S80N09KT

9mΩ, 80V, N-Channel Power MOSFET

General Description

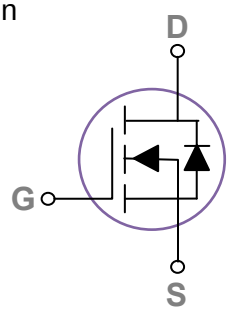
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

BV_{DSS}	$R_{DS(ON)}$Max.	I_D
80V	9.0mΩ	90A

Features

- *80V,90A, $R_{DS(ON)}$Max. =9.0mΩ@V_{GS} = 10V*
- *Improved dv/dt capability*
- *Fast switching*
- *Green Device Available*

TO-220 Pin Configuration



Applications

- *Networking*
- *Load Switch*
- *LED applications*

Absolute Maximum Ratings **Tc=25℃ unless otherwise noted**

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	80	V
V_{GS}	Gate-Source Voltage	±25	V
I_D	Drain Current – Continuous (T_C=25˚C)	90	A
	Drain Current – Continuous (T_C=100˚C)	42	A
I_{DM}	Drain Current – Pulsed[1]	280	A
E_{AS}	Single Pulse Avalanche Energy[2]	360	mJ
I_{AS}	Single Pulse Avalanche Current[2]	85	A
P_D	Power Dissipation (T_C=25˚C)	210	W
T_{STG}	Storage Temperature Range	-50 to 150	˚C
T_J	Operating Junction Temperature Range	-50 to 150	˚C

Note 1: Exceed these limits to damage to the device.
Note 2: Exposure to absolute maximum rating conditions may affect device reliability.

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

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	80			V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=80V , V_{GS}=0V , T_J=25℃			1	uA
		V_{DS}=64V , V_{GS}=0V , T_J=125℃			10	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±25V , V_{DS}=0V			±100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=20A		7.8	9.0	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2	3	4	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient			-8		mV/℃
gfs	Forward Transconductance	V_{DS}=5V , I_D=20A		50		S

Dynamic and switching Characteristics

Q_g	Total Gate Charge[3,4]	V_{DS}=40V , V_{GS}=10V , I_D=10A		70		nC
Q_{gs}	Gate-Source Charge[3,4]			13		
Q_{gd}	Gate-Drain Charge[3,4]			15.2		
$T_{d(on)}$	Turn-On Delay Time[3,4]	V_{DD}=40V , V_{GS}=10V , R_G=6Ω I_D=1A		22		ns
T_r	Rise Time[3,4]			16		
$T_{d(off)}$	Turn-Off Delay Time[3,4]			40		
T_f	Fall Time[3,4]			31		
C_{iss}	Input Capacitance	V_{DS}=30V , V_{GS}=0V , F=1MHz		2800		pF
C_{oss}	Output Capacitance			200		
C_{rss}	Reverse Transfer Capacitance			100		
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, F=1MHz		1.5		Ω

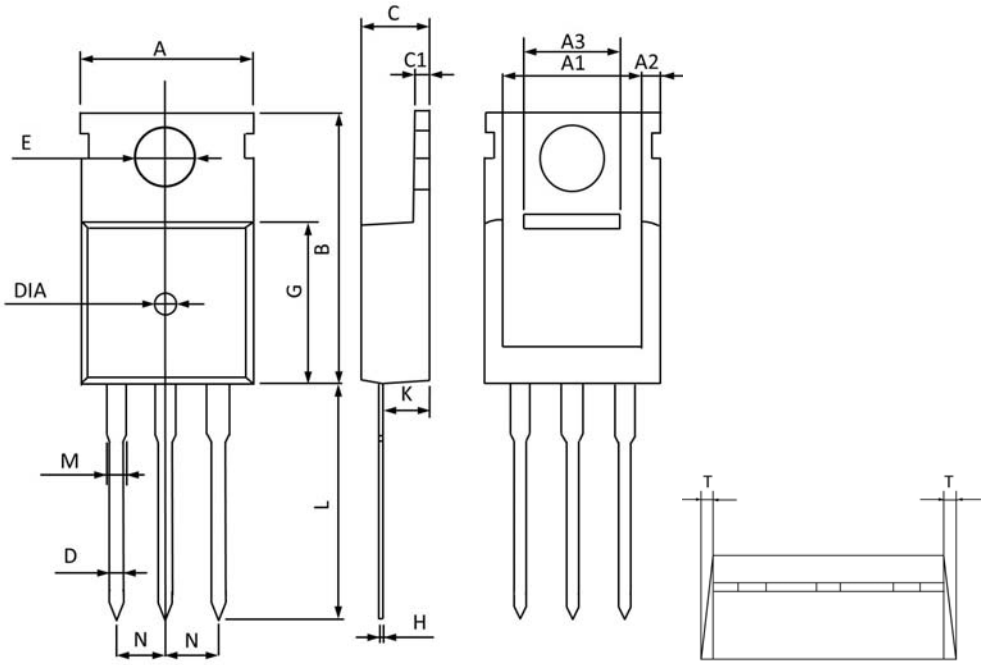
Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current			90	A
I_{SM}	Pulsed Source Current				180	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=1A , T_J=25℃			1	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=60A., Starting T_J=25℃
3. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
4. Essentially independent of operating temperature.

TO-220 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	10.300	9.700	0.406	0.382
A1	8.840	8.440	0.348	0.332
A2	1.250	1.050	0.049	0.041
A3	5.300	5.100	0.209	0.201
B	16.200	15.400	0.638	0.606
C	4.680	4.280	0.184	0.169
C1	1.500	1.100	0.059	0.043
D	1.000	0.600	0.039	0.024
E	3.800	3.400	0.150	0.134
G	9.300	8.700	0.366	0.343
H	0.600	0.400	0.024	0.016
K	2.700	2.100	0.106	0.083
L	13.600	12.800	0.535	0.504
M	1.500	1.100	0.059	0.043
N	2.590	2.490	0.102	0.098
T	W0.35		W0.014	
DIA	Φ1.5 TYP.	deep0.2 TYP.	Φ0.059 TYP.	deep0.008 TYP.