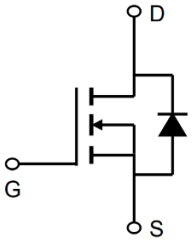
160N10

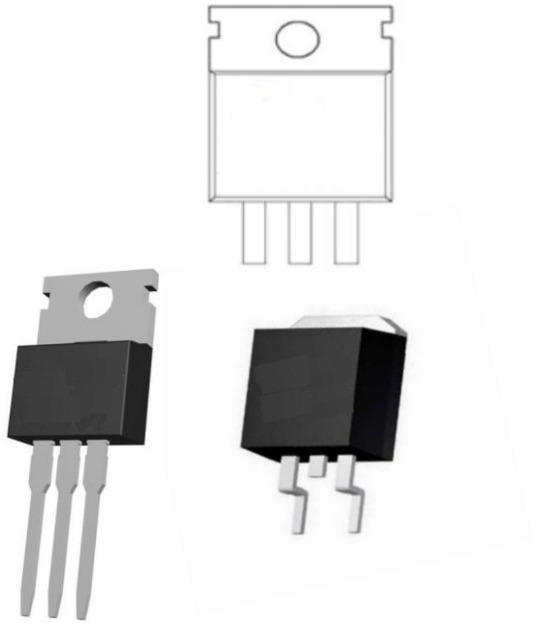
100V N-Channel Enhancement Mode MOSFET

Description

The 160N10 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 10V.

This device is suitable for use as a Battery protection or in other Switching application.





General Features

V_{DS} =100V I_D =160A

$R_{DS(ON)}$ < 4.2mΩ V_{GS}=10V （Type：3.7mΩ）

Application

Battery protection

Load switch

Uninterruptible power supply

Absolute Maximum Ratings (TC=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	100	V
VGS	Gate-Source Voltage	±20	V
ID@TC=25℃	Continuous Drain Current, VGS @ 10V	160	A
ID@TC=100℃	Continuous Drain Current, VGS @ 10V	105	A
IDM	Pulsed Drain Current	600	A
EAS	Single Pulse Avalanche Energy	540	mJ
IAS	Avalanche Current	60	A
PD @TC=25℃	Power dissipation	225	W
TSTG	Storage Temperature Range	-55 to 150	℃
TJ	Operating Junction Temperature Range	-55 to 150	℃
RθJA	Thermal Resistance Junction-Ambient	0.55	℃/W
RθJC	Thermal Resistance Junction-Case	62	℃/W

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V(BR)DSS	Drain-source breakdown voltage	V_{GS}=0V, I_D=250uA	100	110		V
VGS(th)	Gate threshold voltage	V_{DS}=V_{GS},I_D=250uA T_j=25°C	2.5	3.0	4.2	V
IDSS	Zero gate voltage drain current	V_{DS}=100V,V_{GS}=0V T_j=25°C	-	-	1	μA
IDSS	Zero gate voltage drain current	V_{DS}=100V,V_{GS}=0V T_j=125°C	-	-	5	μA
IGSS	Gate-source leakage current	V_{GS}=20V,V_{DS}=0V	-	-	100	nA
RDS(on)	Drain-source on-state resistance	V_{GS}=10V, I_D=80A,T_j=25°C	-	3.7	4.2	mΩ
gfs	Transconductance	V_{DS}=5V,I_D=80A	-	130	-	S
Ciss	Input Capacitance	V_{GS}=0V, V_{DS}=50V, f=1MHz	-	3950	-	pF
Coss	Output Capacitance		-	1200	-	pF
Crss	Reverse Transfer Capacitance		-	45	-	pF
Q_G	Gate Total Charge	T_j=25°C, V_{GS}=10V, V_{DS}=50V,I_D=80A	-	78	-	nC
Qgs	Gate-Source charge		-	32	-	nC
Qgd	Gate-Drain charge		-	17	-	nC
td(on)	Turn-on delay time	V_{GS}=10V, V_{DS}=50V,I_D=80A RG=5Ω	-	27	-	ns
t_r	Rise time		-	52	-	ns
td(off)	Turn-off delay time		-	58	-	ns
t_f	Fall time		-	23	-	nS
R_G	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz	-	0.77	-	Ω
VSD	Body Diode Forward Voltage	V_{GS}=0V,I_{SD}=50A	-	0.85	1.2	V
trr	Body Diode Reverse Recovery Time	I_F=20A, dI/dt=500A/μs	-	82	-	ns
Qrr	Body Diode Reverse Recovery Charge	I_F=20A, dI/dt=500A/μs	-	180	-	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 EAS data shows Max. rating . The test condition is VDD=82V,VGS =10V,L=0.1mH,IAS =53.8A
4、The power dissipation is limited by 150℃ junction temperature
5、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation

Typical Characteristics

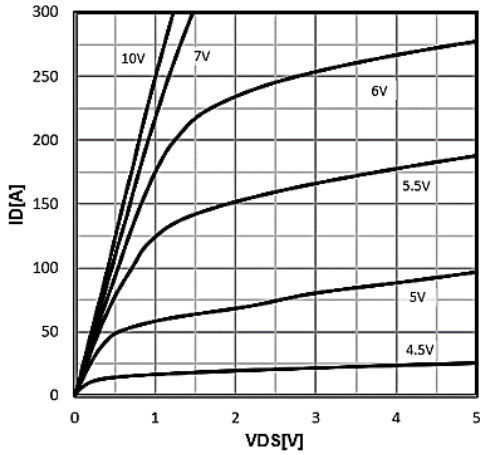


Figure 1. Type. Output Characteristics (Tj=25 ℃)

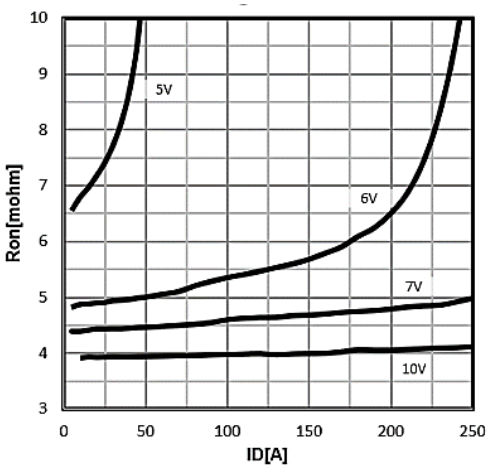


Figure 2. Type. drain-source on resistance

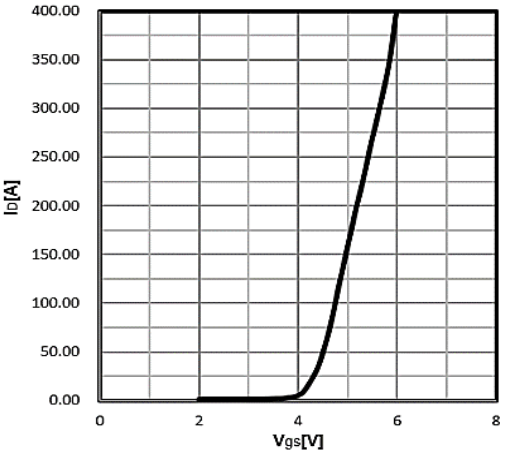


Figure 3. Type. transfer characteristics

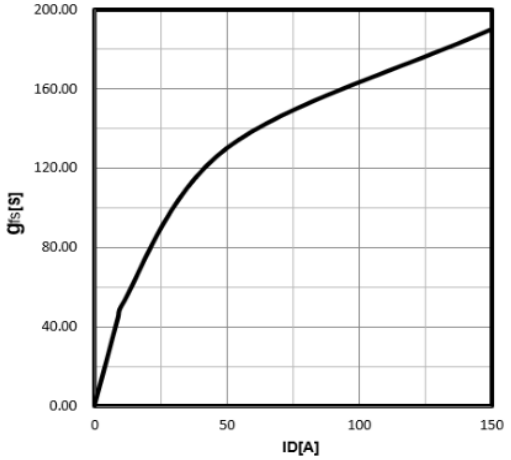


Figure 4. Type. forward transconductance

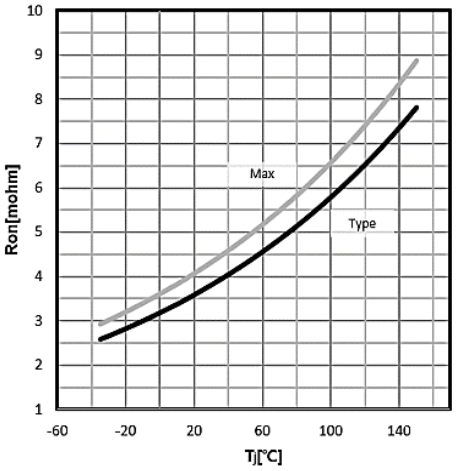


Figure 5. Drain-source on-state resistance
RDS(on) =f(Tj); ID =80A; VGS =10V

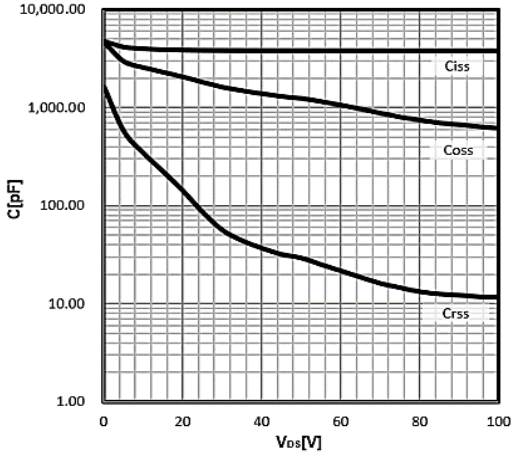


Figure 6 . Body-Diode Characteristics
C=f(VDS); VGS =0V; f=1MHz

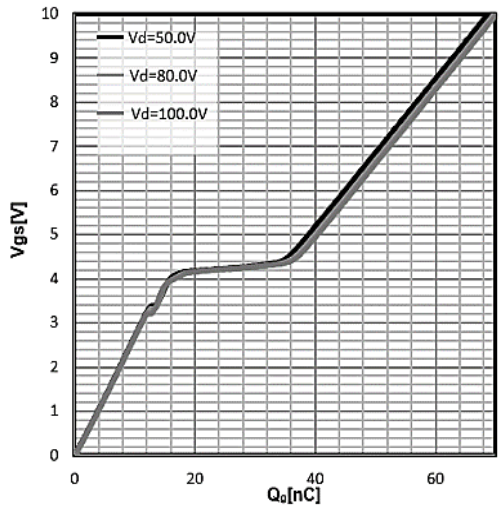


Figure 7. Typ. gate charge
VGS =f(Q gate) ; ID =20A

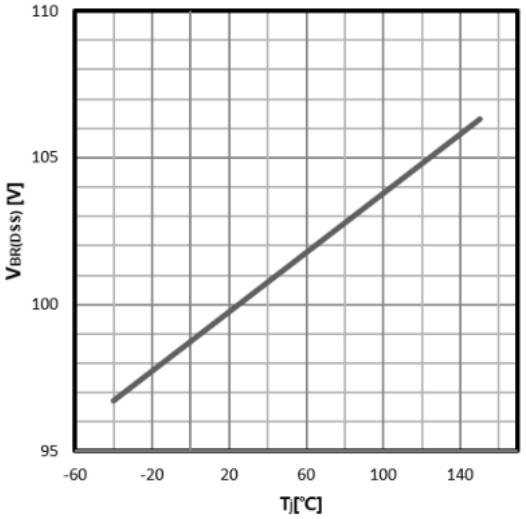


Figure 8. Drain Current Derating
VBR(DSS) =f(T j); I D =250uA

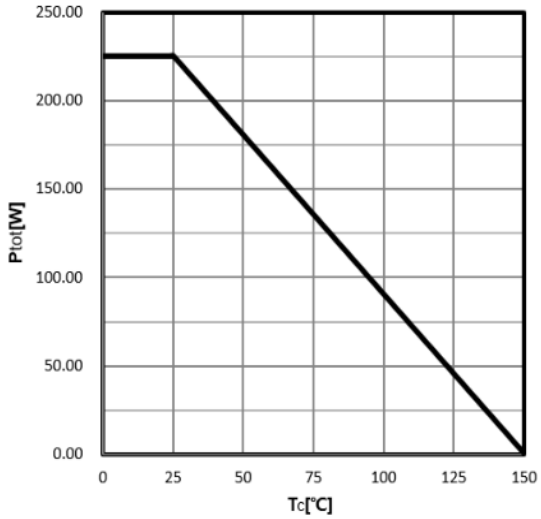


Figure 7. Power Dissipation

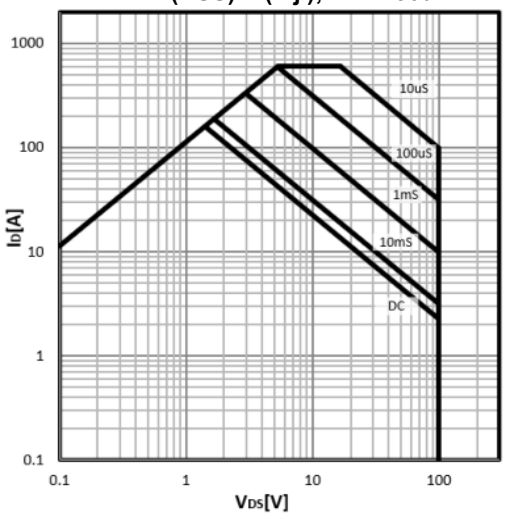


Figure 8. Safe operating area

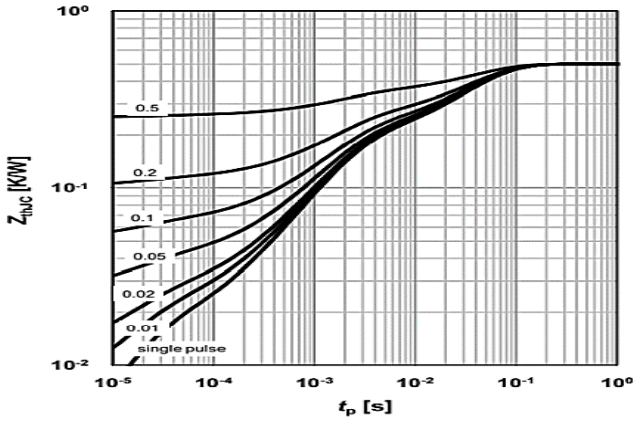


Figure 10. Max. transient thermal impedance

ZthJC =f(tp)

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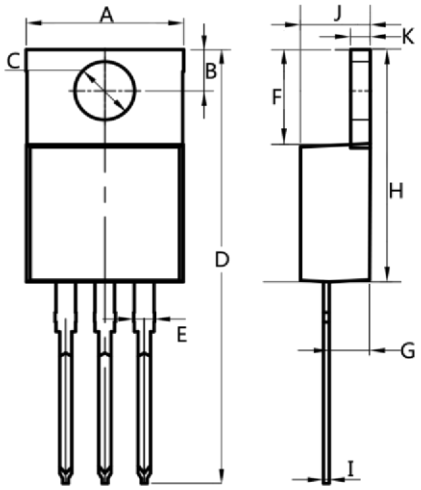

Dim.	Min.	Max.
A	10.0	10.4
B	2.5	3.0
C	3.5	4.0
D	28.0	30.0
E	1.1	1.5
F	6.2	6.6
G	2.9	3.3
H	15.0	16.0
I	0.35	0.45
J	4.3	4.7
K	1.2	1.4
All Dimensions in millimeter		

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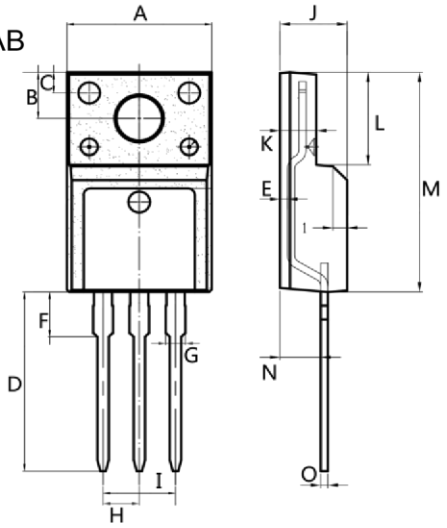
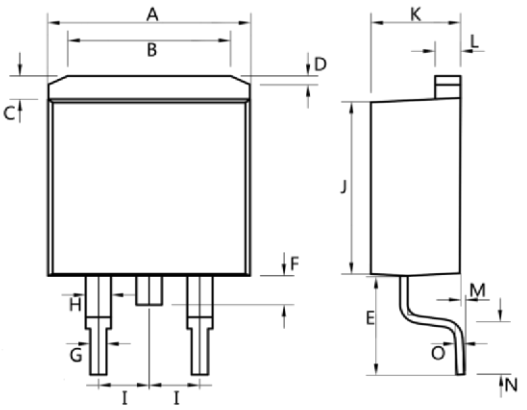


Dim.	Min.	Max.
A	9.9	10.3
B	2.9	3.5
C	1.15	1.45
D	12.75	13.25
E	0.55	0.75
F	3.1	3.5
G	1.25	1.45
H	Typ 2.54	
I	Typ 5.08	
J	4.55	4.75
K	2.4	2. 7
L	6.35	6.75
M	15.0	16.0
N	2.75	3.15
O	0.45	0.60
All Dimensions in millimeter		

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		