Description

Features

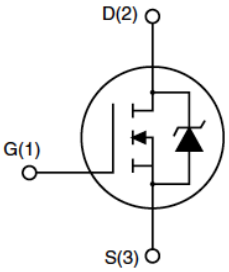
- 55V,110A
- $R_{DS(ON)}$ = 6.8mΩ (Typ.) @ V_{GS} = 10V,I_D=30A
- Fast Switching
- 100% Avalanche Tested
- Improved dv/dt Capability

Application

- Uninterruptible Power Supply(UPS)
- High Efficiency Switch Mode Power Supplies

TO-220C

TO-263



Schematic Diagram

Absolute Maximum Ratings (T_C=25℃ unless otherwise specified)

Symbol	Parameter		Max.	Units
			TO-220C/TO-263	
V_{DSS}	Drain-Source Voltage		55	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C = 25℃	110	A
		T_C = 100℃	80	A
I_{DM}	Pulsed Drain Current note1		390	A
P_D	Power Dissipation	T_C = 25℃	200	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		0.75	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +175	℃

Electrical Characteristics (T_C=25℃ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250μA	55	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} =55V, V_{GS} = 0V, T_J= 25℃	-	-	1.0	μA
		V_{DS} =44V, T_C = 125℃	-	-	10	
I_{GSS}	Gate to Body Leakage Current	V_{DS} =0V,V_{GS} = ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D=250μA	2.0	-	4.0	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note2	V_{GS} =10V, I_D =30A	-	6.8	8.0	mΩ
g_{FS}	Forward Transconductance	V_{DS} =20V, I_D =30A	45	-	-	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	-	3291	-	pF
C_{oss}	Output Capacitance		-	671.5	-	pF
C_{rss}	Reverse Transfer Capacitance		-	112.1	-	pF
Q_g	Total Gate Charge	V_{DD} =44V, I_D =30A, V_{GS} = 10V	-	112	-	nC
Q_{gs}	Gate-Source Charge		-	23.2	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	34.9	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=28V, I_D=30V, R_G=5Ω, V_{GS} =10V,	-	19.5	-	ns
t_r	Turn-on Rise Time		-	50.7	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	55	-	ns
t_f	Turn-off Fall Time		-	24.6	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	110	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	390	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S=30A	-	-	1.3	V
t_{rr}	Reverse Recovery Time	V_{GS} =0V, I_F=30A, di/dt=100A/μs	-	62.3	-	ns
Q_{rr}	Reverse Recovery Charge		-	137	-	nC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

Typical Performance Characteristics

Figure1: Output Characteristics

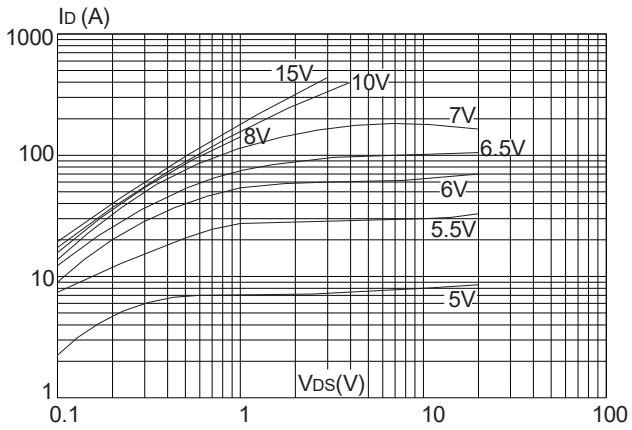


Figure 2: Typical Transfer Characteristics

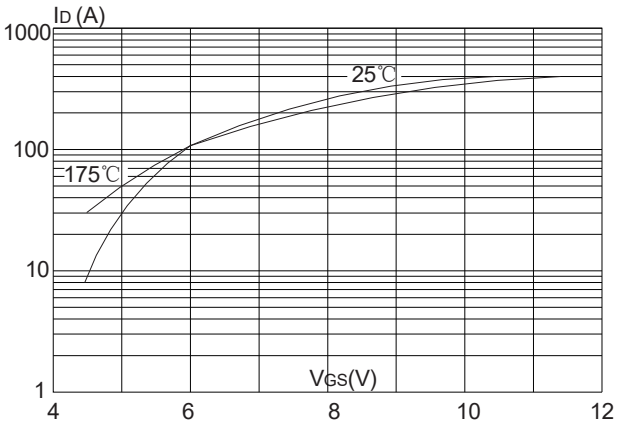


Figure 3: On-resistance vs. Drain Current

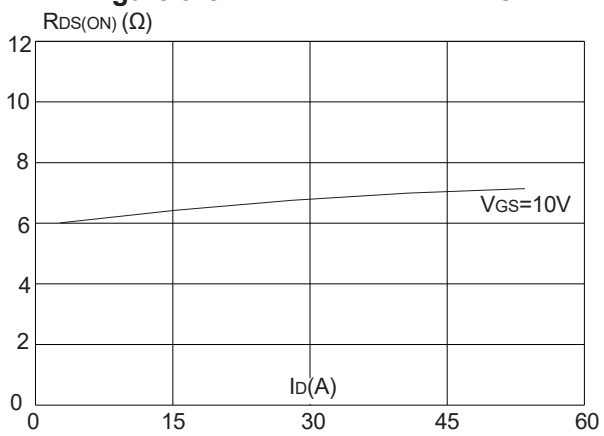


Figure 4: Body Diode Characteristics

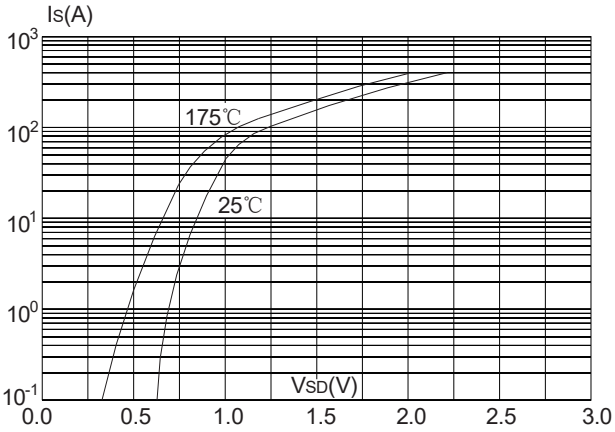


Figure 5: Gate Charge Characteristics

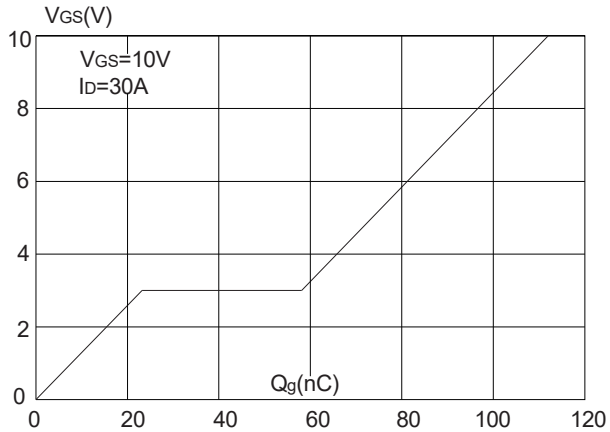


Figure 6: Capacitance Characteristics

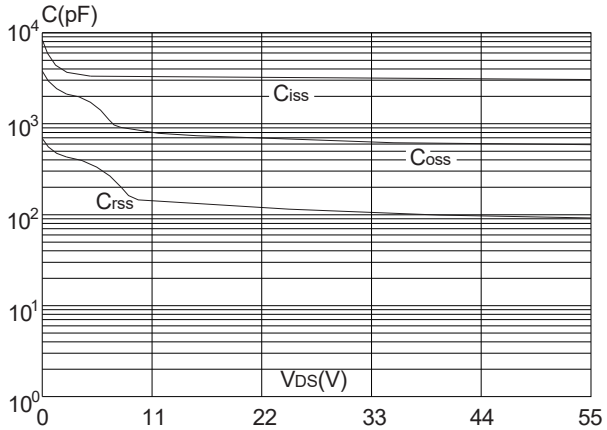


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

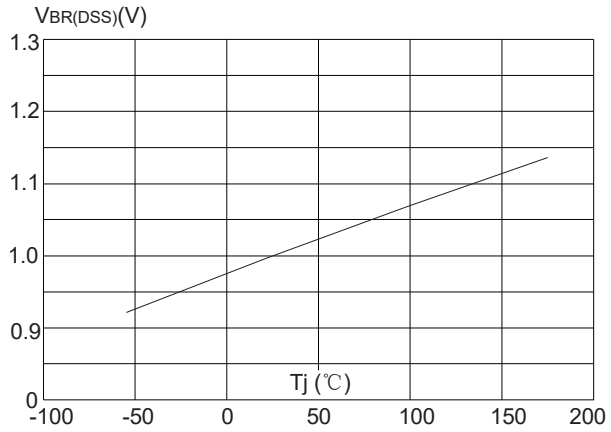


Figure 8: Normalized on Resistance vs. Junction Temperature

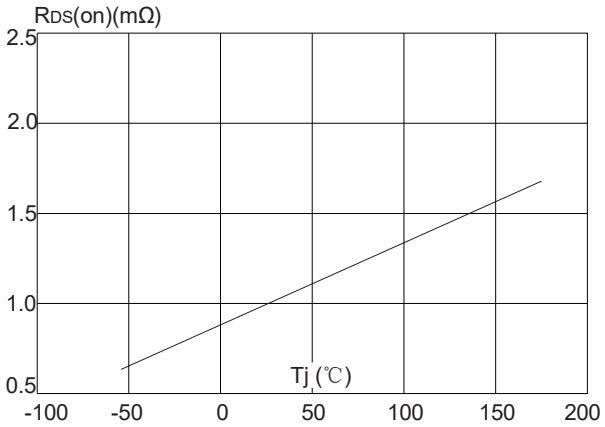


Figure 9: Maximum Safe Operating Area

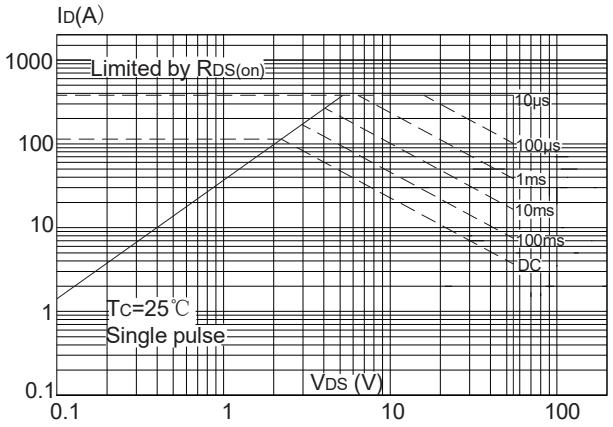


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

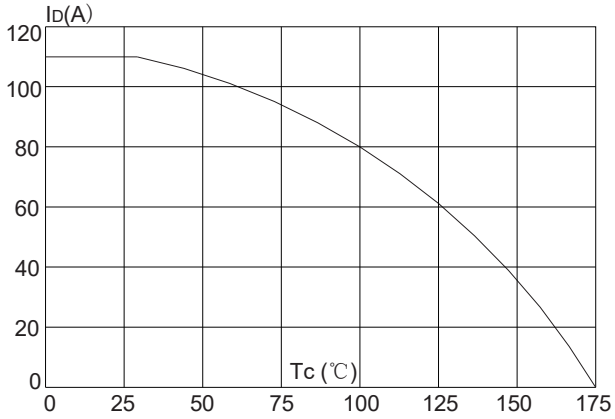
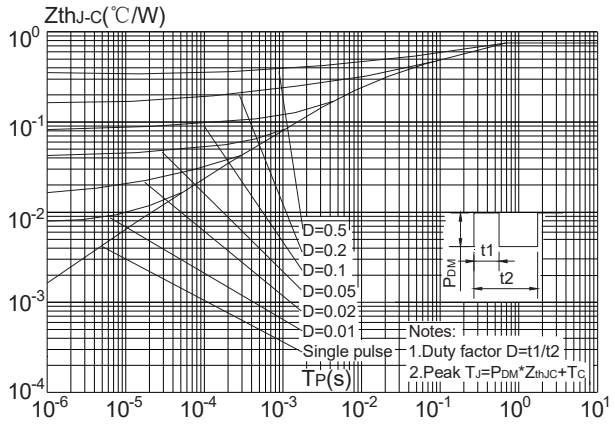


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case (TO-220C,TO-263)



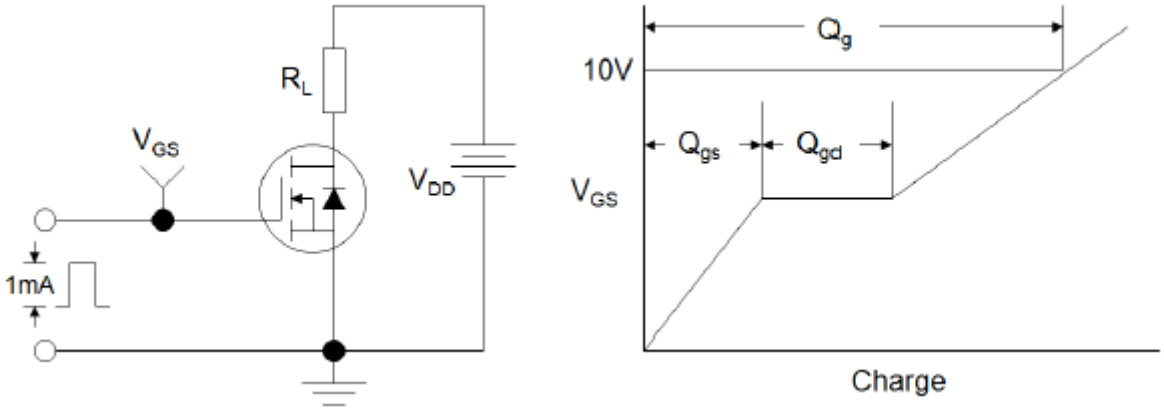


Figure1:Gate Charge Test Circuit & Waveform

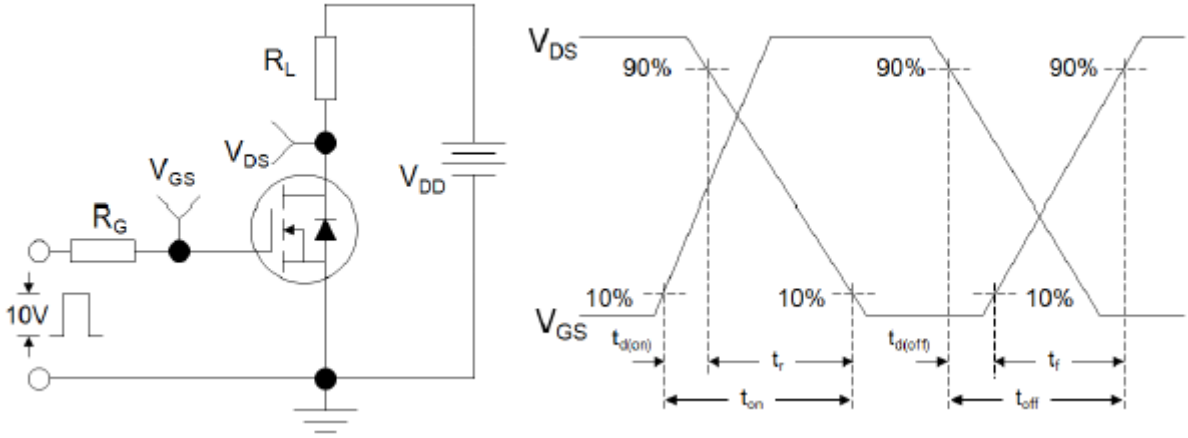


Figure 2: Resistive Switching Test Circuit & Waveforms

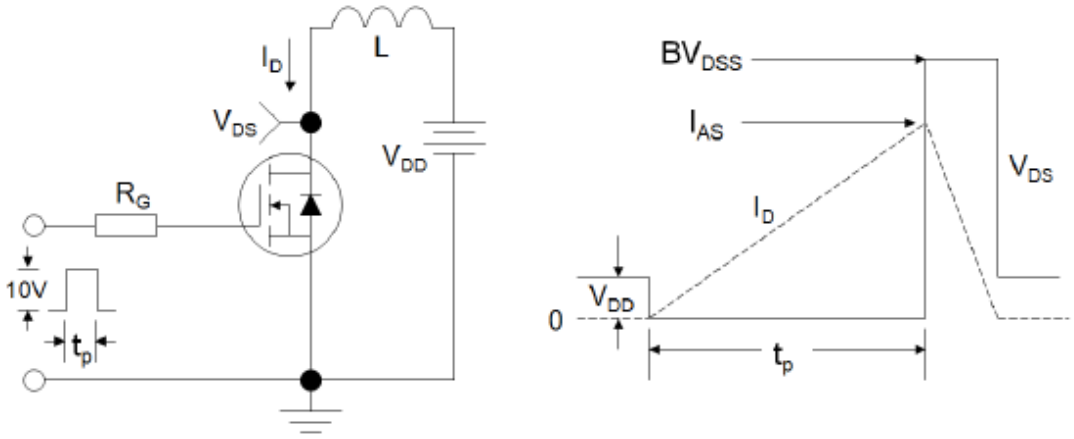


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

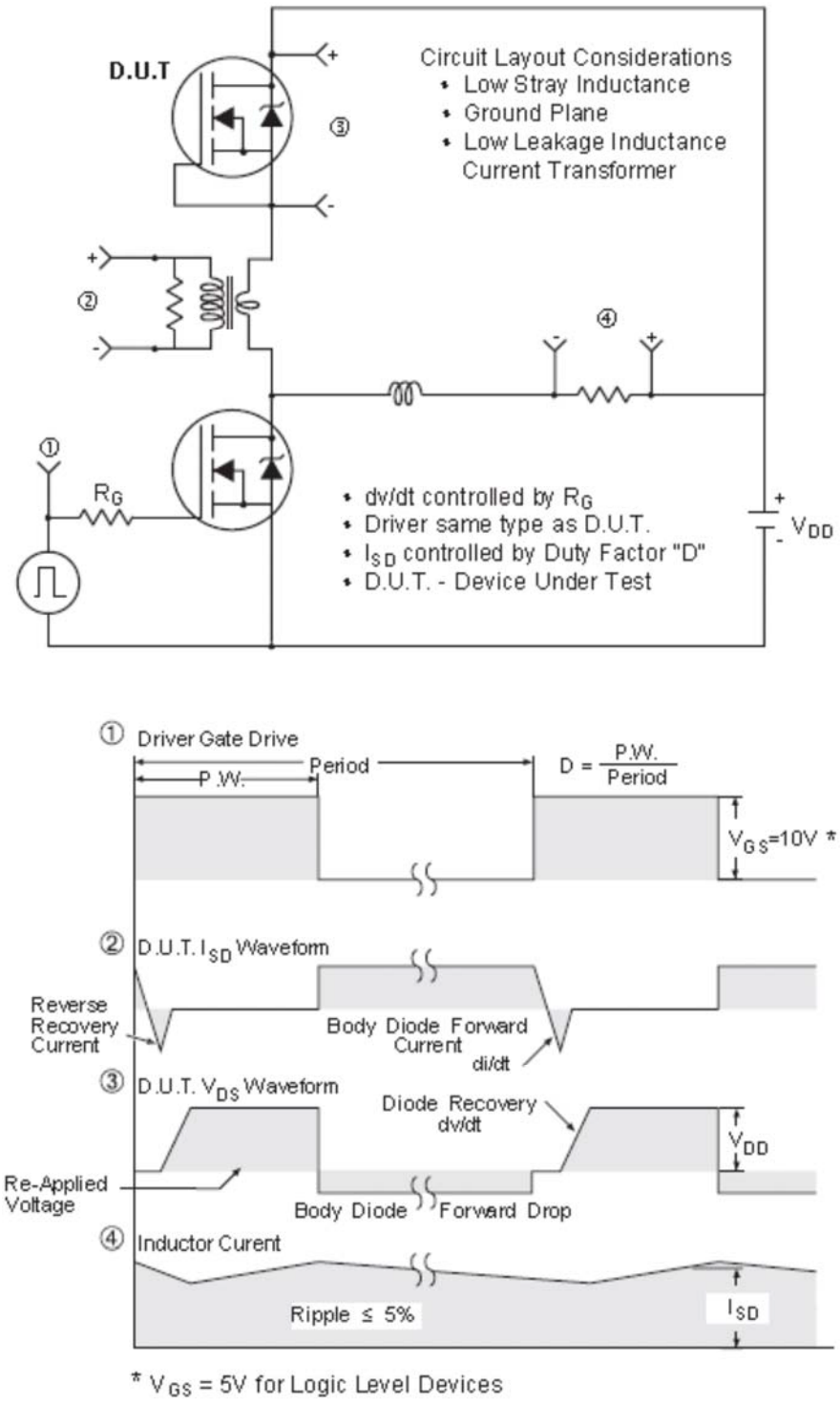


Figure 4:Peak Diode Recovery dv/dt Test Circuit & Waveforms (For N-channel)