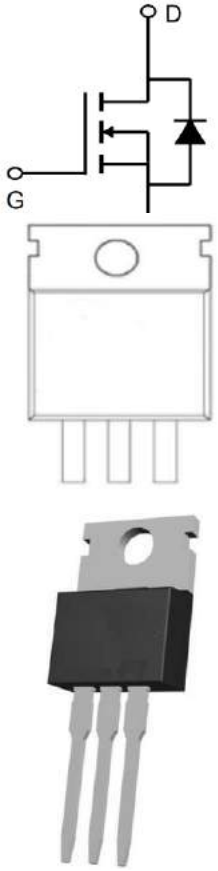
70N10

100V N-Channel Enhancement Mode MOSFET

Description

The 70N10 is silicon N -channel Enhanced VDMOSFETs, is obtained by the self-aligned planar Technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The transistor can be used in various power switching circuit for system miniaturization and higher efficiency.



General Features

VDS =100V,ID =70A

RDS(ON) <14mΩ@ VGS=10V

Application

Power amplifier

motor drive

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

Symbol	Parameter	Value	Unit
VDSS	Drain-Source Voltage	100	V
ID	Continuous Drain Current	70	A
IDM	Pulsed Drain Current	560	A
VGSS	Gate-Source Voltage	±20	V
E_{AS}	Single Pulse Avalanche Energy	2943	mJ
IAR	Avalanche Current	32	A
E_{AR}	Repetitive Avalanche Energy	36	mJ
P_D	Power Dissipation (T_C = 25ºC)	500	W
TJ, Tstg	Operating Junction and Storage Temperature Range	-55 to175	ºC
RthJC	Thermal Resistance, Junction-to-Case	0.75	℃/W
RthJA	Thermal Resistance, Junction-to-Ambient	82	℃/W

100V N-Channel Enhancement Mode MOSFET

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

Symbol	Parameter	Test Conditions	Min	Type	Max	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	100	--	--	V
IDSS	Zero Gate Voltage Drain Current	V_{DS} = 100V, V_{GS} = 0V, T_J = 25ºC	--	--	1	μA
		V_{DS} = 80V, V_{GS} = 0V, T_J = 125ºC	--	--	100	
IGSS	Gate-Source Leakage	V_{GS} = +20V,V_{DS}=0V	--	--	100	nA
		V_{GS}=-20V, V_{DS}=0V	--	--	-100	
VGS(th)	Gate-Source Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2.0	--	4.0	V
RDS(on)	Drain-Source On-Resistance (Note3)	V_{GS} = 10V, I_D = 28A	--	12	14	mΩ
gfs	Forward Transconductance	V_{DS} = 10V, ID = 28A		85		S
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 25V, f = 1.0MHz	--	5600	--	pF
C_{oss}	Output Capacitance		--	610	--	
C_{rss}	Reverse Transfer Capacitance		--	260	--	
Q_g	Total Gate Charge	V_{DD} =50V, I_D = 28A, V_{GS} = 0 to 10V	--	60	--	nC
Q_{gs}	Gate-Source Charge		--	15	--	
Q_{gd}	Gate-Drain Charge		--	45	--	
td(on)	Turn-on Delay Time	VDD = 50V, ID =28A, VGS= 10V R_G = 2.5 Ω	--	20	--	ns
t_r	Turn-on Rise Time		--	28	--	
td(off)	Turn-off Delay Time		--	65	--	
t_f	Turn-off Fall Time		--	15	--	
I_S	Continuous Body Diode Current	T_C = 25 ºC	--	--	57	A
ISM	Pulsed Diode Forward Current		--	--	230	
V_{SD}	Body Diode Voltage	T_J = 25ºC, I_{SD} = 28A, V_{GS} = 0V	--	--	1.5	V
trr	Reverse Recovery Time	V_{GS} = 0V,I_S = 28A, di_F/dt =100A /μs	--	195	--	ns
Q_{rr}	Reverse Recovery Charge		--	107	--	μC

Notes

1、Repetitive Rating: Pulse width limited by maximum junction temperature

2、I_{AS} = 58A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25 ºC

3、Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%

Typical Characteristics

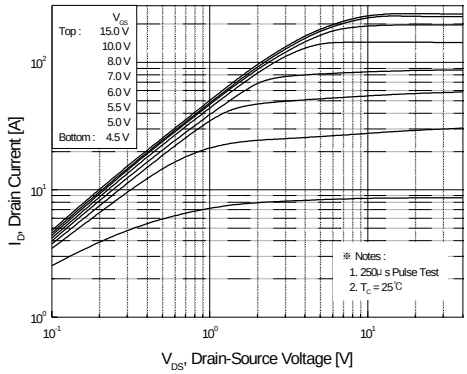


Figure 1. On-Region Characteristics

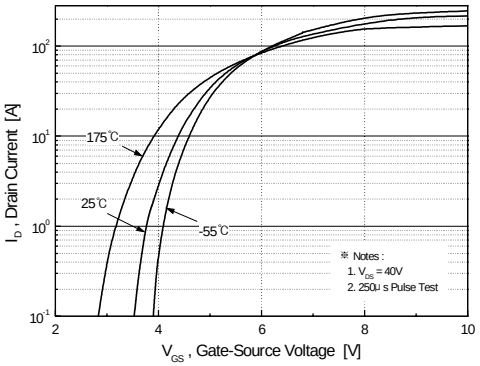


Figure 2. Transfer Characteristics

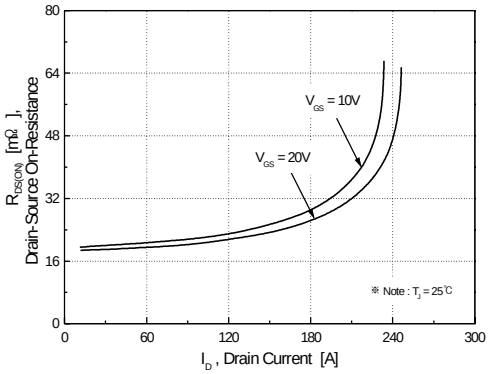


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

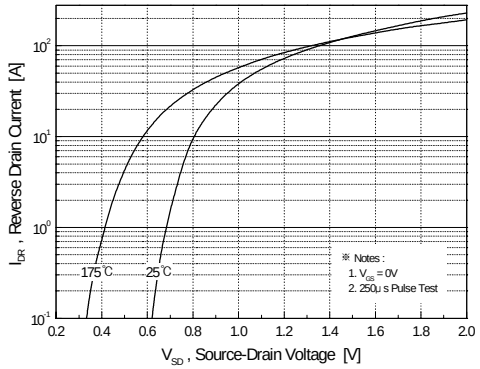


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

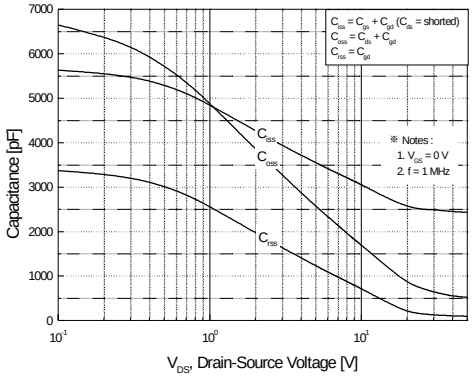


Figure 5. Capacitance Characteristics

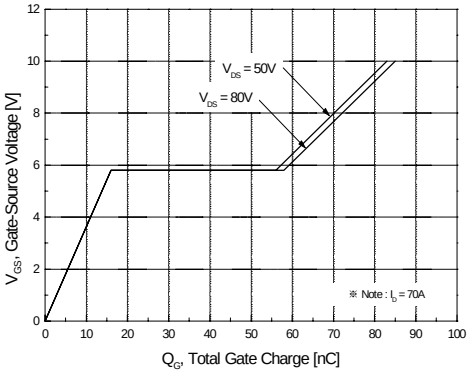


Figure 6. Gate Charge Characteristics

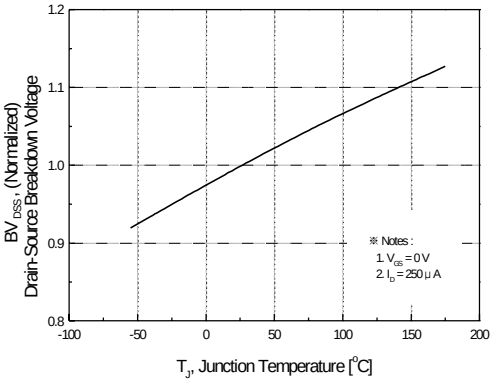


Figure 7. Breakdown Voltage Variation vs. Temperature

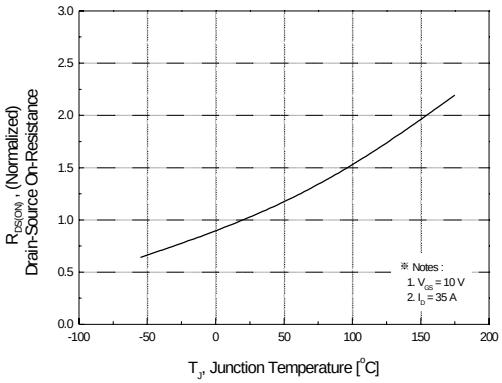


Figure 8. On-Resistance Variation vs. Temperature

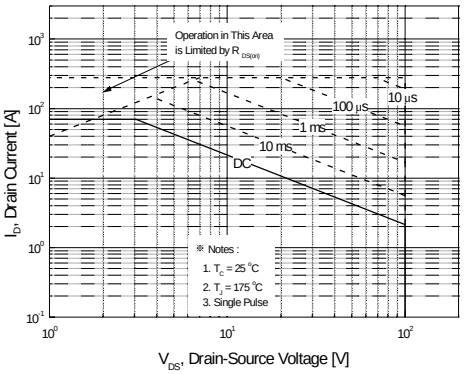


Figure 9. Maximum Safe Operating Area

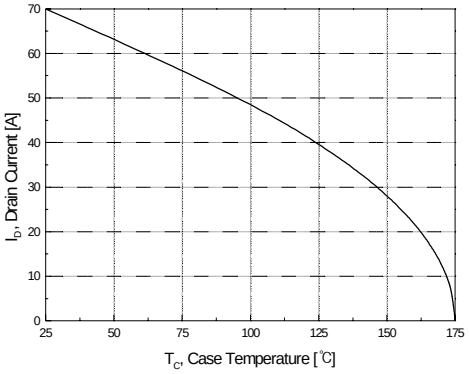


Figure 10. Maximum Drain Current vs. Case Temperature

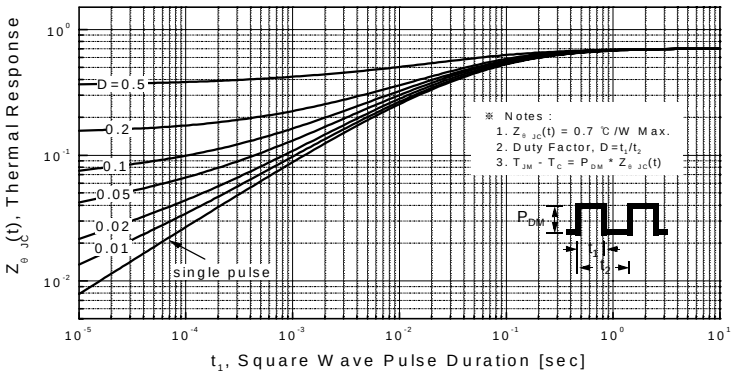


Figure 11. Transient Thermal Response Curve

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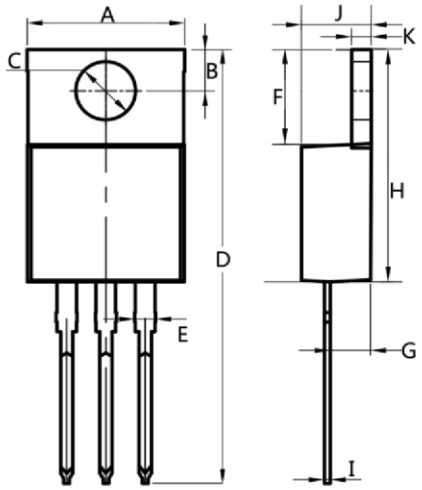

Dim.	Min.	Max.
A	10.0	10.4
B	2.5	3.0
C	3.5	4.0
D	28.0	30.0
E	1.1	1.5
F	6.2	6.6
G	2.9	3.3
H	15.0	16.0
I	0.35	0.45
J	4.3	4.7
K	1.2	1.4
All Dimensions in millimeter		

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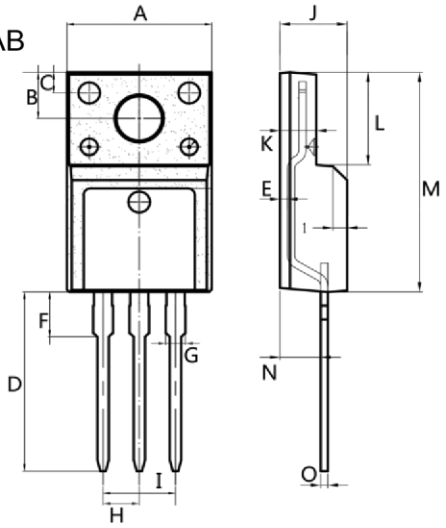

Dim.	Min.	Max.
A	9.9	10.3
B	2.9	3.5
C	1.15	1.45
D	12.75	13.25
E	0.55	0.75
F	3.1	3.5
G	1.25	1.45
H	Typ 2.54	
I	Typ 5.08	
J	4.55	4.75
K	2.4	2. 7
L	6.35	6.75
M	15.0	16.0
N	2.75	3.15
O	0.45	0.60
All Dimensions in millimeter		

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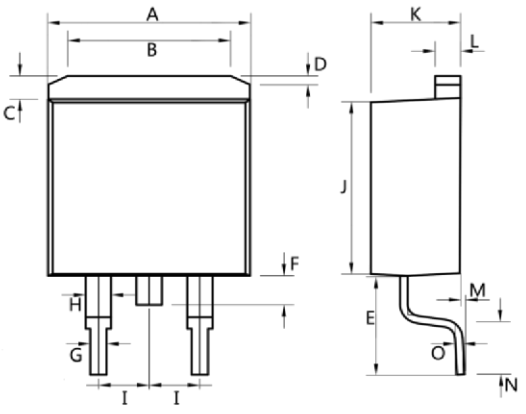

Dim.	Min.	Max.
A	10.0	10. 5
B	7.25	7.75
C	1.3	1.5
D	0.55	0.75
E	5.0	6.0
F	1.4	1.6
G	0.75	0.95
H	1.15	1.35
I	Typ 2.54	
J	8.4	8.6
K	4.4	4.6
L	1.25	1.45
M	0.02	0.1
N	2.4	2.8
O	0.35	0.45
All Dimensions in millimeter		