

## P-Channel Enhancement Mode MOSFET

### 1. Product Information

#### 1.1 Features

- Surface-mounted package
- Advanced trench cell design

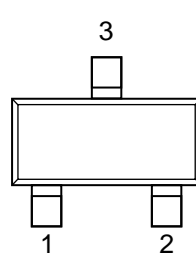
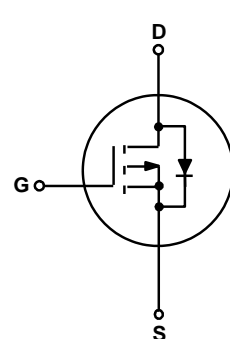
#### 1.2 Applications

- Portable appliances
- Battery management
- High speed switch
- Low power DC to DC Converter

#### 1.3 Quick reference

- $BV \leq -30\text{ V}$
- $R_{DS(ON)} \leq 50\text{ m}\Omega @ V_{GS} = -10\text{ V}$
- $P_{tot} \leq 1.4\text{ W}$
- $R_{DS(ON)} \leq 60\text{ m}\Omega @ V_{GS} = -4.5\text{ V}$
- $I_D \leq -4.3\text{ A}$
- $R_{DS(ON)} \leq 85\text{ m}\Omega @ V_{GS} = -2.5\text{ V}$

### 2. Pin Description

Pin	Description	Simplified Outline	Symbol
1	Gate(G)	 <p style="text-align: center;">Top View SOT-23</p>	
2	Source(S)		
3	Drain(D)		

## 3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V <sub>DS</sub>	Drain-Source Voltage	T <sub>A</sub> = 25 °C	- 30	-	V
V <sub>GS</sub>	Gate-Source Voltage	T <sub>A</sub> = 25 °C	-	± 12	V
I <sub>D</sub> *	Drain Current	T <sub>A</sub> = 25 °C, V <sub>GS</sub> = - 10 V	-	- 4.3	A
		T <sub>A</sub> = 100 °C, V <sub>GS</sub> = - 10 V	-	- 2.7	A
I <sub>DM</sub> *,**	Pulsed Drain Current	T <sub>A</sub> = 25 °C, V <sub>GS</sub> = - 10 V	-	- 17.2	A
P <sub>tot</sub>	Total Power Dissipation	T <sub>A</sub> = 25 °C	-	1.4	W
T <sub>stg</sub>	Storage Temperature		- 55	150	°C
T <sub>J</sub>	Junction Temperature		- 55	150	°C
I <sub>S</sub>	Diode Forward Current	T <sub>A</sub> = 25 °C	-	- 4.3	A
R <sub>θJA</sub> *	Thermal Resistance- Junction to Ambient		-	90	°C / W

Notes :

- \* Surface Mounted on 1 in<sup>2</sup> pad area, t ≤ 10 sec
- \*\* Pulse width ≤ 300 μs, duty cycle ≤ 2 %

## 4. Marking Information

Product Name	Marking
KJ3407S	3407

## 5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
KJ3407S	SOT-23			3000	

Notes :

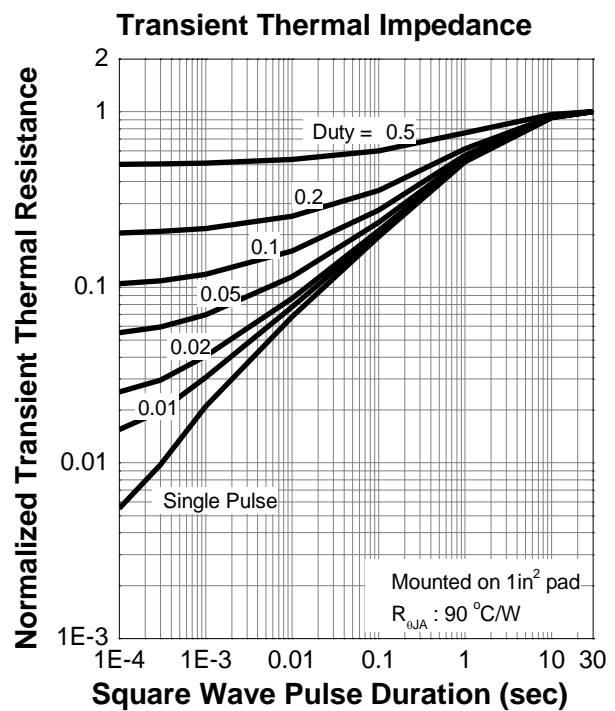
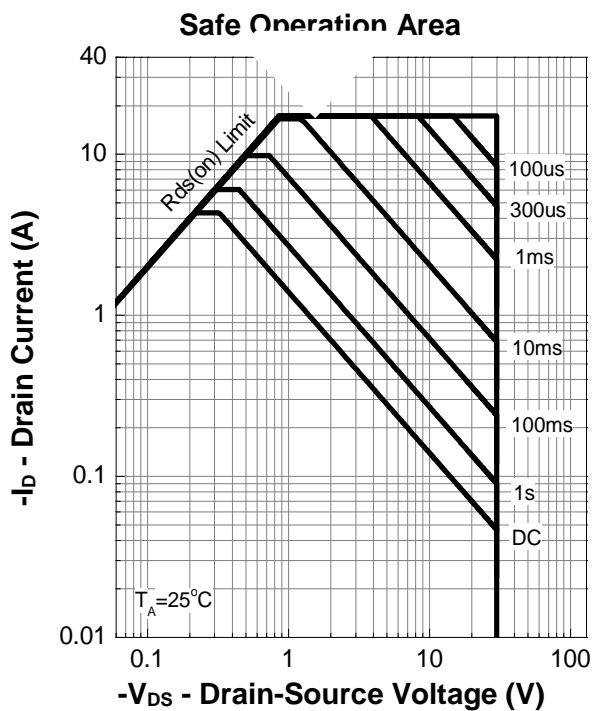
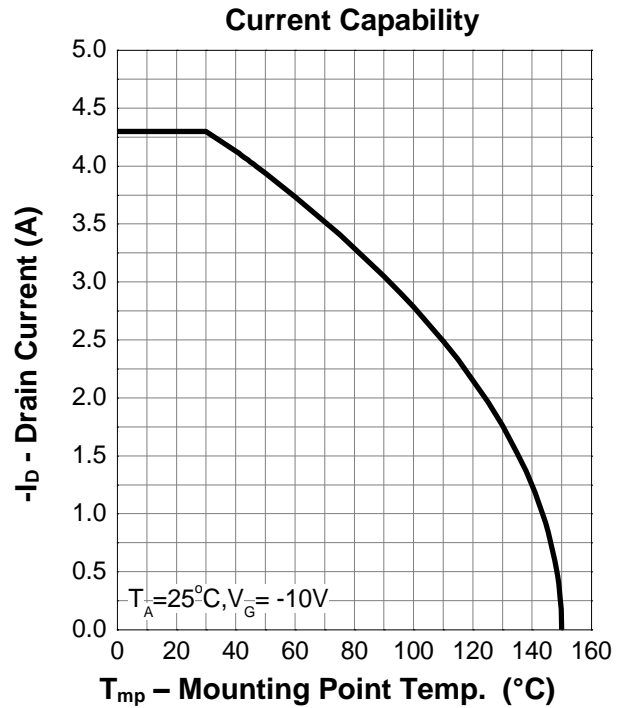
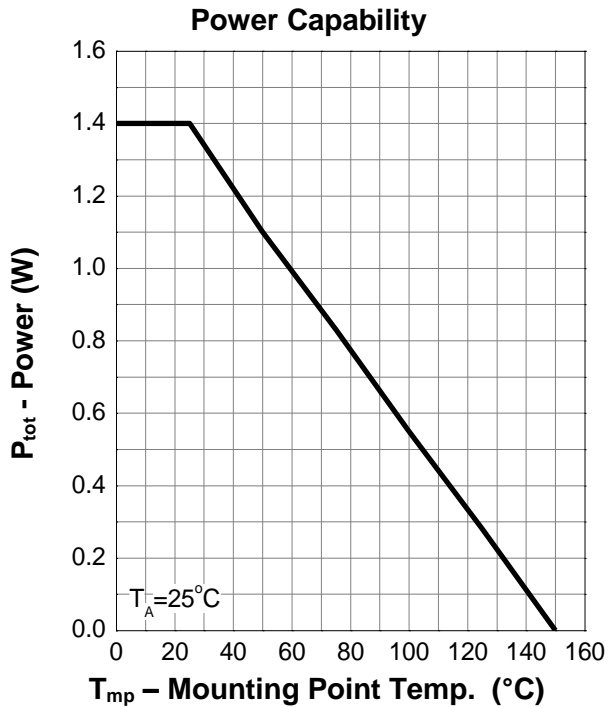
- \* Surface Mounted on 1 in<sup>2</sup> pad area, t ≤ 10 sec
- \*\* Pulse width ≤ 10 μs, duty cycle ≤ 1 %
- \*\*\* Limited by bonding wire

**6. Electrical Characteristics** ( $T_A = 25\text{ }^\circ\text{C}$  Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_{DS} = -250\text{ }\mu\text{A}$	-30	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_{DS} = -250\text{ }\mu\text{A}$	-1.0	-1.5	-2.4	V
$I_{DSS}$	Drain Leakage Current	$V_{DS} = -24\text{ V}, V_{GS} = 0\text{ V}$	-	-	-1	$\mu\text{A}$
		$T_J = 85\text{ }^\circ\text{C}$	-	-	-30	$\mu\text{A}$
$I_{GSS}$	Gate Leakage Current	$V_{GS} = \pm 12\text{ V}, V_{DS} = 0\text{ V}$	-	-	$\pm 100$	nA
$R_{DS(on)}^a$	On-State Resistance	$V_{GS} = -10\text{ V}, I_{DS} = -4\text{ A}$	-	41	50	m $\Omega$
		$V_{GS} = -4.5\text{ V}, I_{DS} = -3\text{ A}$	-	47	60	
		$V_{GS} = -2.5\text{ V}, I_{DS} = -2\text{ A}$	-	60	85	
<b>Diode Characteristics</b>						
$V_{SD}^a$	Diode Forward Voltage	$I_{SD} = -4\text{ A}, V_{GS} = 0\text{ V}$	-	-0.8	-1.3	V
$t_{rr}$	Reverse Recovery Time	$I_{SD} = -4\text{ A}, dI_{SD}/dt = 100\text{ A}/\mu\text{s}$	-	30	-	ns
$Q_{rr}$	Reverse Recovery Charge		-	2.7	-	nC
<b>Dynamic Characteristics<sup>b</sup></b>						
$C_{iss}$	Input Capacitance	$V_{GS} = 0\text{ V}, V_{DS} = -15\text{ V}$ Frequency = 1 MHz	-	750	-	pF
$C_{oss}$	Output Capacitance		-	70	-	
$C_{rss}$	Reverse Transfer Capacitance		-	60	-	
$t_d(on)$	Turn-on Delay Time	$V_{DS} = -15\text{ V}, V_{GEN} = -10\text{ V},$ $R_G = 6\text{ }\Omega, R_L = 3.75\text{ }\Omega,$ $I_{DS} = -4\text{ A}$	-	5.8	-	ns
$t_r$	Turn-on Rise Time		-	22	-	
$t_d(off)$	Turn-off Delay Time		-	172	-	
$t_f$	Turn-off Fall Time		-	69	-	
<b>Gate Charge Characteristics<sup>b</sup></b>						
$Q_g$	Total Gate Charge	$V_{GS} = -10\text{ V}, V_{DS} = -15\text{ V},$ $I_{DS} = -4\text{ A}$	-	17	-	nC
$Q_{gs}$	Gate-Source Charge		-	2.8	-	
$Q_{gd}$	Gate-Drain Charge		-	2	-	

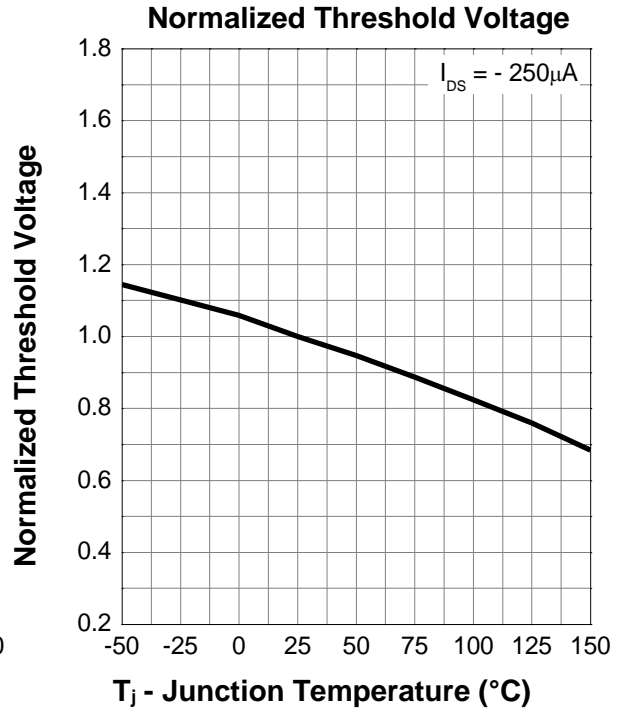
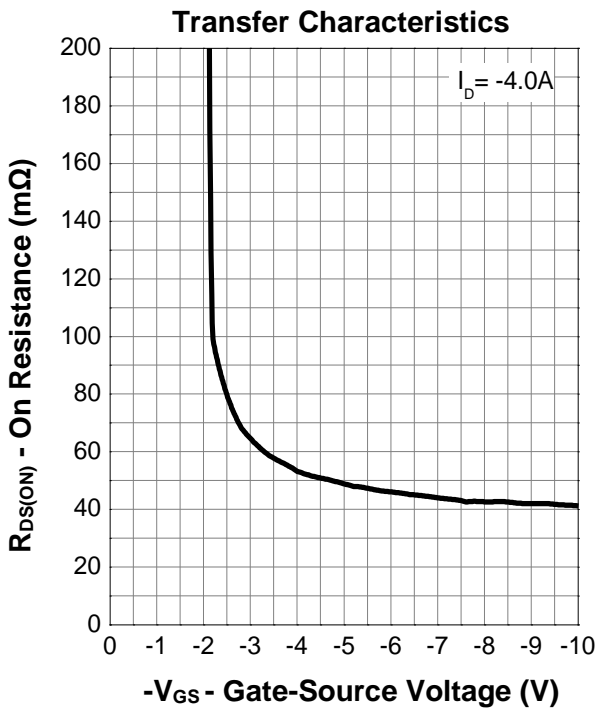
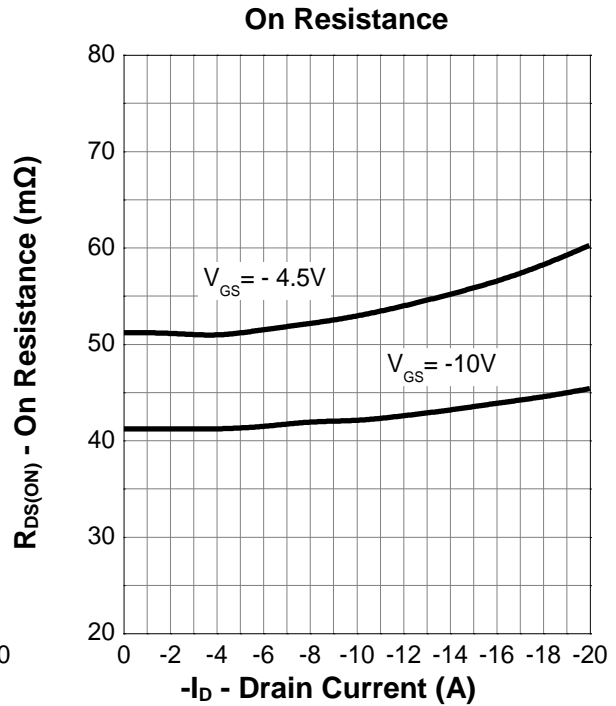
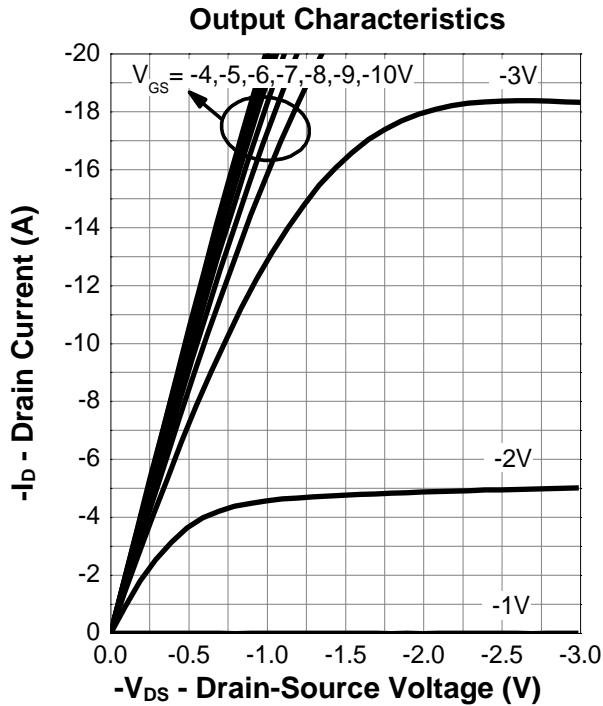
Notes : a : Pulse test ; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$   
b : Guaranteed by design, not subject to production testing

## 7. Typical Characteristics



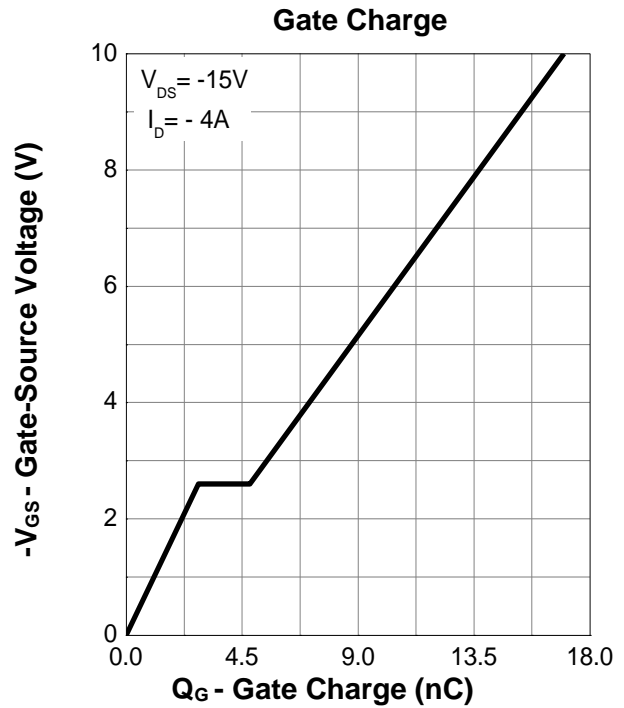
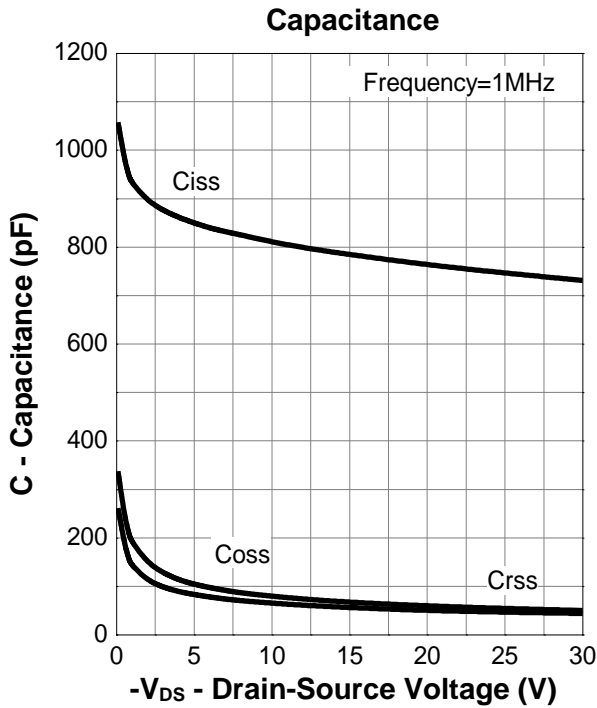
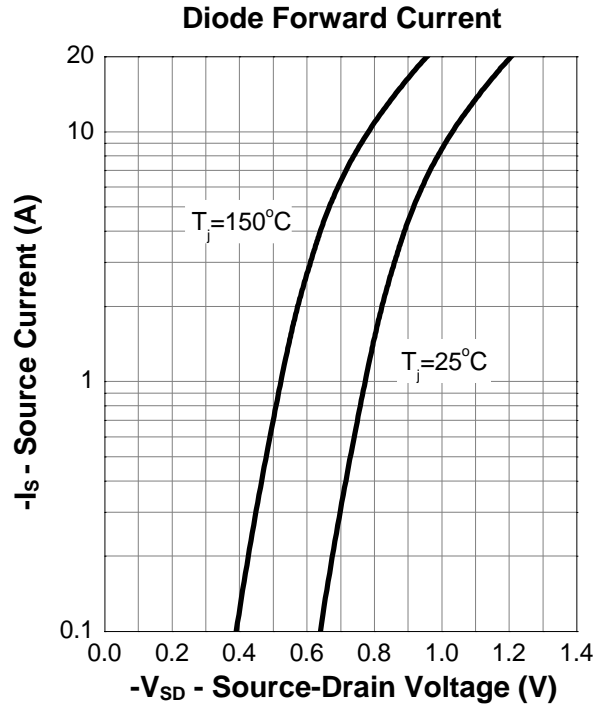
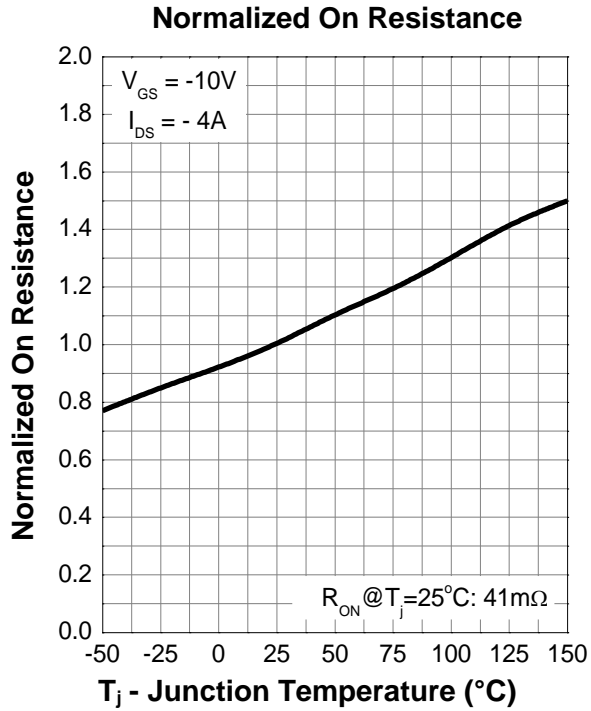


### 7. Typical Characteristics ( cont. )





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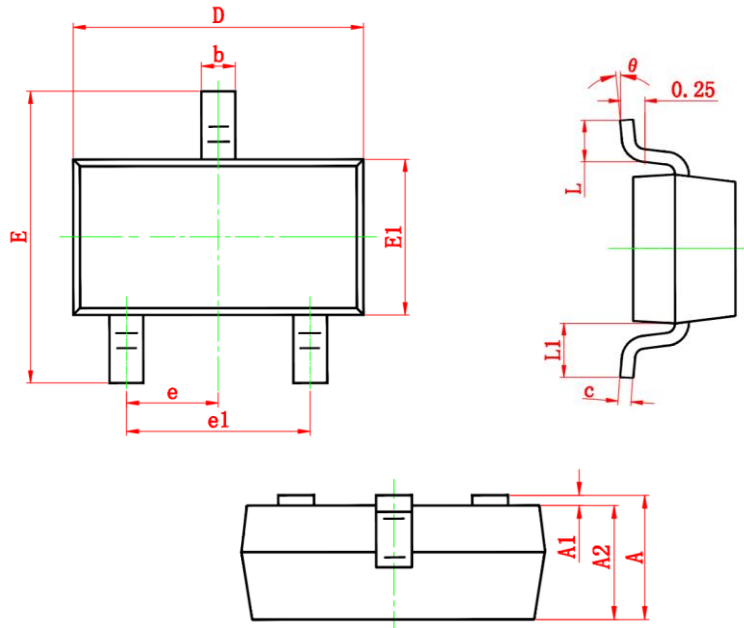


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## 8. Package Dimensions

SOT-23



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	2.250	2.550	0.089	0.100
E1	1.200	1.400	0.047	0.055
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.300	0.500	0.012	0.020
L1	0.550 REF.		0.022 REF.	
$\theta$	0°	8°	0°	8°