

N-Channel Enhancement Mode MOSFET

1. Product Information

Features

Self-aligned Planar Technology
Excellent Switching Performance

Applications

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

Quick reference

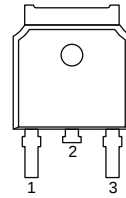
$V_{DS} = 200V$
 $I_D = 10A$
 $R_{DS(ON)} \leq 0.3\Omega @ V_{GS}=10V$ (Type:0.23 Ω)

Pin Description

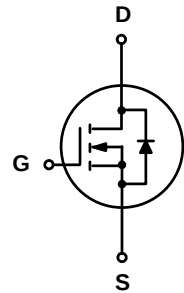
Pin	Description
1	Gate(G)
2	Drain(D)
3	Source(S)

Simplified Outline

Symbol



Top View
TO-252-3L



Package Marking and Ordering Information

Product Name	Package	Marking		Reel Size	Tape Width	Quantity
KJ10N20K	TO-252-3L	10N20 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	Continuous Drain Current, $V_{GS}@10V$	10	A
I_{DM}	Pulsed Drain Current	36	A
E_{AS}	Single Pulse Avalanche Energy	100	mJ
I_{AR}	Avalanche Current	7.5	A
E_{AR}	Repetitive Avalanche Energy	8.1	mJ
$P_D@T_c=25^\circ C$	Power Dissipation	74	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55~+150	°C
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	1.7	°C/ W
$R_{\theta JC}$	Thermal Resistance Junction-Case	60	°C/ W

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	200	-	-	V
I _{GSS}	Gate-body Leakage current	V _{DS} =0V, V _{GS} =±20V	-	-	±100	nA
I _{DSS}	Zero Gate Voltage Drain Current, T _J =25°C	V _{DS} =200V, V _{GS} =0V	-	-	5	μA
I _{DSS}	Zero Gate Voltage Drain Current, T _J =125°C	V _{DS} =160V, V _{GS} =0V	-	-	100	
V _{GS(th)}	Gate-Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.2	-	2.5	V
R _{DS(on)}	Drain-Source on-Resistance	V _{GS} =10V, I _D =4.5A	-	0.23	0.3	Ω
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	-	684	-	pF
C _{oss}	Output Capacitance		-	103	-	
C _{rss}	Reverse Transfer Capacitance		-	37	-	
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =160V, I _D =10A	-	23	-	nC
Q _{gs}	Gate-Source Charge		-	2.5	-	
Q _{gd}	Gate-Drain Charge		-	10	-	
t _{d(on)}	Turn-on Delay Time	V _{GS} =10V, V _{DS} =100V, R _G =25Ω, I _D =10A	-	12	-	ns
t _r	Turn-on Rise Time		-	22	-	
t _{d(off)}	Turn-off Delay Time		-	50	-	
t _f	Turn-off Fall Time		-	48	-	
I _S	Continuous Source Current	T _C =25°C	-	-	9	A
I _{SM}	Pulsed Diode Forward Current		-	-	36	A
V _{SD}	Diode Forward Voltage	T _J =25°C, I _{SD} =10A, V _{GS} =0V	-	-	1.4	V
t _{rr}	Body Diode Reverse Recovery Time	V _{GS} =0V, I _S =10A, di _F /dt=100A/μs	-	190	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	1.7	-	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. I_{AS}=7.5A, V_{DD}=50V, R_G=25Ω, Starting T_J=25°C
3. Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%

4. Typical Characteristics

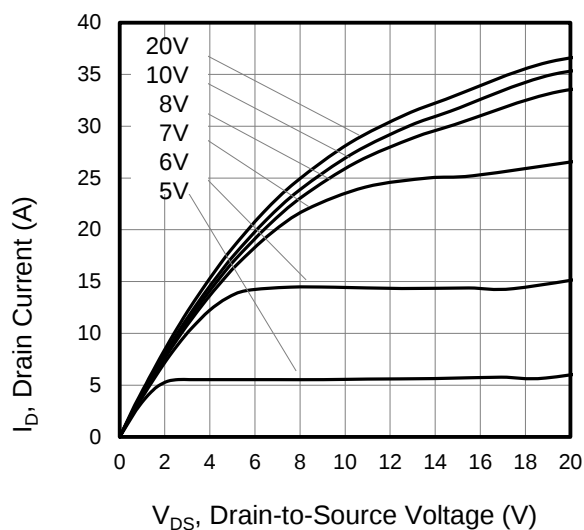


Figure 1. Output Characteristics ($T_J = 25^\circ\text{C}$)

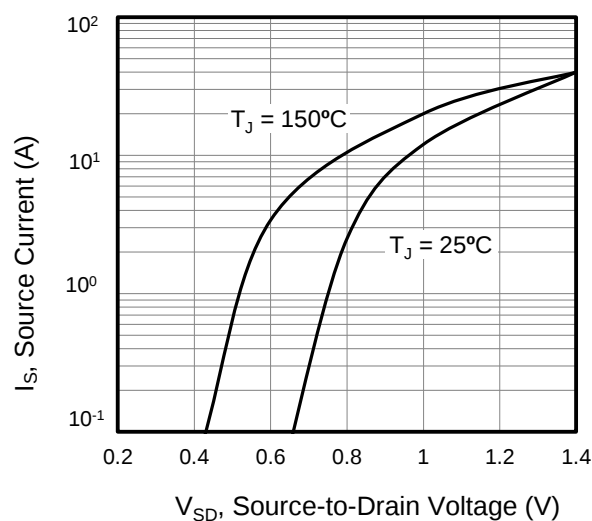


Figure 2. Body Diode Forward Voltage

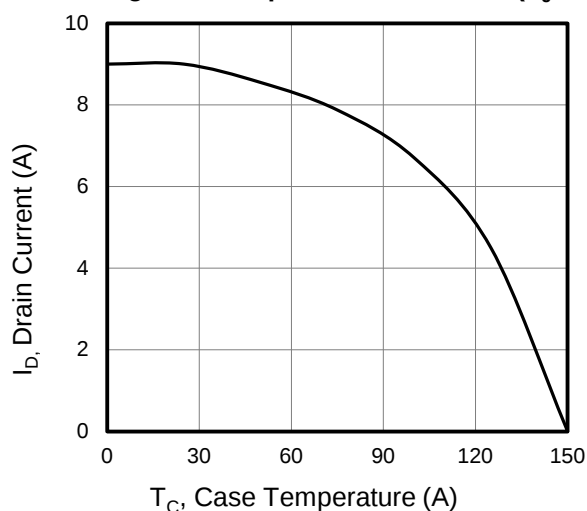


Figure 3. Drain Current vs. Temperature

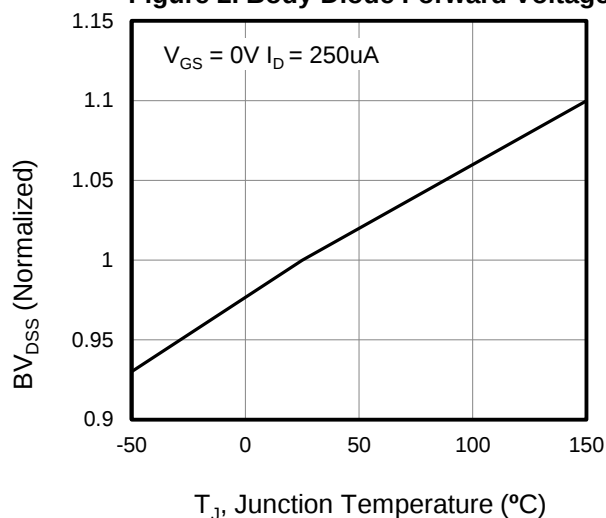


Figure 4. BV_{DS} Variation vs. Temperature

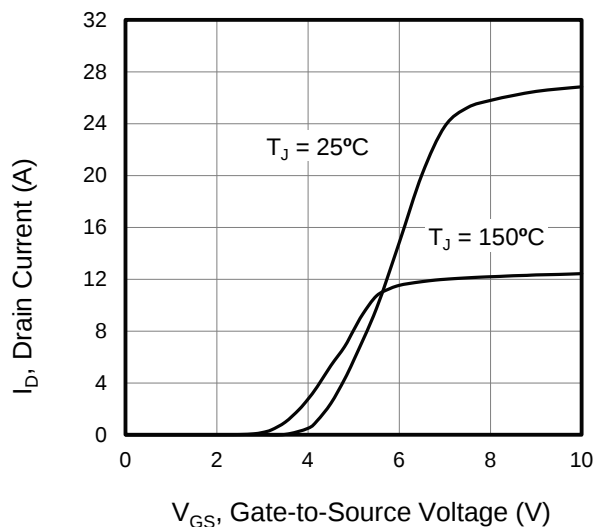


Figure 5. Transfer Characteristics

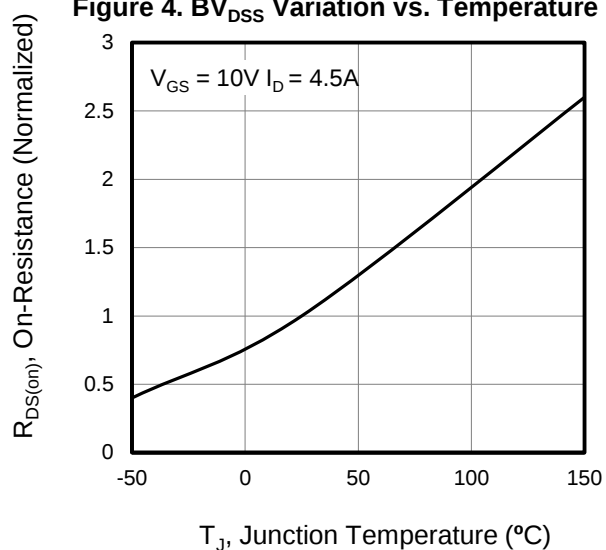


Figure 6. On-Resistance vs. Temperature

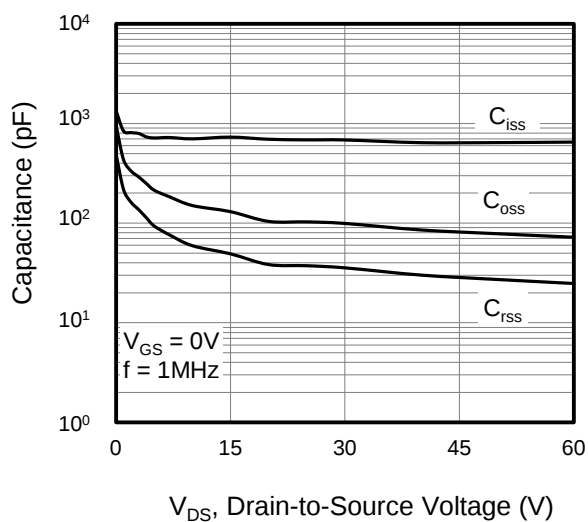


Figure 7. Capacitance

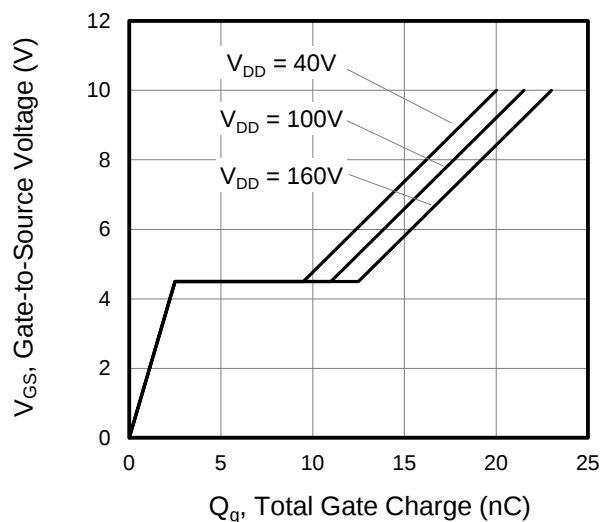


Figure 8. Gate Charge

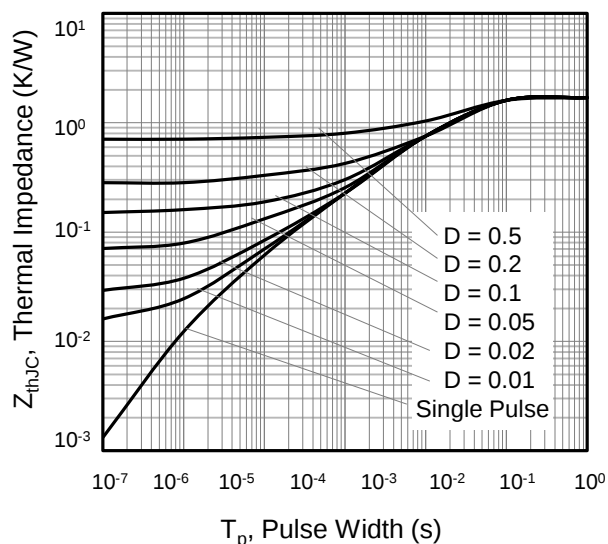


Figure 10. Transient Thermal Impedance

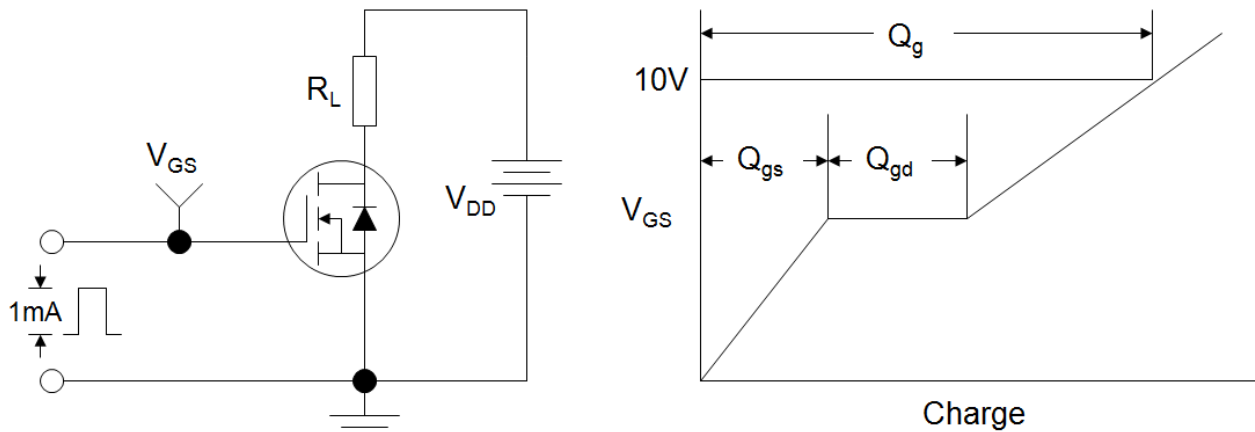


Figure A: Gate Charge Test Circuit and Waveform

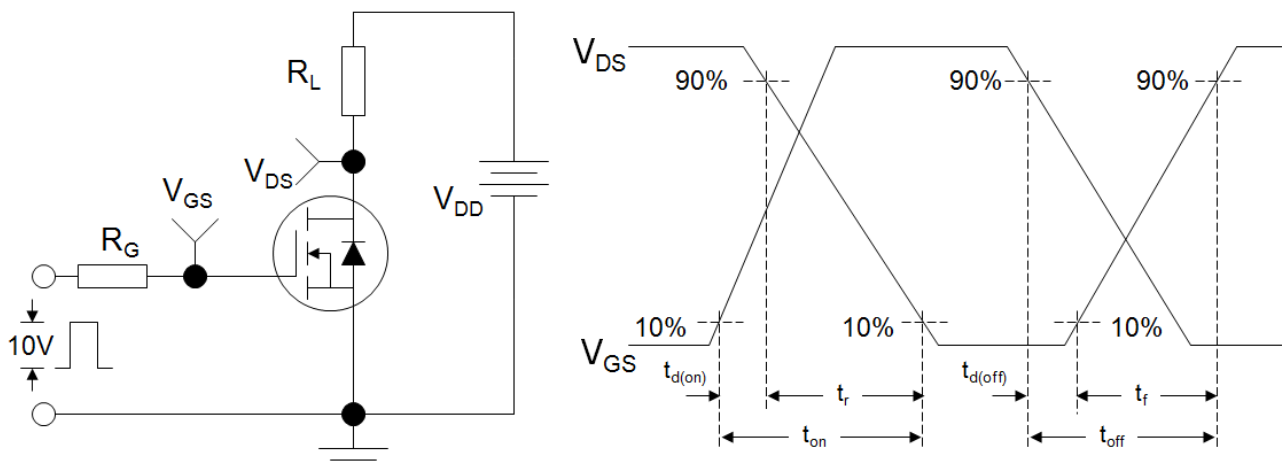


Figure B: Resistive Switching Test Circuit and Waveform

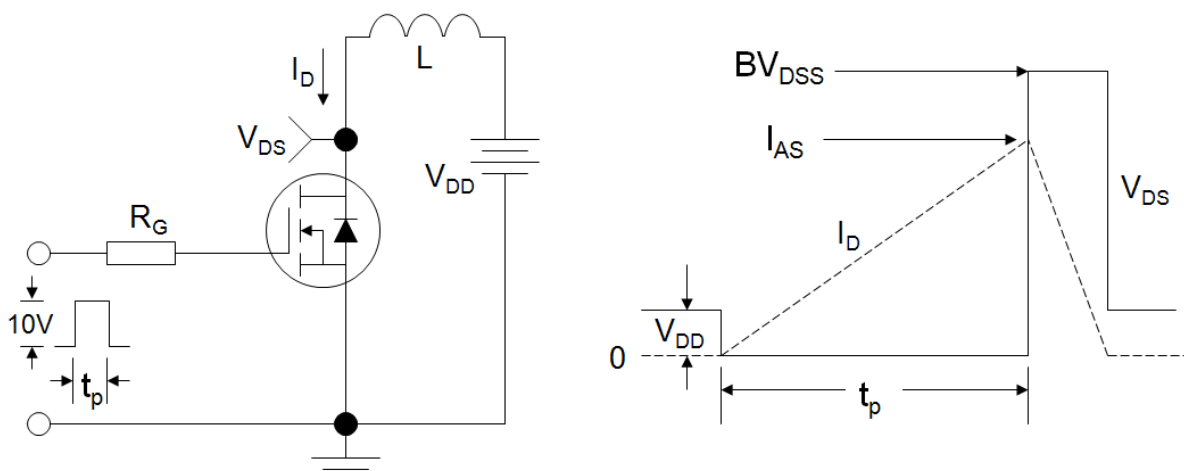
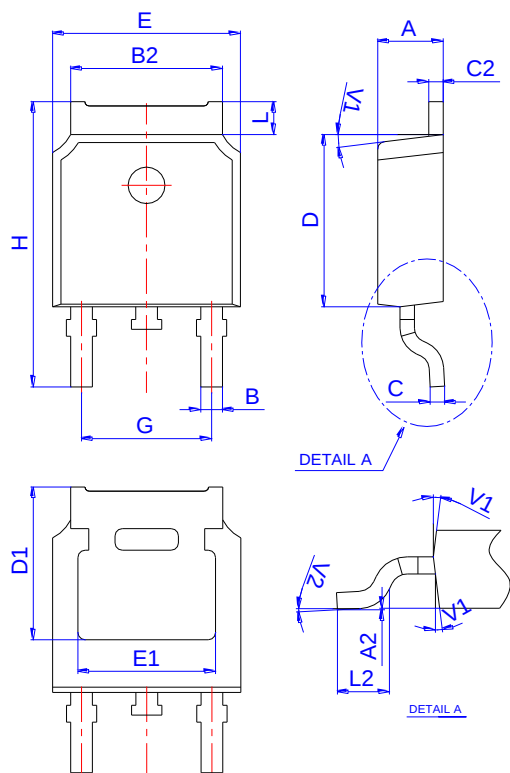


Figure C: Unclamped Inductive Switching Test Circuit and Waveform

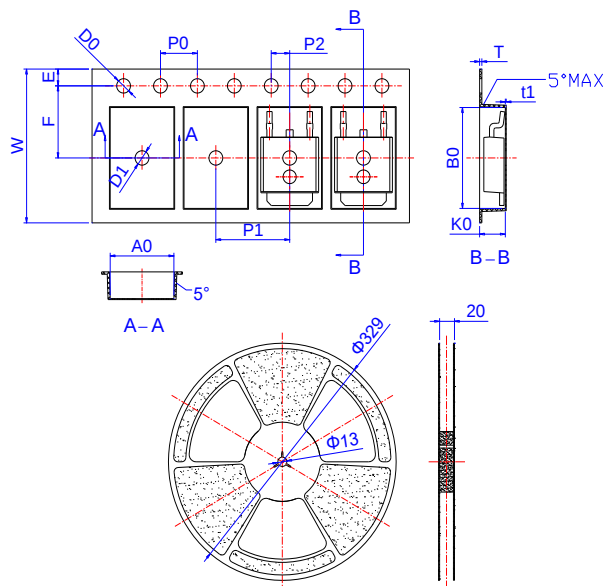
5.Package Mechanical Data

TO-252-3L



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°

Reel Specification-TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	15.90	16.00	16.10	0.626	0.630	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	0.270	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