



# 产品规格书

## DP4407B

### Datasheet of DP4407B

深圳市德普微电子有限公司

Shenzhen Developer Microelectronics Co., Ltd.

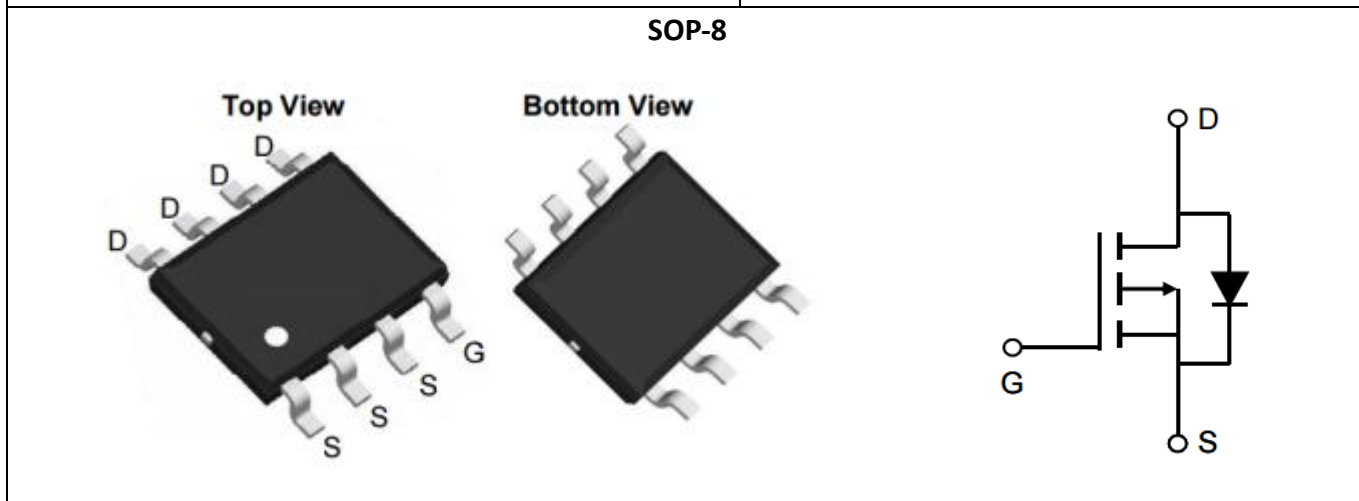
地址：深圳市南山区高新南四道创维半导体设计大厦西座 707-710 单元

Address: Unit 7-10, 7/F., west block, Skyworth Semiconductor design Building,

The 4th on High-tech Zone, Nanshan District, Shenzhen.



<p><b>General Description</b></p> <p><b>DP4407B</b> uses advanced trench technology to provide excellent <math>R_{DS(ON)}</math>, low gate charge with a <b>25V</b> gate rating. This device is suitable for use as a load switch or in PWM applications.</p> <p>* RoHS and Halogen-Free Complaint</p>	<p><b>Product Summary</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 70%;"><math>V_{DS}</math></td> <td style="text-align: right;">-30 V</td> </tr> <tr> <td><math>I_D</math> (at <math>V_{GS}=-20V</math>)</td> <td style="text-align: right;">-12A</td> </tr> <tr> <td><math>R_{DS(ON)}</math> (at <math>V_{GS} = -20V</math>)</td> <td style="text-align: right;">&lt; 11m<math>\Omega</math></td> </tr> <tr> <td><math>R_{DS(ON)}</math> (at <math>V_{GS} = -10V</math>)</td> <td style="text-align: right;">&lt; 13m<math>\Omega</math></td> </tr> <tr> <td><math>R_{DS(ON)}</math> (at <math>V_{GS} = -6V</math>)</td> <td style="text-align: right;">&lt; 17m<math>\Omega</math></td> </tr> </table>	$V_{DS}$	-30 V	$I_D$ (at $V_{GS}=-20V$ )	-12A	$R_{DS(ON)}$ (at $V_{GS} = -20V$ )	< 11m $\Omega$	$R_{DS(ON)}$ (at $V_{GS} = -10V$ )	< 13m $\Omega$	$R_{DS(ON)}$ (at $V_{GS} = -6V$ )	< 17m $\Omega$
$V_{DS}$	-30 V										
$I_D$ (at $V_{GS}=-20V$ )	-12A										
$R_{DS(ON)}$ (at $V_{GS} = -20V$ )	< 11m $\Omega$										
$R_{DS(ON)}$ (at $V_{GS} = -10V$ )	< 13m $\Omega$										
$R_{DS(ON)}$ (at $V_{GS} = -6V$ )	< 17m $\Omega$										



**Absolute Maximum Ratings  $T_A=25^\circ C$  unless otherwise noted**

Parameter	Symbol	P-Channel	Unit
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 25$	V
Drain Current-Continuous @ $T_J=25^\circ C$	$I_D$	-12	A
Pulsed <sup>b</sup>	$I_{DM}$	-60	A
Drain-Source Diode Forward Current <sup>a</sup>	$I_S$	-3.0	A
Maximum Power Dissipation <sup>a</sup>	$P_D$	3.1	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 150	$^\circ C$

**Thermal Characteristic**

Parameter	Symbol	Limit	Unit
Thermal Resistance, Junction-to-Ambient <sup>a</sup>	$R_{\theta JA}$	60	$^\circ C/W$

**Notes:**

- a. Surface Mounted on 1in<sup>2</sup> Pad area ,  $T < 10$  sec ;
- b. Guaranteed by Design, not subject to production testing.

**Electrical Characteristics ( $T_A=25^\circ C$  unless otherwise noted)**

Parameter	Symbol	Condition	Min	Typ	Max	Unit
-----------	--------	-----------	-----	-----	-----	------



# DP4407B

## Single P Channel Enhancement Power

Off Characteristics						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-30	-	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-30V, V_{GS}=0V$	-	-	-1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 25V, V_{DS}=0V$	-	-	$\pm 100$	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-1.8	-3	V
Drain-Source On-State Resistance	$R_{DS(ON)}^a$	$V_{GS}=-20V, I_D=-12A$	-	9	11	m $\Omega$
		$V_{GS}=-10V, I_D=-12A$	-	10	13	
		$V_{GS}=-6V, I_D=-10A$	-	12.7	17	
Forward Transconductance	$g_{FS}$	$V_{DS}=-5V, I_D=-10A$	-	21	-	S
Dynamic Characteristics <sup>b</sup>						
Input Capacitance	$C_{ISS}$	$V_{DS}=-15V,$ $V_{GS}=0V, F=1.0MHz$	-	2060	-	pF
Output Capacitance	$C_{OSS}$		-	370	-	
Reverse Transfer Capacitance	$C_{RSS}$		-	295	-	
Switching Characteristics <sup>b</sup>						
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=-15V,$ $I_D=-1A$ $V_{GS}=-10V, R_{GEN}=3\Omega,$ $R_L=1.25\Omega$	-	11	-	nS
Turn-on Rise Time	$t_r$		-	9.4	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	24	-	nS
Turn-Off Fall Time	$t_f$		-	12	-	nS
Total Gate Charge	$Q_g$	$V_{DS}=-15V,$ $I_D=-12A,$ $V_{GS}=-10V$	-	30	-	nC
Gate-Source Charge	$Q_{gs}$		-	4.6	-	nC
Gate-Drain Charge	$Q_{gd}$		-	10	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	$V_{SD}^a$	$V_{GS}=0V, I_S=-1A$	-	-0.7	-1	V

**Notes:**

Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$ .



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Resistive Switching Test Circuit & Waveforms

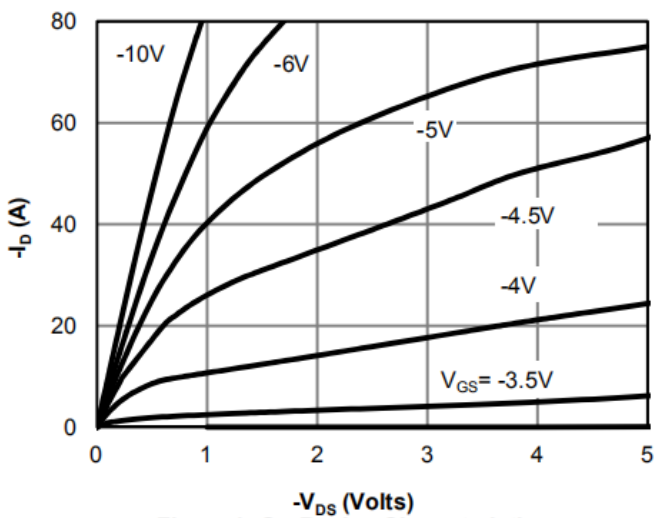
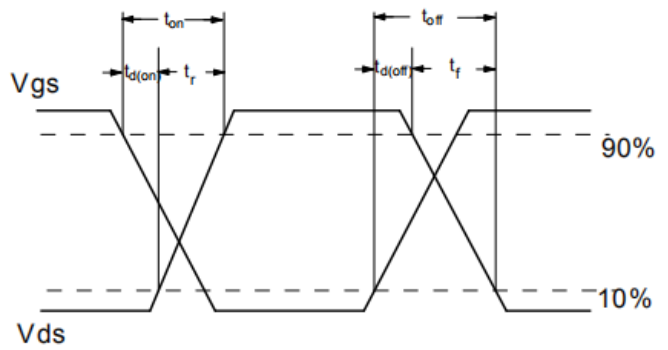
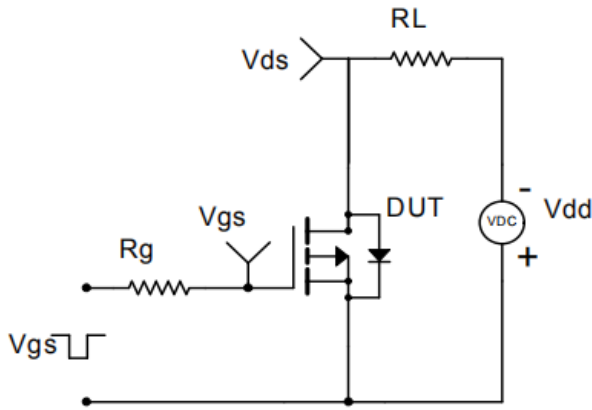


Figure 1: On-Region Characteristics

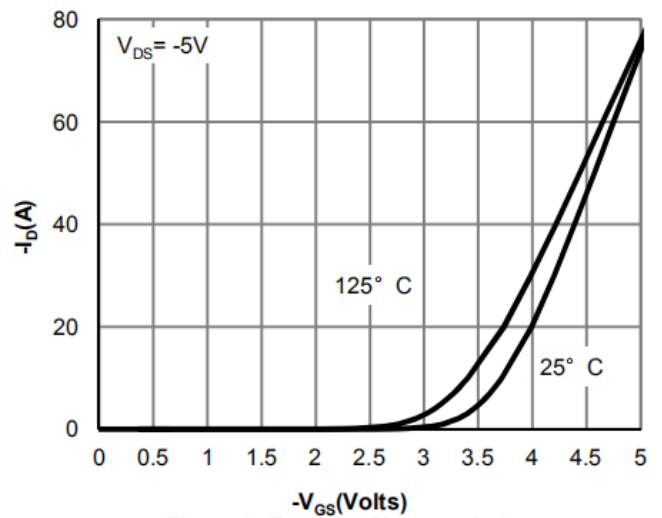


Figure 2: Transfer Characteristics

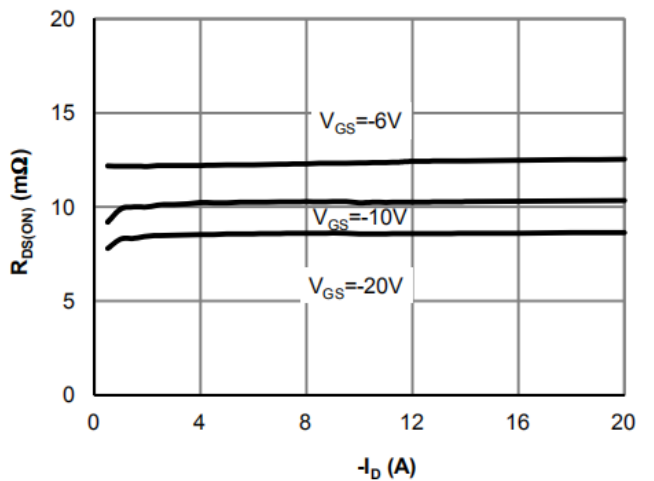


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

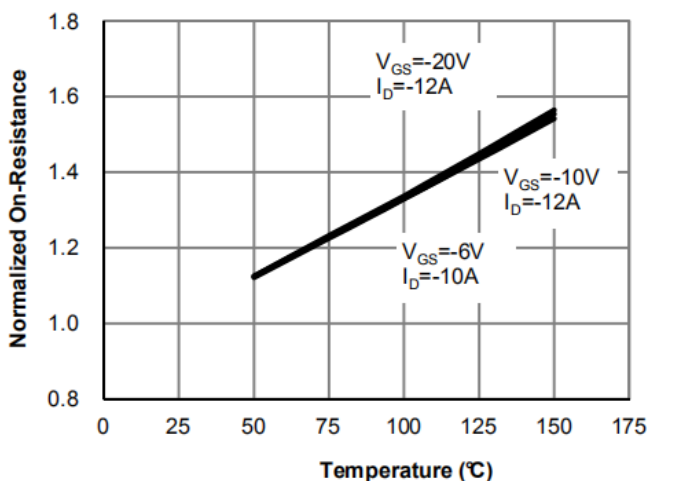


Figure 4: On-Resistance vs. Junction Temperature



# DP4407B

## Single P Channel Enhancement Power

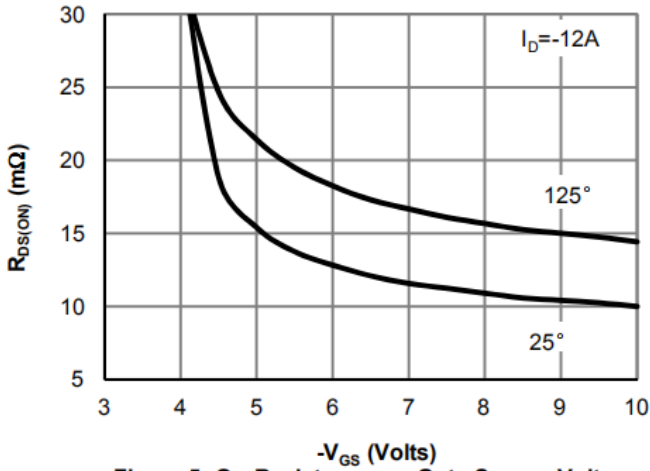


Figure 5: On-Resistance vs. Gate-Source Voltage

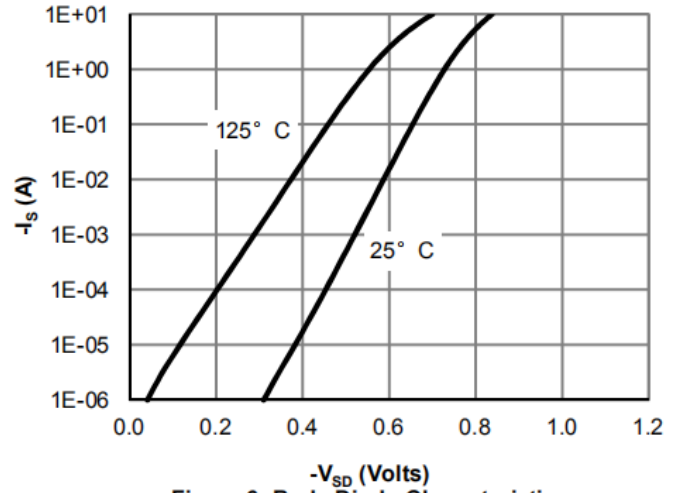


Figure 6: Body-Diode Characteristics

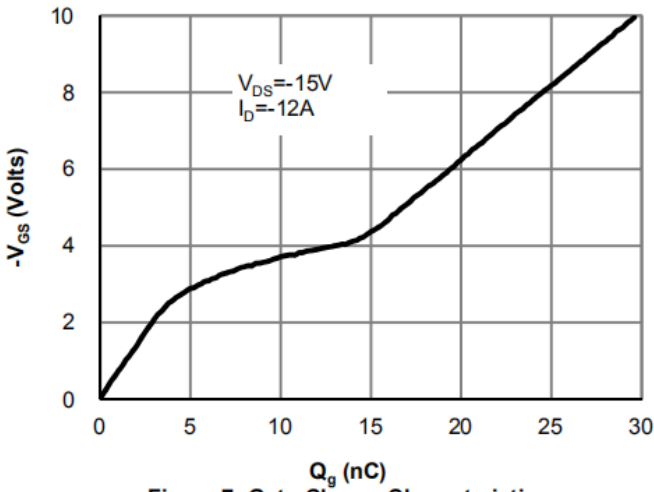


Figure 7: Gate-Charge Characteristics

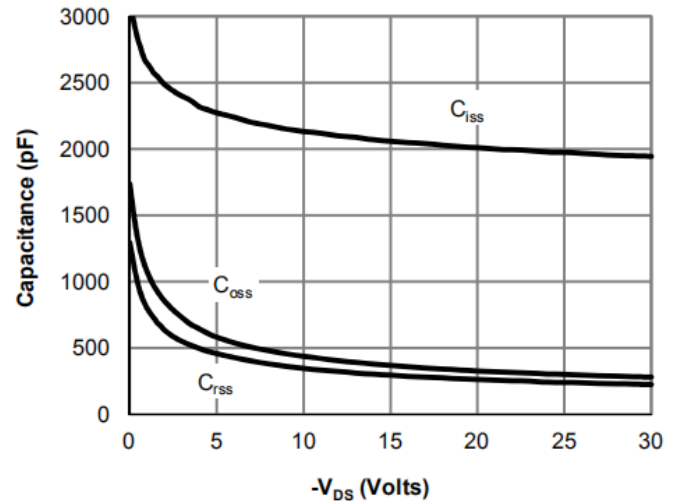


Figure 8: Capacitance Characteristics

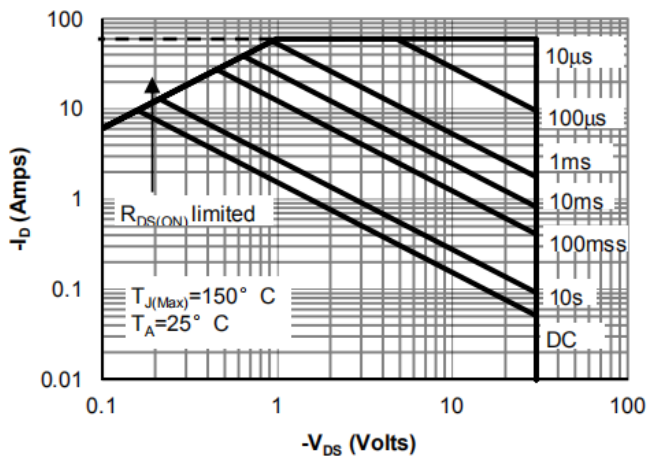


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

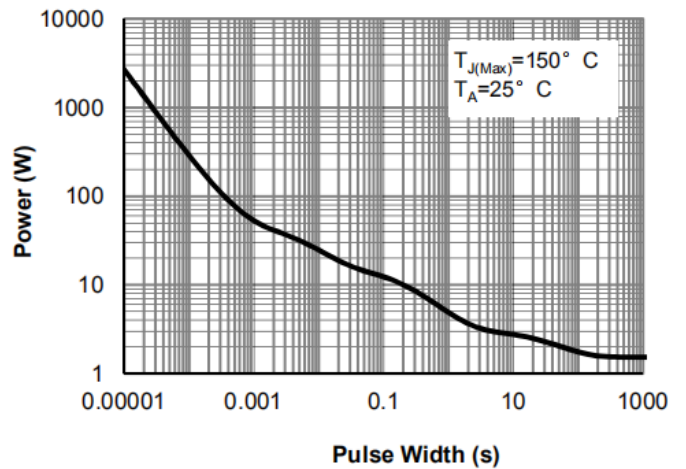
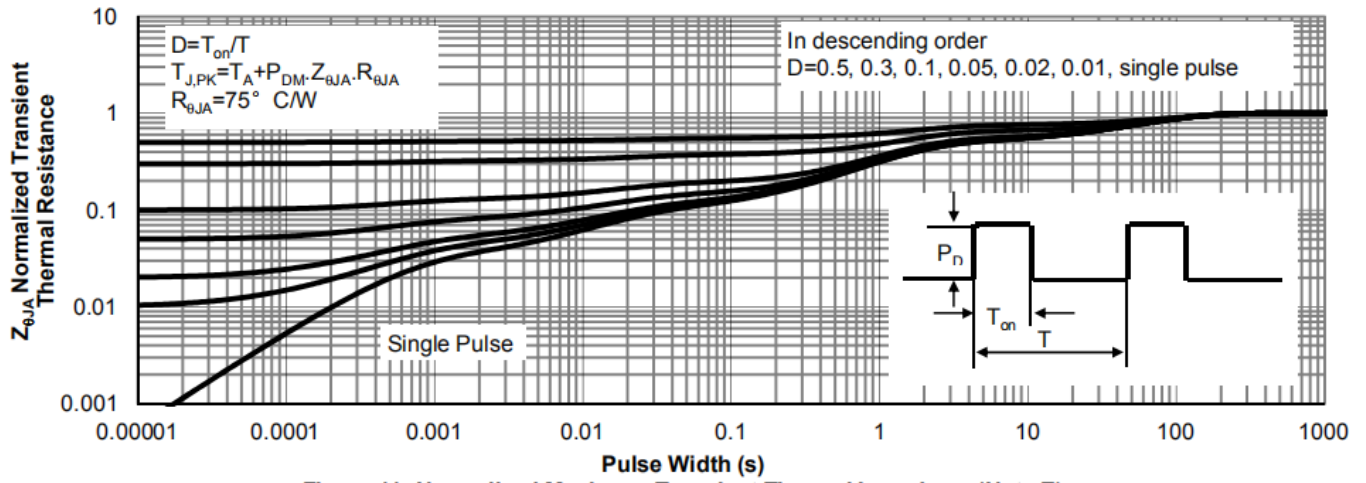


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)



# DP4407B

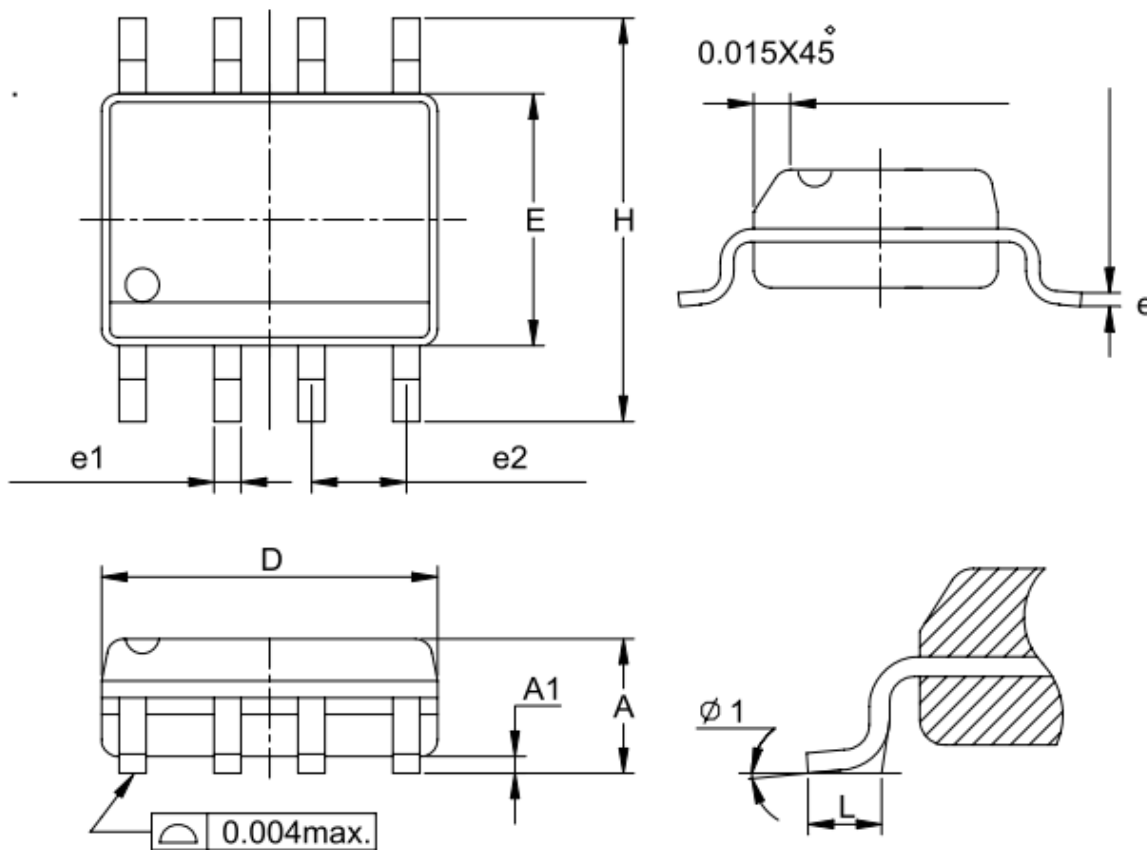
## Single P Channel Enhancement Power





**Package Outline Dimensions**

**SOP-8**



Dim	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
D	4.80	5.00	0.189	0.197
E	3.80	4.00	0.150	0.157
H	5.80	6.20	0.228	0.244
L	0.40	1.27	0.016	0.050
e1	0.33	0.51	0.013	0.020
e2	1.27BSC		0.5BSC	
φ 1	8°		8°	



**Revision History**

<b>Date</b>	<b>Rev</b>	<b>Description</b>	<b>Reviser</b>	<b>Approver</b>
2019/10/09	1.0	First Release	Zhou Hui	Xu Yan