

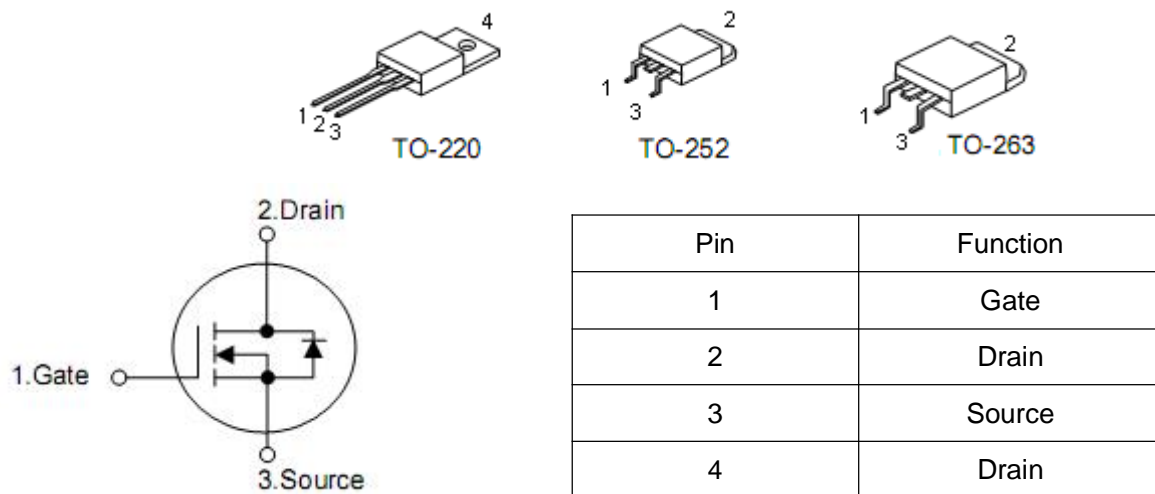
1. Features

- 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}	± 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

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-source breakdown voltage	BV_{DSS}	$V_{GS}=0V, I_{DS}=250\text{mA}$	100	-	-	V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=80V, V_{GS}=0V$	-	-	1	μA
		$T_J=125^{\circ}\text{C}$	-	-	20	
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_{D}=250\mu\text{A}$	2.0	3.0	4.0	V
Gate leakage current	I_{GSS}	$V_{GS}=\pm 25V, V_{DS}=0V$	-	-	± 100	nA
Drain-source on-state resistance	$R_{DS(on)}^1$	$V_{GS}=10V, I_{DS}=50A$ (TO-220\TO-263)	-	9	11	m Ω
		$V_{GS}=10V, I_{DS}=50A$ (TO-252)	-	9	14	
Gate resistance	R_g	$V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$	-	1.2	-	Ω
Diode forward voltage	V_{SD}^1	$I_{SD}=50A, V_{GS}=0V$	-	-	1.3	V
Reverse recovery time	t_{rr}	$I_{SD}=50A,$ $di_{SD}/dt=100A/\mu\text{s}$	-	46	-	nS
Reverse recovery charge	Q_{rr}		-	86	-	nC
Input capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V,$ $f=1\text{MHz}$	-	2946	-	pF
Output capacitance	C_{oss}		-	339	-	
Reverse transfer capacitance	C_{rss}		-	179	-	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=50V, I_{DS}=30A,$ $R_G=6.8\Omega, V_{GS}=10V$	-	15	-	ns
Rise time	t_r		-	108	-	
Turn-off delay time	$t_{d(off)}$		-	51	-	
Fall time	t_f		-	59	-	
Total gate charge	Q_g	$V_{DS}=50V, V_{GS}=10V$ $I_{DS}=30A$	-	60	-	nC
Gate-source charge	Q_{gs}		-	13.7	--	
Gate-drain charge	Q_{gd}		-	22.8	--	

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

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

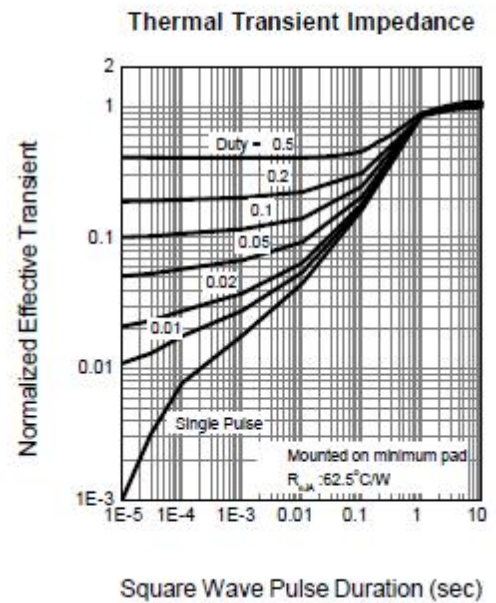
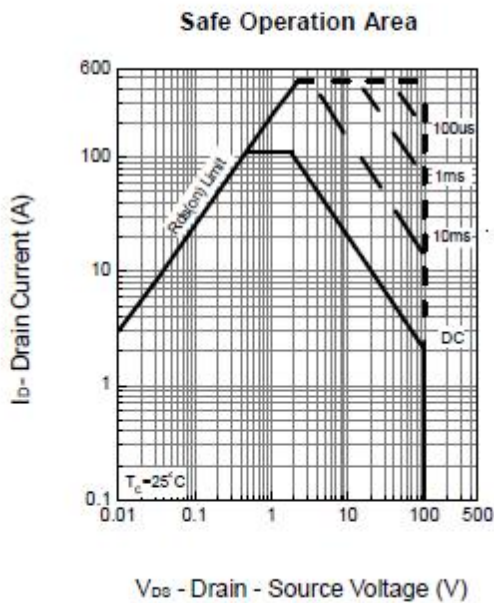
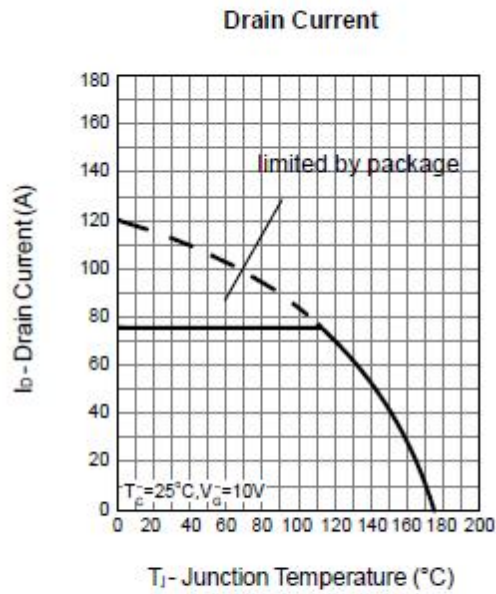
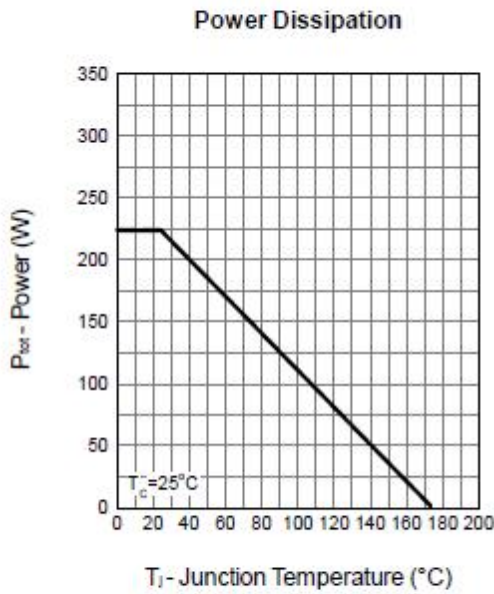
3. Package limitation current is 55A.

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

5. Starting $T_J=25^{\circ}\text{C}$, $L=0.5\text{mH}$, $I_{AS}=30A$.

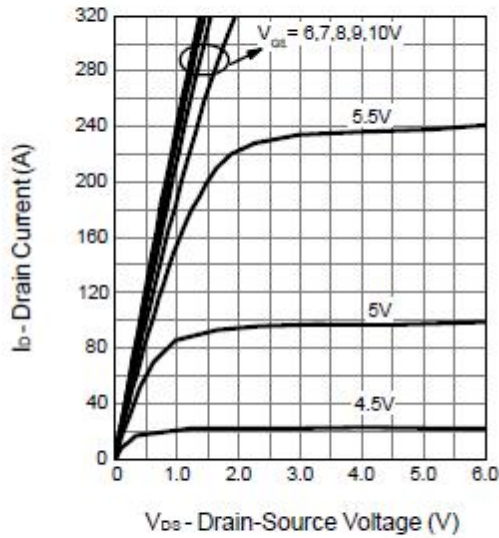
7. Test circuits and waveforms

Typical Operating Characteristics

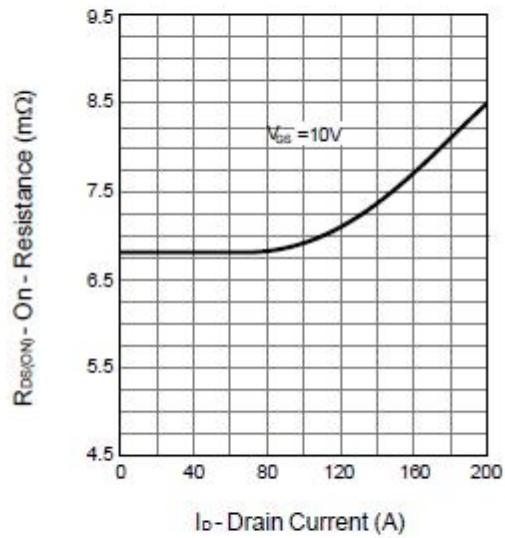


Typical Operating Characteristics (Cont.)

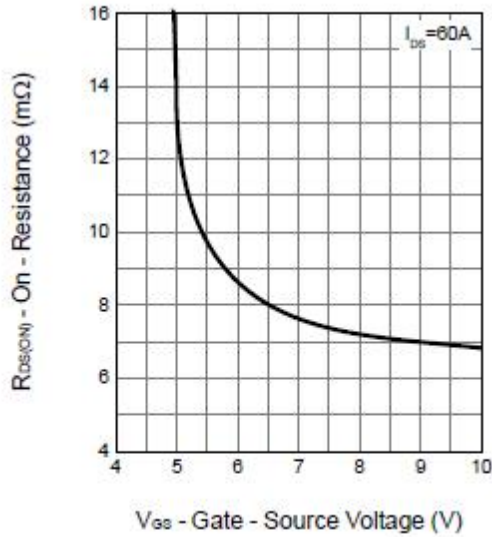
Output Characteristics



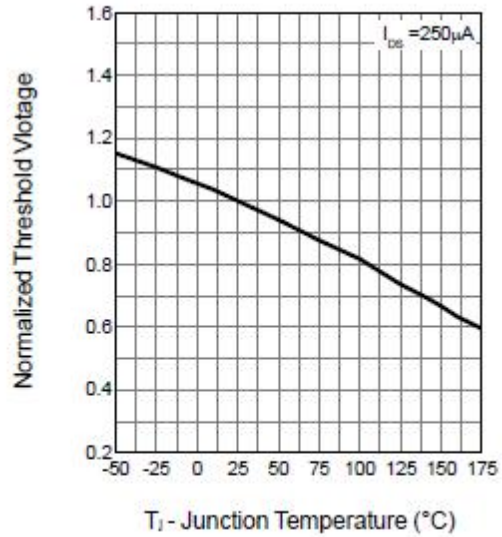
Drain-Source On Resistance



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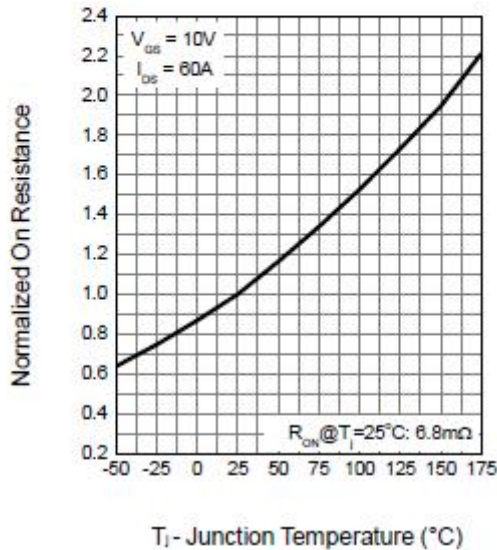


Gate Threshold Voltage

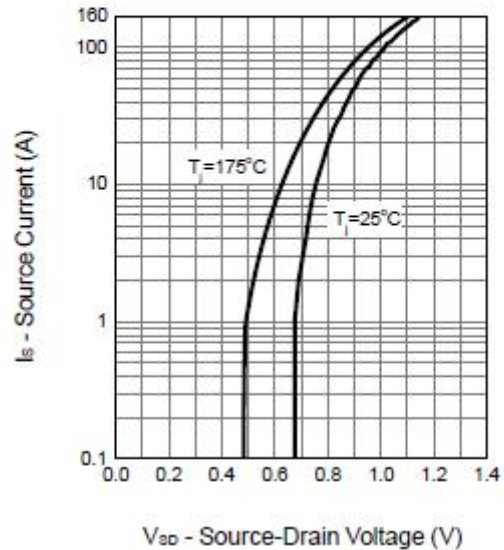


Typical Operating Characteristics (Cont.)

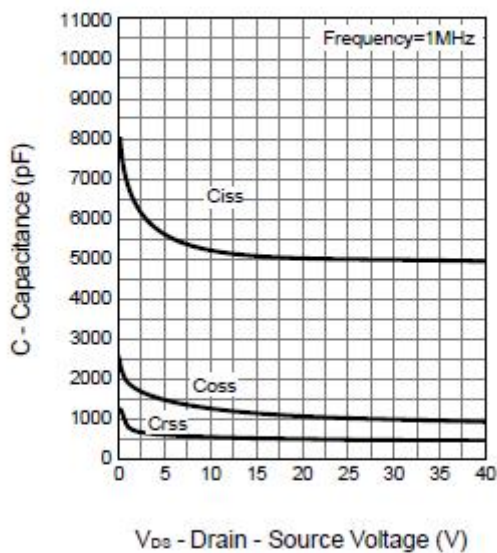
Drain-Source On Resistance



Source-Drain Diode Forward



Capacitance



Gate Charge

