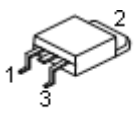
1. Features

- $R_{DS(ON)}$=0.7Ω (typ) @V_{GS}=10V
- RoHS compliant
- Low on resistance
- Low gate charge
- Peak current vs pulse width curve

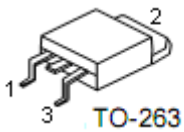
2. Applications

- Adaptor
- TV main power
- SMPS power supply
- LCD panel power

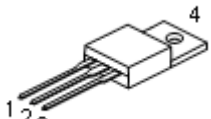
3.Symbol



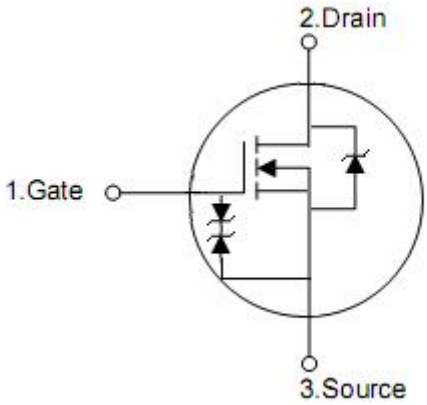
TO-252



TO-263



TO-220



Pin	Function
1	Gate
2	Drain
3	Source
4	Drain

4. Absolute maximum ratings

(T_C=25°C,unless otherwise specified)

Parameter	Symbol	Rating		Units
		TO-220 TO-263	TO-252	
Drain-source voltage	V_{DSS}	500		V
Continuous drain current	I_D	8.0		A
Continuous drain current T_C=100 ºC		5.5		A
Pulsed drain current	I_{DM}[a1]	28		A
Power dissipation	P_D	160	100	W
Derating factor above 25℃		1.28	0.8	W/ ºC
Gate-source voltage	V_{GS}	±20		V
Single pulse avalanche energy	E_{AS}[a2]	400		mJ
Avalanche energy, repetitive	E_{AR}[a1]	30		mJ
Avalanche current	I_{AR} [a1]	7.0		A
Peak diode recovery dv/dt	dv/dt [a3]	5.5		V/ns
Gate-source ESD(HBM-C=100pF,R=1.5KΩ)	$VESD_{(G-S)}$	4000		V
Operating junction and storage temperature range	T_J ,T_{STG}	150,-55 to150		ºC
Maximum temperature for soldering	T_L	300		ºC

*Drain current limited by maximum junction temperature

Caution：Stresses greater than those listed in the”Absolute maximum ratings”table may cause permanent Damage to the device

5. Thermal characteristics

Parameter	Symbol	Rating	Unit	Test condition
Junction-case	$R_{\theta JC}$	1.04	ºC/W	Drain lead soldered to water cooled heatsink,P_D adjusted for a peak junction temperature of +150 ºC
Junction-ambient	$R_{\theta JA}$	100	ºC/W	1 cubic foot chamber,free air

6. Electrical characteristics

(T_C=25°C,unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0V,I_D=250μA	500	-	-	V
Bvdss temperature coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference 25℃ I_D=250uA	-	0.74	-	V/ºC
Drain-source leakage current	I_{DSS}	V_{DS}=500V, V_{GS}=0V T_A=25°C	-	-	25	μA
		V_{DS}=400V, V_{GS}=0V T_A=125°C	-	-	250	
Gate source breakdown voltage	V_{GSO}	I_{GS}=±1mA (open drain)	±20	-	-	V
Gate-source forward leakage	$I_{GSS(F)}$	V_{GS}=20V	-	-	10	uA
Gate-source reverse leakage	$I_{GSS(R)}$	V_{GS}=-20V	-	-	-10	
Drain-source on-resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=4A	-	0.7	0.9	Ω
Gate threshold voltage	$V_{GS(TH)}$	V_{DS}= V_{GS}, I_D=250uA	2	3	4	V
Pulse width tp≤380μs, δ≤2%						
Forward transconductance	gfs	V_{DS}=15V, I_D=3A	-	8.5	-	S
Input capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V f=1MHz	-	960	-	pF
Output capacitance	C_{oss}		-	110	-	
Reverse transfer capacitance	C_{rss}		-	10	-	
Turn-on delay time	$t_{d(on)}$	V_{DD}=250V, I_D=8A, R_G=12Ω,V_{GS}=10V	-	11	-	ns
Rise time	t_r		-	17	-	
Turn-off delay time	$t_{d(off)}$		-	46	-	
Fall time	t_f		-	22	-	
Total gate charge	Q_g	V_{DD}=250V, I_D=8A, V_{GS}=10V	-	24	-	nC
Gate-source charge	Q_{gs}		-	4.0	-	
Gate-drain charge	Q_{gd}		-	10	-	
Continuous source current（body biode）	I_S		-	-	8	A
Maximum pulsed current（body biode）	I_{SM}		-	-	32	
Diode forward voltage	V_{SD}	I_S=8A, V_{GS}=0V	-	-	1.5	V
Reverse recovery time	t_{rr}	I_S=8A, V_{GS}=0V dI_F/dt=100A/μs T_J=25ºC	-	175	-	ns
Reverse recovery charge	Q_{rr}		-	0.75	-	nC
Reverse recovery current	I_{RRM}		-	8.57	-	A
Pulse width tp≤380μs, δ≤2%						

Note:a1.Repetitive rating;pulse width limited by maximum junction temperature

a2.L=10.0mH,Start T_J=25ºC.

a3. I_{SD}=8A di/dt≤100A/μs,V_{DD}≤ BV_{DS},Start T_J=25ºC.

7. Typical operating characteristics

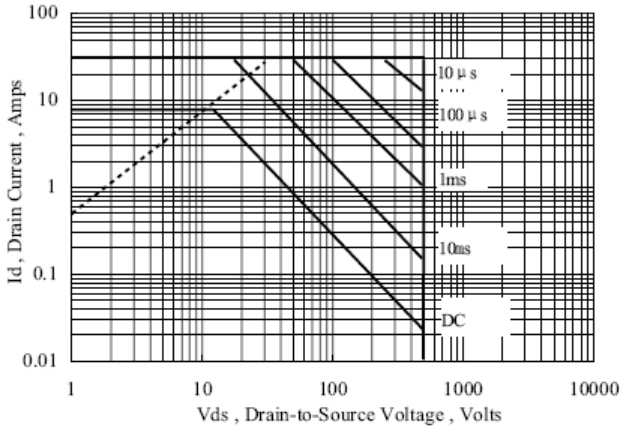


Figure 1 Maximun Forward Bias Safe Operating Area

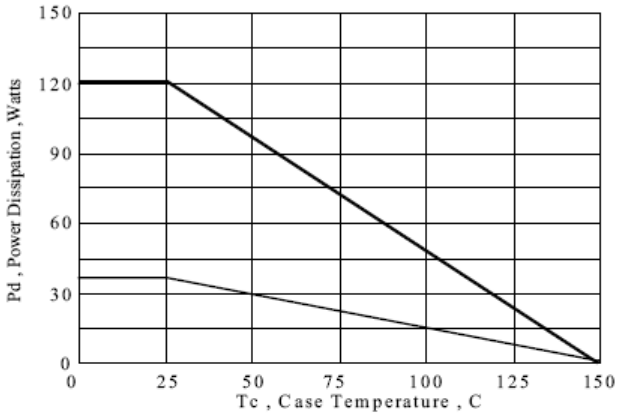


Figure 2 Maximun Power Dissipation vs Case Temperature

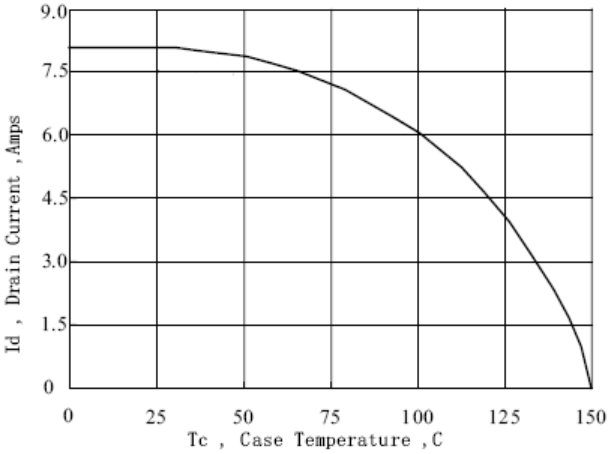


Figure 3 Maximum Continuous Drain Current vs Case Temperature

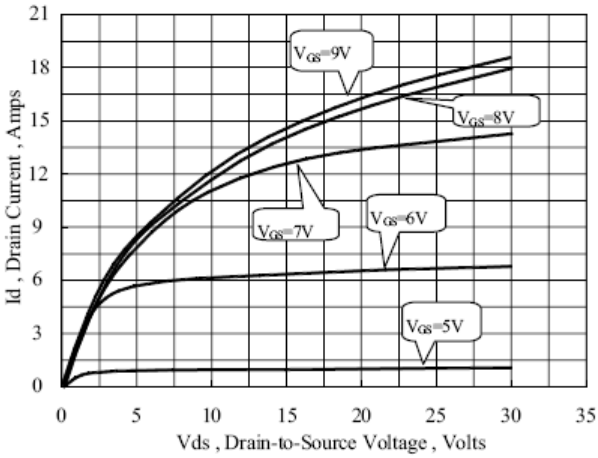


Figure 4 Typical Output Characteristics

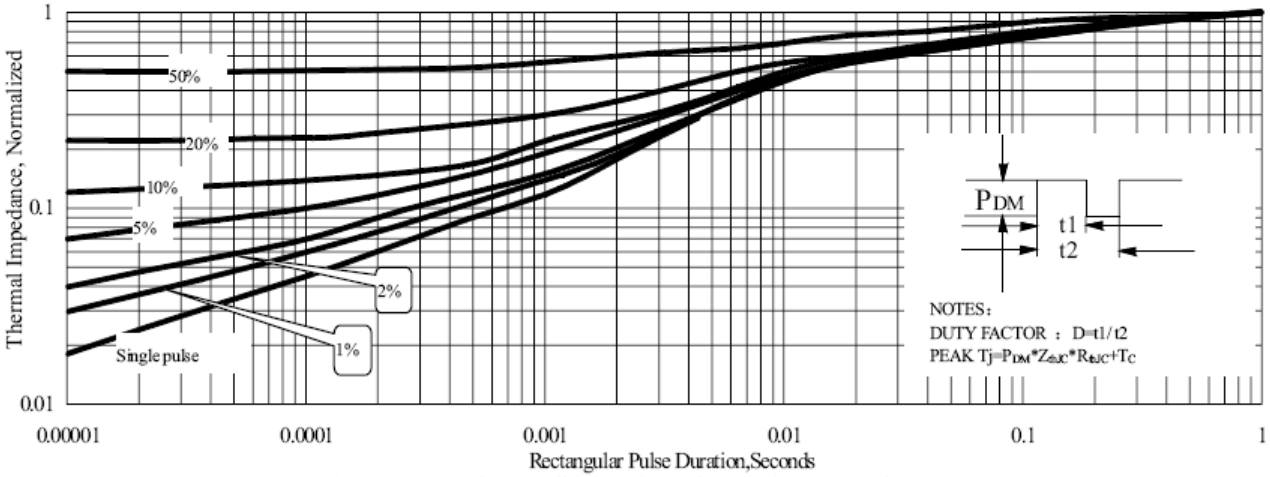


Figure 5 Maximum Effective Thermal Impendance , Junction to Case

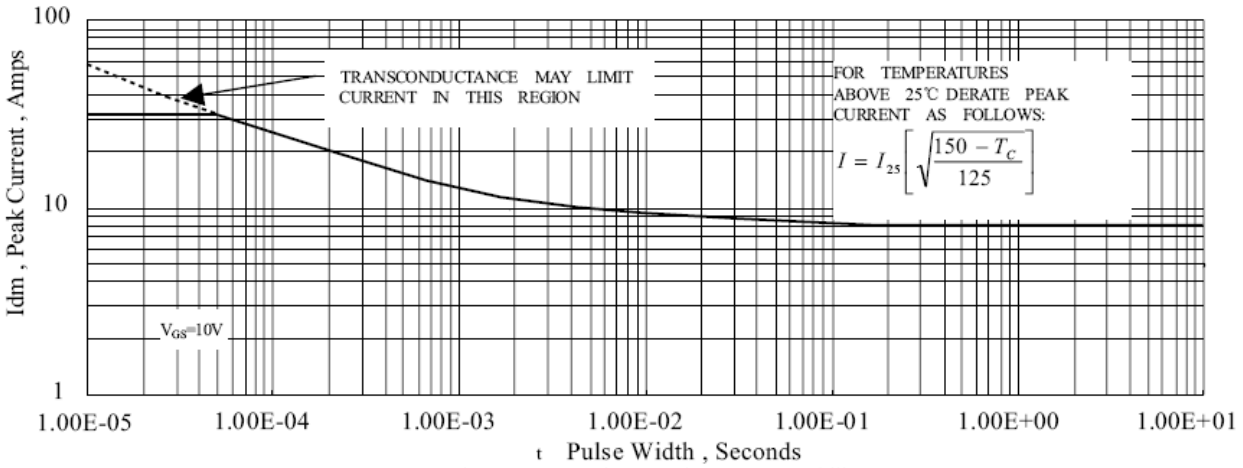


Figure 6 Maximun Peak Current Capability

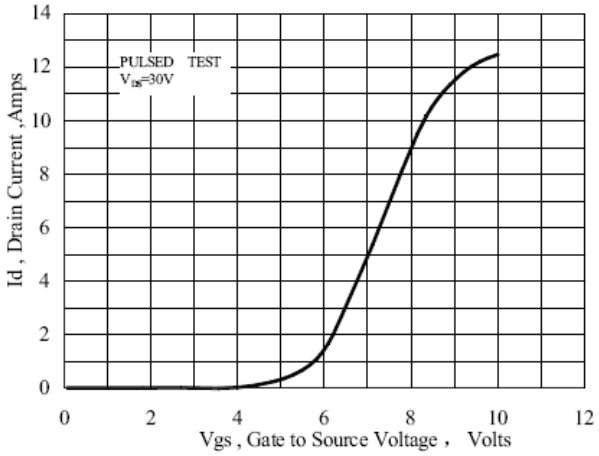


Figure 7 Typical Transfer Characteristics

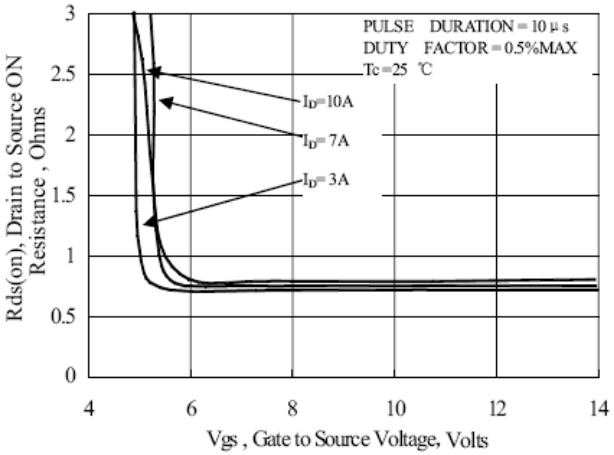


Figure 8 Typical Drain to Source ON Resistance vs Gate Voltage and Drain Current

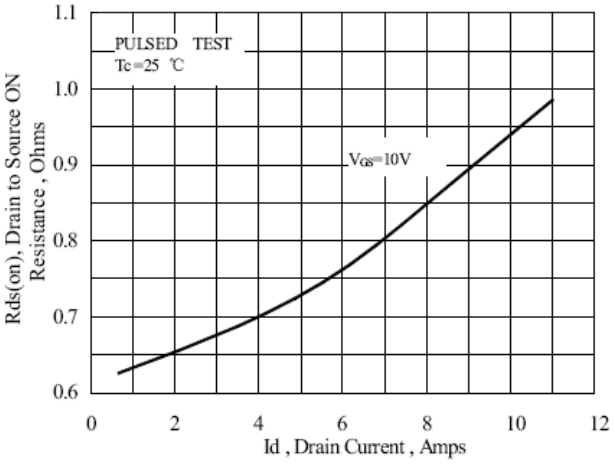


Figure 9 Typical Drain to Source ON Resistance vs Drain Current

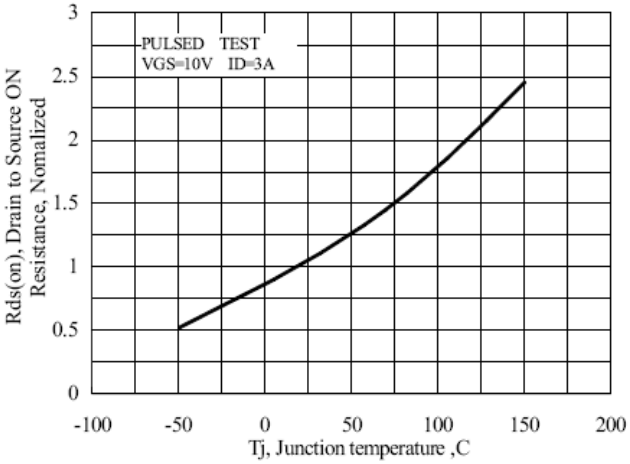


Figure 10 Typical Drian to Source on Resistance vs Junction Temperature

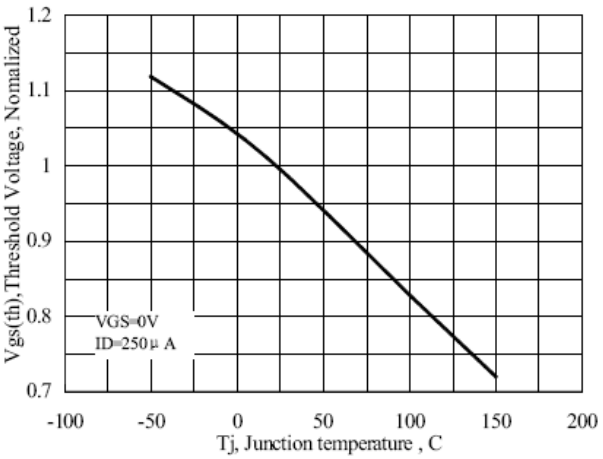


Figure 11 Typical Theshold Voltage vs Junction Temperature

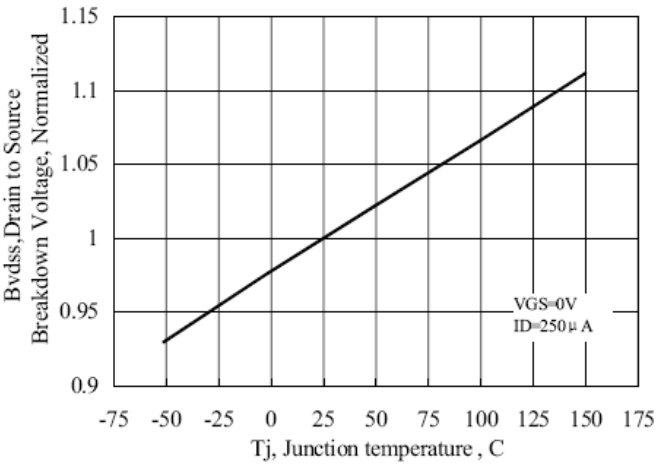


Figure 12 Typical Breakdown Voltage vs Junction Temperature

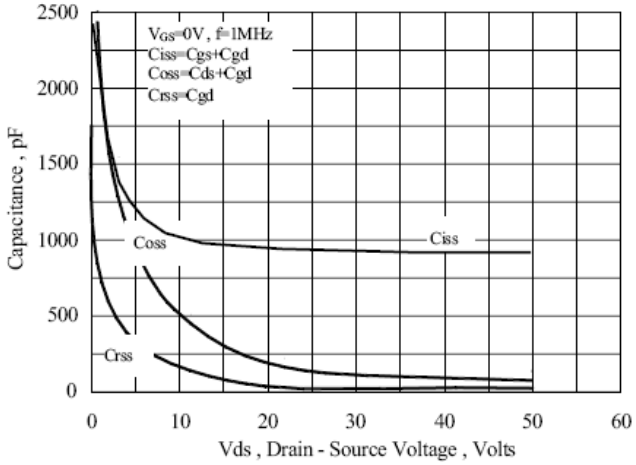


Figure 13 Typical Capacitance vs Drain to Source Voltage

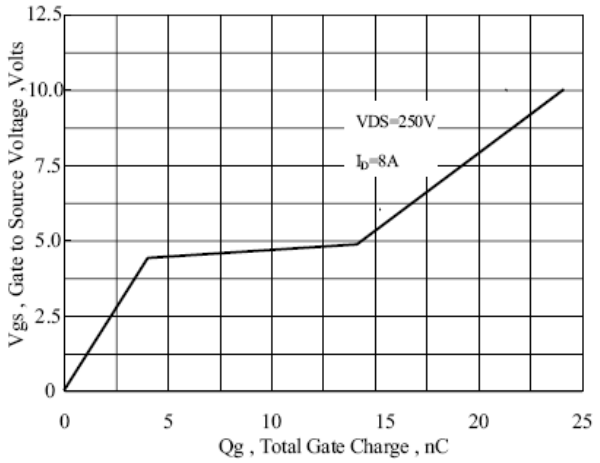


Figure 14 Typical Gate Charge vs Gate to Source Voltage

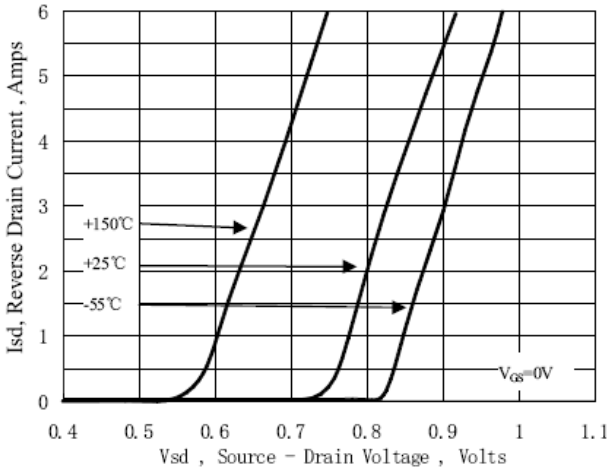


Figure 15 Typical Body Diode Transfer Characteristics

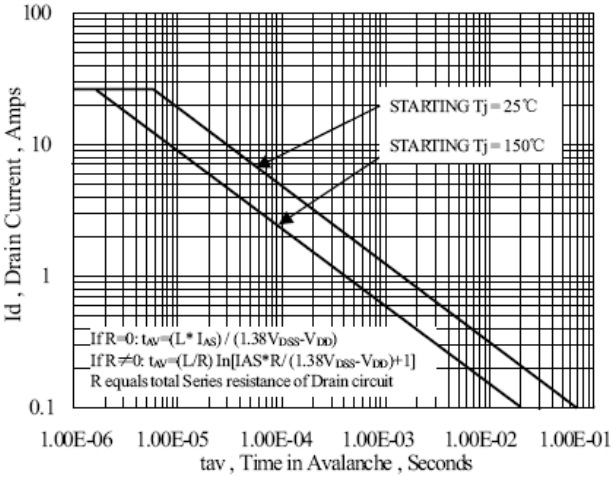


Figure 16 Unclamped Inductive Switching Capability