钍地半导体
Tudi Semiconductor

Product Specification

TUDI-TC4451/4452

12A High-Speed MOSFET Drivers

网址 www.sztdbdt.com

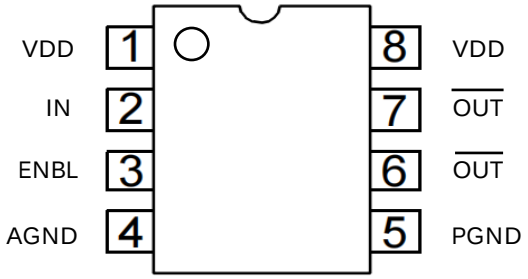
用芯智造·卓越品质

semiconductor device manufacturer

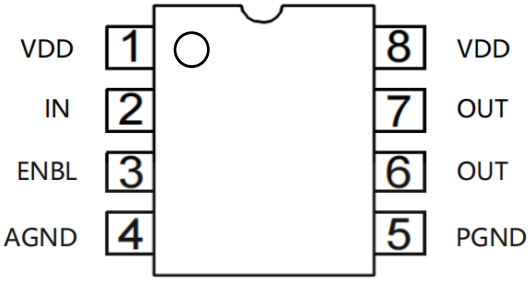
- Design
- research and development
- production
- and sales

Features

- High Peak Output Current: 13A (typical)
- Low Shoot-Through/Cross-Conduction Current in Stage
- Wide Input Supply Voltage Operating Range:
- 4.5V to 18V
- High Continuous Output Current: 2.6A maximum
- Matched Fast Rise and Fall Times:
- 21 ns with 10,000 pF Load
- 42 ns with22000 pF Load
- Matched Short Propagation Delays: 44 ns(typical)
- Low Output Impance: 0.9 (typical)
- Latch-Up Protected: Withstands 1.5A Output everse Current
- Inputstands Negative Inputs Up To 5V



TC4451 Pin Diagram



TC4452 Pin Diagram

Explanation

The TC4451/TC4452 are single-output MOSFETdrivers. These devices are high-current buffers/driverscapable of driving large MOSFETs and insulated gatebipolar transistors (IGBTs).
The TC4451/TC4452 havematched output rise and fall times, as well as matched leading and falling-edge propagation delay times. TheTC4451/TC4452 devices also have very low crossconduction current, reducing the overall powerdissipation of the device.These devices are essentially immune to any form ofupset, except direct overvoltage or over-dissipation.They cannot be latched under any conditions withintheir power and voltage ratings. These parts are not subject to damage or improper operation when up to 5V of ground bounce is present on their ground terminals. They can accept, without damage or logic upset, more than 1.5A inductive current of either polarity being forced back into their outputs. In addition,all terminals are fully protected against electrostatic discharge (ESD) up to 4.0 kV (HBM) and 400V (MM).
The TC4451/TC4452 inputs may be driven directly from either TTL or CMOS (3V to 18V). Moreover,300 mV of hysteresis is built into the input, providing noise immunity and enabling the device to be driven from slowly rising or falling waveforms.With a wide operating temperature range and having both surface-mount and pin-through-hole packages,the TC4451/TC4452 family of 12A MOSFET drivers fits into any application where high gate/line capacitance drive is required.

Applications

- Line Drivers for Extra Heavily-Loaded Lines
- Pulse Generators
- Driving the Largest MOSFETs and IGBTs
- Local Power On/Off Switch
- Motor and Solenoid Driver
- LF Initiator

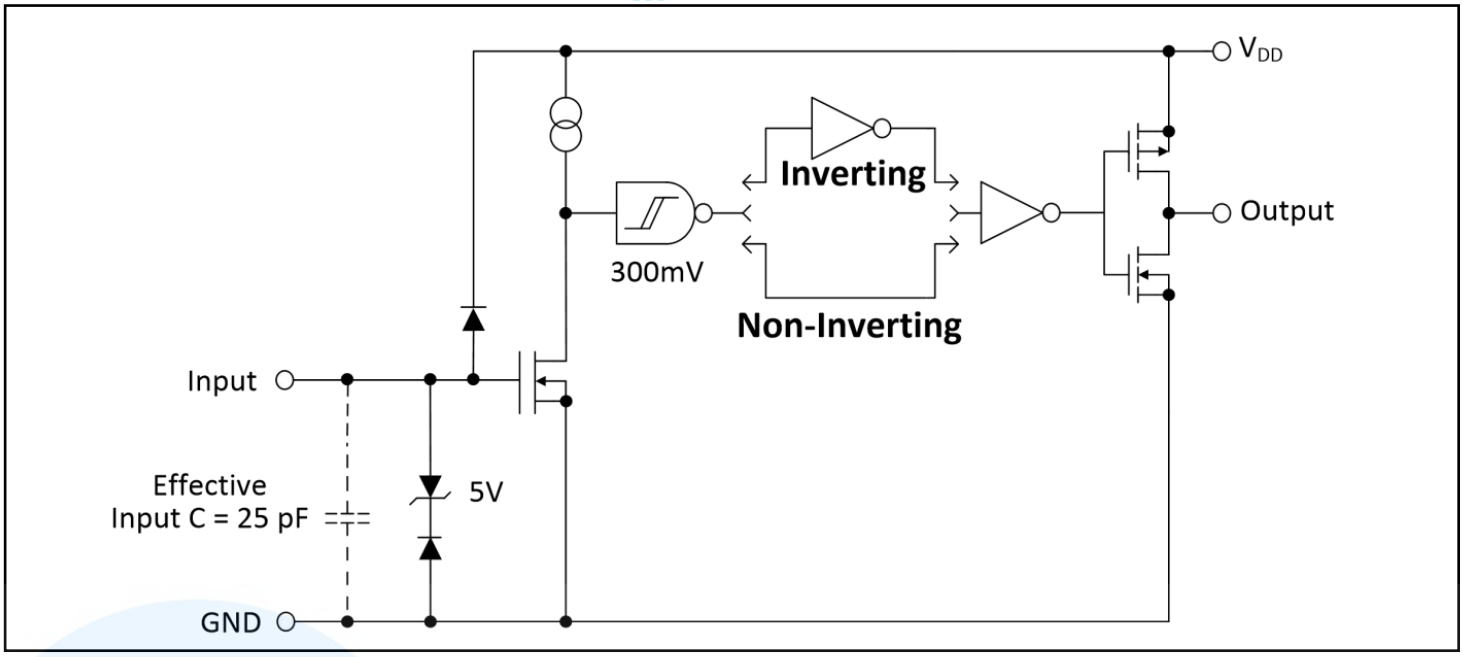


Figure 2. Functional Block Diagram

4451: Output out of phase with inputU
4452: Output in phase with input

Pin Description

Pin	Name	Description
1	VDD	Power Supply
2	INPUT	Control input,TTL/CMOS compatible input
3	NC	No Connection
4	AGND	Ground
5	PGND	Ground
6	OUTPUT	CMOS push-pull output
7	OUTPUT	CMOS push-pull output
8	VDD	Power Supply
	PAD	Exposed Metal Pad,electrically isolated

Note: Duplicate pins must both be connected for proper operation.

Product Specification

Absolute Maximum Ratings(1)			
Parameter	Min	Max	Unit
DC supply voltage Vs		28	V
Operating junction temperature	-40	+125	℃
Storage temperature	-55	+150	℃
Maximum input voltage	GND-5	VDD+0.3	V

Thermal Data		
Parameter	Rating	Unit
Package Thermal Resistance	155(SOP8) 125(DIP8)	℃/W

Recommended Operating Conditions		
Parameter	Rating	Unit
DC Supply Voltage	4.5-18	V
Operating ambient temperature	-40 to+125	℃

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
INPUT						
Input Signal High Threshold	VIH		1.6			V
Input Signal Low Threshold	VIL				0.7	V
Input Signal Hysteresis	VHYS			0.3		V
Input Signal High Current	IH	Inverting Input Current, VINx=18V			0.01	μA
		Non-inverting Input Current, VINx=18V		88	125	
Input Signal High Current	IL	Inverting Input Current, VINx=0V		88	125	μA
		Non-inverting Input Current, VINx=0V			0.01	

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
OUTPUT						
High Output Voltage VOH	VoH	DC Test	VDD-0.025			V
Low Output Voltage	VoL	DC Test			0.025	V
Pull-Up Resistance	RoH	Source Current =10mA		0.83		Q
Pull-Down Resistance	RoL	Sink Current =-10mA		0.5		Ω
Peak Output Current	lpK	10V≤VDD ≤18V		9.0		A
POWER SUPPLY						
Power Supply Current	lcc	VIN=3V		0.85		mA
		VIN=0V		0.65		
Operating Voltage Range	VDD		4.5		18	V
Under-Voltage Lockout ON Threshold				3.7	4.1	V
Under-Voltage Lockout Hysteresis				0.5		V
SWITCHING CHARACTERISTICS						
Rise Time	tR	CL=10,000 pF, See Figure 3		35		ns
Fall Time	tF	CL=10,000 pF, See Figure 3		36		ns
Turn-On Delay Time	tD1	4451,C=10,000pF 4452,		58		ns
		C=10,000pF 4451,C=10		60		ns
Turn-Off Delay Time	tD2	,000pF 4452,C=10,		59		ns
		000pF		63		ns
OVER-TEMPERATURE	PROTECTION					
Thermal Shutdown				150		℃
Thermal Shutdown Threshold				25		℃

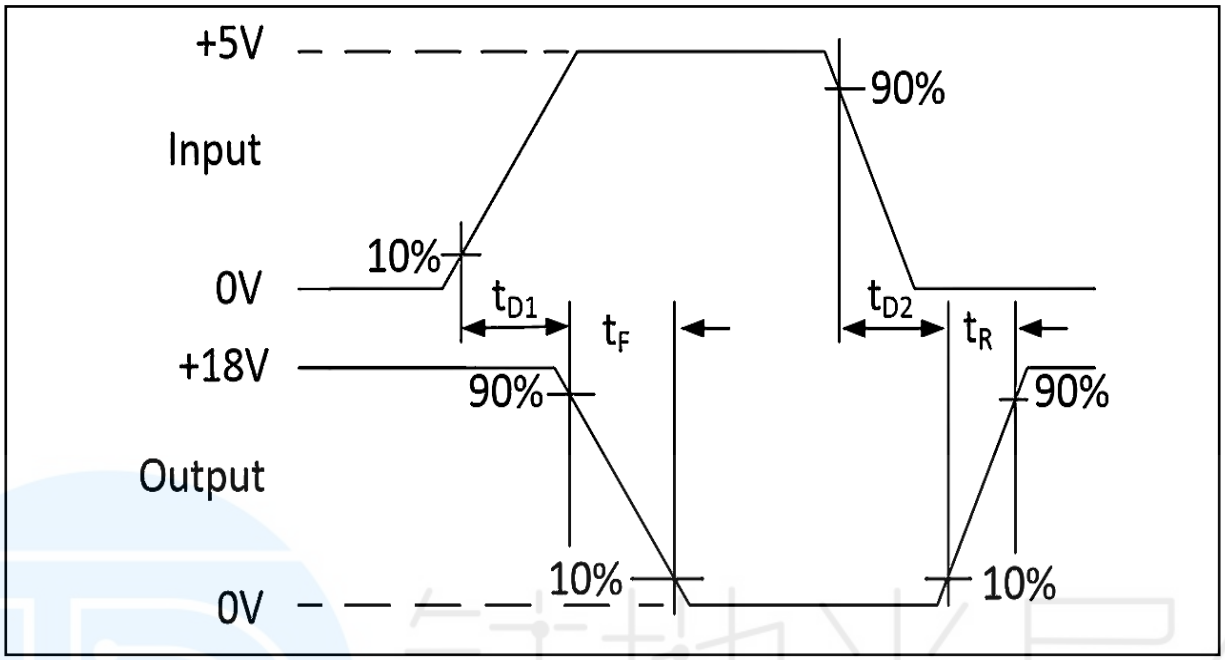
Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Input
MOSFET driver input is a high-impedance,TTL/CMOS compatible input.It also has 300 mV of hysteresis between the high and low thresholds that prevents output glitching even when the rise and fall time of the input signal is very slow.
Ground (GND)
Ground is the device return pin.The Ground pin(s)should have a low-impedance connection to the bias supply source return.High peak current flows out the Ground pin(s)when the capacitive load is being discharged.
Output
MOSFET driver outputs are low-impedance,CMOS push-pull style outputs.The pull-down and pullup devices are of equal strength,making the rise and fall times equivalent.The Output is held LOW if Input is unbiased or floating.
Supply Input (VDD)
The VDD input is the bias supply for the MOSFET driver and is rated for 4.5V to 18V with respect to the Ground pin.The VDD input should be bypassed with local ceramic capacitors.The value of these capacitors should be chosen based on the capacitive load that is being driven.A value of 1.0 μF is suggested.
Exposed Metal Pad
The exposed metal pad of the DFN-S package is not internally connected to any potential.Therefore,this pad can be connected to a ground plane or other copper plane on a Printed Circuit Board(PCB),to aid in heat removal from the package.

Ordering Information

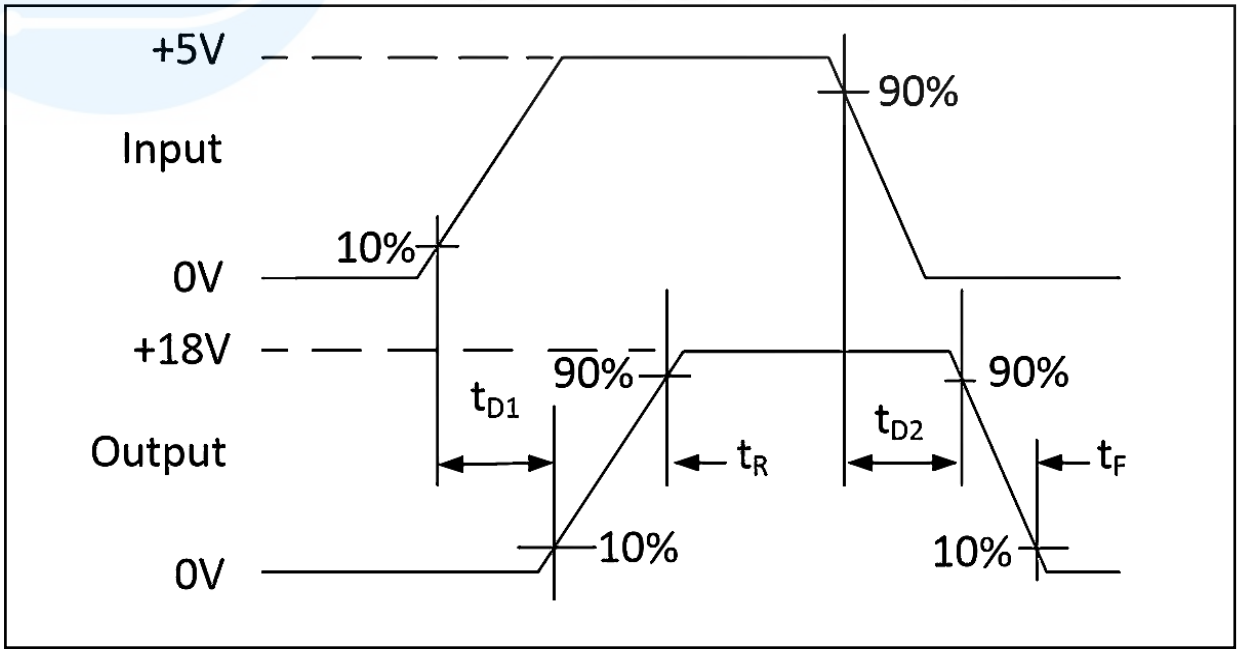
Order Number	Package	Package Quantity	Marking On The park	Temperature
TC4451VOA-TUDI	SOP8	Tape,Reel,2500	TC4451VOA	- 40°C to 125°C
TC4451VPA-TUDI	DIP8	Tube,50,A box of 2000	TC4451VPA	
TC4452VOA-TUDI	SOP8	Tape,Reel,2500	TC4452VOA	
TC4452VPA-TUDI	DIP8	Tube,50,A box of 2000	TC4452VPA	

Application Information



Inverting Driver

4451



Non-Inverting Driver

4452

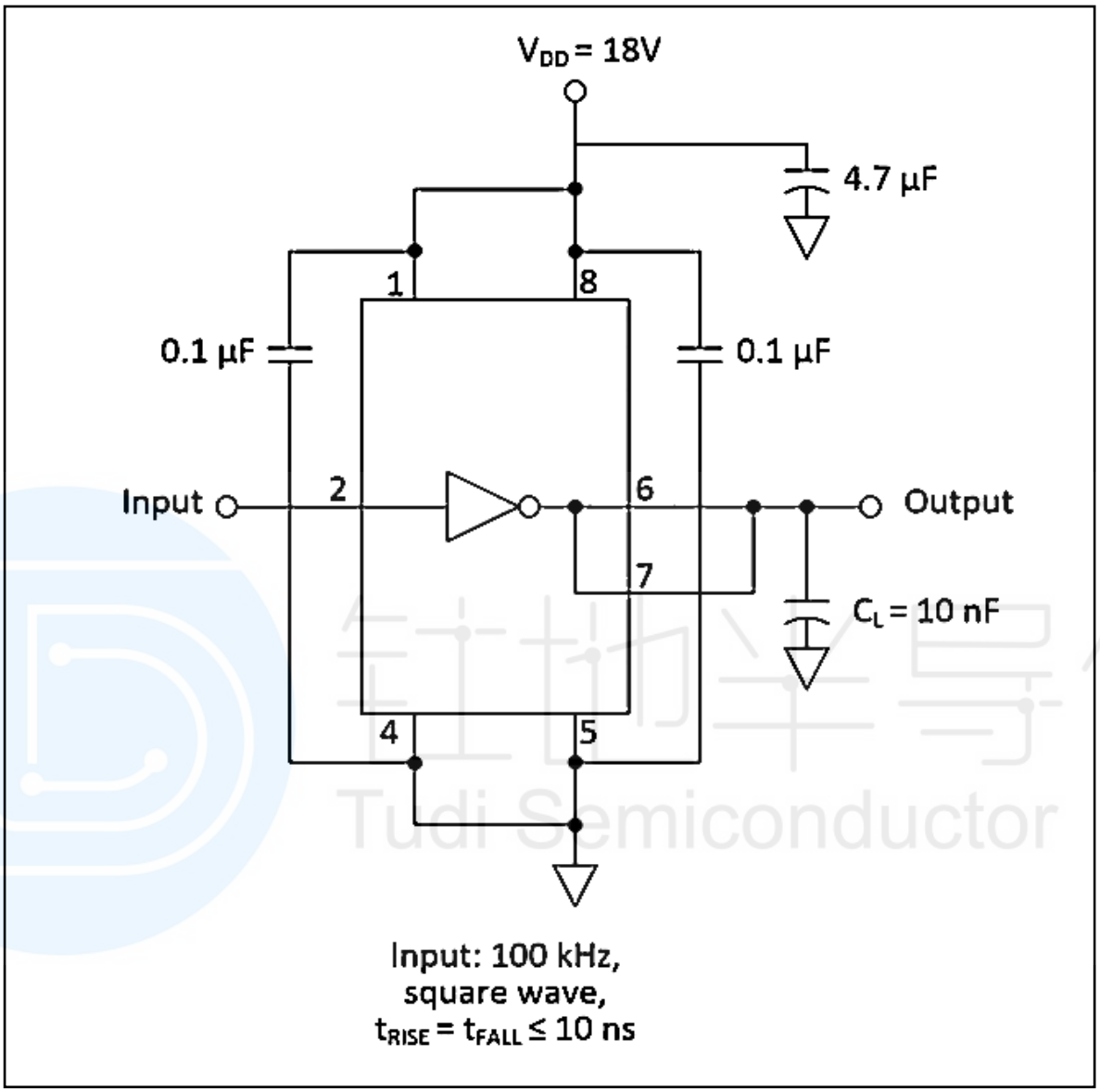
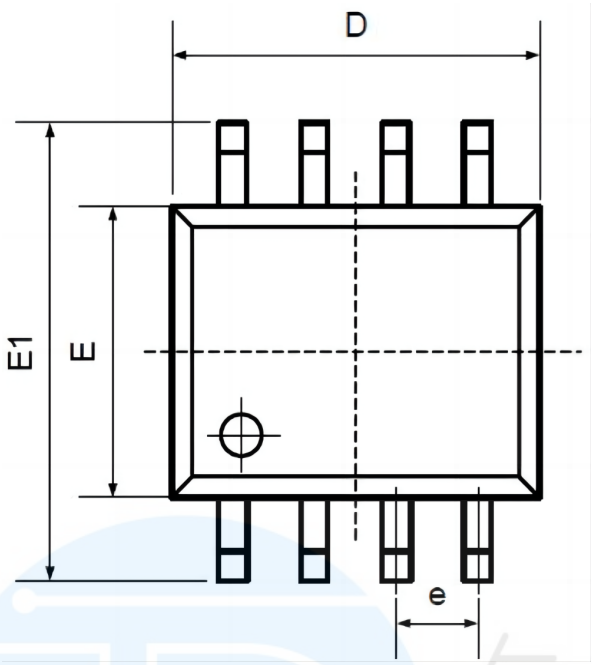
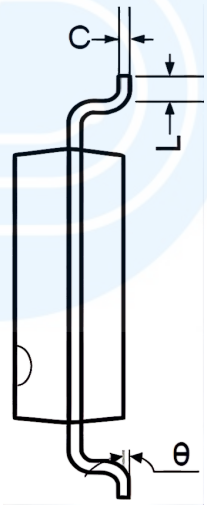
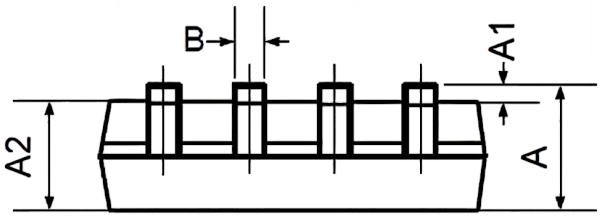


Figure 3. Switching Time Test Circuit

Package SOP8

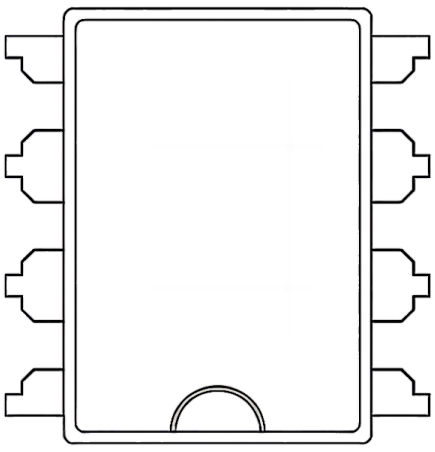


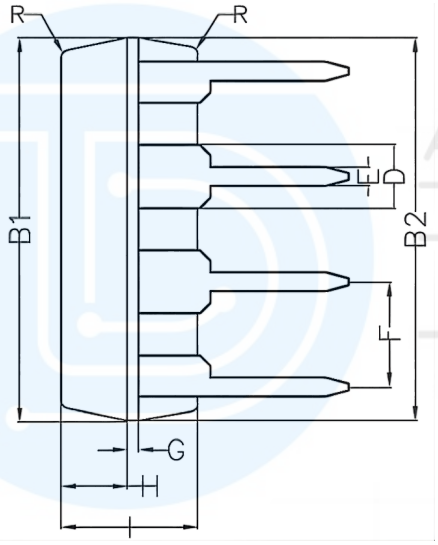


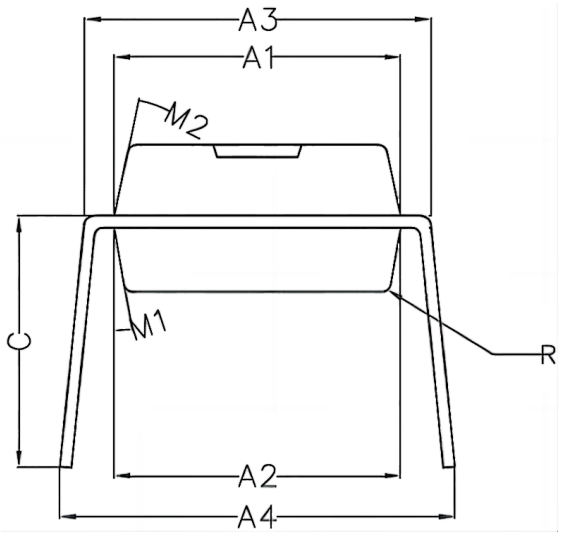


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
B	0.330	0.510	0.013	0.020
C	0.190	0.250	0.007	0.010
D	4.780	5.000	0.188	0.197
E	3.800	4.000	0.150	0.157
E1	5.800	6.300	0.228	0.248
e	1.270TYP		0.050TYP	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

Package DIP8







Symbol	Min	Non	Max
A1	6.28	6.33	6.38
A2	6.33	6.38	6.43
A3	7.52	7.62	7.72
A4	7.80	8.40	9.00
B1	9.15	9.20	9.25
B2	9.20	9.25	9.30
C		5.57	
D		1.52	
E	0.43	0.45	0.47
F		2.54	
G		0.25	
H	1.54	1.59	1.64
工	3.22	3.27	3.32
R		0.20	
M1	9°	10°	11°
M2	11°	12°	13°

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