

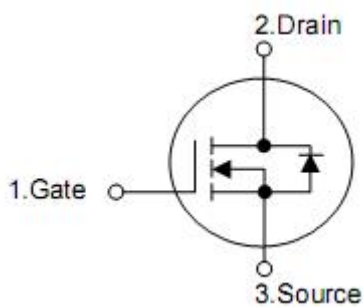
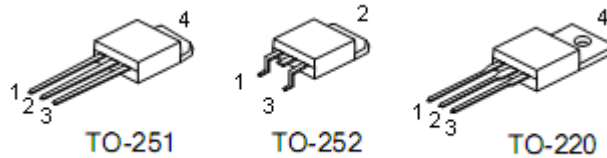
## 1. Features

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

## 2. Applications

- n Power supply
- n UPS
- n Battery management system

## 3. Symbol



Pin	Function
1	Gate
2	Drain
3	Source
4	Drain

#### 4. Absolute maximum ratings

( $T_A=25^{\circ}\text{C}$ , unless otherwise noted)

Parameter		Symbol	Rating	Units
Drain-source voltage		$V_{DS}$	60	V
Gate-source voltage		$V_{GS}$	$\pm 25$	V
Continuous drain current	$T_C=25^{\circ}\text{C}$	$I_D^3$	50	A
	$T_C=100^{\circ}\text{C}$		35	A
Pulse drain current		$I_{DP}^4$	250	A
Avalanche current		$I_{AS}^5$	15	A
Avalanche energy,		$E_{AS}^5$	120	mJ
Maximum power dissipation	$T_C=25^{\circ}\text{C}$	$P_D$	88	W
	$T_C=100^{\circ}\text{C}$		44	W
Junction & storage temperature range		$T_J, T_{STG}$	-55-175	$^{\circ}\text{C}$

#### 5. Thermal characteristics

Parameter	Symbol	Rating		Unit
		To-252/ 251	To-220	
Thermal resistance, Junction-ambient	$R_{\theta JA}$	100	62.5	$^{\circ}\text{C/W}$
Thermal resistance, Junction-case	$R_{\theta JC}$	1.1	1.7	$^{\circ}\text{C/W}$

## 6. Electrical characteristics

(T<sub>A</sub>=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-source breakdown voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>DS</sub> =250μA	60	-	-	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =48V, V <sub>GS</sub> =0V	-	-	1	μA
		T <sub>J</sub> =125°C	-	-	20	
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2.0	3.0	4.0	V
Gate leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±25V, V <sub>DS</sub> =0V	-	-	±100	nA
Drain-source on-resistance	R <sub>DS(on)</sub> <sup>1</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =30A	-	10.5	12.5	mΩ
Gate resistance	R <sub>g</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz	-	1.0	-	Ω
Diode forward voltage	V <sub>SD</sub> <sup>1</sup>	I <sub>SD</sub> =30A, V <sub>GS</sub> =0V	-	0.8	1.3	V
Diode continuous forward current	I <sub>S</sub> <sup>3</sup>		-	-	50	A
Reverse recovery time	t <sub>rr</sub>	I <sub>F</sub> =30A , dI <sub>SD</sub> /dt=100A/μs	-	32	-	nS
Reverse recovery charge	Q <sub>rr</sub>		-	60	-	nC
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHz	-	2060	-	pF
Output capacitance	C <sub>oss</sub>		-	755	-	
Reverse transfer capacitance	C <sub>rss</sub>		-	375	-	
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =30V, I <sub>D</sub> =30A, R <sub>G</sub> =5Ω, V <sub>GS</sub> =10V	-	14	-	nS
Rise time	t <sub>r</sub>		-	13	-	
Turn-off delay time	t <sub>d(off)</sub>		-	20	-	
Fall time	t <sub>f</sub>		-	7.5	-	
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> =48V, V <sub>GS</sub> =10V I <sub>DS</sub> =30A	-	50	-	nC
Gate-source charge	Q <sub>gs</sub>		-	12	--	
Gate-drain charge	Q <sub>gd</sub>		-	17	--	

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

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

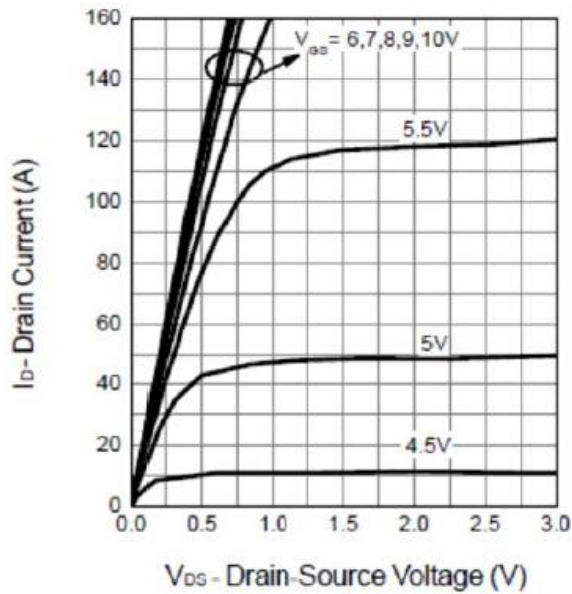
3: Package limitation current is 50A. Calculated continuous current based on maximum allowable junction temperature.

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

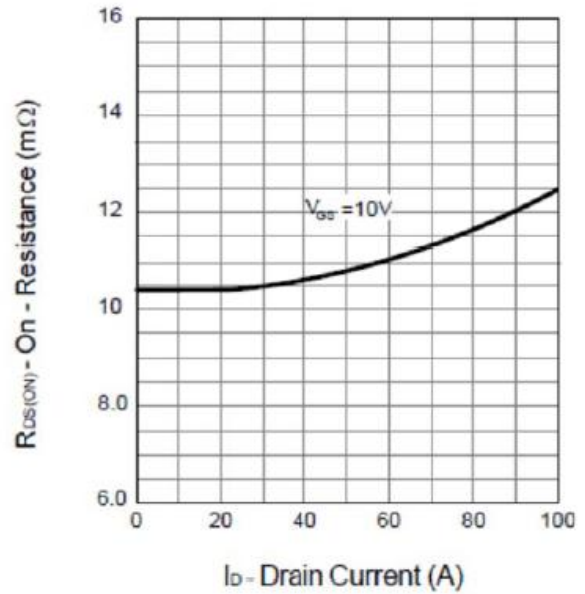
5: Starting T<sub>J</sub>=25°C, L=0.5mH, I<sub>AS</sub>=31A.

**7. Test circuits and waveforms**

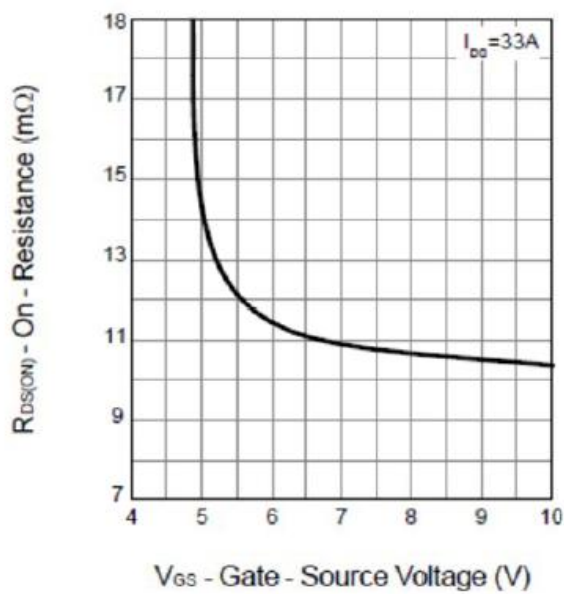
**Output Characteristics**



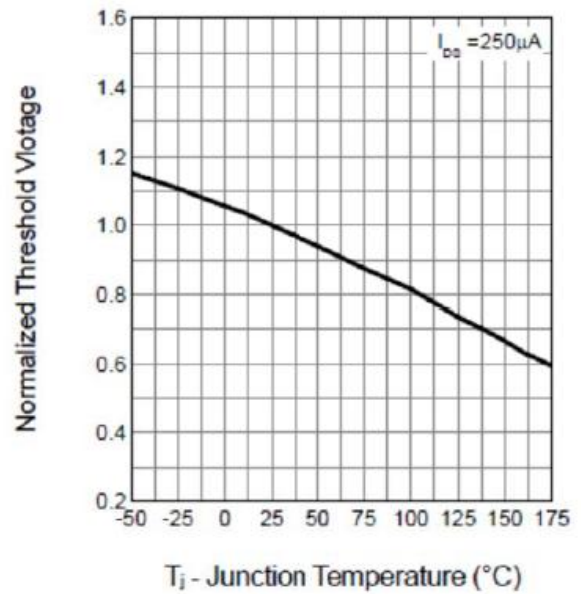
**Drain-Source On Resistance**



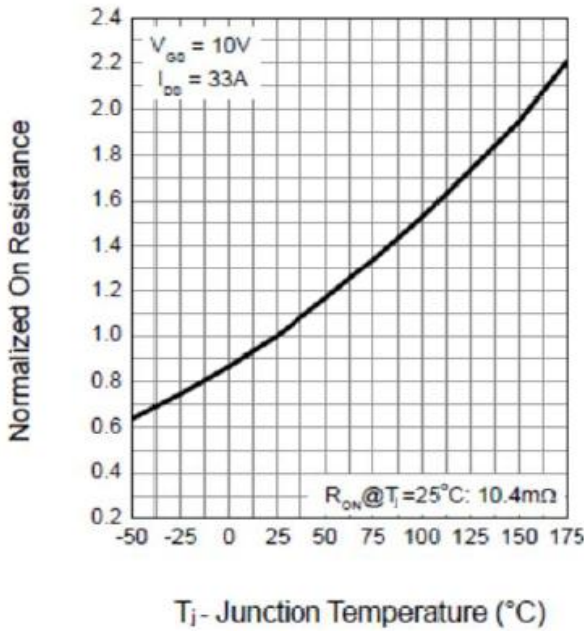
**Drain-Source On Resistance**



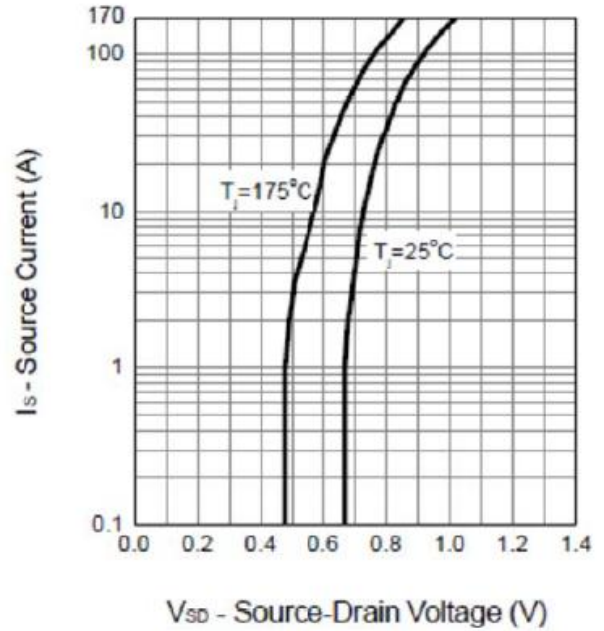
**Gate Threshold Voltage**



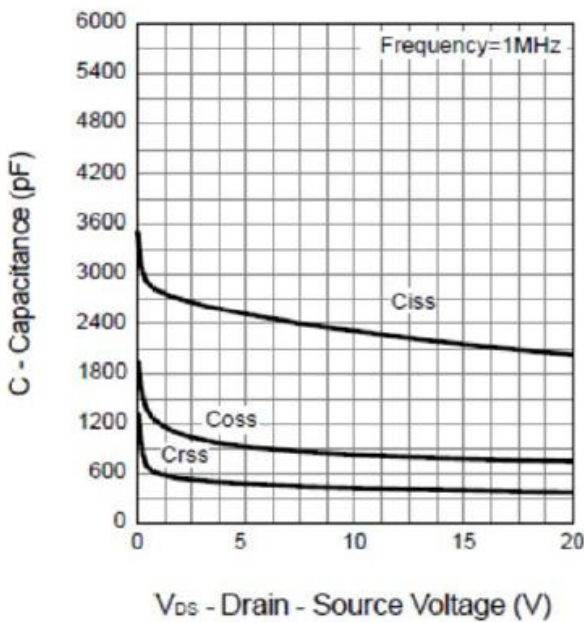
**Drain-Source On Resistance**



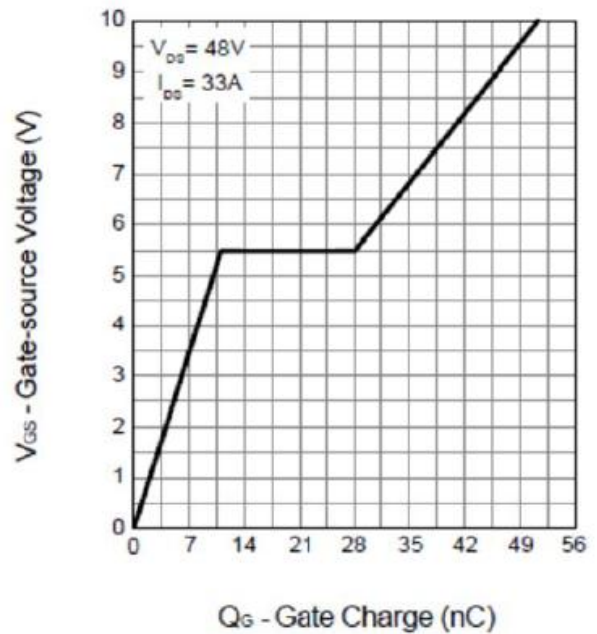
**Source-Drain Diode Forward**



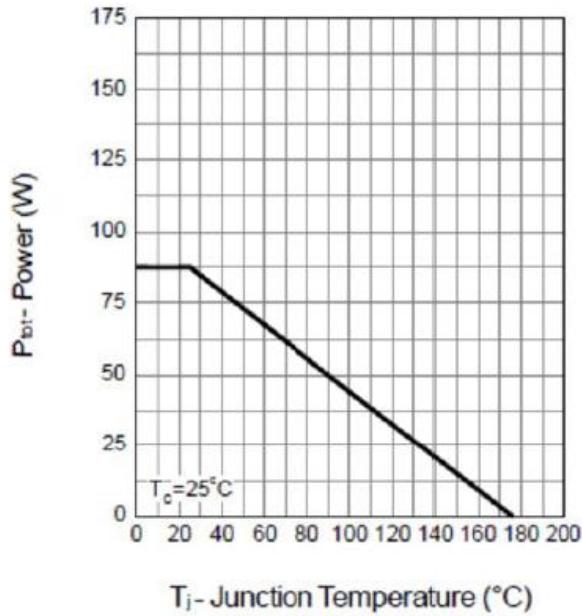
**Capacitance**



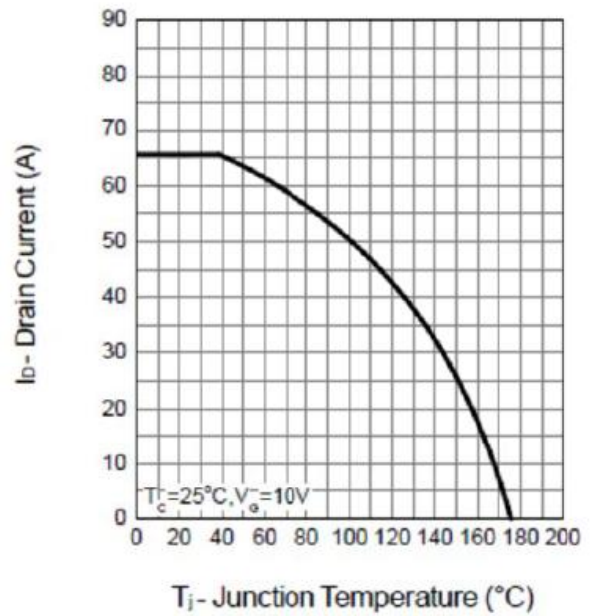
**Gate Charge**



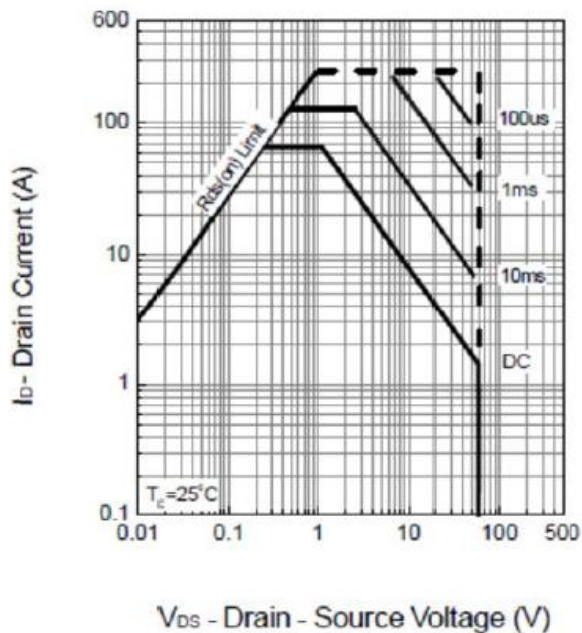
**Power Dissipation**



**Drain Current**



**Safe Operation Area**



**Thermal Transient Impedance**

