KJ220N06P

N-Channel Enhancement Mode MOSFET

1. Product Information

Features

SGT technology

Excellent $R_{DS(ON)}$

Low gate charge

Applications

DC/DC Converter

Uninterruptible Power Supply

Power Management Switches

Quick reference

V_{DS} = 60 V

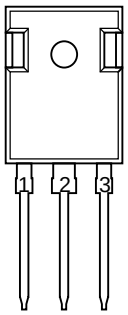
I_D = 220 A

$R_{DS(ON)}$ ≤ 3 mΩ @V_{GS} = 10 V（Type: 2.4 mΩ）

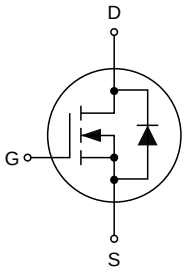
Pin Description

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

Simplified Outline	Symbol



Top View
TO-247



Package Marking and Ordering Information

Product Name	Package	Marking	Reel size	Tape width	Quantity (pcs)
KJ220N06P	TO-247-3L	KJ220N06P XXXXXX	N/A	N/A	1000

2. Absolute Maximum Ratings (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Values	Unit
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current, V_{GS}@10 V, T_C=25℃	220	A
	Continuous Drain Current, V_{GS}@10 V, T_C=100℃	155	A
I_{DM}	Pulsed Drain Current	660	A
E_{AS}	Single Pulse Avalanche Energy [3]	506	mJ
I_{AS}	Avalanche Current	45	A
P_D	Power Dissipation, T_C=25℃ [4]	230	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55~150	℃
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	0.65	℃/ W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	40	℃/ W

3. Electrical Characteristics (T_C=25℃, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0 V, I_D=250 μA	60	66	-	V
I_{GSS}	Gate-body Leakage current	V_{DS}=0 V, V_{GS}=±20 V	-	-	±100	nA
I_{DSS}	Zero Gate Voltage Drain Current, T_J=25°C	V_{DS}=60 V, V_{GS}=0 V	-	-	1	μA
$V_{GS(th)}$	Gate-Threshold Voltage	V_{DS}=V_{GS}, I_D=250 μA	2.0	-	4.0	V
$R_{DS(ON)}$	Drain-Source on-Resistance [2]	V_{GS}=10 V, I_D=20 A	-	2.4	3	mΩ
C_{iss}	Input Capacitance	V_{GS}=0 V, V_{DS}=30 V, f=1 MHz	-	6160	-	pF
C_{oss}	Output Capacitance		-	1310	-	
C_{rss}	Reverse Transfer Capacitance		-	88	-	
Q_g	Total Gate Charge	V_{GS}=10 V, V_{DS}=30 V, I_D=20 A	-	96	-	nC
Q_{gs}	Gate-Source Charge		-	18	-	
Q_{gd}	Gate-Drain Charge		-	15	-	
$t_{d(on)}$	Turn-on Delay Time	V_{GS}=10 V, V_{DS}=30 V, R_G=2 Ω, I_D=20 A	-	23	-	ns
t_r	Turn-on Rise Time		-	7	-	
$t_{d(off)}$	Turn-off Delay Time		-	80	-	
t_f	Turn-off Fall Time		-	28	-	
V_{SD}	Diode Forward Voltage [2]	I_F=20 A, V_{GS}=0 V	-	-	1.2	V
I_S	Maximum Body-Diode Continuous Current [1, 5]	V_G=V_D=0V, Force Current	-	-	220	A
t_{rr}	Body Diode Reverse Recovery Time	I_F=20 A, di/dt=100 A/μs	-	70	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	75	-	nC

Notes:
1. Surface mounted on a 1 inch^2 FR-4 board with 2 OZ copper.
2. Pulse width ≤ 300 us, duty cycle ≤ 2%.
3. E_{AS} test condition is V_{DD}=48 V, V_{GS}=10 V, L=0.5 mH, I_{AS}=45 A.
4. The power dissipation is limited by 175°C junction temperature.
5. The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

4. Typical Characteristics

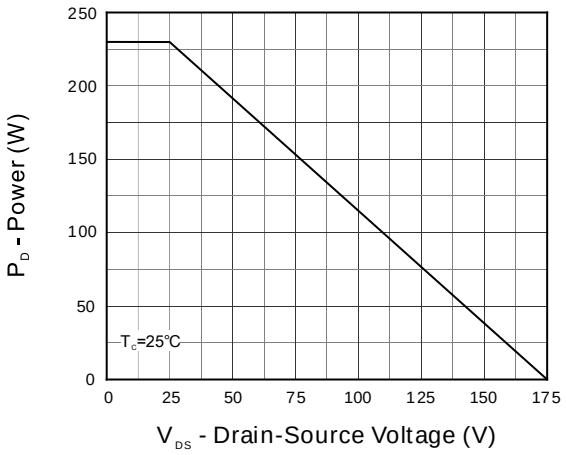


Figure 1. Output Characteristics

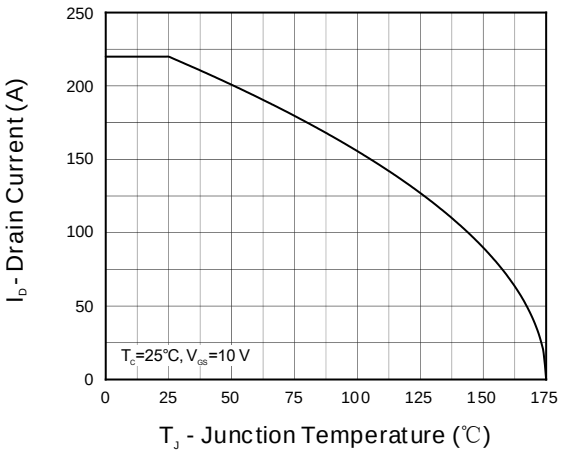


Figure 2. Current Capability

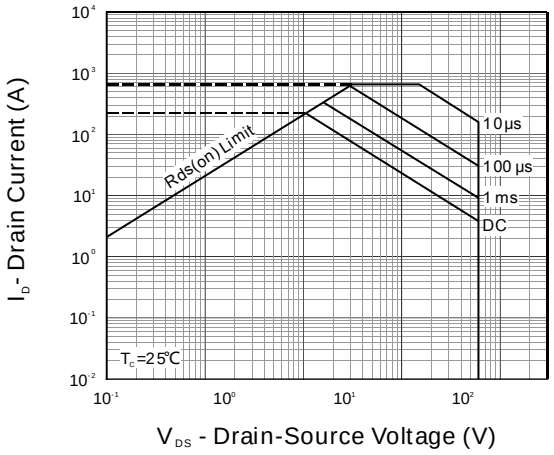


Figure 3. Safe Operation Area

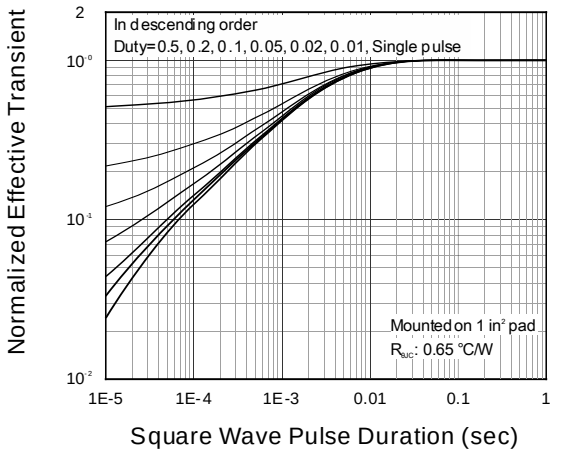


Figure 4. Transient Thermal Impedance

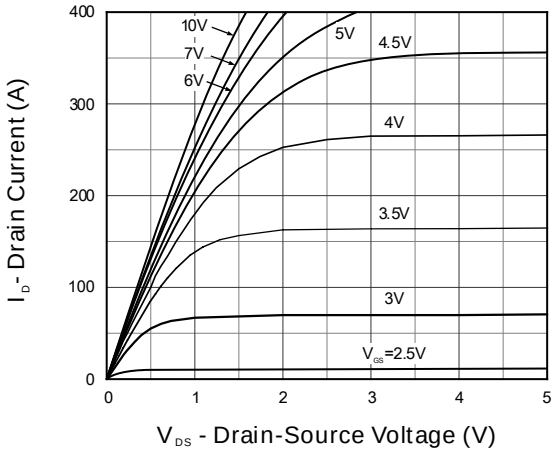


Figure 5. Output Characteristics

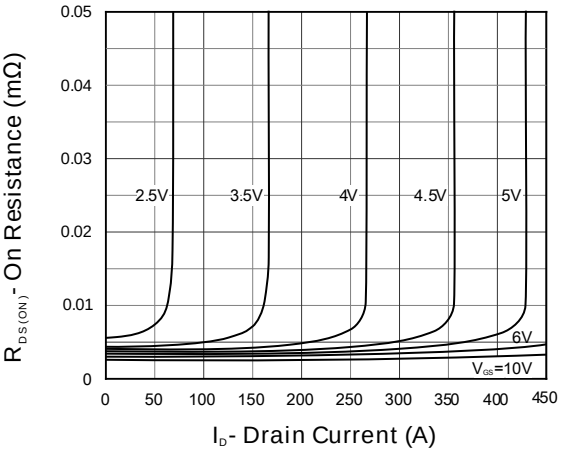


Figure 6. On Resistance

4. Typical Characteristics (cont.)

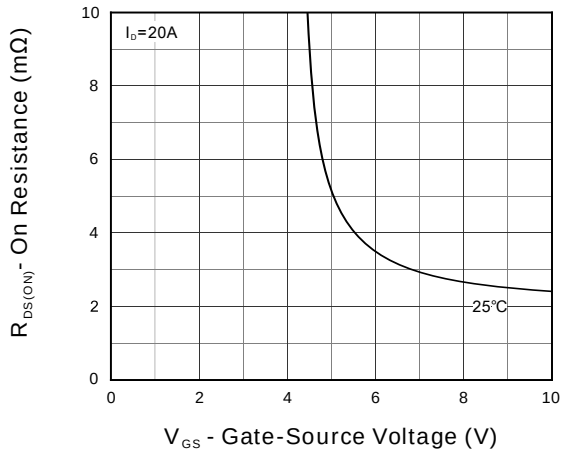


Figure 7. Transfer Characteristics

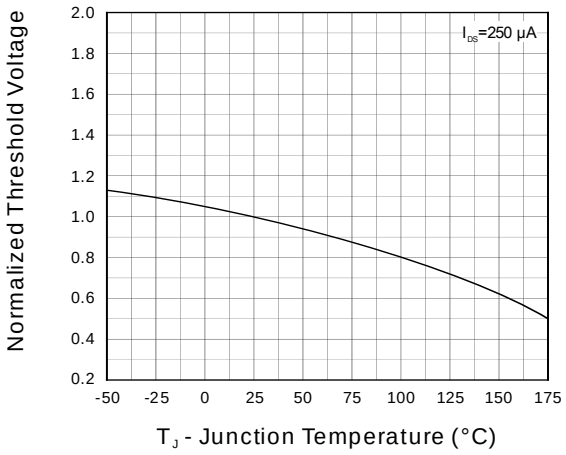


Figure 8. Normalized Threshold Voltage

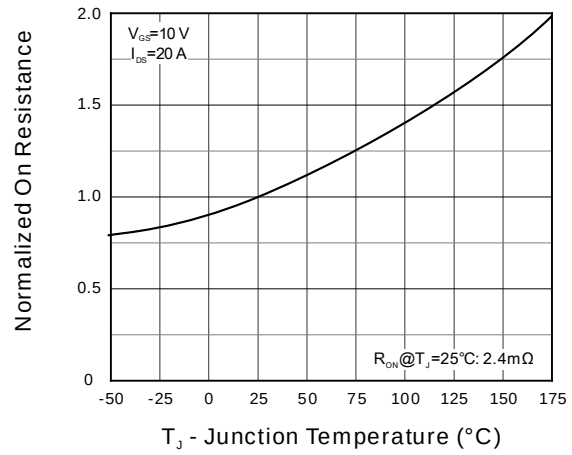


Figure 9. Normalized On Resistance

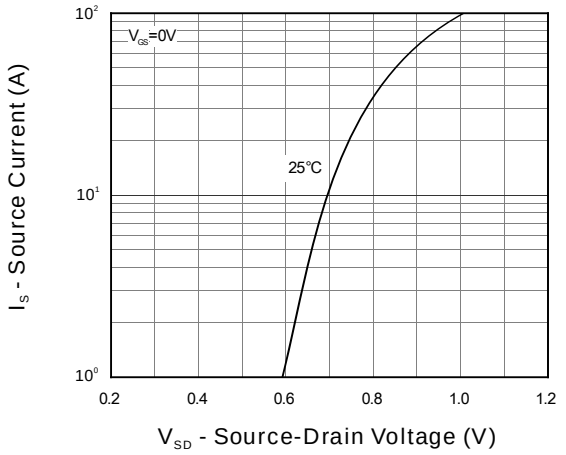


Figure 10. Diode Forward Current

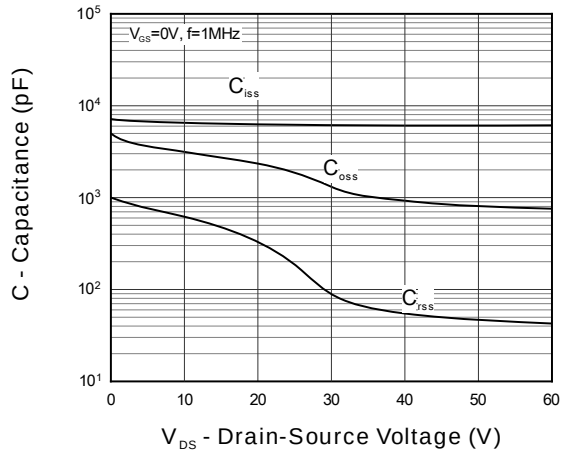


Figure 11. Capacitance

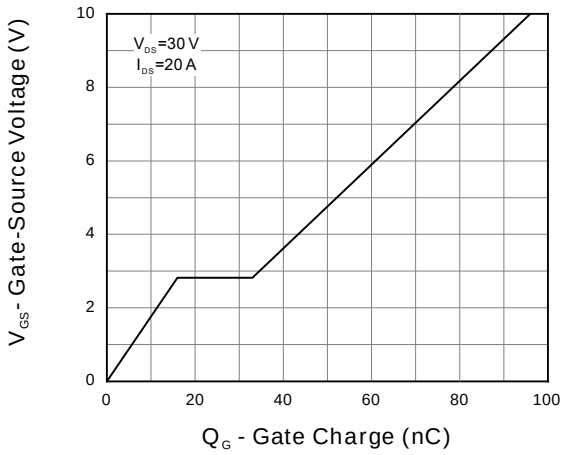
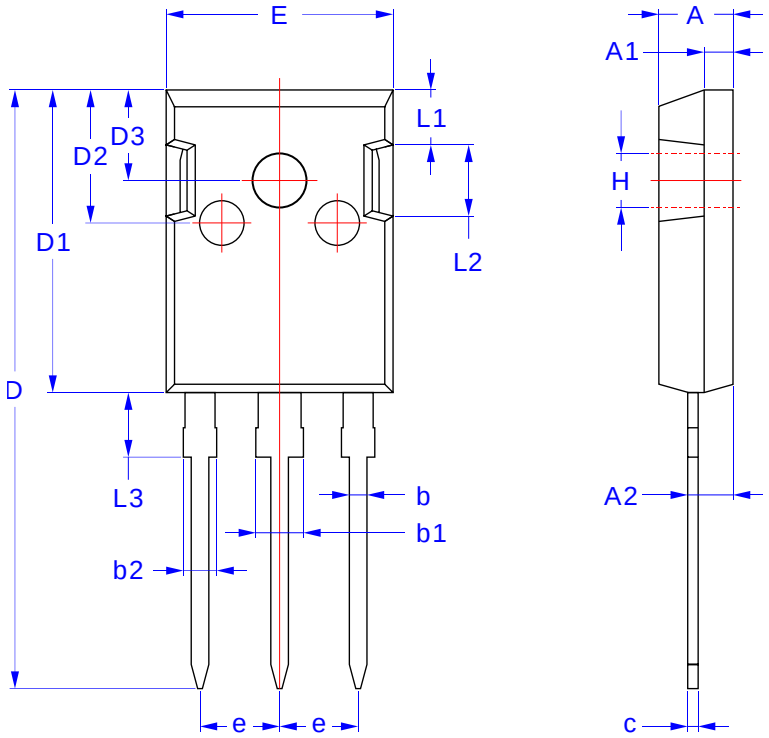


Figure 12. Gate Charge

5. Package Mechanical Data

TO-247-3L



Symbol	Dimensions in Millimeters	
	MIN	MAX
A	4.90	5.10
A1	1.90	2.10
A2	2.00	3.00
b	1.20	1.30
b1	2.50	3.50
b2	1.75	2.50
c	0.55	0.75
D	41.00	42.00
D1	20.00	21.00
D2	8.00	10.00
D3	5.00	6.00
E	15.00	16.00
e	TYP 5.08	
H	3.00	3.50
L1	3.50	4.00
L2	4.75	5.25
L3	4.00	5.00