

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- Advanced trench cell design
- Low thermal resistance

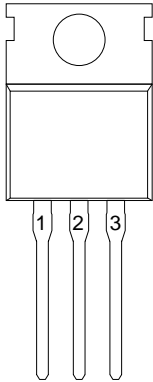
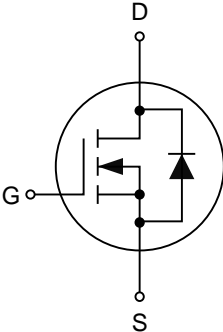
1.2 Applications

- Motor drivers
- DC/DC converter

1.3 Quick reference

- $BV \geq 100\text{ V}$
- $R_{DS(ON)} \leq 3.5\text{ m}\Omega @V_{GS} = 10\text{ V}$
- $P_{tot} \leq 147\text{ W}$
- $R_{DS(ON)} \leq 5.0\text{ m}\Omega @V_{GS} = 6\text{ V}$
- $I_D \leq 140\text{ A}$

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1	Gate (G)		
2	Drain (D)		
3	Source (S)		

**Top View
TO-220**

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	$T_C=25^{\circ}C$	-	100	V
V_{GS}	Gate-Source Voltage	$T_C=25^{\circ}C$	-	± 20	V
I_D^*	Drain Current (DC)	$T_C=25^{\circ}C, V_{GS}=10\text{ V}$	-	140	A
		$T_C=100^{\circ}C, V_{GS}=10\text{ V}$	-	89	A
$I_{DM}^{*,**}$	Drain Current (Pulsed)	$T_C=25^{\circ}C, V_{GS}=10\text{ V}$	-	560	A
P_{tot}^*	Total Power Dissipation	$T_C=25^{\circ}C$	-	147	W
I_S	Diode Forward Current	$T_C=25^{\circ}C$	-	140	A
E_{AS}^*	Single Pulsed Avalanche Energy	$V_{DD}=50\text{ V}, L=1.0\text{ mH}$	-	367	mJ
T_J, T_{stg}	Operating Junction and Storage Temperature Range		-55	150	$^{\circ}C$
$R_{\theta JA}^*$	Thermal Resistance-Junction to Ambient		-	62.5	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance-Junction to Case		-	0.85	

Notes:

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

4. Marking Information

Product Name	Marking
KJ03N10C	<div style="display: inline-block; border: 1px solid black; padding: 2px;"> 03N10 YWWXXX </div> YWWXXX: Date Code

5. Ordering Code

Product Name	Package	Reel size	Tape width	Quantity
KJ03N10C	TO-220	N/A	N/A	1000

Note: KUIJIEXIN 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)

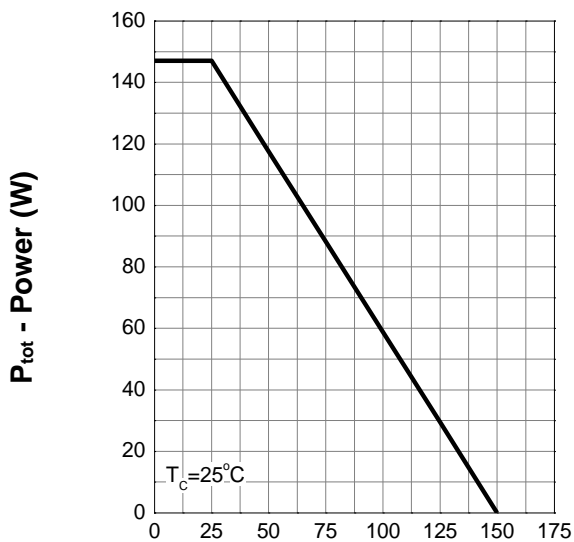
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
B _V DSS	Drain-Source Breakdown Voltage	V _{GS} =0 V, I _D =250 μA	100	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250 μA	2	-	4	V
I _{DSS}	Zero Gate Voltage Source Current	V _{DS} =80 V, V _{GS} =0 V	-	-	1	μA
I _{GSS}	Gate Leakage Current	V _{GS} =±20 V, V _{DS} =0 V	-	-	±100	nA
R _{DS(ON)} ^a	Drain-Source On-State Resistance	V _{GS} =10 V, I _D =50 A	-	3.1	3.5	mΩ
	Drain-Source On-State Resistance	V _{GS} =6 V, I _D =30 A	-	4.1	5.0	mΩ
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	-	89	-	ns
Q _{rr}	Reverse Recovery Charge		-	141	-	nC
Dynamic Characteristics^b						
C _{iss}	Input Capacitance	V _{GS} =0 V, V _{DS} =50 V, f=1 MHz	-	5363	-	pF
C _{oss}	Output Capacitance		-	824	-	
C _{rss}	Reverse Transfer Capacitance		-	38	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} =50 V, V _{GEN} =10 V, R _G =3.9 Ω, R _L =1 Ω, I _D =50 A	-	19	-	ns
t _r	Turn-on Rise Time		-	85	-	
t _{d(off)}	Turn-off Delay Time		-	56	-	
t _f	Turn-off Fall Time		-	97	-	
Gate Charge Characteristics^b						
Q _g	Total Gate Charge	V _{GS} =10 V, V _{DS} =50 V, I _{DS} =50 A	-	90	-	nC
Q _{gs}	Gate-Source Charge		-	28	-	
Q _{gd}	Gate-Drain Charge		-	21	-	

Notes:

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

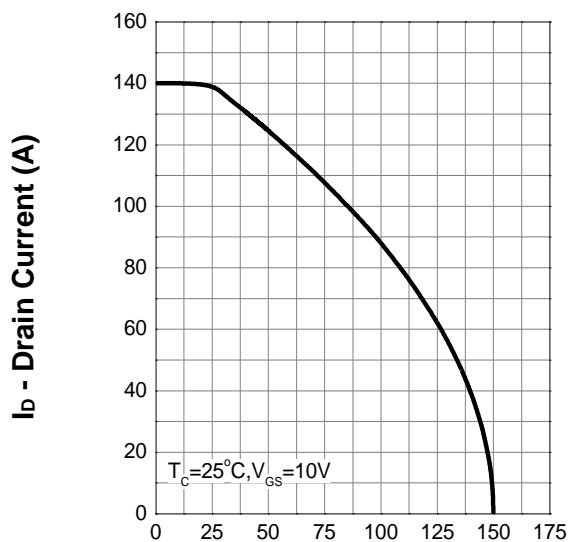
7. Typical Characteristics

Power Capability



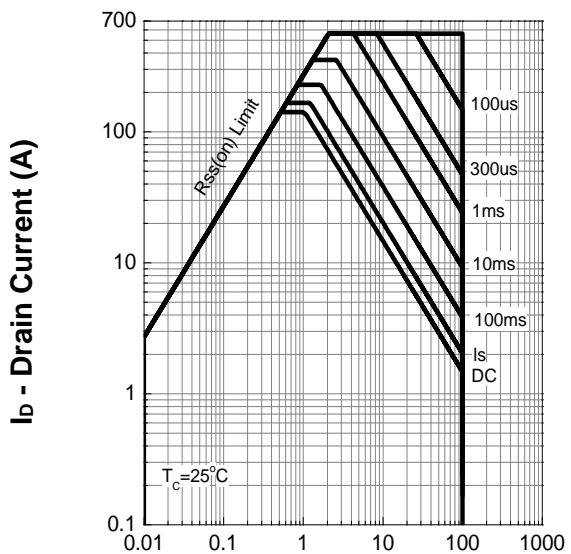
T_j - Junction Temperature (°C)

Current Capability



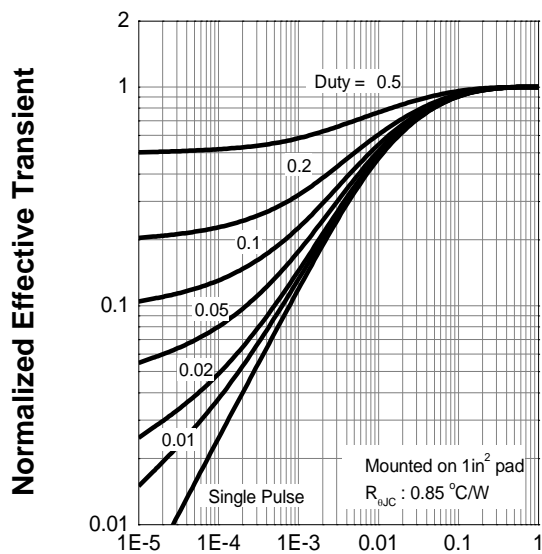
T_j - Junction Temperature (°C)

Safe Operation Area



V_{DS} - Drain-Source Voltage (V)

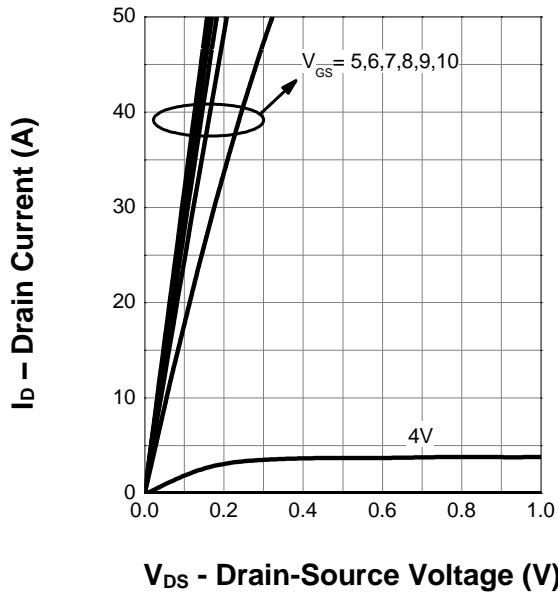
Thermal Transient Impedance



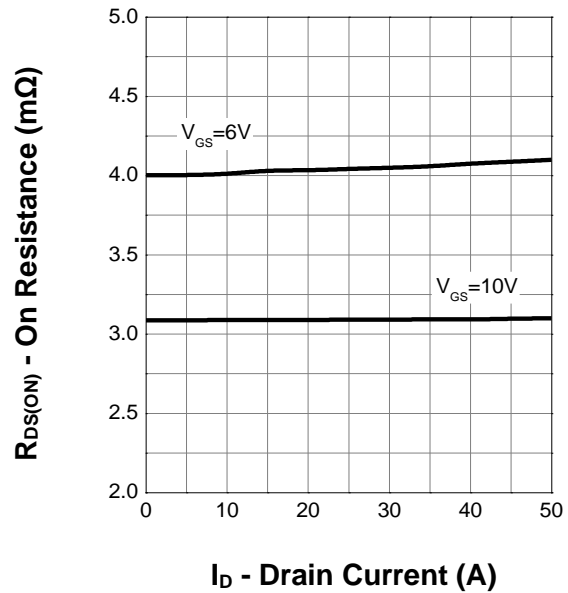
Square Wave Pulse Duration (sec)

7. Typical Characteristics (cont.)

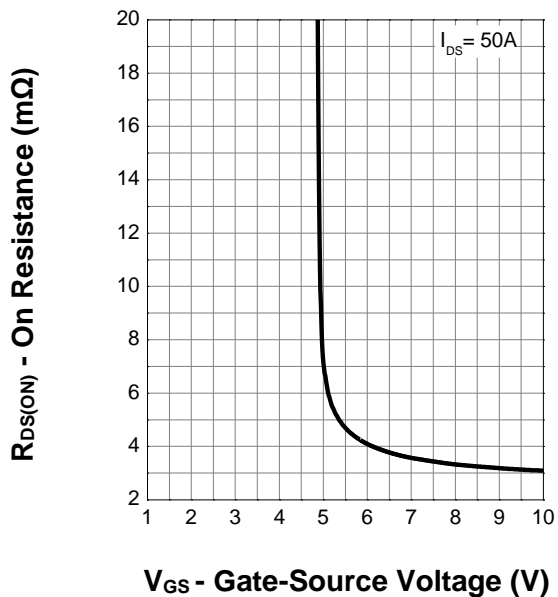
Output Characteristics



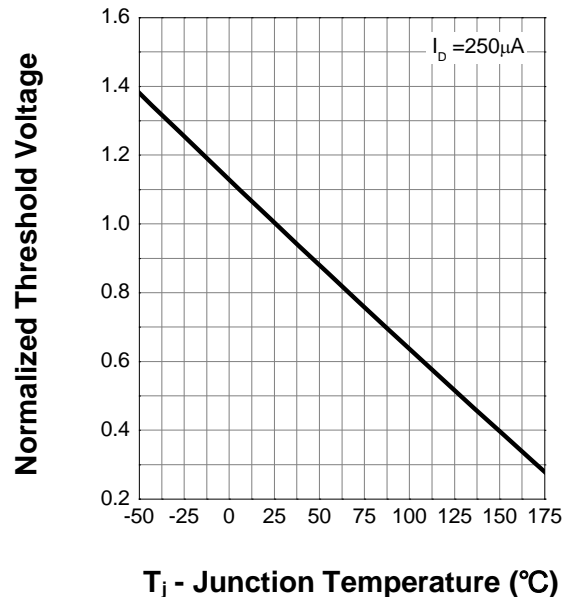
Drain-Source On Resistance



Transfer Characteristics

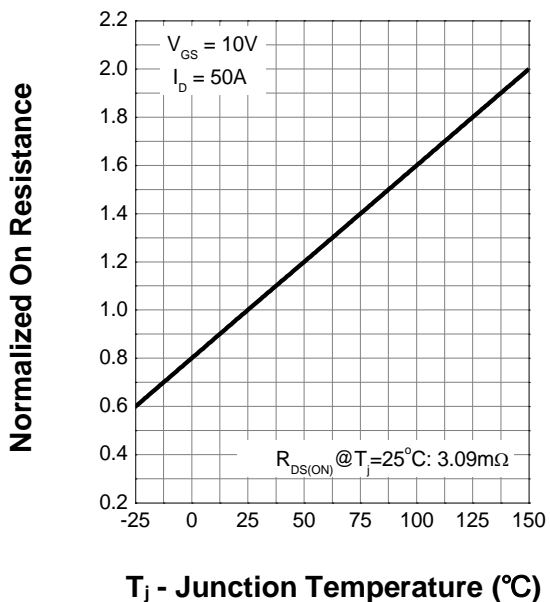


Gate Threshold Voltage

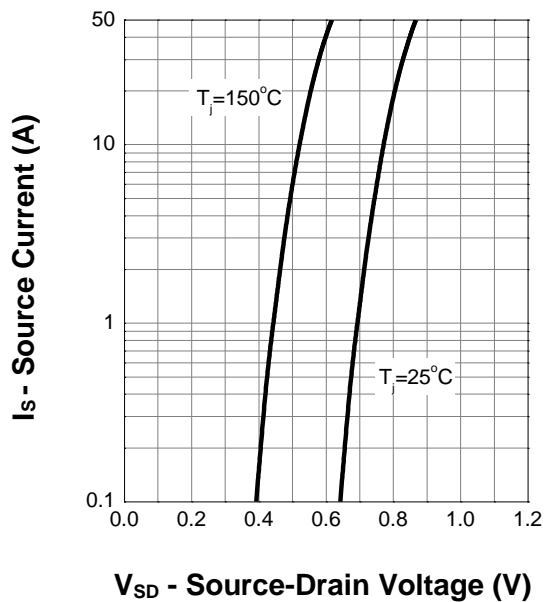


7. Typical Characteristics (cont.)

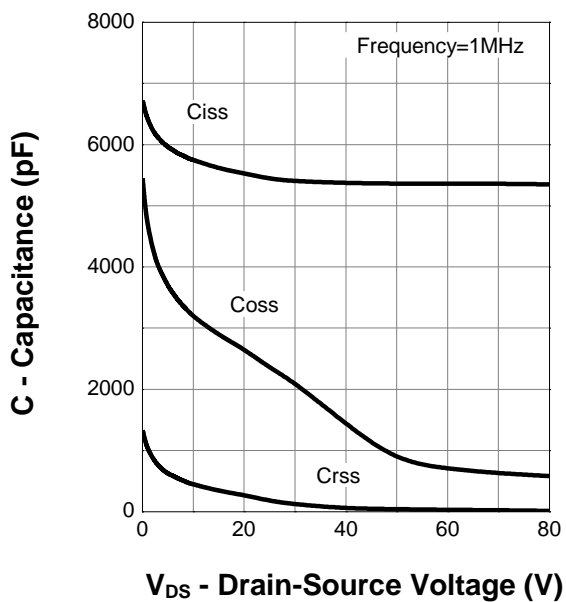
Drain-Source On Resistance



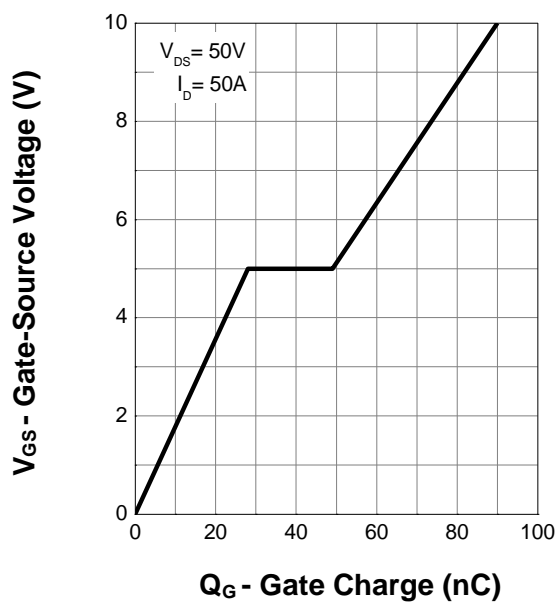
Body Diode Characteristics



Capacitance

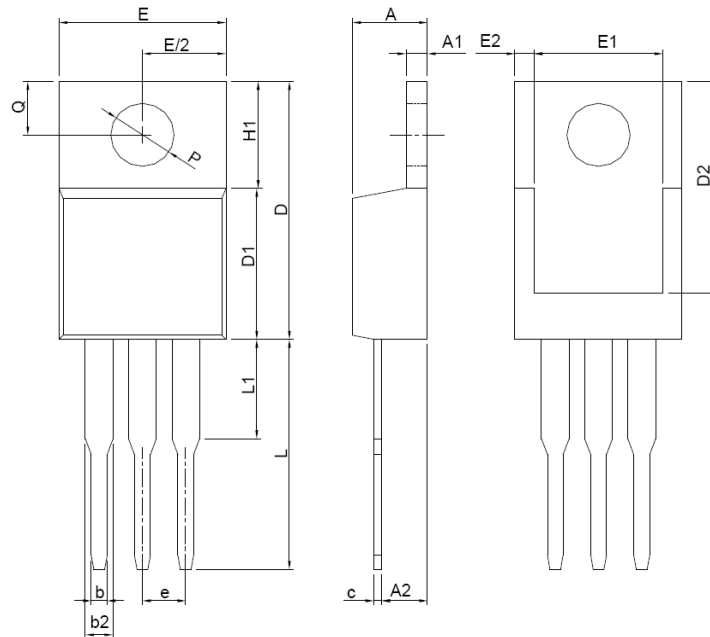


Gate Charge



8. Package Dimensions

TO-220 Package



Symbol	Dimensions In Millimeters	
	MIN	MAX
A	3.56	4.83
A1	0.51	1.40
A2	2.03	2.92
b	0.38	1.02
b2	1.14	1.78
c	0.36	0.61
D	14.22	16.51
D1	8.38	9.02
D2	12.19	12.88
E	9.65	10.67
E1	6.86	8.89
E2	0.76BSC	
e	2.54BSC	
H1	5.84	6.86
L	12.70	14.73
L1	6.35BSC	
P	3.53	4.09
Q	2.54	3.43