

# N-Channel Enhancement Mode MOSFET

## 1. Product Information

### Features

Advanced Technology  
Excellent  $R_{DS(ON)}$ , Low gate charge, High EAS

### Applications

Battery protection  
Load switch  
Uninterruptible power supply

### Quick reference

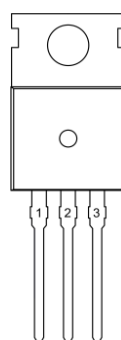
$V_{DS} \geq 68V$   
 $I_D \leq 80A$   
 $R_{DS(ON)} \leq 9.0m\Omega$  @  $V_{GS} = 10V$  (Type:7.2 m $\Omega$ )

### Pin Description

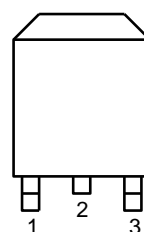
Pin	Description
1	Gate(G)
2	Drain(D)
3	Source(S)

### Simplified Outline

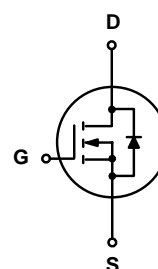
### Symbol



Top View  
TO-220



Top View  
TO-263



### Package Marking and Ordering Information

Product Name	Package	Marking	Reel Size	Tape width	Quantity
KJ80N07C	TO-220	<b>80N07</b> <b>YWWXXX</b> YWWXXX: Date Code			1000
KJ80N07D	TO-263				800

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

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	68	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, $V_{GS}$ @ 10V <sup>1</sup>	80	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, $V_{GS}$ @ 10V <sup>1</sup>	52	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	320	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	110	mJ
IAS	Avalanche Current	22	A
$P_D@T_C=25^\circ C$	Total Power Dissipation <sup>4</sup>	103	W
TSTG	Storage Temperature Range	-55 to 150	°C
$T_J$	Operating Junction Temperature Range	-55 to 150	°C
$R_{\theta JA}$	Thermal Resistance Junction-ambient <sup>1</sup>	63	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case <sup>1</sup>	1.46	°C/W

### 3. Electrical Characteristics (T<sub>J</sub>=25°C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	68	72	---	V
ΔBVDSS/ΔT <sub>J</sub>	BVDSS Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =1mA	---	0.023	---	V/°C
RDS(ON)	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =10A	---	7.2	9.0	mΩ
VGS(th)	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	2.0	3.0	4.0	V
ΔVGS(th)	VGS(th) Temperature Coefficient		---	-4.2	---	mV/°C
IDSS	Drain-Source Leakage Current	V <sub>DS</sub> =68V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	1	uA
		V <sub>DS</sub> =68V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C	---	---	5	
IGSS	Gate-Source Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	---	---	±100	nA
Q <sub>g</sub>	Total Gate Charge (4.5V)	V <sub>DS</sub> =30V, I <sub>D</sub> =30A, V <sub>GS</sub> =10V	---	35	---	nC
Q <sub>gs</sub>	Gate-Source Charge		---	11	---	
Q <sub>gd</sub>	Gate-Drain Charge		---	9	---	
Td(on)	Turn-On Delay Time	V <sub>DS</sub> =30V, I <sub>D</sub> =30A, R <sub>GEN</sub> =3Ω, V <sub>GS</sub> =10V	---	15	---	ns
T <sub>r</sub>	Rise Time		---	90	---	
Td(off)	Turn-Off Delay Time		---	45	---	
T <sub>f</sub>	Fall Time		---	30	---	
Ciss	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz	---	400	---	pF
Coss	Output Capacitance		---	267	---	
Crss	Reverse Transfer Capacitance		---	250	---	
IS	Continuous Source Current <sup>1,5</sup>	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	80	A
ISM	Pulsed Source Current <sup>2,5</sup>		---	---	320	A
VSD	Diode Forward Voltage <sup>2</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> =80A	---	---	1.2	V
trr	Reverse Recovery Time	T <sub>J</sub> =25°C I <sub>F</sub> =20A, dI/dt=100A/μs	---	78	---	nS
Q <sub>rr</sub>	Reverse Recovery Charge		---	51	---	nC

#### Note :

- 1、The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 20Z 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<sub>J</sub>=25°C, VDD =35V, V<sub>G</sub>=10V, R<sub>G</sub>=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. Typical Characteristics

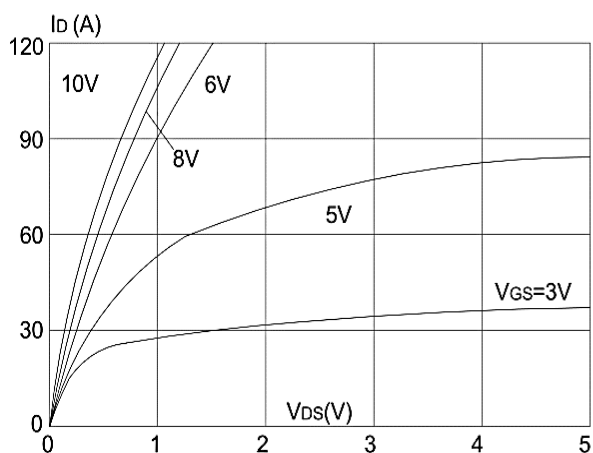


Figure1: Output Characteristics

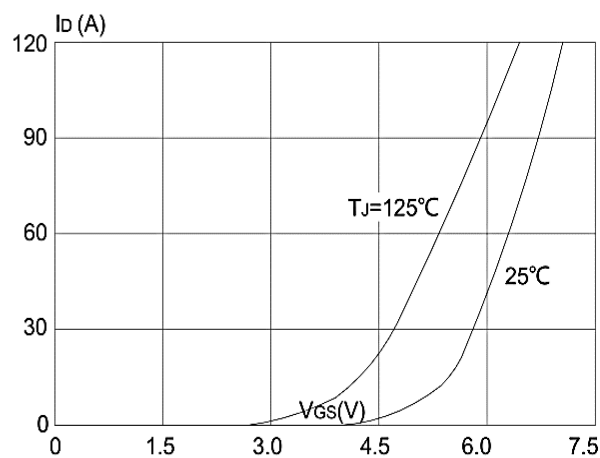


Figure 2: Typical Transfer Characteristics

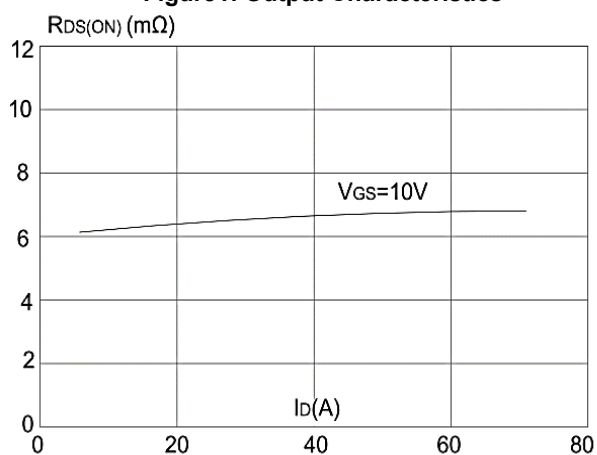


Figure 3: On-resistance vs. Drain Current

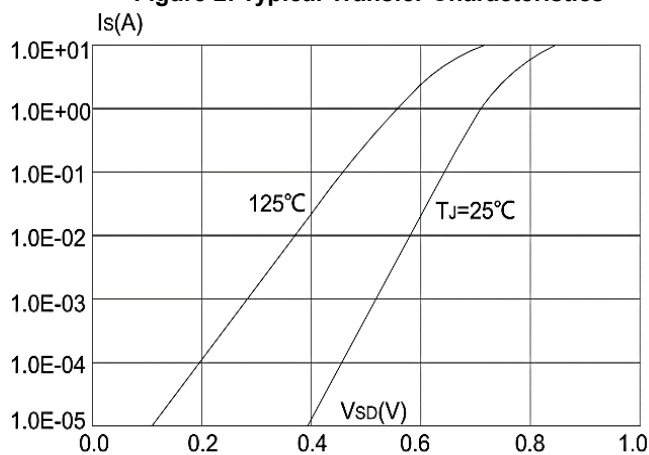


Figure 4: Body Diode Characteristics

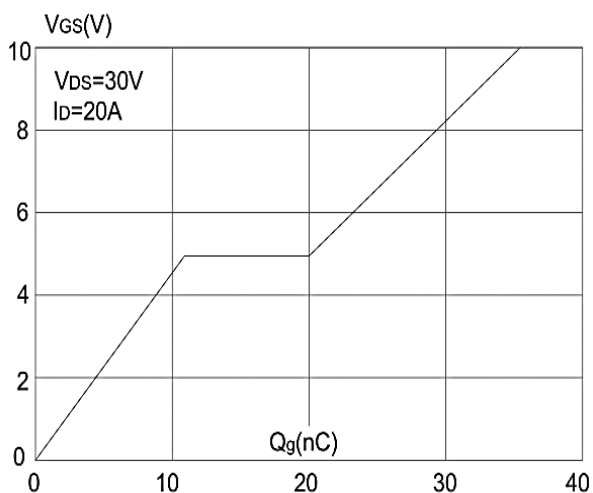


Figure 5: Gate Charge Characteristics

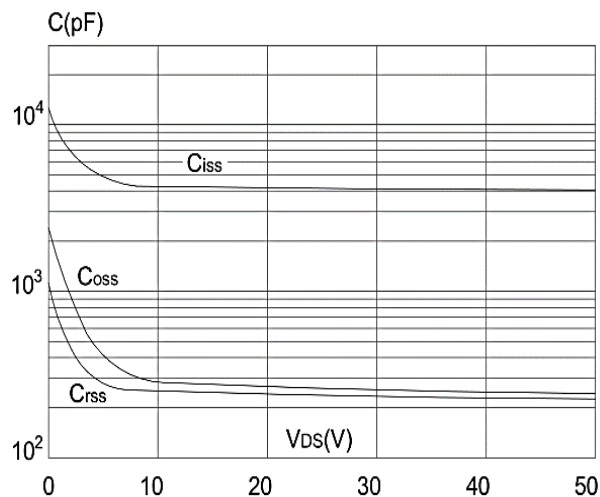
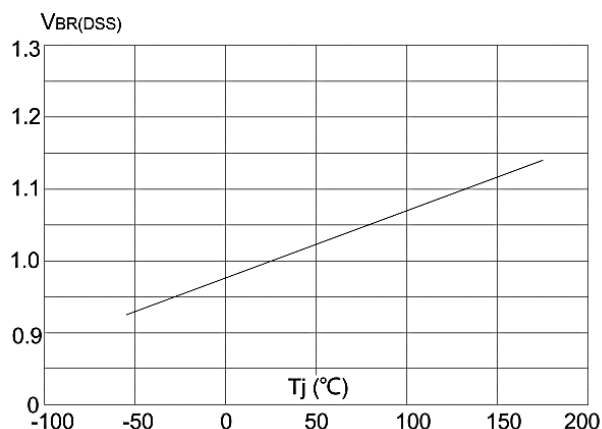
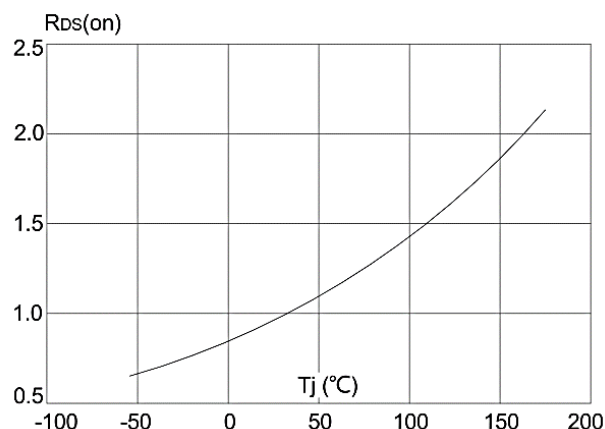


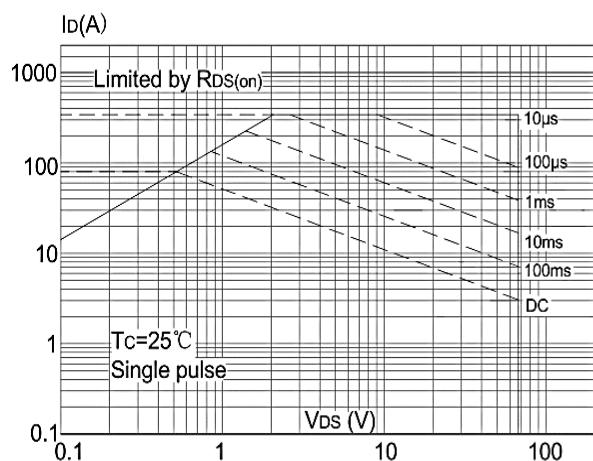
Figure 6: Capacitance Characteristics



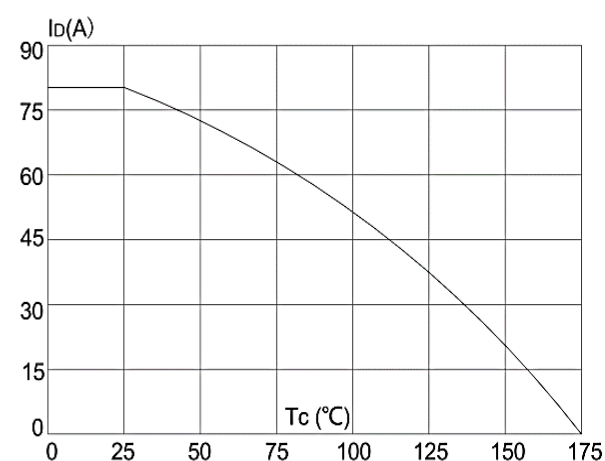
**Figure 7: Normalized Breakdown Voltage vs. Junction Temperature**



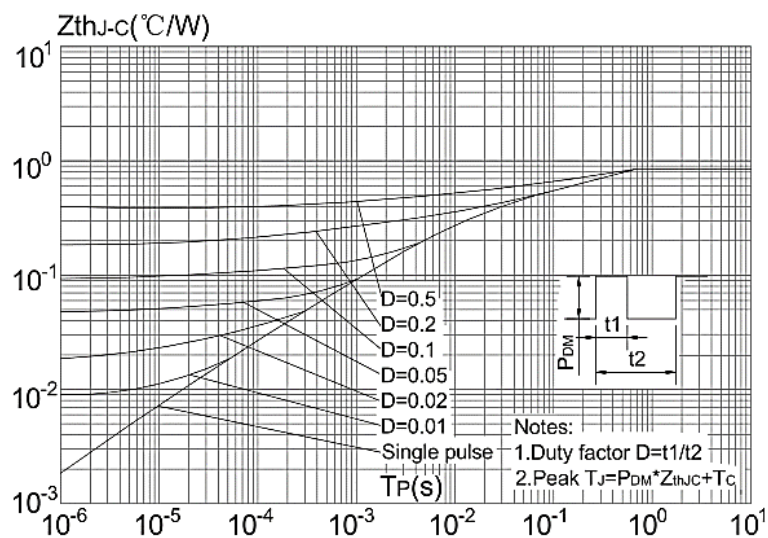
**Figure 8: Normalized on Resistance vs. Junction Temperature**



**Figure 9: Maximum Safe Operating Area**



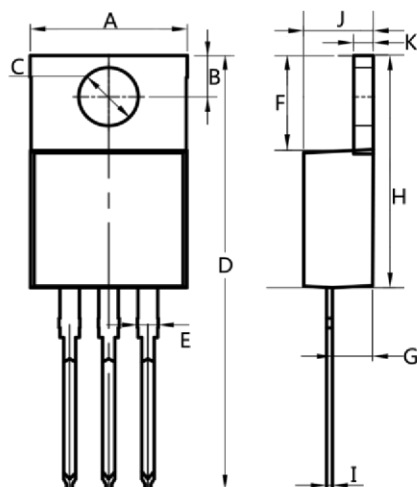
**Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature**



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

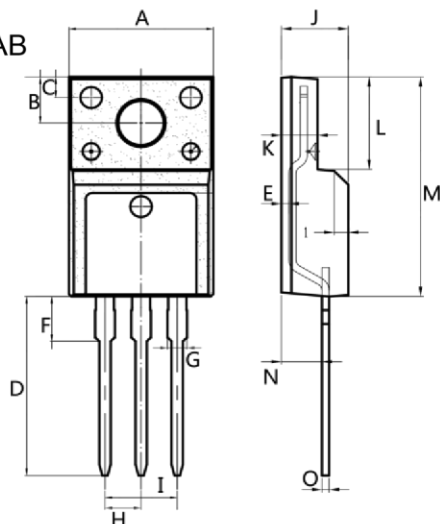
## 5.Package Mechanical Data

TO-220AB



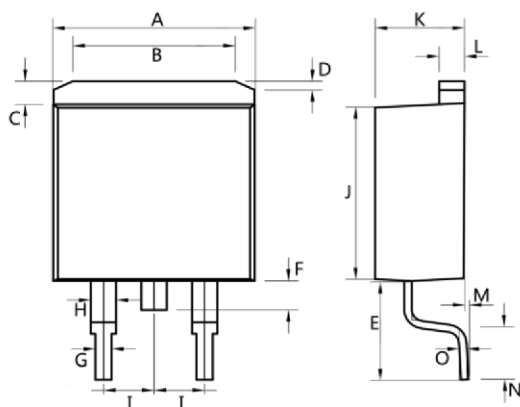
Dim.	Min.	Max.
A	10.0	10.4
B	2.5	3.0
C	3.5	4.0
D	28.0	30.0
E	1.1	1.5
F	6.2	6.6
G	2.9	3.3
H	15.0	16.0
I	0.35	0.45
J	4.3	4.7
K	1.2	1.4
All Dimensions in millimeter		

ITO-220AB



Dim.	Min.	Max.
A	9.9	10.3
B	2.9	3.5
C	1.15	1.45
D	12.75	13.25
E	0.55	0.75
F	3.1	3.5
G	1.25	1.45
H	Typ 2.54	
I	Typ 5.08	
J	4.55	4.75
K	2.4	2.7
L	6.35	6.75
M	15.0	16.0
N	2.75	3.15
O	0.45	0.60
All Dimensions in millimeter		

TO-263



Dim.	Min.	Max.
A	10.0	10.5
B	7.25	7.75
C	1.3	1.5
D	0.55	0.75
E	5.0	6.0
F	1.4	1.6
G	0.75	0.95
H	1.15	1.35
I	Typ 2.54	
J	8.4	8.6
K	4.4	4.6
L	1.25	1.45
M	0.02	0.1
N	2.4	2.8
O	0.35	0.45
All Dimensions in millimeter		