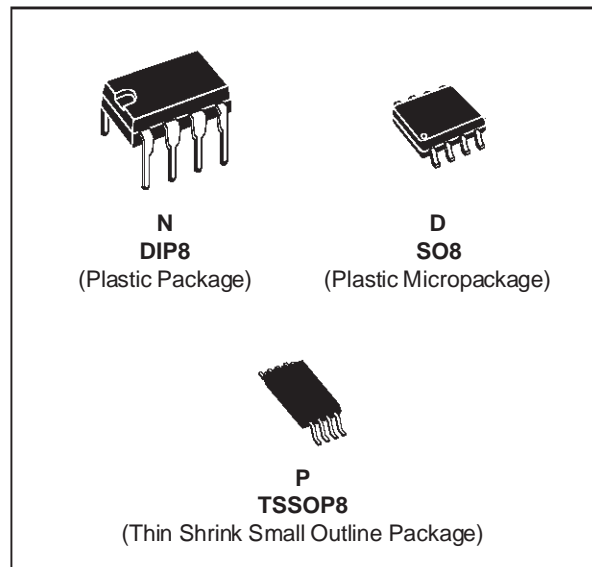




# MC4558

## 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.

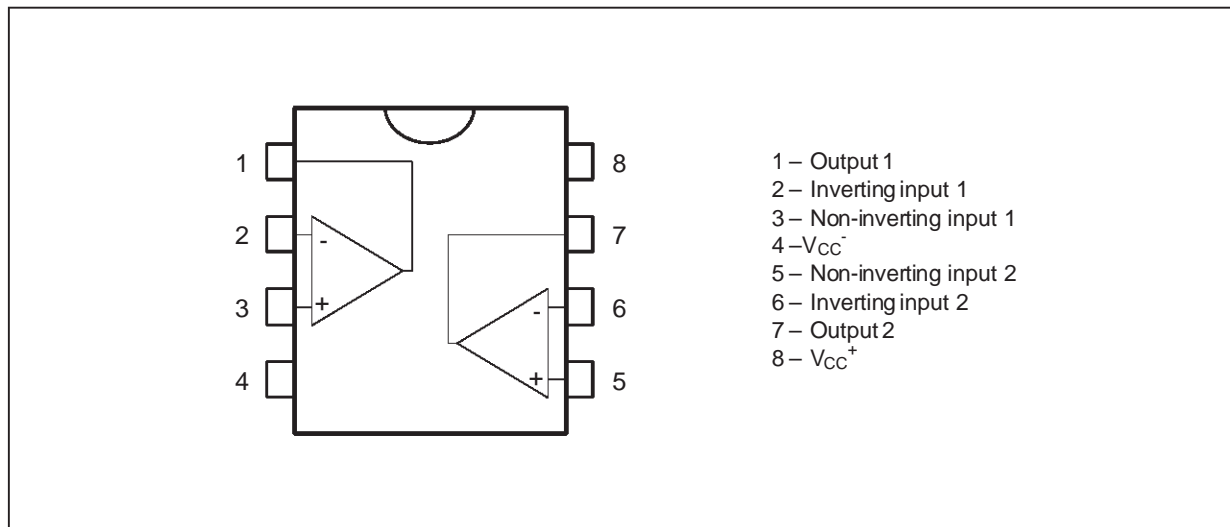
The circuit combines all the outstanding features of the MC1458 and, in addition, possesses three times the unity gain bandwidth of the industry standard.

### ORDER CODES

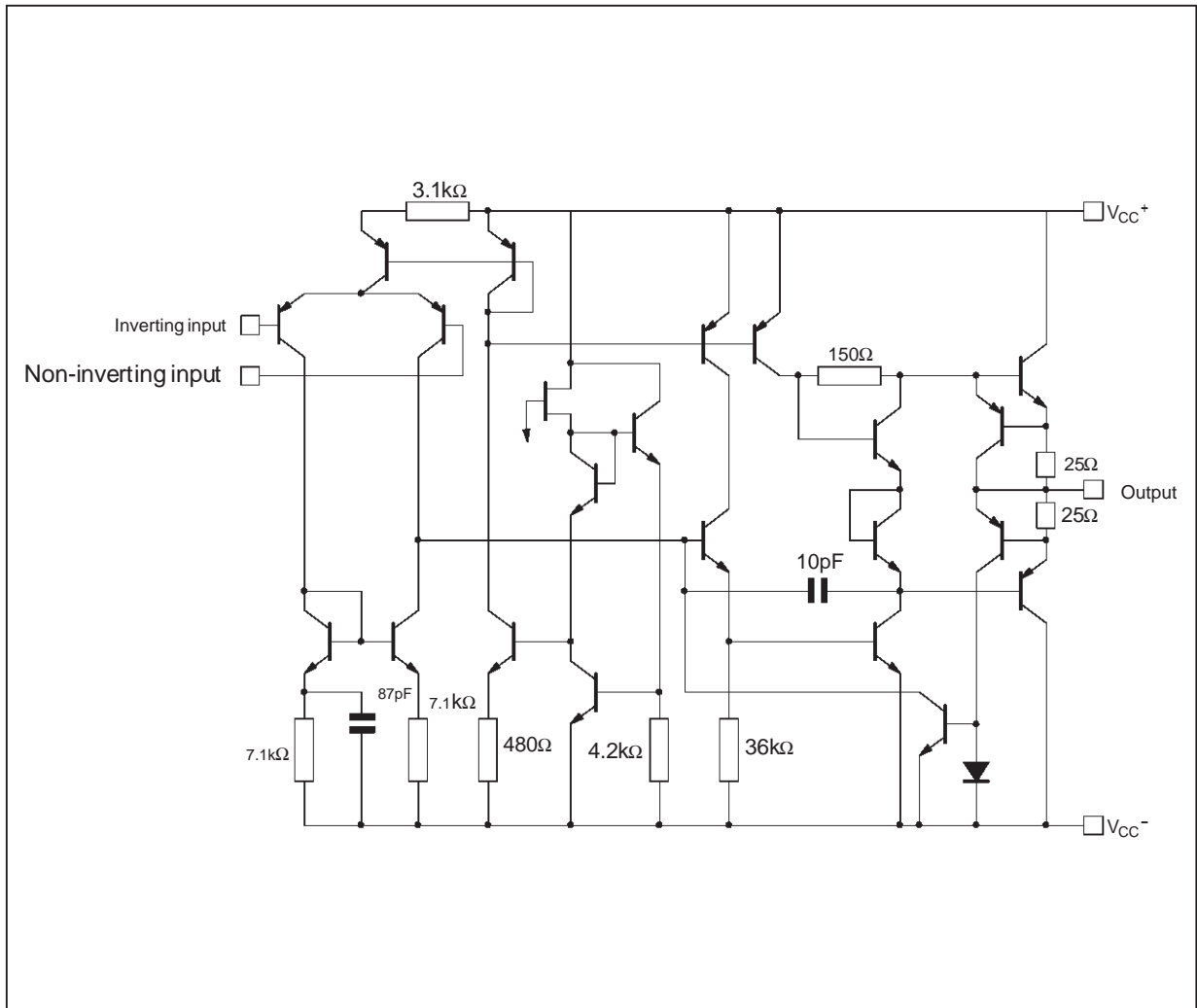
Part Number	Temperature Range	Package		
		N	D	P
MC4558C	0°C, +70°C	•	•	•
MC4558I	-40°C, +105°C	•	•	•

**Example** : MC4558CN

### PIN CONNECTIONS (top view)



SCHMATIC DIAGRAM (1/2 MC4558)



ABSOLUTE MAXIMUM RATINGS

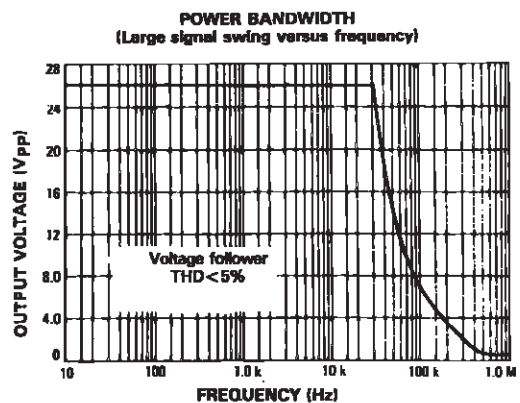
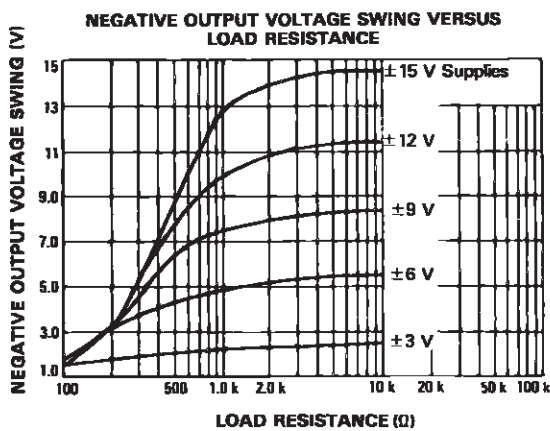
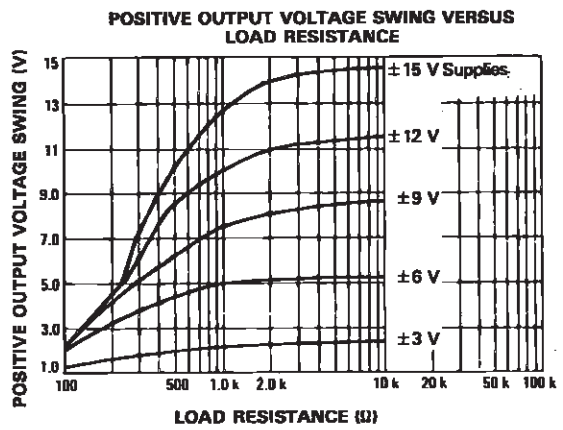
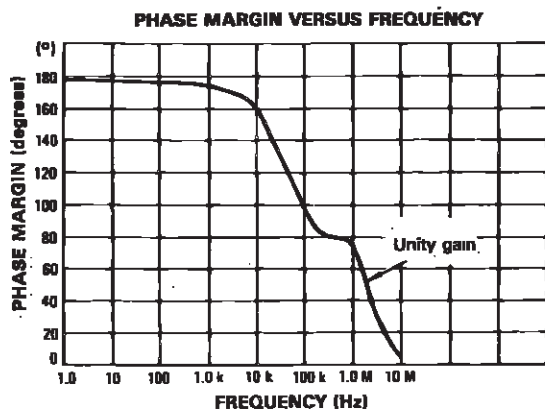
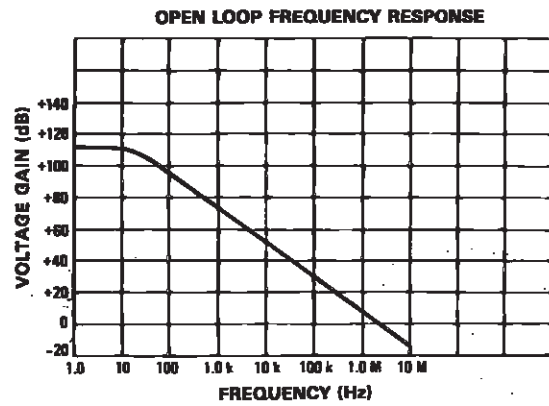
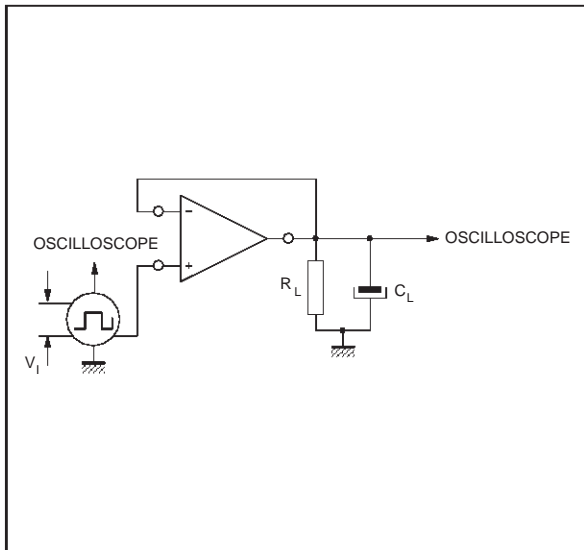
Symbol	Parameter	MC4558I	MC4558C	Unit
$V_{CC}$	Supply Voltage	±22	±22	V
$V_i$	Input Voltage	±15	±15	V
$V_{id}$	Differential Input Voltage	±30	±30	V
$P_{tot}$	Power Dissipation	680	680	mW
	Output Short-circuit Duration	Infinite		
$T_{oper}$	Operating Free-air Temperature Range	-40 to +105	0 to +70	°C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

**ELECTRICAL CHARACTERISTICS**

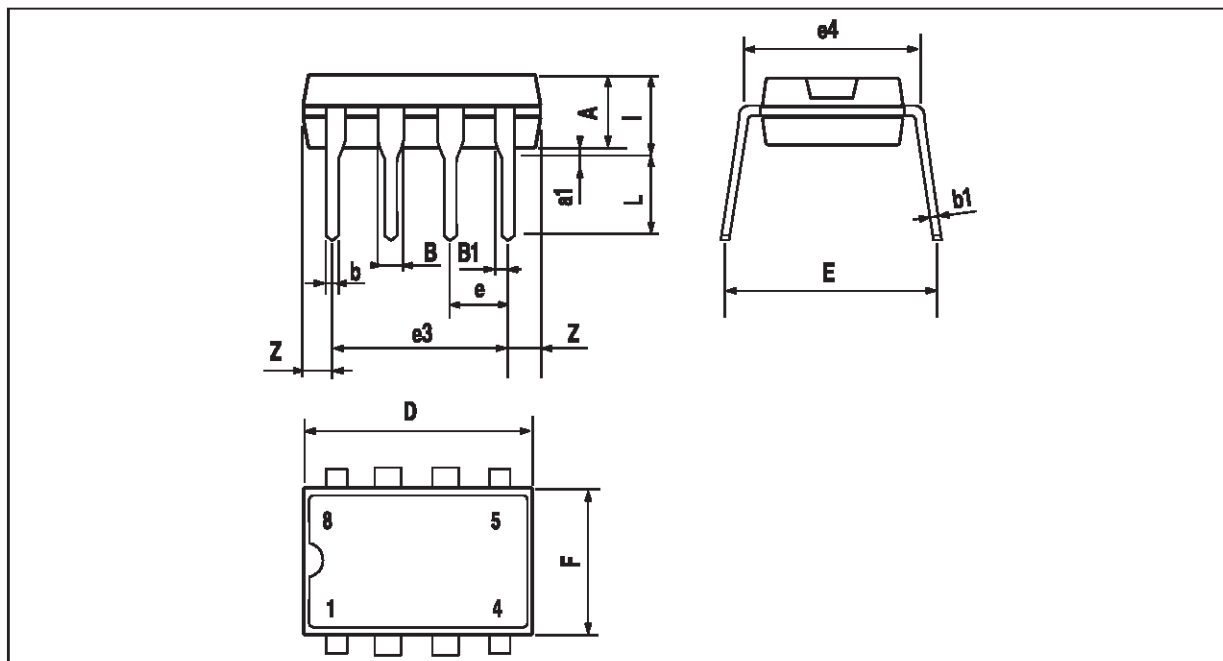
$V_{CC} = \pm 15V$ ,  $T_{amb} = 25^{\circ}C$  (unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit
$V_{io}$	Input Offset Voltage ( $R_S \leq 10\text{ k}\Omega$ ) $T_{amb} = 25^{\circ}C$ $T_{min.} \leq T_{amb} \leq T_{max.}$		1	5 6	mV
$I_{io}$	Input Offset Current $T_{amb} = 25^{\circ}C$ $T_{min.} \leq T_{amb} \leq T_{max.}$		20	100 200	nA
$I_{ib}$	Input Bias Current $T_{amb} = 25^{\circ}C$ $T_{min.} \leq T_{amb} \leq T_{max.}$		50	400 500	nA
$A_{vd}$	Large Signal Voltage Gain ( $V_O = \pm 10V$ , $R_L = 2\text{ k}\Omega$ ) $T_{amb} = 25^{\circ}C$ $T_{min.} \leq T_{amb} \leq T_{max.}$	50 25	200		V/mV
SVR	Supply Voltage Rejection Ratio ( $R_S \leq 10\text{ k}\Omega$ ) $T_{amb} = 25^{\circ}C$ $T_{min.} \leq T_{amb} \leq T_{max.}$	77 77	90		dB
$I_{CC}$	Supply Current, all Amp, no Load $T_{amb} = 25^{\circ}C$ $T_{min.} \leq T_{amb} \leq T_{max.}$		2.3	4.5 6	mA
$V_{icm}$	Input Common Mode Voltage Range $T_{amb} = 25^{\circ}C$ $T_{min.} \leq T_{amb} \leq T_{max.}$	$\pm 12$ $\pm 12$			V
CMR	Common-mode Rejection Ratio ( $R_S \leq 10\text{ k}\Omega$ ) $T_{amb} = 25^{\circ}C$ $T_{min.} \leq T_{amb} \leq T_{max.}$	70 70	90		dB
$I_{os}$	Output Short-circuit Current	10	20	40	mA
$V_o$	Output Voltage Swing $T_{amb} = 25^{\circ}C$ $T_{min.} \leq T_{amb} \leq T_{max.}$	$\pm 12$ $\pm 10$ $\pm 12$ $\pm 10$	$\pm 14$ $\pm 13$		V
SR	Slew Rate ( $V_I = \pm 10V$ , $R_L = 2\text{ k}\Omega$ , $C_L = 100\text{ pF}$ , $T_{amb} = 25^{\circ}C$ , unity gain)	1.5	2.2		V/ $\mu$ s
$t_r$	Rise Time ( $V_I = \pm 20\text{ mV}$ , $R_L = 2\text{ k}\Omega$ , $C_L = 100\text{ pF}$ , $T_{amb} = 25^{\circ}C$ , unity gain)		0.3		$\mu$ s
$K_{OV}$	Overshoot ( $V_I = \pm 20\text{ mV}$ , $R_L = 2\text{ k}\Omega$ , $C_L = 100\text{ pF}$ , $T_{amb} = 25^{\circ}C$ , unity gain)		15		%
$R_i$	Input Resistance	0.3	2		M $\Omega$
$C_i$	Input Capacitance		1.4		pF
$R_o$	Output Resistance		75		$\Omega$
B	Unity Gain Bandwidth		2.8		MHz
GBP	Gain Bandwidth Product ( $V_I = 10\text{ mV}$ , $R_L = 2\text{ k}\Omega$ , $C_L = 100\text{ pF}$ , $f = 100\text{ kHz}$ , $T_{amb} = 25^{\circ}C$ )		5.5		MHz
THD	Total Harmonic Distortion ( $f = 1\text{ kHz}$ , $A_v = 20\text{ dB}$ , $R_L = 2\text{ k}\Omega$ , $V_o = 2V_{pp}$ , $C_L = 100\text{ pF}$ , $T_{amb} = 25^{\circ}C$ )		0.008		%
$e_n$	Equivalent Input Noise Voltage ( $f = 1\text{ kHz}$ , $R_s = 100\Omega$ )		12		$\frac{nV}{\sqrt{Hz}}$
$V_{O1}/V_{O2}$	Channel Separation		120		dB

TRANSIENT RESPONSE TEST CIRCUIT



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



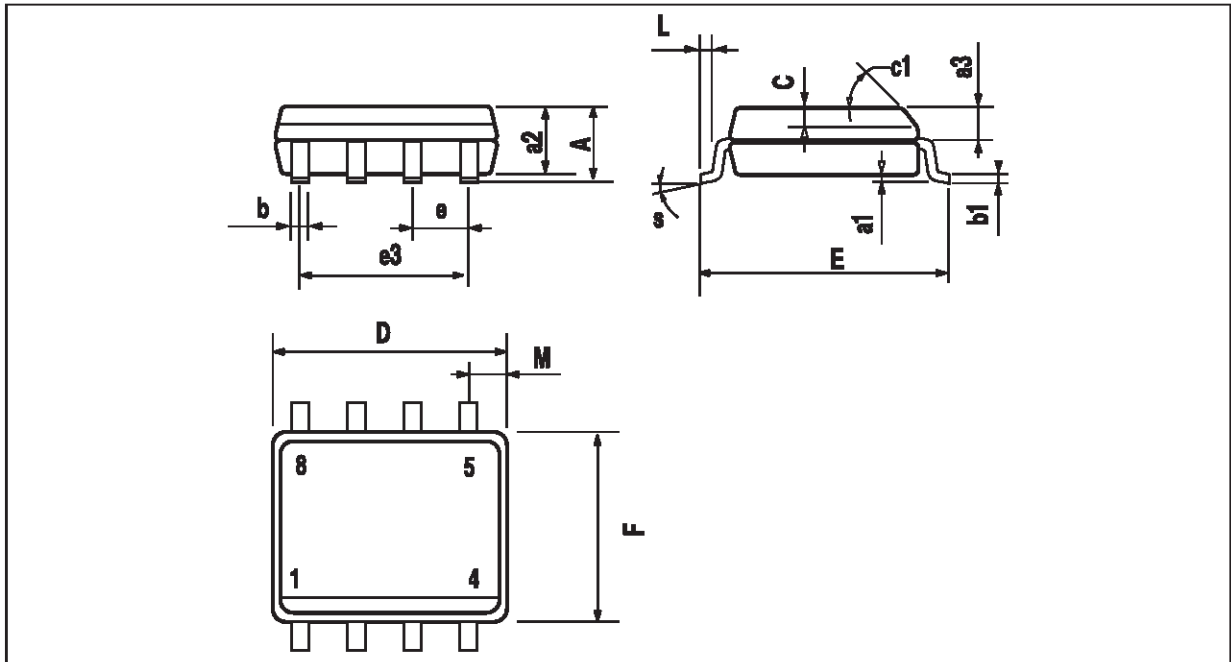
PM-DIP8EFS

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.TBL

# MC4558

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



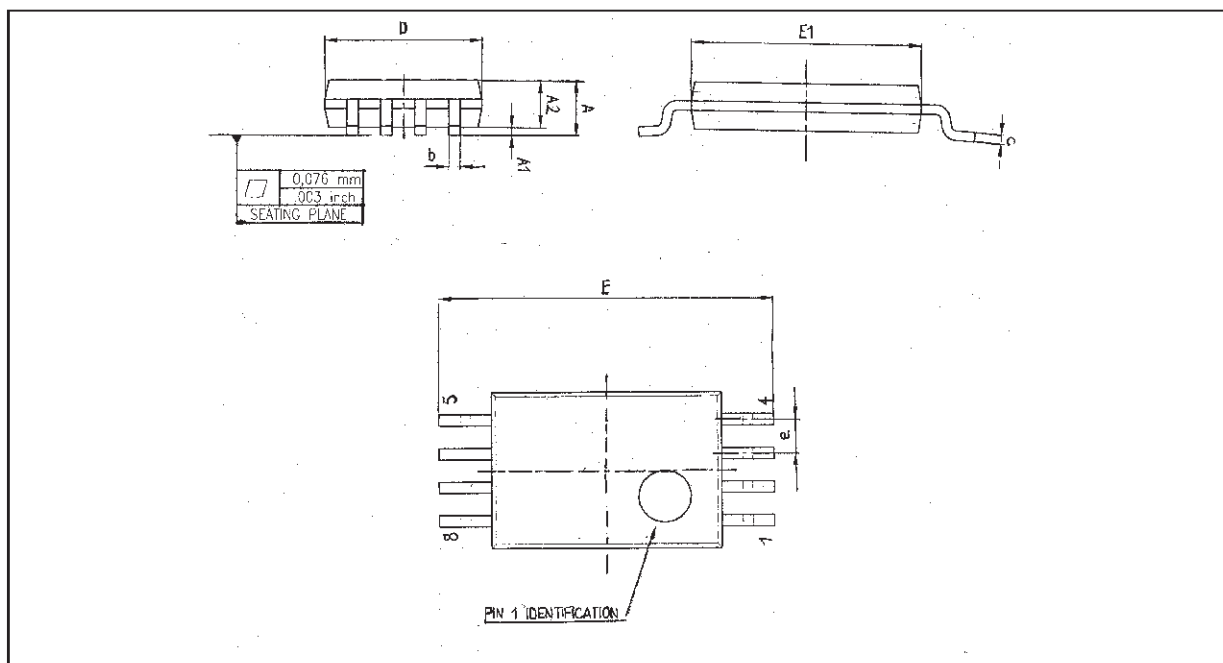
PM-SC08.EPS

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.)					

SO8.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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