

## N-Channel Enhancement Mode MOSFET

### 1. Product Information

#### Features

- SGT Technology
- Excellent  $R_{DS(ON)}$
- Low Gate Charge

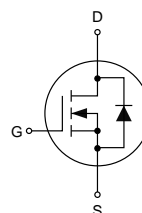
#### Applications

- DC/DC Converter
- Power Management Switches
- BMS
- UPS

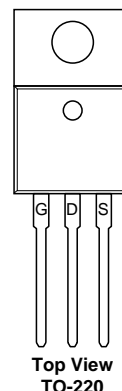
#### Quick reference

- $V_{DS} = 200\text{ V}$
- $I_D = 100\text{ A}$
- $P_D = 275\text{ W}$
- $R_{DS(ON)} \leq 11\text{ m}\Omega$  @  $V_{GS}=10\text{ V}$  (Type: 8.8 m $\Omega$ )

#### Schematic Diagram



#### Pin Assignment



#### Package Marking and Ordering Information

Product Name	Package	Marking	Reel Size	Tape Width	Quantity (pcs)
KJ100N20C	TO-220	KJ100N20C	-	-	50

### 2. Absolute Maximum Ratings (T<sub>C</sub>=25°C unless otherwise noted)

Symbol	Parameter	Values	Unit
$V_{DS}$	Drain-Source Voltage	200	V
$V_{GS}$	Gate-Source Voltage	±20	V
$I_D$	Continuous Drain Current, T <sub>C</sub> =25°C	100	A
	Continuous Drain Current, T <sub>C</sub> =100°C	75	A
$I_{DM}$	Pulsed Drain Current	550	A
$P_D$	Power Dissipation	275	W
$E_{AS}$	Single Pulse Avalanche Energy	2000	mJ
$I_{AS}$	Avalanche Current	45	A
T <sub>J</sub> , T <sub>STG</sub>	Operating Junction and Storage Temperature Range	-55~150	°C
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	62.5	°C/W
$R_{\theta JC}$	Thermal Resistance from Junction to Case	0.45	°C/W

## 3. Electrical Characteristics (T<sub>J</sub>=25°C, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0 V, I <sub>D</sub> =250 μA	200	-	-	V
V <sub>GS(th)</sub>	Gate-Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250 μA	2.0	3.5	4.5	V
I <sub>GSS</sub>	Gate-Source Leakage	V <sub>DS</sub> =0 V, V <sub>GS</sub> =±20 V	-	-	±100	nA
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =160 V, V <sub>GS</sub> =0 V	-	-	1	μA
R <sub>DS(on)</sub>	Drain-Source On-Resistance	V <sub>GS</sub> =10 V, I <sub>D</sub> =20 A	-	8.8	11	mΩ
R <sub>g</sub>	Gate Resistance	V <sub>GS</sub> =0 V, V <sub>DS</sub> =0 V, f=1.0 MHz	-	1.7	-	Ω
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =50 V, V <sub>GS</sub> =0 V, f=1.0 MHz	-	10556	-	pF
C <sub>oss</sub>	Output Capacitance		-	389	-	
C <sub>rss</sub>	Reverse Transfer Capacitance		-	16	-	
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =100 V, V <sub>GS</sub> =10 V, I <sub>D</sub> =55 A	-	146	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	49	-	
Q <sub>gd</sub>	Gate-Drain Charge		-	24	-	
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =100 V, V <sub>GS</sub> =10 V, I <sub>D</sub> =55 A, R <sub>G</sub> =4.7 Ω	-	23	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	115	-	
t <sub>d(off)</sub>	Turn-off Delay Time		-	45	-	
t <sub>f</sub>	Turn-off Fall Time		-	102	-	
V <sub>SD</sub>	Diode Forward Voltage <sup>2</sup>	V <sub>GS</sub> =0V, I <sub>SD</sub> =20 A, V <sub>GS</sub> =0V	-	-	1.2	V
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0 V, Force Current	-	-	420	A
t <sub>rr</sub>	Reverse Recovery Time	I <sub>S</sub> =55 A, diF/dt=100 A/μs	-	181	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge		-	473	-	nC

### Notes:

1. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2 OZ copper.
2. The test condition is Pulse Test: Pulse width ≤ 300 μs, Duty Cycle ≤ 2%.
3. The E<sub>AS</sub> data shows Max. rating. I<sub>AS</sub>=45 A, V<sub>DD</sub>=50 V, L=0.5 mH.
4. The power dissipation is limited by 150°C junction temperature.
5. The data is theoretically the same as I<sub>D</sub> and I<sub>DM</sub>, in real applications, should be limited by total power dissipation.

## 4. Typical Characteristics

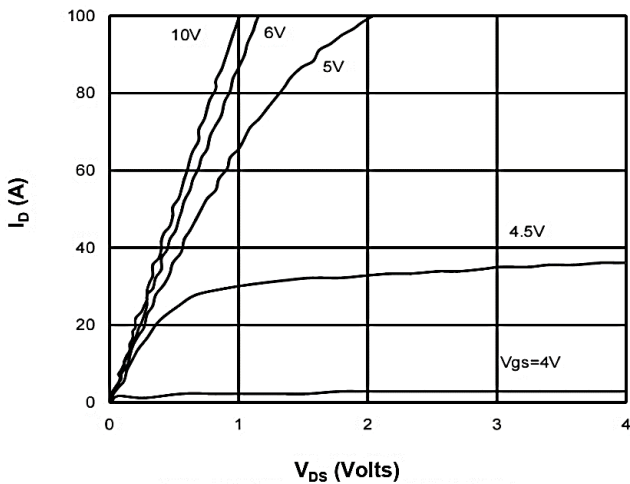


Figure 1: On-Region Characteristics

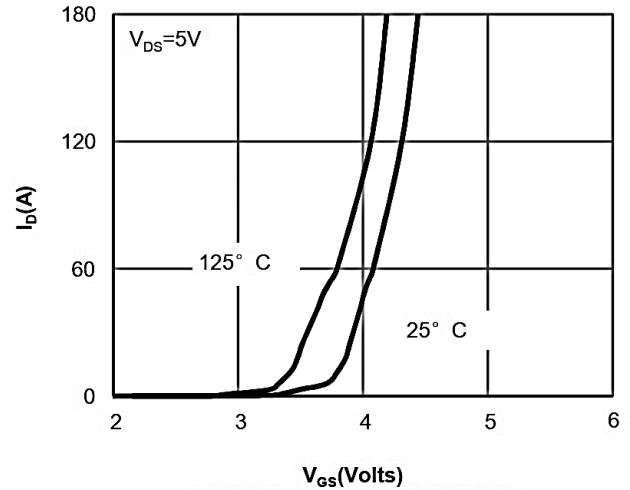


Figure 2: Transfer Characteristics

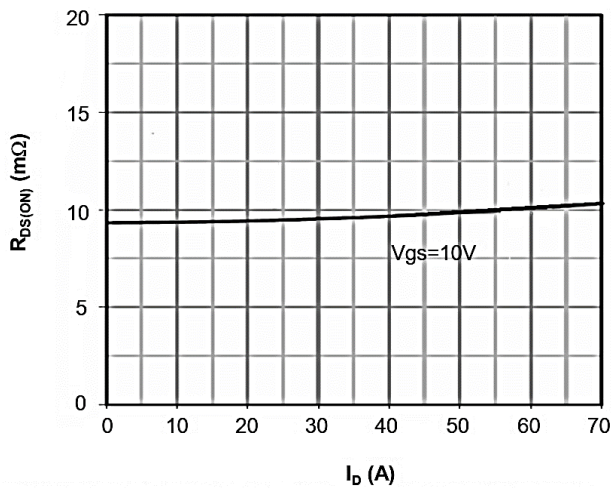


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

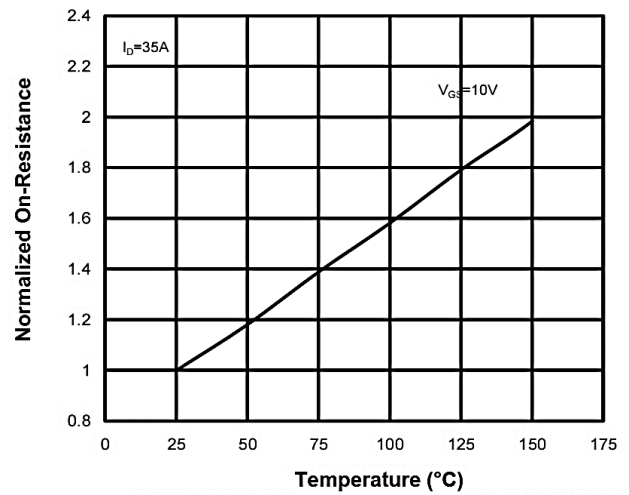


Figure 4: On-Resistance vs. Junction Temperature

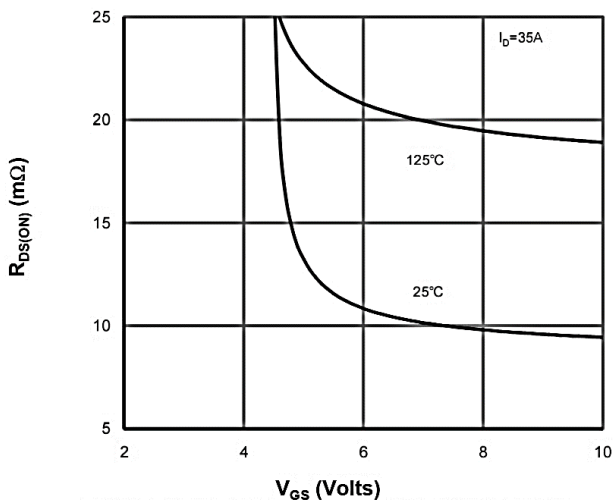


Figure 5: On-Resistance vs. Gate-Source Voltage

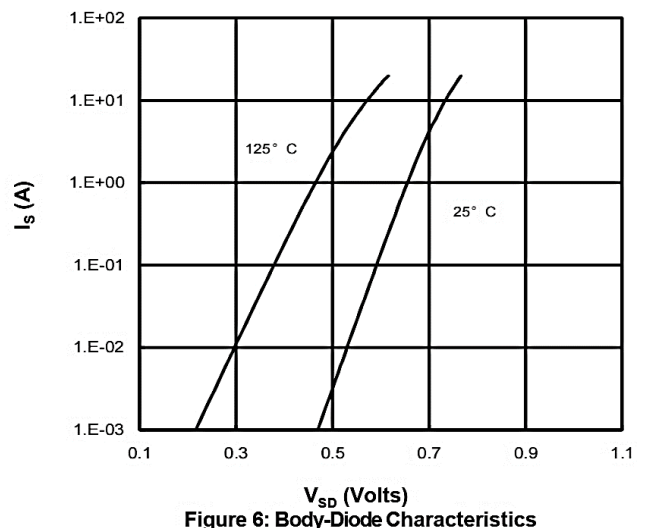


Figure 6: Body-Diode Characteristics

## 4. Typical Characteristics (cont.)

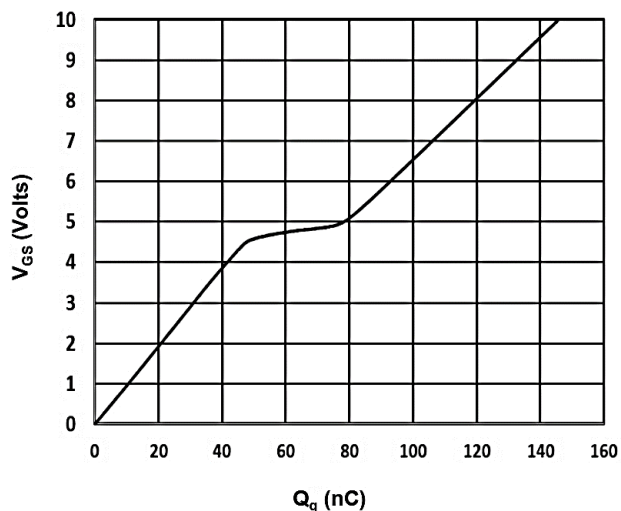


Figure 7: Gate-Charge Characteristics

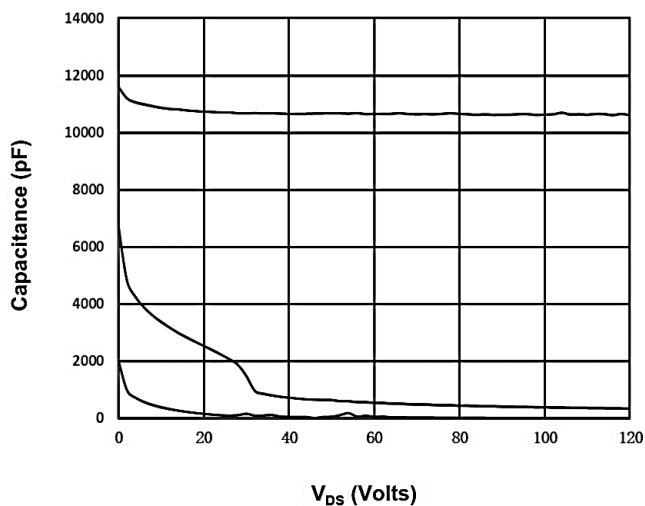


Figure 8: Capacitance Characteristics

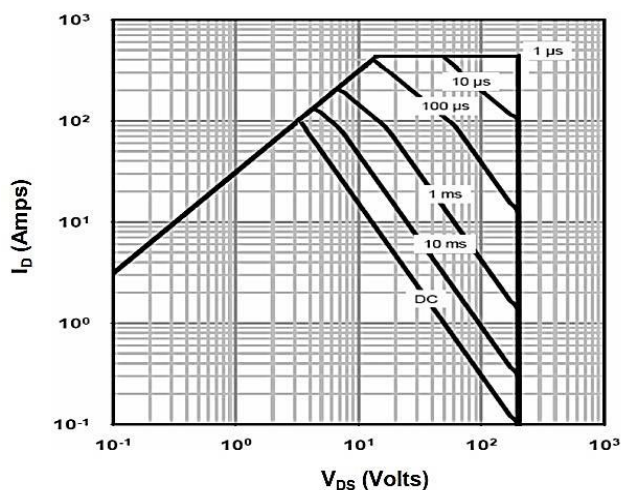
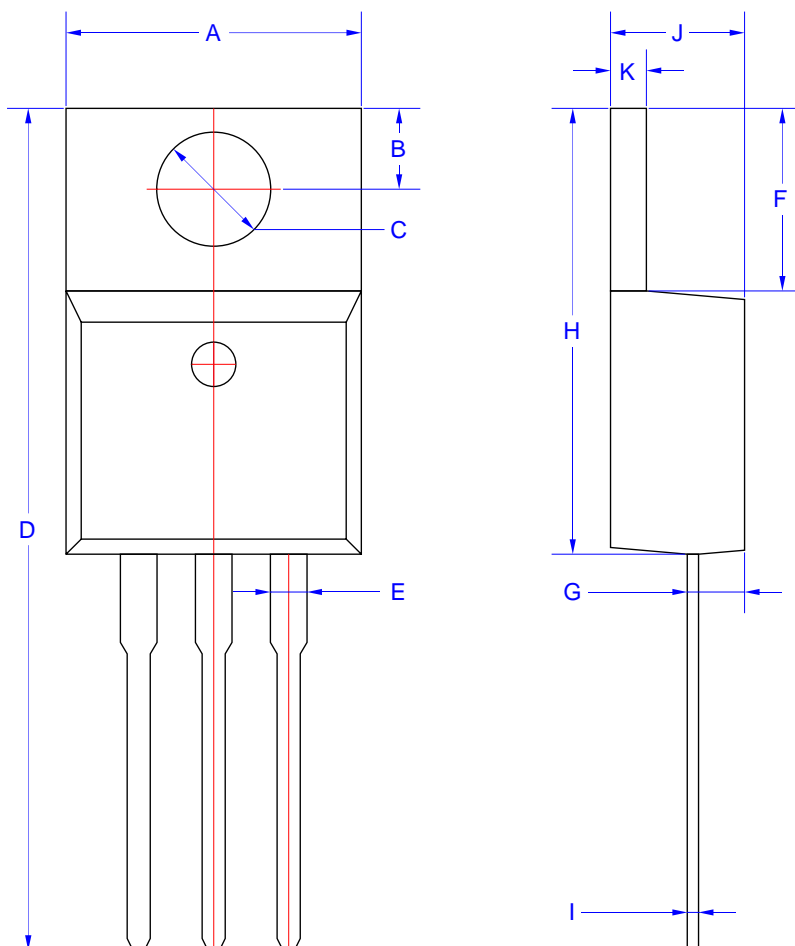


Figure 9: Maximum Forward Biased Safe Operating Area

## 5. Package Mechanical Data

TO-220 Package



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	10.0	10.4
B	2.5	3.0
C	3.5	4.0
D	28.0	30.0
E	1.1	1.5
F	6.2	6.6
G	2.9	3.3
H	15.0	16.0
I	0.35	0.45
J	4.3	4.7
K	1.2	1.4