快捷芯
KUAIJIEXIN

KJ140N20P

N-Channel Enhancement Mode MOSFET

1. Product Information

Features

Excellent $R_{DS(ON)}$

Planar Technology

Applications

Uninterruptible Power Supply

Power Factor Correction

Quick reference

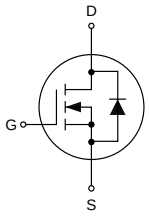
V_{DS} = 200 V

I_D = 140 A

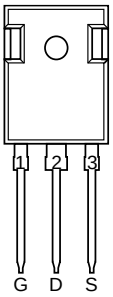
P_D = 280 W

$R_{DS(ON)}$ ≦ 11 mΩ @ V_{GS}=10V（Type: 9 mΩ）

Schematic Diagram



Pin Assignment



Package Marking and Ordering Information

Product Name	Package	Marking	Reel Size	Tape Width	Quantity
KJ140N20P	TO-247	KJ140N20P	-	-	300

2. Absolute Maximum Ratings (T_C=25℃ 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_C=25℃	140	A
	Continuous Drain Current, T_C=100℃	75	A
I_{DM}	Pulsed Drain Current	500	A
P_D	Power Dissipation	280	W
E_{AS}	Single Pulse Avalanche Energy	2000	mJ
I_{AS}	Avalanche Current	45	A
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55~150	℃
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	40	℃/W
$R_{\theta JC}$	Thermal Resistance from Junction to Case	0.45	℃/W

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0 V, I_D=250 μA	200	-	-	V
$V_{GS(th)}$	Gate-Threshold Voltage	V_{DS}=V_{GS}, I_D=250 μA	2.0	3.5	4.5	V
I_{GSS}	Gate-Source Leakage	V_{DS}=0 V, V_{GS}=±20 V	-	-	±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=160 V, V_{GS}=0 V	-	-	1	μA
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS}=10 V, I_D=20 A	-	9	11	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=50 V, V_{GS}=0 V, f=1.0 MHz	-	10648	-	pF
C_{oss}	Output Capacitance		-	390	-	
C_{rss}	Reverse Transfer Capacitance		-	17	-	
R_G	Gate resistance	f=1.0 MHz open drain	-	1.7	-	Ω
Gate Charge Characteristics						
Q_g	Total Gate Charge	V_{DS}=100 V, V_{GS}=10 V, I_D=55 A	-	147	-	nC
Q_{gs}	Gate-Source Charge		-	50	-	
Q_{gd}	Gate-Drain Charge		-	70	-	
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=100 V, V_{GS}=10 V, I_D=55 A, R_G=4.7 Ω	-	23	-	ns
t_r	Turn-on Rise Time		-	116	-	
$t_{d(off)}$	Turn-off Delay Time		-	45	-	
t_f	Turn-off Fall Time		-	105	-	
Diode Characteristics						
I_{SD}	Continuous Source Current	T_C=25℃	-	-	140	A
I_{SM}	Pulsed Diode Forward Current		-	-	440	A
V_{SD}	Diode Forward Voltage [3]	V_{GS}=0V, I_{SD}=20 A, V_{GS}=0V	-	-	1.2	V
trr	Reverse Recovery Time	V_{DD}=100 V, V_{GS}=0 V, I_S=55 A, diF/dt=100 A/μs	-	185	-	ns
Qrr	Reverse Recovery Charge		-	470	-	μC

Notes:

1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2 OZ copper.
2. The E_{AS} data shows Max. rating. I_{AS}=45 A, V_{DD}=50 V, L=0.5 mH, Starting T_J=25℃
3. The test condition is Pulse Test: Pulse width ≤ 300 μs, Duty Cycle ≤ 2%
4. The power dissipation is limited by 150℃ 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

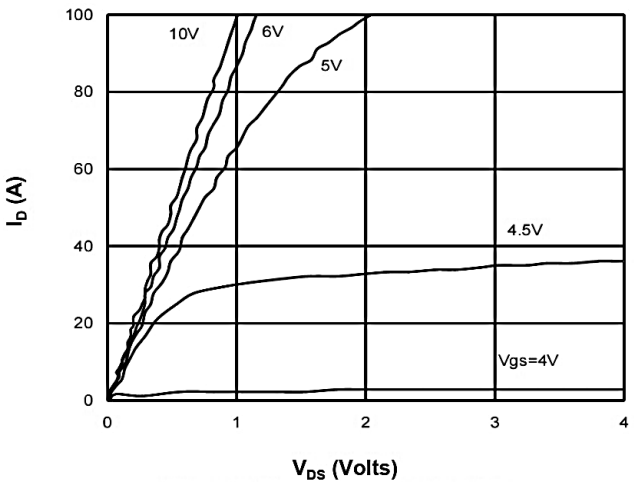


Figure 1. On-Region Characteristics

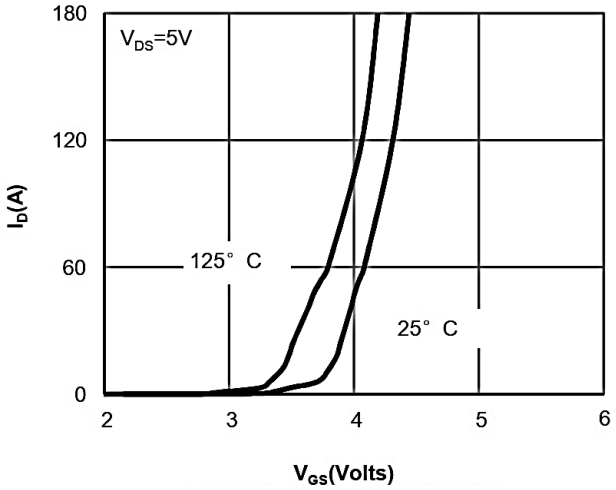


Figure 2. Transfer Characteristics

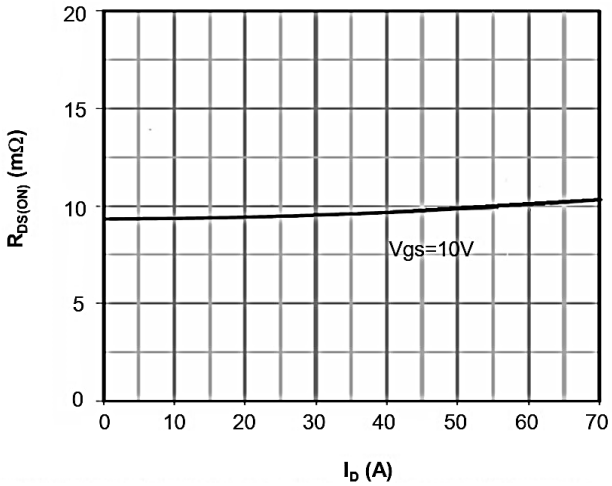


Figure 3. On-Resistance vs. Drain Current

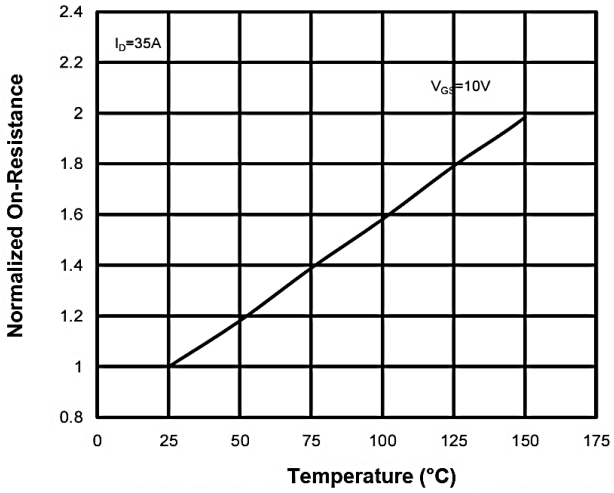


Figure 4. On-Resistance vs. Junction Temperature

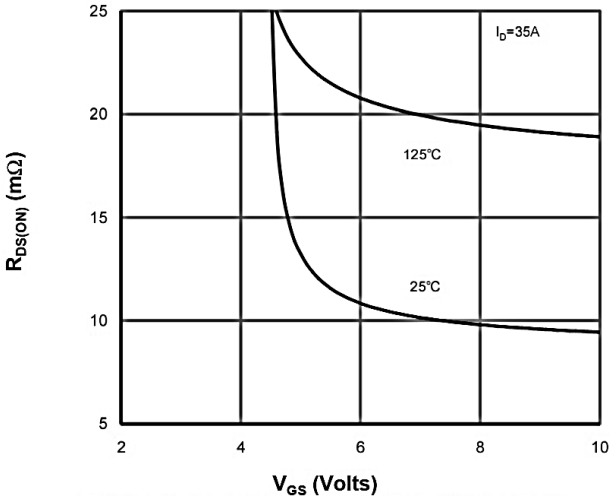


Figure 5. On-Resistance vs. Gate-Source Voltage

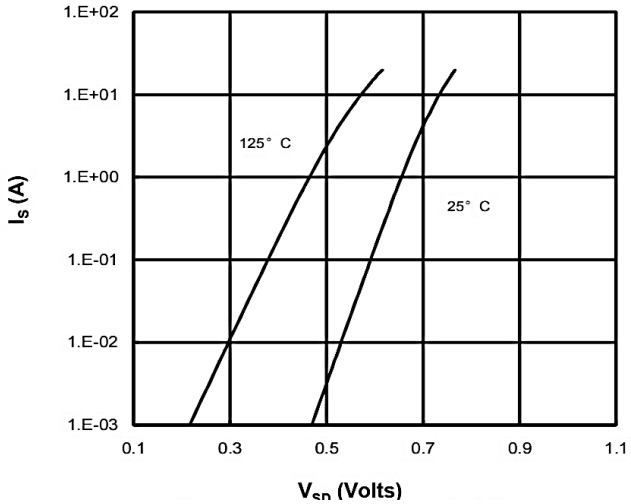


Figure 6. Body-Diode Characteristics

4. Typical Characteristics (Cont.)

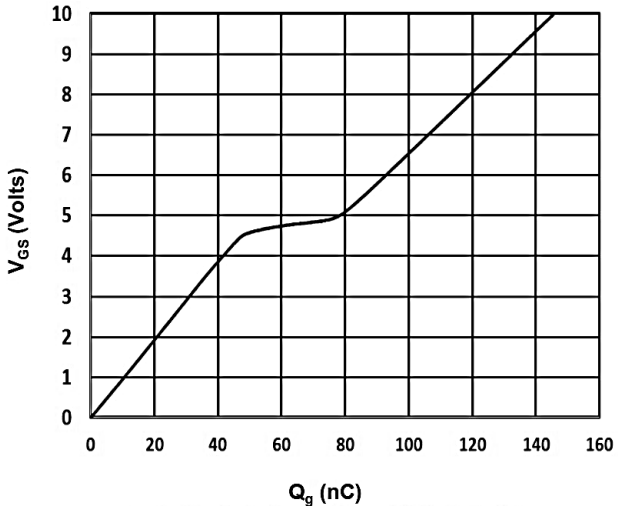


Figure 7. Gate-Charge Characteristics

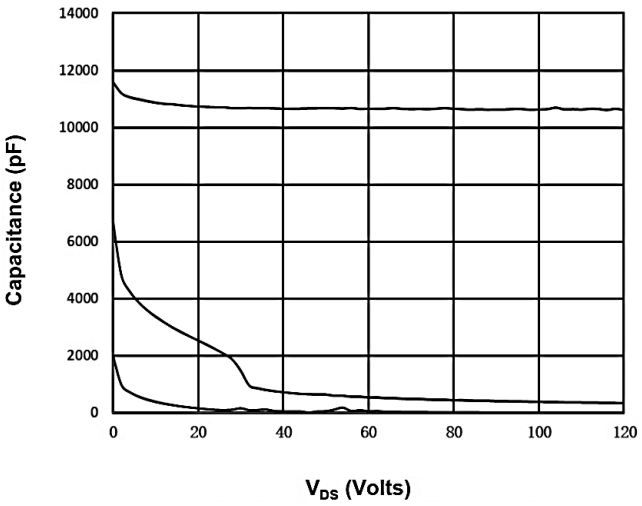


Figure 8. Capacitance characteristics

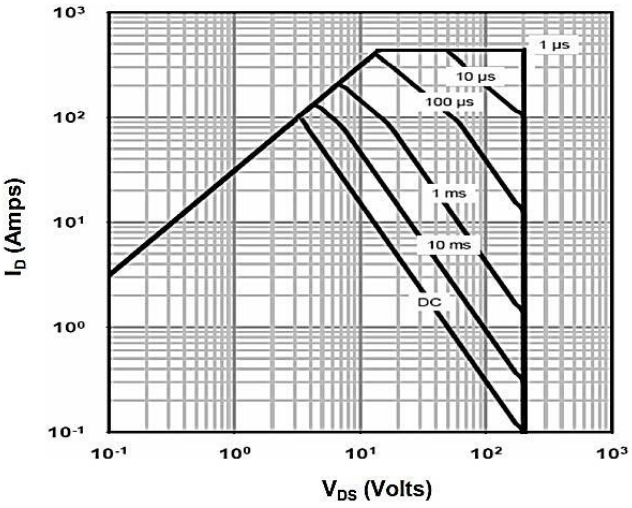
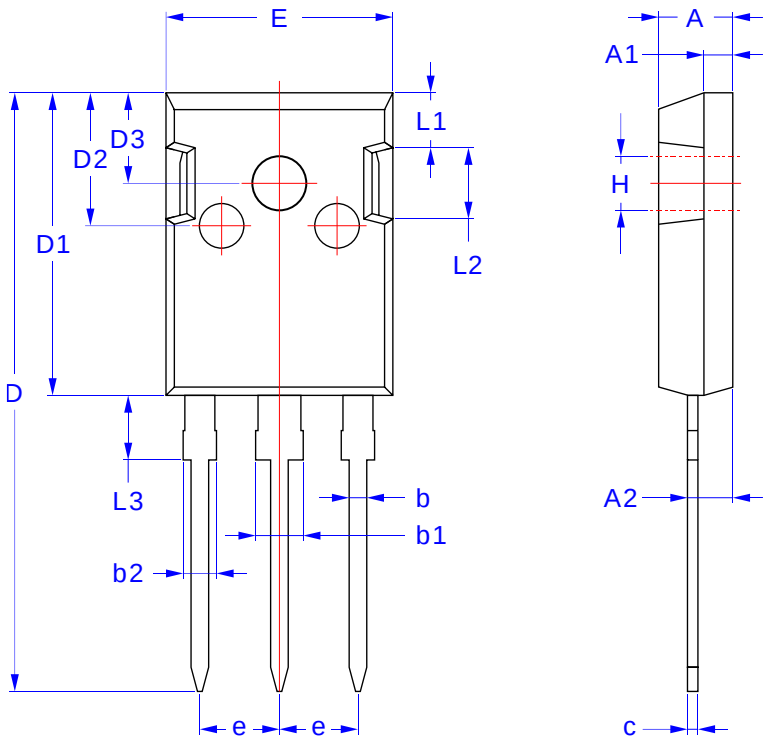


Figure 9. Forward-Bias Safe Operating Area

5. Package Mechanical Data

TO-247 Package



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	4.90	5.10
A1	1.90	2.10
A2	2.00	3.00
b	0.55	0.75
b1	2.50	3.50
b2	1.75	2.50
c	1.20	1.30
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