

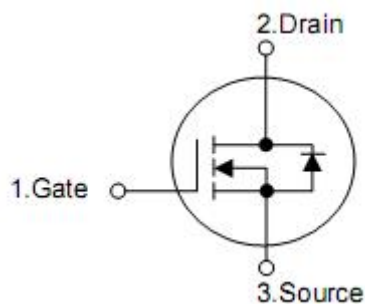
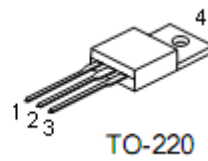
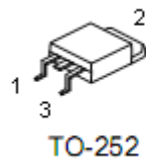
1. Applications

- n Motor drivers
- n Switch systems

2. Features

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

3. Pin configuration



Pin	Function
1	Gate
2	Drain
3	Source
4	Drain

4. Absolute maximum ratings

(T_C=25 °C , 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 °C ¹	I _D	90	100	A	
Continuous drain current T _C =100 °C ¹		63	70	A	
300us pulsed drain current tested T _C =25 °C ²	I _{DP}	360		A	
Avalanche energy single pulse ³	E _{AS}	380		mJ	
Power dissipation	P _D	T _C =25 °C	107	178	W
		T _C =100 °C	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 °C ¹	I _S	60		A	

5. Thermal characteristics

Parameter	Symbol	Rating	Unit
Thermal resistance,Junction-to-case	θ _{JC}	1.4	°C/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 °C	-	-	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	-

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

2. Pulse width limited by safe operating area.

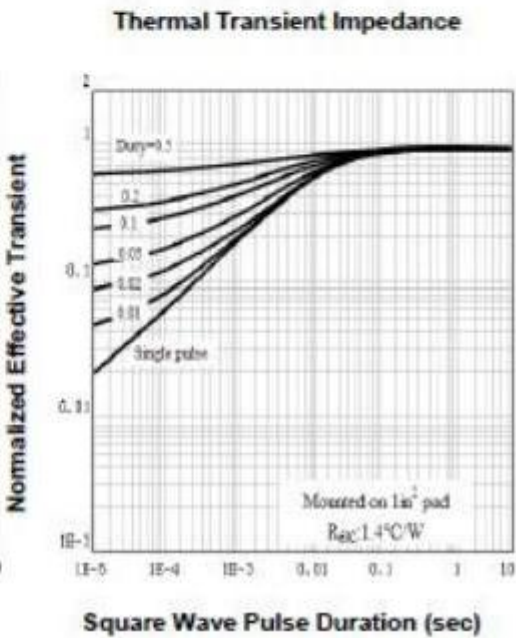
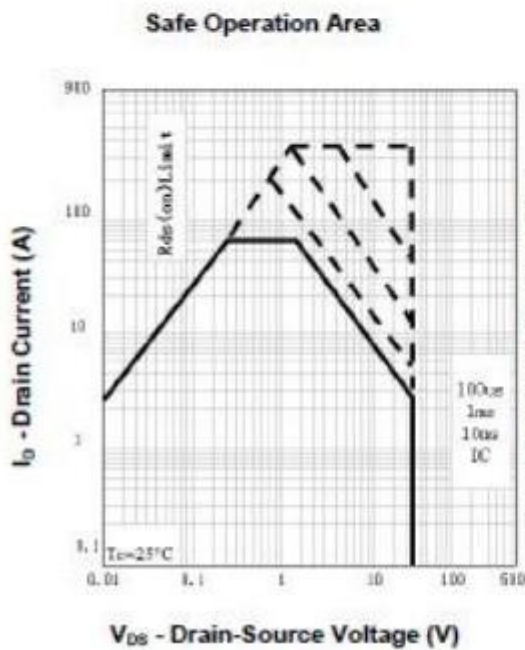
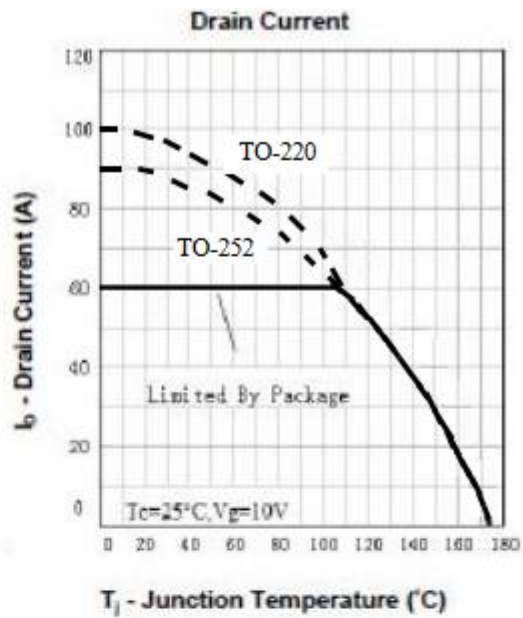
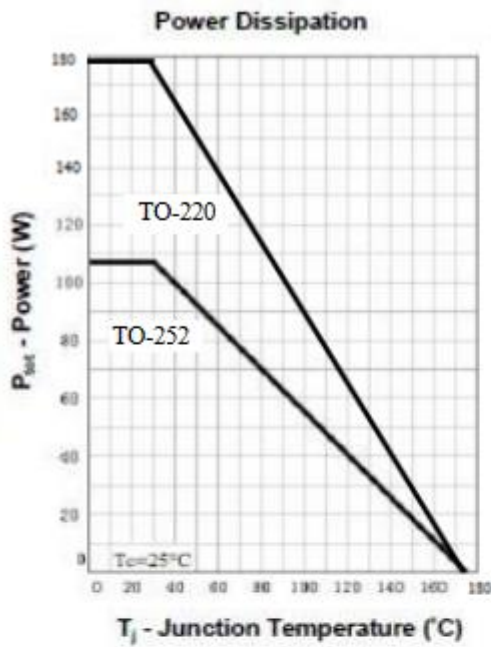
3. Limited by T_{Jmax}, I_{AS}=39A, V_{DD}=32V, R_G=50Ω, Starting T_J=25°C.

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

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

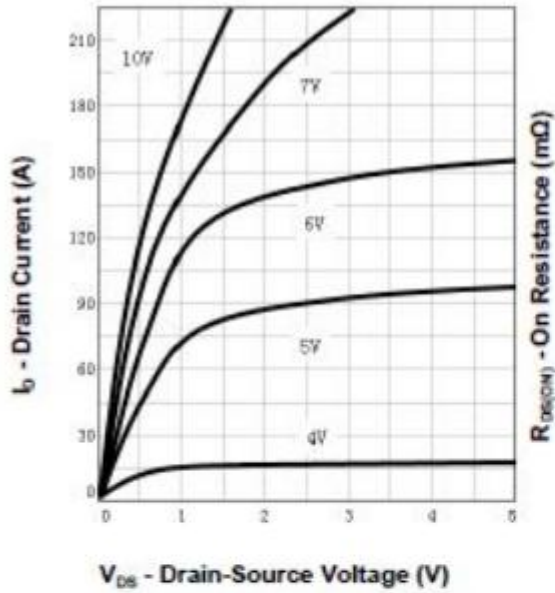
7. Typical characteristics

Typical Characteristics

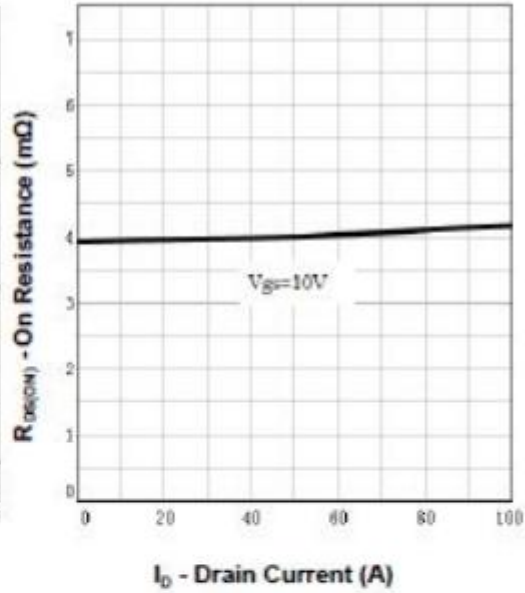


Typical Characteristics

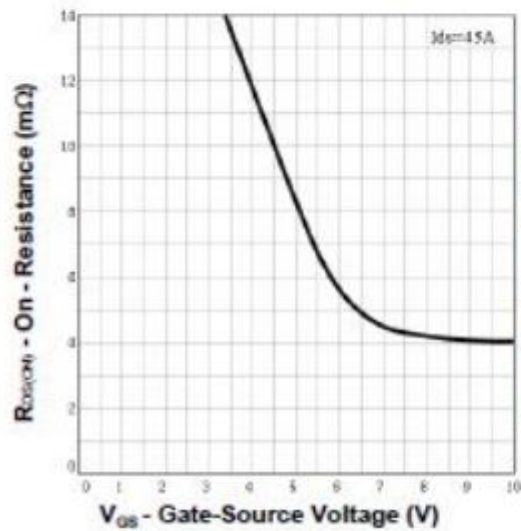
Output Characteristics



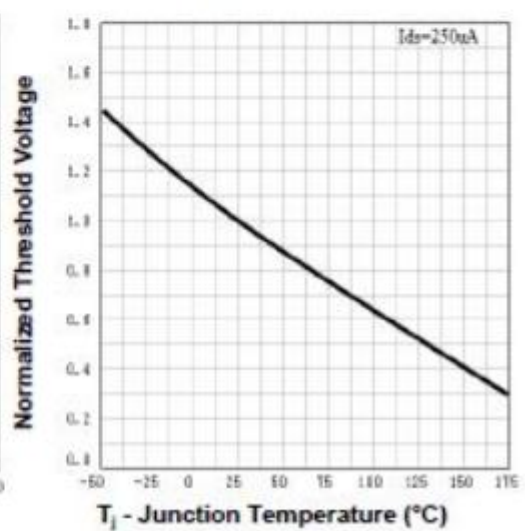
Drain-Source On Resistance



Drain-Source On Resistance

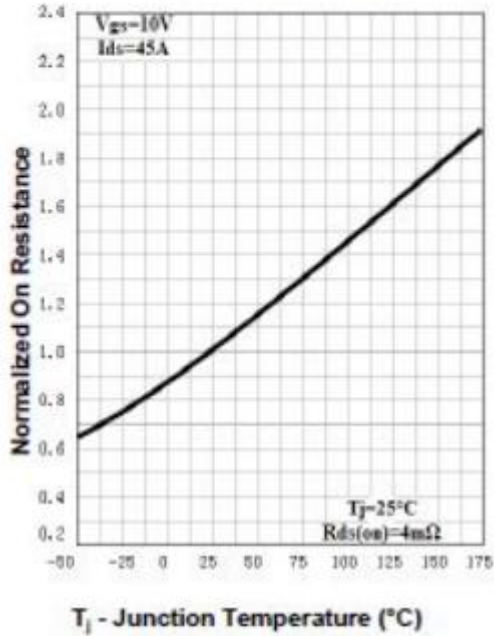


Gate Threshold Voltage

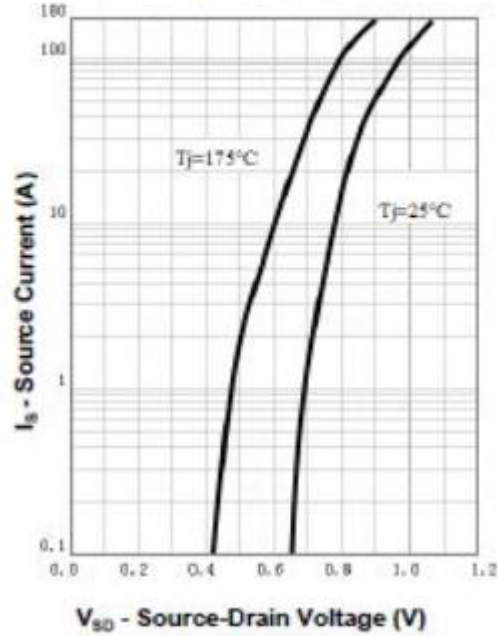


Typical Characteristics

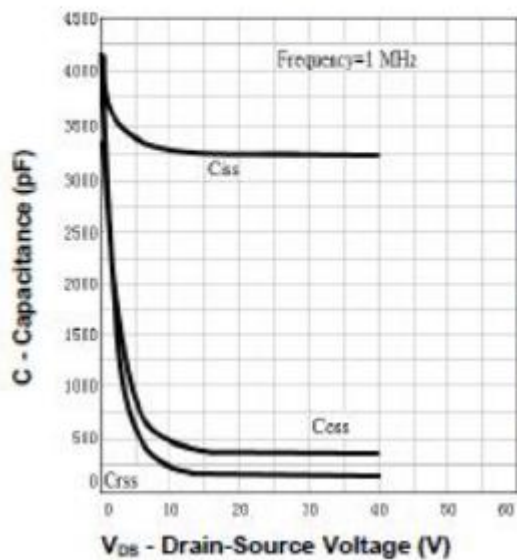
Drain-Source On Resistance



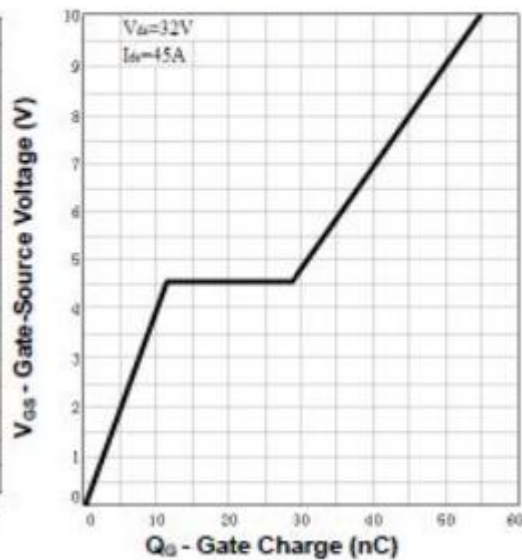
Source-Drain Diode Forward



Capacitance

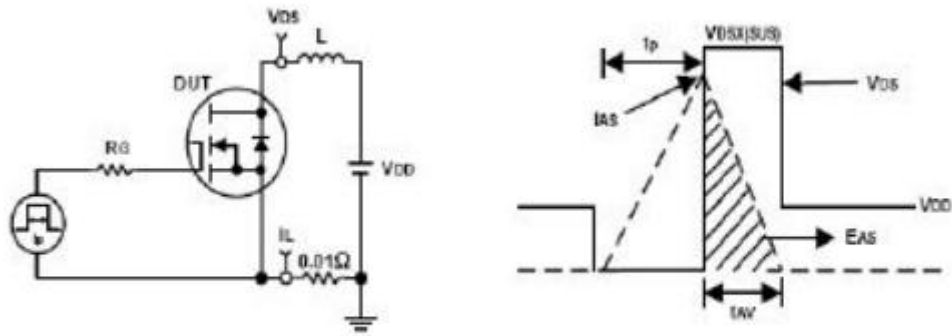


Gate Charge



8. Test circuits and waveforms

Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms

