

N-Channel Enhancement Mode MOSFET

1. Product Information

Features

Advanced Trench Technology
Low $R_{DS(ON)}$, Low gate charge, Fast switching

Applications

Battery protection
Load switch
Uninterruptible power supply

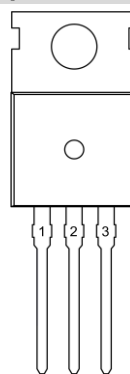
Quick reference

$V_{DS} \geq 60V$
 $I_D \leq 90A$
 $R_{DS(ON)} \leq 7.0m\Omega @ V_{GS} = 10V$ (Type: 5.8m Ω)

Pin Description

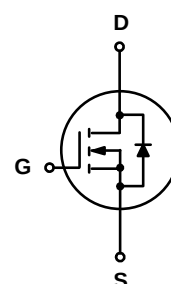
Pin	Description
1	Gate(G)
2	Drain(D)
3	Source(S)

Simplified Outline



Top View
TO-220-3L

Symbol



Package Marking and Ordering Information

Product Name	Package	Marking	Reel Size	Tape width	Quantity
KJ90N06C	TO-220-3L	90N06 YWWXXX	YWWXXX: Date Code		1000

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

Symbol	Parameter	Value	Unit
V_{DS}	Drain source voltage	60	V
V_{GS}	Gate source voltage	± 20	V
I_D	Continuous drain current ¹⁾	90	A
I_{DM}	Pulsed drain current ²⁾	320	A
I_S	Diode forward current	37	A
I_{SP}	Pulsed source current	210	A
P_D	Power dissipation	108	W
E_{AS}	Single pulsed avalanche energy ³⁾	205.4	mJ
T_{stg}, T_j	Operation and storage temperature	-55 to 150	°C
$R_{\theta JC}$	Thermal resistance, junction-case	1.4	°C/W
$R_{\theta JA}$	Thermal resistance, junction-ambient ⁴⁾	62.5	°C/W

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	60	64	-	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} =60V, V _{GS} =0V,	-	-	1.0	μA
IGSS	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} =±20V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	2.0	3.0	4.0	V
RDS(on)	Static Drain-Source on-Resistance note	V _{GS} =10V, I _D =30A	-	5.8	7.0	mΩ
C _{iss}	Input Capacitance	V _{DS} =30V, V _{GS} =0V, f=1.0MHz	-	4136	-	pF
C _{oss}	Output Capacitance		-	286	-	pF
C _{rss}	Reverse Transfer Capacitance		-	257	-	pF
Q _g	Total Gate Charge	V _{DS} =30V, I _D =30A, V _{GS} =10V	-	90	-	nC
Q _{gs}	Gate-Source Charge		-	9	-	nC
Q _{gd}	Gate-Drain("Miller") Charge		-	18	-	nC
td(on)	Turn-on Delay Time	V _{DS} =30V, I _D =30A, R _G =1.8Ω, V _{GS} =10V	-	9	-	ns
t _r	Turn-on Rise Time		-	7	-	ns
td(off)	Turn-off Delay Time		-	40	-	ns
t _f	Turn-off Fall Time		-	15	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	90	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	320	A
VSD	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =30A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I _F =30A, dI/dt=100A/μs	-	33	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	46	-	nC

Note :

- 1、The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2、The data tested by pulsed , pulse width .The EAS data shows Max. rating .
- 3、The test cond ≡ 300us duty cycle ≡ 2%, duty cycle ition is T_J =25°C, VDD =35V, VG =10V, R G =25Ω, L=0.5mH, IAS =21A
- 4、The power dissipation is limited by 175°C junction temperature
- 5、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

4. Electrical Characteristics Diagrams

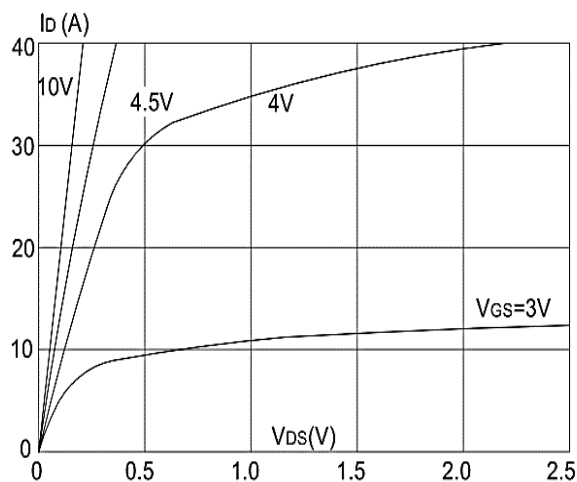


Figure1: Output Characteristics

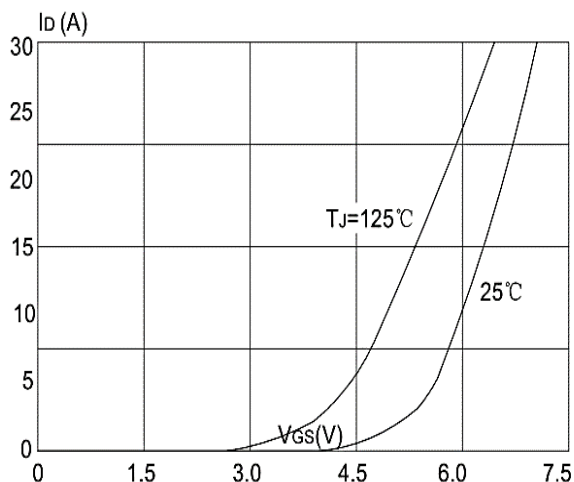


Figure 2: Typical Transfer Characteristics

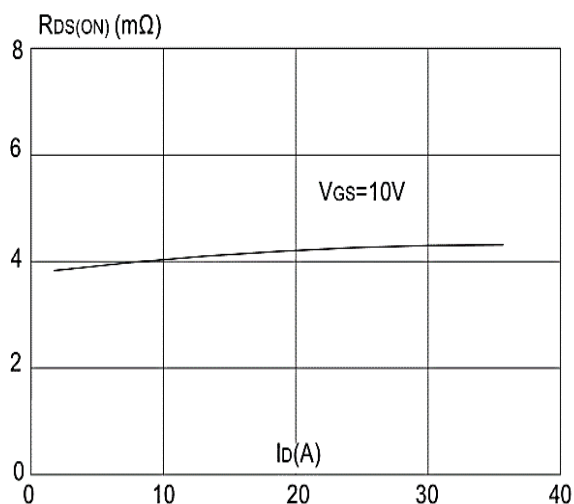


Figure 3: On-resistance vs. Drain Current

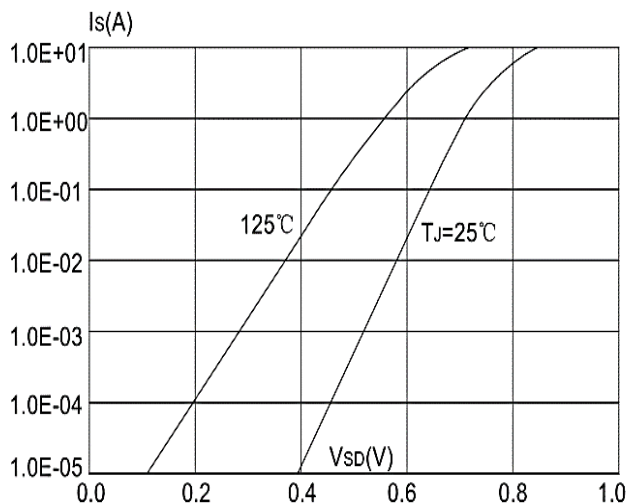


Figure 4: Body Diode Characteristics

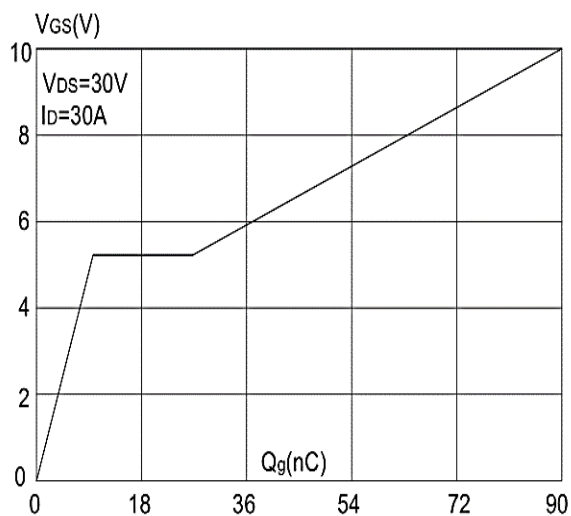


Figure 5: Gate Charge Characteristics

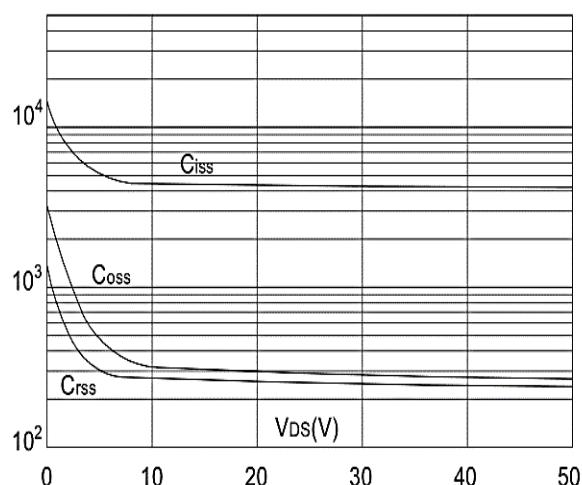


Figure 6: Capacitance Characteristics

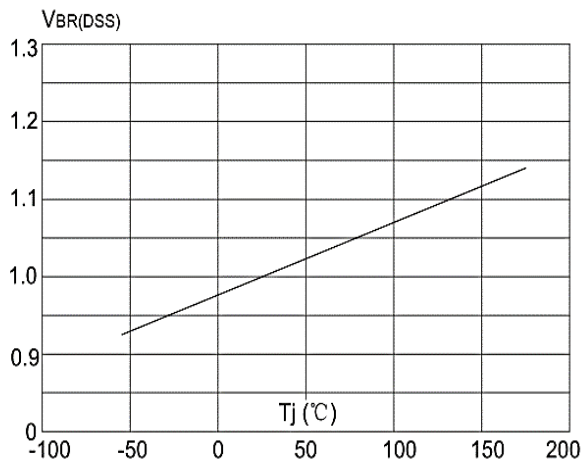


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

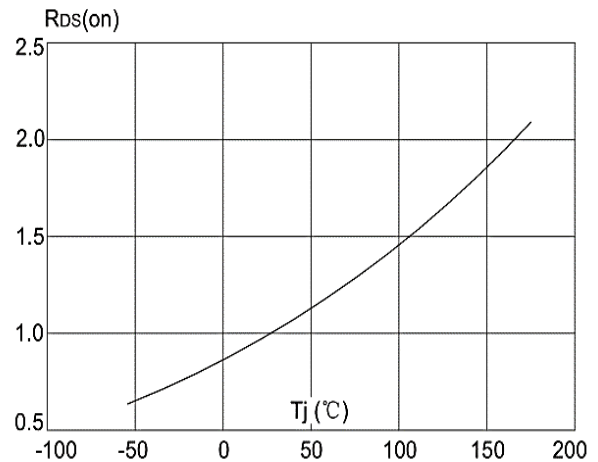


Figure 8: Normalized on Resistance vs. Junction Temperature

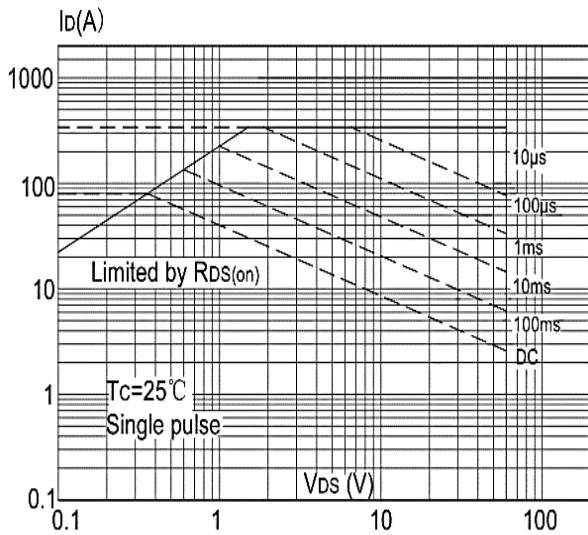


Figure 9: Maximum Safe Operating Area

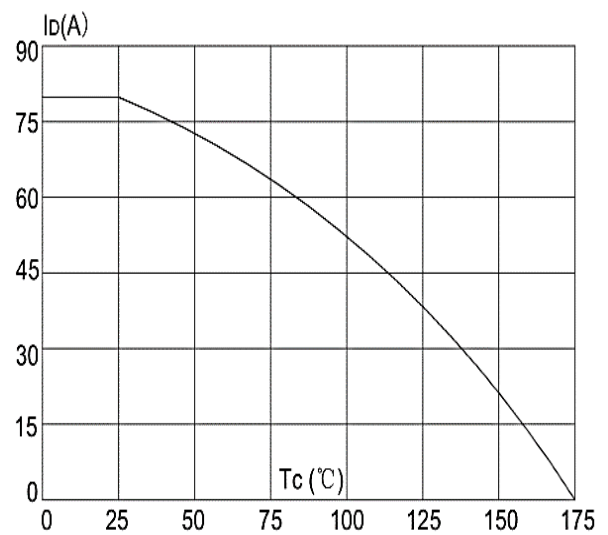


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

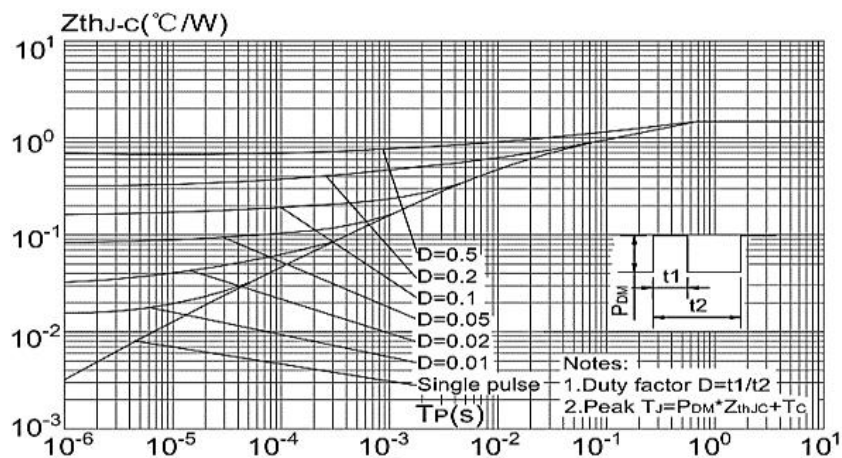
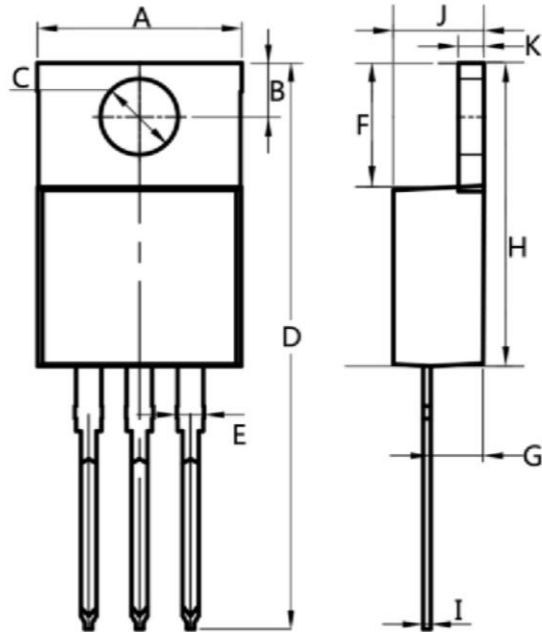


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

5.Package Mechanical Data

TO-220-3L



Dim.	Min.	Max.
A	10.0	10.4
B	2.5	3.0
C	3.5	4.0
D	28.0	30.0
E	1.1	1.5
F	6.2	6.6
G	2.9	3.3
H	15.0	16.0
I	0.35	0.45
J	4.3	4.7
K	1.2	1.4
All Dimensions in millimeter		