

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☒ Surface-mounted package
- ☒ T_J max 175°C
- ☒ Advanced trench cell design
- ☒ MSL1

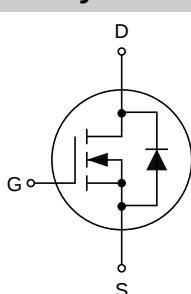
1.2 Applications

- ☒ Motor drivers
- ☒ DC/DC converter

1.3 Quick reference

- ☒ BV ≥ 40 V
- ☒ P_D ≤ 187 W
- ☒ I_D ≤ 350 A
- ☒ R_{DS(ON)} ≤ 0.55 mΩ @V_{GS} = 10 V
- ☒ R_{DS(ON)} ≤ 1.05 mΩ @V_{GS} = 6 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	$T_C=25^{\circ}\text{C}$	-	40	V
V_{GS}	Gate-Source Voltage	$T_C=25^{\circ}\text{C}$	-	± 20	V
I_D^*	Drain Current	$T_C=25^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	350	A
		$T_C=100^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	266	A
$I_{DM}^{*,**}$	Pulsed Source Current	$T_C=25^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	1400	A
P_D^*	Drain Power Dissipation	$T_C=25^{\circ}\text{C}$	-	187	W
I_S	Diode Forward Current	$T_C=25^{\circ}\text{C}$	-	50	A
E_{AS}^*	Single Pulsed Avalanche Energy	$V_{DD}=40\text{ V}, L=1.0\text{ mH}$	-	1512	mJ
T_J, T_{stg}	Operating Junction and Storage Temperature Range		-55	175	$^{\circ}\text{C}$
$R_{\theta JA}^*$	Thermal Resistance-Junction to Ambient		-	48	$^{\circ}\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case		-	0.8	

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
KJ005N04ST	AYWWXX KJ005N04ST XXXXXX YWWXXX: Date Code

5. Ordering Code

Product Name	Package	Reel size	Tape width	Quantity (pcs)
KJ005N04ST	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	40	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250 μA	2	2.5	3	V
I _{DSS}	Zero Gate Voltage Source Current	V _{DS} =32 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	Drain-Source On-State Resistance	V _{GS} =10 V, I _{DS} =50 A	-	0.5	0.55	mΩ
		V _{GS} =6 V, I _{DS} =30 A	-	0.9	1.05	
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, dI _{SD} /dt=100 A/μs	-	53	-	ns
Q _{rr}	Reverse Recovery Charge		-	51	-	nC
Dynamic Characteristics ^b						
C _{iss}	Input Capacitance	V _{GS} =0 V, V _{DS} =20 V, f=1 MHz	-	8525	-	pF
C _{oss}	Output Capacitance		-	3753	-	
C _{rss}	Reverse Transfer Capacitance		-	75	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} =20 V, V _{GEN} =10 V, R _G =3.9 Ω, R _L =0.4 Ω, I _{DS} =50 A	-	19	-	ns
t _r	Turn-on Rise Time		-	107	-	
t _{d(off)}	Turn-off Delay Time		-	99	-	
t _f	Turn-off Fall Time		-	86	-	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{DS} =20 V, V _{GS} =10 V, I _{DS} =50 A	-	142	-	nC
Q _{gs}	Gate-Source Charge		-	40	-	
Q _{gd}	Gate-Drain Charge		-	34	-	

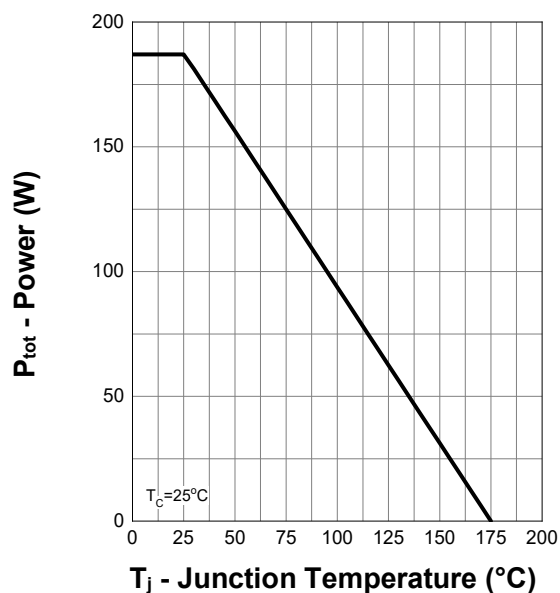
Notes:

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

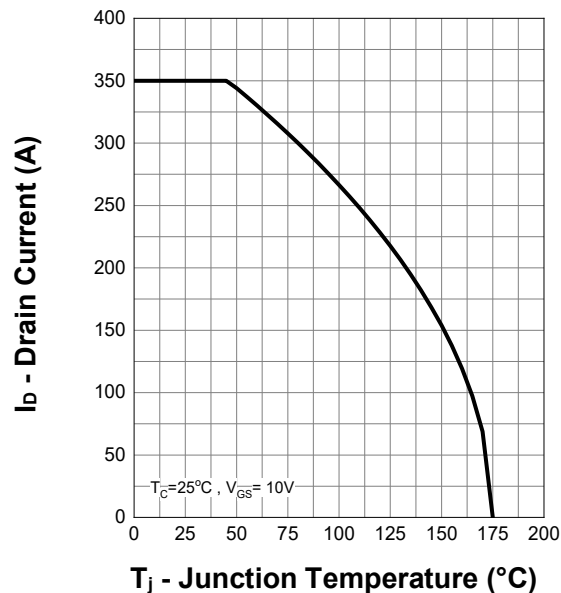
b. Guaranteed by design, not subject to production testing.

7. Typical Characteristics

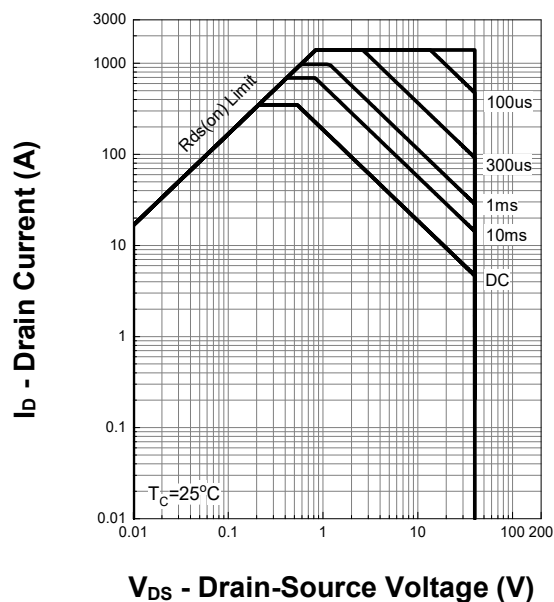
Power Capability



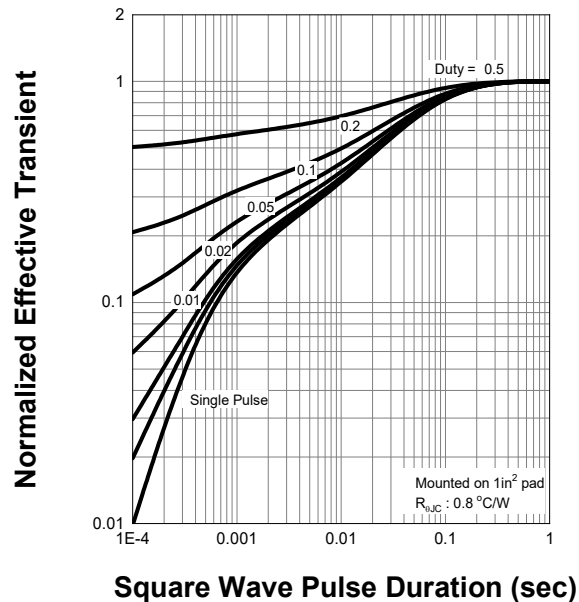
Current Capability



Safe Operating Area

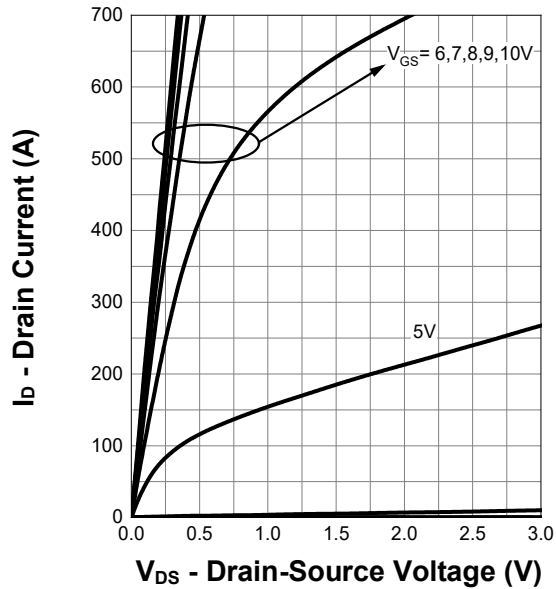


Transient Thermal Impedance

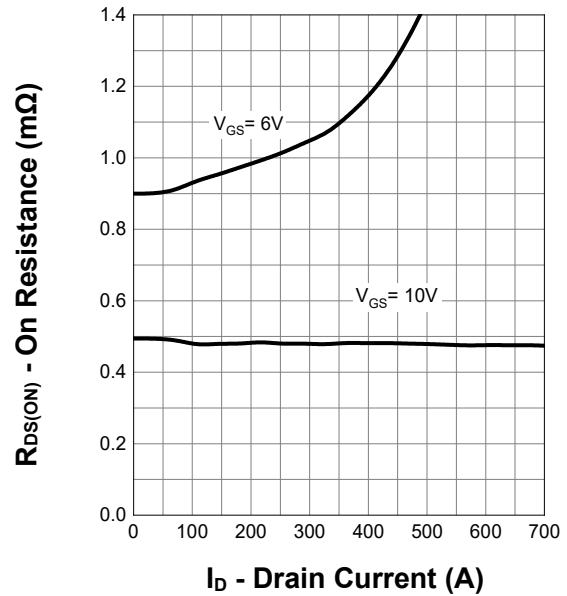


7. Typical Characteristics (cont.)

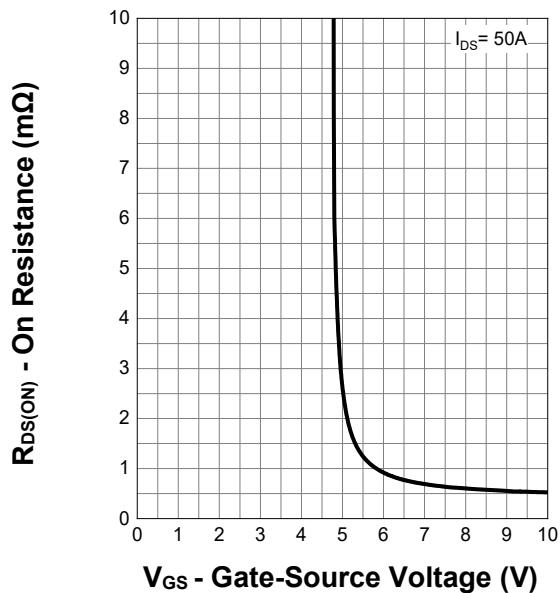
Output Characteristics



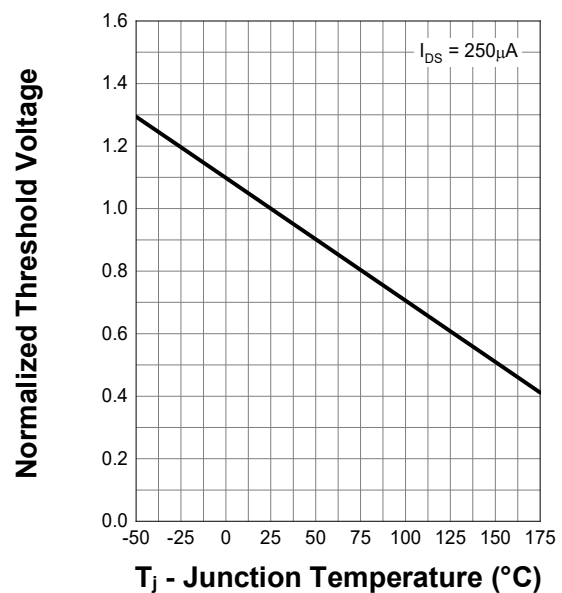
On Resistance



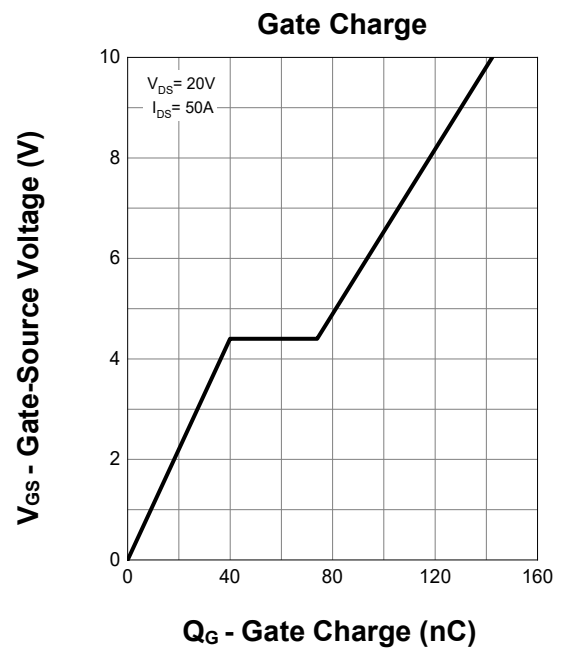
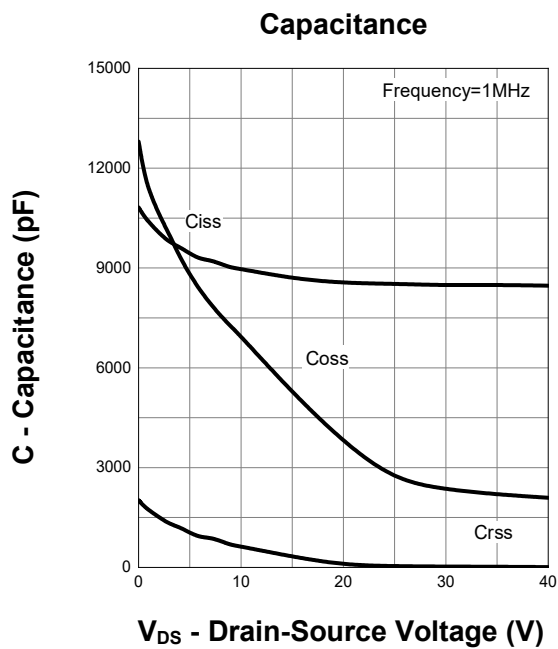
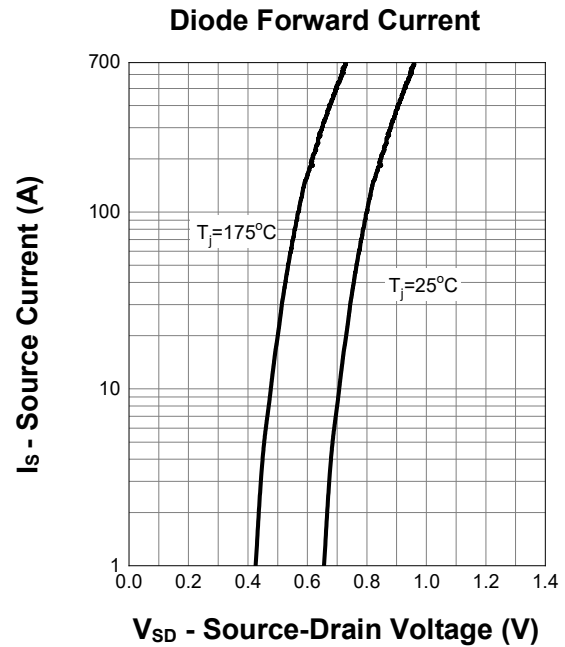
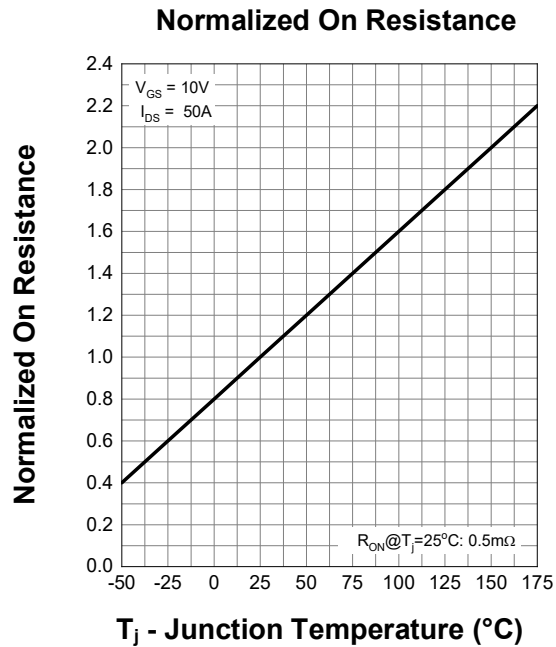
Transfer Characteristics



Normalized Threshold Voltage

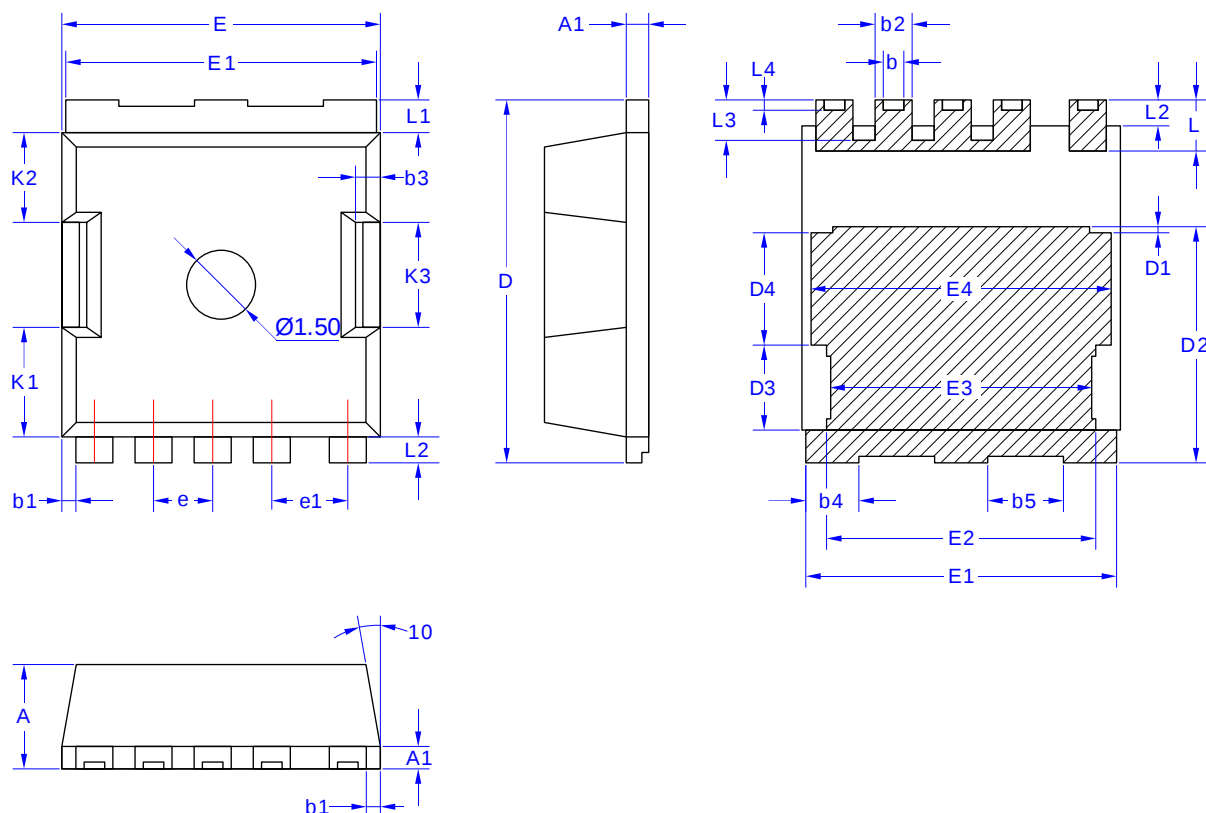


7. Typical Characteristics (cont.)



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