

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ✓ Surface-mounted package
- ✓ $T_{J\text{ Max}} 175^{\circ}\text{C}$
- ✓ Advanced trench cell design
- ✓ MSL1

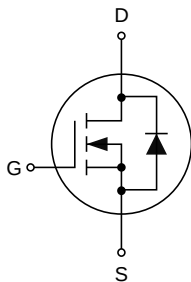
1.2 Applications

- ✓ Motor drivers
- ✓ High power inverter system
- ✓ DC/DC Converter
- ✓ Battery management

1.3 Quick reference

- ✓ $BV \geq 100\text{ V}$
- ✓ $P_{\text{tot}} \leq 150\text{ W}$
- ✓ $I_D \leq 160\text{ A}$
- ✓ $R_{\text{DS(ON)}} \leq 2.2\text{ m}\Omega @ V_{\text{GS}} = 10\text{ V}$
- ✓ $R_{\text{DS(ON)}} \leq 4.0\text{ m}\Omega @ V_{\text{GS}} = 6\text{ V}$

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1,2,3,4	Source	 Top View sTOLL	
5	Gate		
6	Drain		

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	$T_C=25^{\circ}\text{C}$	-	100	V
V_{GS}	Gate-Source Voltage	$T_C=25^{\circ}\text{C}$	-	± 20	V
I_D^*	Drain Current	$T_C=25^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	160	A
		$T_C=100^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	113	A
$I_{DM}^{*,**}$	Pulsed Source Current	$T_C=25^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	640	A
P_{tot}	Drain power dissipation	$T_C=25^{\circ}\text{C}$	-	150	W
T_J, T_{stg}	Operating Junction and Storage Temperature		-55	175	$^{\circ}\text{C}$
I_S	Continuous-Source Current	$T_C=25^{\circ}\text{C}$	-	160	A
E_{AS}^*	Single Pulsed Avalanche Energy	$V_{DD}=50\text{ V}, L=1.0\text{ mH}$	-	1404	mJ
$R_{\theta JA}^*$	Thermal Resistance-Junction to Ambient		-	47	$^{\circ}\text{C/W}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case		-	1	

Notes:

- * Surface Mounted on 1 in² pad area, $t \leq 10\text{ sec}$
- ** Pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
- *** Limited by bonding wire

4. Marking Information

Product Name	Marking
KJ022N10ST	AYWWXX KJ022N10ST XXXXXX YWW: Date Code

5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
KJ022N10ST	sTOLL	-	-	2000	

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°C Unless Otherwise Noted)

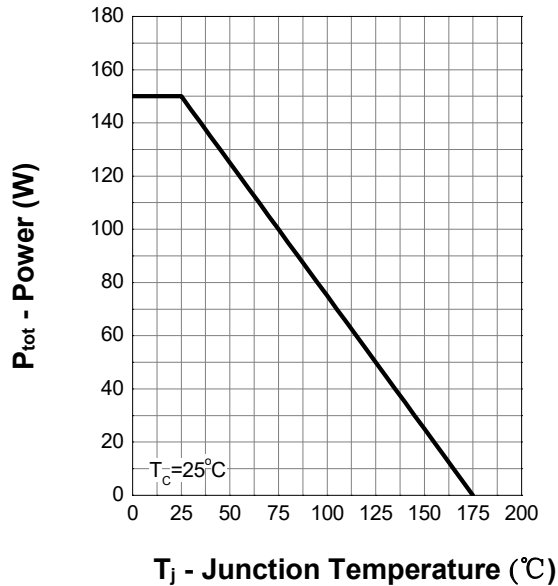
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0 V, I _{DS} =250 μA	100	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250 μA	2.0	-	4.0	V
I _{DSS}	Drain Leakage Current	V _{DS} =80 V, V _{GS} =0 V	-	-	1	μA
I _{GSS}	Gate Leakage Current	V _{GS} =±20 V, V _{DS} =0 V	-	-	±100	nA
R _{DS(ON)} ^a	On-State Resistance	V _{GS} =10 V, I _{DS} =50 A	-	2.0	2.2	mΩ
		V _{GS} =6 V, I _{DS} =30 A	-	3.3	4.0	
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} =50 A, V _{GS} =0 V	-	-	1.3	V
t _{rr}	Reverse Recovery Time	I _{SD} =50 A, V _{GS} =0 V, dI _{SD} /dt=100 A/μs	-	97	-	ns
Q _{rr}	Reverse Recovery Charge		-	138	-	nC
Dynamic Characteristics ^b						
C _{iss}	Input Capacitance	V _{GS} =0 V, V _{DS} =50 V, Frequency=1 MHz	-	6237	-	pF
C _{oss}	Output Capacitance		-	1064	-	
C _{rss}	Reverse Transfer Capacitance		-	15	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} =50 V, V _{GEN} =10 V, R _G =3.9 Ω, R _L =0.6 Ω, I _{DS} =50 A	-	28	-	ns
t _r	Turn-on Rise Time		-	69	-	
t _{d(off)}	Turn-off Delay Time		-	72	-	
t _f	Turn-off Fall Time		-	51	-	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{DS} =50 V, V _{GS} =10 V, I _{DS} =50 A	-	118	-	nC
Q _{gs}	Gate-Source Charge		-	35	-	
Q _{gd}	Gate-Drain Charge		-	38	-	

Notes:

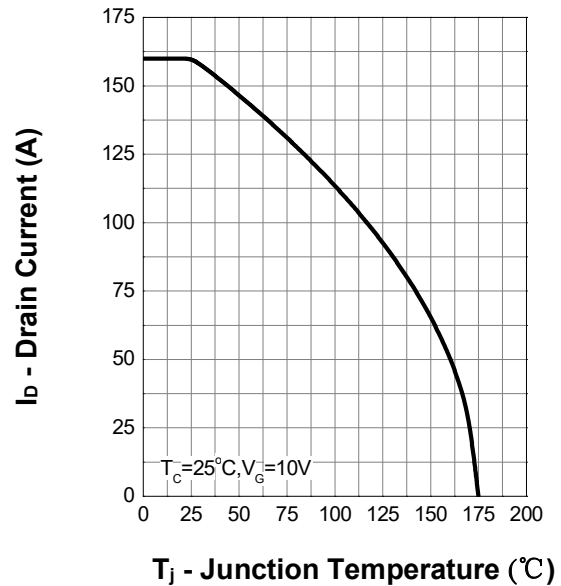
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%
- Guaranteed by design, not subject to production testing

7. Typical Characteristics

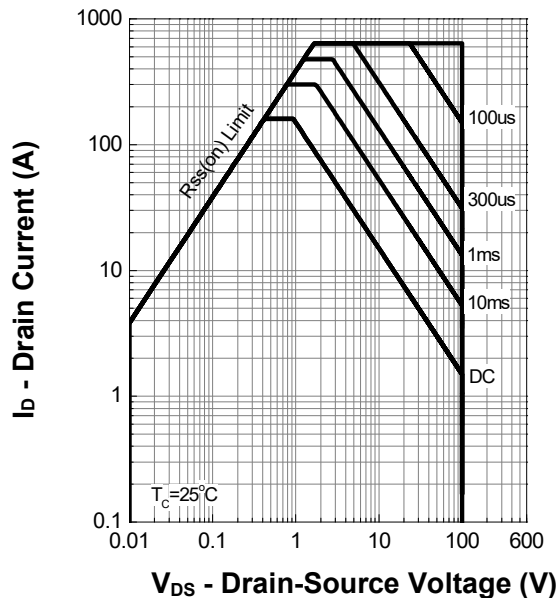
Power Capability



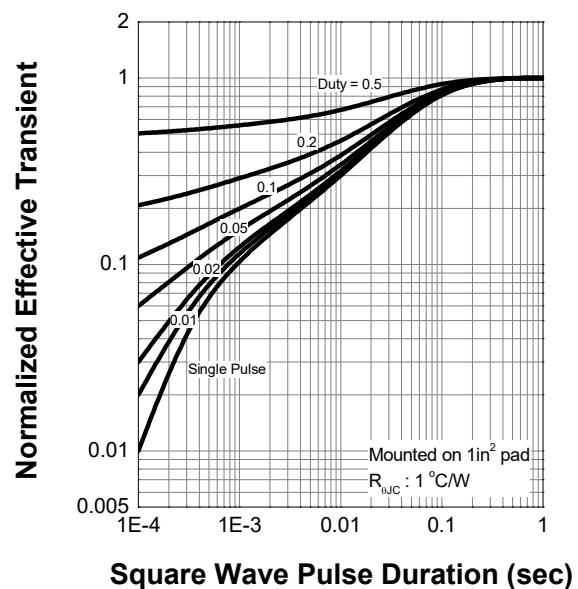
Current Capability



Safe Operation Area

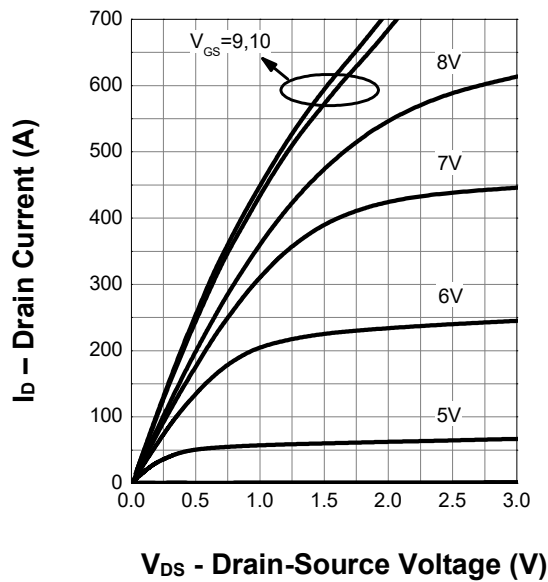


Thermal Transient Impedance

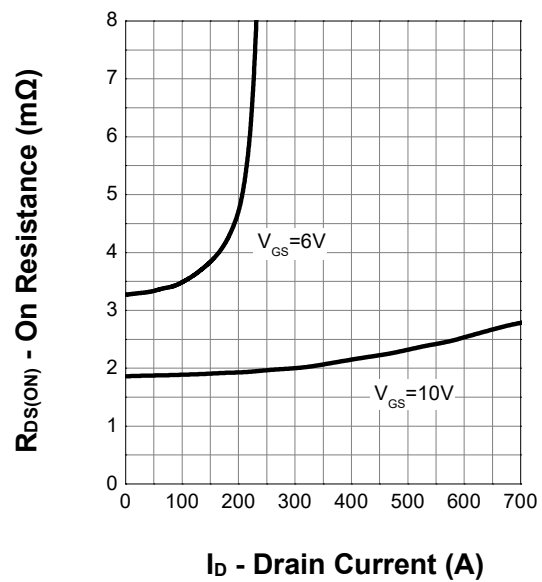


7. Typical Characteristics (Cont.)

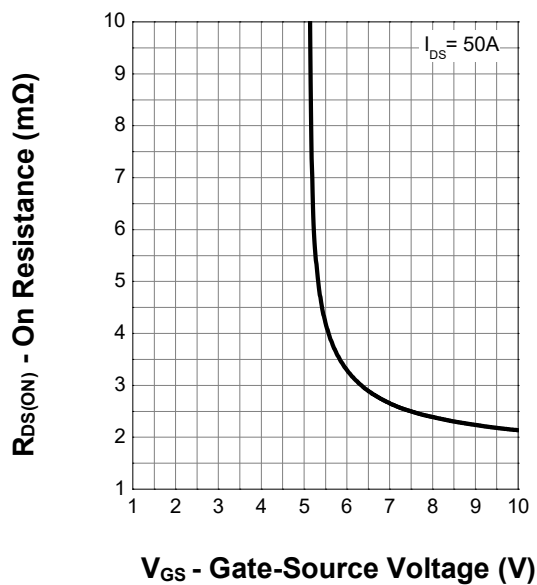
Output Characteristics



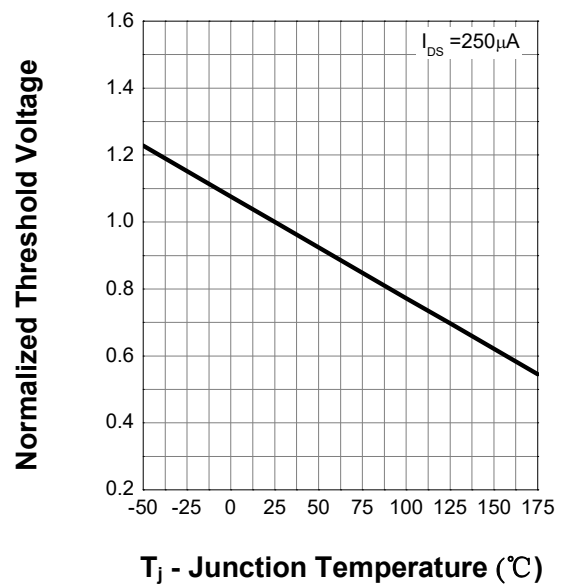
Drain-Source On Resistance



Transfer Characteristics

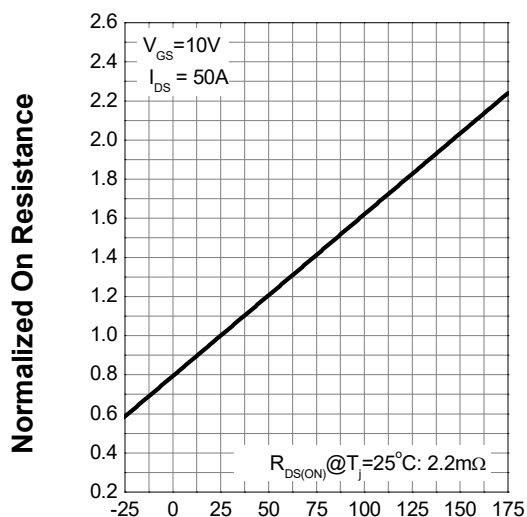


Gate Threshold Voltage

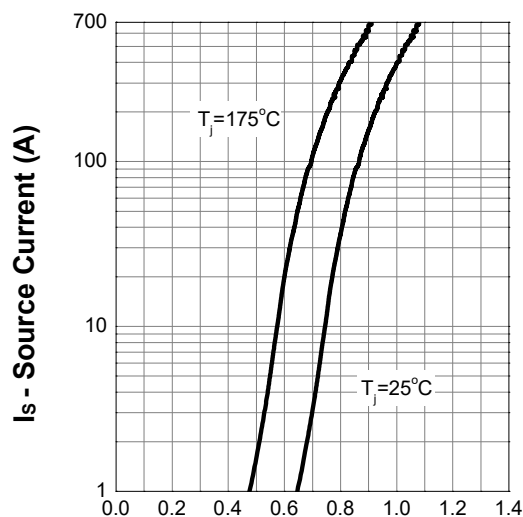


7. Typical Characteristics (Cont.)

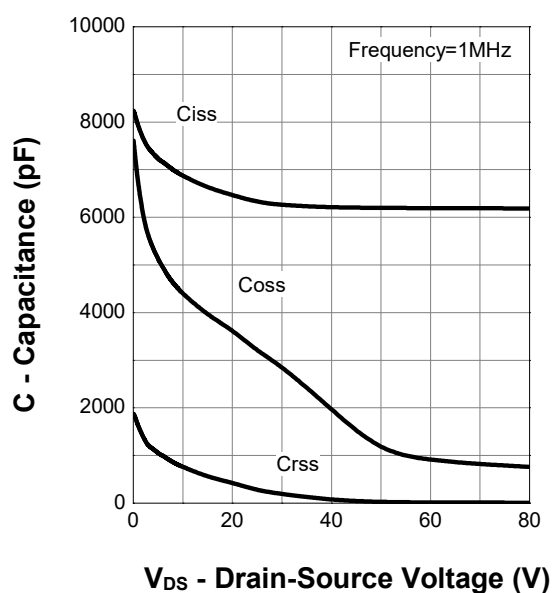
Drain-Source On Resistance



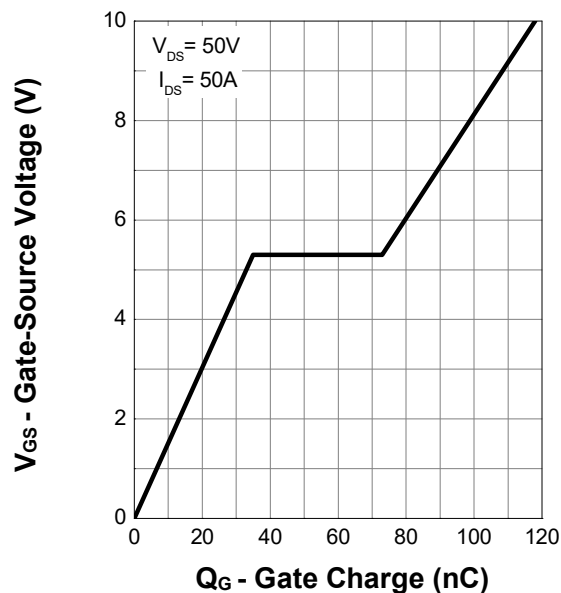
Body Diode Characteristics



Capacitance

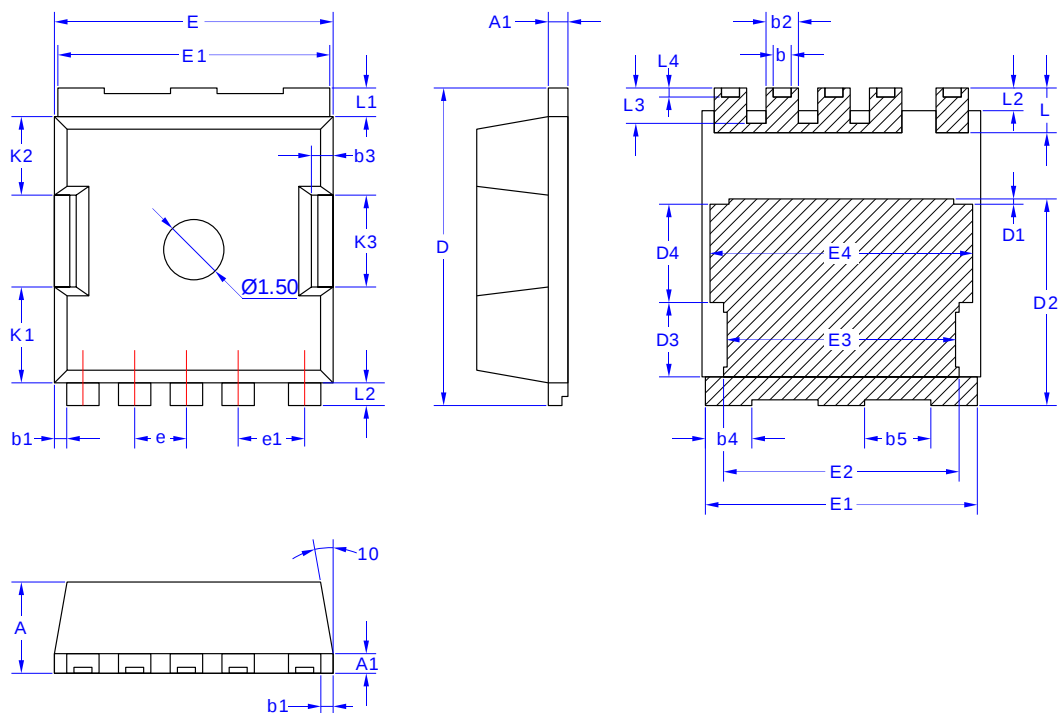


Gate Charge



8. Package Dimensions

sTOLL Package



Symbol	Dimensions in Millimeters		
	MIN.	NOM.	MAX.
A	2.300	2.200	2.400
A1	0.490	0.500	0.508
b	0.750	0.800	0.850
b1	0.350 ref		
b2	0.350	0.450	0.550
b3	0.425 ref		
b4	1.100	1.200	1.300
b5	1.550	1.650	1.750
D	7.900	8.000	8.100
D1	0.130 ref		
D2	5.100	5.200	5.300
D3	2.470	2.570	2.670
D4	2.400	2.500	2.600
E	6.900	7.000	7.100

Symbol	Dimensions in Millimeters		
	MIN.	NOM.	MAX.
E1	6.800	6.900	7.000
E2	5.860	5.960	6.060
E3	5.560	5.660	5.760
E4	6.460	6.560	6.660
e	1.30 BSC		
e1	1.60 BSC		
K1	2.430 ref		
K2	1.970 ref		
K3	2.300 ref		
L	1.050	1.150	1.250
L1	0.600	0.700	0.800
L2	0.500	0.600	0.700
L3	0.800	0.900	1.000
L4	0.135	0.235	0.335