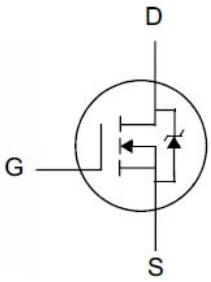
WLP50N250

250V N-Channel MOSFET

General Features

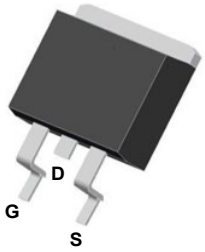
- Proprietary New Planar Technology
- $R_{DS(ON),typ.}$=45mΩ@V_{GS}=10V
- Low Gate Charge Minimize Switching Loss
- Fast Recovery Body Diode



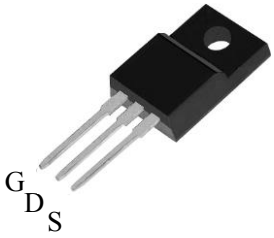
Applications

- DC-DC Converters
- DC-AC Inverters for UPS
- SMPS and Motor controls

BV_{DSS}	$R_{DS(ON),typ.}$	I_D
250V	43mΩ	50A



TO-263



TO-220F

Symbol	Parameter	Rating	Unit
V_{DSS}	Drain-to-Source Voltage[1]	250	V
V_{GSS}	Gate-to-Source Voltage	±20	
I_D	Continuous Drain Current	50	A
$I_{D\ @\ Tc=100℃}$	Continuous Drain Current @ Tc=100℃	25	
I_{DM}	Pulsed Drain Current at V_{GS}=10V[2]	200	
E_{AS}	Single Pulse Avalanche Energy	1250	mJ
dv/dt	Peak Diode Recovery dv/dt[3]	5.0	V/ns
P_D	Power Dissipation	125	W
	Derating Factor above 25℃	1.0	W/℃
T_L T_{PAK}	Maximum Temperature for Soldering Leads at 0.063in (1.6mm) from Case for 10 seconds, Package Body for 10 seconds	300 260	℃
T_J& T_{STG}	Operating and Storage Temperature Range	-55 to 150	
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.0	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	100	

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	250	--	--	V	V_{GS}=0V, I_D=250uA
I_{DSS}	Drain-to-Source Leakage Current	--	--	1	uA	V_{DS}=250V, V_{GS}=0V
		--	--	100		V_{DS}=200V, V_{GS}=0V, T_J =125℃
I_{GSS}	Gate-to-Source Leakage Current	--	--	+100	nA	V_{GS}=+20V, V_{DS}=0V
		--	--	-100		V_{GS}=-20V, V_{DS}=0V
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance[4]	--	43	60	mΩ	V_{GS}=10V, I_D=25A
$V_{GS(TH)}$	Gate Threshold Voltage	2.0	--	4.0	V	V_{DS}=V_{GS}, I_D=250uA
gfs	Forward Transconductance[4]	--	65	--	S	V_{DS}=15V,I_D=20A
C_{iss}	Input Capacitance	--	4000	--	pF	V_{GS}=0V, V_{DS}=25V, f=1.0MH_Z
C_{rss}	Reverse Transfer Capacitance	--	250	--		
C_{oss}	Output Capacitance	--	500	--		
Q_g	Total Gate Charge	--	75	--	nC	V_{DD}=100V, I_D=20A, V_{GS}=0 to 10V
Q_{gs}	Gate-to-Source Charge	--	26	--		
Q_{gd}	Gate-to-Drain (Miller) Charge	--	20	--		
$t_{d(ON)}$	Turn-on Delay Time	--	20	--	nS	V_{DD}=100V, I_D=20A, V_{GS}= 10V R_G=3.9Ω
t_{rise}	Rise Time	--	30	--		
$t_{d(OFF)}$	Turn-Off Delay Time	--	65	--		
t_{fall}	Fall Time	--	25	--		
I_{SD}	Continuous Source Current[4]	--	--	50	A	Integral PN-diode in MOSFET
I_{SM}	Pulsed Source Current[4]	--	--	200		
V_{SD}	Diode Forward Voltage	--	--	1.5	V	I_S=40A, V_{GS}=0V
trr	Reverse recovery time	--	180	--	ns	V_{GS}=0V ,I_F=20A, di_F/dt=100A/μs
Qrr	Reverse recovery charge	--	400	--	nC	

Figure 1. Maximum Transient Thermal Impedance

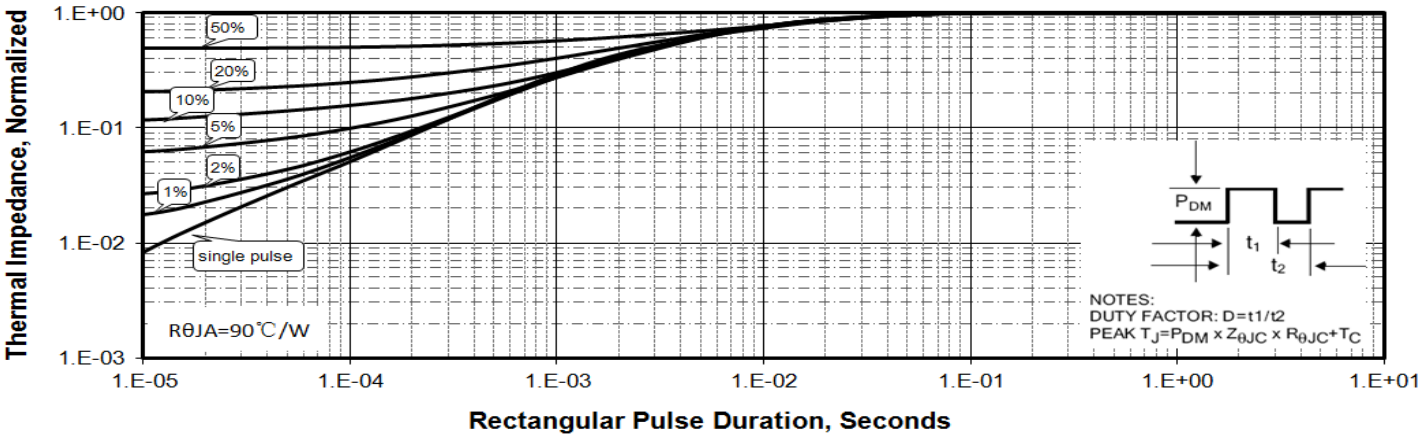


Figure 2 . Max. Power Dissipation vs Case Temperature

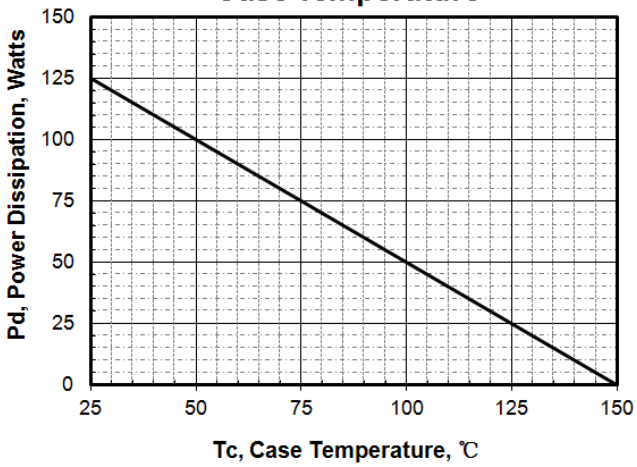


Figure 3 .Maximum Continuous Drain Current vs Tc

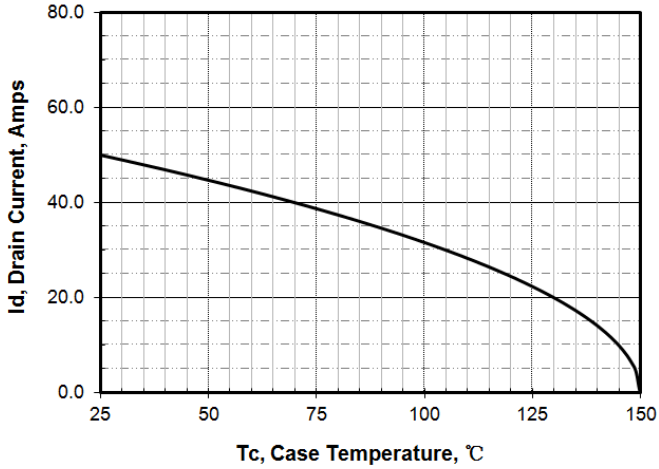


Figure 4. Output Characteristics

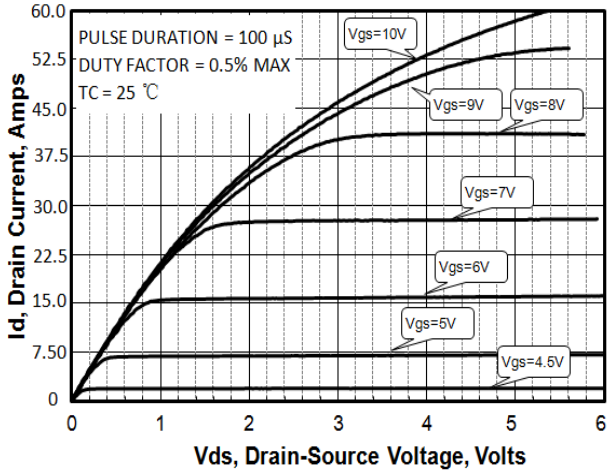


Figure 5. Rdson vs Gate Voltage

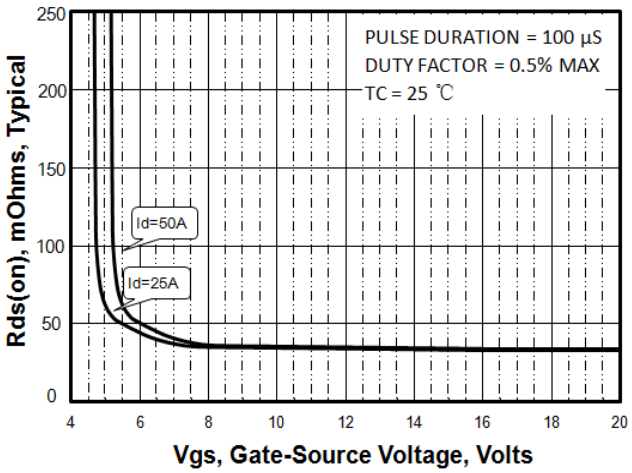


Figure 6. Peak Current Capability

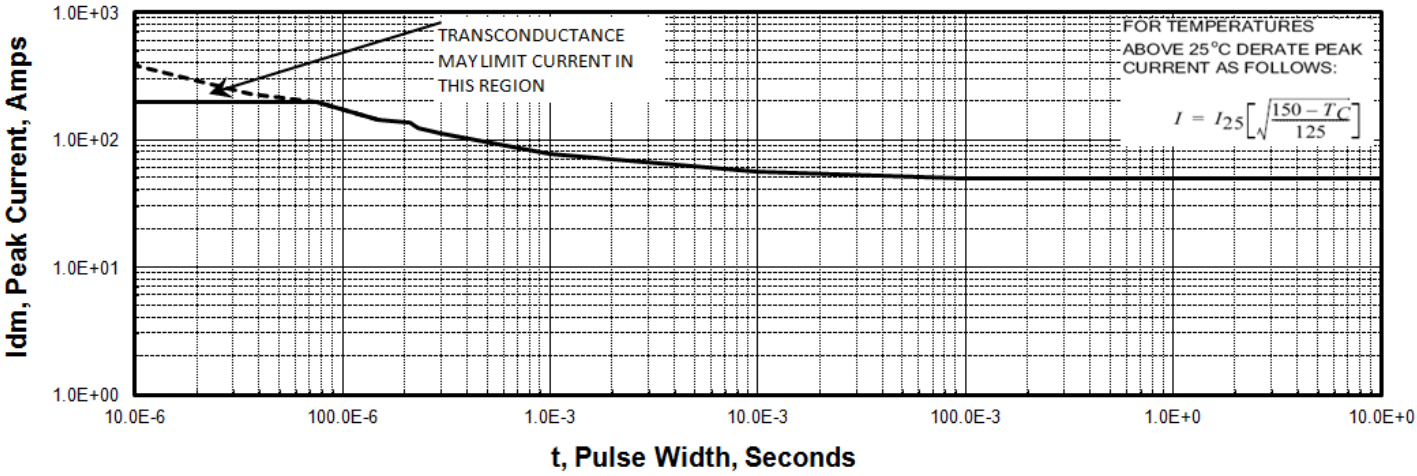


Figure 7. Transfer Characteristics

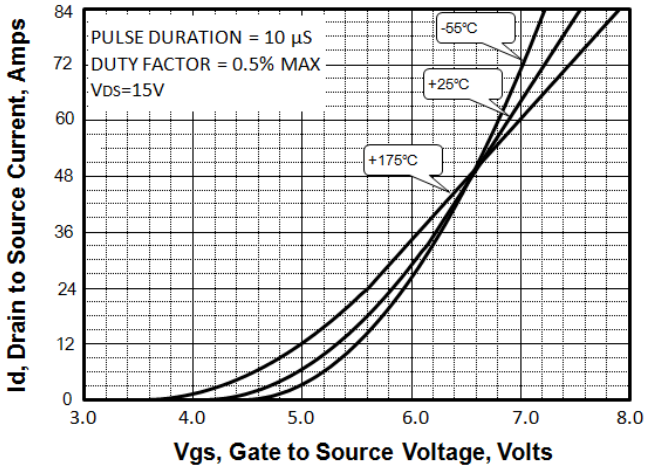


Figure 8. Unclamped Inductive Switching Capability

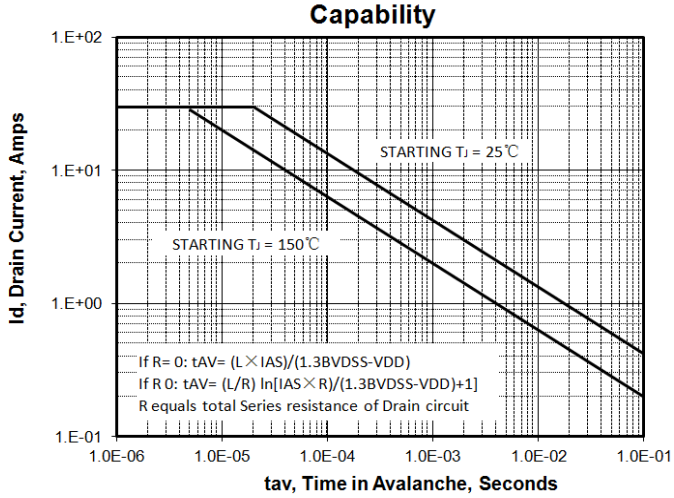


Figure 9. Drain to Source ON Resistance vs Drain Current

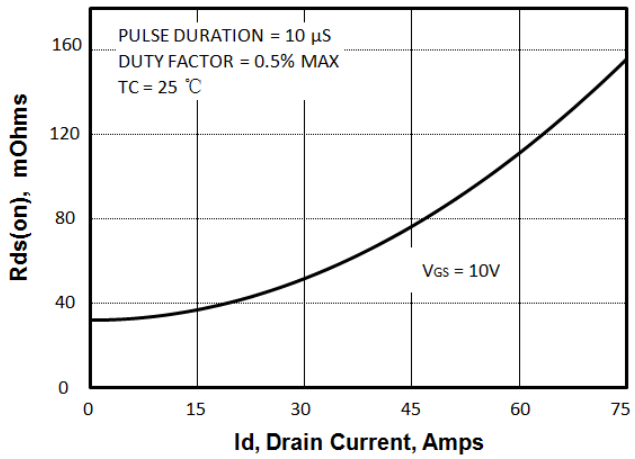


Figure 10. Rdson vs Junction Temperature

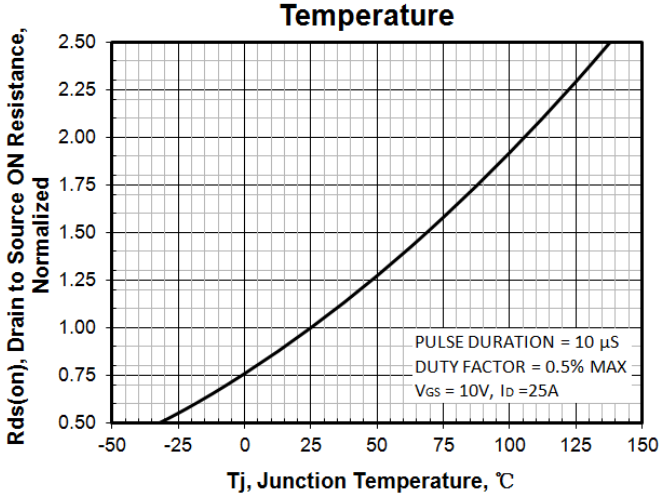


Figure 11. Typical Breakdown Voltage vs Junction Temperature

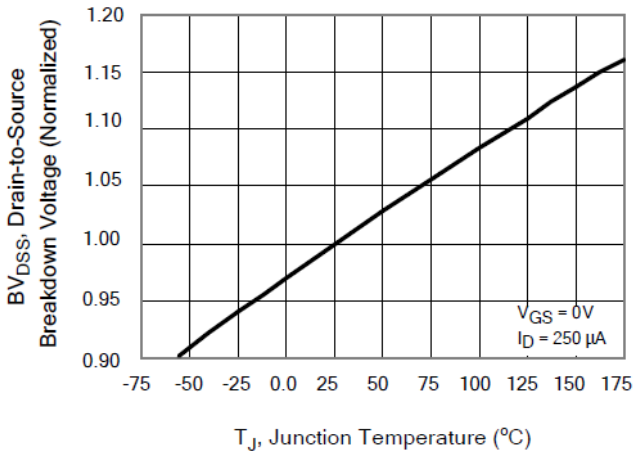


Figure 12. Typical Threshold Voltage vs Junction Temperature

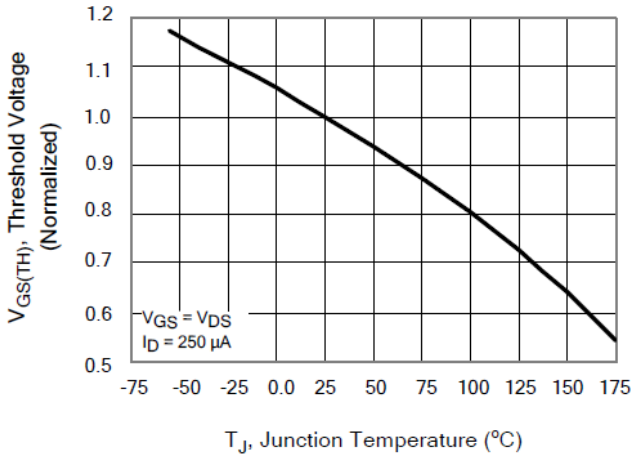


Figure 13 . Maximum Safe Operating Area(TO-220F)

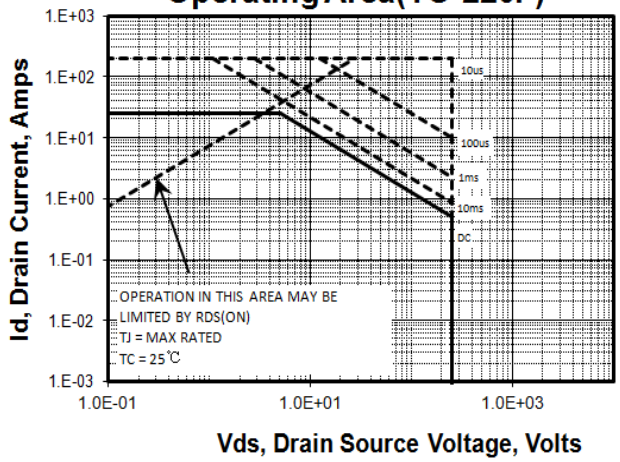


Figure 14. Capacitance vs Vds

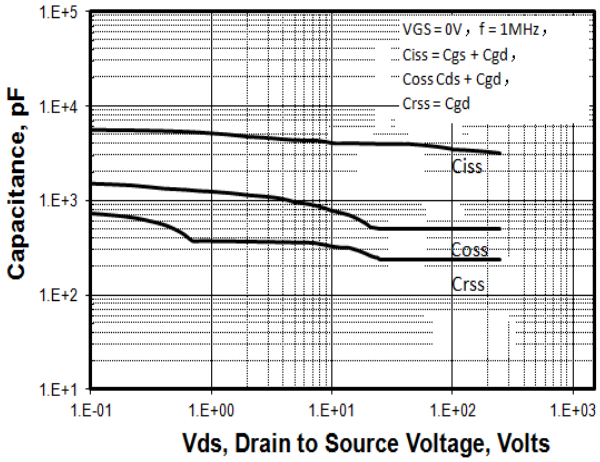


Figure 15 .Typical Gate Charge

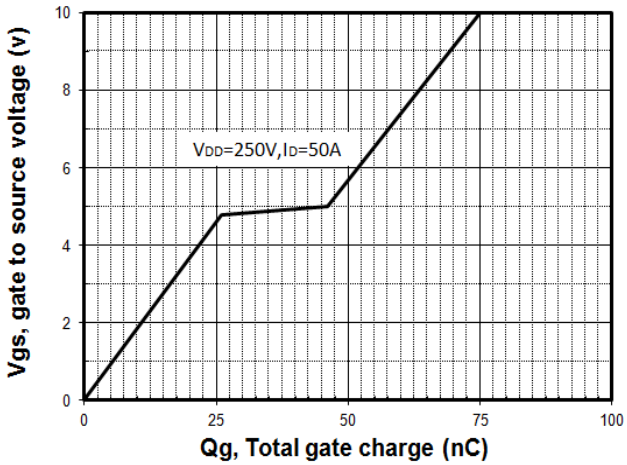
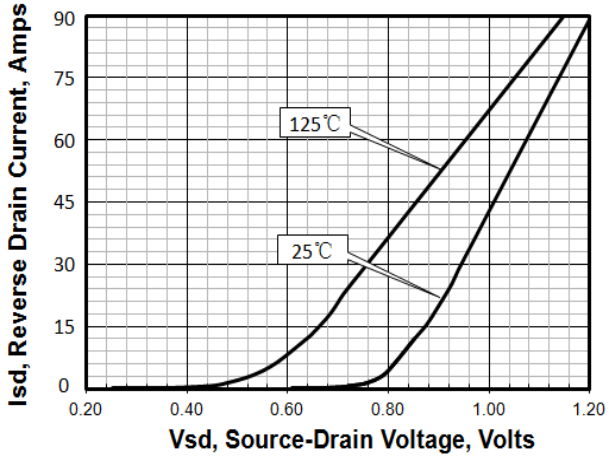


Figure 16.Body Diode Transfer Characteristics



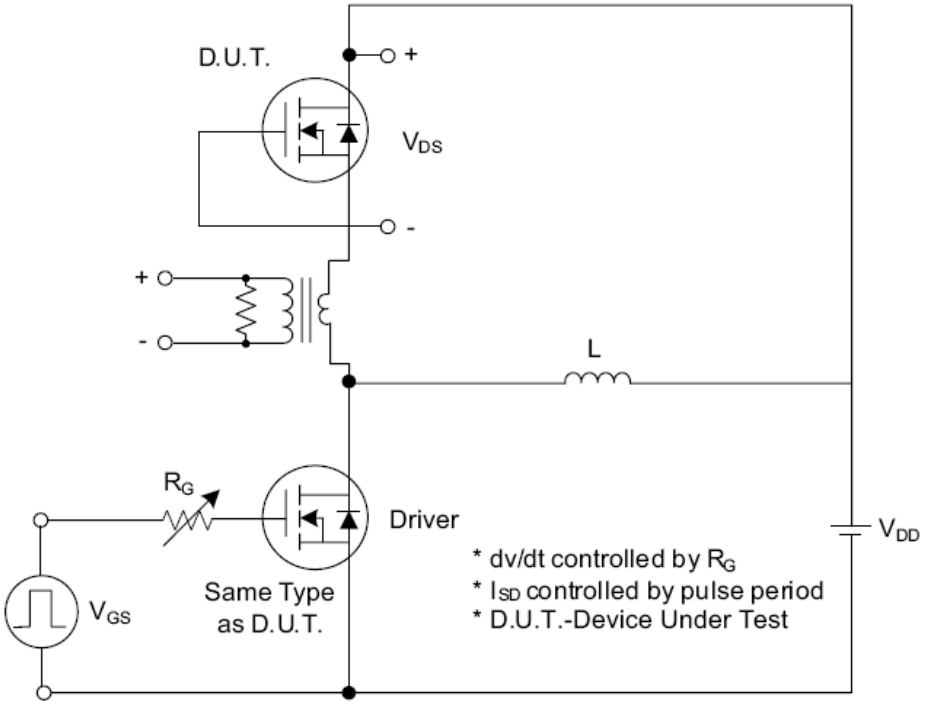


Fig. 1.1 Peak Diode Recovery dv/dt Test Circuit

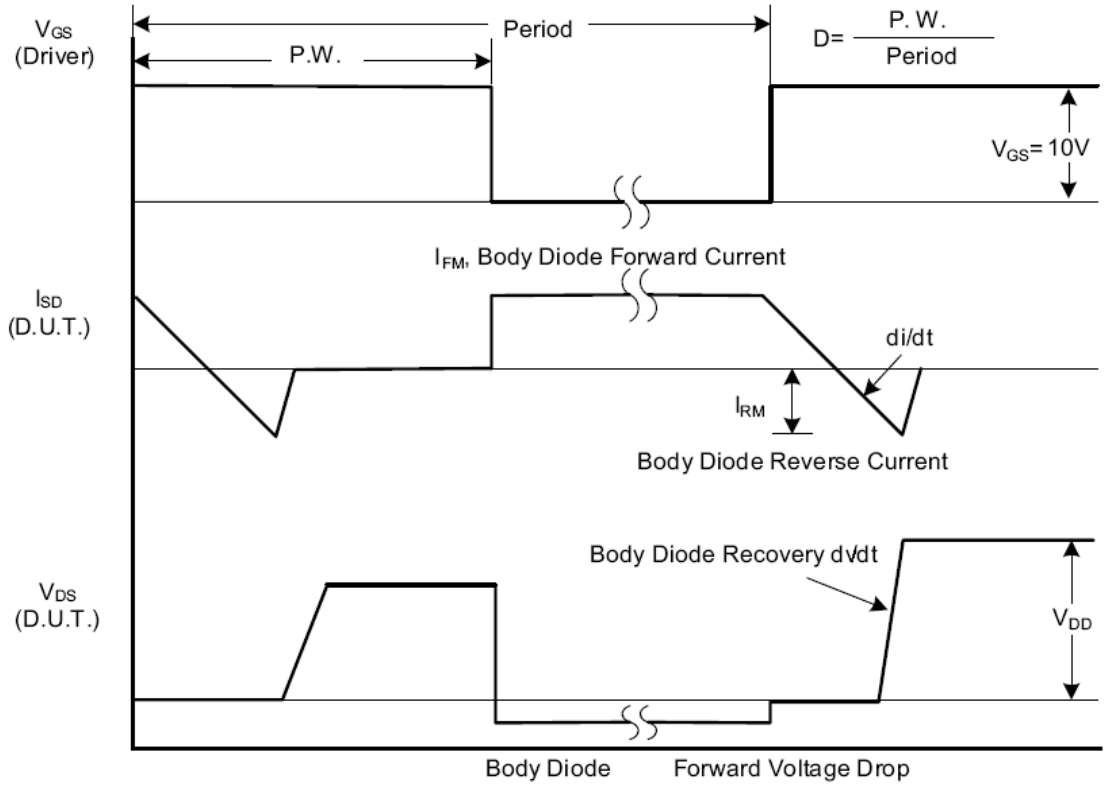


Fig. 1.2 Peak Diode Recovery dv/dt Waveforms

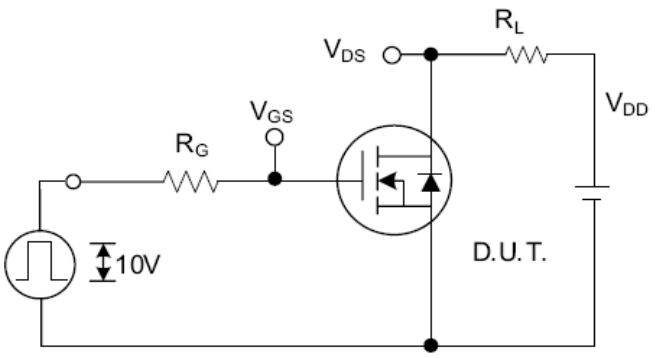


Fig. 2.1 Switching Test Circuit

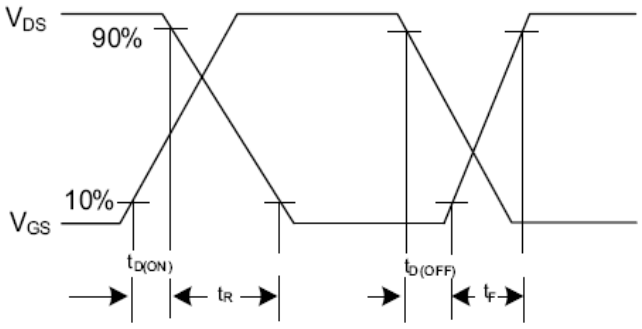


Fig. 2.2 Switching Waveforms

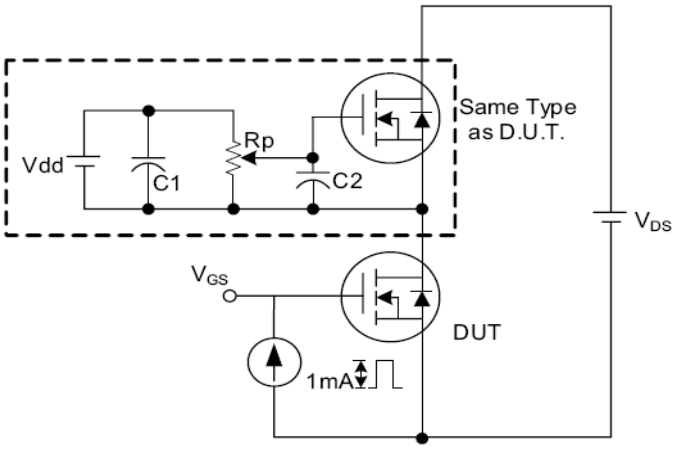


Fig. 3 . 1 Gate Charge Test Circuit

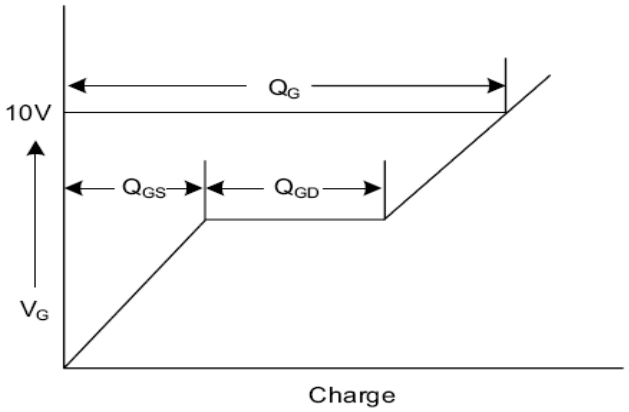


Fig. 3 . 2 Gate Charge Waveform

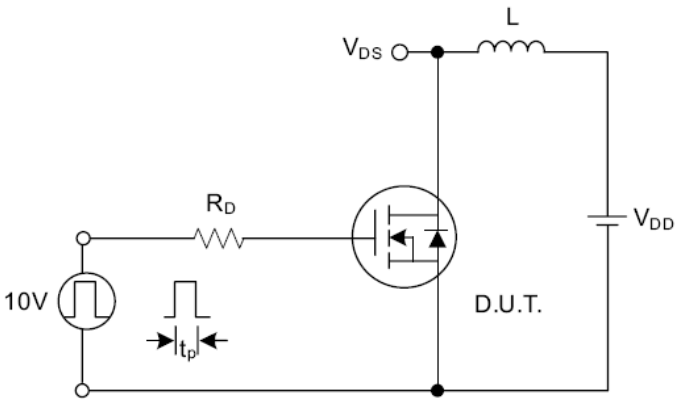


Fig. 4.1 Unclamped Inductive Switching Test Circuit

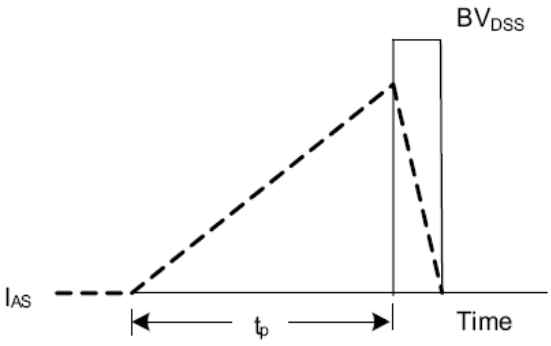
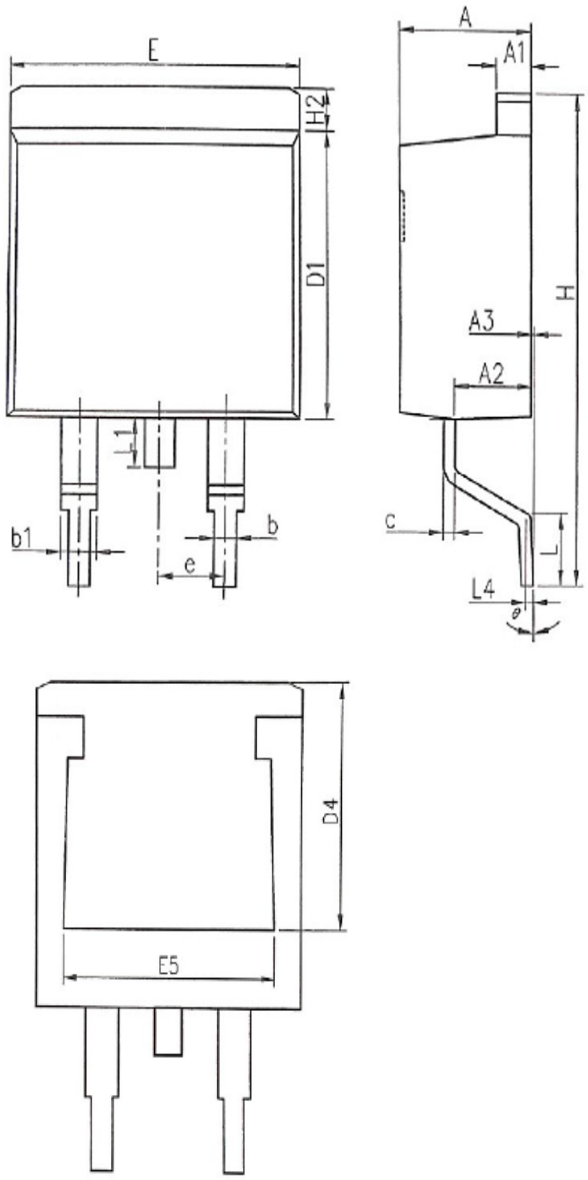


Fig. 4.2 Unclamped Inductive Switching Waveforms

250V N-Channel MOSFET

Mechanical Dimensions for TO-263



COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	4.37	4.89
A1	1.17	1.42
A2	2.20	2.90
A3	0.00	0.25
b	0.70	0.96
b1	1.17	1.47
c	0.28	0.60
D1	8.45	9.30
D4	6.60	-
E	9.80	10.40
E5	7.06	-
e	2.54BSC	
H	14.70	15.70
H2	1.07	1.47
L	2.00	2.80
L1	-	1.75
L4	0.254BSC	
θ	0°	9°