

N-Channel Enhancement Mode MOSFET

1. Product Information

Features

Fast Switching Capability
Avalanche Energy Specified
Improved dv/dt Capability, High Ruggedness

Applications

Uninterruptible Power Supply
Power Factor Correction

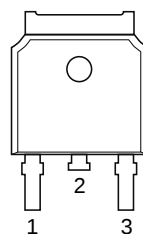
Quick reference

$V_{DS} = 200\text{ V}$
 $I_D = 5\text{ A}$
 $R_{DS(ON)} \leq 600\text{ m}\Omega @ V_{GS}=10\text{ V}$ (Type: 530 m Ω)

Pin Description

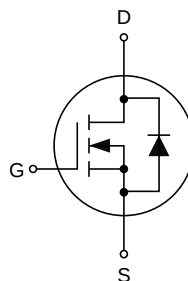
Pin	Description
1	Gate(G)
2	Drain(D)
3	Source(S)

Simplified Outline



Top View
TO-252

Symbol



Package Marking and Ordering Information

Product Name	Package	Marking		Reel Size	Tape Width	Quantity
KJ5N20KH	TO-252	KJ5N20KH XXXXYY	XXXXYY: Date Code	-	-	2500

2. Absolute Maximum Ratings (T_c=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	Drain Current Continuous	5	A
I_{DM}	Pulsed Drain Current	20	A
I_{AR}	Repetitive Avalanche Current	3	A
E_{AS}	Single Pulse Avalanche Energy	45	mJ
E_{AR}	Repetitive Avalanche Energy	3.2	mJ
P_D	Power Dissipation	46	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55~150	°C
R_{thJA}	Thermal Resistance, Junction-to-Case	60	°C/W
R_{thJC}	Thermal Resistance, Junction-to-Ambient	2.7	°C/W

3. Electrical Characteristics (T_C=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 _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =200 V, V _{GS} =0 V	-	-	5	μA
		V _{DS} =160 V, T _C =125°C	-	-	100	
I _{GSS}	Gate-Source Leakage Current	V _{DS} =0 V, V _{GS} =±20 V	-	-	±100	nA
V _{GS(th)}	Gate-Source Threshold Voltage	V _{DS} =V _{GS} , I _D =250 μA	2.5	3.1	4.0	V
R _{DS(on)}	Drain-Source On-Resistance ^(note 3)	V _{GS} =10 V, I _D =2.5 A	-	530	600	mΩ
C _{iss}	Input Capacitance	V _{GS} =0 V, V _{DS} =25 V, f=1.0 MHz	-	228	-	pF
C _{oss}	Output Capacitance		-	48	-	
C _{rss}	Reverse Transfer Capacitance		-	17	-	
Q _g	Total Gate Charge	V _{DS} =160 V, V _{GS} =10 V, I _D =5 A	-	18	-	nC
Q _{gs}	Gate-Source Charge		-	1.5	-	
Q _{gd}	Gate-Drain Charge		-	9.5	-	
t _{d(on)}	Turn-on Delay Time	V _{DD} =100 V, I _D =5 A, R _G =25 Ω	-	10	-	ns
t _r	Turn-on Rise Time		-	19	-	
t _{d(off)}	Turn-off Delay Time		-	43	-	
t _f	Turn-off Fall Time		-	32	-	
I _S	Maximum Continuous Drain-Source Diode Forward Current		-	-	5	A
I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current		-	-	20	A
V _{SD}	Diode Forward Voltage	T _C =25°C, V _{GS} =0 V, I _S =5 A	-	-	1.4	V
t _{rr}	Reverse Recovery Time	V _{GS} =0 V, I _S =5 A,	-	160	-	ns
Q _{rr}	Reverse Recovery Charge	dI/dt=100 A/μs	-	1.5	-	μC

Note:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2 OZ copper.
2. The E_{AS} data shows Max. rating. I_{AS}=3 A, V_{DD}=50 V, R_G=25 Ω, Starting T_J=25°C
3. 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

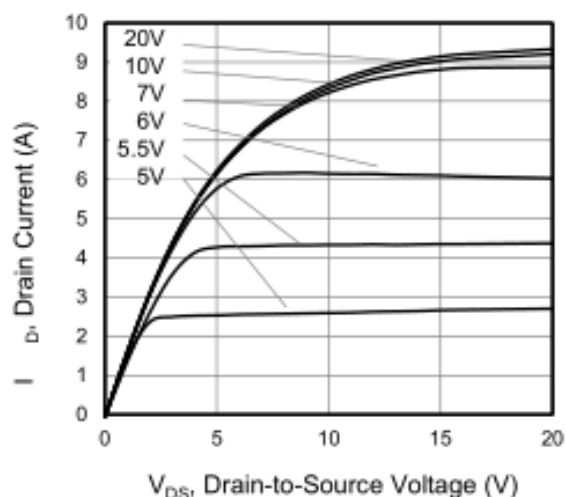


Figure1: Output Characteristics ($T_J=25^\circ\text{C}$)

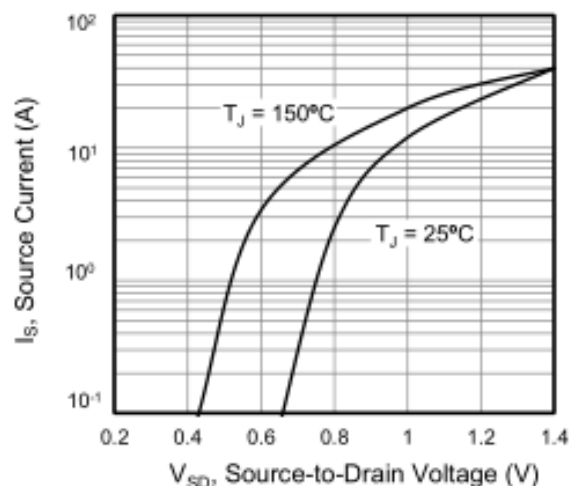


Figure 2: Body Diode Forward Voltage

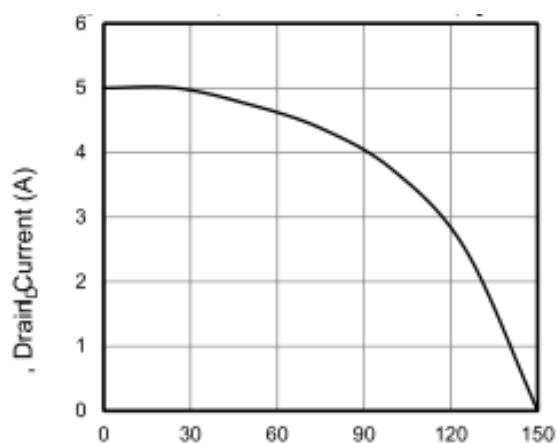


Figure 3: Drain Current vs. Temperature

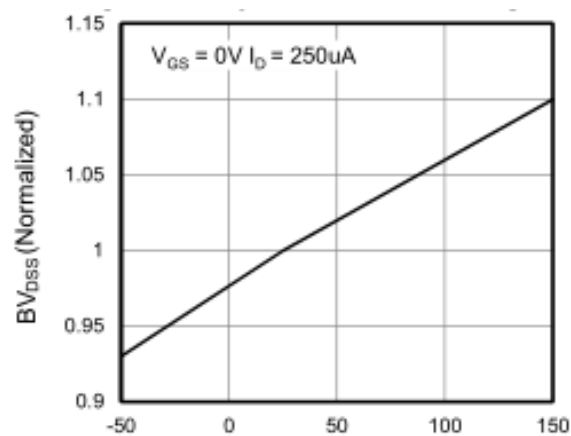


Figure 4: Body Diode Characteristics

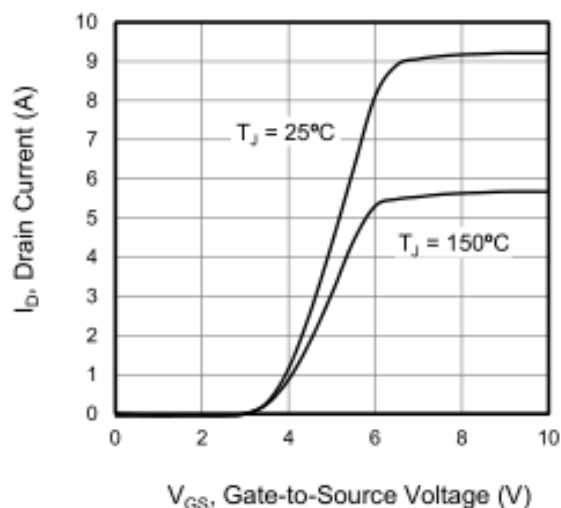


Figure 5: Transfer Characteristics

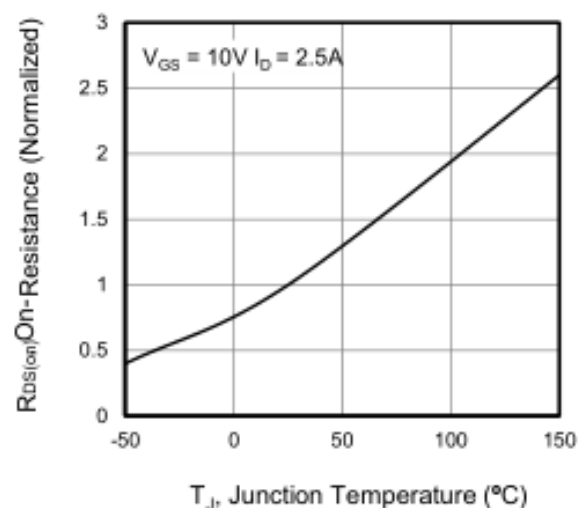


Figure 6: On-resistance vs. Temperature

4. Typical Characteristics (Cont.)

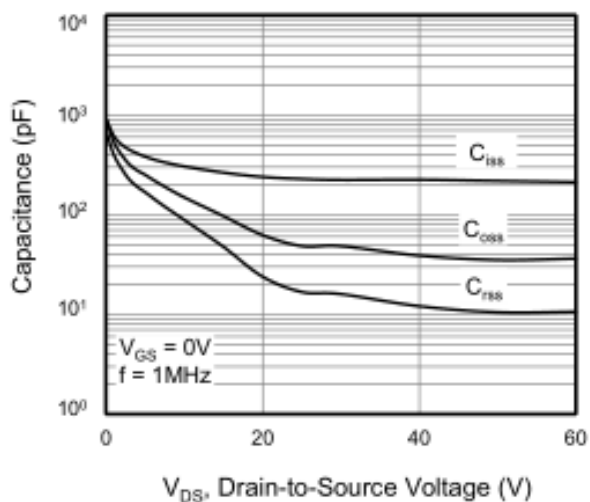


Figure 7: Capacitance

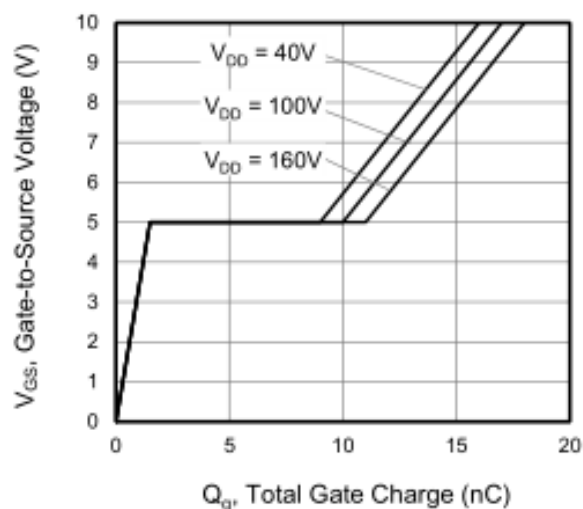


Figure 8: Gate Charge

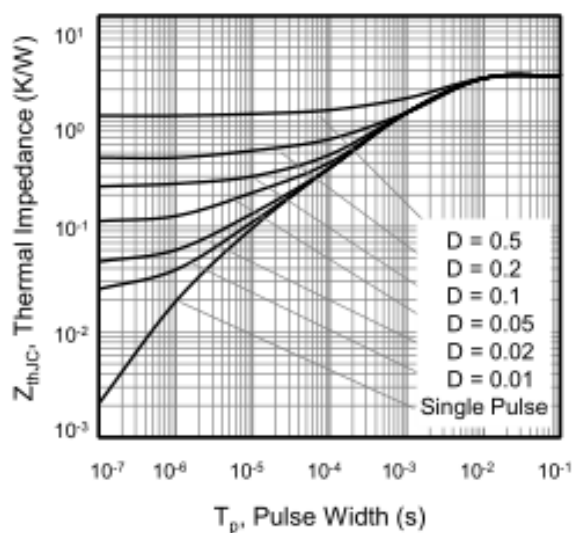
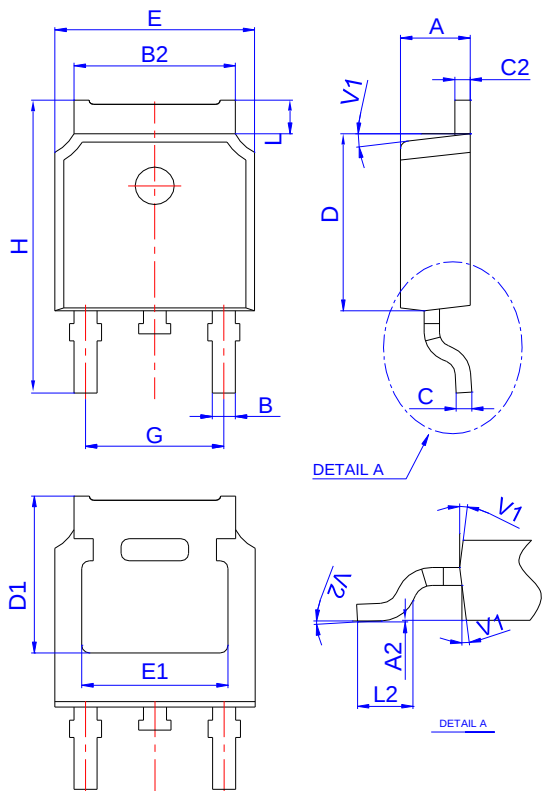


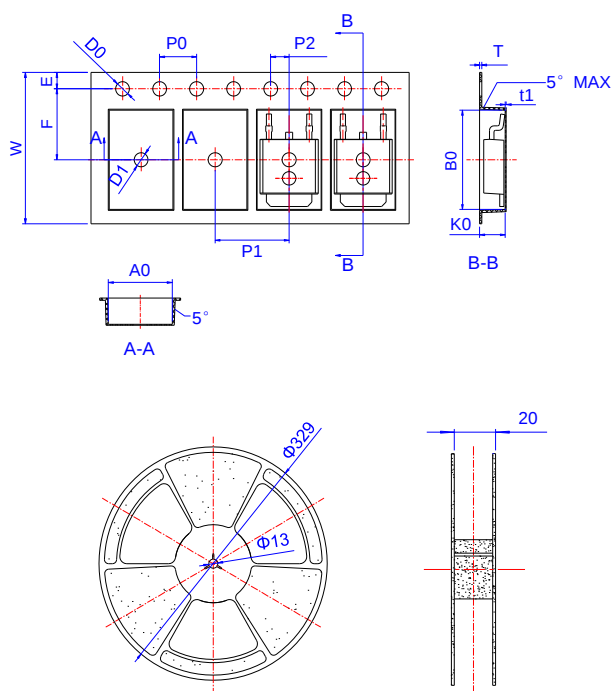
Figure 9: Transient Thermal Impedance

5. Package Mechanical Data

TO-252 Package



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	15.90	16.00	16.10	0.626	0.63	0.634
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
D0	1.40	1.50	1.60	0.055	0.059	0.063
D1	1.40	1.50	1.60	0.055	0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
A0	6.85	6.90	7.00	0.27	0.271	0.276
B0	10.45	10.50	10.60	0.411	0.413	0.417
K0	2.68	2.78	2.88	0.105	0.109	0.113
T	0.24		0.27	0.009		0.011
t1	0.10			0.004		
10P0	39.80	40.00	40.20	1.567	1.575	1.583