

N-Channel Enhancement Mode MOSFET

1. Product Information

Features

Advanced SGT Technology
Excellent $R_{DS(ON)}$ and Low gate charge

Applications

Battery protection
Load switch
Uninterruptible power supply

Quick reference

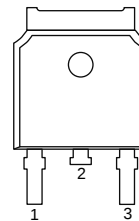
$V_{DS} = 60V$
 $I_D = 80A$
 $R_{DS(ON)} \leq 10m\Omega$ @ $V_{GS}=10V$ (Type: 8 m Ω)

Pin Description

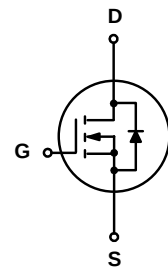
Pin	Description
1	Gate(G)
2	Drain(D)
3	Source(S)

Simplified Outline

Symbol



Top View
TO-252-3L



Package Marking and Ordering Information

Product Name	Package	Marking		Reel Size	Tape Width	Quantity
KJ80N06K	TO-252-3L	80N06 XXXXYY	XXXXYY: Date Code	-	-	2500

2. Absolute Maximum Ratings ($T_J=25^{\circ}C$ unless otherwise noted)

Symbol	Parameter	Values	Unit
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^{\circ}C$	Continuous Drain Current, $V_{GS}@10V$ ¹	80	A
I_{DM}	Pulsed Drain Current ²	180	A
$P_D@T_C=25^{\circ}C$	Power Dissipation ³	125	W
E_{AS}	Single Pulse Avalanche Energy ⁴	30	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55~150	$^{\circ}C$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance, Junction-Case ⁴	1	$^{\circ}C/W$

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	60	71	-	V
V _{GS(th)}	Gate-Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.0	2.0	2.5	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =40V, V _{GS} =0V	-	-	1	μA
I _{GSS}	Gate-body Leakage current	V _{DS} =0V, V _{GS} =±20V	-	-	±100	nA
R _{DS(on)}	Drain-Source on-Resistance	V _{GS} =10V, I _D =20A	-	8	10	mΩ
R _{DS(on)}	Drain-Source on-Resistance	V _{GS} =4.5V, I _D =10A	-	10	13	mΩ
C _{iss}	Input Capacitance	V _{DS} =50V V _{GS} =0V f=1MHz	-	1182.1	-	pF
C _{oss}	Output Capacitance		-	199.5	-	
C _{rss}	Reverse Transfer Capacitance		-	4.1	-	
Q _g	Total Gate Charge	V _{GS} =10V V _{DS} =50V I _D =10A	-	18.4	-	nC
Q _{gs}	Gate-Source Charge		-	3.3	-	
Q _{gd}	Gate-Drain Charge		-	3.1	-	
V _{plateau}	Gate plateau voltage		-	2.8	-	
t _{d(on)}	Turn-on Delay Time	V _{GS} =10V V _{DS} =50V R _G =2Ω I _D =10A	-	-	-	ns
t _r	Turn-on Rise Time		-	4.0	-	
t _{d(off)}	Turn-off Delay Time		-	34.9	-	
t _f	Turn-off Fall Time		-	5.5	-	
I _S	Diode Forward Current	V _{GS} <V _{th}	-	-	60	A
I _{SM}	Pulsed Diode Forward Current		-	-	180	A
V _{SD}	Diode Forward Voltage	I _S =20A, V _{GS} =0V	-	-	1.3	V
t _{rr}	Body Diode Reverse Recovery Time	I _S =10A, V _{GS} =0V dI/dt=100A/μs	-	41.8	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	36.1	-	nC
I _{rrm}	Peak reverse recovery current		-	1.4	-	A

Notes:

1. Calculated continuous current based on maximum allowable junction temperature.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. P_D is based on max. junction temperature, using junction-case thermal resistance.
4. V_{DD}=50 V, R_G=50 Ω, L=0.3 mH, starting T_J=25 °C.
5. The value of R_{θJA} is measured with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25 °C.

4. Typical Characteristics

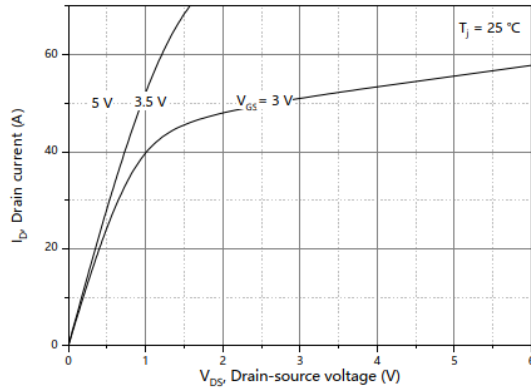


Figure 1, Typ. output characteristics

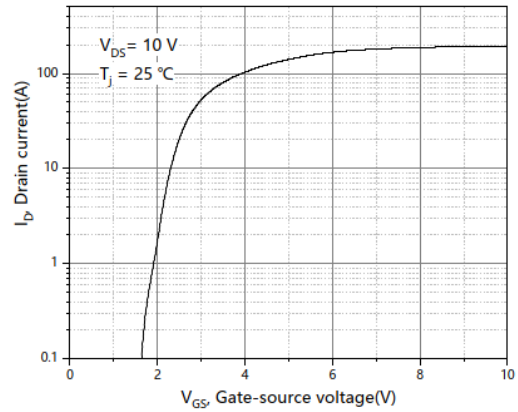


Figure 2, Typ. transfer characteristics

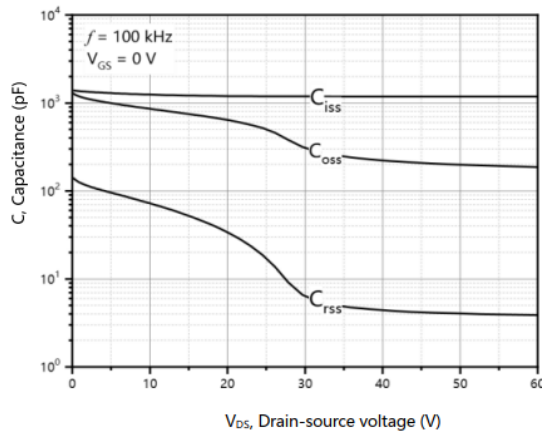


Figure 3, Typ. capacitances

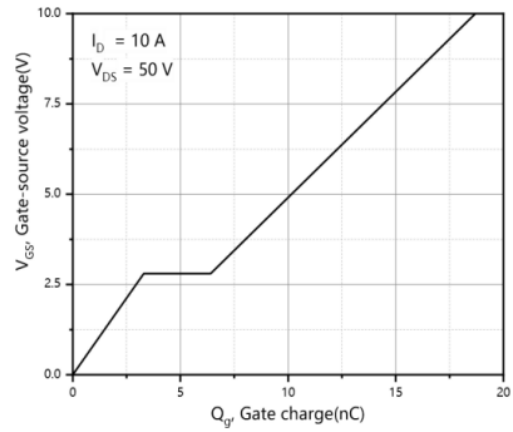


Figure 4, Typ. gate charge

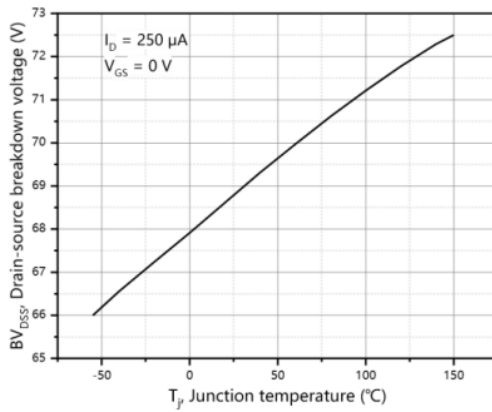


Figure 5, Drain-source breakdown voltage

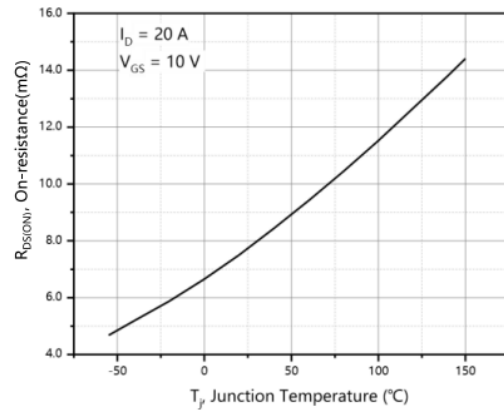


Figure 6, Drain-source on-state resistance

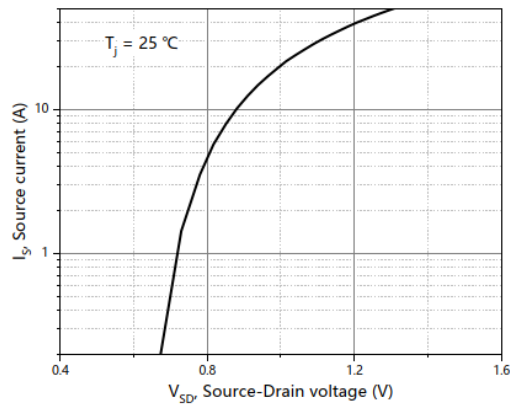


Figure 7, Forward characteristic of body diode

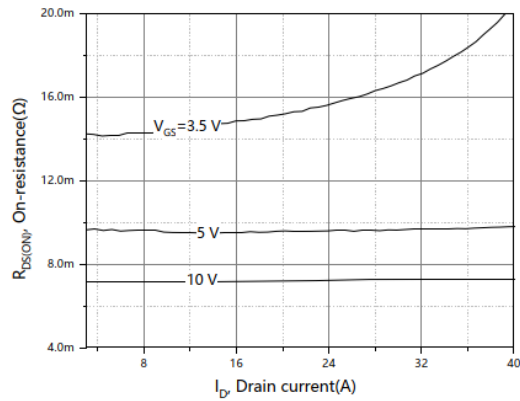


Figure 8, Drain-source on-state resistance

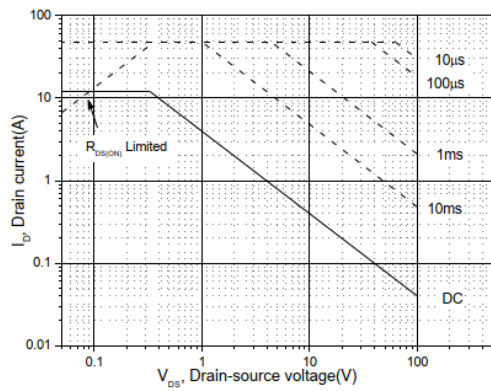


Figure 9, Safe operation area $T_C = 25\text{ }^{\circ}\text{C}$

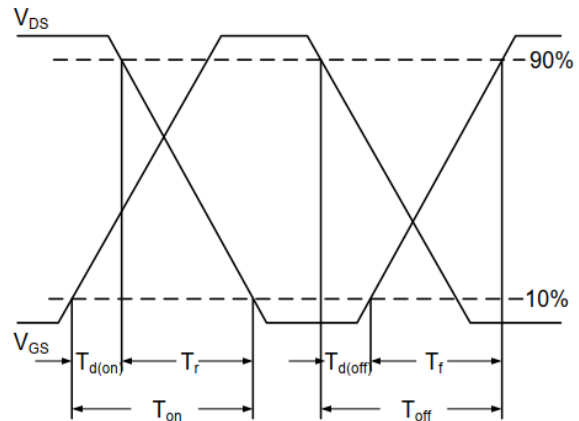


Fig.10 Switching Time Waveform

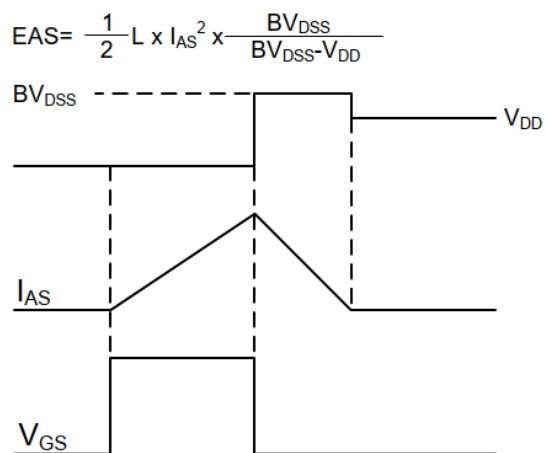
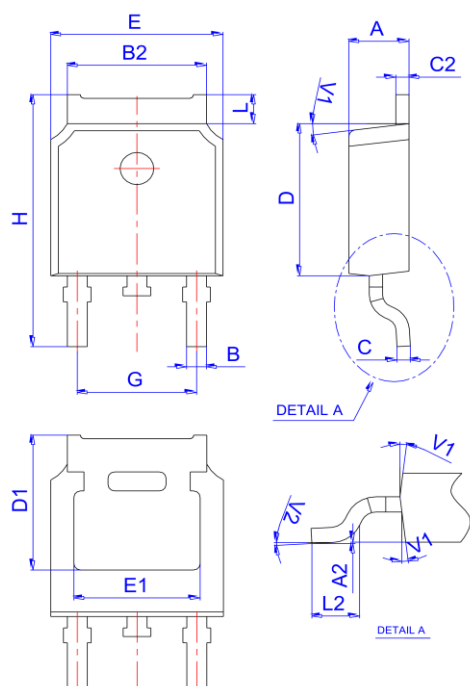


Fig.11 Unclamped Inductive Switching Waveform

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$

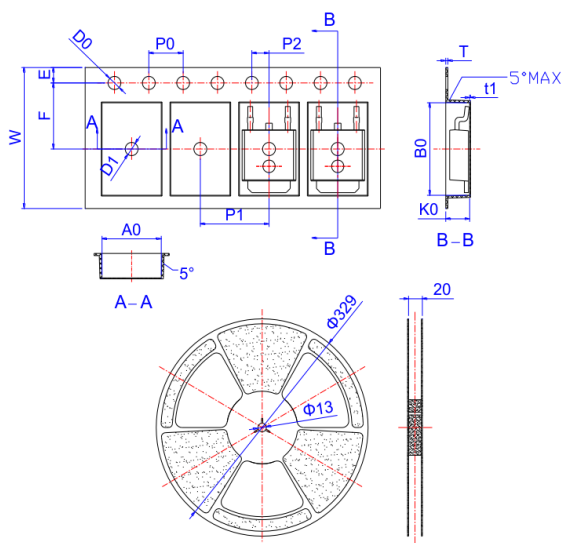
5.Package Mechanical Data

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