

# N-Channel Enhancement Mode MOSFET

## 1. Product Information

### 1.1 Features

- Surface-mounted package
- Extremely low threshold voltage
- Advanced trench cell design

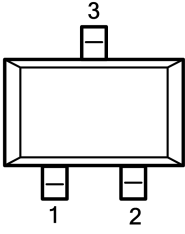
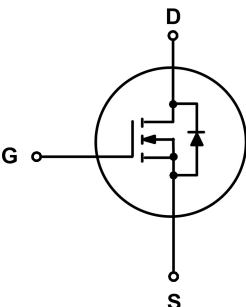
### 1.2 Applications

- Portable appliances

### 1.3 Quick reference

- $BV \geq 20\text{ V}$
- $R_{DS(ON)} \leq 35\text{ m}\Omega @ V_{GS} = 4.5\text{ V}$
- $P_{tot} \leq 1\text{ W}$
- $R_{DS(ON)} \leq 48\text{ m}\Omega @ V_{GS} = 2.5\text{ V}$
- $I_D \leq 4.4\text{ A}$

## 2. Pin Description

Pin	Description	Simplified Outline	Symbol
1	Gate(G)	 Top View SOT23-3L	
2	Source(S)		
3	Drain(D)		

## 3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{DS}$	Drain-Source Voltage	$T_A = 25\text{ }^\circ\text{C}$	20	-	V
$V_{GS}$	Gate-Source Voltage	$T_A = 25\text{ }^\circ\text{C}$	-	$\pm 12$	V
$I_D^*$	Drain Current	$T_A = 25\text{ }^\circ\text{C}$ , $V_{GS} = 4.5\text{ V}$	-	4.4	A
$I_{DM}^{*,**}$	Pulsed Drain Current	$T_A = 25\text{ }^\circ\text{C}$ , $V_{GS} = 4.5\text{ V}$	-	17.6	A
$P_{tot}^*$	Total Power Dissipation	$T_A = 25\text{ }^\circ\text{C}$	-	1	W
$T_{stg}$	Storage Temperature		- 55	150	$^\circ\text{C}$
$T_J$	Junction Temperature		-	150	$^\circ\text{C}$
$I_S^*$	Diode Forward Current	$T_A = 25\text{ }^\circ\text{C}$	-	4.4	A
$E_{AS}^*$	Single Pulsed Avalanche Energy	$V_{DD} = 20\text{ V}$ , $L = 1.0\text{ mH}$	-	12	mJ
$R_{\theta JA}^*$	Thermal Resistance- Junction to Ambient		-	125	$^\circ\text{C} / \text{W}$

Notes :

- \* Surface Mounted on 1 in<sup>2</sup> pad area,  $t \leq 10\text{ sec}$
- \*\* Pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$

## 4. Marking Information

Product Name	Marking
KJ2302S	2302

## 5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
KJ2302S	SOT23-3L			3000	

Note: KUAJIEXIN defines " Green " as lead-free ( RoHS compliant ) and halogen free ( Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC / JEDEC J-STD-020C )

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

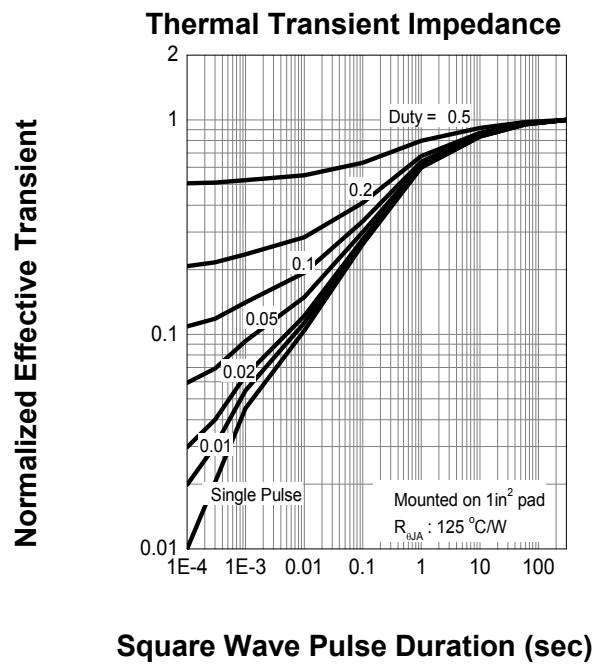
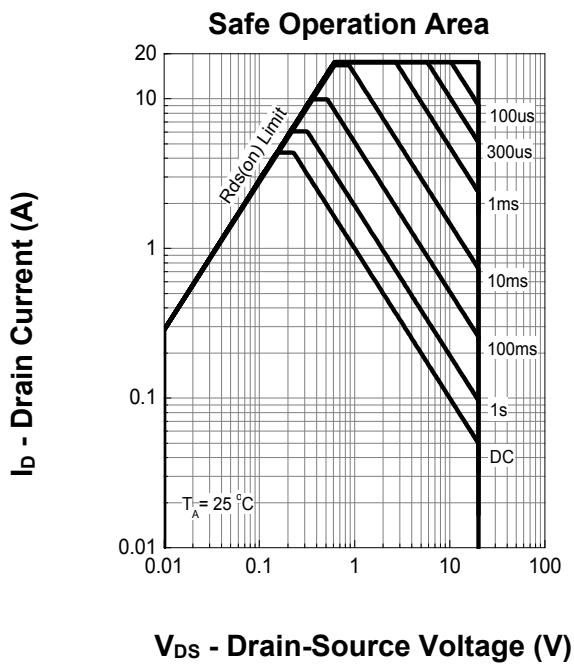
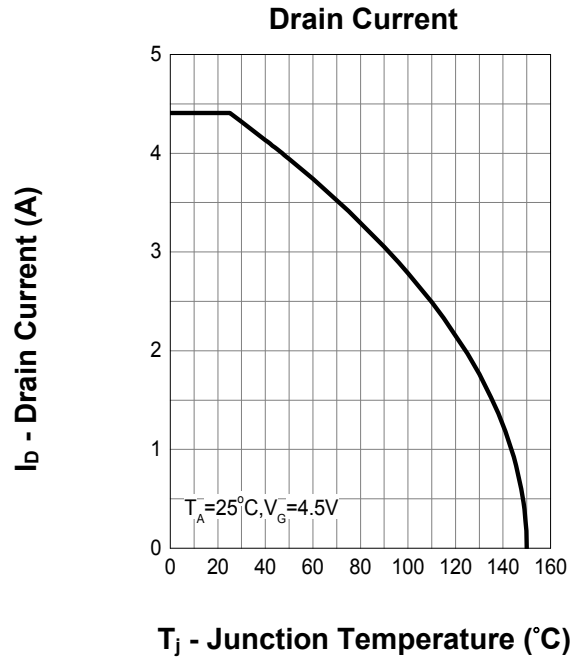
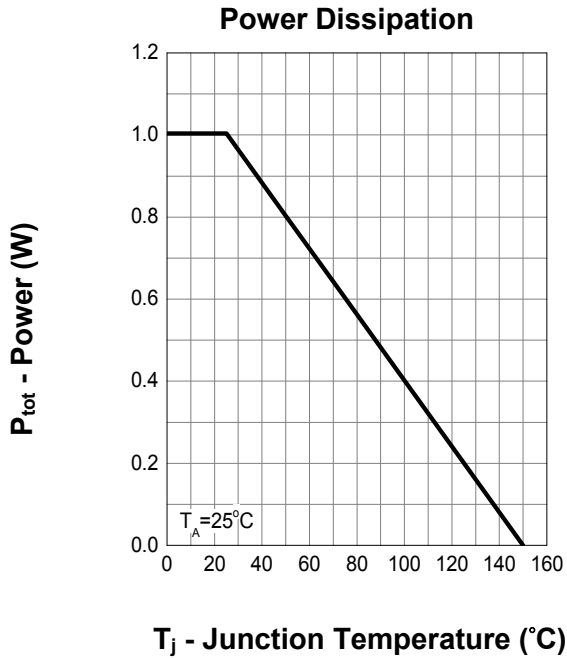
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_{DS} = 250\text{ }\mu\text{A}$	20	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_{DS} = 250\text{ }\mu\text{A}$	0.5	-	1	V
$I_{DSS}$	Drain Leakage Current	$V_{DS} = 16\text{ V}, V_{GS} = 0\text{ V}$	-	-	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	$V_{GS} = 4.5\text{ V}, I_{DS} = 3\text{ A}$	-	28	35	m $\Omega$
		$V_{GS} = 2.5\text{ V}, I_{DS} = 2\text{ A}$	-	37	48	
<b>Diode Characteristics</b>						
$V_{SD}^a$	Diode Forward Voltage	$I_{SD} = 3\text{ A}, V_{GS} = 0\text{ V}$	-	-	1.3	V
$t_{rr}$	Reverse Recovery Time	$I_{SD} = 3\text{ A}, dI_{SD}/dt = 100\text{ A}/\mu\text{s}$	-	9.4	-	nS
$Q_{rr}$	Reverse Recovery Charge		-	2.8	-	nC
<b>Dynamic Characteristics<sup>b</sup></b>						
$C_{iss}$	Input Capacitance	$V_{GS} = 0\text{ V}, V_{DS} = 10\text{ V}$ Frequency = 1 MHz	-	278	-	pF
$C_{oss}$	Output Capacitance		-	52	-	
$C_{rss}$	Reverse Transfer Capacitance		-	46	-	
$t_d(on)$	Turn-on Delay Time	$V_{DS} = 10\text{ V}, V_{GEN} = 4.5\text{ V},$ $R_G = 4.5\text{ }\Omega, R_L = 3.3\text{ }\Omega,$ $I_{DS} = 3\text{ A}$	-	3.9	-	nS
$t_r$	Turn-on Rise Time		-	28	-	
$t_d(off)$	Turn-off Delay Time		-	16	-	
$t_f$	Turn-off Fall Time		-	23	-	
$Q_g$	Total Gate Charge	$V_{GS} = 4.5\text{ V}, V_{DS} = 10\text{ V},$ $I_{DS} = 3\text{ A}$	-	4	-	nC
$Q_{gs}$	Gate-Source Charge		-	1	-	
$Q_{gd}$	Gate-Drain Charge		-	1.2	-	

Notes :

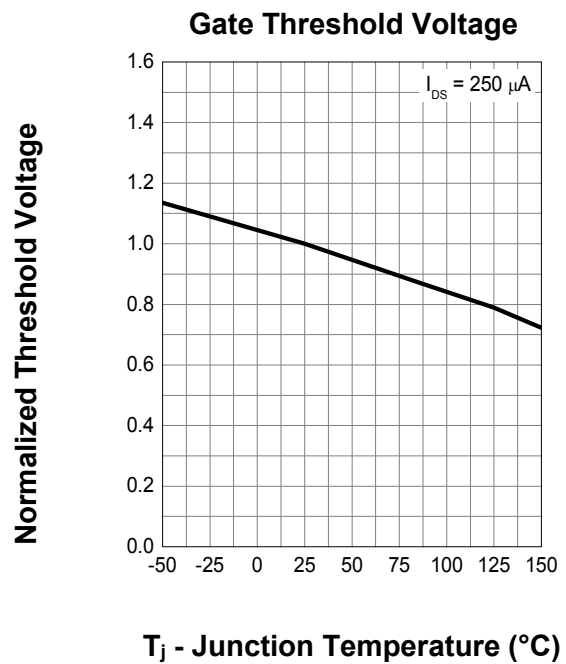
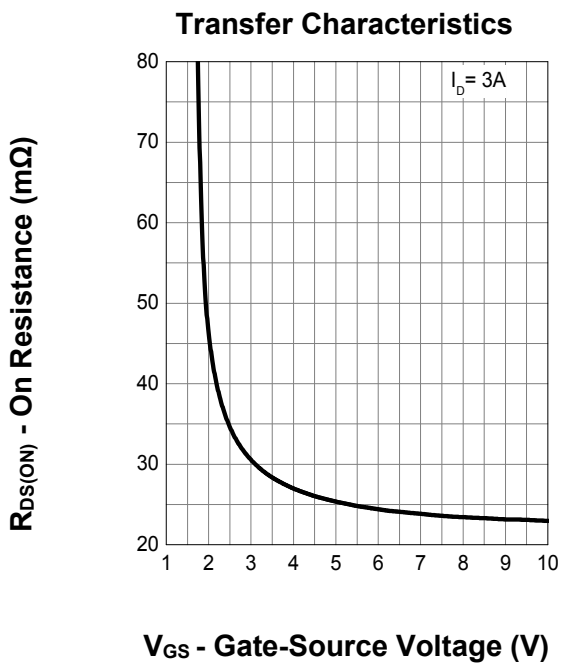
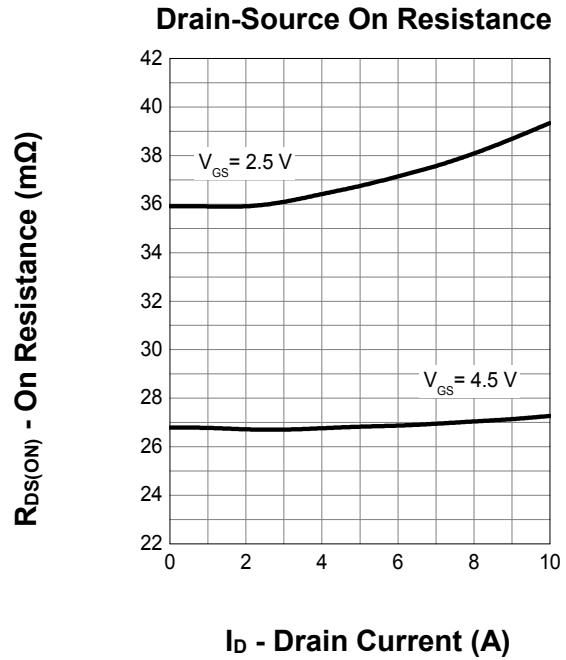
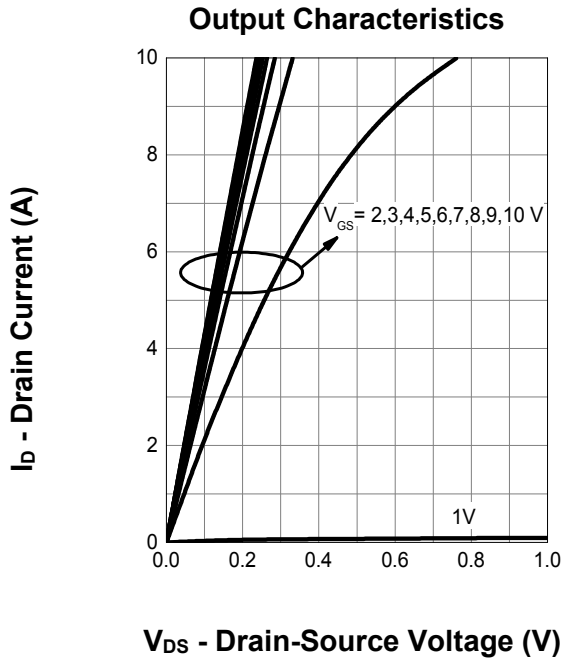
a : Pulse test ; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$

b : Guaranteed by design, not subject to production testing

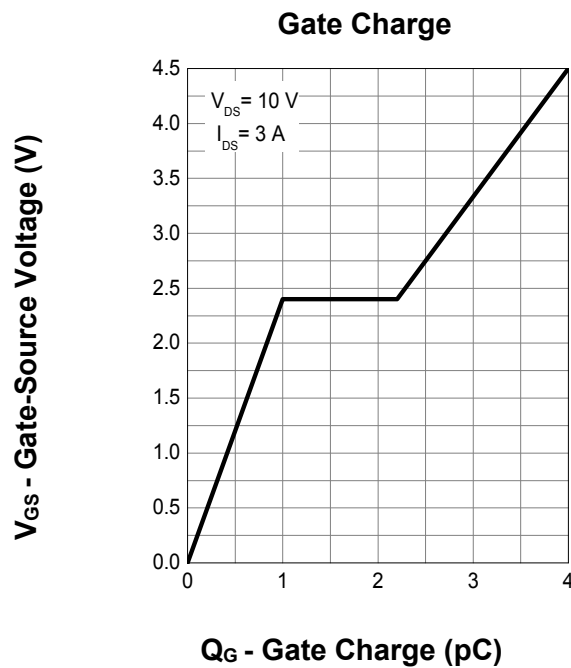
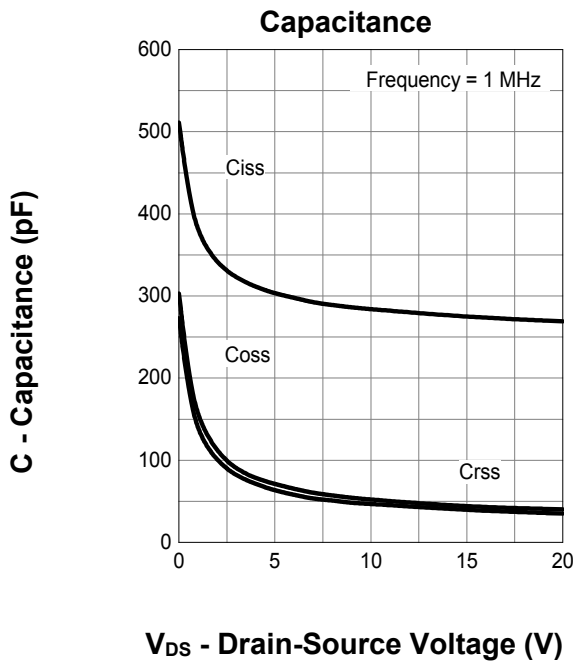
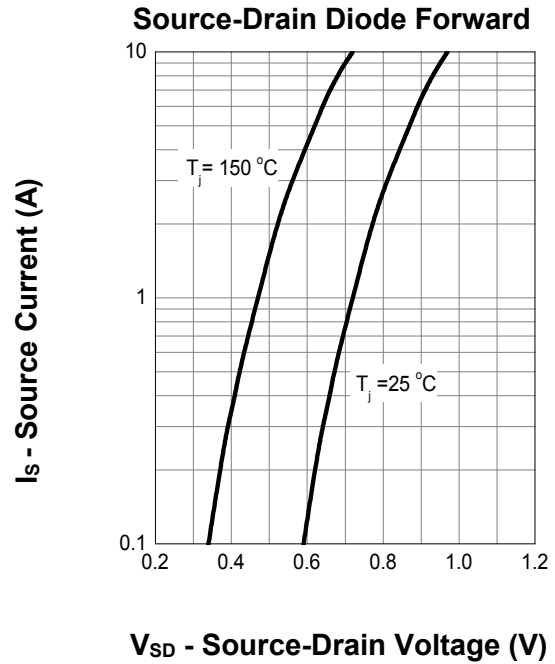
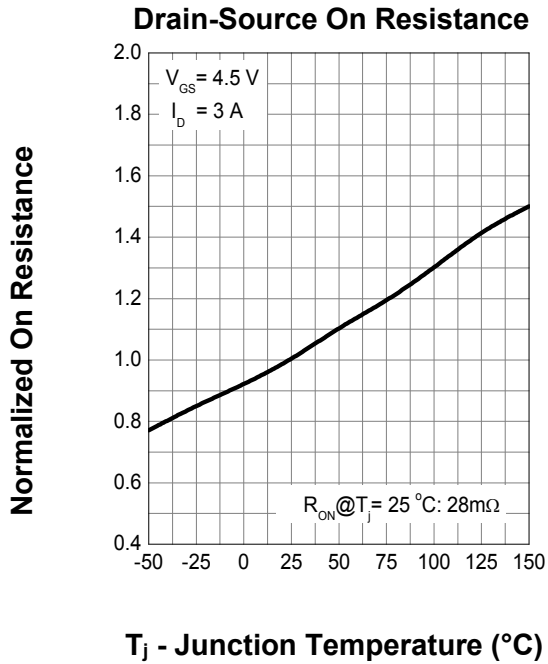
## 7. Typical Characteristics



## 7. Typical Characteristics (cont.)

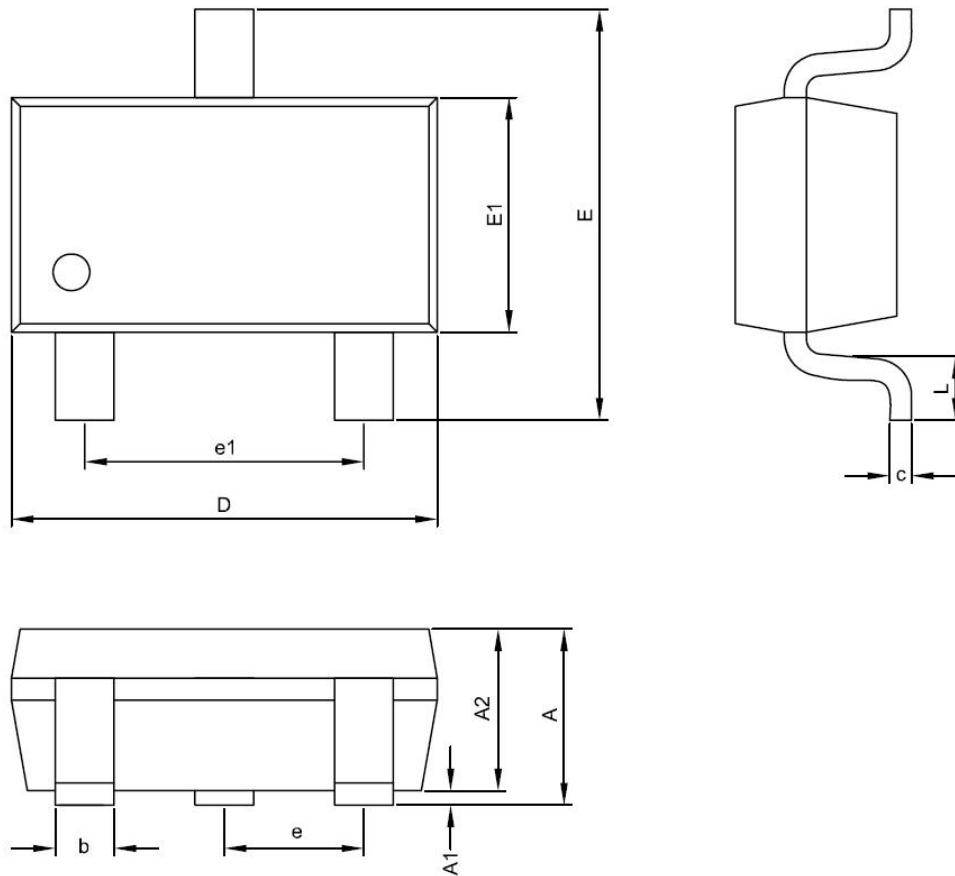


## 7. Typical Characteristics (cont.)



## 8. Package Dimensions

SOT23-3L



Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	1.00	1.45
A1	0.00	0.15
A2	1.00	1.30
D	2.70	3.10
E	2.60	3.00
E1	1.50	1.70
c	0.08	0.25
b	0.30	0.50
e	0.95 BSC	
e1	1.90 BSC	
L	0.30	0.60