

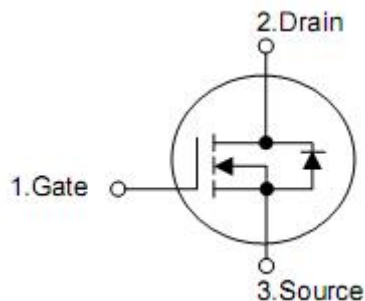
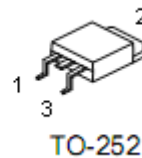
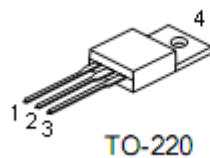
1. Features

- n $R_{DS(ON)}=9m\Omega@V_{GS}=10V$
- 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 DC-DC converters

3. Pin configuration



Pin	Function
1	Gate
2	Drain
3	Source
4	Drain

4. Absolute maximum ratings

Parameter		Symbol	Maximum		Units
			TO-220	TO-252	
Drain-source voltage		V_{DSS}	80		V
Gate-source voltage		V_{GSS}	±25		V
Continuous drain current	$T_C=25\text{ °C}$	I_D^3	110	80	A
	$T_C=100\text{ °C}$		70	50	A
Pulse drain current		I_{DP}^4	340		A
Avalanche current		I_{AS}^5	20		A
Avalanche energy		E_{AS}^5	410		mJ
Maximum power dissipation	$T_C=25\text{ °C}$	P_D	240	200	W
	$T_C=100\text{ °C}$		100	80	W
Junction & storage temperature range		T_J, T_{STG}	-55~175		°C

5. Thermal characteristics

Parameter	Symbol	Typical	Units
Thermal resistance-junction to case	$R_{\theta jc}$	0.52	°C/W
Thermal resistance-junction to ambient	$R_{\theta ja}$	55	

6. Electrical characteristics

(T_A=25°C, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static characteristics						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V, I _{DS} =250μA	80	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =64V, V _{GS} =0V T _J =125 °C	-	-	1	μA
			-	-	100	
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _{DS} =250μA	2	3	4	V
Gate leakage current	I _{GSS}	V _{GS} =±25V, V _{DS} =0V	-	-	±100	nA
Drain-source on-state resistance	R _{DS(on)} ¹	V _{GS} =10V, I _{DS} =40A	-	9	12	mΩ
Diode characteristics						
Diode forward voltage	V _{SD} ¹	I _{SD} =40A, V _{GS} =0V	-	-	1.3	V
Diode continuous forward current	I _S ³		-	-	80	A
Reverse recovery time	t _{rr}	I _F =40A, di/dt=100A/μs	-	25	-	nS
Reverse recovery charge	Q _{rr}		-	18.5	-	nC
Dynamic characteristics ²						
Gate resistance	R _G	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	1.3	-	Ω
Input capacitance	C _{iss}	V _{GS} =0V, V _{DS} =25V, F=1.0MHz	-	3110	-	pF
Output capacitance	C _{oss}		-	445	-	
Reverse transfer capacitance	C _{rss}		-	270	-	
Turn-on delay time	t _{d(ON)}	V _{DD} =37.5V, I _D =40A, V _{GS} =10V, R _G =6.8Ω	-	20.4	-	nS
Turn-on rise time	t _r		-	63	-	
Turn-off delay time	t _{d(OFF)}		-	67	-	
Turn-off fall time	t _f		-	43	-	
Gate charge characteristics ²						
Total gate charge	Q _g	V _{DS} =37.5V, V _{GS} =10V, I _D =40A,	-	76	-	nC
Gate-source charge	Q _{gs}		-	9.5	-	
Gate-drain charge	Q _{gd}		-	40	-	

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

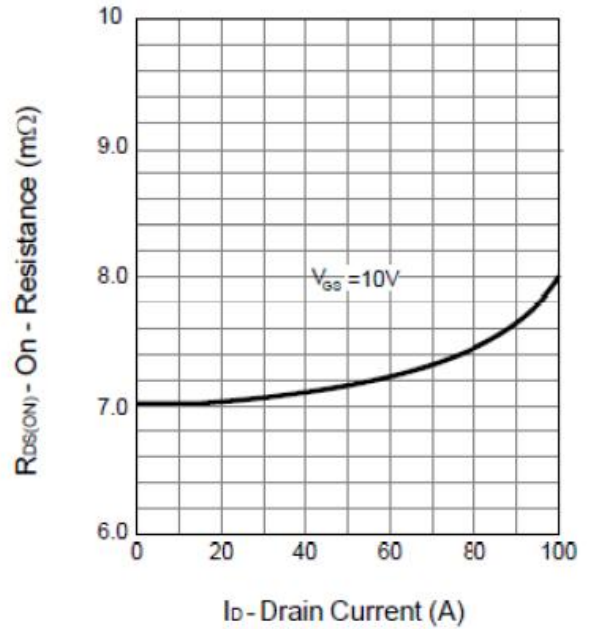
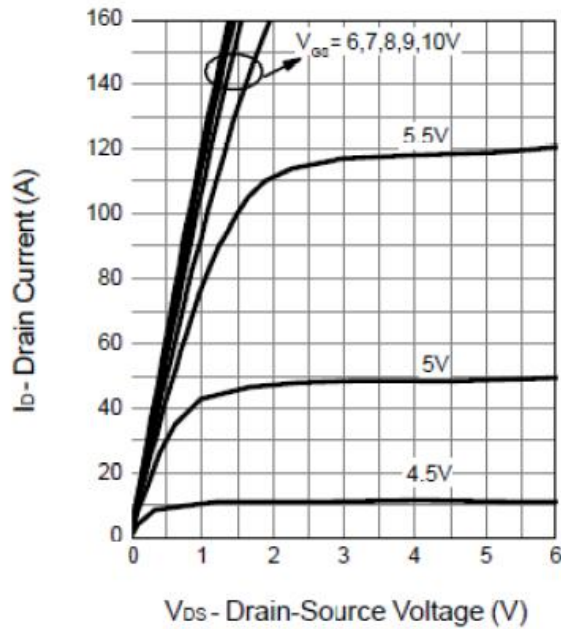
2. Guaranteed by design, not subject to production testing.

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

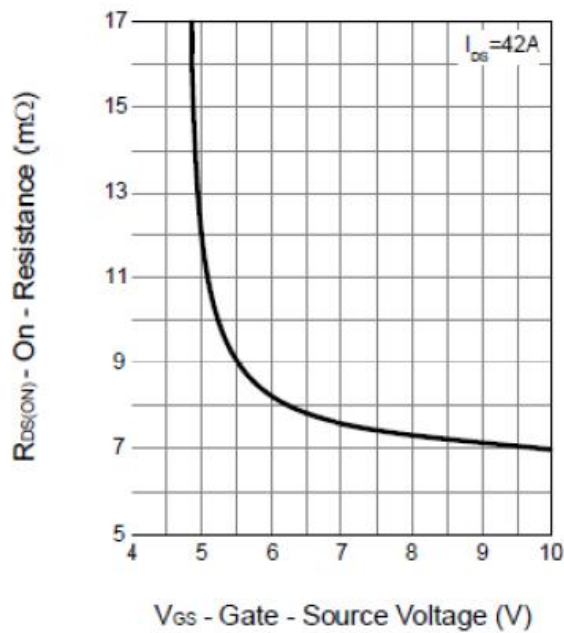
4. Repetitive rating, pulse width limited by max junction temperature.

5. Starting T_J=25 °C, L=1mH, I_{AS}=40A.

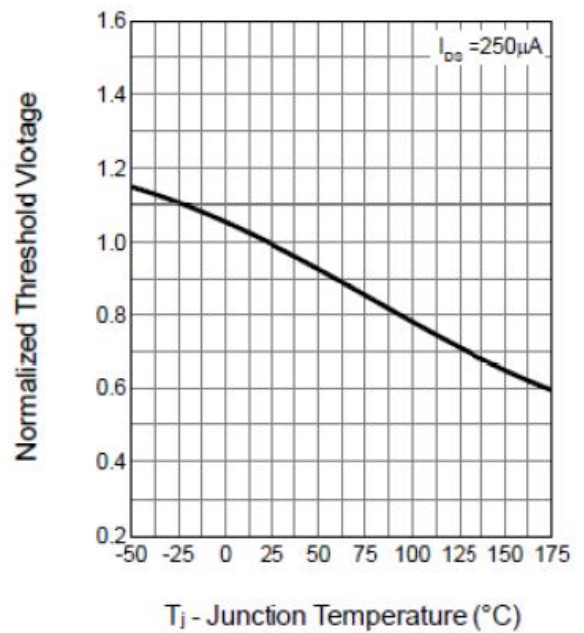
7. Test circuits and waveforms



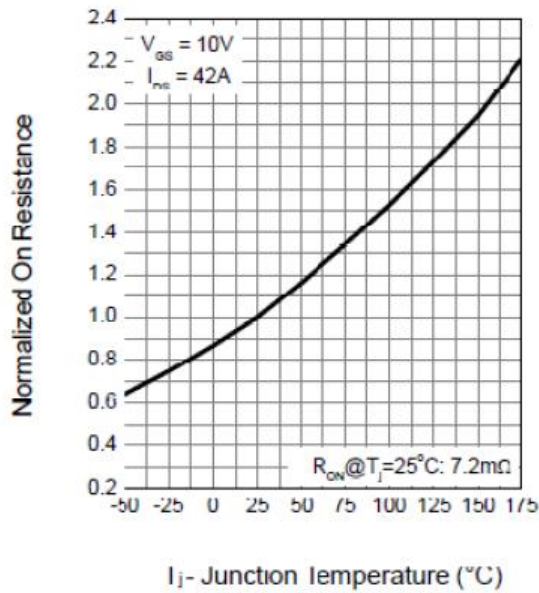
Drain-Source On Resistance



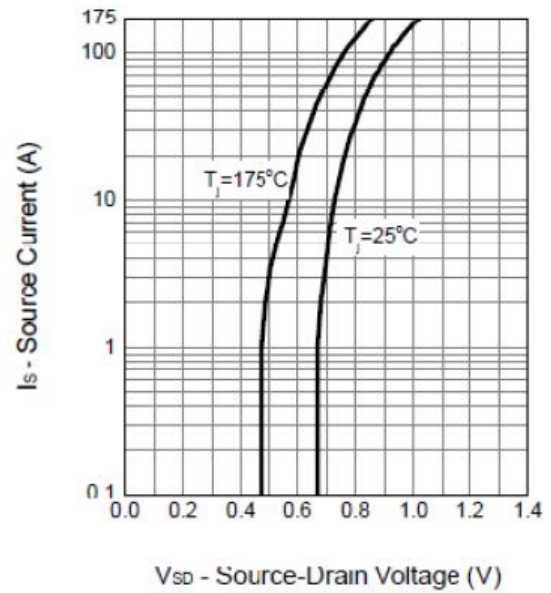
Gate Threshold Voltage



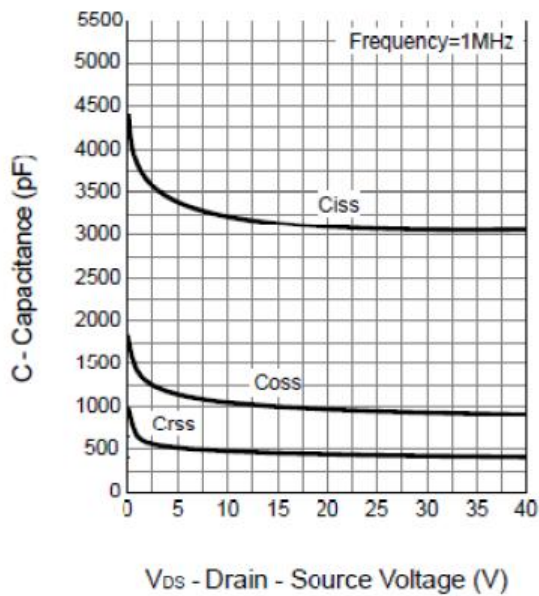
Drain-Source On Resistance



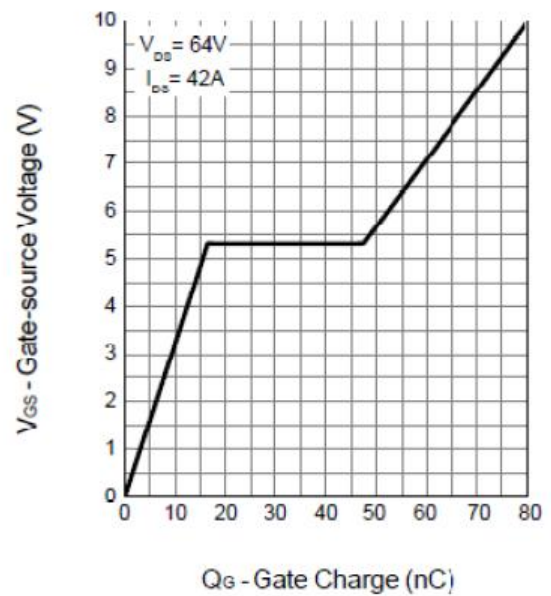
Source-Drain Diode Forward



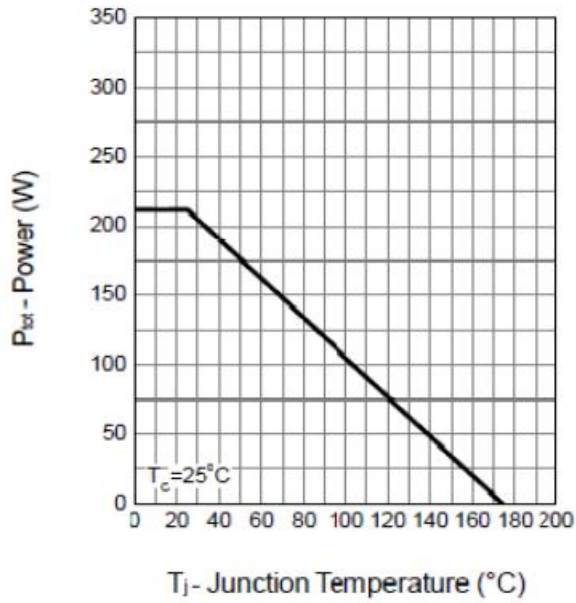
Capacitance



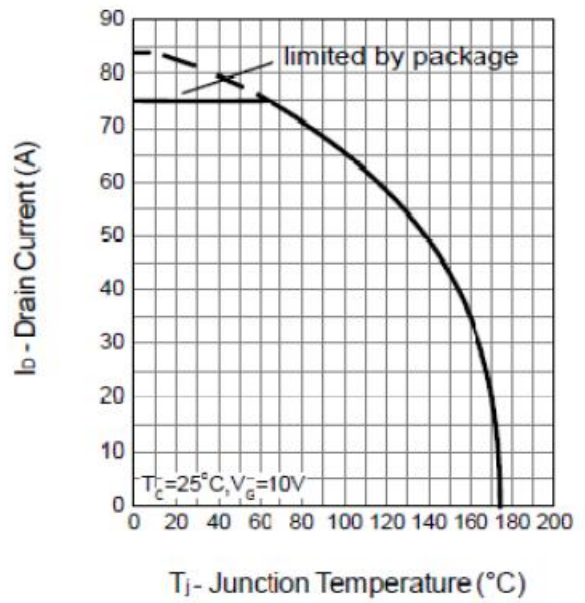
Gate Charge



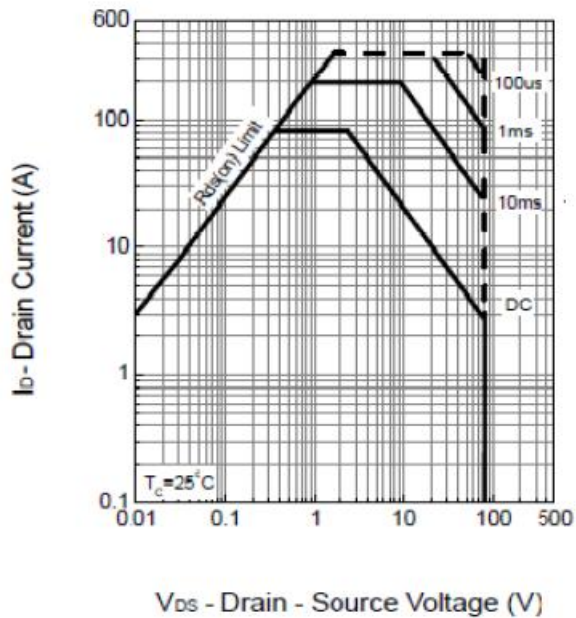
Power Dissipation



Drain Current



Safe Operation Area



Thermal Transient Impedance

