

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

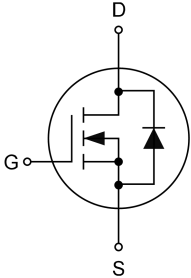
1.2 Applications

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

1.3 Quick reference

- ☒ $BV \geq 100\text{ V}$
- ☒ $P_{\text{tot}} \leq 326\text{ W}$
- ☒ $I_D \leq 244\text{ A}$
- ☒ $R_{\text{DS(ON)}} \leq 2.5\text{ m}\Omega @V_{\text{GS}} = 10\text{ V}$

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	$T_C=25^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	244	A
		$T_C=100^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	172	A
I_{DM}^*	Pulsed Drain Current	$T_C=25^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	844	A
P_{tot}	Total Power Dissipation	$T_C=25^{\circ}\text{C}$	-	326	W
I_S	Diode Forward Current	$T_C=25^{\circ}\text{C}$	-	244	A
E_{AS}	Single Pulsed Avalanche Energy	$V_{DD}=50\text{ V}, L=0.3\text{ mH}$	-	844	mJ
T_J, T_{stg}	Operating Junction and Storage Temperature Range		-55	175	$^{\circ}\text{C}$
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		-	52	$^{\circ}\text{C/W}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case		-	0.46	

Notes:

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

4. Marking Information

Product Name	Marking
KJ022N10ST	CYWWXX KJ022N10ST XXXXXX-X

5. Ordering Code

Product Name	Package	Reel size	Tape width	Quantity (pcs)
KJ022N10ST	sTOLL	13"	16 mm	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	-	4	V
I _{DSS}	Drain Source Current	V _{DS} =100 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)}	On-State Resistance	V _{GS} =10 V, I _{DS} =20 A	-	2.2	2.5	mΩ
Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _{SD} =50 A, V _{GS} =0 V	-	0.75	1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =1 A, V _{GS} =0 V, dI _{SD} /dt=100 A/μs	-	90	-	ns
Q _{rr}	Reverse Recovery Charge		-	250	-	nC
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} =0 V, V _{DS} =50 V, Frequency=1 MHz	-	4900	-	pF
C _{oss}	Output Capacitance		-	2350	-	
C _{rss}	Reverse Transfer Capacitance		-	52	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} =50 V, V _{GEN} =10 V, R _G =3 Ω, I _{DS} =20 A	-	12	-	ns
t _r	Turn-on Rise Time		-	22	-	
t _{d(off)}	Turn-off Delay Time		-	50	-	
t _f	Turn-off Fall Time		-	27	-	
Gate Charge Characteristics						
Q _g	Total Gate Charge	V _{DS} =50 V, V _{GS} =10 V, I _{DS} =20 A	-	75	-	nC
Q _{gs}	Gate-Source Charge		-	25	-	
Q _{gd}	Gate-Drain Charge		-	18	-	

7. Typical Characteristics

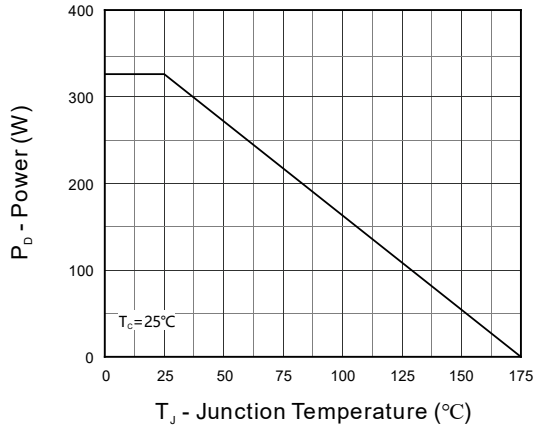


Figure 1. Power Capability

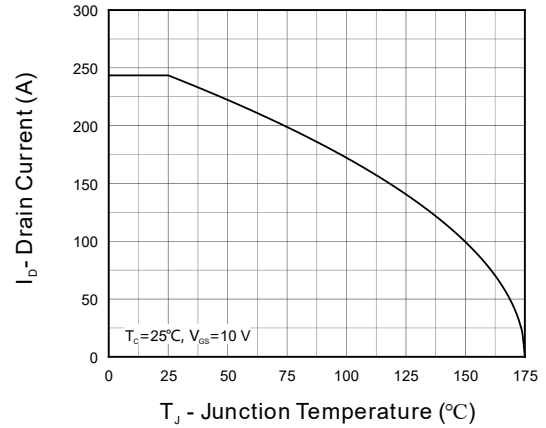


Figure 2. Current Capability

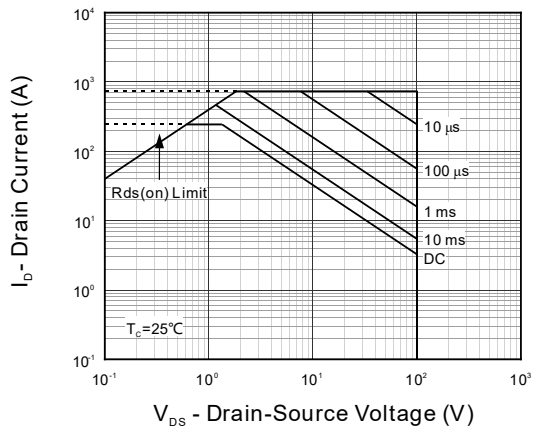


Figure 3. Safe Operation Area

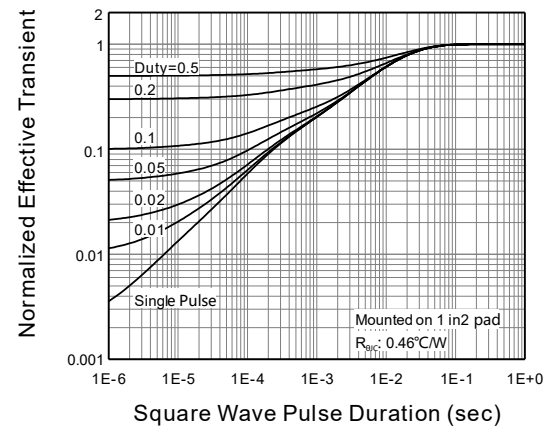
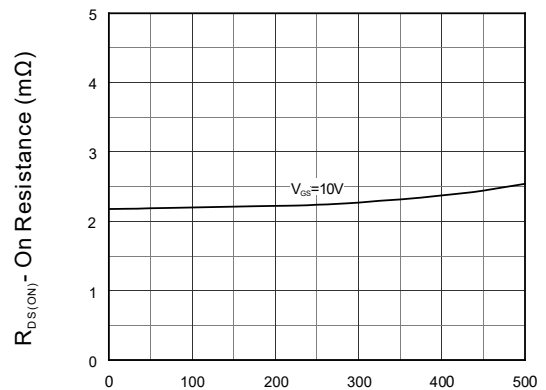
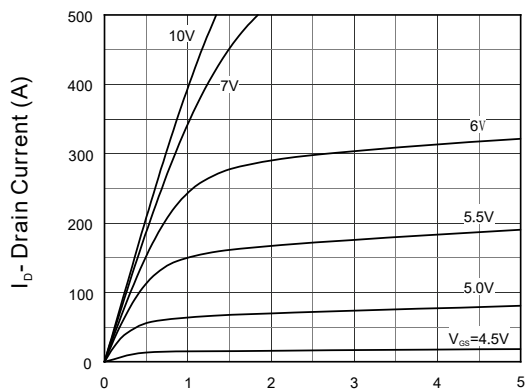


Figure 4. Transient Thermal Impedance



7. Typical Characteristics (cont.)

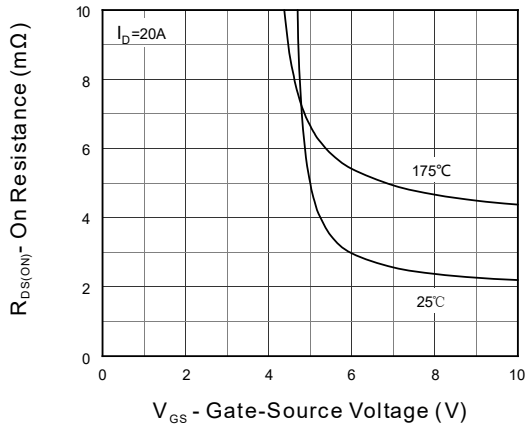


Figure 7. Transfer Characteristics

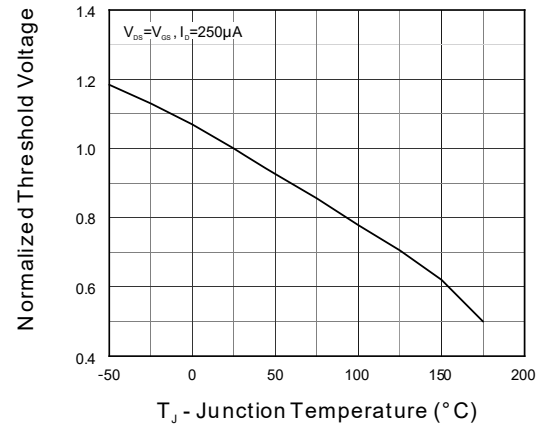


Figure 8. Normalized Threshold Voltage

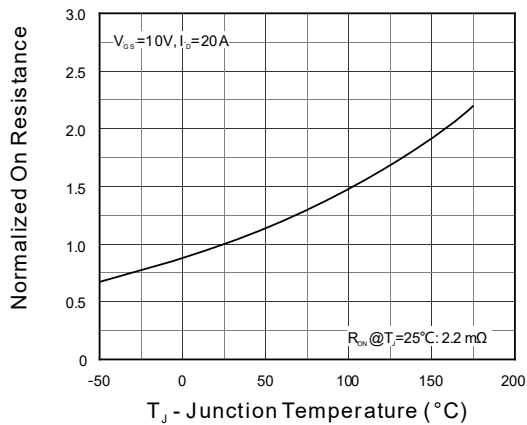


Figure 9. Normalized On Resistance

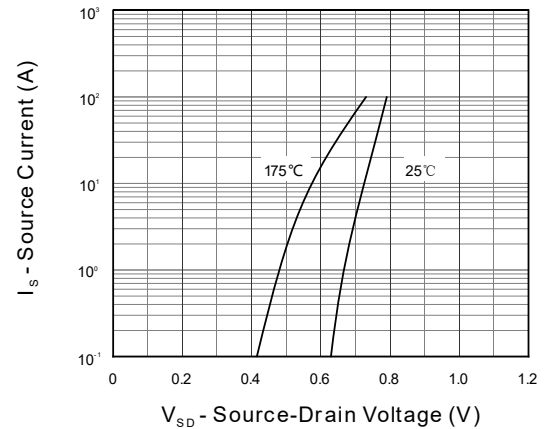


Figure 10. Diode Forward Current

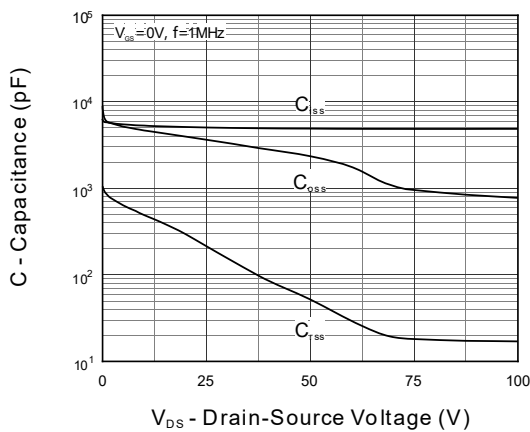


Figure 11. Capacitance

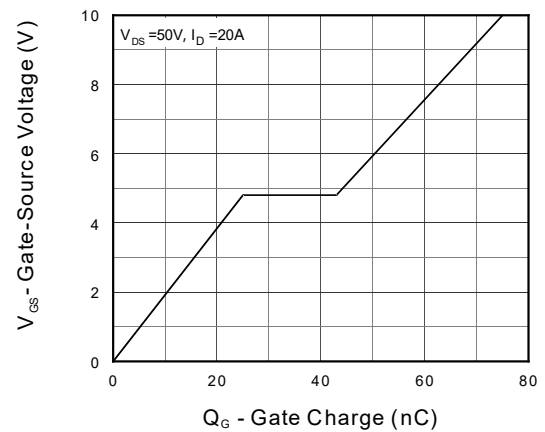
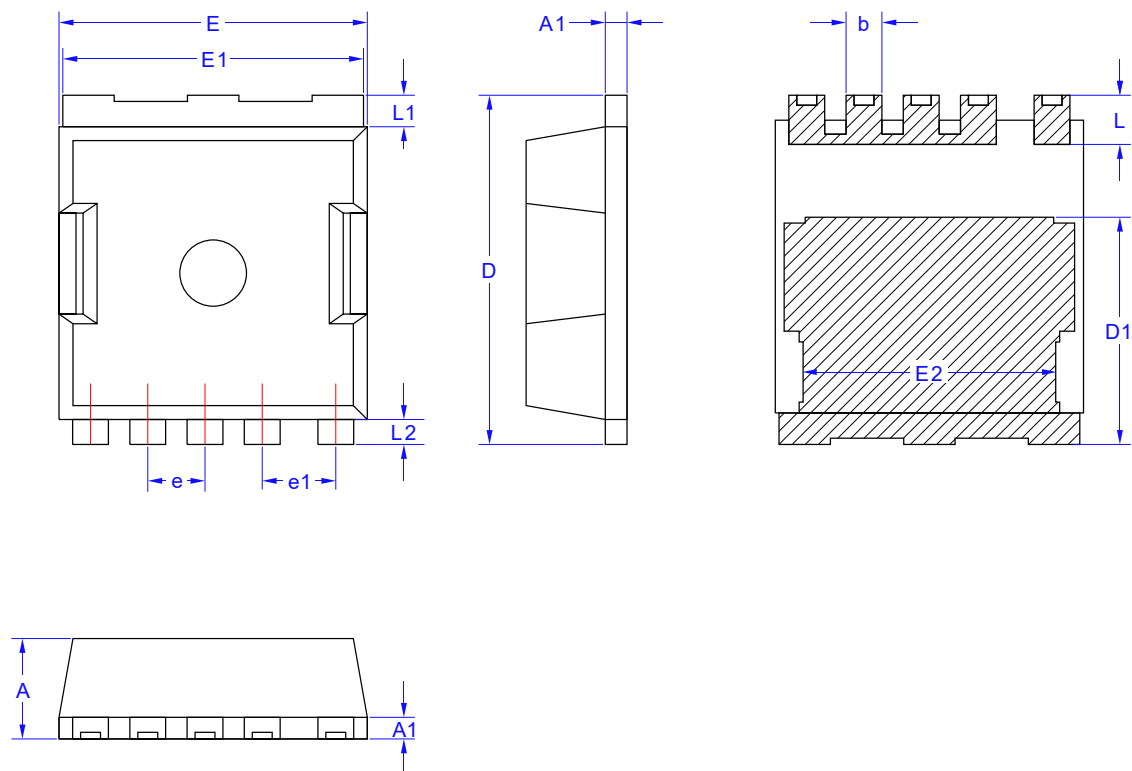


Figure 12. Gate Charge

8. Package Dimensions

sTOLL Package



Symbol	Dimensions in Millimeters		
	MIN	NOM	MAX
A	2.200	2.300	2.400
A1	0.490	0.500	0.508
b	0.750	0.800	0.850
D	7.900	8.000	8.100
D1	5.100	5.200	5.300
E	6.900	7.000	7.100
E1	6.800	6.900	7.000

Symbol	Dimensions in Millimeters		
	MIN	NOM	MAX
E2	5.560	5.660	5.760
e	1.30 BSC		
e1	1.60 BSC		
L	1.050	1.150	1.250
L1	0.600	0.700	0.800
L2	0.500	0.600	0.700