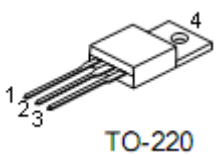
1. Features

- $R_{DS(on)}$=10.5mΩ@ V_{GS}=10V
- Lead free and green device available
- Low Rds-on to minimize conductive loss
- High avalanche current

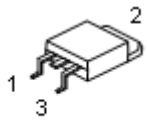
2. Applications

- Power supply
- UPS
- Battery management system

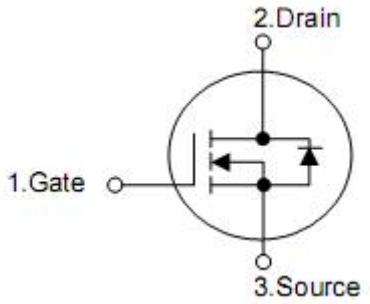
3.Symbol



TO-220



TO-252



Pin	Function
1	Gate
2	Drain
3	Source
4	Drain

4. Absolute maximum ratings

(T_A=25°C,unless otherwise noted)

Parameter		Symbol	Rating	Units
Drain-source voltage		V_{DSS}	60	V
Gate-source voltage		V_{GSS}	±25	V
Continuous drain current	T_C=25ºC	I_D[3]	50	A
	T_C=100ºC		35	A
Pulse drain current	T_C=25ºC	I_{DP}[4]	250	A
Avalanche current		I_{AS}[5]	15	A
Avalanche energy,		E_{AS}[5]	120	mJ
Maximum power dissipation	T_C=25 ºC	P_D	88	W
	T_C=100ºC		44	W
Junction & storage temperature range		T_J,T_{STG}	-55-175	℃

5. Thermal characteristics

Parameter	Symbol	Rating		Unit
		To-252	To-220	
Thermal resistance,Junction-ambient	$R_{\theta JA}$	100	62.5	ºC/W
Thermal resistance,Junction-case	$R_{\theta JC}$	1.1	1.7	ºC/W

6. Electrical characteristics

(T_A=25°C,unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0V,I_{DS}=250μA	60	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=48V, V_{GS}=0V	-	-	1	μA
		T_J=125°C	-	-	20	
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	2.0	3.0	4.0	V
Gate leakage current	I_{GSS}	V_{GS}=±25V, V_{DS}=0V	-	-	±100	nA
Drain-source on-resistance	$R_{DS(on)}$[1]	V_{GS}=10V,I_D=30A	-	10.5	12.5	mΩ
Gate resistance	R_g	V_{DS}=0V, V_{GS}=0V,f=1MHz	-	1.0	-	Ω
Diode forward voltage	V_{SD}[1]	I_{SD}=30A, V_{GS}=0V	-	0.8	1.3	V
Diode continuous forward current	I_S[3]		-	-	50	A
Reverse recovery time	t_{rr}	I_F=30A , dI_{SD}/dt=100A/μs	-	32	-	nS
Reverse recovery charge	Q_{rr}		-	60	-	nC
Input capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V, f=1MHz	-	2060	-	pF
Output capacitance	C_{oss}		-	755	-	
Reverse transfer capacitance	C_{rss}		-	375	-	
Turn-on delay time	$t_{d(on)}$	V_{DD}=30V, I_D=30A, R_G=5Ω,V_{GS}=10V	-	14	-	nS
Rise time	t_r		-	13	-	
Turn-off delay time	$t_{d(off)}$		-	20	-	
Fall time	t_f		-	7.5	-	
Total gate charge	Q_g	V_{DS}=48V, V_{GS}=10V I_{DS}=30A	-	50	-	nC
Gate-source charge	Q_{gs}		-	12	--	
Gate-drain charge	Q_{gd}		-	17	--	

Note:1: Pulse test; pulse width≤300us duty cycle≤2%.

2: Guaranteed by design, not subject to production testing.

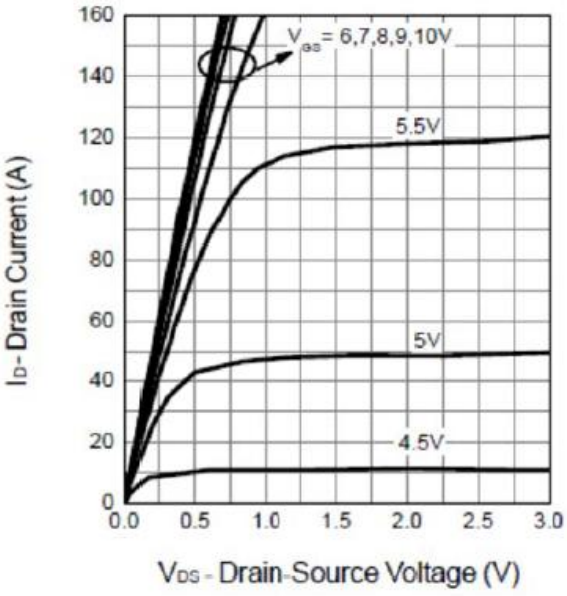
3: Package limitation current is 50A.Calculated continuous current based on maximum allowable junction temperature.

4: Repetitive rating, pulse width limited by max junction temperature.

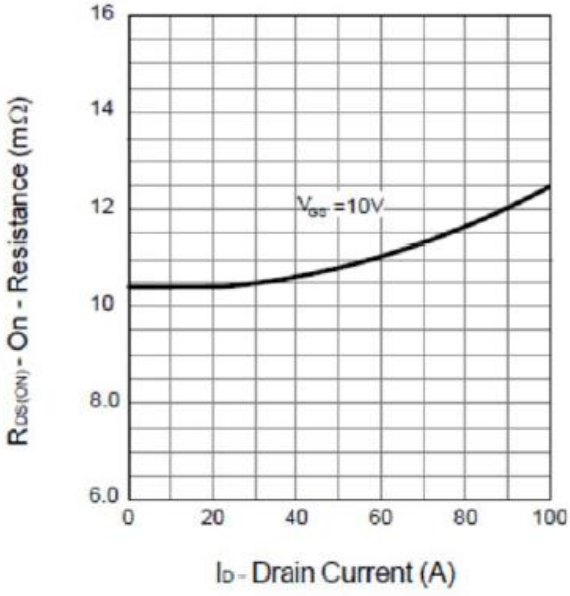
5: Starting T_J=25℃,L=0.5mH,I_{AS}=31A.

7. Test circuits and waveforms

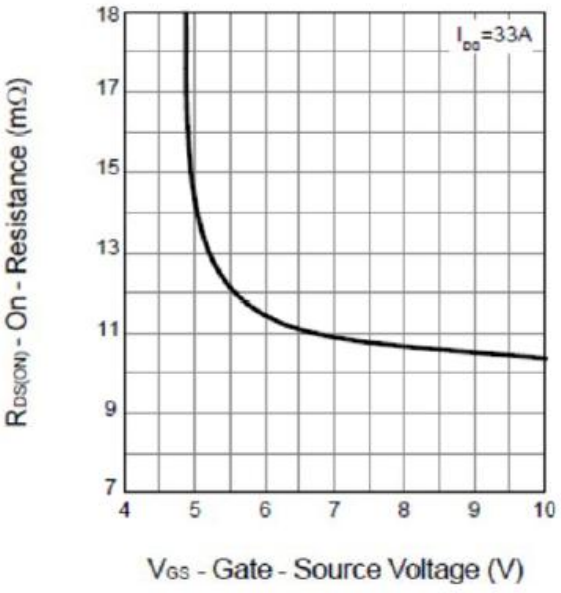
Output Characteristics



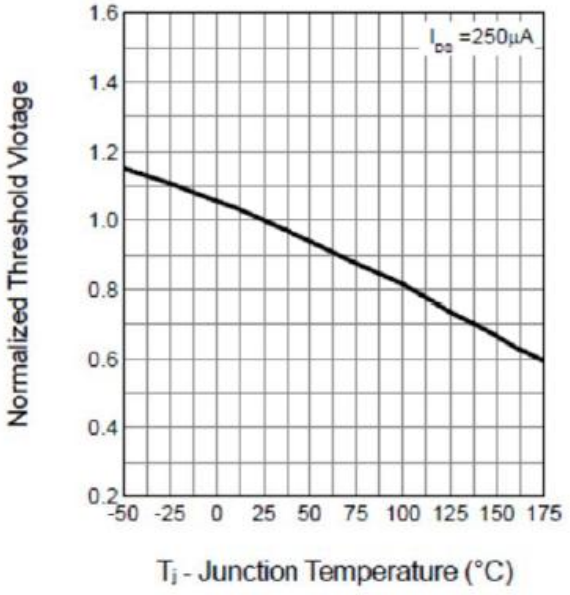
Drain-Source On Resistance

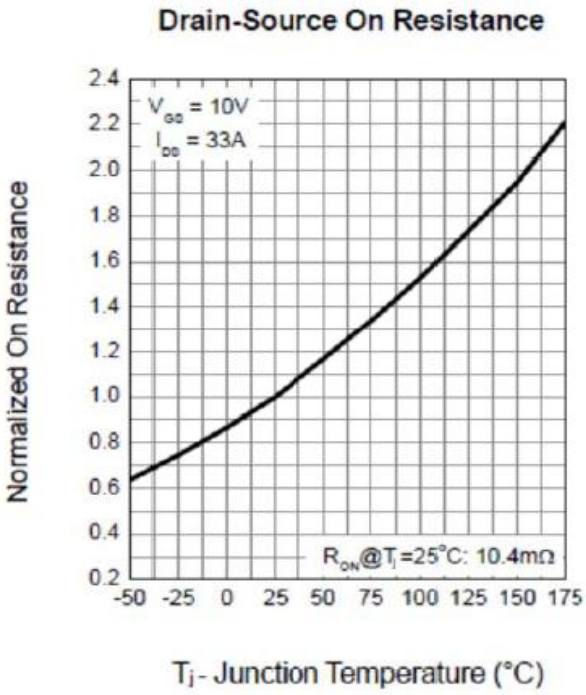


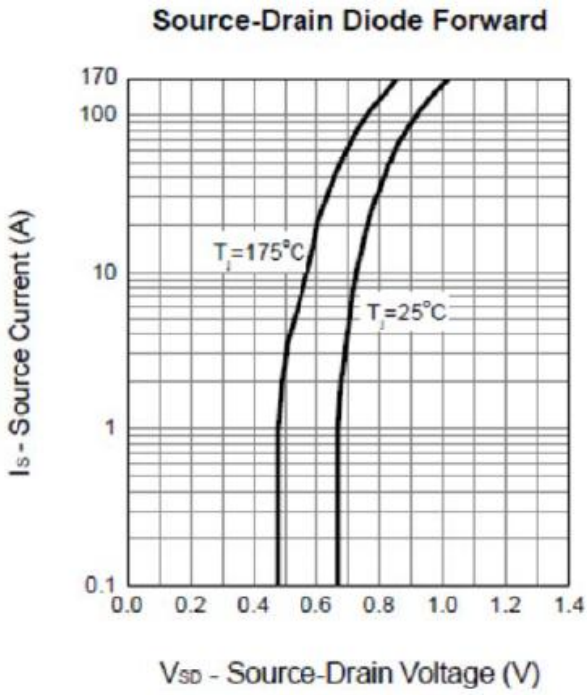
Drain-Source On Resistance

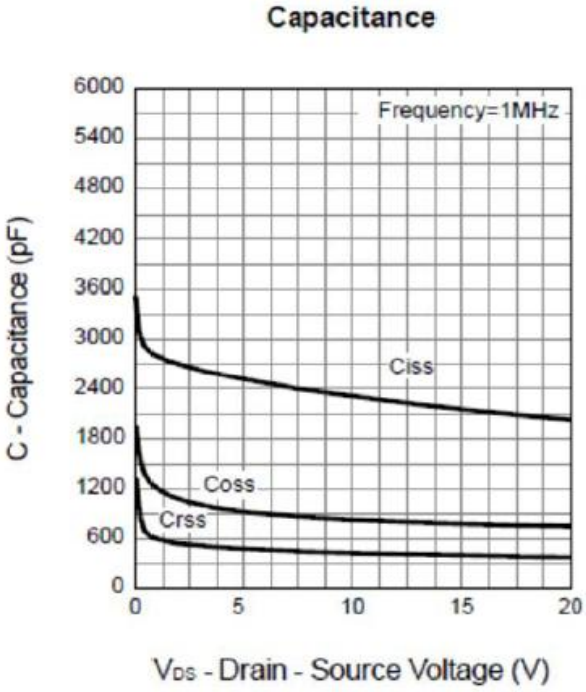


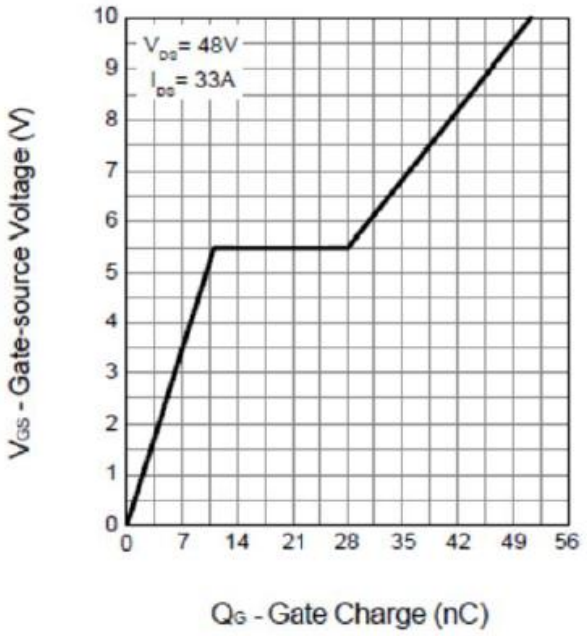
Gate Threshold Voltage



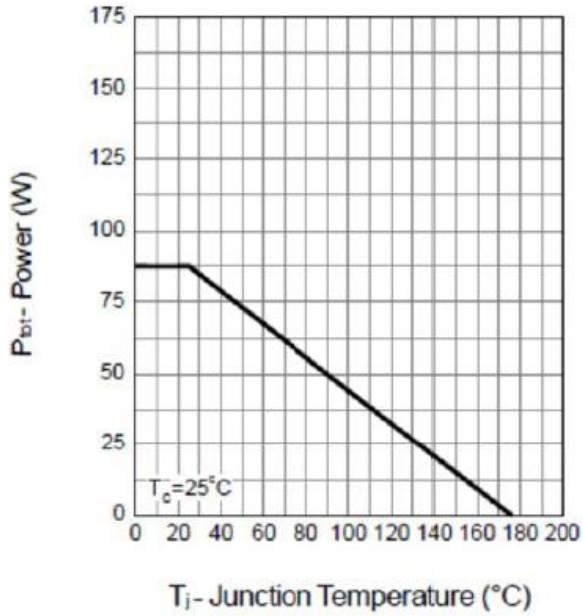

Drain-Source On Resistance
Normalized On Resistance
V_{GS} = 10V
I_{DS} = 33A
R_{ON}@T_j=25°C: 10.4mΩ
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
-50 -25 0 25 50 75 100 125 150 175
Tj - Junction Temperature (°C)


Source-Drain Diode Forward
IS - Source Current (A)
170
100
10
1
0.1
Tj=175°C
Tj=25°C
0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4
VSD - Source-Drain Voltage (V)

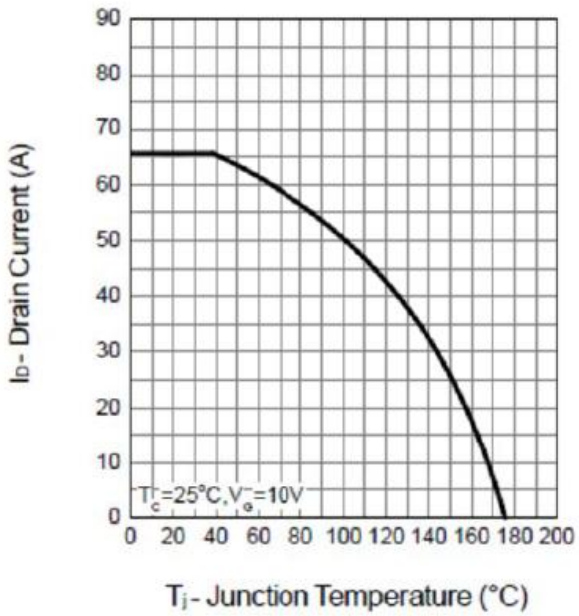

Capacitance
C - Capacitance (pF)
6000
5400
4800
4200
3600
3000
2400
1800
1200
600
0
Frequency=1MHz
Ciss
Coss
Crss
0 5 10 15 20
VDS - Drain - Source Voltage (V)


Gate Charge
VGS - Gate-source Voltage (V)
10
9
8
7
6
5
4
3
2
1
0
VDS= 48V
IDS= 33A
0 7 14 21 28 35 42 49 56
QG - Gate Charge (nC)

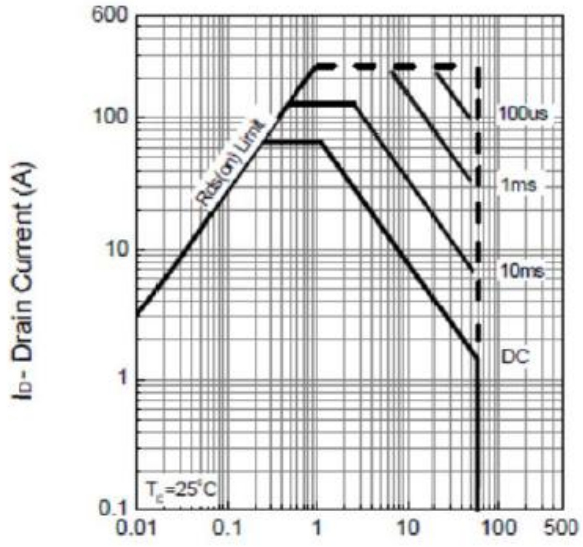
Power Dissipation



Drain Current



Safe Operation Area



Thermal Transient Impedance