快捷芯
KUAIJIEXIN

KJ025N03K

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☑ Advanced Trench Technology
- ☑ Low F_{OM} $R_{DS(ON)} \times Q_{gd}$

1.2 Applications

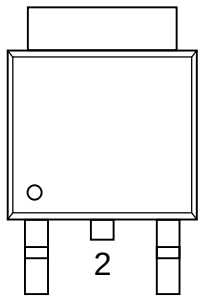
- ☑ DC/DC Converter
- ☑ Load Switch
- ☑ Battery Protection Charge/Discharge
- ☑ Synchronous Rectification

1.3 Quick reference

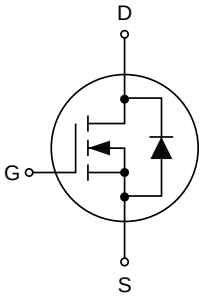
- ☑ BV ≧ 30 V
- ☑ P_{tot} ≦ 41 W
- ☑ I_D ≦ 130 A
- ☑ $R_{DS(ON)}$ ≦ 3.0 mΩ @ V_{GS} = 10 V
- ☑ $R_{DS(ON)}$ ≦ 5.0 mΩ @ V_{GS} = 4.5 V

2. Pin Description

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



Top View
TO-252



3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	T_C=25℃	-	30	V
V_{GS}	Gate-Source Voltage	T_C=25℃	-	±20	V
I_D*,***	Drain Current (DC)	T_C=25℃, V_{GS}=10 V	-	130	A
		T_C=100℃, V_{GS}=10 V	-	100	A
I_{DM}*	Pulsed Source Current	T_C=25℃, V_{GS}=10 V	-	400	A
P_{tot}	Total Power Dissipation	T_C=25℃	-	41	W
T_J, T_{stg}	Operating Junction and Storage Temperature		-55	150	℃
I_S	Diode Forward Current	T_C=25℃	-	130	A
E_{AS}*	Single Pulsed Avalanche Energy	V_{DD}=20 V, L=0.5 mH	-	178	mJ
$R_{\theta JA}$**	Thermal Resistance-Junction to Ambient		-	35	℃/W
$R_{\theta JC}$**	Thermal Resistance-Junction to Case		-	3	

Notes:

* Pulse width ≤ 300 μs, duty cycle ≤ 2%

** Surface Mounted on 1 in^2 pad area, t ≤ 10 sec

*** Limited by bonding wire

4. Marking Information

Product Name	Marking
KJ025N03K	KJ025N03 YWWXXX YWW: Date Code

5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
KJ025N03K	TO-252	-	-	2500	

Note: KUAIJIEXIN 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_J=25℃ 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	30	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250 μA	1.4	1.8	2.2	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30 V, V_{GS}=0 V	-	-	1	μA
		V_{DS}=30 V, V_{GS}=0 V, T_J=125℃	-	-	100	μA
I_{GSS}	Gate Leakage Current	V_{DS}=0 V, V_{GS}=±20 V	-	-	±100	nA
$R_{DS(ON)}$ [a]	On-State Resistance	V_{GS}=10 V, I_{DS}=20 A	-	2.5	3.0	mΩ
		V_{GS}=4.5 V, I_{DS}=20 A	-	4.0	5.0	
R_G	Gate Resistance	f=1.0 MHz, open drain	-	1	-	Ω
Diode Characteristics						
V_{SD} [a]	Diode Forward Voltage	I_{SD}=20 A, V_{GS}=0 V	-	-	1.2	V
I_S	Continuous Diode Forward Current		-	-	100	A
t_{rr}	Reverse Recovery Time	I_{DS}=20 A, V_{GS}=0V, dI_{SD}/dt=100 A/μs	-	22	-	ns
Q_{rr}	Reverse Recovery Charge		-	47	-	nC
Dynamic Characteristics [b]						
C_{iss}	Input Capacitance	V_{GS}=0 V, V_{DS}=15 V, Frequency=1.0 MHz	-	3277	-	pF
C_{oss}	Output Capacitance		-	663	-	
C_{rss}	Reverse Transfer Capacitance		-	559	-	
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=15 V, V_{GEN}=10 V, R_G=3 Ω, I_{DS}=20 A	-	22	-	ns
t_r	Turn-on Rise Time		-	18	-	
$t_{d(off)}$	Turn-off Delay Time		-	44	-	
t_f	Turn-off Fall Time		-	15	-	
Gate Charge Characteristics [b]						
Q_g	Total Gate Charge	V_{DS}=15 V, V_{GS}=10 V, I_{DS}=20 A	-	73.4	-	nC
Q_{gs}	Gate-Source Charge		-	12.2	-	
Q_{gd}	Gate-Drain Charge		-	15.7	-	
$V_{Plateau}$	Gate Plateau Voltage		-	3.2	-	

Notes:

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

b. Guaranteed by design, not subject to production testing

7. Typical Characteristics

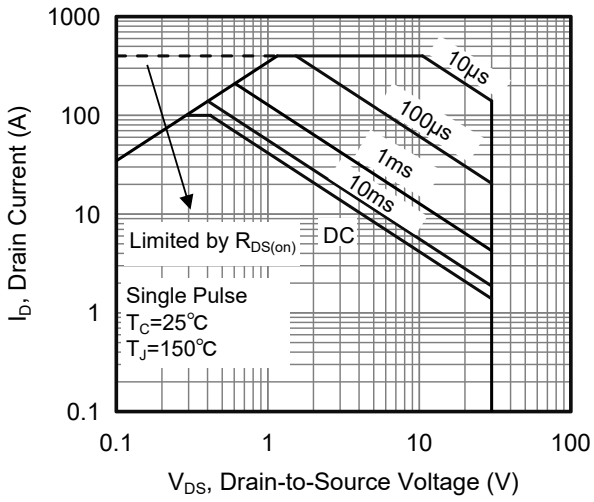


Figure 1. Maximum Safe Operating Area

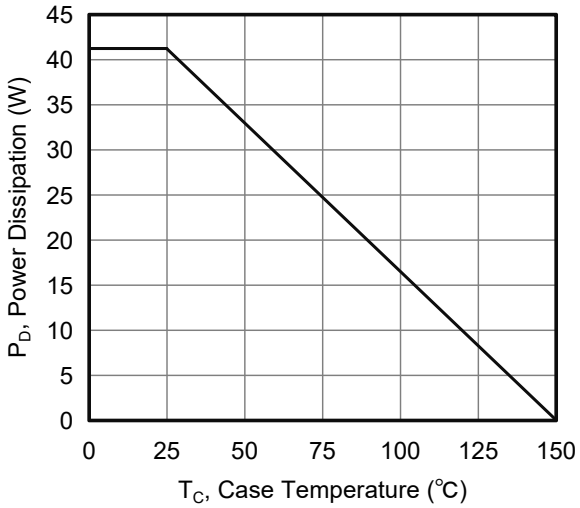


Figure 2. Maximum Power Dissipation vs Case Temperature

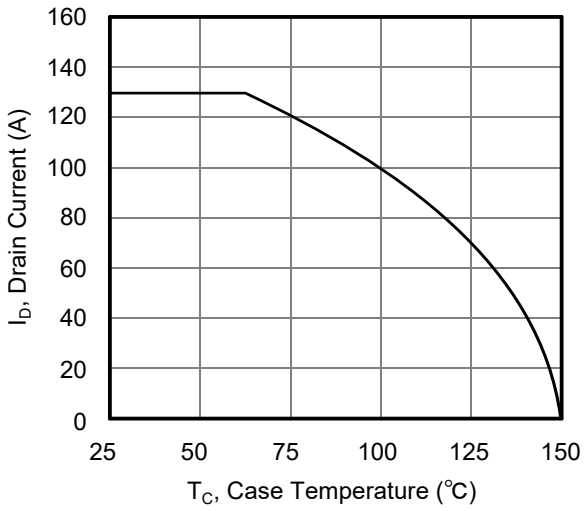


Figure 3. Maximum Continuous Drain Current vs Case Temperature

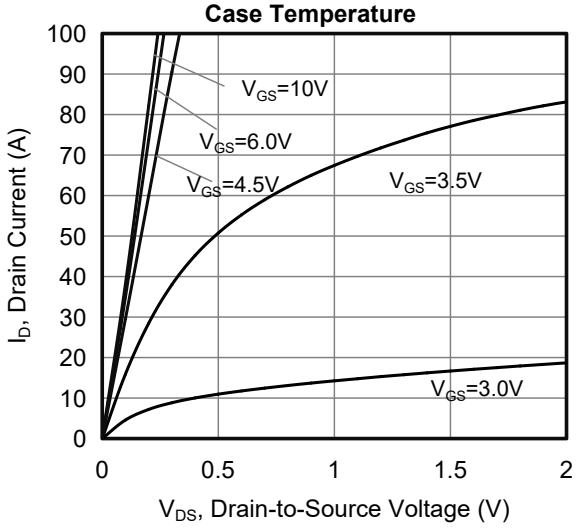


Figure 4. Typical output Characteristics

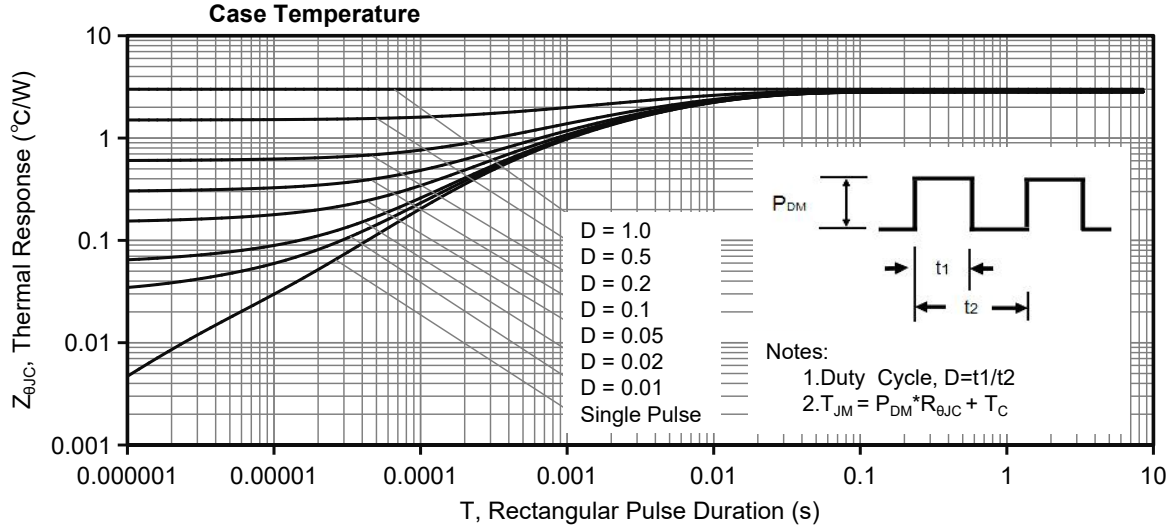


Figure 5. Maximum Effective Thermal Impedance, Junction to Case

7. Typical Characteristics (cont.)

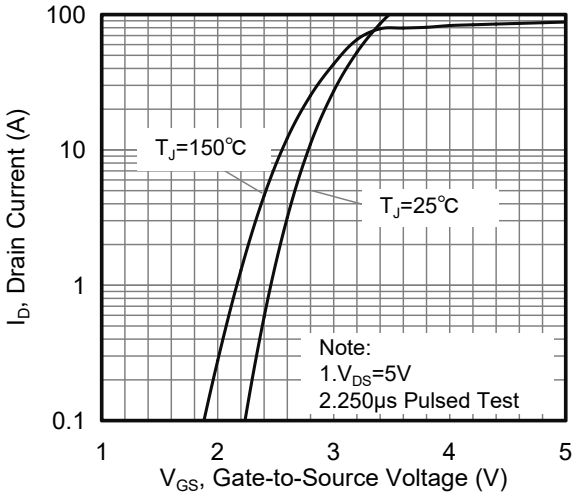


Figure 6. Typical Transfer Characteristics

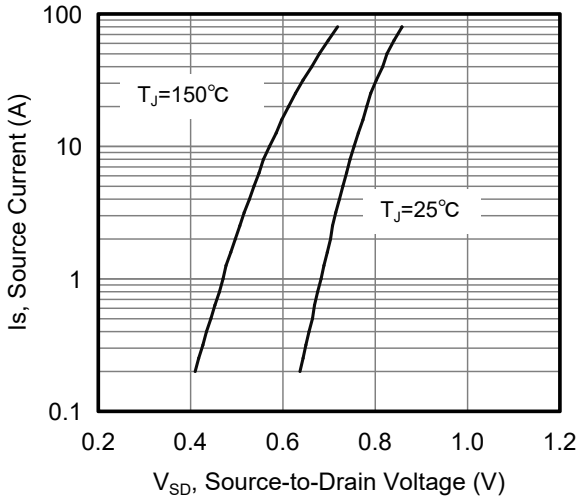


Figure 7. Typical Body Diode Transfer Characteristics

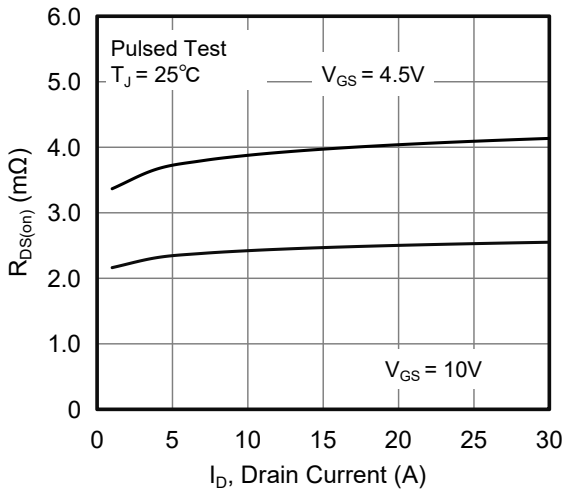


Figure 8. Drain-to-Source On Resistance vs Drain Current

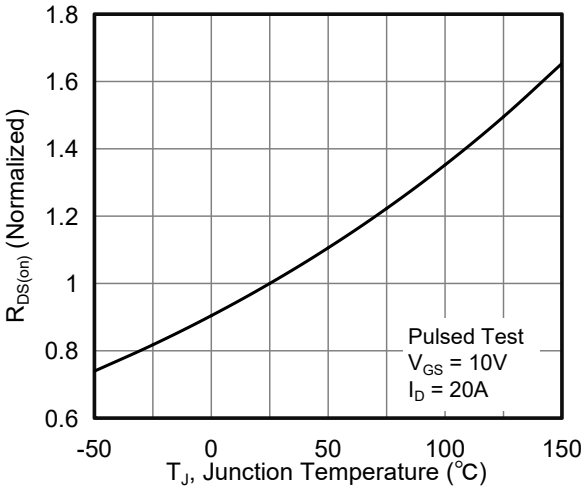


Figure 9. Normalized On Resistance vs Junction Temperature

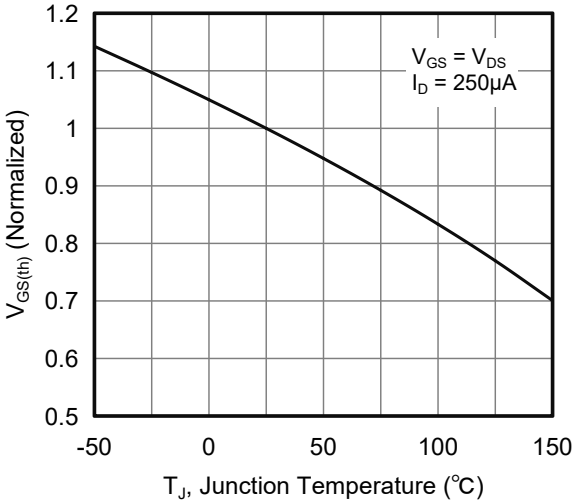


Figure 10. Normalized Threshold Voltage vs Junction Temperature

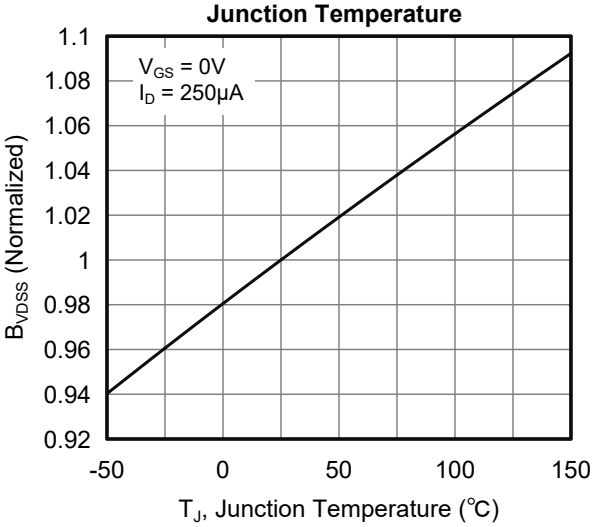


Figure 11. Normalized Breakdown Voltage vs Junction Temperature

7. Typical Characteristics (cont.)

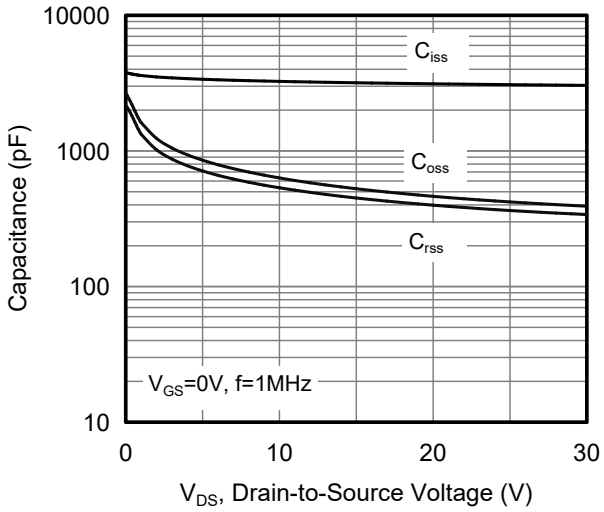


Figure 12. Capacitance Characteristics

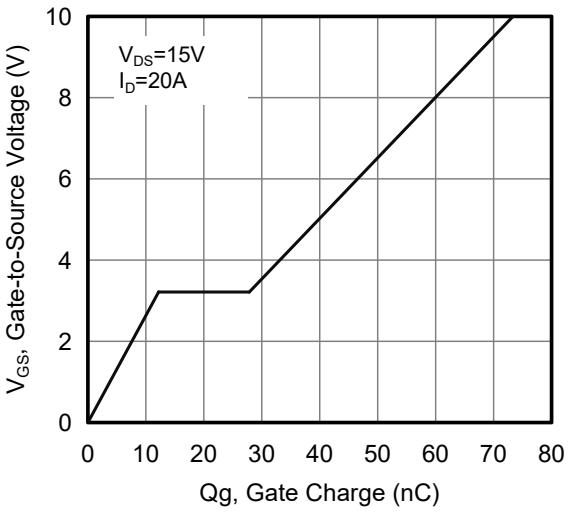
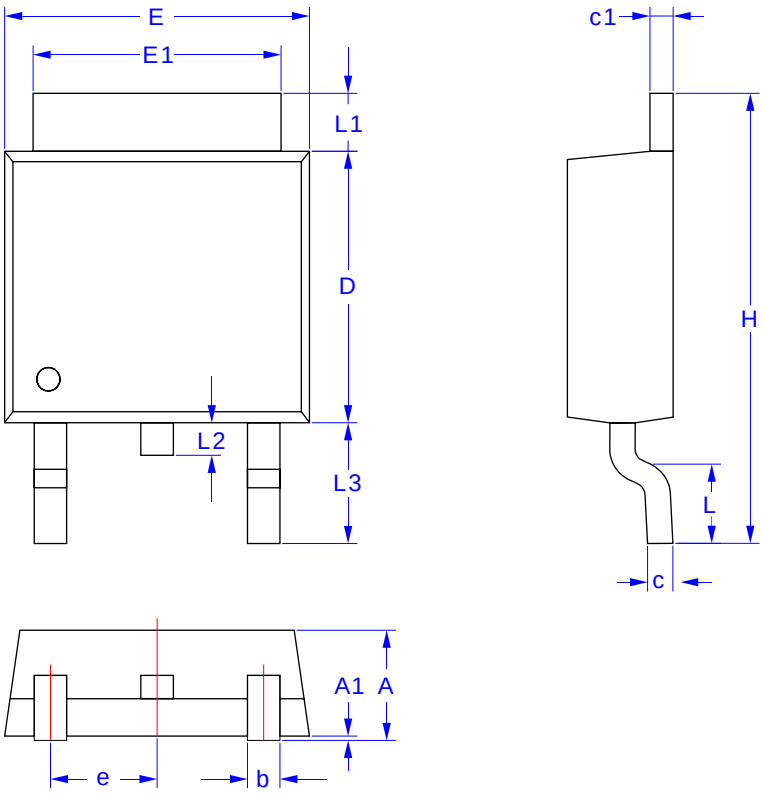


Figure 13. Typical Gate Charge vs Gate to Source Voltage

8. Package Dimensions

TO-252 Package



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	2.19	2.38
A1	0.02	0.13
b	0.55	0.85
c	0.40	0.60
c1	0.40	0.60
D	5.30	6.40
E	6.35	6.80
E1	5.20	5.50
e	2.30 BCS	
L	1.00	1.80
L1	0.70	1.80
L2	0.70 BCS	
L3	2.40	2.80
H	9.20	10.40