

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

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

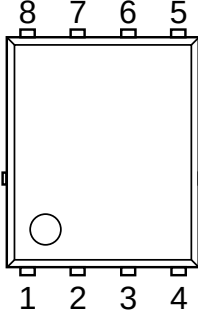
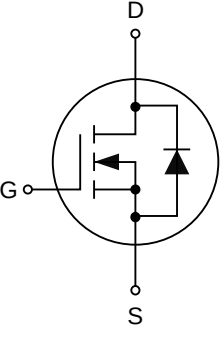
1.2 Applications

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

1.3 Quick reference

- ✓ $BV \geq 30\text{ V}$
- ✓ $R_{DS(ON)} \leq 2.3\text{ m}\Omega @ V_{GS} = 10\text{ V}$
- ✓ $P_{tot} \leq 41\text{ W}$
- ✓ $R_{DS(ON)} \leq 3.5\text{ m}\Omega @ V_{GS} = 4.5\text{ V}$
- ✓ $I_D \leq 100\text{ A}$

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1,2,3	Source	 Top View PDFN5x6-8L	
4	Gate		
5,6,7,8	Drain		

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	$T_C=25^{\circ}\text{C}$	-	30	V
V_{GS}	Gate-Source Voltage	$T_C=25^{\circ}\text{C}$	-	± 20	V
$I_D^{*,***}$	Drain Current (DC)	$T_C=25^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	100	A
		$T_C=100^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	75	A
I_{DM}^*	Pulsed Source Current	$T_C=25^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	400	A
P_{tot}	Total Power Dissipation	$T_C=25^{\circ}\text{C}$	-	41	W
T_J, T_{stg}	Operating Junction and Storage Temperature		-55	150	$^{\circ}\text{C}$
I_S	Continuous Diode Forward Current	$T_C=25^{\circ}\text{C}$	-	100	A
E_{AS}^*	Single Pulsed Avalanche Energy	$V_{DD}=20\text{ V}, L=0.5\text{ mH}$	-	180	mJ
$R_{\theta JA}^{**}$	Thermal Resistance-Junction to Ambient		-	35	$^{\circ}\text{C/W}$
$R_{\theta JC}^{**}$	Thermal Resistance-Junction to Case		-	3	

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 maximum junction temperature.

4. Marking Information

Product Name	Marking
KJ30N03G	30N03G YWWXXX YWW: Date Code

5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
KJ30N03G	PDFN 5×6-8L	13"	12 mm	5000	

Note: KUAJIE XIN 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°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	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°C	-	-	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	-	1.8	2.3	mΩ
		V _{GS} =4.5 V, I _{DS} =20 A	-	2.8	3.5	
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
t _{rr}	Reverse Recovery Time	I _{DS} =20 A, V _{GS} =0V, dI _{SD} /dt=100 A/μs	-	25	-	ns
Q _{rr}	Reverse Recovery Charge		-	48	-	nC
Dynamic Characteristics ^b						
C _{iss}	Input Capacitance	V _{GS} =0 V, V _{DS} =15 V, Frequency=1.0 MHz	-	3305	-	pF
C _{oss}	Output Capacitance		-	668	-	
C _{rss}	Reverse Transfer Capacitance		-	562	-	
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		-	19	-	
t _{d(off)}	Turn-off Delay Time		-	45	-	
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	-	74	-	nC
Q _{gs}	Gate-Source Charge		-	12.5	-	
Q _{gd}	Gate-Drain Charge		-	16	-	

Notes:

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

7. Typical Characteristics

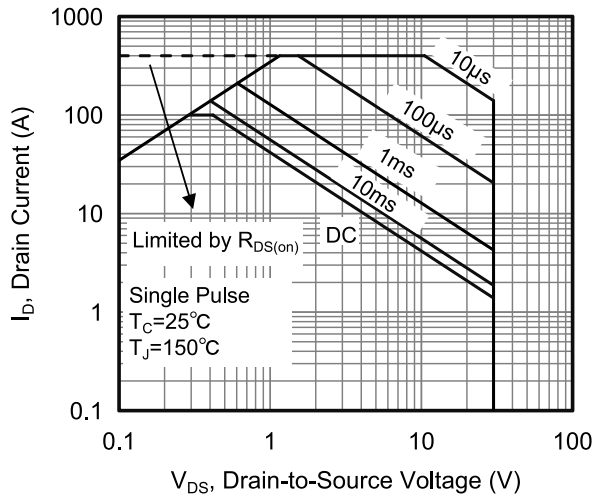


Figure 1. Maximum Safe Operating Area

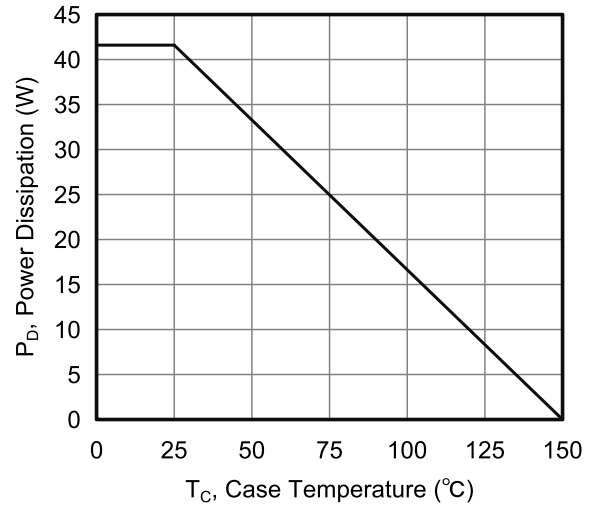


Figure 2. Maximum Power Dissipation vs. Case Temperature

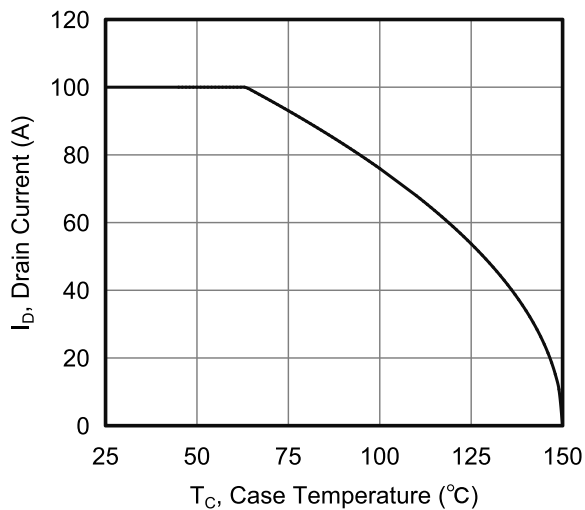


Figure 3. Maximum Continuous Drain Current vs. Case Temperature

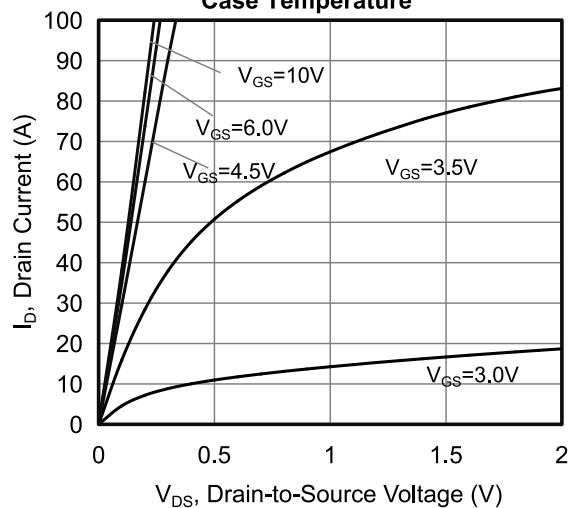


Figure 4. Typical output Characteristics

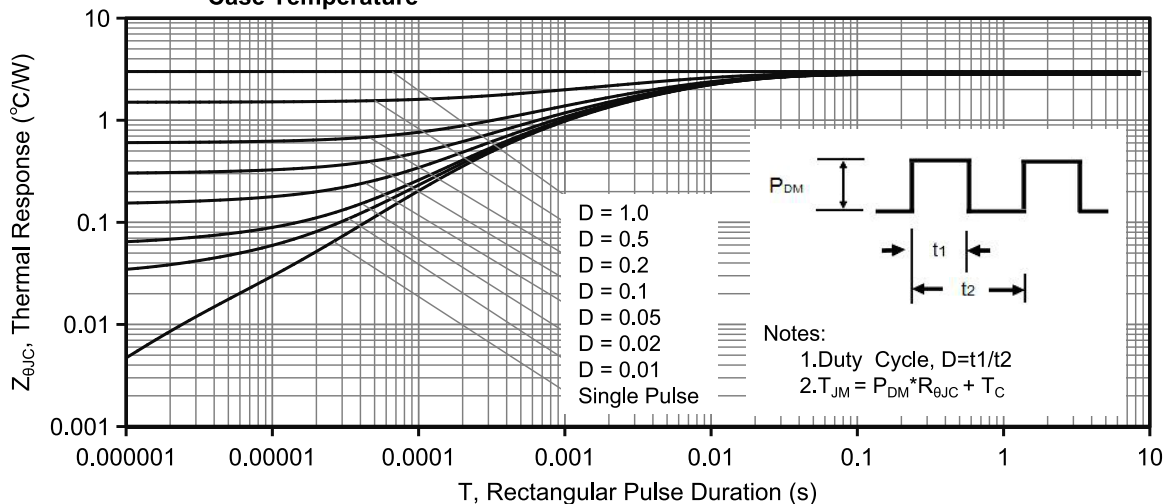


Figure 5. Maximum Effective Thermal Impedance, Junction to Case

7. Typical Characteristics (cont.)

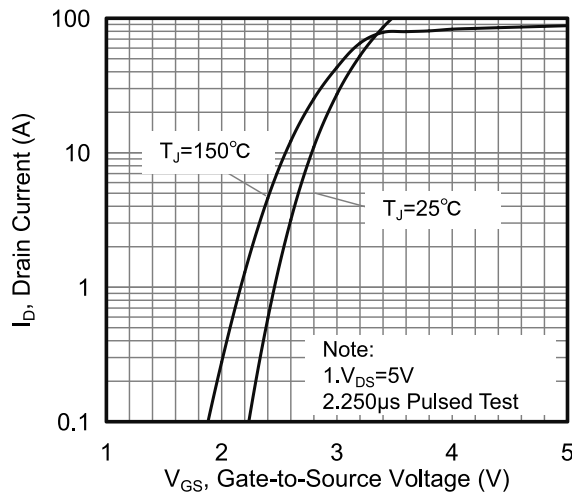


Figure 6. Typical Transfer Characteristics

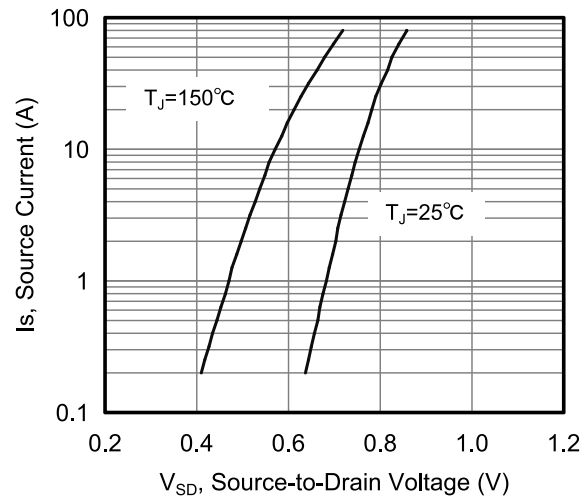


Figure 7. Typical Body Diode Transfer Characteristics

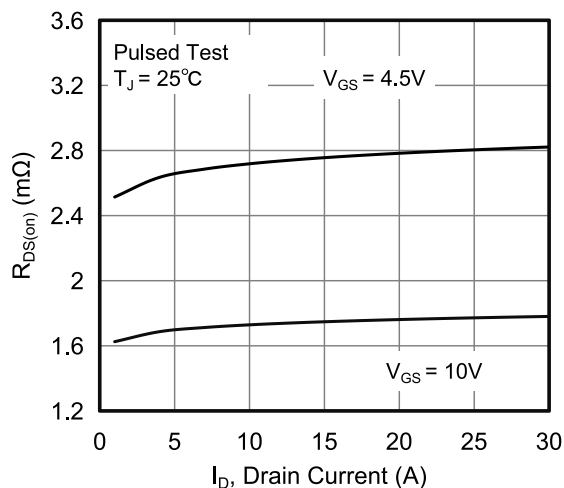


Figure 8. Drain-to-Source On Resistance vs Drain Current

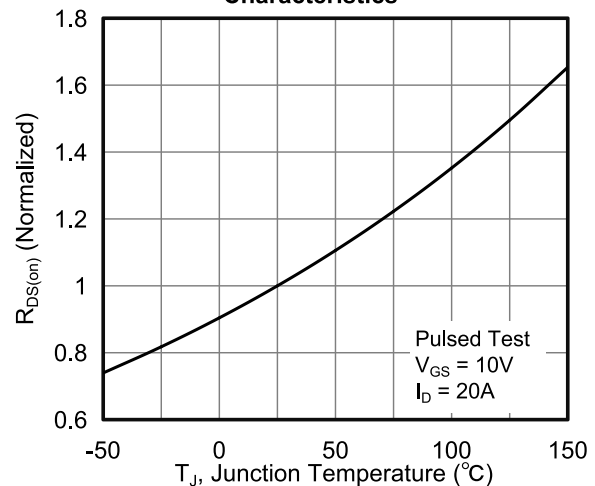


Figure 9. Normalized On Resistance vs Junction Temperature

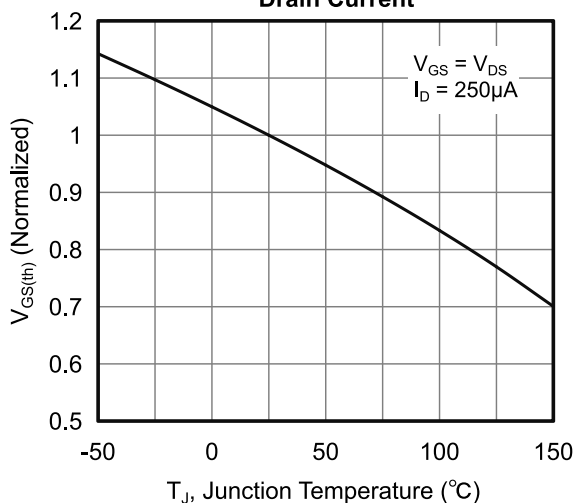


Figure 10. Normalized Threshold Voltage vs Junction Temperature

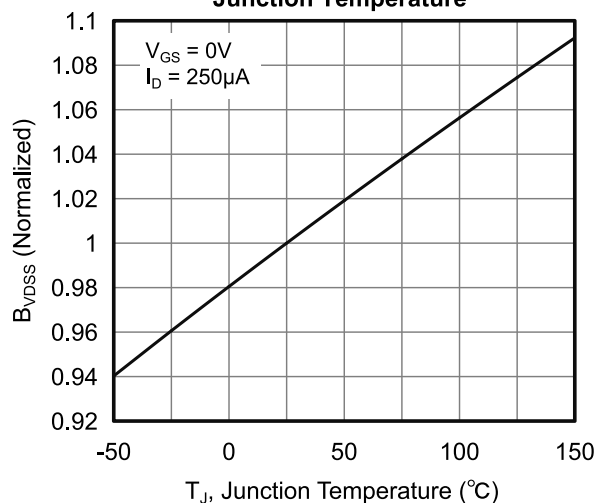


Figure 11. Normalized Breakdown Voltage vs Junction Temperature

7. Typical Characteristics (cont.)

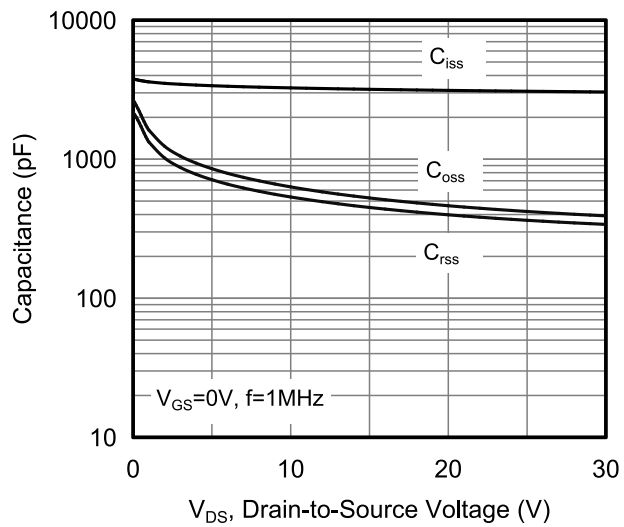


Figure 12. Capacitance Characteristics

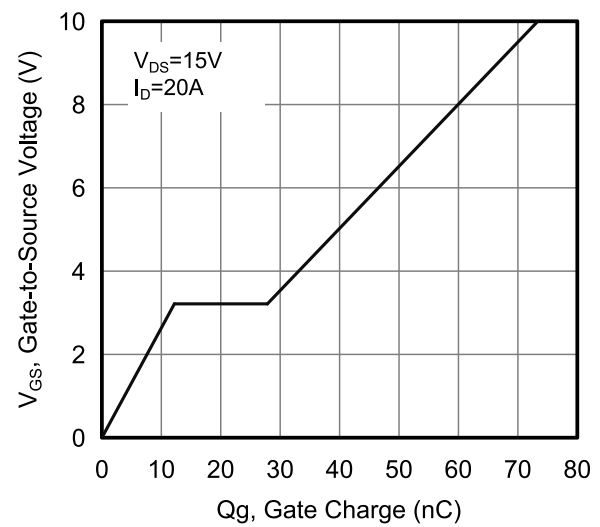
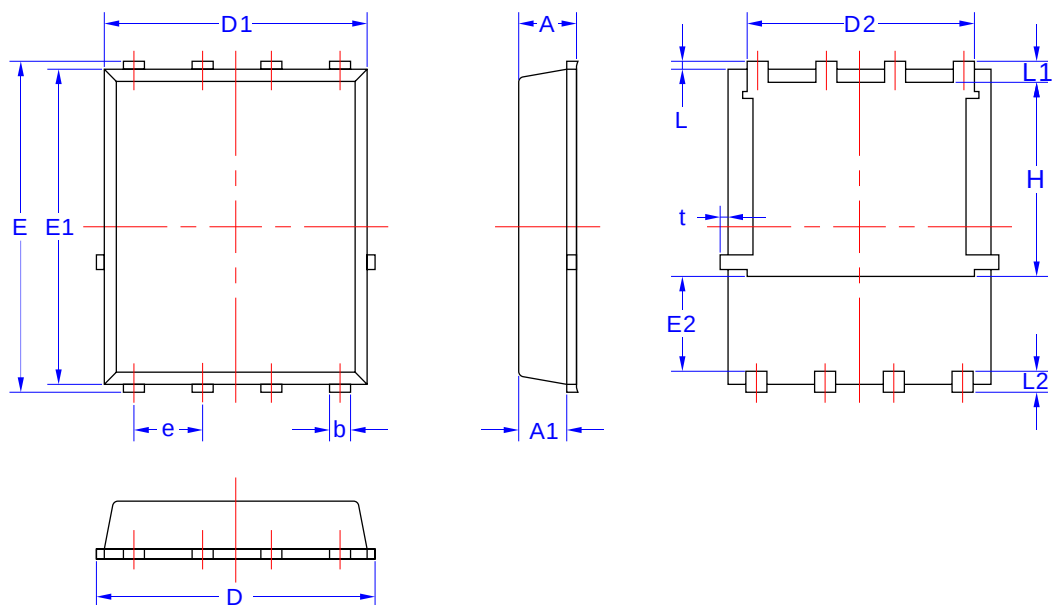


Figure 13. Typical Gate Charge vs Gate to Source Voltage

8. Package Dimensions

PDFN 5×6-8L Package



Symbol	Dimensions in Millimeters	
	MIN.	MAX
A	1.03	1.17
A1	0.824	0.97
b	0.34	0.48
D	4.80	5.40
D1	4.80	5.00
D2	4.11	4.31
E	5.95	6.15
E1	5.65	5.85
E2	1.40	-
e	1.27 BSC	
L	0.05	0.25
L1	0.38	0.50
L2	0.38	0.71
H	3.30	3.50
t	-	0.18