

**60V,0.34A  
N-Channel Mosfet**

### FEATURES

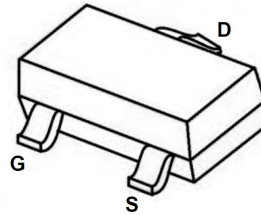
$R_{DS(ON)} \leq 2.3 \Omega @V_{GS}=10V$

$R_{DS(ON)} \leq 2.7 \Omega @V_{GS}=4.5V$

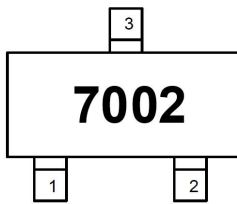
### APPLICATIONS

Portable appliances

### SOT-23

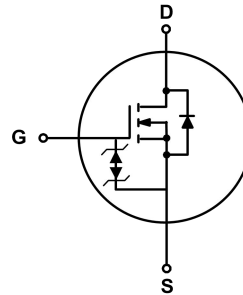


### MARKING



**7002:Device Code**

### N-CHANNEL MOSFET



### Maximum ratings ( $T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	
Continuous Drain Current*	$I_D^*$	0.34	A
Pulsed Drain Current*	$I_{DM}^*$	1.7	
Maximum Continuous Drain to Source Diode Forward*	$I_S^*$	0.34	
Maximum Power Dissipation ( $T_a=25^\circ\text{C}$ )*	$P_D^*$	0.83	W
Thermal Resistance from Junction to Ambient( $t \leq 5s$ )	$R_{\theta JA}$	150	$^\circ\text{C}/\text{W}$
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55 ~ +150	

**MOSFET ELECTRICAL CHARACTERISTICS Ta=25 °C unless otherwise specified**

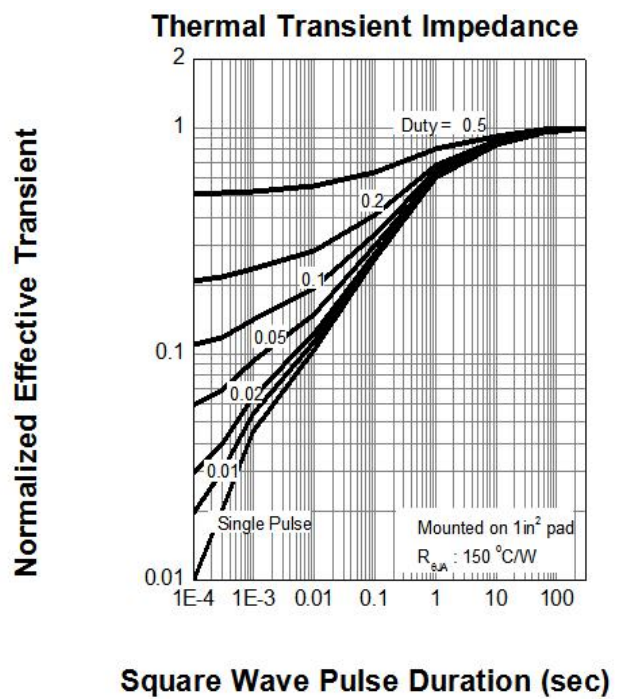
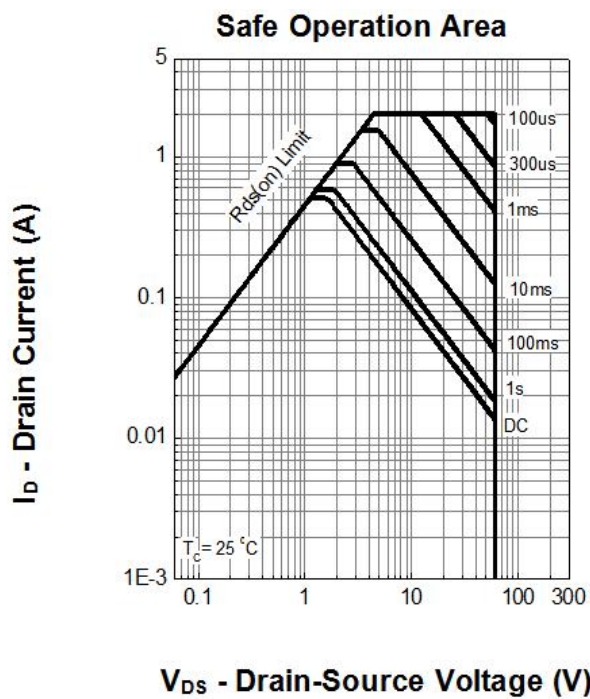
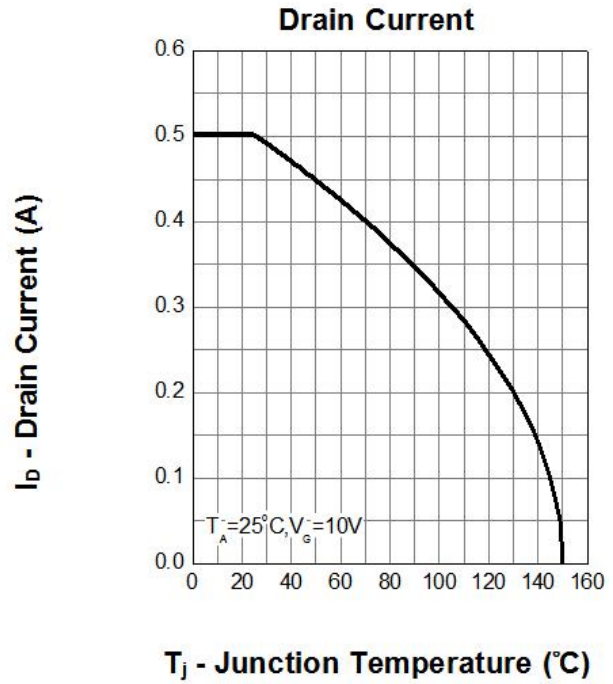
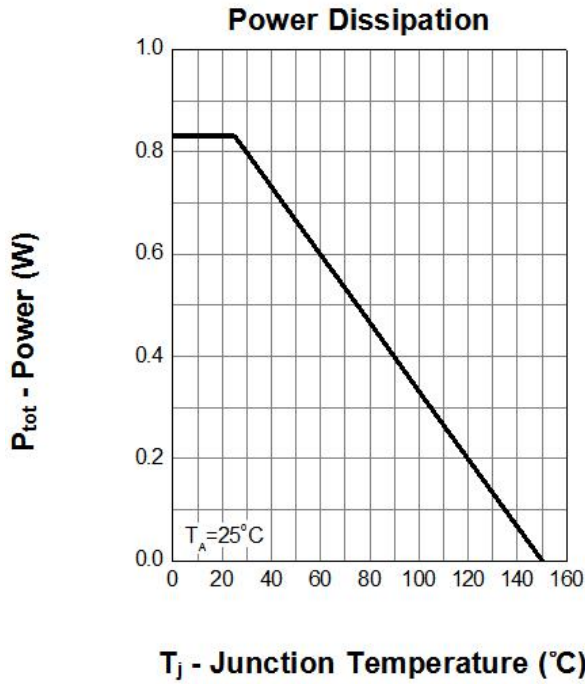
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0 V, I <sub>DS</sub> = 250 μA	60	-	-	V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>DS</sub> = 250 μA	1.0	1.5	2.5	V
I <sub>DSS</sub>	Drain Leakage Current	V <sub>DS</sub> = 48 V, V <sub>GS</sub> = 0 V	-	-	1	μA
		T <sub>J</sub> = 85 °C	-	-	30	μA
I <sub>GSS</sub>	Gate Leakage Current	V <sub>GS</sub> = ± 20 V, V <sub>DS</sub> = 0 V	-	-	± 10	μA
R <sub>DS(ON)</sub> <sup>a</sup>	On-State Resistance	V <sub>GS</sub> = 10 V, I <sub>DS</sub> = 0.5 A	-	-	2.3	Ω
		V <sub>GS</sub> = 4.5 V, I <sub>DS</sub> = 0.1 A	-	-	2.7	
<b>Diode Characteristics</b>						
V <sub>SD</sub> <sup>a</sup>	Diode Forward Voltage	I <sub>SD</sub> = 0.5 A, V <sub>GS</sub> = 0 V	-	-	1.3	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>SD</sub> = 0.5 A, dI <sub>SD</sub> / dt = 100 A / μs	-	42	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge		-	41	-	nC
<b>Dynamic Characteristics<sup>b</sup></b>						
R <sub>G</sub>	Gate Resistance	V <sub>GS</sub> = V <sub>DS</sub> = 0 V, F = 1 MHz	-	100	-	Ω
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V Frequency = 1 MHz	-	22.8	-	pF
C <sub>oss</sub>	Output Capacitance		-	3.5	-	
C <sub>rss</sub>	Reverse Transfer Capacitance		-	2.9	-	
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> = 30 V, V <sub>GEN</sub> = 10 V, R <sub>G</sub> = 25 Ω, R <sub>L</sub> = 60 Ω, I <sub>DS</sub> = 0.5 A	-	3.8	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	3.4	-	
t <sub>d(off)</sub>	Turn-off Delay Time		-	19	-	
t <sub>f</sub>	Turn-off Fall Time		-	12	-	
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> = 4.5 V, V <sub>DS</sub> = 10 V, I <sub>DS</sub> = 0.5 A	-	280	-	pC
Q <sub>gs</sub>	Gate-Source Charge		-	82	-	
Q <sub>gd</sub>	Gate-Drain Charge		-	201	-	

**Notes:**

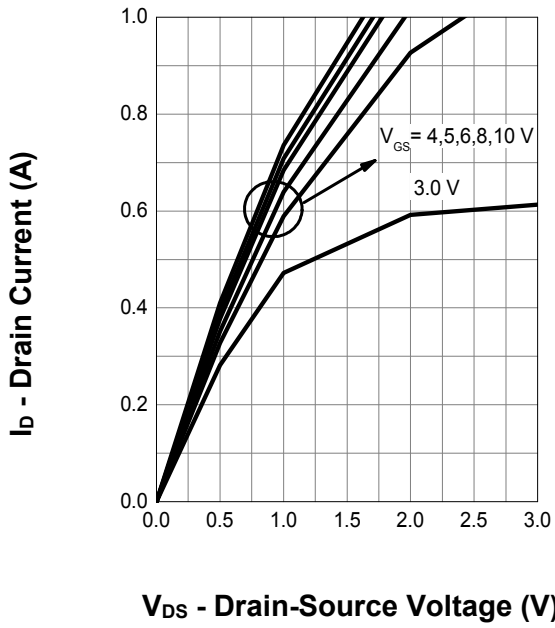
a : Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2 %

b : Guaranteed by design, not subject to production testing

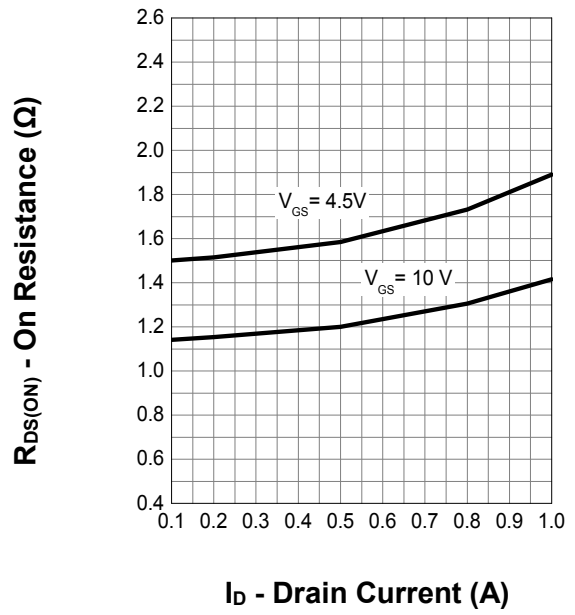
## Typical Performance Characteristics



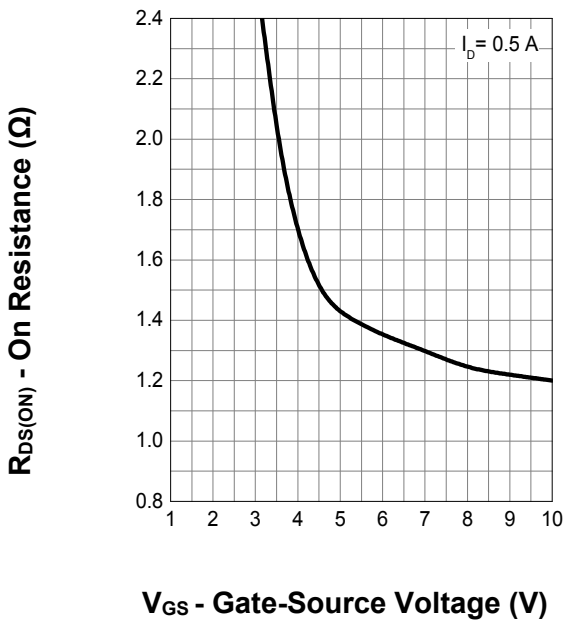
Output Characteristics



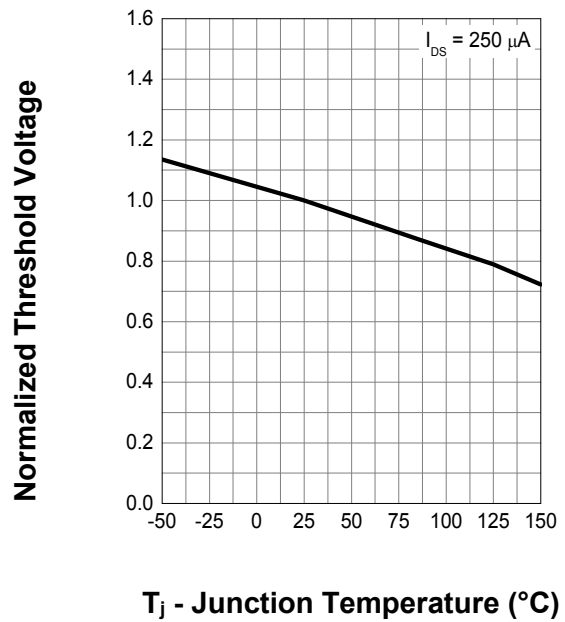
Drain-Source On Resistance



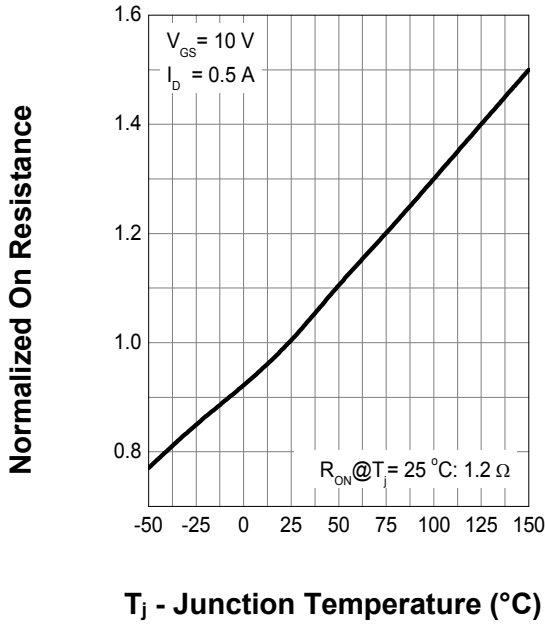
Transfer Characteristics



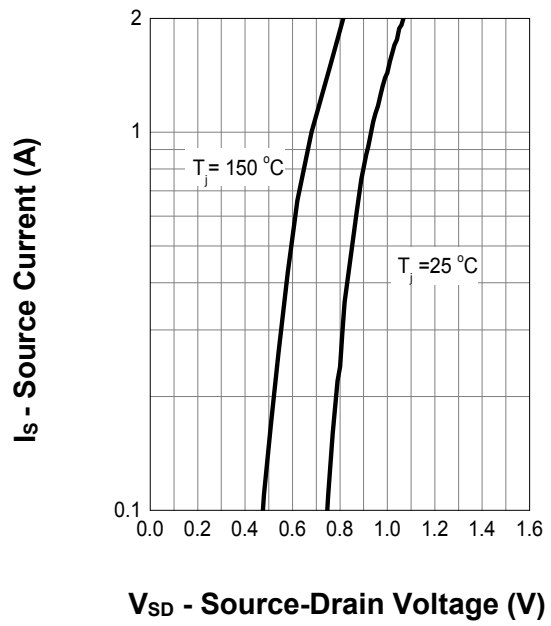
Gate Threshold Voltage



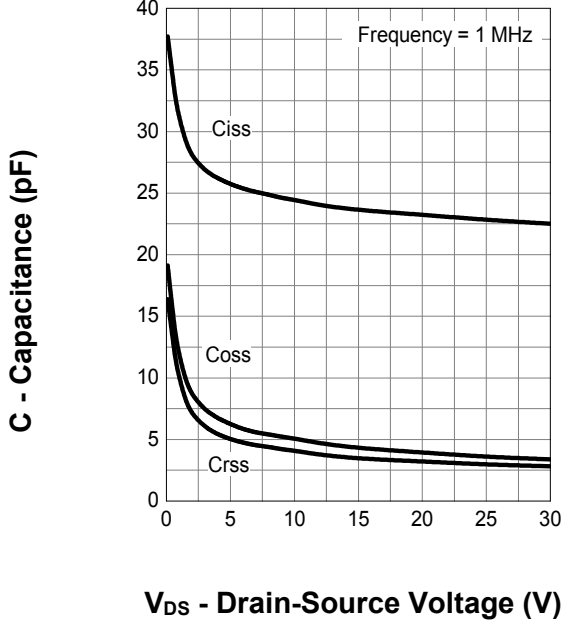
Drain-Source On Resistance



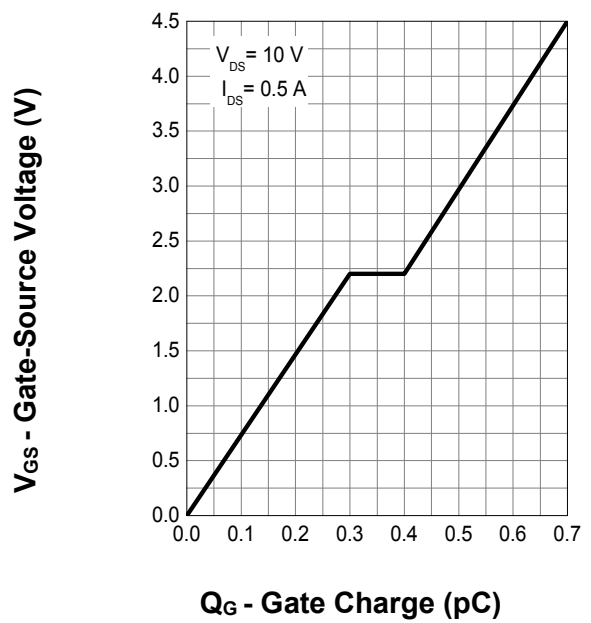
Source-Drain Diode Forward

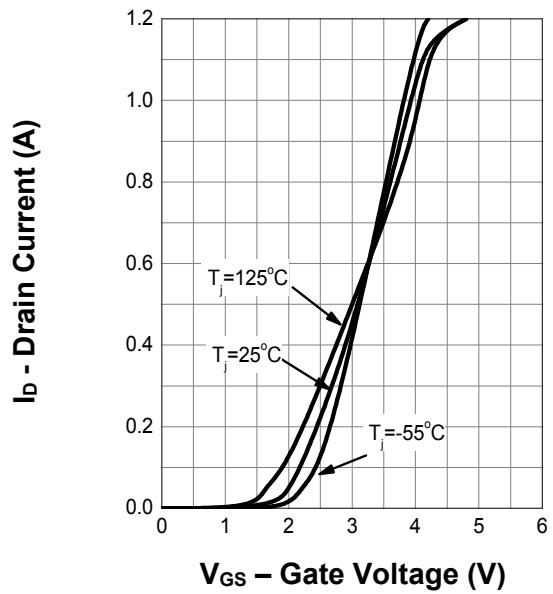
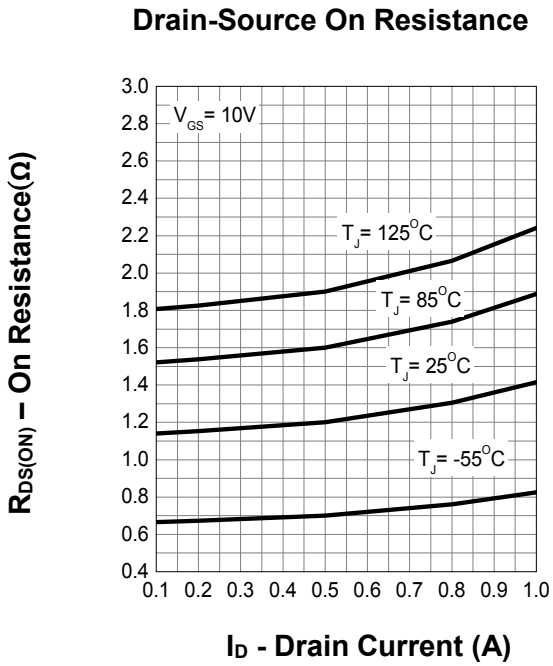
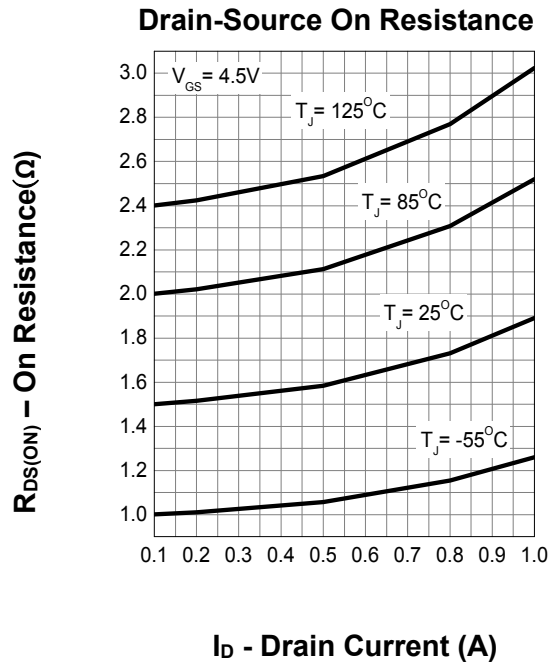
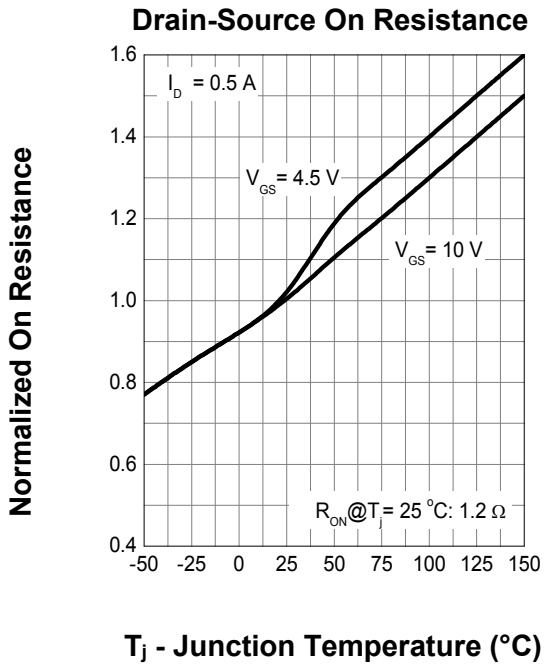


Capacitance

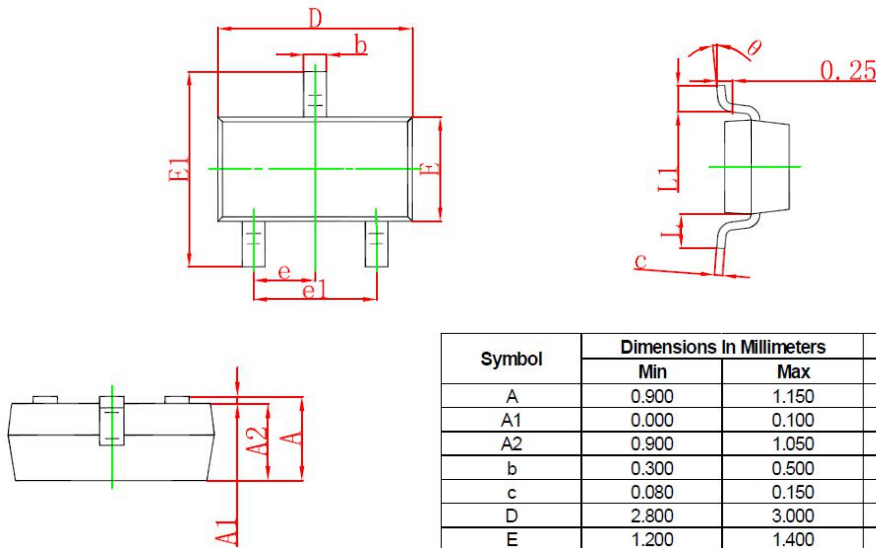


Gate Charge



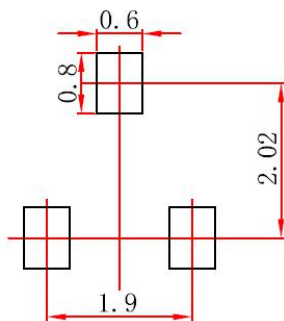


## SOT-23 package



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	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

## SOT-23 Suggested Pad Layout



### Note:

1. Controlling dimension; in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.