36V,11MHZ，23V/μs Op Amps

1 Features

- Single-Supply Operation from +3V ~ +36V
- Offset Voltage: ± 100μV Maximum
- Differential Input Voltage Range to Supply Rail, can Work as Comparator
- Input Rail to -VS , Rail to Rail Output
- Bandwidth: 11MHz
- Slew Rate: 23V/μs
- Excellent EMI Suppress Performance: 45dB at 1GHz
- Quiescent Current: 2.7mA per Amplifier (Typ)
- -40°C to 125°C Operation Temperature Range
- Small Package:
  - MCOA61 Available in SOT23-5 Package
  - MCOA62 Available in SOP-8 and MSOP-8 Packages
  - MCOA64 Available in SOP-14 and TSSOP-14 Packages

2 Applications

- Instrumentation
- Active Filters, ASIC Input or Output Amplifier
- Sensor Interface
- Motor Control
- Industrial Control

3 Description

The MCOA6X series amplifiers are newest high supply voltage amplifiers with low offset, low power and stable high frequency response. Good AC performance with 11MHz bandwidth, 23V/μs slew rate and low distortion while drawing only 2.7mA of quiescent current per amplifier. The input common -mode voltage range extends to -VS , and the outputs swing rail-to-rail. The MCOA6X family can be used as plug-in replacements

for many commercially available Op-Amps to reduce power and improve input/output range and performance. The MCOA61 single is available in SOT23-5 package. The MCOA62 Dual is available in Green SOP-8 and MSOP-8 packages. The MCOA64 Quad is available in Green SOP-14 and TSSOP-14 packages.

4 Pin Configuration

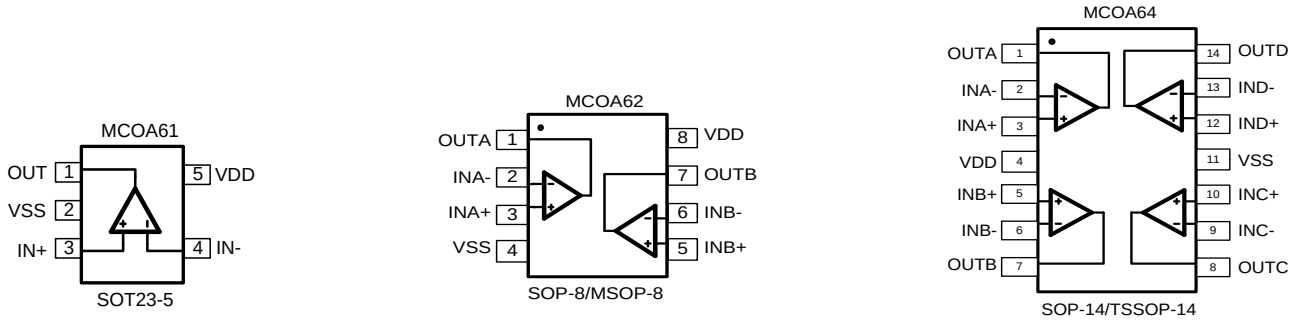


Figure 1. Pin Assignment Diagram

5 Specifications

5.1 Absolute Maximum Ratings

	MIN	TYP	MAX	UNIT
Power Supply voltage(V_{CC} to V_{SS})	-0.5		40	V
Analog Input Voltage(IN+ or IN-)	Vss-0.5		V_{DD}+0.5	V
PDB Input voltage	Vss-0.5		40	V
Operating Temperature Range	–40		125	°C
Junction Temperature		160		°C
Storage temperature range	–55		150	°C
Lead Temperature (soldering, 10sec)		260		°C

5.2 ESD Ratings

		VALUE	UNIT
$V_{(ESD)}$ Electrostatic discharge	HBM	2000	V
	MM	300	

5.3 Package Thermal Resistance (TA=+25°C)

			UNIT
$R_{\theta JA}$ Junction-to-ambient thermal resistance	SOP-8	125	°C/W
	MSOP-8	216	
	SOT23-5	190	
	SOP-14	120	
	TSSOP-14	180	

NOTE: Stress greater than those listed under Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions outside those indicated in the operational sections of this specification are not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

5.2 Electrical Characteristics

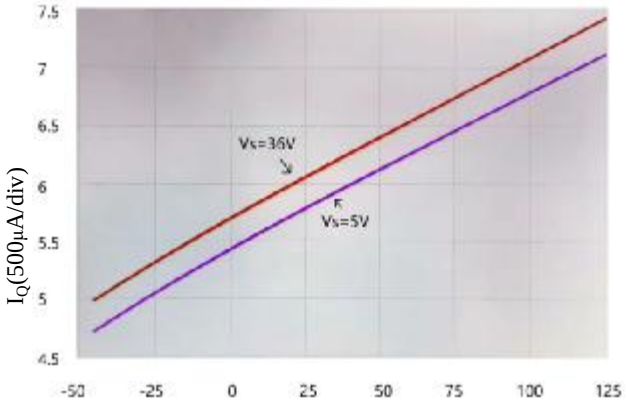
(All test condition is V_S= 30V, T_A = 25°C, R_L = ∞, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	MCOA61/62/64			
			TYP	MIN	MAX	UNITS
INPUT CHARACTERISTICS						
Input Offset Voltage	V_{OS}	$V_{CM} = V_S/2$	1.4	-100	100	μV
Input Bias Current	I_B		100			pA
Input Offset Current	I_{OS}		25			pA
Common-Mode Voltage Range	V_{CM}	V_S =30V	0 to (V_S -1.5V)			V
Common-Mode Rejection Ratio	CMRR	V_S = 30V, V_{CM} = 0V to 28.5V	120	100		dB
Open-Loop Voltage Gain	A_{OL}	Vs=30V, R_L = 10kΩ, V_{CM} = 0V to 28.5V	130	100		dB
Input Offset Voltage Drift	$\Delta V_{OS}/\Delta_T$		2.0			μV/℃
OUTPUT CHARACTERISTICS						
Output Voltage Swing from Rail	V_{OH}	Vs=30V, RL = 10kΩ	29.85	29.65		V
	V_{OL}		100		300	mV
	V_{OH}	Vs=30V, RL = 2kΩ	29.25	28.0		V
	V_{OL}		500		1500	mV
Output Current	I_{SOURCE}	Vs=30V	39			mA
	I_{SINK}		35			
POWER SUPPLY						
Operating Voltage Range			3.3			V
			36			V
Power Supply Rejection Ratio	PSRR	VS = +3.3V to +30V, VCM = +0.5V	120	100		dB
Quiescent Current / Amplifier	I_Q		2.7			mA
DYNAMIC PERFORMANCE						
Gain-Bandwidth Product	GBP		11			MHz
Slew Rate	SR	G = +1, 5V Output Step	23			V/μs
NOISE PERFORMANCE						
Input Voltage Noise	e_np-p	f = 0.1Hz to 10Hz	3.0			μV_{RMS}
Input Voltage Noise	e_n	f = 1kHz	34			nV/√Hz
		f = 10kHz	13			

5.3 Typical Performance characteristics

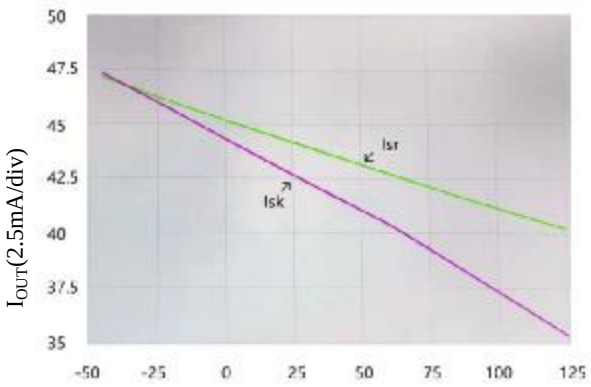
TA=+25°C, V_S=+30V, and R_L= ∞connected to V_S/2, unless otherwise specified.

Supply Current(MCOA62) vs. Temperature



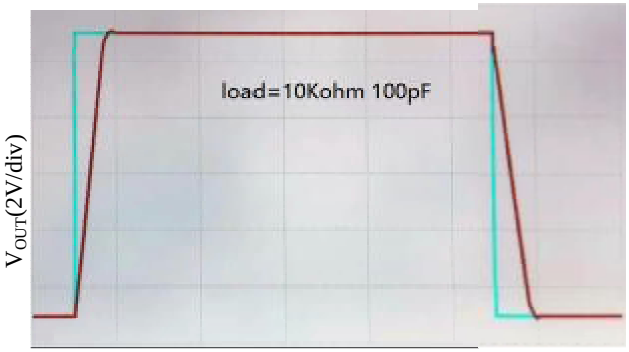
Temperature(25°C/div)

Output Short-Circuit Current vs. Temperature



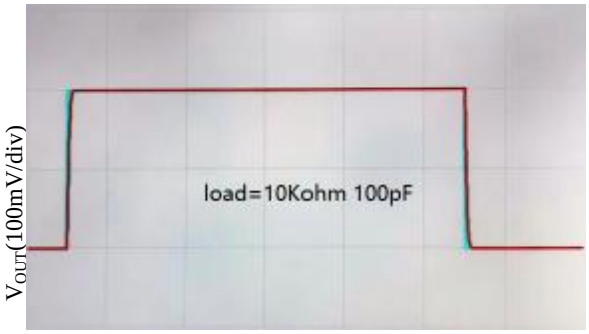
Temperature(25°C/div)

Large Signal Pulse Response



Time(1us/div)

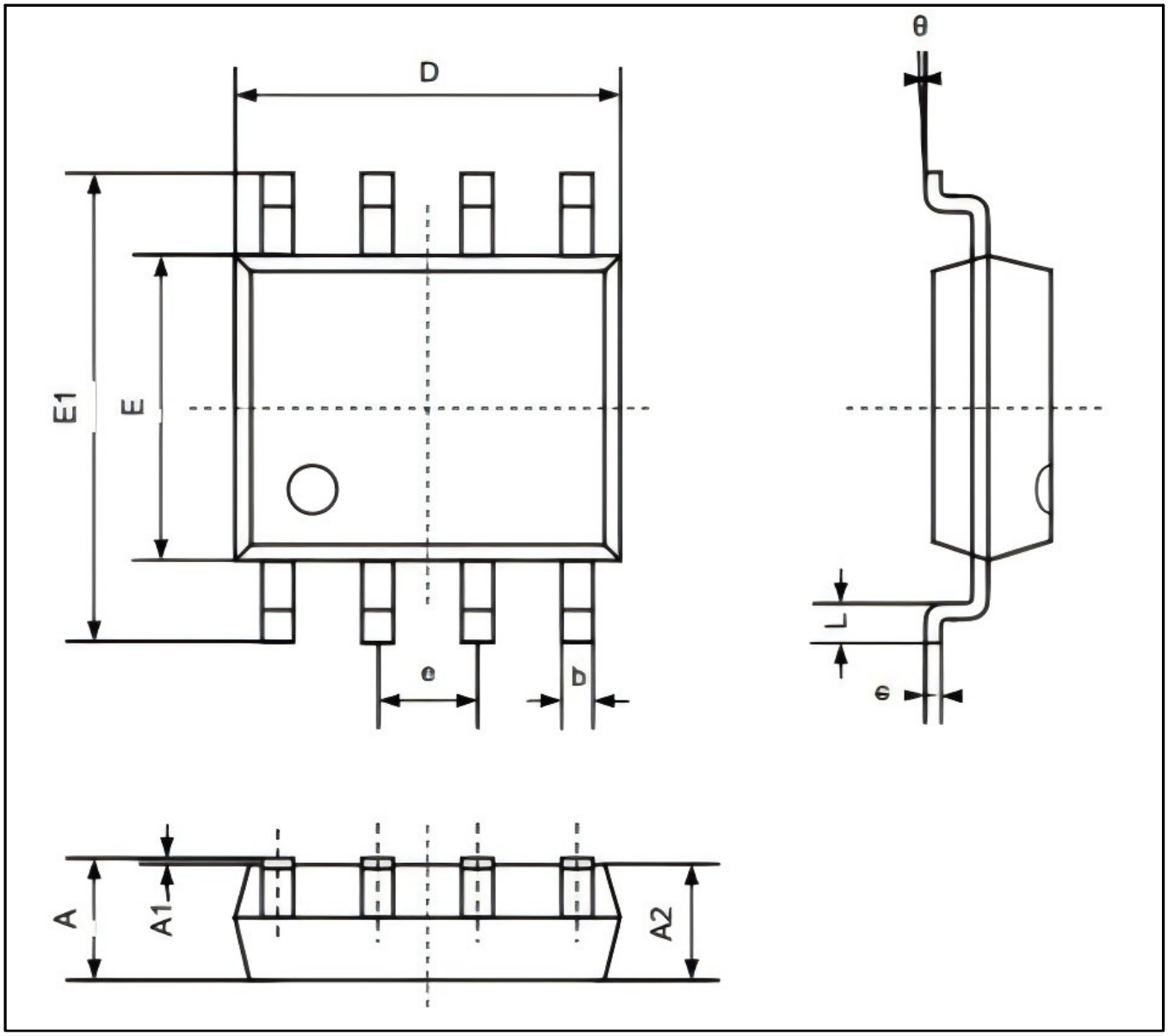
Small Signal Pulse Response



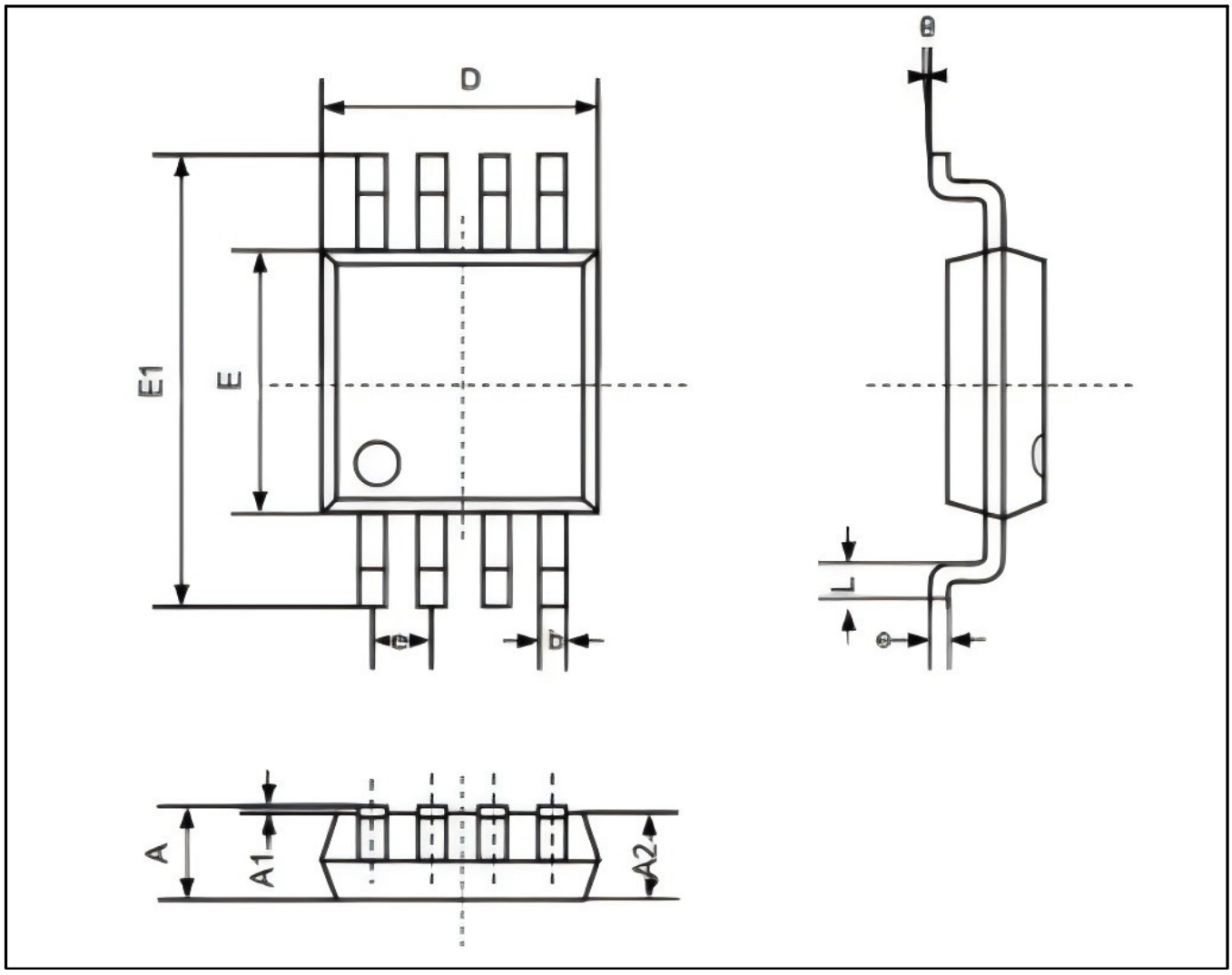
Time(1us/div)

PACKAGE/ORDERING INFORMATION

MODEL	CHANNEL	ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION	MARKING INFORMATION
MCOA61	Single	MCOA61-TR	SOT23-5	Tape and Reel,3000	61
MCOA62	Dual	MCOA62-SR	SOP-8	Tape and Reel,4000	MCOA62
		MCOA62-MR	MSOP-8	Tape and Reel,3000	MCOA62
MCOA64	Quad	MCOA64-TR	TSSOP-14	Tape and Reel,3000	MCOA64
		MCOA64-SR	SOP-14	Tape and Reel,2500	MCOA64

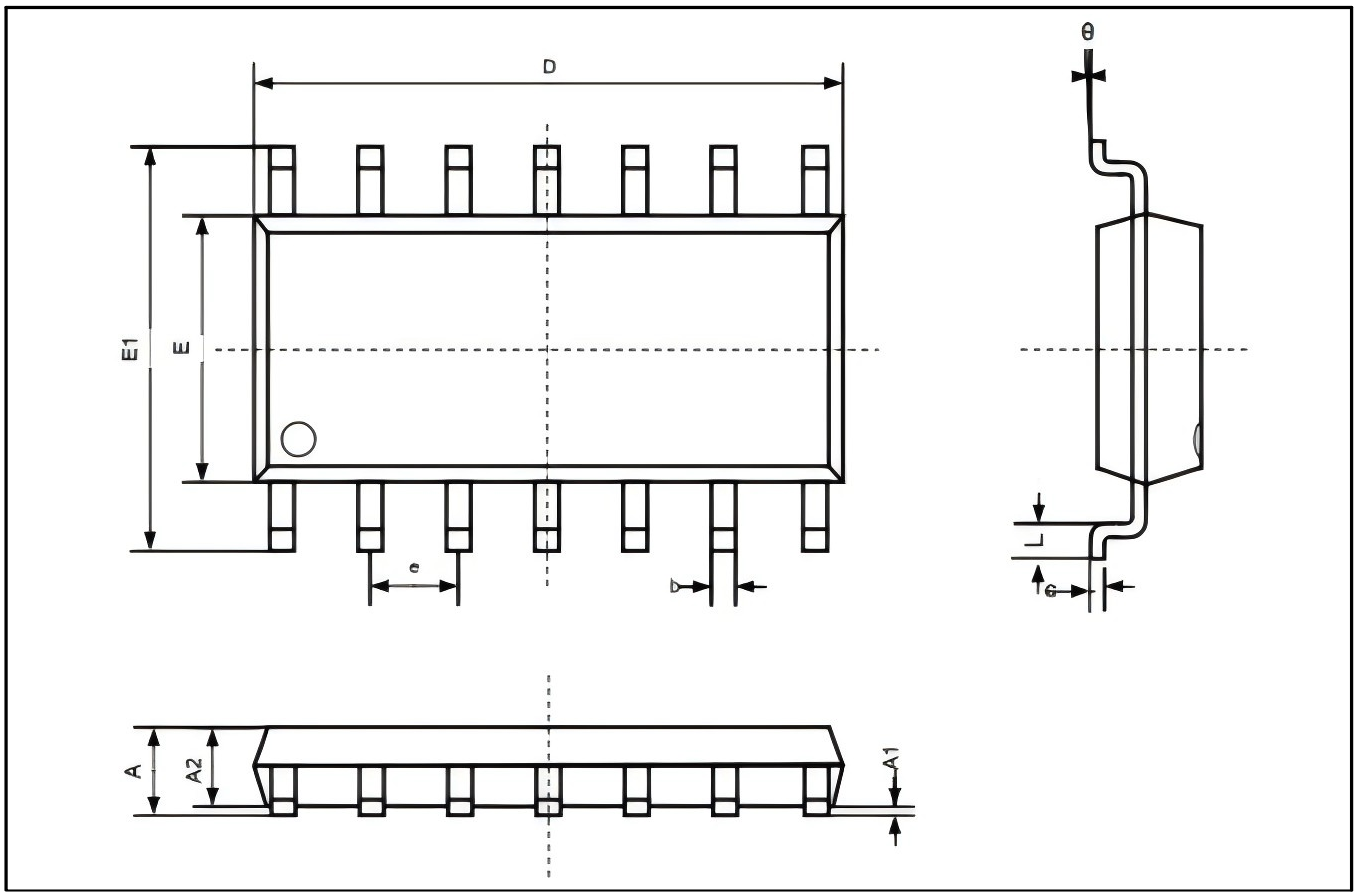


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 BSC		0.050BSC	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

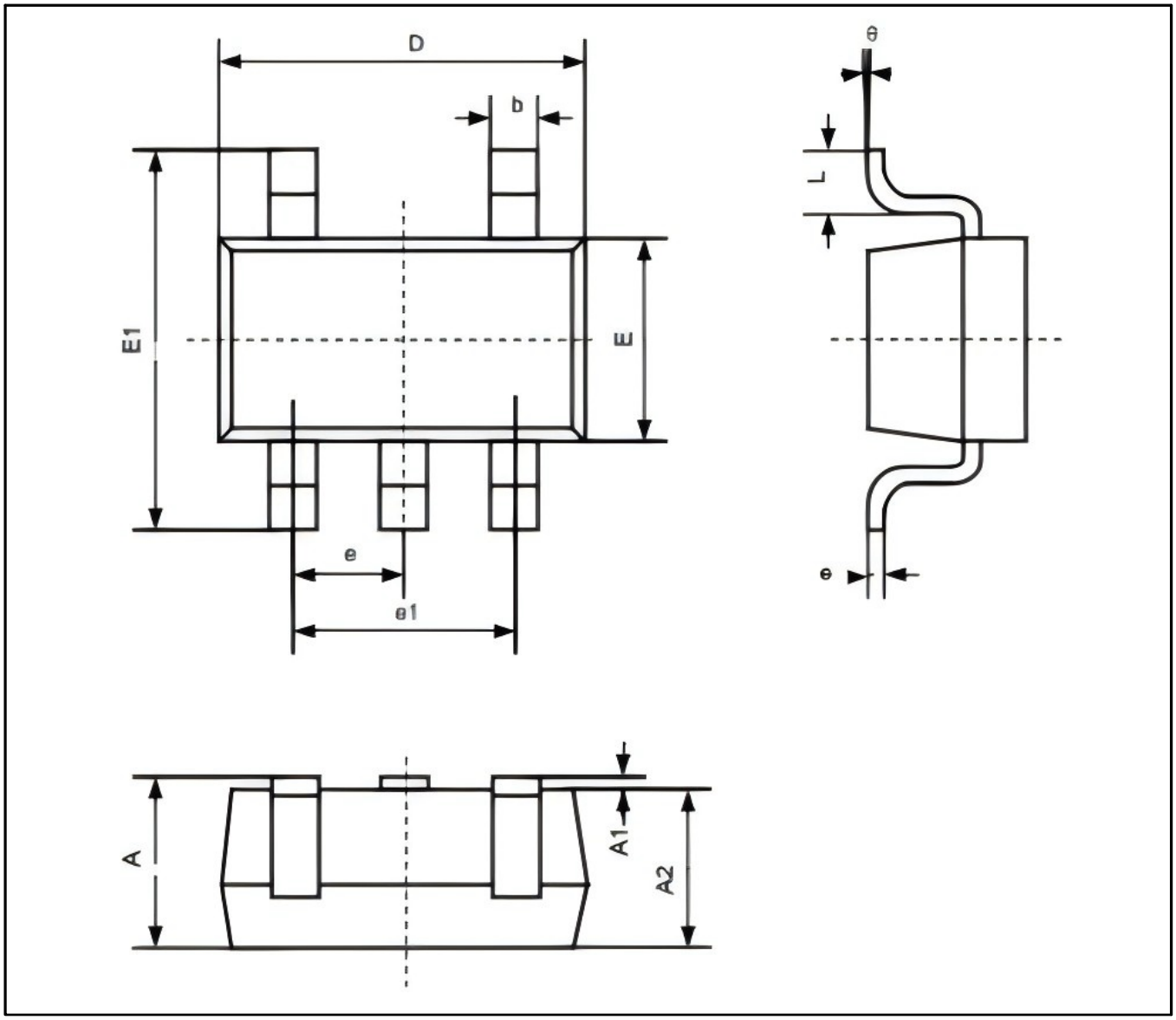


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.820	1.100	0.032	0.043
A1	0.020	1.150	0.001	0.008
A2	0.750	0.950	0.030	0.037
b	0.250	0.380	0.010	0.015
c	0.090	0.230	0.004	0.009
D	2.900	3.100	0.114	0.122
E	2.900	3.100	0.114	0.122
E1	4.750	5.050	0.187	0.199
e	0.650 BSC		0.026 BSC	
L	0.400	0.800	0.016	0.031
θ	0°	6°	0°	6°

SOP-14



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	MIN	MOD	MAX	MIN	MOD	MAX
A	1.350		1.750	0.053		0.069
A1	0.100		0.250	0.004		0.010
A2	1.250		1.650	0.049		0.065
A3	0.550		0.750	0.022		0.030
b	0.360		0.490	0.014		0.019
D	8.530		8.730	0.336		0.344
E	5.800		6.200	0.228		0.244
E1	3.800		4.000	0.150		0.157
e		1.270 BSC			0.050 TYP	
L	0.450		0.800	0.018		0.032
L1		1.040 REF			0.040 REF	
L2		0.250 BSC			0.010 BSC	
R	0.070			0.003		
R1	0.070			0.003		
h	0.300		0.500	0.012		0.020
θ	0°		8°	0°		8°



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 BSC		0.037 BSC	
e1	1.900 BSC		0.075 BSC	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°