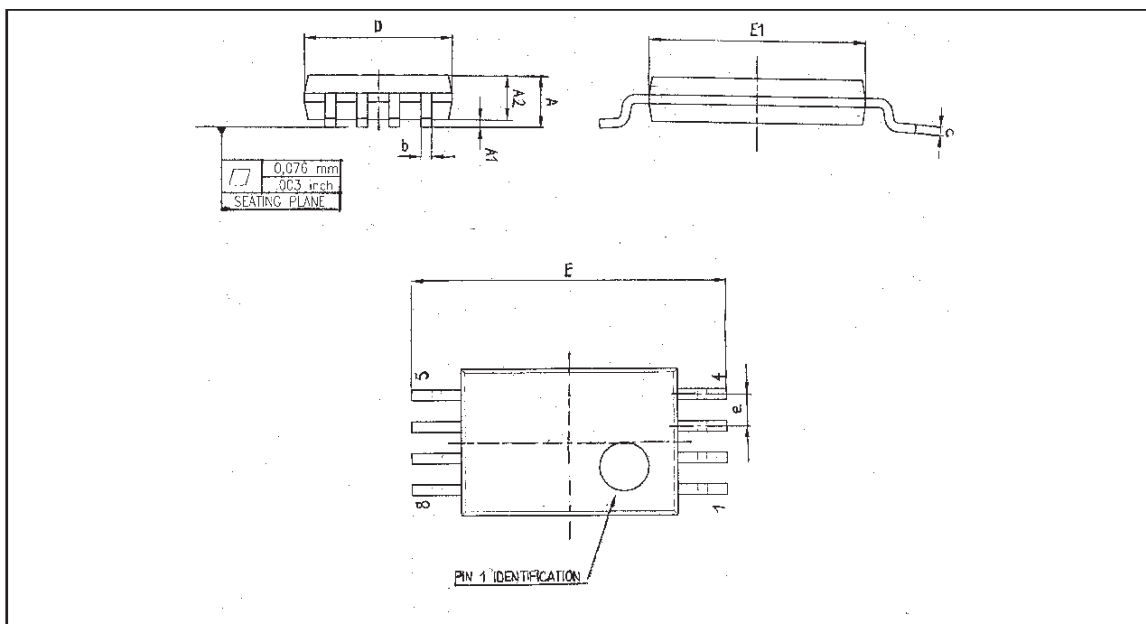


PM-S08EFS

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.)					

S08:TBL

**PACKAGE MECHANICAL DATA**  
**8 PINS – THIN SHRINK SMALL OUTLINE PACKAGE**



Dim.	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			1.20			0.05
A1	0.05		0.15	0.01		0.006
A2	0.80	1.00	1.05	0.031	0.039	0.041
b	0.19		0.30	0.007		0.15
c	0.09		0.20	0.003		0.012
D	2.90	3.00	3.10	0.114	0.118	0.122
E		6.40			0.252	
E1	4.30	4.40	4.50	0.169	0.173	0.177
e		0.65			0.025	
k	0°		8°	0°		8°
l	0.50	0.60	0.75	0.09	0.0236	0.030

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