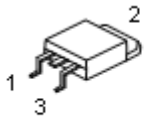
1. Applications

- Motor drivers
- Switch systems

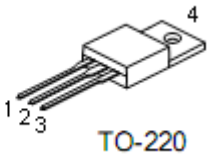
2. Features

- $R_{DS(on)}$= 3.8mΩ @V_{GS}= 10 V
- Super high dense cell design
- Ultra low On-Resistance
- 100% avalanche tested
- Lead Free and Green devices avallable (RoHS Compliant)

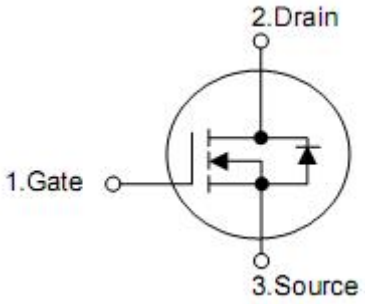
3. Pin configuration



TO-252



TO-220



Pin	Function
1	Gate
2	Drain
3	Source
4	Drain

4. Absolute maximum ratings

(T_C=25 ºC , unless otherwise specified)

Parameter		Symbol	Ratings		Units
			To-252	To-220	
Drain-source voltage		V_{DSS}	40		V
Gate-source voltage		V_{GSS}	±20		V
Continuous drain current T_C=25 ºC[1]		I_D	90	100	A
Continuous drain current T_C=100 ºC[1]			63	70	A
300us pulsed drain current tested T_C=25 ºC[2]		I_{DP}	360		A
Avalanche energy single pulse[3]		E_{AS}	380		mJ
Power dissipation	T_C=25 ºC	P_D	107	178	W
	T_C=100 ºC		53.5	89	W
Maximum junction temperature		T_J	175		°C
Storage temperature range		T_{STG}	-55~+175		°C
Diode continuous forward current T_C=25 ºC[1]		I_S	60		A

5. Thermal characteristics

Parameter	Symbol	Rating	Unit
Thermal resistance,Junction-to-case	θ_{JC}	1.4	ºC/W

6. Electrical characteristics

(T_C=25°C,unless otherwise notes)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0V,I_D=250μA	40	-	-	V
Drain-to-source leakage current	I_{DSS}	V_{DS}=40V ,V_{GS}=0V	-	-	1	μA
		T_J=85 ºC	-	-	30	μA
Gate-to-source leakage current	I_{GSS}	V_{GS}=20V,V_{DS}=0V	-	-	100	nA
		V_{GS}=-20V,V_{DS}=0V	-	-	-100	nA
On characteristics						
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	2.0	3.0	4.0	V
Static drain-source on-resistance[4]	$R_{DS(on)}$	V_{GS}=10V,I_D=45A	-	3.8	5.0	mΩ
Dynamic characteristics						
Input capacitance	C_{iss}	V_{DS}=20V,V_{GS}=0V,f=1.0MHz	-	3250	-	pF
Output capacitance	C_{oss}		-	360	-	
Reverse transfer capacitance	C_{rss}		-	195	-	
Gate series resistance	R_G	V_{DS}=0V,V_{GS}=0V,f=1.0MHz	-	1.8	-	Ω
Total gate charge	Q_g	V_{DD}=32V,I_D=45A,V_{GS}=10V	-	55	-	nC
Gate-source charge	Q_{gs}		-	11	-	
Gate-drain (Miller)charge	Q_{gd}		-	18	-	
Resistive switching characteristics						
Turn-on delay time	$T_{d(ON)}$	V_{DD}=20V,I_D=45A,V_{GEN}=10V, R_G=4.7Ω, R_L=0.5Ω	-	13	-	nS
Rise time	t_{rise}		-	38	-	
Turn-off delay time	$T_{d(OFF)}$		-	54	-	
Fall time	t_{fall}		-	21	-	
Source-drain body diode characteristics	T_J=25°C,unless otherwise notes					
Diode forward voltage[4]	V_{SD}	V_{GS}=0V,I_S=45A	-	-	1.2	V
Reverse recovery time	t_{rr}	I_{SD}=45A,di_F/dt=100A/μs,	-	39	-	ns
Reverse recovery charge	Q_{rr}		-	46	-	nC

Note: 1. Caiculated continuous current based on maximum allowable junction temperature. Package limitation current is 60A.

2. Pulse width limited by safe operating area.

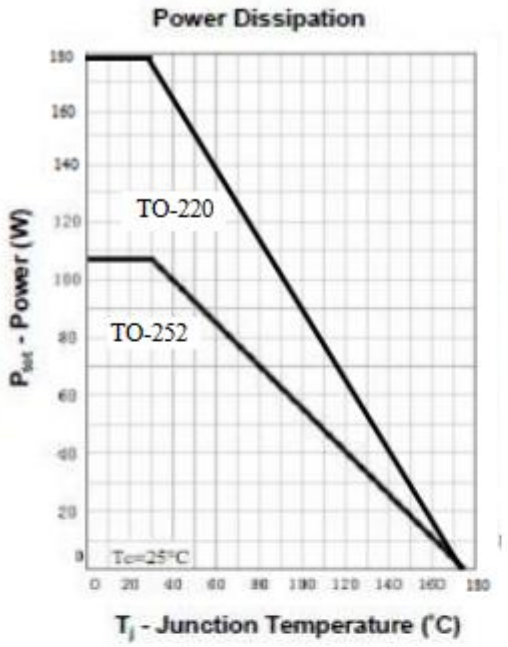
3. Limited by T_{Jmax}, I_{AS}=39A, V_{DD}=32V, R_G=50Ω, Starting T_J=25°C.

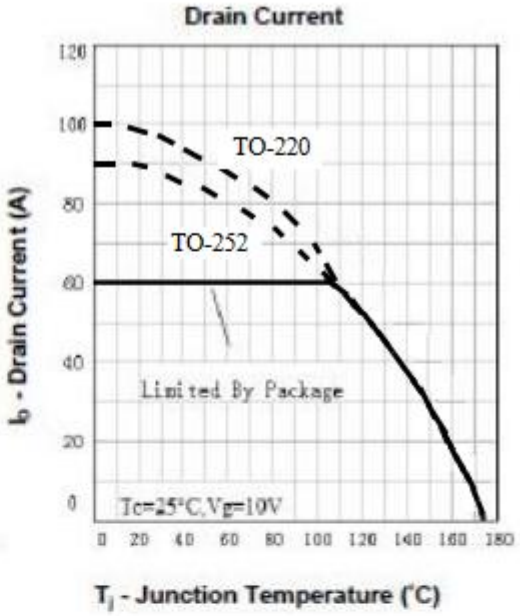
4. Pulse test; Pulse width ≤300μs; duty cycle ≤2%.

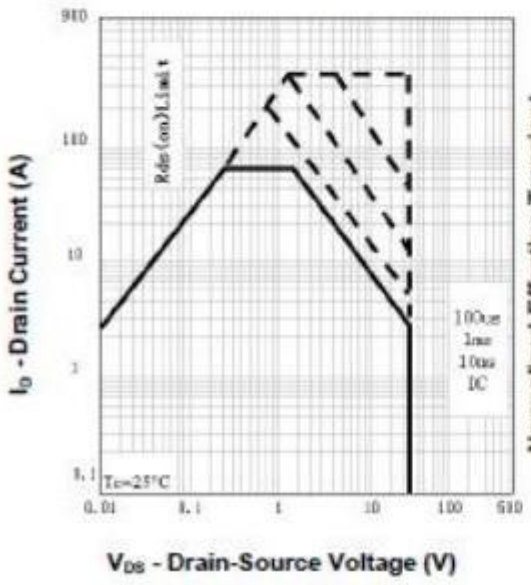
5. Guaranteed by design, not subject to production testing.

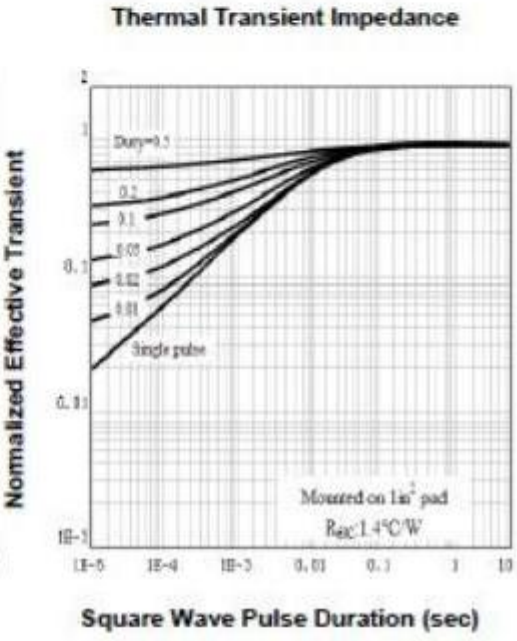
7. Typical characteristics

Typical Characteristics



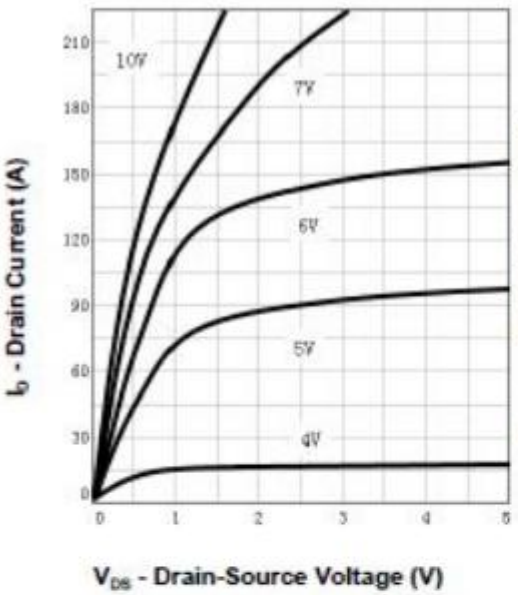




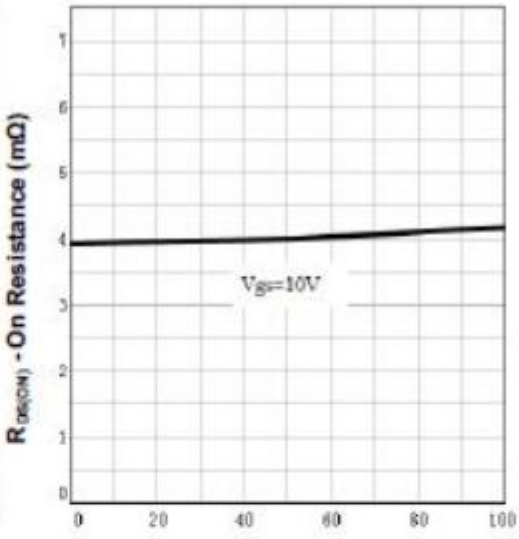


Typical Characteristics

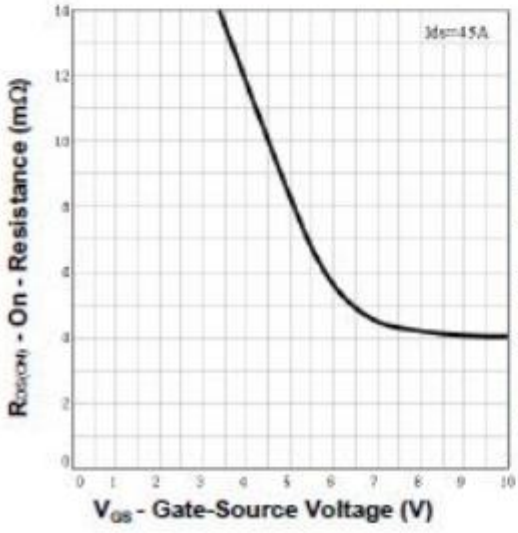
Output Characteristics



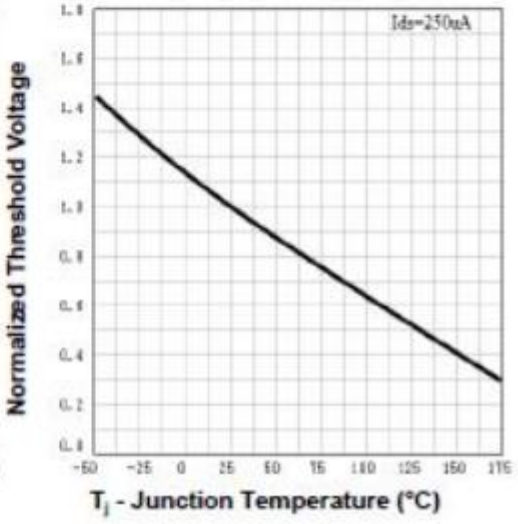
Drain-Source On Resistance



Drain-Source On Resistance

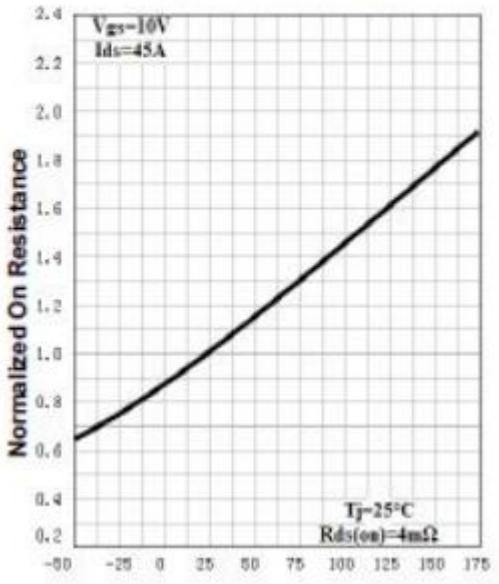


Gate Threshold Voltage



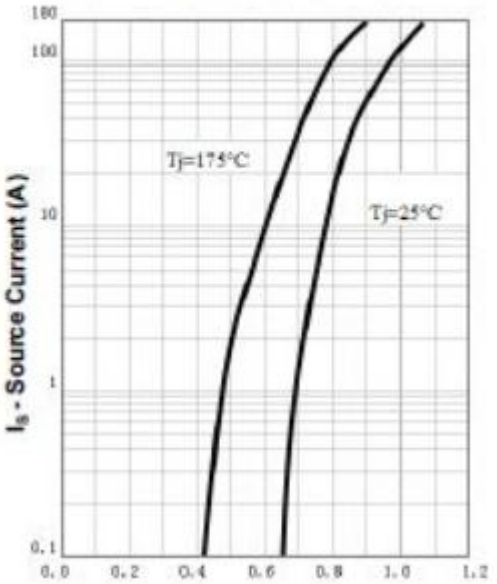
Typical Characteristics

Drain-Source On Resistance



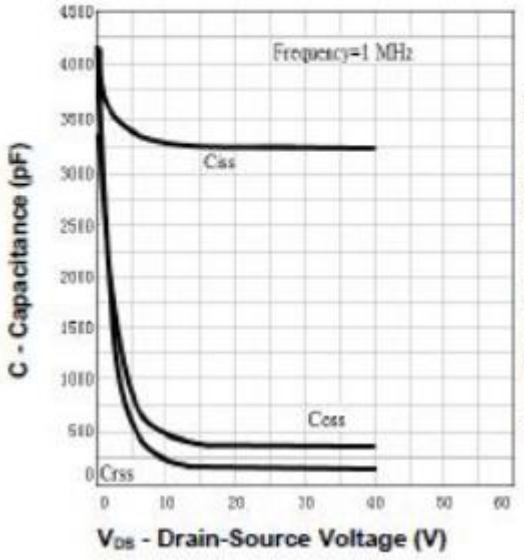
T_j - Junction Temperature (°C)

Source-Drain Diode Forward



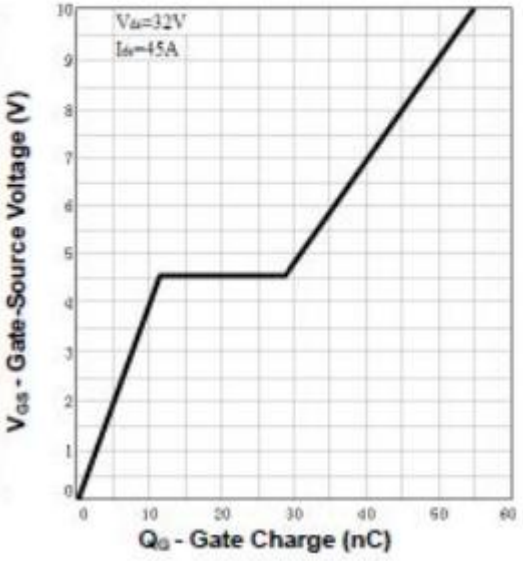
V_{SD} - Source-Drain Voltage (V)

Capacitance



V_{DS} - Drain-Source Voltage (V)

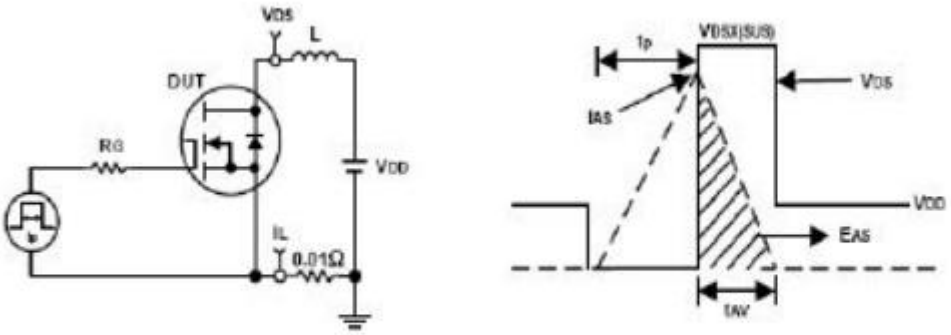
Gate Charge



Q_G - Gate Charge (nC)

8. Test circuits and waveforms

Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms