

N-Channel Enhancement Mode MOSFET

1. Product Information

Features

- VD-MOSFET technology
- Improve switching performance

Applications

- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)

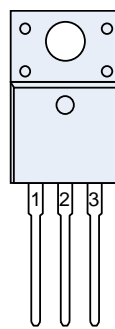
Quick reference

- $V_{DS} = 200\text{ V}$
- $I_D = 18\text{ A}$
- $R_{DS(ON)} \leq 150\text{ m}\Omega @ V_{GS} = 10\text{ V}$ (Type:120 m Ω)

Pin Description

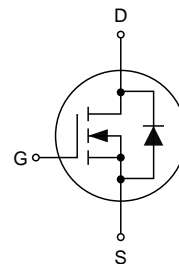
Pin	Description
1	Gate(G)
2	Drain(D)
3	Source(S)

Simplified Outline



Top View
TO-220F

Symbol



Package Marking and Ordering Information

Product Name	Package	Marking	Reel size	Tape width	Quantity (pcs)
KJ18N20CF	TO-220F	KJ18N20F XXXXYY	N/A	N/A	1000

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

Symbol	Parameter	Values	Unit
V_{DS}	Drain-Source Voltage, $V_{GS}=0V$	200	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current	18	A
I_{DM}	Pulsed Drain Current ¹	72	A
E_{AS}	Single Pulse Avalanche Energy ²	340	mJ
I_{AS}	Avalanche Current ¹	15	A
E_{AR}	Repetitive Avalanche Energy ¹	8.3	mJ
P_D	Power Dissipation @T _C =25°C	104	W
T _J , T _{STG}	Operating Junction and Storage Temperature Range	-55~150	°C
R _{θJA}	Thermal Resistance, Junction to Ambient	62.5	°C/W
R _{θJC}	Thermal Resistance Junction to Case	1.2	°C/W

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0 V, I _D =250 μA	200	220	-	V
I _{GSS}	Gate-body Leakage current	V _{DS} =0 V, V _{GS} =±20 V	-	-	±100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =200 V, V _{GS} =0 V, T _J =25°C	-	-	5	μA
		V _{DS} =160 V, V _{GS} =0 V, T _J =125°C	-	-	100	
V _{GS(th)}	Gate-Threshold Voltage	V _{DS} =V _{GS} , I _D =250 μA	2	3.5	4	V
R _{DS(on)}	Drain-Source on-Resistance ³	V _{GS} =10 V, I _D =9 A	-	120	150	mΩ
C _{iss}	Input Capacitance	V _{GS} =0 V, V _{DS} =25 V, f=1 MHz	-	1318	-	pF
C _{oss}	Output Capacitance		-	180	-	
C _{rss}	Reverse Transfer Capacitance		-	75	-	
Q _g	Total Gate Charge	V _{DS} =160 V, V _{GS} =10 V, I _D =18 A	-	41	-	nC
Q _{gs}	Gate-Source Charge		-	5.5	-	
Q _{gd}	Gate-Drain Charge		-	19.5	-	
t _{d(on)}	Turn-on Delay Time	V _{DD} =100 V, R _G =25 Ω, I _D =18 A	-	24	-	ns
t _r	Turn-on Rise Time		-	45	-	
t _{d(off)}	Turn-off Delay Time		-	101	-	
t _f	Turn-off Fall Time		-	95	-	
I _S	Continuous Source Current	T _C =25°C	-	-	18	A
I _{SM}	Pulsed Diode Forward Current		-	-	72	A
V _{SD}	Diode Forward Voltage	T _J =25°C, I _{SD} =18 A, V _{GS} =0 V	-	-	1.4	V
t _{rr}	Body Diode Reverse Recovery Time	V _{GS} =0 V, I _S =18 A, diF/dt=100 A/μs	-	230	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	1.8	-	μC

Notes:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2 OZ copper.
2. The EAS data shows Max. rating. I_{AS}=15 A, V_{DD}=50 V, R_G=25 Ω, Starting T_J=25°C.
3. The test condition is Pulse Test: Pulse width ≤ 300 μs, Duty Cycle ≤ 1%.
4. The power dissipation is limited by 150°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

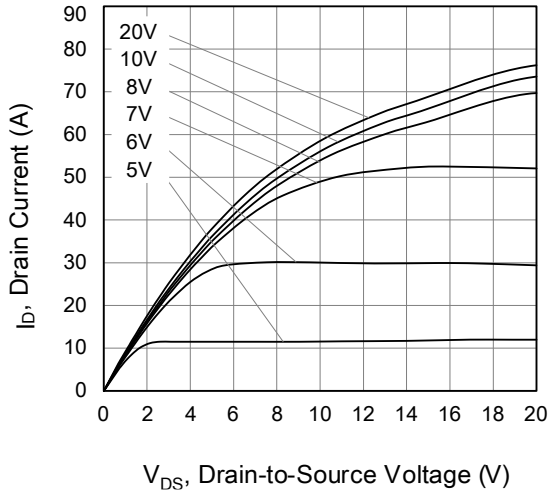


Figure 1: Output Characteristics ($T_J=25^\circ\text{C}$)

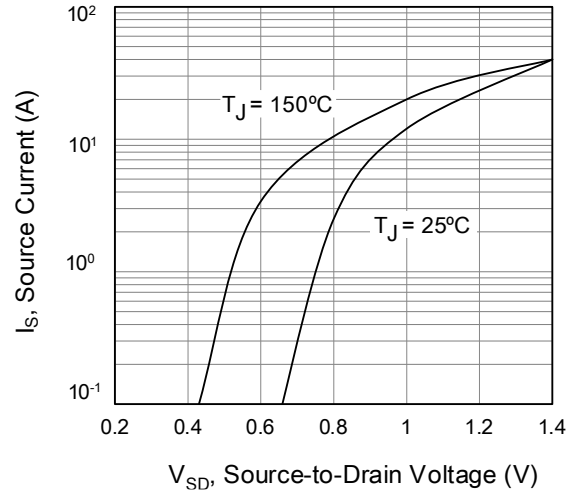


Figure 2: Body Diode Forward Voltage

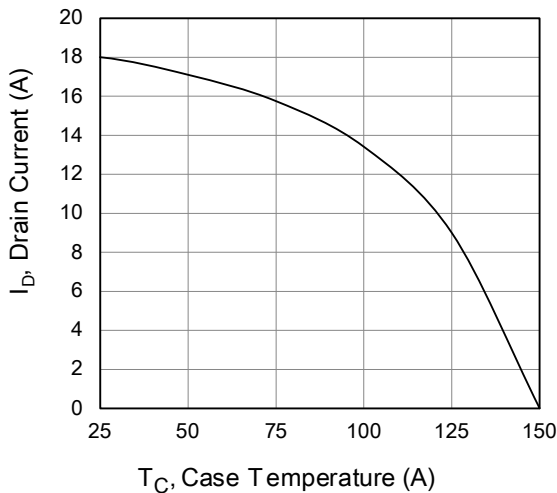


Figure 3: Drain Current vs. Temperature

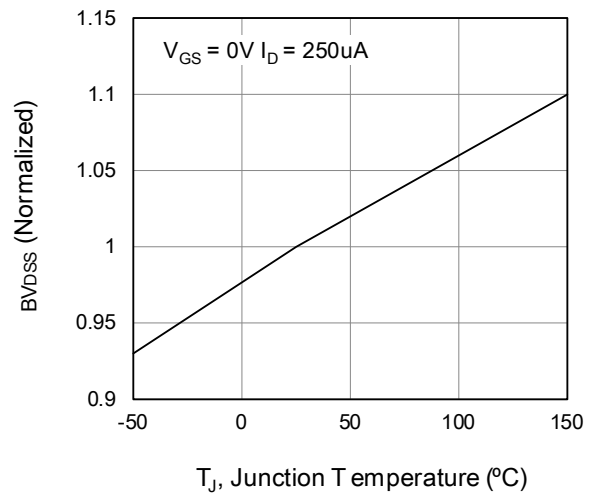


Figure 4: Body Diode Characteristics

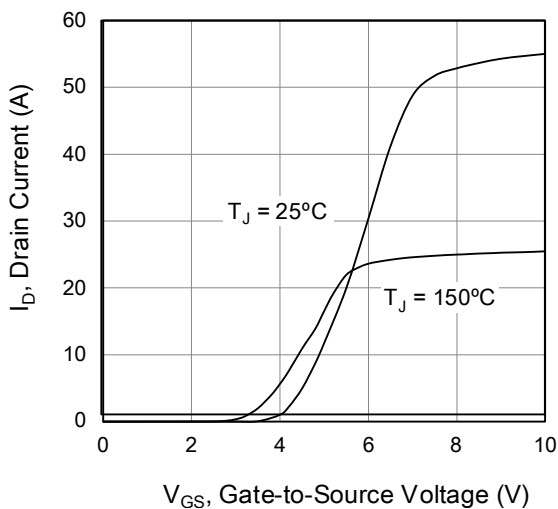


Figure 5: Transfer Characteristics

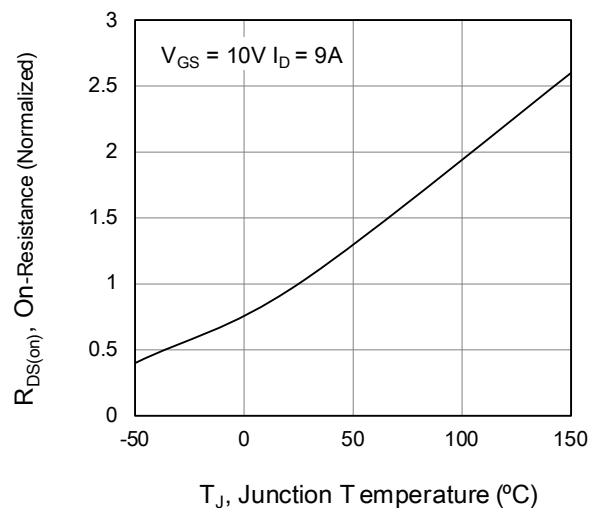


Figure 6: On-resistance vs. Temperature

4. Typical Characteristics (cont.)

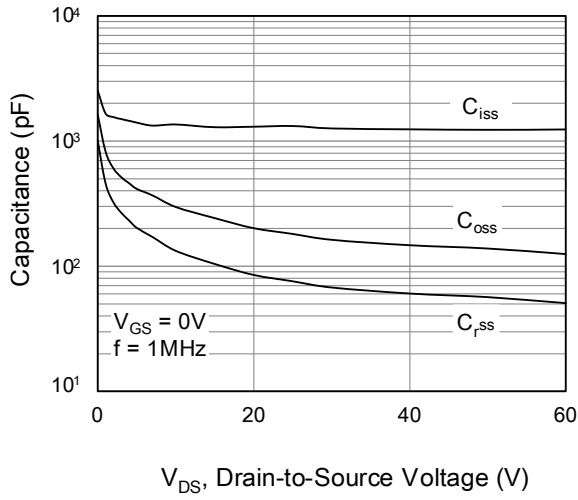


Figure 7: Capacitance

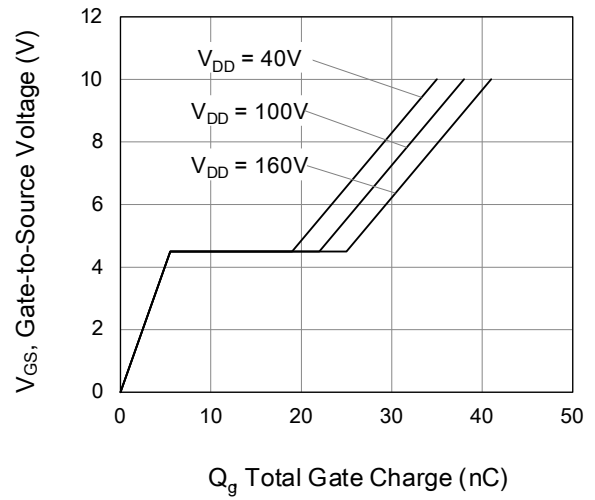


Figure 8: Gate Charge

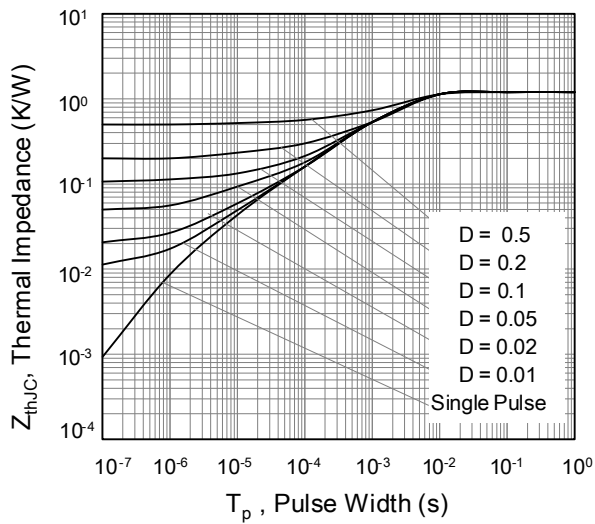
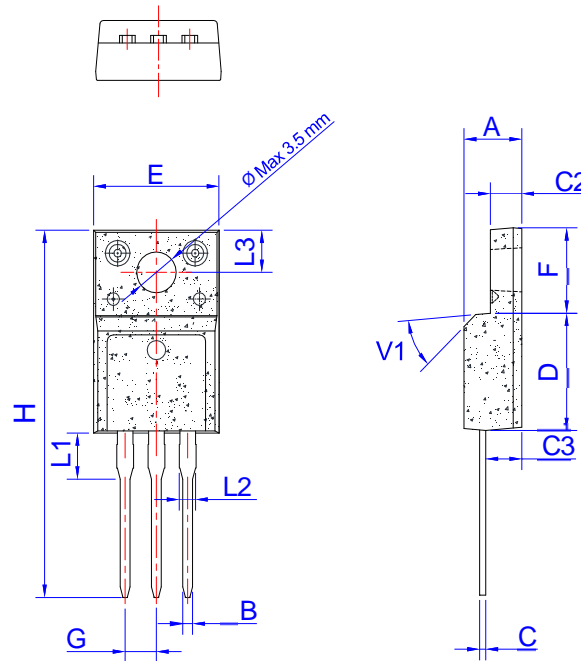


Figure 9: Transient Thermal Impedance

5. Package Mechanical Data

TO-220F Package



Symbol	Dimensions in Millimeters		
	MIN	NOM	MAX
A	4.50		4.90
B	0.74	0.80	0.83
C	0.47		0.65
C2	2.45		2.75
C3	2.60		3.00
D	8.80		9.30
E	9.80		10.4
F	6.40		6.80
G		2.54	
H	28.0		29.8
L1		3.63	
L2	1.14		1.70
L3		3.30	
V1		45°	