

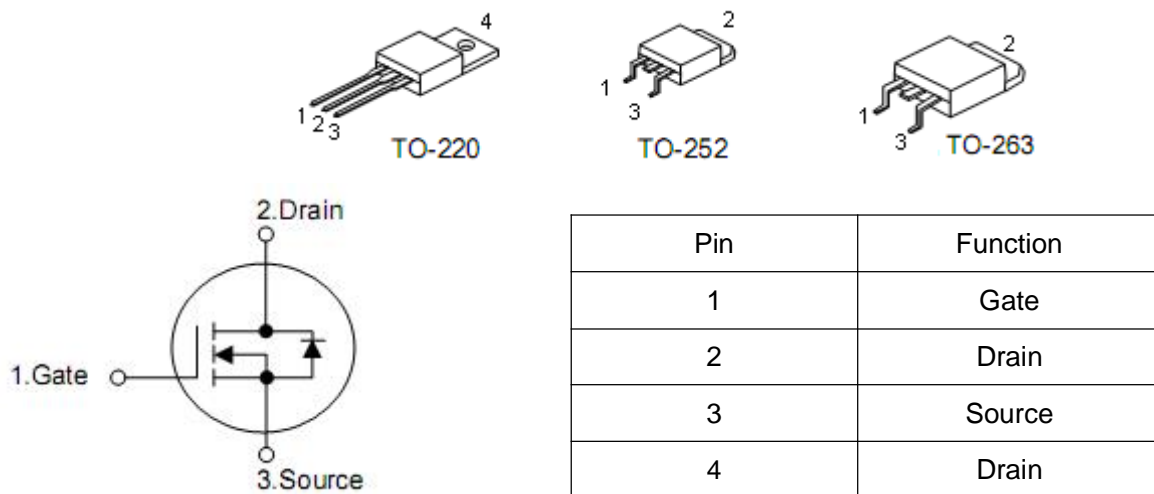
## 1. Features

- n  $R_{DS(on)}=9m\Omega$  (typ.) @  $V_{GS}=10V$
- n 100% avalanche tested
- n Reliable and rugged
- n Lead free and green device available (RoHS Compliant)

## 2. Applications

- n Switching application
- n Power management for inverter systems

## 3.Symbol



#### 4. Absolute maximum ratings

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

Parameter	Symbol	Rating		Units	
		To-220/263	To-252		
Drain-source voltage	$V_{DSS}$	100		V	
Gate-source voltage	$V_{GSS}$	$\pm 25$		V	
Maximum junction temperature	$T_J$	175		$^{\circ}\text{C}$	
Storage temperature range	$T_{STG}$	-55 to 175		$^{\circ}\text{C}$	
Continuous drain current	$I_{D^3}$	$T_C=25^{\circ}\text{C}$	75	65	A
		$T_C=100^{\circ}\text{C}$	51	44	A
Pulsed drain current	$I_{DP^4}$	$T_C=25^{\circ}\text{C}$ 219		A	
Avalanche current	$I_{AS^5}$	30		A	
Avalanche energy	$E_{AS^5}$	225		mJ	
Maximum power dissipation	$P_D$	$T_C=25^{\circ}\text{C}$	166		W
		$T_C=100^{\circ}\text{C}$	83		W

#### 5. Thermal characteristics

Parameter	Symbol	Rating	Unit
Thermal resistance, Junction-ambient	$R_{\theta JA}$	62.5	$^{\circ}\text{C}/\text{W}$
Thermal resistance, Junction-case	$R_{\theta JC}$	0.9	$^{\circ}\text{C}/\text{W}$

## 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> =250mA	100	-	-	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =80V, 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-state resistance	R <sub>DS(on)</sub> <sup>1</sup>	V <sub>GS</sub> =10V, I <sub>DS</sub> =50A (TO-220\TO-263)	-	9	11	mΩ
		V <sub>GS</sub> =10V, I <sub>DS</sub> =50A (TO-252)	-	9	14	
Gate resistance	R <sub>g</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz	-	1.2	-	Ω
Diode forward voltage	V <sub>SD</sub> <sup>1</sup>	I <sub>SD</sub> =50A, V <sub>GS</sub> =0V	-	-	1.3	V
Reverse recovery time	t <sub>rr</sub>	I <sub>SD</sub> =50A, dI <sub>SD</sub> /dt=100A/μs	-	46	-	nS
Reverse recovery charge	Q <sub>rr</sub>		-	86	-	nC
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHz	-	2946	-	pF
Output capacitance	C <sub>oss</sub>		-	339	-	
Reverse transfer capacitance	C <sub>rss</sub>		-	179	-	
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =50V, I <sub>DS</sub> =30A, R <sub>G</sub> =6.8Ω, V <sub>GS</sub> =10V	-	15	-	ns
Rise time	t <sub>r</sub>		-	108	-	
Turn-off delay time	t <sub>d(off)</sub>		-	51	-	
Fall time	t <sub>f</sub>		-	59	-	
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =10V I <sub>DS</sub> =30A	-	60	-	nC
Gate-source charge	Q <sub>gs</sub>		-	13.7	--	
Gate-drain charge	Q <sub>gd</sub>		-	22.8	--	

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

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

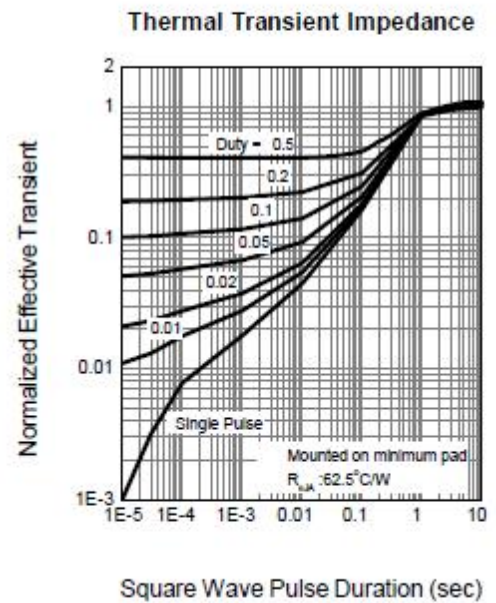
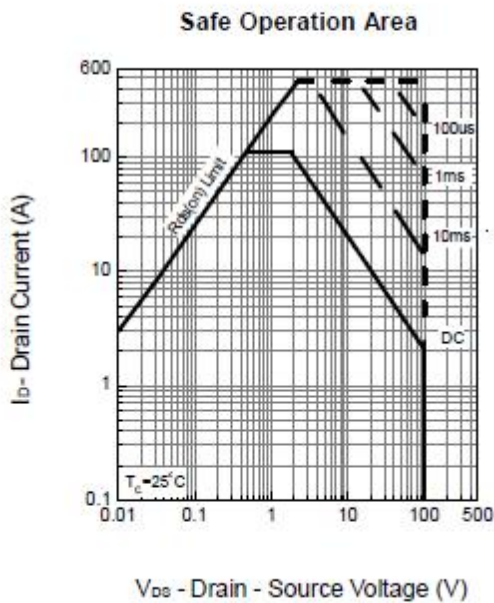
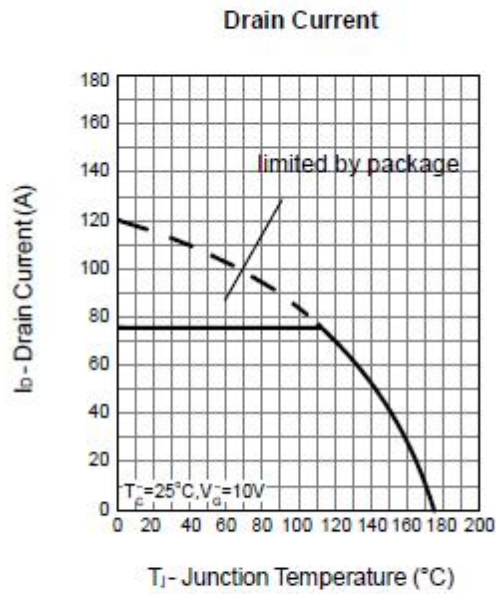
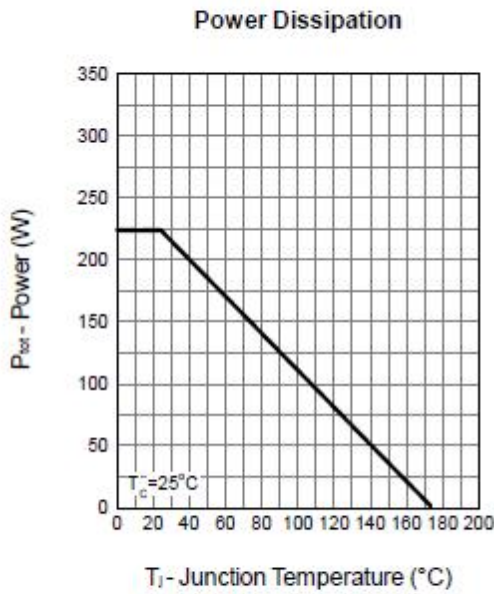
3. Package limitation current is 55A.

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>=30A.

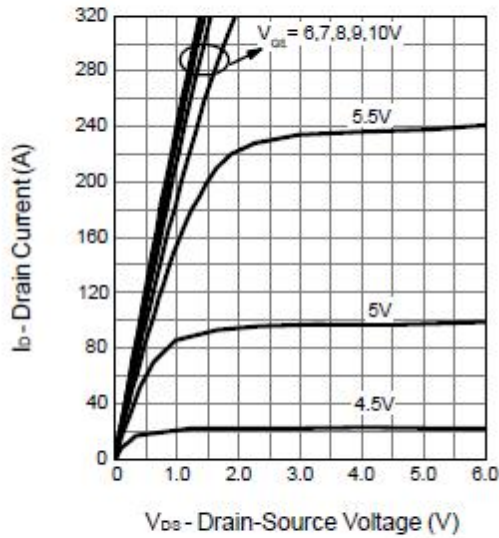
**7. Test circuits and waveforms**

**Typical Operating Characteristics**

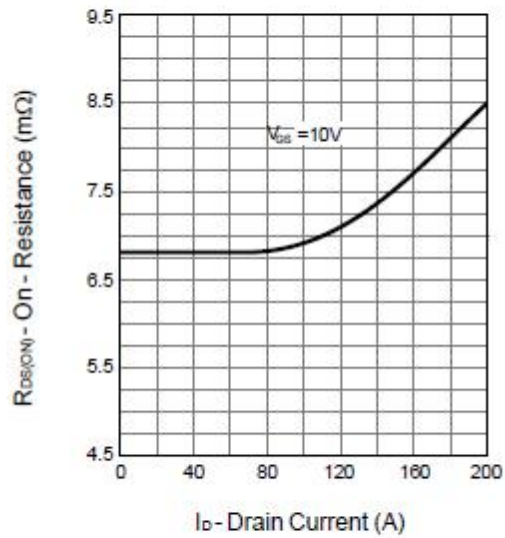


**Typical Operating Characteristics (Cont.)**

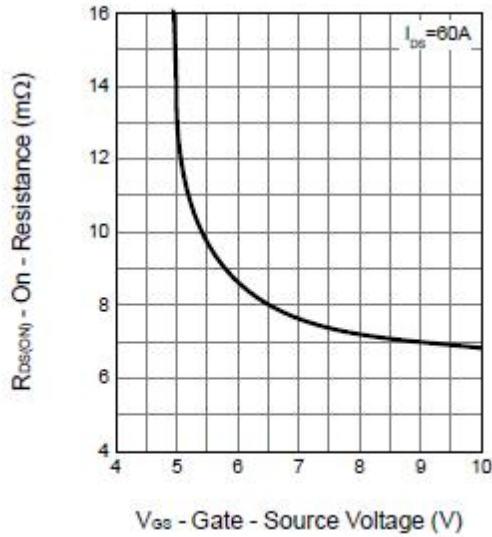
Output Characteristics



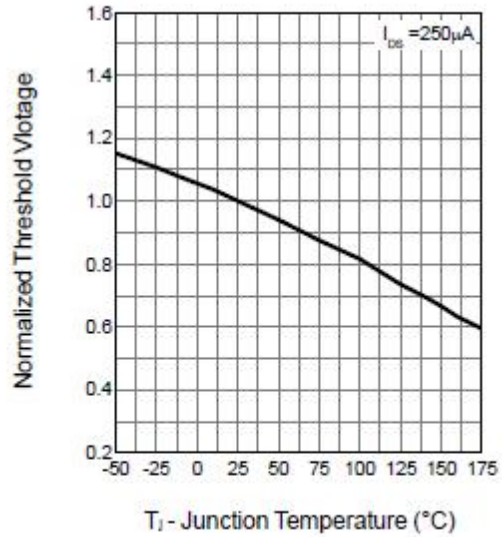
Drain-Source On Resistance



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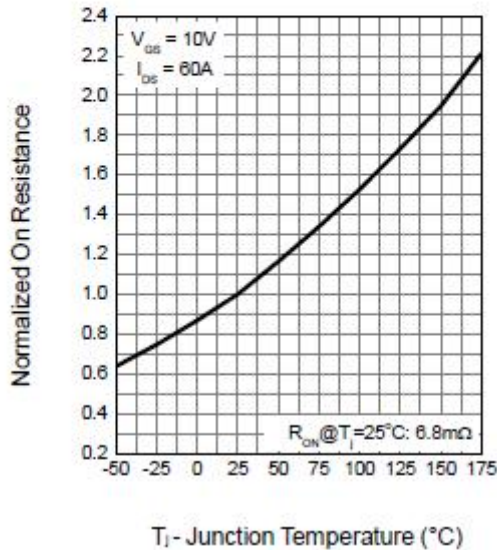


Gate Threshold Voltage

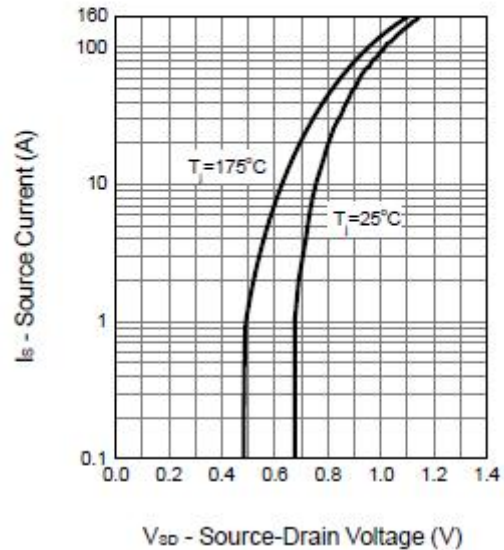


**Typical Operating Characteristics (Cont.)**

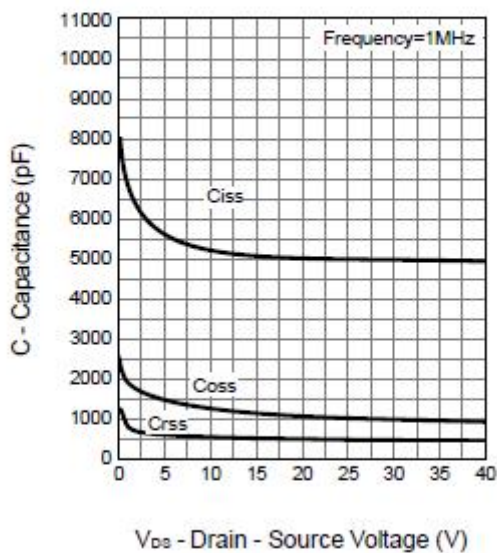
**Drain-Source On Resistance**



**Source-Drain Diode Forward**



**Capacitance**



**Gate Charge**

