KJ50N06K

N-Channel Enhancement Mode MOSFET

1. Product Information

Features

- Advanced trench technology
- Excellent $R_{DS(ON)}$
- Low gate charge

Applications

- Battery protection
- Load switch
- Uninterruptible power supply

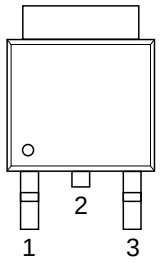
Quick reference

- V_{DS} = 60V
- I_D = 58A
- $R_{DS(ON)}$ ≦ 16mΩ @ V_{GS} = 10V（Type:11mΩ）

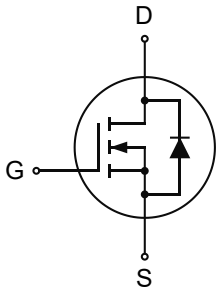
Pin Description

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

Simplified Outline	Symbol



Top View
TO-252



Package Marking and Ordering Information

Product Name	Package	Marking	Reel Size	Tape width	Quantity
KJ50N06K	TO-252	50N06 XXXYYY　XXXYYY: Date Code	-	-	2500

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V [1]	58	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V [1]	30	A
I_{DM}	Pulsed Drain Current [2]	90	A
E_{AS}	Single Pulse Avalanche Energy [3]	39.2	mJ
I_{AS}	Avalanche Current	38	A
P_D@T_C=25℃	Total Power Dissipation [4]	45	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	62	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case [1]	2.8	℃/W

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	60	65	-	V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃, I_D=1mA	-	0.057	-	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance [2]	V_{GS}=10V, I_D=20A	-	11	16	mΩ
		V_{GS}=4.5V, I_D=10A	-	16	20	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS}, I_D =250uA	1.2	1.8	2.5	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		-	-5.68	-	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=48V, V_{GS}=0V, T_J=25℃	-	-	1	uA
			-	-	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	-	-	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=15A	-	45	-	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	-	1.7	-	Ω
Q_g	Total Gate Charge (4.5V)	V_{DS}=48V V_{GS}=4.5V I_D=15A	-	19.3	-	nC
Q_{gs}	Gate-Source Charge		-	7.1	-	
Q_{gd}	Gate-Drain Charge		-	7.6	-	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=30V, V_{GS}=10V R_G=3.3Ω, I_D=15A	-	7.2	-	ns
T_r	Rise Time		-	50	-	
$T_{d(off)}$	Turn-Off Delay Time		-	36.4	-	
T_f	Fall Time		-	7.6	-	
C_{iss}	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1MHz	-	2423	-	pF
C_{oss}	Output Capacitance		-	145	-	
C_{rss}	Reverse Transfer Capacitance		-	97	-	
I_S	Continuous Source Current [1,5]	V_G=V_D=0V, Force Current	-	-	35	A
I_{SM}	Pulsed Source Current [2,5]		-	-	80	A
V_{SD}	Diode Forward Voltage [2]	V_{GS}=0V, I_S=A, T_J=25℃	-	-	1	V
t_{rr}	Reverse Recovery Time	I_F=15A, dI/dt=100A/μs, T_J=25℃	-	16.3	-	ns
Q_{rr}	Reverse Recovery Charge		-	11	-	nC

Note :

1、The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

2、The data tested by pulsed , pulse width ≦ 300us, duty cycle ≦ 2%

3、The E_{AS} data shows Max. rating. The test condition is V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=38A

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

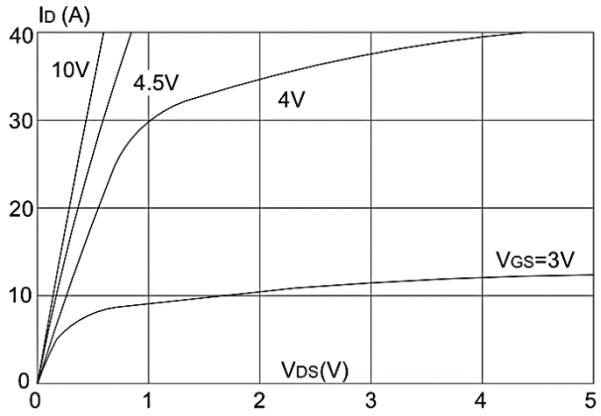


Figure1: Output Characteristics

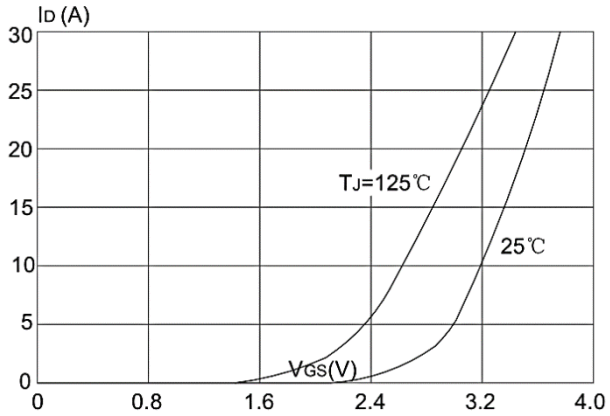


Figure 2: Typical Transfer Characteristics

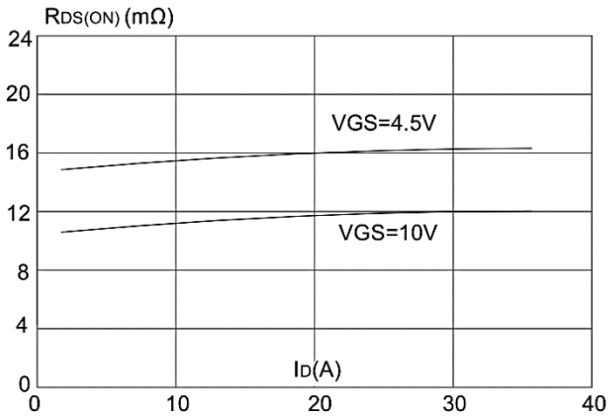


Figure 3:On-resistance vs. Drain Current

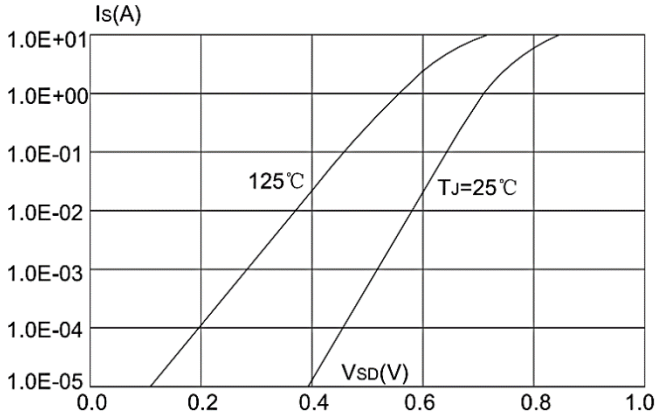


Figure 4: Body Diode Characteristics

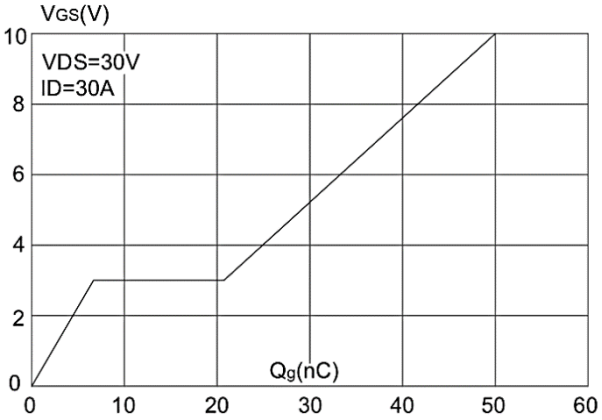


Figure 5: Gate Charge Characteristics

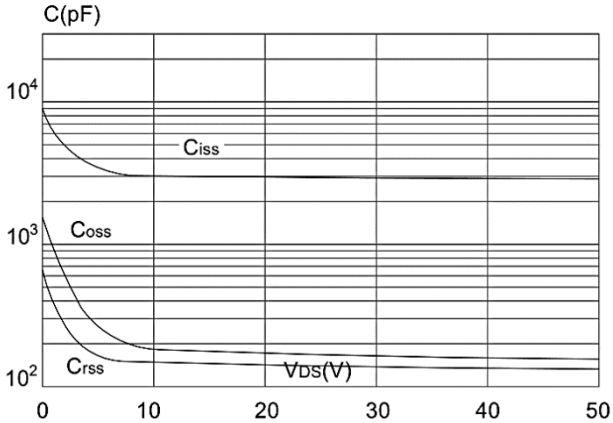


Figure 6: Capacitance Characteristics

4. Typical Characteristics (cont.)

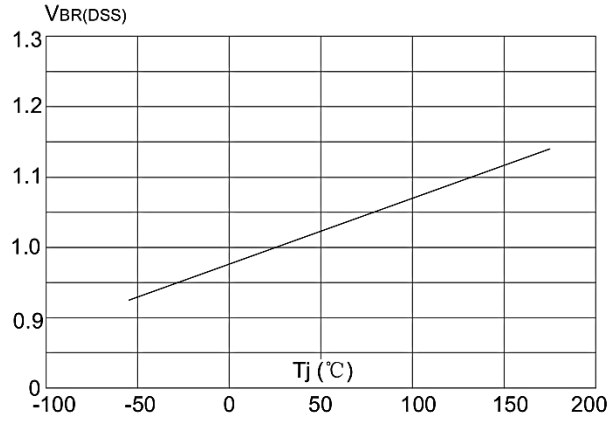


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

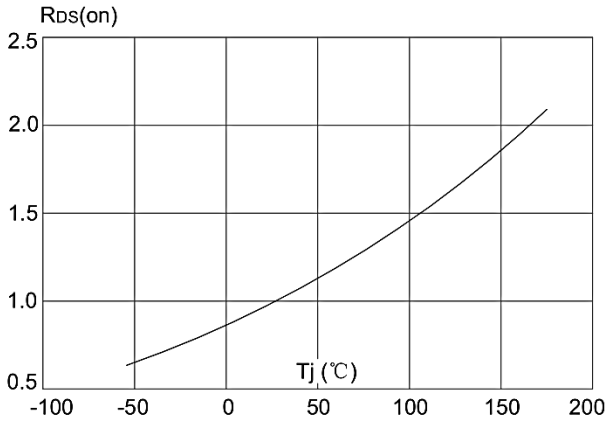


Figure 8: Normalized on Resistance vs. Junction Temperature

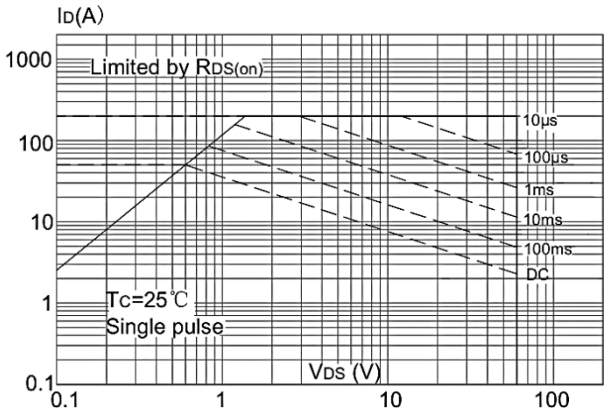


Figure 9: Maximum Safe Operating Area

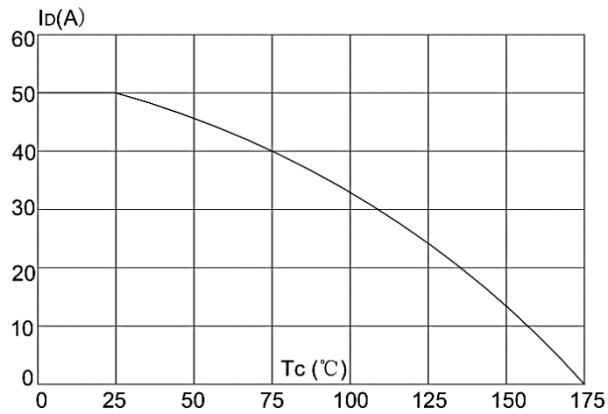


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

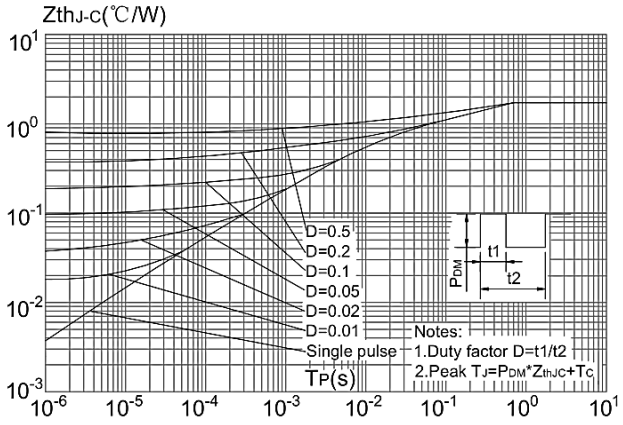
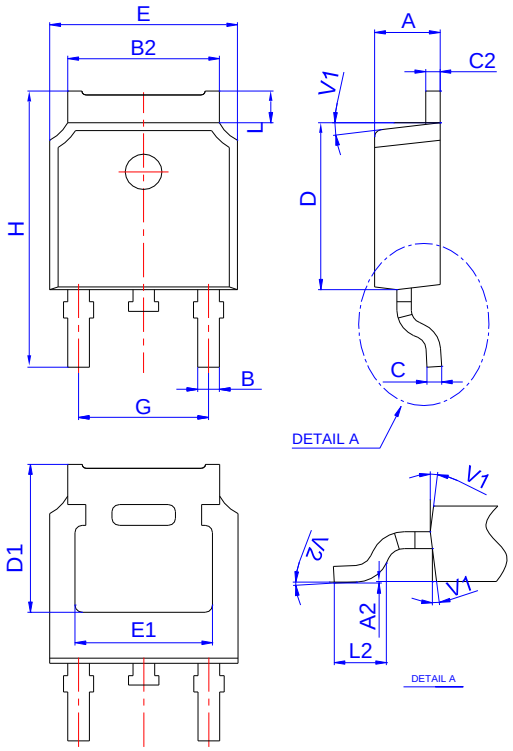


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

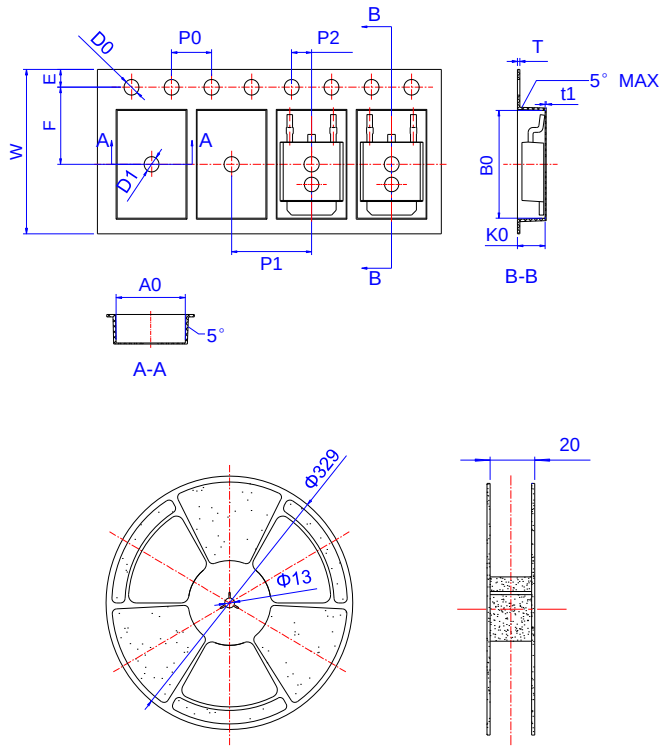
5. Package Mechanical Data

TO-252 Package



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.1		2.5	0.083		0.098
A2	0		0.1	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.4		0.6	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.9		6.3	0.232		0.248
D1	5.30REF			0.209REF		
E	6.4		6.8	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.5		10.7	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



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	15.9	16	16.1	0.626	0.63	0.634
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.4	7.5	7.6	0.291	0.295	0.299
D0	1.4	1.5	1.6	0.055	0.059	0.063
D1	1.4	1.5	1.6	0.055	0.059	0.063
P0	3.9	4	4.1	0.154	0.157	0.161
P1	7.9	8	8.1	0.311	0.315	0.319
P2	1.9	2	2.1	0.075	0.079	0.083
A0	6.85	6.9	7	0.27	0.271	0.276
B0	10.45	10.5	10.6	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	0.1			0.004		
10P0	39.8	40	40.2	1.567	1.575	1.583