

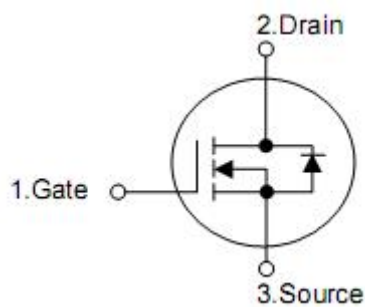
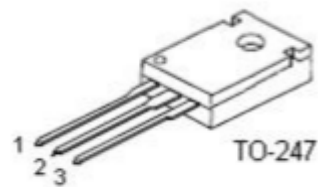
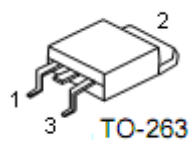
## 1. Features

- n  $R_{DS(ON)}=6.2m\Omega@V_{GS}=10V$
- 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. Absolute maximum ratings

Parameter		Symbol	Maximum			Units
			TO-252	TO-263	TO-247	
Drain-source voltage		$V_{DSS}$	80			V
Gate-source voltage		$V_{GSS}$	±25			V
Continuous drain current	$T_C=25\text{ °C}$	$I_D^3$	80*	80	80	A
	$T_C=100\text{ °C}$		70*	70	70	A
Pulse drain current		$T_C=25\text{ °C}$	$I_{DP}^4$			A
Avalanche current		$I_{AS}^5$	20			A
Avalanche energy		$E_{AS}^5$	410			mJ
Maximum power dissipation	$T_C=25\text{ °C}$	$P_D$	120	240	288	W
	$T_C=100\text{ °C}$		60	100	144	W
Junction & storage temperature range		$T_J, T_{STG}$	-55~175			°C

\*Drain current limited by maximum junction temperature.

#### 5. Thermal characteristics

Parameter	Symbol	Typical			Units
		TO-252	TO-263	TO-247	
Thermal resistance-junction to case	$R_{\theta jc}$	1.04	0.52	0.44	°C/W
Thermal resistance-junction to ambient	$R_{\theta ja}$	55			

## 6. Electrical characteristics

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static characteristics						
Drain-source breakdown voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>DS</sub> =250μA	80	-	-	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =64V, V <sub>GS</sub> =0V	-	-	1	μA
		T <sub>J</sub> =125 °C	-	-	100	
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =250μA	2	3	4	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> =30A	-	6.2	9	mΩ
Diode characteristics						
Diode forward voltage	V <sub>SD</sub> <sup>1</sup>	I <sub>SD</sub> =40A, V <sub>GS</sub> =0V	-	-	1.3	V
Diode continuous forward current	I <sub>S</sub> <sup>3</sup>		-	-	80	A
Reverse recovery time	t <sub>rr</sub>	I <sub>F</sub> =40A, di/dt=100A/μs	-	25	-	nS
Reverse recovery charge	Q <sub>rr</sub>		-	18.5	-	nC
Dynamic characteristics <sup>2</sup>						
Gate resistance	R <sub>G</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz	-	1.3	-	Ω
Input capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, F=1.0MHz	-	3110	-	pF
Output capacitance	C <sub>oss</sub>		-	445	-	
Reverse transfer capacitance	C <sub>rss</sub>		-	270	-	
Turn-on delay time	t <sub>d(ON)</sub>	V <sub>DD</sub> =37.5V, I <sub>D</sub> =40A, V <sub>GS</sub> =10V, R <sub>G</sub> =6.8Ω	-	20.4	-	nS
Turn-on rise time	t <sub>r</sub>		-	63	-	
Turn-off delay time	t <sub>d(OFF)</sub>		-	67	-	
Turn-off fall time	t <sub>f</sub>		-	43	-	
Gate charge characteristics <sup>2</sup>						
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> =37.5V, V <sub>GS</sub> =10V, I <sub>D</sub> =40A,	-	76	-	nC
Gate-source charge	Q <sub>gs</sub>		-	9.5	-	
Gate-drain charge	Q <sub>gd</sub>		-	40	-	

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

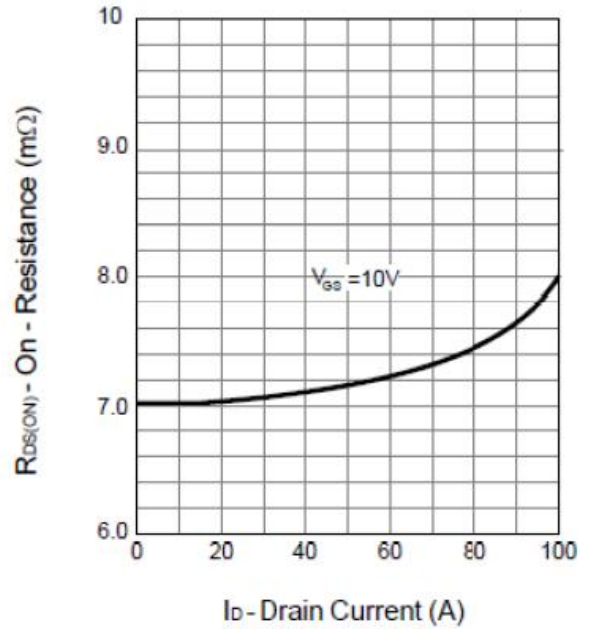
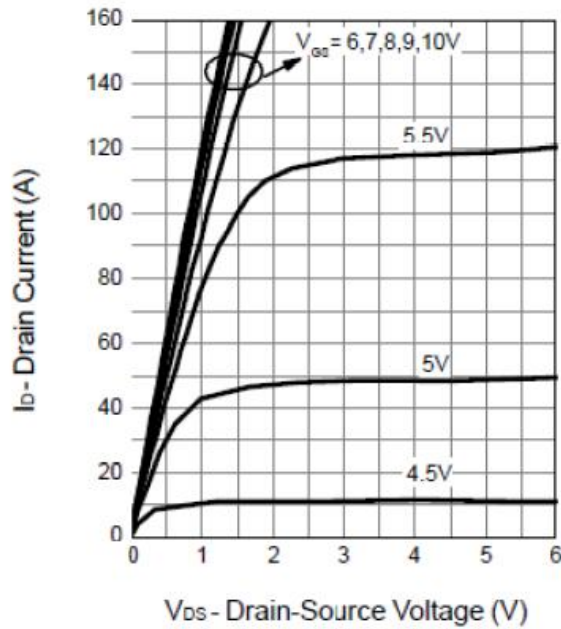
2. Guaranteed by design, not subject to production testing.

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

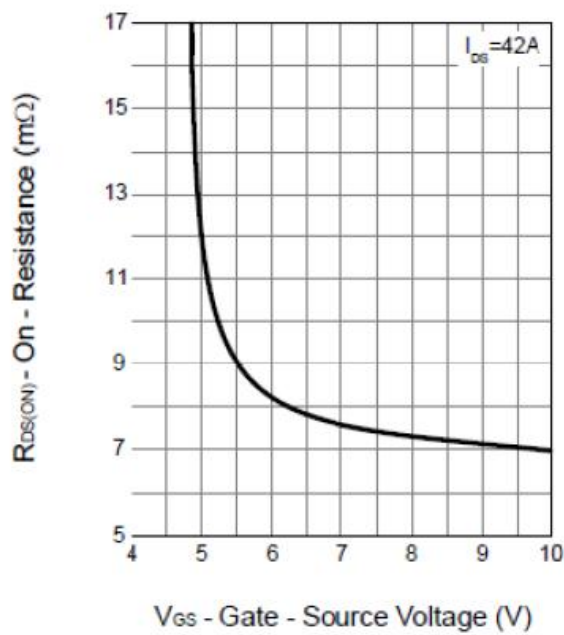
4. Repetitive rating, pulse width limited by max junction temperature.

5. Starting T<sub>J</sub>=25 °C, L=1mH, I<sub>AS</sub>=40A.

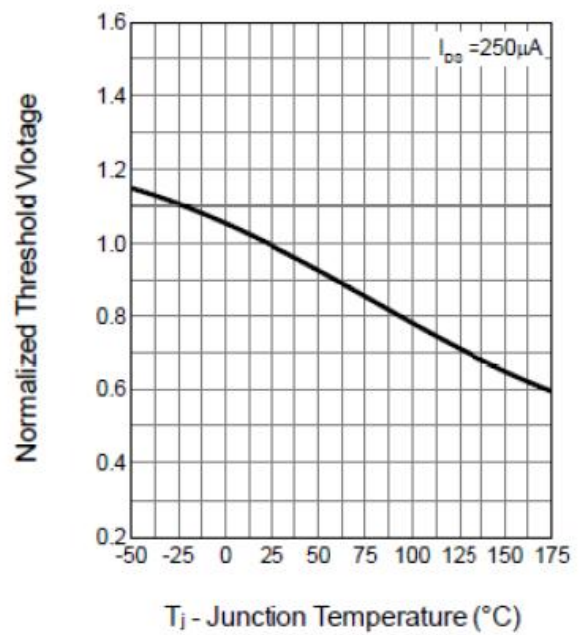
**7. Test circuits and waveforms**



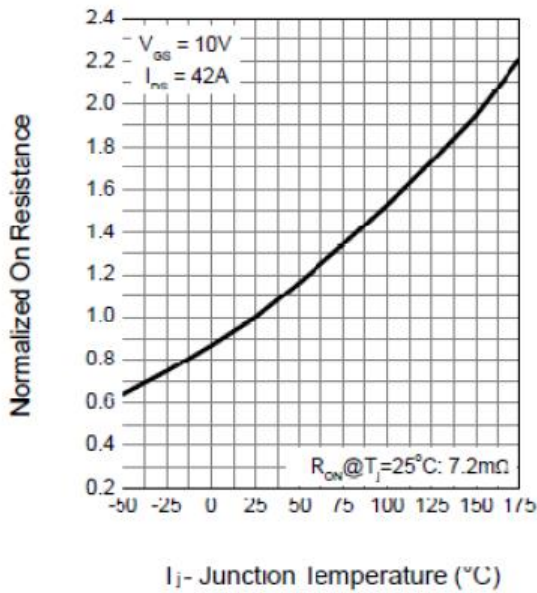
**Drain-Source On Resistance**



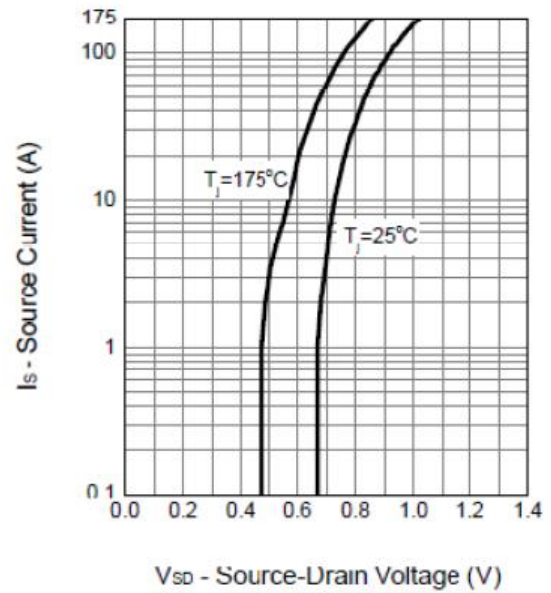
**Gate Threshold Voltage**



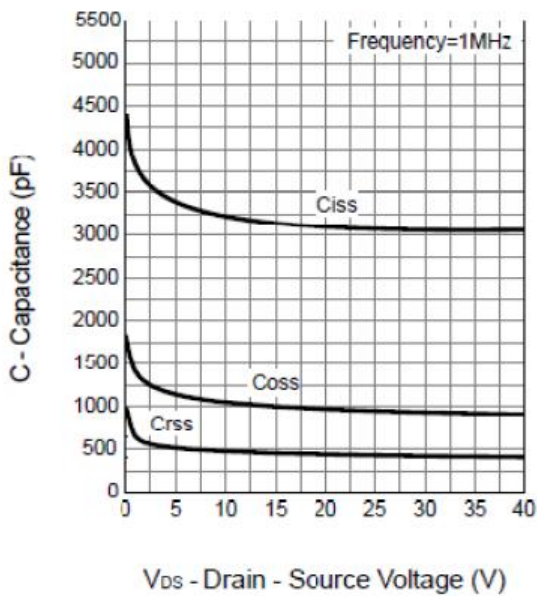
**Drain-Source On Resistance**



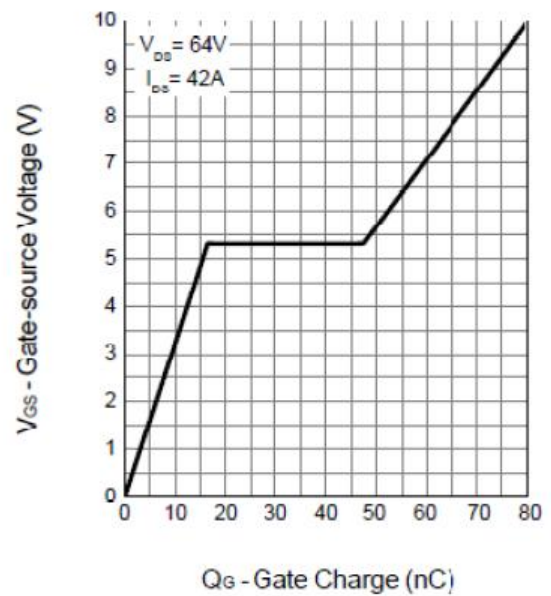
**Source-Drain Diode Forward**



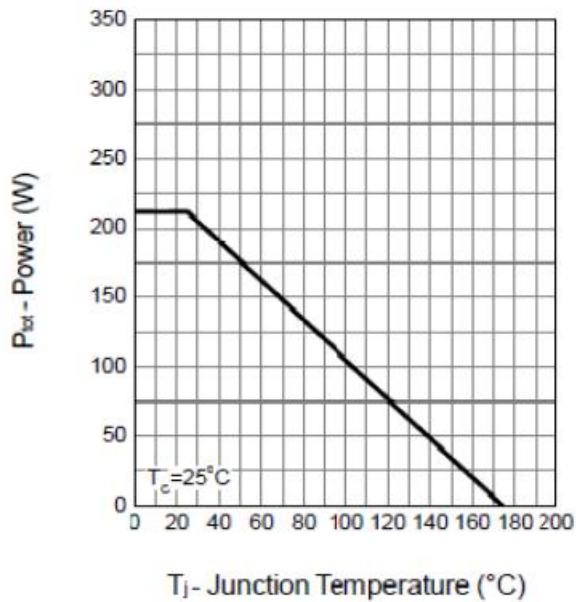
**Capacitance**



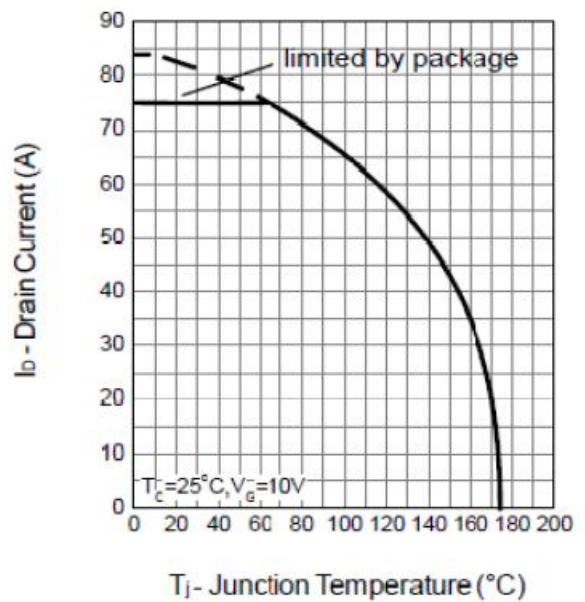
**Gate Charge**



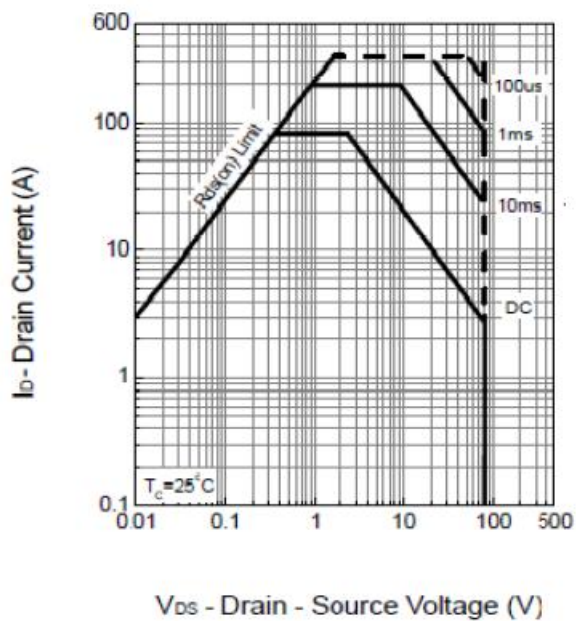
**Power Dissipation**



**Drain Current**



**Safe Operation Area**



**Thermal Transient Impedance**

