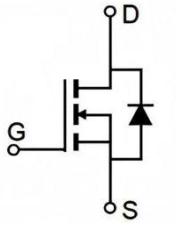
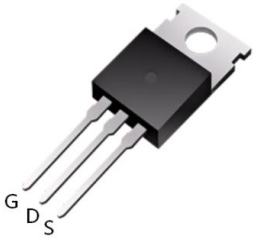
N-Channel Enhancement Mode MOSFET

Parameter	Value	Unit
V_{DS}	40	V
$R_{DS(on)}$ @VGS=10V	2.0	mΩ
I_D	140	A





TO-220

Features

- Ultra-Low RDS(ON)
- Low Gate Charge
- High Current Capability

Applications

- Load switch
- Battery management system
- Uninterrupible Power Supplies

Absolute Maximum Ratings(Ta=25℃,unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Continue Drain Current	I_D	140	A
Pulsed Drain Current (Note1)	I_{DM}	380	A
Power Dissipation	P_D	96	W
Single Pulse Avalanche Energy (Note1)	E_{AS}	500	mJ
Operating Temperature Range	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Case	$R_{\theta JC}$	1.3	°C/W
Thermal Resistance from Junction to Ambient 3)	$R_{\theta JA}$	62	°C/W

Note:

1) Pulse Test: Pulse Width ≤ 100μs, Duty Cycle ≤ 2%, Repetitive rating, pulse width limited by $T_{J(MAX)}$=150°C.
2) Limited by $T_{J(MAX)}$, starting T_J=25°C, L=0.5mH, R_g=25Ω
3) Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate in still air.

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

Parameter	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	BV_{DSS}	40	-	-	V
Drain-Source Leakage Current	V_{DS}=40V, V_{GS}=0V	I_{DSS}	-	-	1	μA
Gate Leakage Current	V_{GS}= ± 20V, V_{DS}=0V	I_{GSS}	-	-	±100	nA
Gate-Source Threshold Voltage	V_{DS}=VGS , I_D=250μA	$V_{GS(th)}$	1	-	2.2	V
Drain-Source On-State Resistance (Note	V_{GS}=10V, I_D=20A	$R_{DS(on)}$	-	2.0	2.7	mΩ
	V_{GS}=4.5 V, I_D=15 A		-	2.5	3.5	mΩ
Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1MHz	C_{iss}	-	6680	-	pF
Output Capacitance		C_{oss}	-	1256	-	pF
Reverse Transfer Capacitance		C_{rss}	-	780	-	pF
Turn-on Delay Time(Note2)	V_{DD}=20V, V_{GS}=10V R_G=3.7Ω , I_D=70A	$t_{d(ON)}$	-	25	-	ns
Rise Time(Note2)		t_r	-	80	-	ns
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	85	-	ns
Fall Time(Note2)		t_f	-	42	-	ns
Total Gate Charge(Note2)	V_{DS}=20V , V_{GS}=4.5V I_D=70A	Q_G	-	170	-	nC
Gate to Source Charge(Note2)		Q_{GS}	-	52	-	nC
Gate to Drain Charge(Note2)		Q_{GD}	-	70	-	nC
Maximum Body-Diode Continuous Current		I_S	-	-	140	A
Drain-Source Diode Forward Voltage	V_{GS}=0V , I_S=20A , T_J=25℃	V_{SD}	-	-	1.2	V
Reverse Recovery Time(Note2)	T_J=25℃, I_F=40A	t_{rr}	-	31	-	ns
Reverse Recovery Charge(Note2)	di/dt=100A/μs	Q_{rr}	-	27	-	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. Device mounted on FR-4 PCB, 1inch x 0.85inch x 0.062 inch
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%.

Typical Characteristics

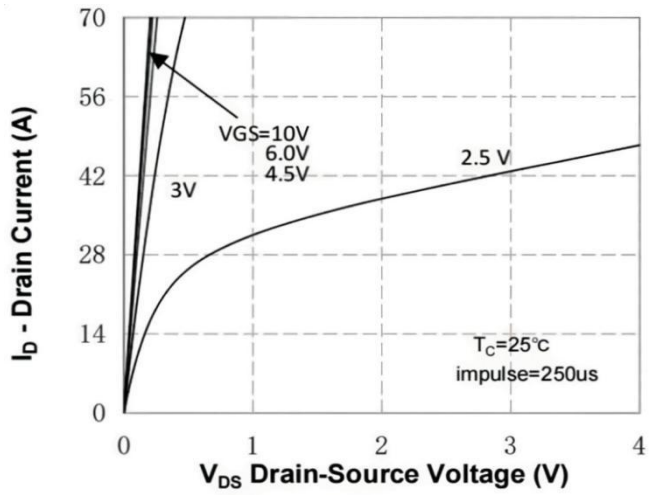


Figure 1. On-Region Characteristics

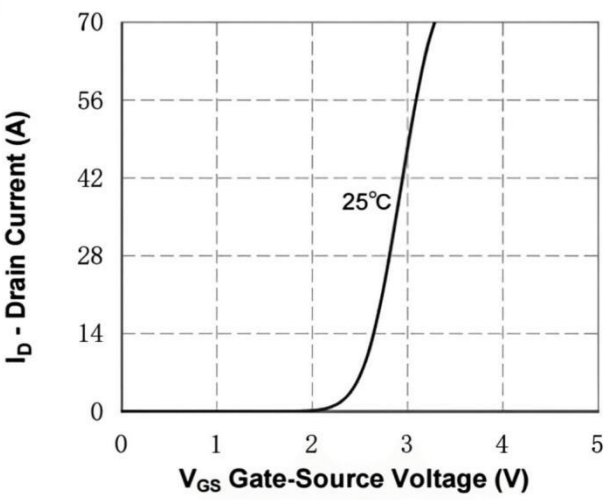


Figure 2. Transfer Characteristics

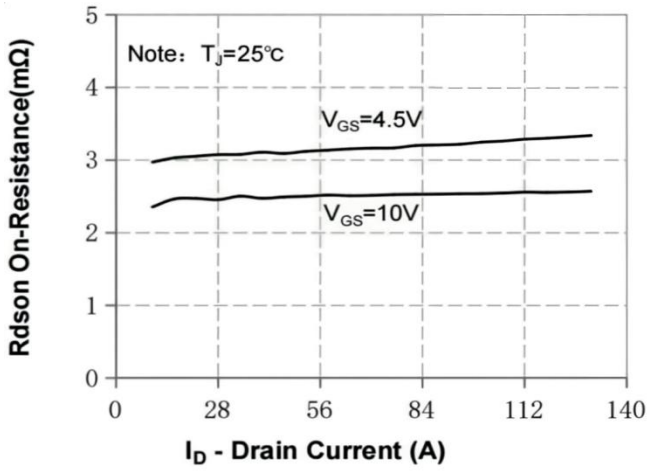


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

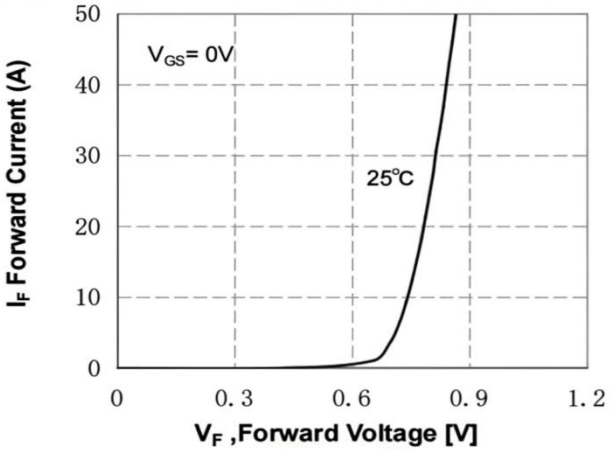


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

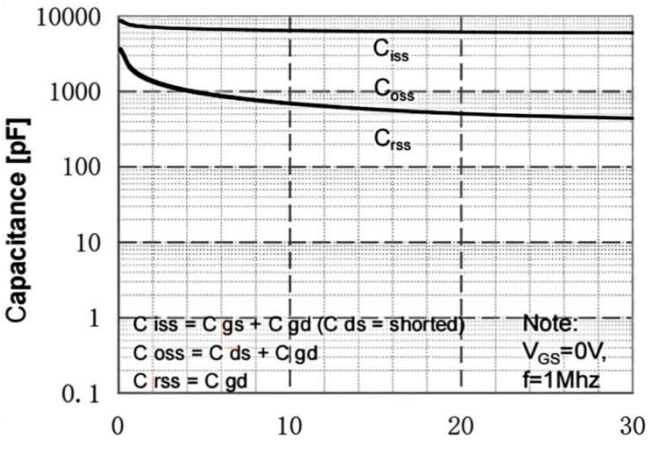


Figure 5. Capacitance Characteristics

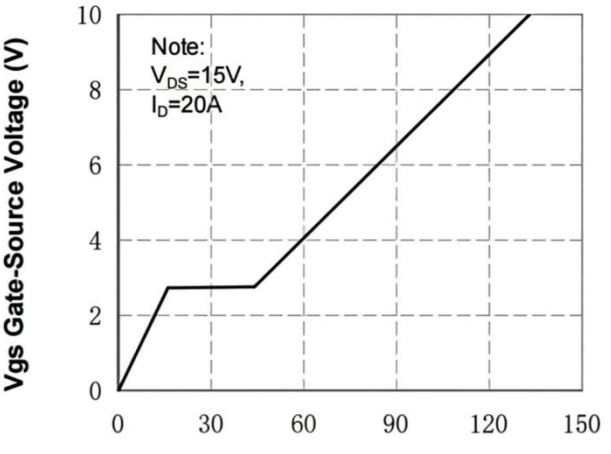


Figure 6. Gate Charge Characteristics

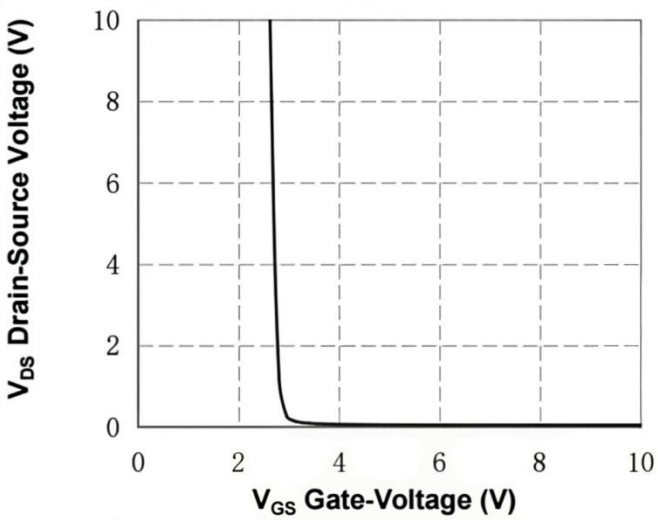


Figure 7. Vds Drain-Source Voltage vs Gate Voltage

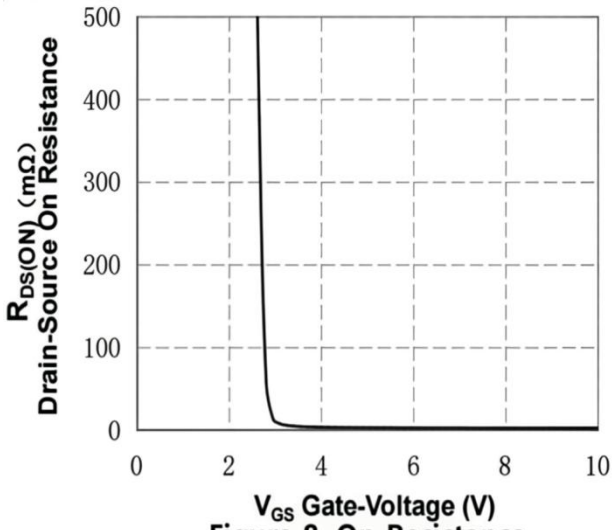


Figure 8. On-Resistance vs Gate Voltage

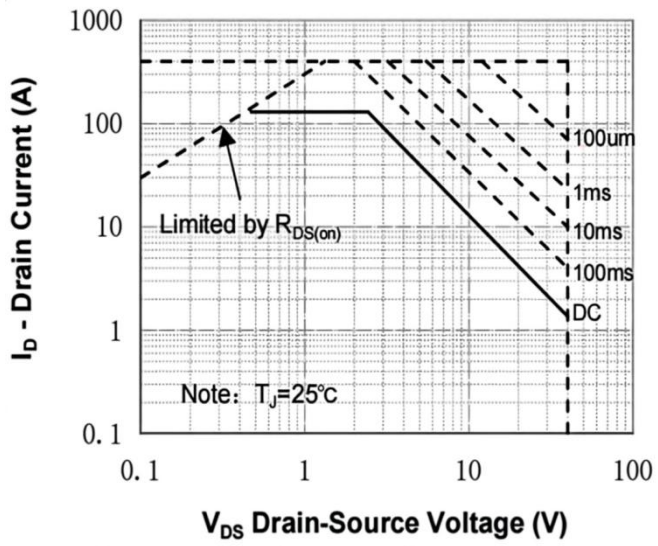


Figure 9. Maximum Safe Operating Area

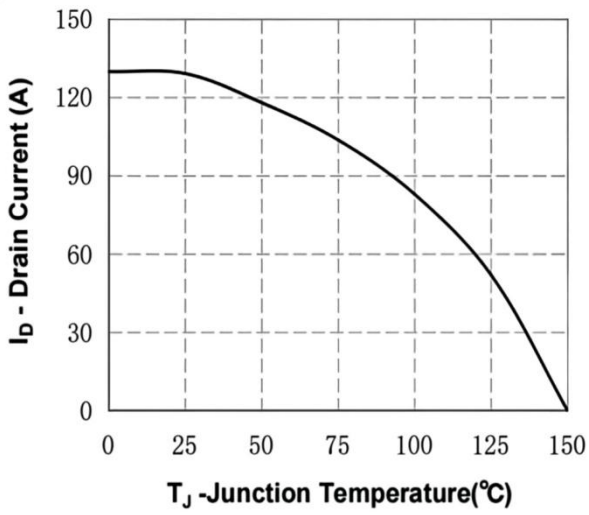


Figure 10. Maximum Continuous Drain Current vs Case Temperature

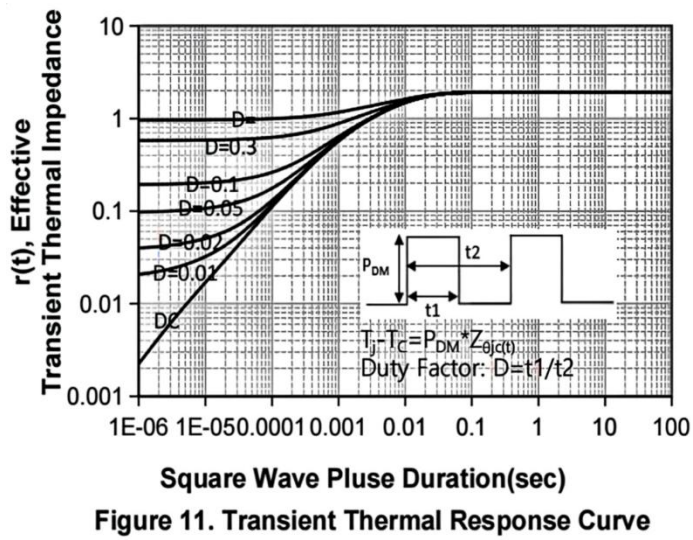
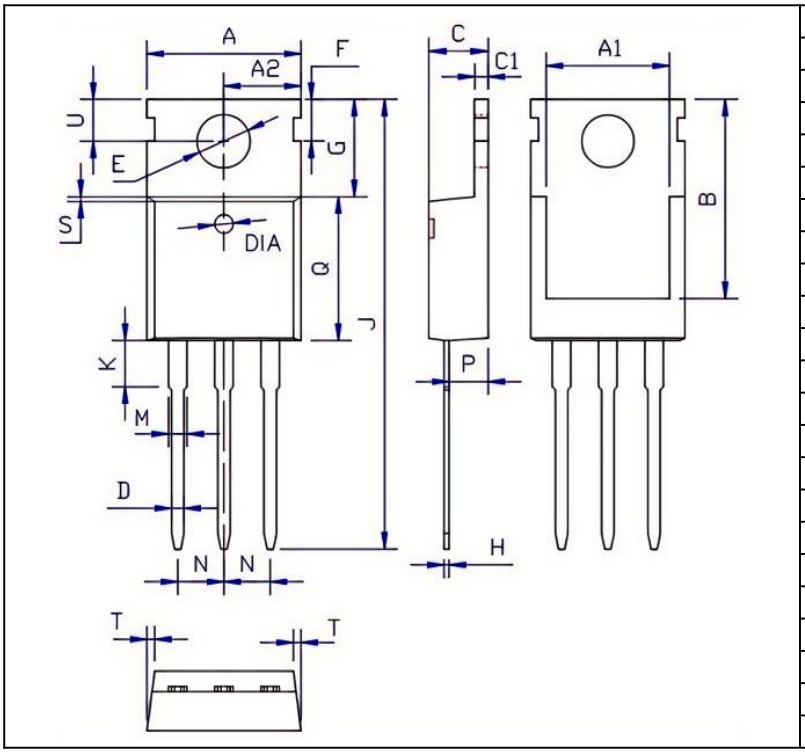


Figure 11. Transient Thermal Response Curve

Package Outline (TO-220) (unit:mm)



Dim.	Min.	Max.
A	9.8	10.2
A1	7.8	8.2
A2	4.8	5.2
B	13	13.4
C	4.35	4.65
C1	1.15	1.45
D	0.65	0.95
E	3.45	3.75
F	2.85	3.15
G	6.4	6.8
H	0.35	0.65
J	28.68	29.08
K	2.8	3.2
M	1.15	1.45
N	Typ2.54	
P	2.2	2.6
Q	9	9.4
S	0.15	0.35
T	0.15	0.35
U	2.65	2.95
DIA	Dia 1.5±0.1 D MAX0.5	
All Dimensions in millimeter		

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