

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ✓ SGT Technology
- ✓ Fast switching
- ✓ Low FOM $R_{DS(ON)} \times Q_{gd}$
- ✓ Low Crss

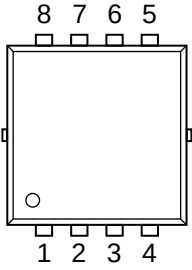
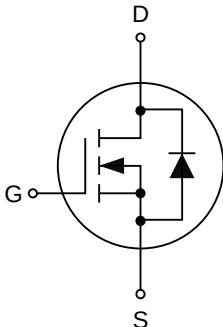
1.2 Applications

- ✓ PWM Application
- ✓ Load Switch
- ✓ Power management

1.3 Quick reference

- ✓ $BV \geq 30\text{ V}$
- ✓ $P_{tot} \leq 62.5\text{ W}$
- ✓ $I_D \leq 90\text{ A}$
- ✓ $R_{DS(ON)} \leq 4.8\text{ m}\Omega @ V_{GS} = 10\text{ V}$
- ✓ $R_{DS(ON)} \leq 9\text{ m}\Omega @ V_{GS} = 4.5\text{ V}$

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1,2,3	Source	 Top View PDFN3.3x3.3-8L	
4	Gate		
5,6,7,8	Drain		

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V _{DS}	Drain-Source Voltage	T _C =25°C	30	-	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	-	90	A
		T _C =100°C, V _{GS} =10 V	-	57	A
I _{DM} *	Pulsed Source Current	T _C =25°C, V _{GS} =10 V	-	360	A
P _{tot}	Total Power Dissipation	T _C =25°C	-	62.5	W
T _J , T _{stg}	Operating Junction and Storage Temperature Range		-55	150	°C
E _{AS}	Single Pulsed Avalanche Energy	V _{DD} =15 V, L=0.5 mH	-	125	mJ
R _{θJA}	Thermal Resistance, Junction to Ambient		-	62.5	°C/W
R _{θJC}	Thermal Resistance, Junction to Case		-	2	

Notes:

- * Pulse width ≤ 300 μs, duty cycle ≤ 2%.
- ** Surface Mounted on 1 in² pad area, t ≤ 10 sec.
- *** Limited by maximum junction temperature.

4. Marking Information

Product Name	Marking
KJ3090Q	3090Q XXXXXX

5. Ordering Code

Product Name	Package	Reel size	Tape width	Quantity (pcs)
KJ3090Q	PDFN 3.3×3.3-8L	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	1.5	2.5	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30 V, V _{GS} =0 V	-	-	1	μA
I _{GSS}	Gate Leakage Current	V _{DS} =0 V, V _{GS} =±20 V	-	-	±100	nA
R _{DS(ON)}	On-State Resistance	V _{GS} =10 V, I _{DS} =20 A	-	3.8	4.8	mΩ
		V _{GS} =4.5 V, I _{DS} =15 A	-	6.5	9	
Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _{SD} =20 A, V _{GS} =0 V	-	0.85	1.3	V
t _{rr}	Reverse Recovery Time	I _{DS} =20 A, V _{GS} =0V, dI _{SD} /dt=100 A/μs	-	19	-	ns
Q _{rr}	Reverse Recovery Charge		-	14	-	nC
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} =0 V, V _{DS} =15 V, Frequency=1.0 MHz	-	2110	-	pF
C _{oss}	Output Capacitance		-	205	-	
C _{rss}	Reverse Transfer Capacitance		-	176	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} =15 V, V _{GEN} =10 V, R _G =3 Ω, R _L =1 Ω, I _{DS} =20 A	-	11	-	ns
t _r	Turn-on Rise Time		-	6	-	
t _{d(off)}	Turn-off Delay Time		-	34	-	
t _f	Turn-off Fall Time		-	13	-	
Gate Charge Characteristics						
Q _g	Total Gate Charge	V _{DS} =15 V, V _{GS} =10 V, I _{DS} =20 A	-	43	-	nC
Q _{gs}	Gate-Source Charge		-	11	-	
Q _{gd}	Gate-Drain Charge		-	15	-	

7. Typical Characteristics

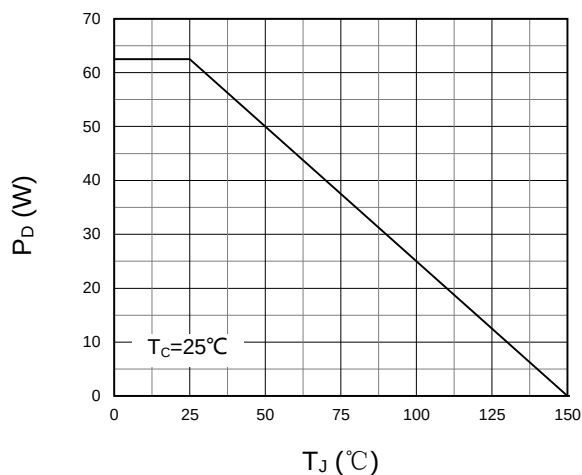


Figure 1. Power Capability

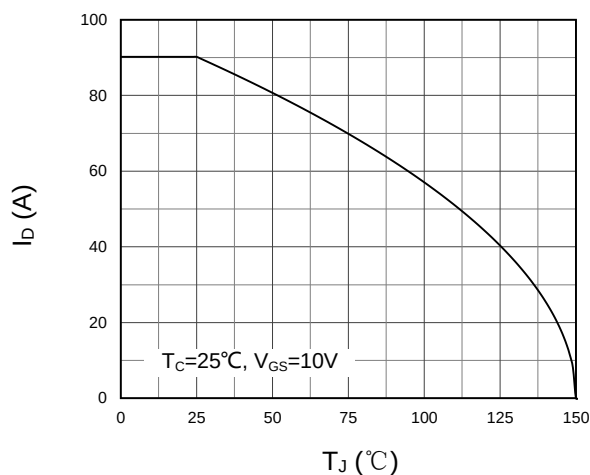


Figure 2. Current Capability

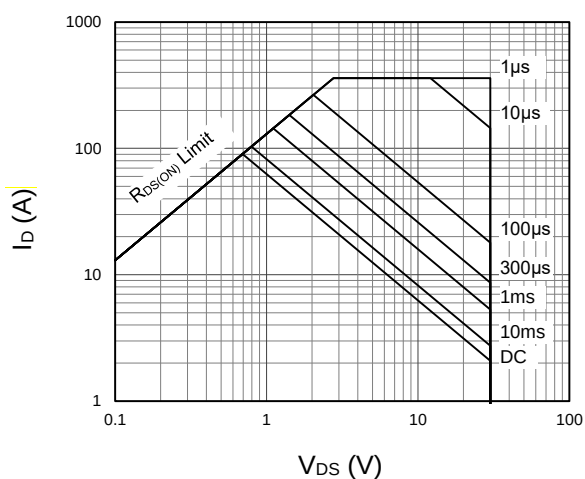


Figure 3. Transient thermal impedance

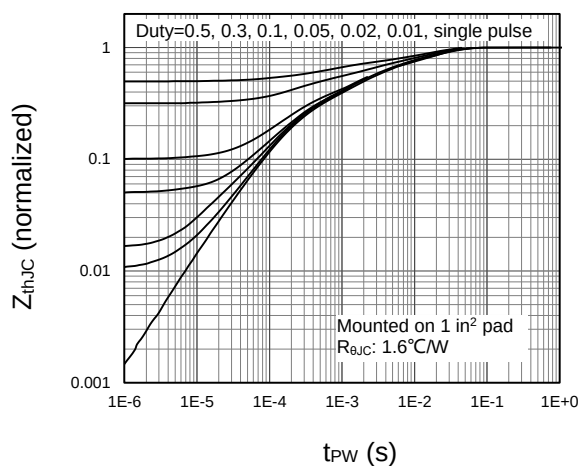


Figure 4. Safe operating area

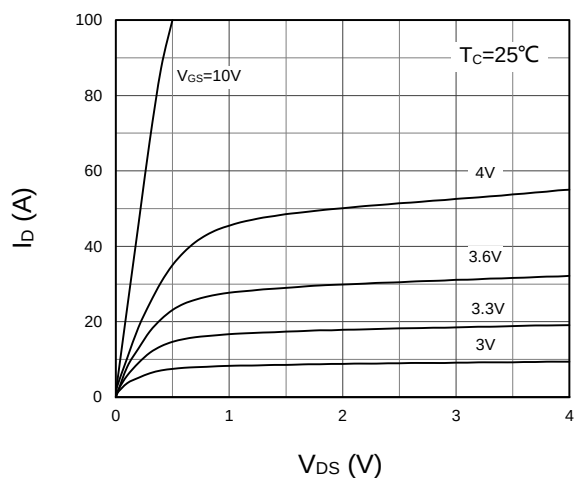


Figure 5. Output characteristics

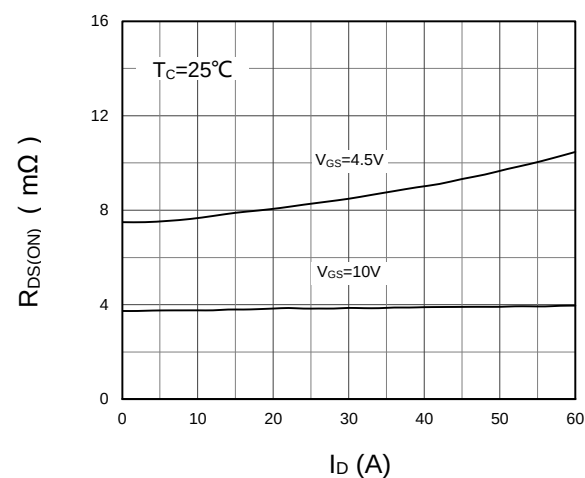


Figure 6. On-resistance vs I_D

7. Typical Characteristics (cont.)

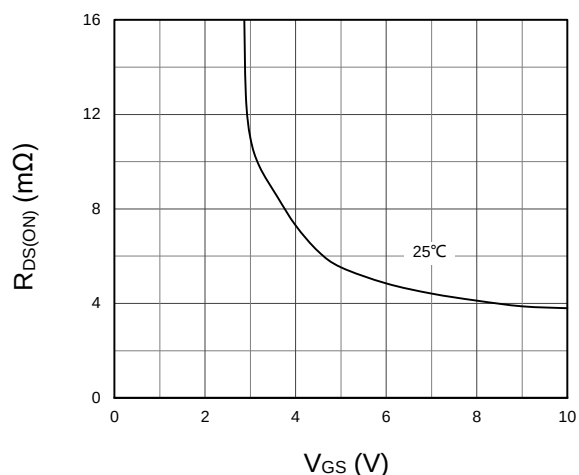


Figure 7. On-resistance vs gate-source voltage

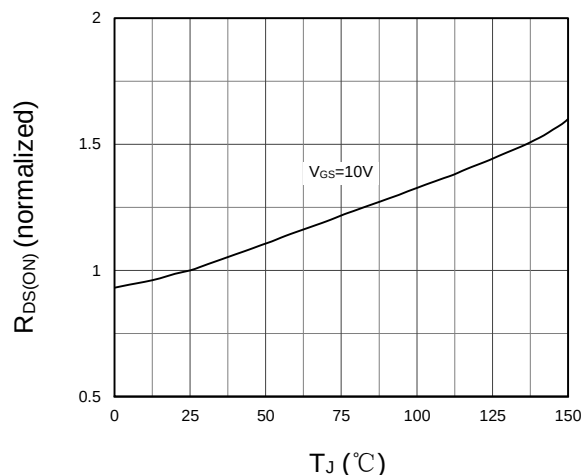


Figure 8. Normalized on-resistance vs junction temperature

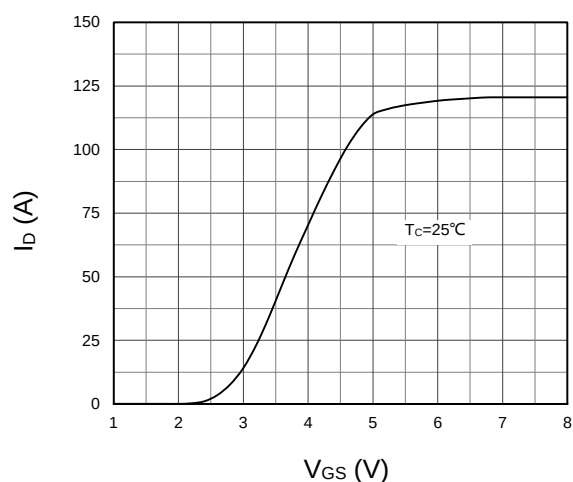


Figure 9. Typical Transfer Characteristics

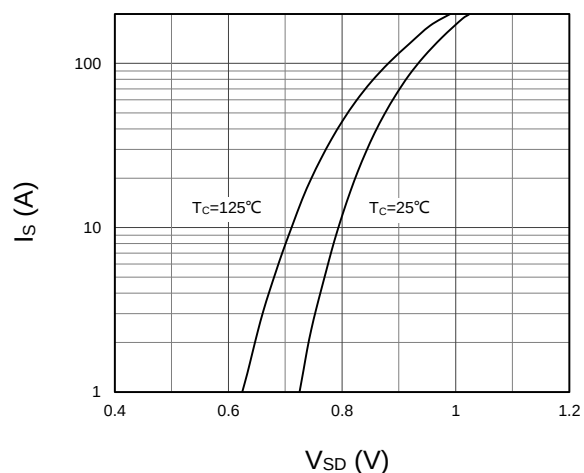


Figure 10. Forward characteristics of body diode

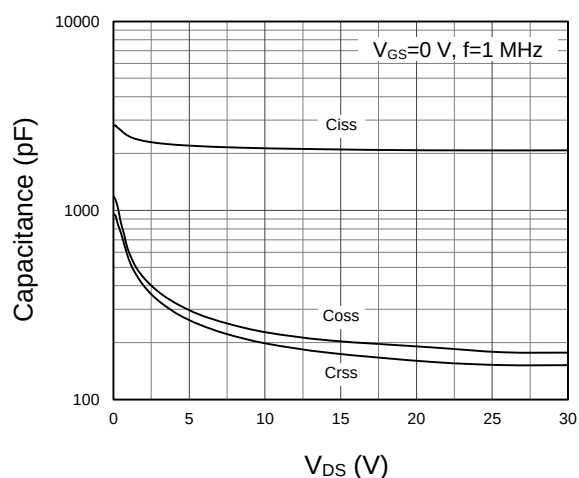


Figure 11. Capacitance

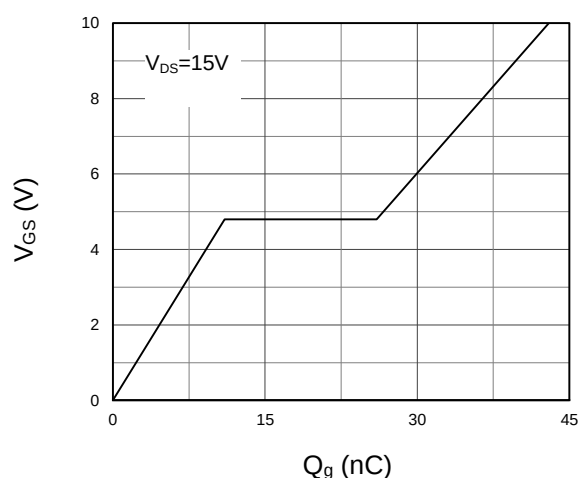
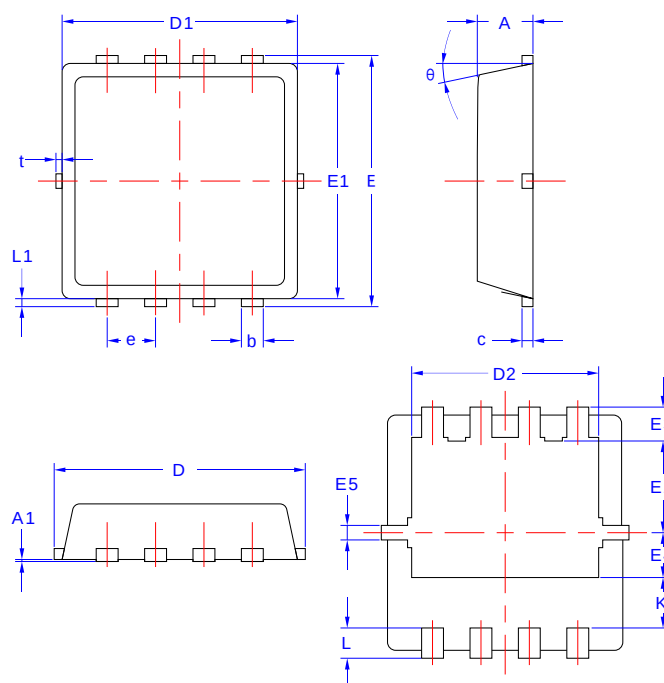


Figure 12. Gate charge

8. Package Dimensions

PDFN 3.3x3.3-8L Package



Symbol	Dimensions in Millimeters	
	MIN	MAX
A	0.70	0.85
A1	/	0.05
b	0.20	0.40
c	0.10	0.25
D	3.15	3.45
D1	3.00	3.25
D2	2.29	2.65
E	3.15	3.45
E1	2.90	3.20
E2	1.54	1.94
E3	0.28	0.68
E4	0.37	0.77
E5	0.10	0.30
e	0.60	0.70
K	0.59	0.89
L	0.30	0.50
L1	0.06	0.20
t	0.00	0.13
θ	/	12°