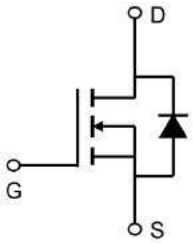
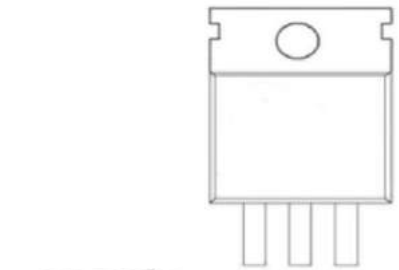
55N10

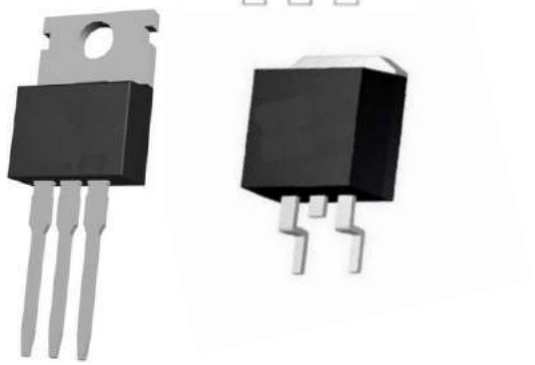
N-Channel Enhancement Mode MOSFET

General Description

The 55N10 uses advanced trench technology to provide excellent $R_{DS(ON)}$,device is suitable for use as a Battery protection or in other Switching application.







Application

Battery protection Load switch

Uninterruptible power supply

General Features

V_{DS} = 100V I_D = 55A

$R_{DS(ON)}$ < 21mΩ @ V_{GS}=10V

Absolute Maximum Ratings at T_j=25℃ unless otherwise noted

Symbol	Parameter	Value	Unit
V_{DS}	Drain source voltage	100	V
V_{GS}	Gate source voltage	±20	V
I_D	Continuous drain current[1], T_C=25 ℃	55	A
$I_{D, pulse}$	Pulsed drain current[2], T_C=25 ℃	110	A
P_D	Power dissipation[3], T_C=25 ℃	50	W
E_{AS}	Single pulsed avalanche energy[5]	57	mJ
T_{stg}， T_j	Operation and storage temperature	-55 to 150	℃

Electrical Characteristics at T_j=25 ℃ unless otherwise specified

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
BVDSS	Drain-source breakdown voltage	V_{GS}=0 V, I_D=250 μA	100			V
VGS(th)	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250 μA	1.4		2.5	V
RDS(ON)	Drain-source on-state resistance	V_{GS}=10 V, I_D=10 A		15	21	mΩ
RDS(ON)	Drain-source on-state resistance	V_{GS}=4.5 V, I_D=7 A		20	26	mΩ
IGSS	Gate-source leakage current	V_{GS}=20 V			100	nA
		V_{GS}=-20 V			-100	
IDSS	Drain-source leakage current	V_{DS}=100 V, V_{GS}=0 V			1	uA
Ciss	Input capacitance	V_{GS}=0 V, V_{DS}=50 V, f=100 kHz		1003.9		pF
Coss	Output capacitance			185.4		pF
Crss	Reverse transfer capacitance			9.8		pF
td(on)	Turn-on delay time	V_{GS}=10 V, V_{DS}=50 V, R_G=10 Ω, I_D=5 A		16.6		ns
t_r	Rise time			3.8		ns
td(off)	Turn-off delay time			75.5		ns
t_f	Fall time			46		ns
Q_g	Total gate charge	I_D=5 A, V_{DS}=50 V, V_{GS}=10 V		16.2		nC
Q_{gs}	Gate-source charge			2.8		nC
Qgd	Gate-drain charge			4.1		nC
Vplateau	Gate plateau voltage			3		V
I_S	Diode forward current	VGS<Vth			16	A
ISP	Pulsed source current				48	
VSD	Diode forward voltage	I_S=[1234] A, V_{GS}=0 V			1.3	V
trr	Reverse recovery time	I_S=[5] A, di/dt=100 A/μs		49		ns
Q_{rr}	Reverse recovery charge			61.8		nC
Irrm	Peak reverse recovery current			2.4		A

1) Calculated continuous current based on maximum allowable junction temperature.

2) Repetitive rating; pulse width limited by max. junction temperature.

3) Pd is based on max. junction temperature, using junction-case thermal resistance.

4) The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a=25 °C.

5) V_{DD}=50 V, R_G=50 Ω, L=0.3 mH, starting T_j=25 °C.

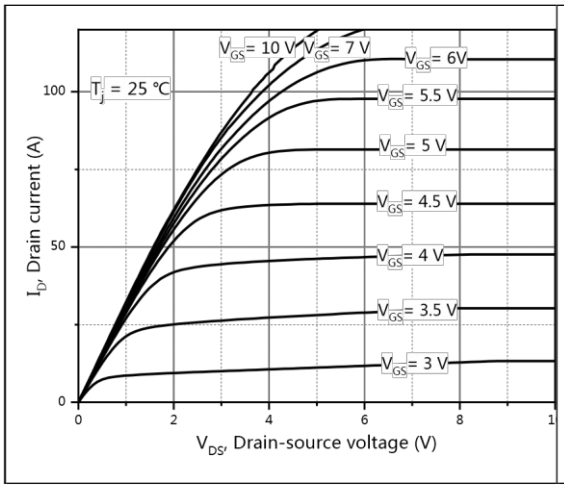


Figure 1, Typ. output characteristics

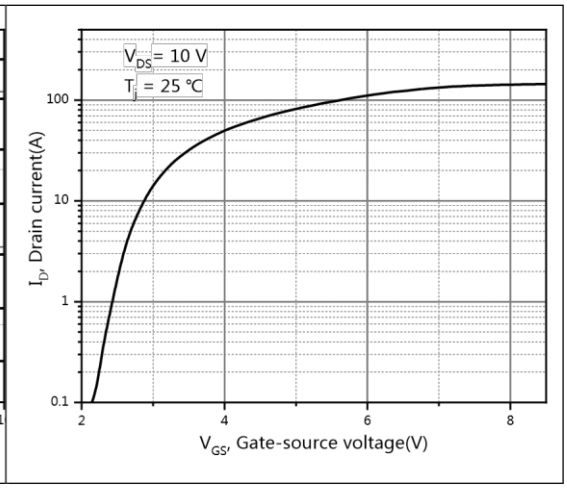


Figure 2, Typ. transfer characteristics

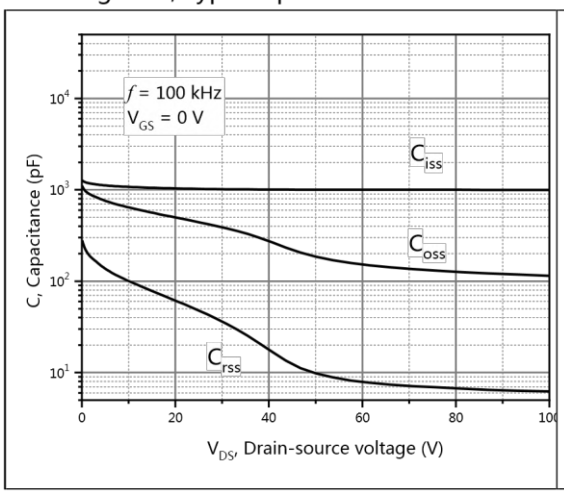


Figure 3, Typ. capacitances

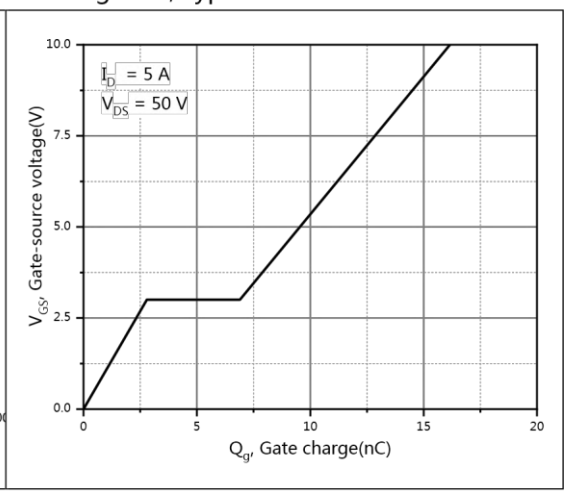


Figure 4, Typ. gate charge

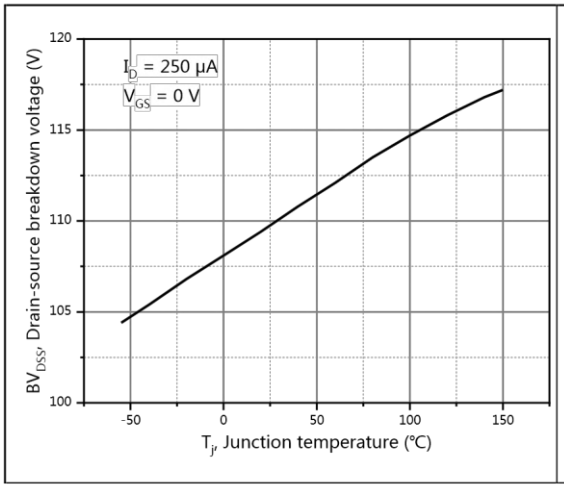


Figure 5, Drain-source breakdown voltage

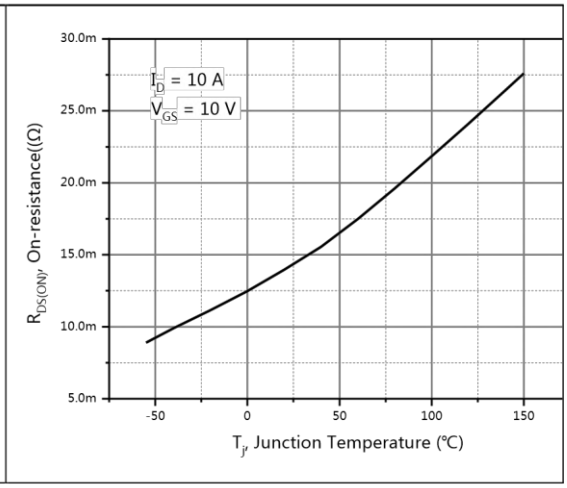


Figure 6, Drain-source on-state resistance

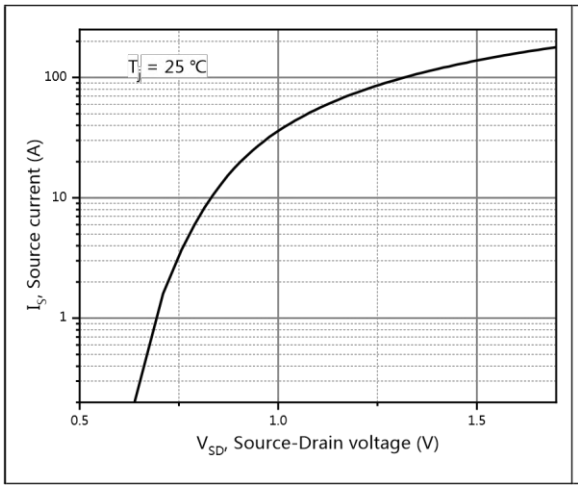


Figure 7, Forward characteristic of body diode

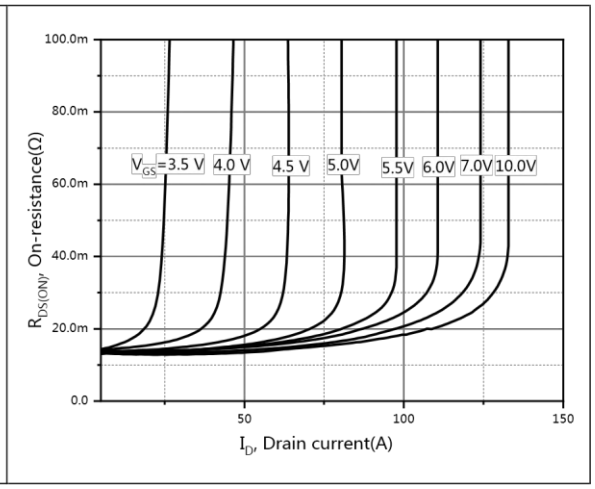


Figure 8, Drain-source on-state resistance

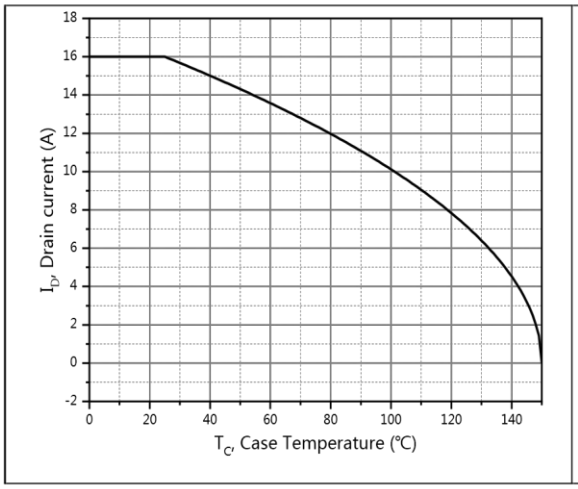


Figure 9, Drain current

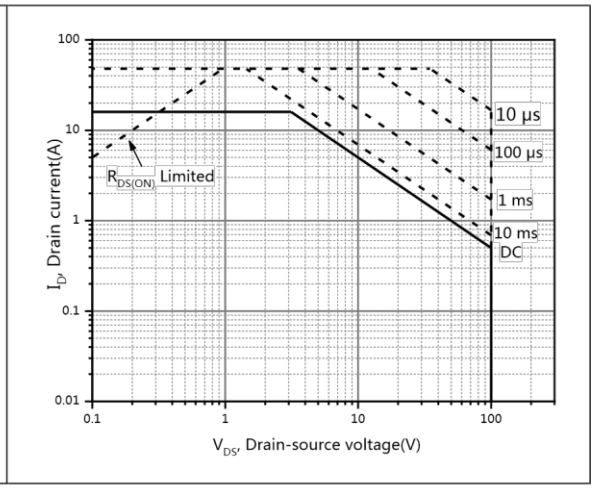
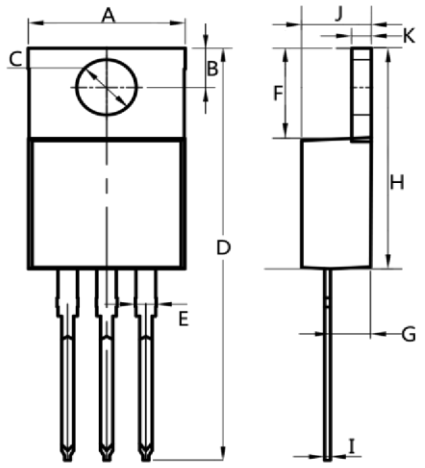


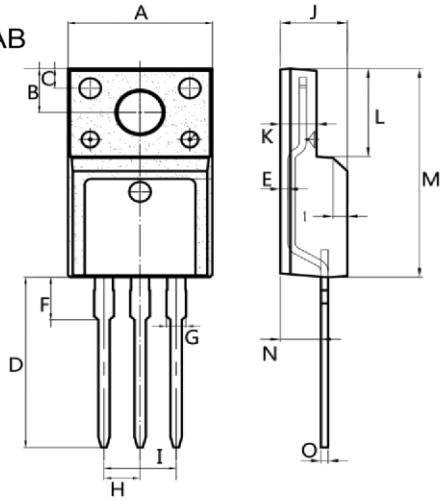
Figure 10, Safe operation area T_C=25 °C

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		

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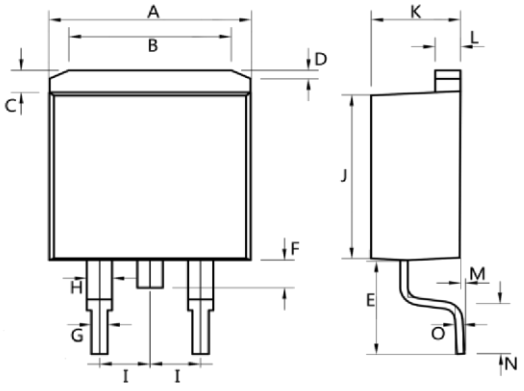

Dim.	Min.	Max.
A	10.0	10. 5
B	7.25	7.75
C	1.3	1.5
D	0.55	0.75
E	5.0	6.0
F	1.4	1.6
G	0.75	0.95
H	1.15	1.35
I	Typ 2.54	
J	8.4	8.6
K	4.4	4.6
L	1.25	1.45
M	0.02	0.1
N	2.4	2.8
O	0.35	0.45
All Dimensions in millimeter		