

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☒ Surface-mounted package
- ☒ Low on-resistance
- ☒ SGT technology
- ☒ 100% Avalanche Tested

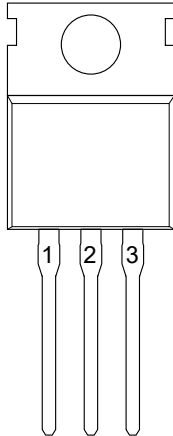
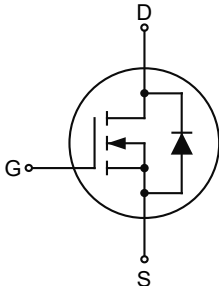
1.2 Applications

- ☒ Motor control and driver
- ☒ Uninterruptible power supplies
- ☒ Battery management

1.3 Quick reference

- ☒ $BV \geq 80\text{ V}$
- ☒ $P_D \leq 156\text{ W}$
- ☒ $I_D \leq 120\text{ A}$
- ☒ $R_{DS(ON)} \leq 5.25\text{ m}\Omega @ V_{GS} = 10\text{ V}$

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1	Gate(G)	 Top View TO-220	
2	Drain(D)		
3	Source(S)		

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V _{DS}	Drain-Source Voltage	T _C =25°C	-	80	V
V _{GS}	Gate-Source Voltage	T _C =25°C	-	±20	V
I _D ***	Drain Current (DC)	T _C =25°C, V _{GS} =10 V (Silicon limit)	-	150	A
		T _C =25°C, V _{GS} =10 V (Package limit)	-	120	A
		T _C =100°C, V _{GS} =10 V (Silicon limit)	-	85	A
I _{DM} *, ***	Drain Current (Pulsed)	T _C =25°C, V _{GS} =10 V	-	480	A
P _D	Drain Power Dissipation	T _C =25°C	-	156	W
I _S	Continuous-Source Current	T _C =25°C	-	120	A
E _{AS} *	Single Pulsed Avalanche Energy	V _{DD} =20 V, L=0.5 mH	-	338	mJ
T _J , T _{stg}	Operating Junction and Storage Temperature Range		-55	150	°C
R _{θJA} **	Thermal Resistance-Junction to Ambient		-	62.5	°C/W
R _{θJC} **	Thermal Resistance-Junction to Case		-	0.8	

Notes:

- * Pulse width ≤ 300 μs, duty cycle ≤ 2%.
- ** Surface mounted on 1 in² pad area, t ≤ 10 sec.
- *** Limited by bonding wire.

4. Marking Information

Product Name	Marking
KJ052N08C	KJ052N08C XXXXXX

5. Ordering Code

Product Name	Package	Reel size	Tape width	Quantity (pcs)
KJ052N08C	TO-220	N/A	N/A	1000

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)

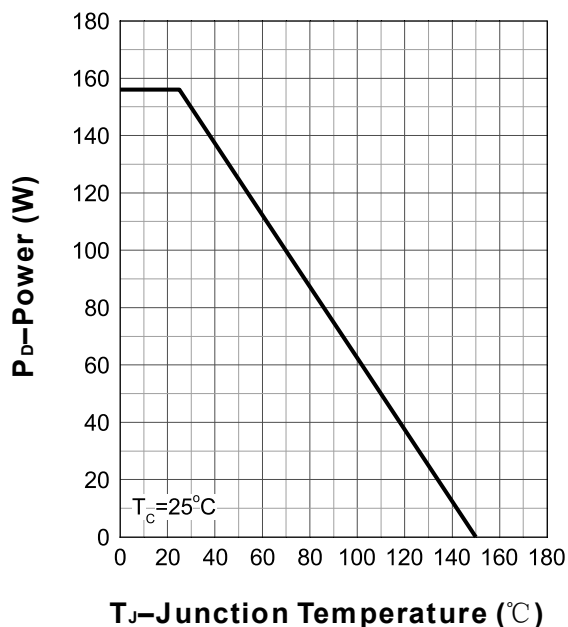
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0 V, I _{DS} =250 μA	80	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250 μA	2	-	4	V
I _{DSS}	Drain Leakage Current	V _{DS} =80 V, V _{GS} =0 V	-	-	1	μA
I _{GSS}	Gate Leakage Current	V _{GS} =0 V, V _{GS} =±20 V	-	-	±100	nA
R _{DS(ON)} ^a	On-State Resistance	V _{GS} =10 V, I _{DS} =20 A	-	4.3	5.25	mΩ
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} =20 A, V _{GS} =0 V	-	-	1.4	V
t _{rr}	Reverse Recovery Time	I _{DS} =20 A, V _{GS} =0 V, dI _{SD} /dt=100 A/μs	-	72	-	ns
Q _{rr}	Reverse Recovery Charge		-	122	-	nC
Dynamic Characteristics ^b						
C _{iss}	Input Capacitance	V _{GS} =0 V, V _{DS} =40 V, f=1 MHz	-	3680	-	pF
C _{oss}	Output Capacitance		-	1700	-	
C _{rss}	Reverse Transfer Capacitance		-	210	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} =40 V, V _{GEN} =10 V, R _G =4.5 Ω, R _L =2 Ω, I _{DS} =20 A	-	19	-	ns
t _r	Turn-on Rise Time		-	45	-	
t _{d(off)}	Turn-off Delay Time		-	52	-	
t _f	Turn-off Fall Time		-	25	-	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{DS} =40 V, V _{GS} =10 V, I _{DS} =20 A	-	87	-	nC
Q _{gs}	Gate-Source Charge		-	26	-	
Q _{gd}	Gate-Drain Charge		-	24	-	

Notes:

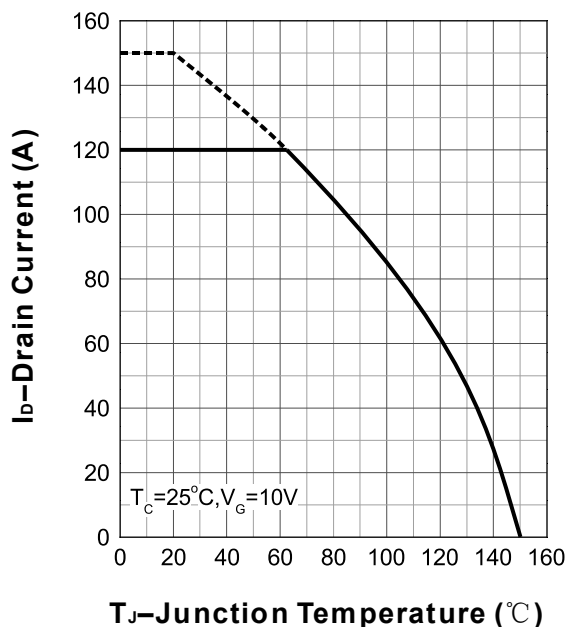
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- b. Guaranteed by design, not subject to production testing.

7. Typical Characteristics

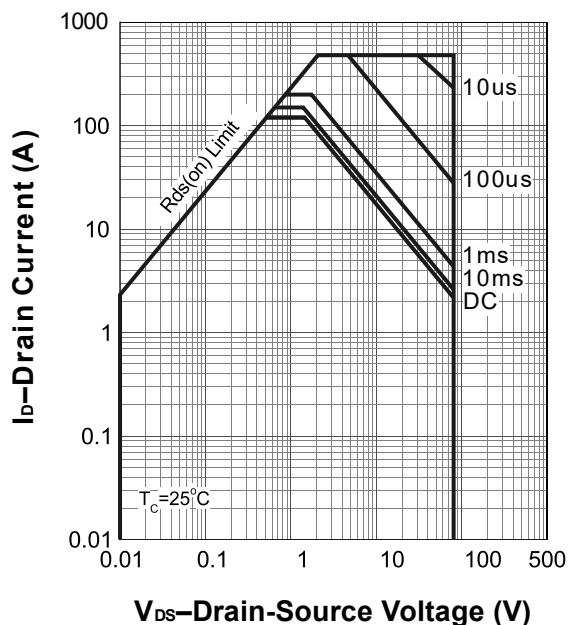
Power Capability



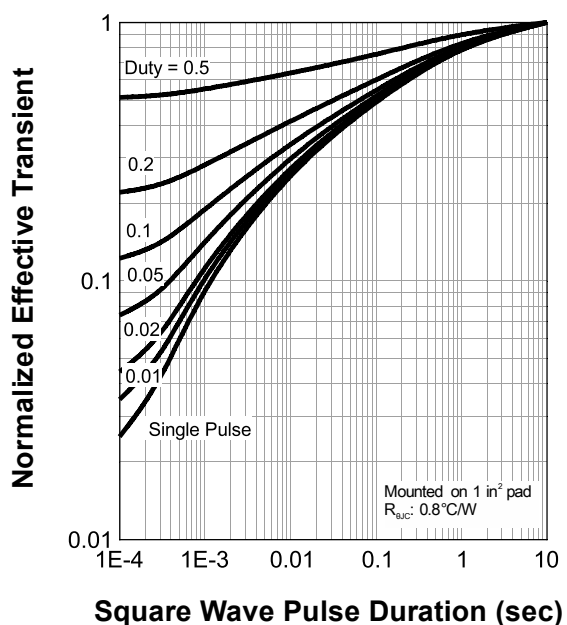
Current Capability



Safe Operating Area

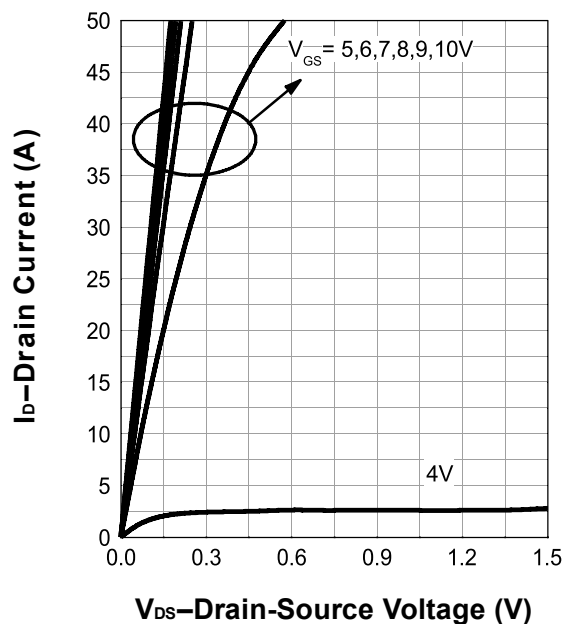


Transient Thermal Impedance

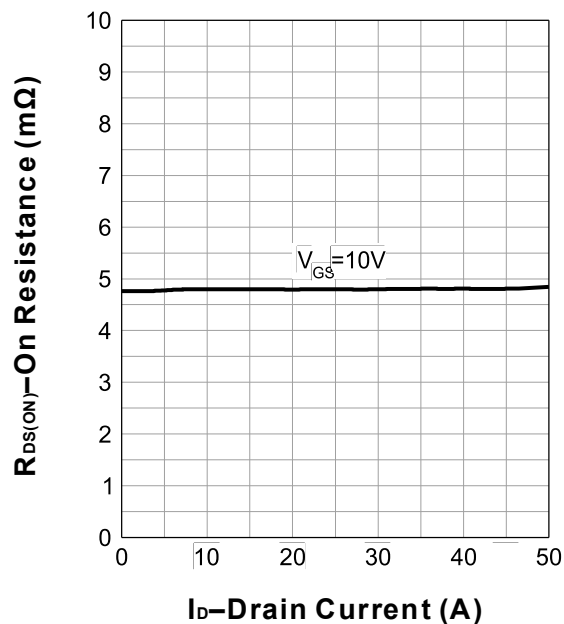


7. Typical Characteristics (cont.)

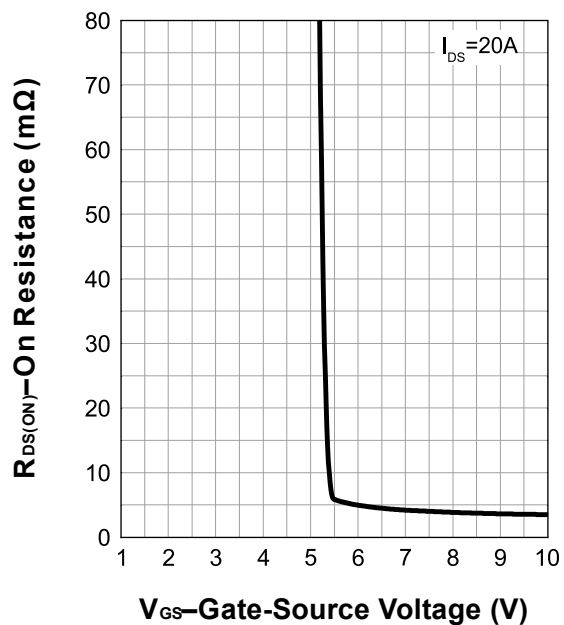
Output Characteristics



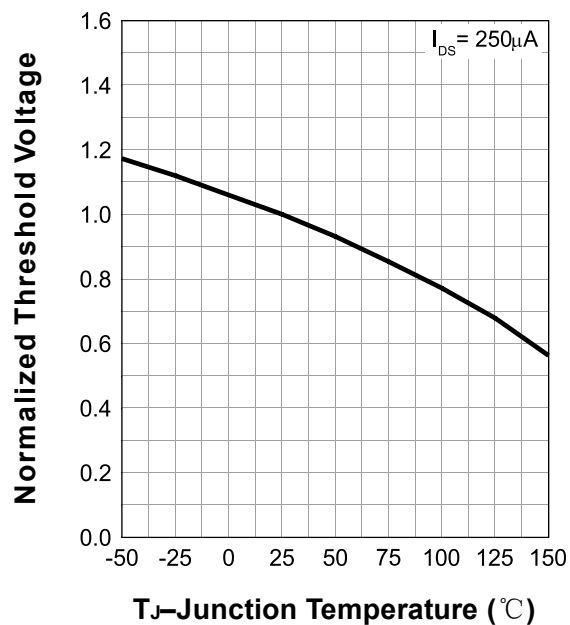
On Resistance



Transfer Characteristics

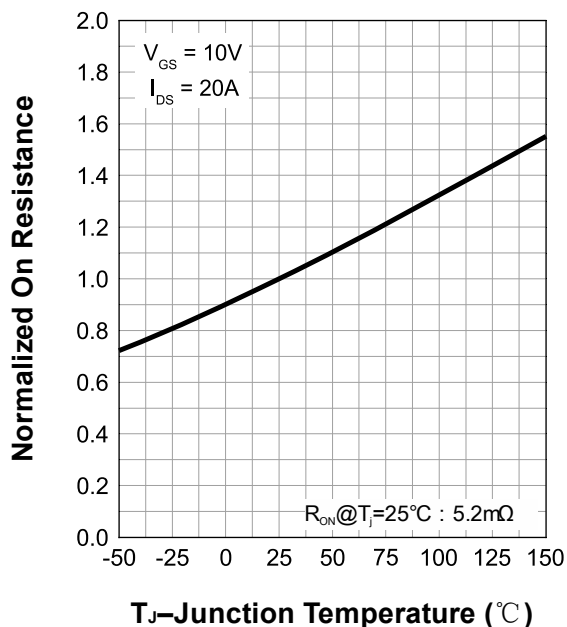


Normalized Threshold Voltage

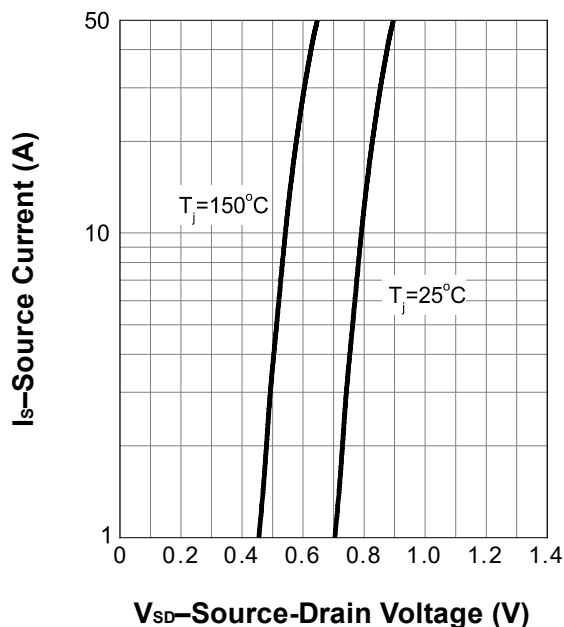


7. Typical Characteristics (cont.)

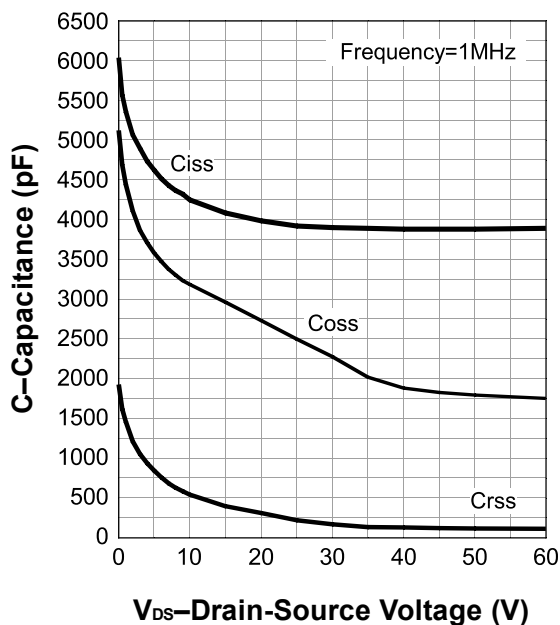
Normalized On Resistance



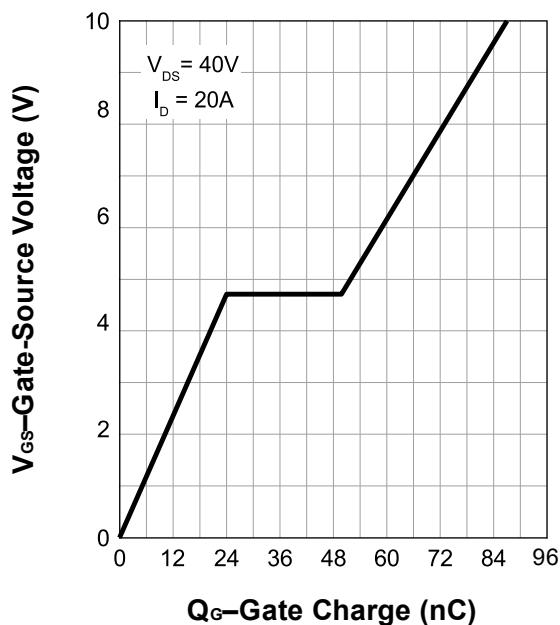
Diode Forward Current



Capacitance

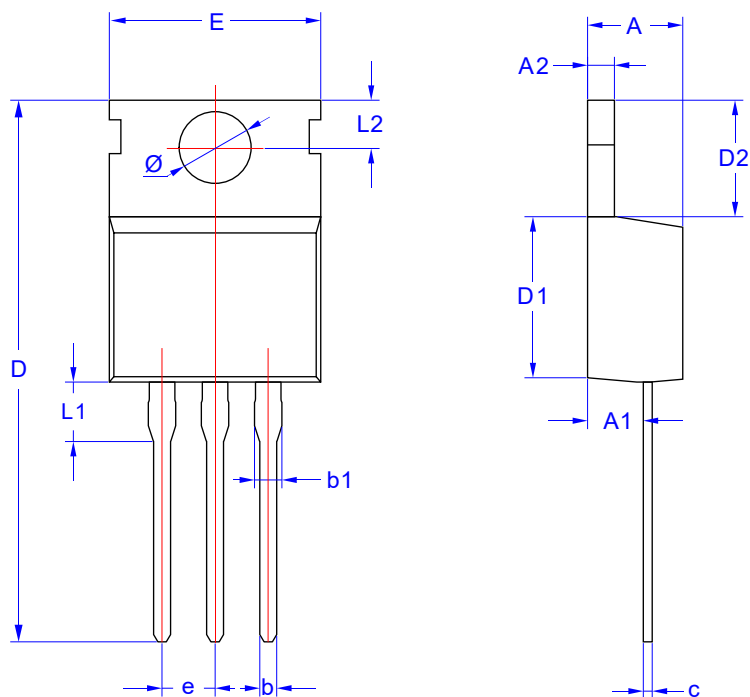


Gate Charge



8. Package Dimensions

TO-220 Package



Symbol	Dimensions in Millimeters	
	MIN	MAX
A	4.24	4.70
A1	2.20	3.00
A2	1.15	1.40
b	0.70	0.95
b1	1.14	1.70
c	0.40	0.60
D	28.0	29.8
D1	8.80	9.90
D2	6.25	6.90
E	9.70	10.50
L1	3.80	
L2	2.40	3.00
e	2.54 BSC	
Φ	3.60	