

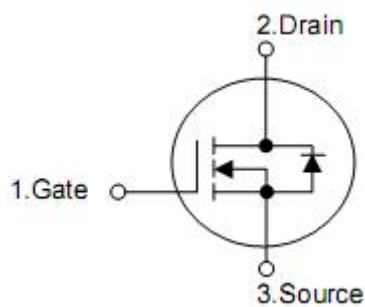
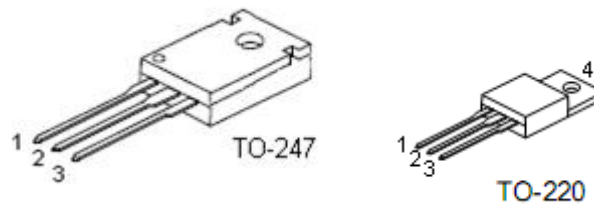
## 1. Features

- n  $R_{DS(on)}=5.5m\Omega @ V_{GS}=10V$
- 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 Power Tool

## 3. Symbol



Pin	Function
1	Gate
2	Drain
3	Source
4	Drain

#### 4. Absolute maximum ratings

Parameter		Symbol	Rating		Units
			To-220	To-247	
Drain-source voltage		$V_{DSS}$	60		V
Gate-source voltage		$V_{GSS}$	±25		V
Junction and storage temperature range		$T_{STG}$	-55 to 175		°C
Continuous drain current	$T_C=25^\circ\text{C}$	$I_D^3$	130		A
	$T_C=100^\circ\text{C}$		90		A
Pulse drain current	$T_C=25^\circ\text{C}$	$I_{DP}^4$	360		A
Avalanche current		$I_{AS}^5$	25		A
Maximum power dissipation		$E_{AS}^5$	250		mJ
Maximum power dissipation	$T_C=25^\circ\text{C}$	$P_D$	200	300	W
	$T_C=100^\circ\text{C}$		90	150	W

#### 5. Thermal characteristics

Parameter	Symbol	Rating	Unit
Thermal resistance, Junction-ambient	$R_{\theta JA}$	62.5	°C/W
Thermal resistance, Junction-case	$R_{\theta JC}$	0.735	°C/W

## 6. Electrical characteristics

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-source breakdown voltage	$BV_{DSS}$	$V_{GS}=0V, I_{DS}=250\mu A$	60	-	-	V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS}=48V, V_{GS}=0V$	-	-	1	$\mu A$
		$T_J=125^{\circ}\text{C}$	-	-	30	
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3	4	V
Gate leakage current	$I_{GSS}$	$V_{GS}=\pm 25V, V_{DS}=0V$	-	-	$\pm 100$	nA
Drain-source on-state resistance	$R_{DS(on)}^1$	$V_{GS}=10V, I_D=50A$	-	5.5	7	$m\Omega$
Gate resistance	$R_g$	$V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$	-	1.2	-	$\Omega$
Diode forward voltage	$V_{SD}^1$	$I_{SD}=50A, V_{GS}=0V$	-	0.88	1.3	V
Diode continuous forward current	$I_S^3$		-	-	50	A
Reverse recovery time	$t_{rr}$	$I_{SD}=70A, V_{DD}=50V,$ $di_{SD}/dt=100A/\mu s$	-	15.2	-	nS
Reverse recovery charge	$Q_{rr}$		-	6.16	-	nC
Input capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V,$ $f=1\text{MHz}$	-	3100	-	$\mu F$
Output capacitance	$C_{oss}$		-	926	-	
Reverse transfer capacitance	$C_{rss}$		-	451	-	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=30V, I_D=70A,$ $R_G=25\Omega, V_{GS}=10V$	-	20	-	ns
Rise time	$t_r$		-	83.7	-	
Turn-off delay time	$t_{d(off)}$		-	108	-	
Fall time	$t_f$		-	92.6	-	
Total gate charge	$Q_g$	$V_{DS}=50V, V_{GS}=10V$ $I_D=70A$	-	66.34	-	nC
Gate-source charge	$Q_{gs}$		-	12.35	--	
Gate-drain charge	$Q_{gd}$		-	33.52	--	

Note:1. Pulse test; pulse width  $\leq 300\mu s$  duty cycle  $\leq 2\%$ .

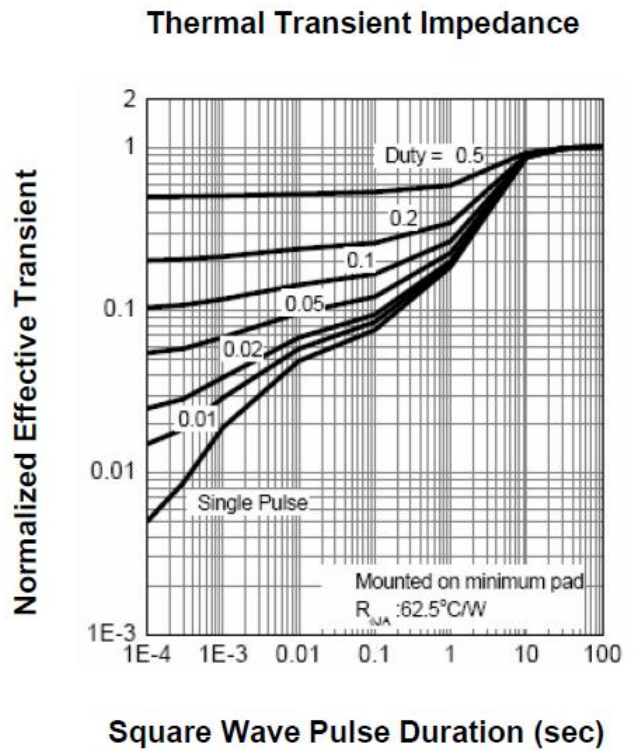
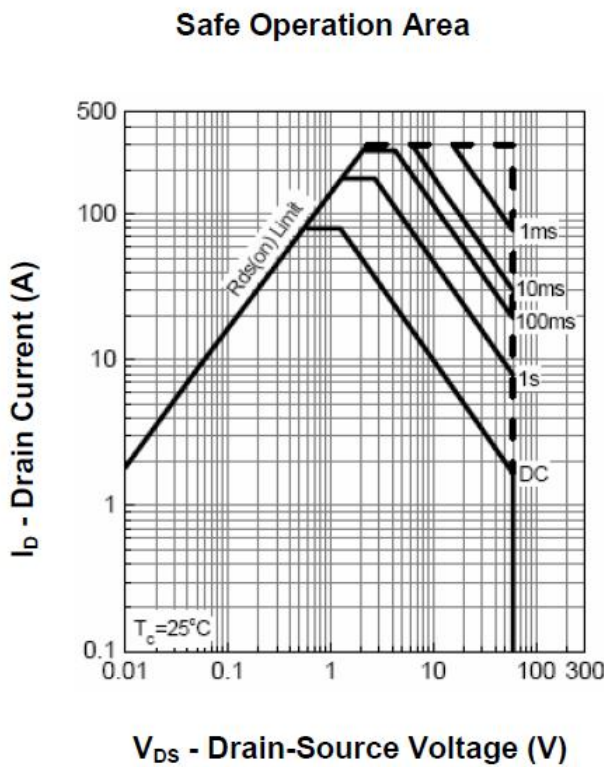
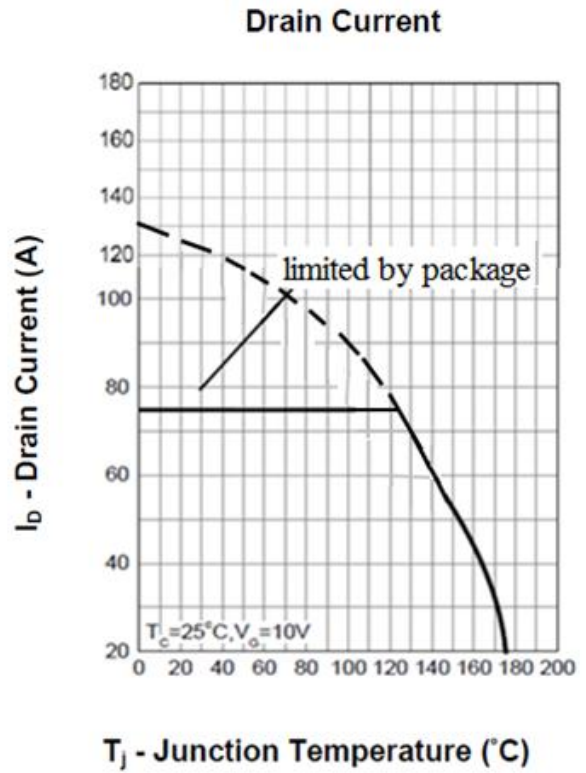
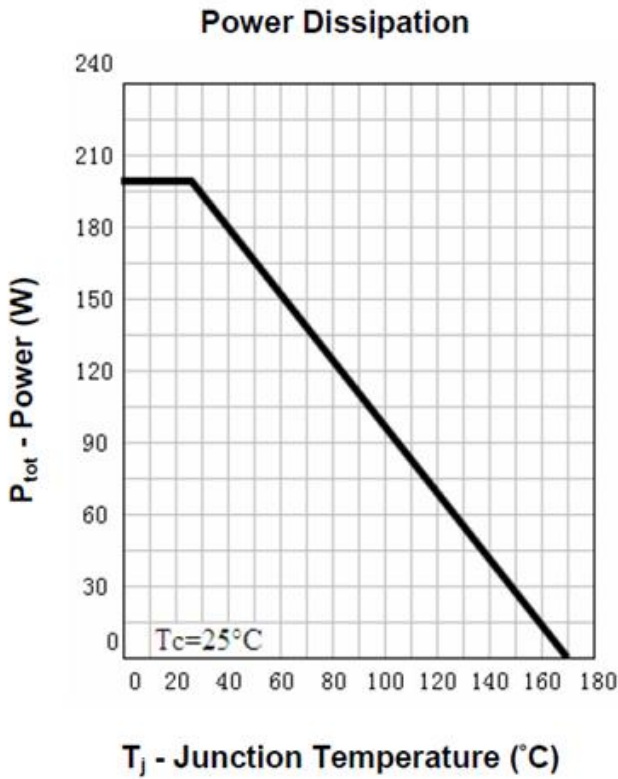
2. Guaranteed by design, not subject to production testing.

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

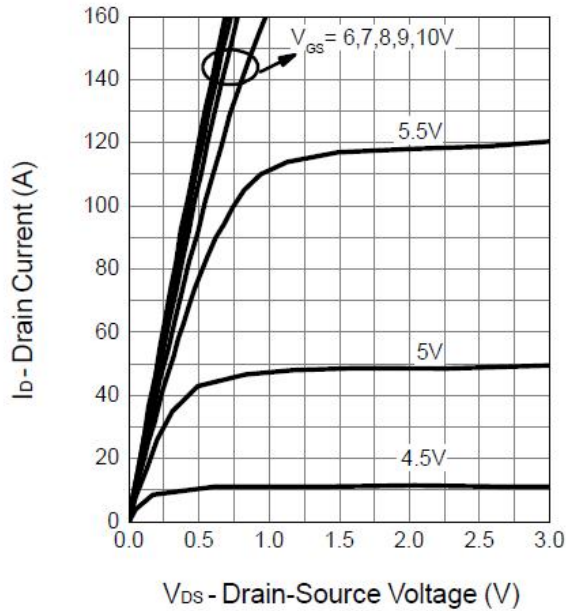
4. Repetitive rating, pulse width limited by max junction temperature.

5. Starting  $T_J=25^{\circ}\text{C}, L=0.4\text{mH}, I_{AS}=50A$ .

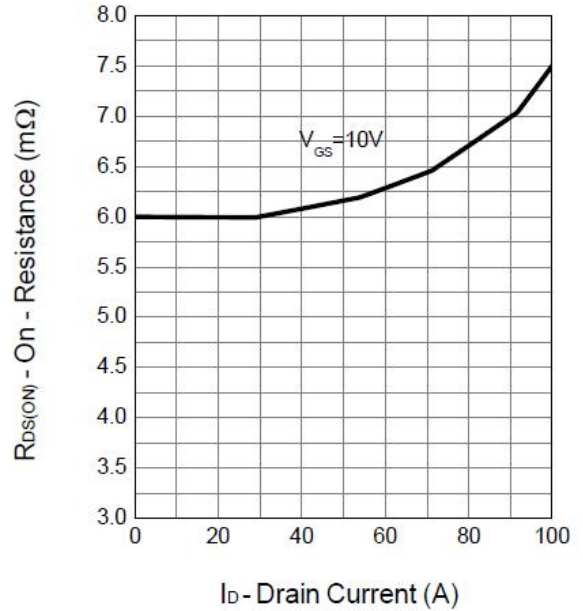
**7. Test circuits and waveforms**



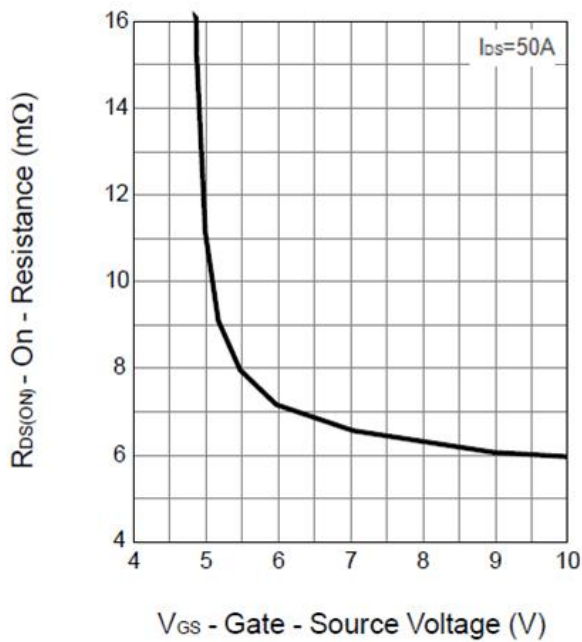
**Output Characteristics**



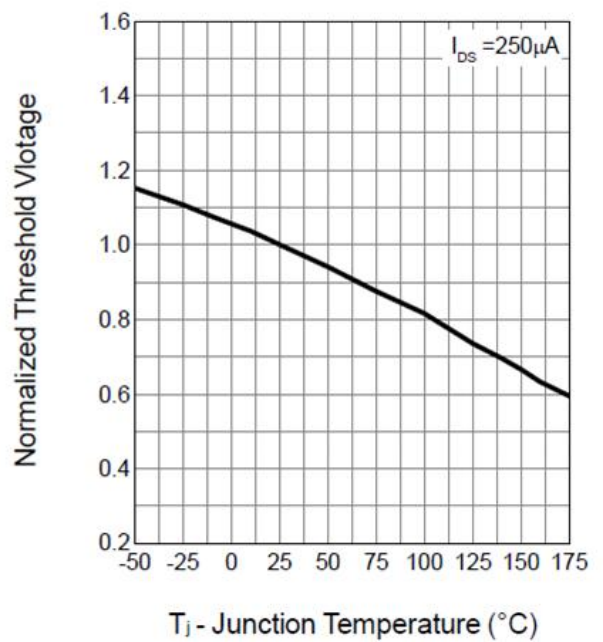
**Drain-Source On Resistance**



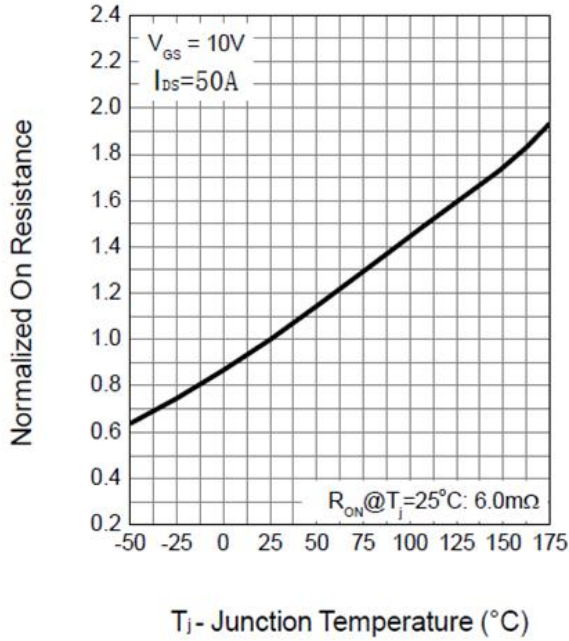
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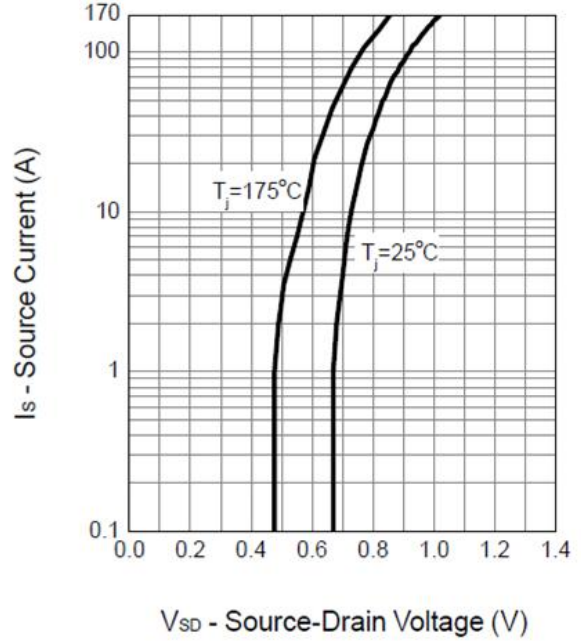
**Gate Threshold Voltage**



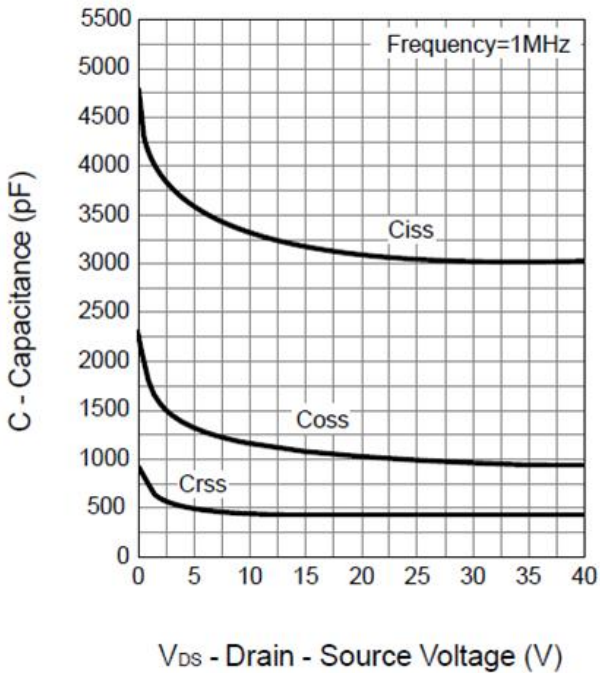
**Drain-Source On Resistance**



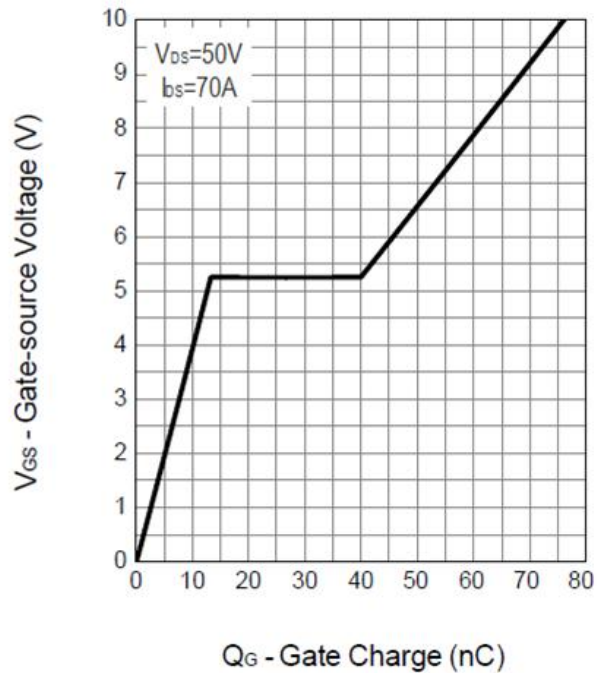
**Source-Drain Diode Forward**



**Capacitance**



**Gate Charge**



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