

Features

- Fast Switching
- Low On-Resistance
- Low Gate Charge
- Low Reverse transfer capacitances
- High avalanche ruggedness
- RoHS product

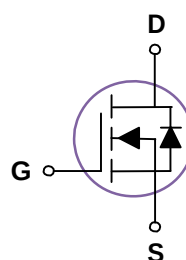
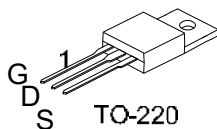
Product Summary



V_{DS}	85	V
$R_{DS(on), Typ @ V_{GS}=10\text{ V}}$	5.8	mΩ
I_D	118	A

Application

- Switching applications
- Motor drivers



ABSOLUTE RATINGS at $T_C=25^\circ\text{C}$, unless otherwise specified

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-Source Voltage	85	V
I_D	Continuous Drain Current, Silicon Limited	118	A
	Continuous Drain Current @ $T_C=100^\circ\text{C}$, Silicon Limited	75	A
I_{DM} ^{Note1}	Pulsed Drain Current	320	A
V_{GS}	Gate-Source Voltage	± 20	V
E_{AS} ^{Note2}	Avalanche Energy	196	mJ
P_D	Power Dissipation	156.2	W
	Derating Factor above 25°C	1.25	W/ $^\circ\text{C}$
T_J, T_{stg}	Operating Junction and Storage Temperature Range	150, -55 to 150	$^\circ\text{C}$
T_L	Maximum Temperature for Soldering	260	$^\circ\text{C}$

Note1: Repetitive Rating: Pulse width limited by maximum junction temperature

Note2: $L=0.5\text{mH}$, $I_{as}=28\text{A}$, Start $T_J=25^\circ\text{C}$

Thermal characteristics

Symbol	Parameter	Max	Units
$R_{\theta JC}$	thermal resistance, Junction-Case	0.8	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	thermal resistance, Junction-Ambient	62.5	$^\circ\text{C}/\text{W}$

Electrical Characteristics at $T_C=25^{\circ}\text{C}$, unless otherwise specified

OFF Characteristics						
Symbol	Parameter	Test Conditions	Values			Units
			Min	Typ	Max	
V_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	85	--	--	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=85V, V_{GS}=0V$	--	--	1	μA
		$V_{DS}=68V, V_{GS}=0V$ @ $T_C=125^{\circ}\text{C}$	--	--	100	μA
$I_{GSS(F)}$	Gate-Source Forward Leakage	$V_{GS}=+20V$	--	--	100	nA
$I_{GSS(R)}$	Gate-Source Reverse Leakage	$V_{GS}=-20V$	--	--	-100	nA

ON Characteristics						
Symbol	Parameter	Test Conditions	Values			Unit S
			Min	Typ	Max	
$R_{DS(on)}$	Drain-Source On-Resistance	$V_{GS}=10V, I_D=50A$	--	5.8	6.5	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	3.2	4.0	V
Pulse width $t_p \leq 300\mu s, \delta \leq 2\%$						

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Values			Units
			Min	Typ	Max	
C_{iss}	Input Capacitance	$V_{DS}=40V,$ $V_{GS}=0,$ $f=1MHz$	--	3090	--	pF
C_{oss}	Output Capacitance		--	490	--	
C_{rss}	Reverse Transfer Capacitance		--	13	--	
Q_g	Total Gate Charge	$V_{DD}=40V,$ $I_D=50A,$ $V_{GS}=10V$	--	64	--	nC
Q_{gs}	Gate-Source charge		--	18.4	--	
Q_{gd}	Gate-Drain charge		--	19	--	

Switching Characteristics						
Symbol	Parameter	Test Conditions	Values			Units
			Min	Typ	Max	
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=40V,$ $I_D=50A,$ $V_{GS}=10V,$ $R_G=3\Omega,$ Resistive Load	--	17	--	ns
t_r	Rise Time		--	30	--	
$t_{d(off)}$	Turn-Off Delay Time		--	37	--	
t_f	Fall Time		--	20	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Values			Units
			Min	Typ	Max	
I_S	Continuous Source Current		--	--	80	A
I_{SM}	Maximum Pulsed Current		--	--	320	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=50A$	--	--	1.2	V
T_{rr}	Reverse Recovery Time	$I_S=20A,$ $di/dt=100A/us$	--	57	--	ns
Q_{rr}	Reverse Recovery Charge		--	65	--	μC

Characteristics Curves

Figure 1. Safe Operating Area

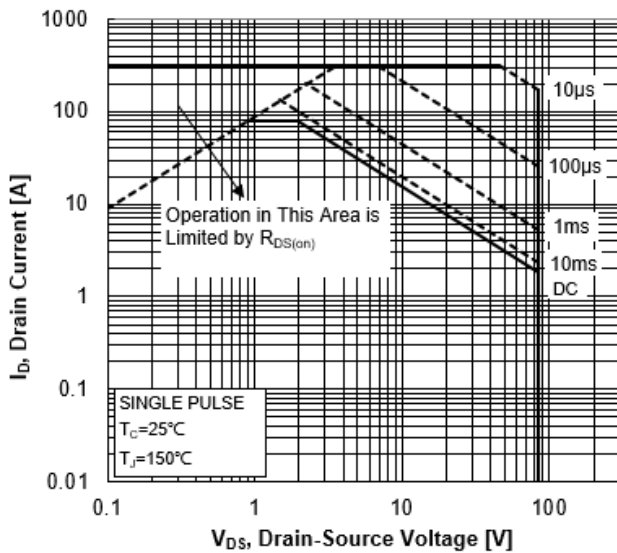


Figure 2. Maximum Power Dissipation vs Case Temperature

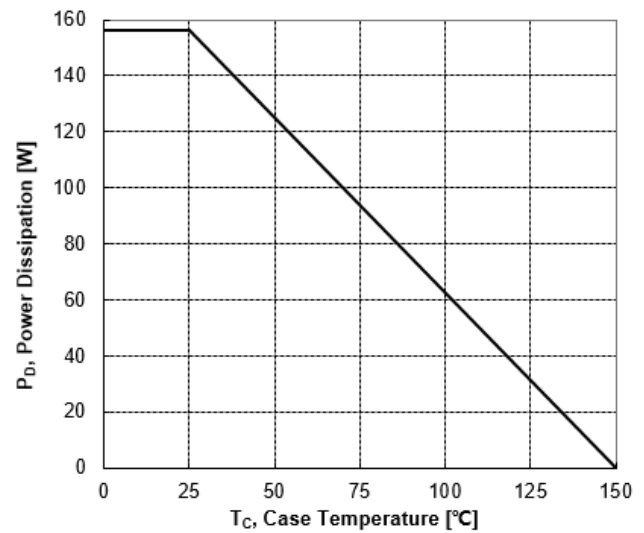


Figure 3. Maximum Continuous Drain Current vs Case Temperature

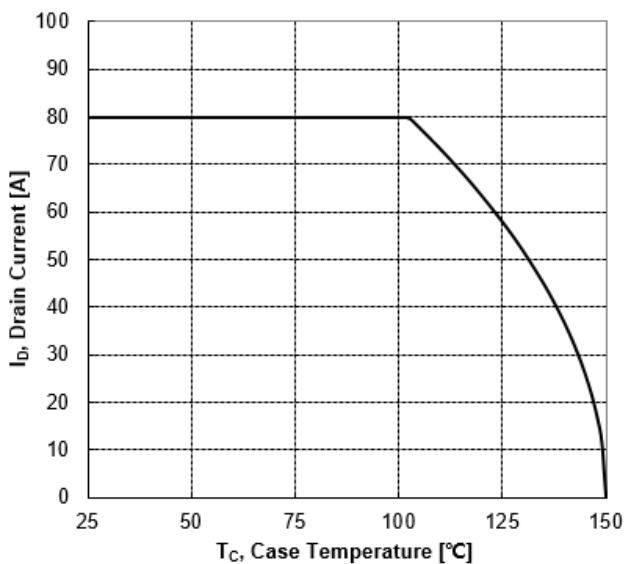


Figure 4. Typical Output Characteristics

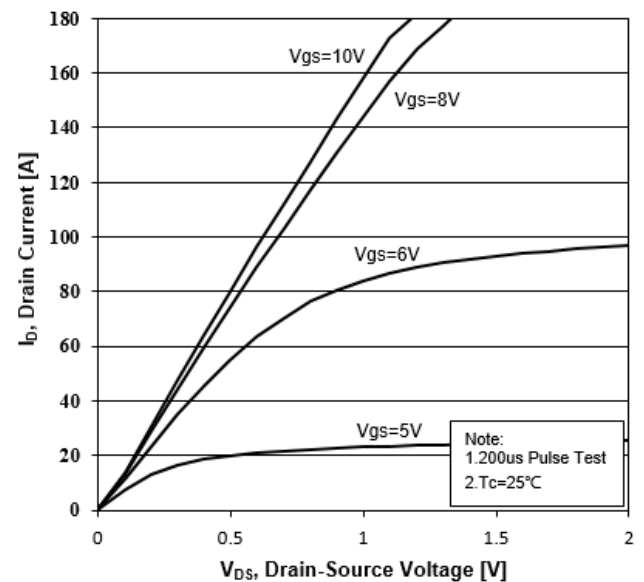


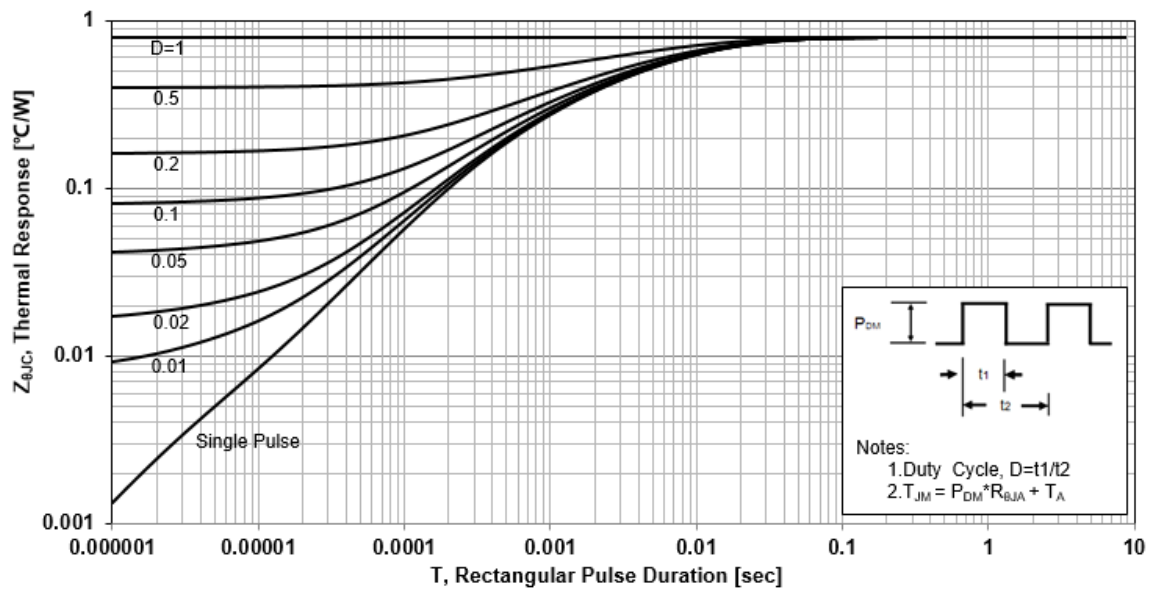
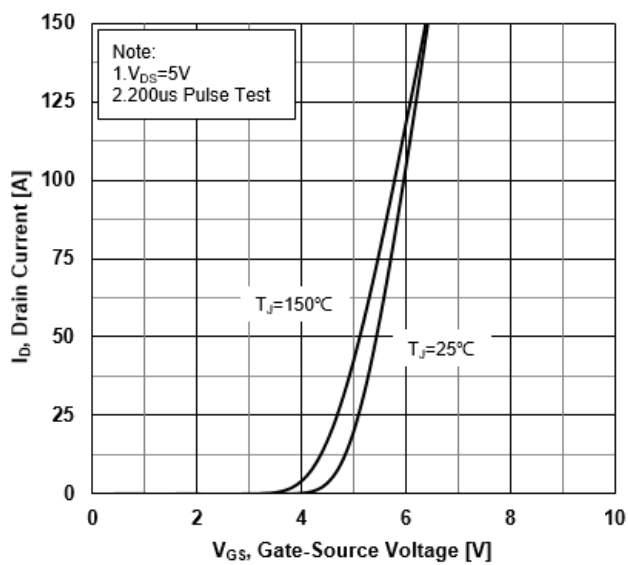
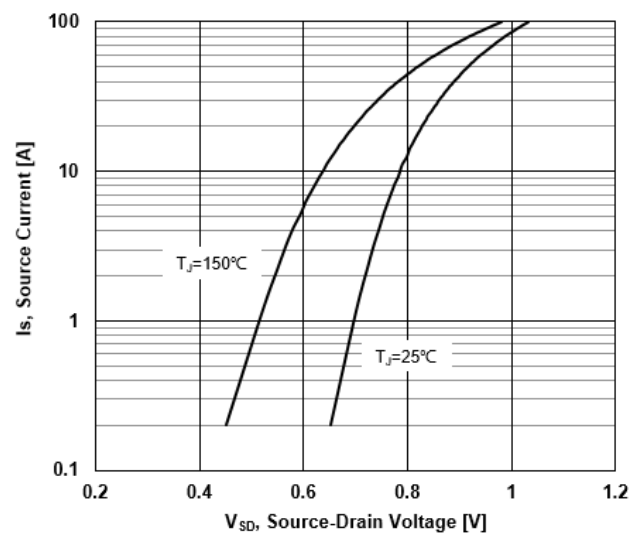
Figure 5. Transient Thermal Impedance

Figure 6. Typical Transfer Characteristics

Figure 7. Source-Drain Diode Forward Characteristics


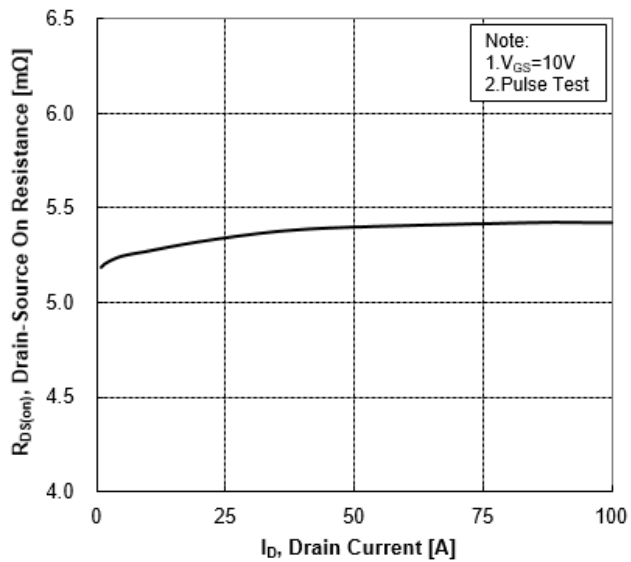
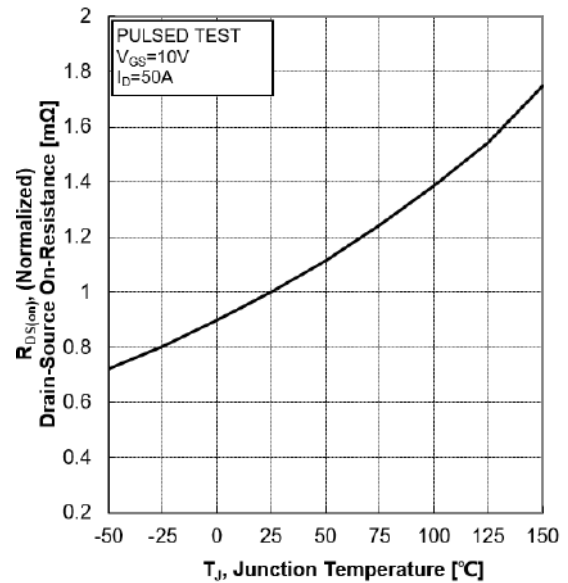
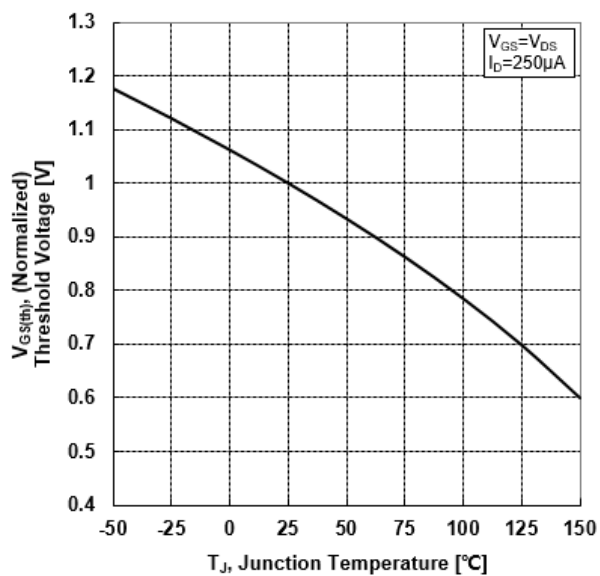
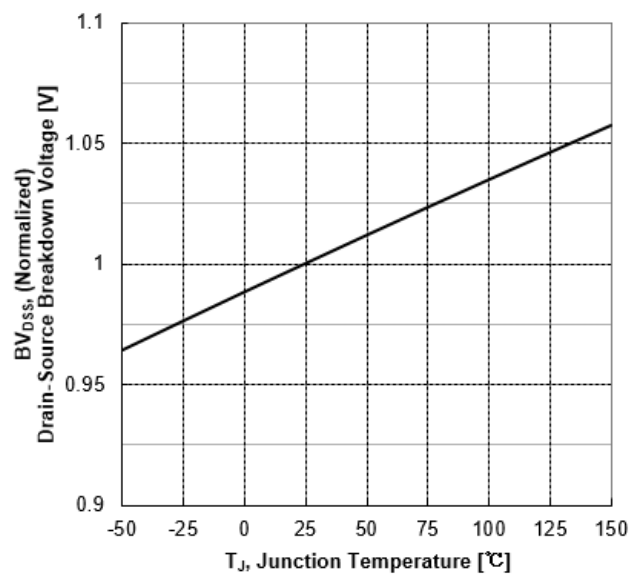
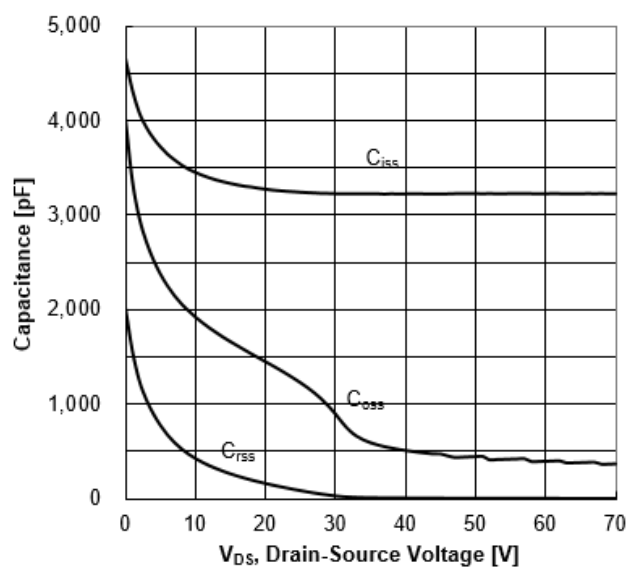
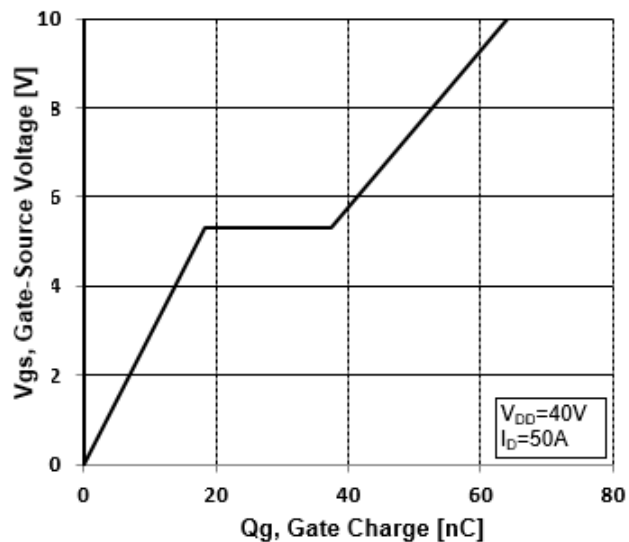
Figure 8. Drain-Source On-Resistance vs Drain Current

Figure 9. Normalized On-Resistance vs Junction Temperature

Figure 10. Normalized Threshold Voltage vs Junction Temperature

Figure 11. Normalized Breakdown Voltage vs Junction Temperature


Figure 12. Capacitance Characteristics

Figure 13. Typical Gate Charge vs Gate-Source Voltage


Test Circuit and Waveform

Figure 14. Resistive Switching Test Circuit

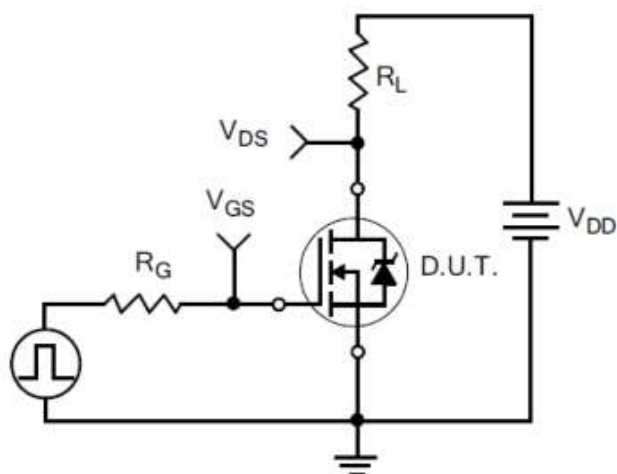


Figure 15. Resistive Switching Waveforms

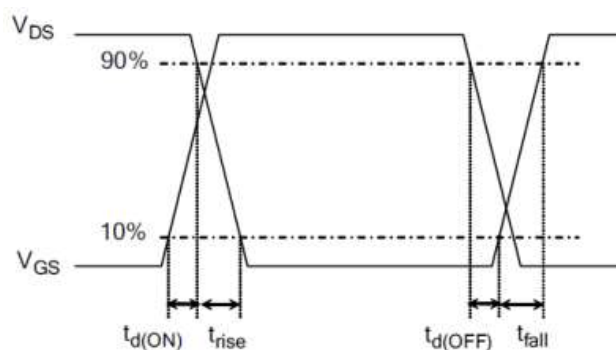


Figure 16. Gate Charge Test Circuit

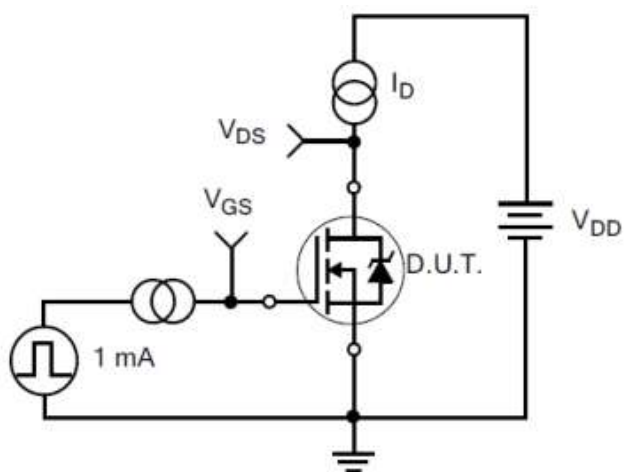


Figure 17. Gate Charge Waveforms

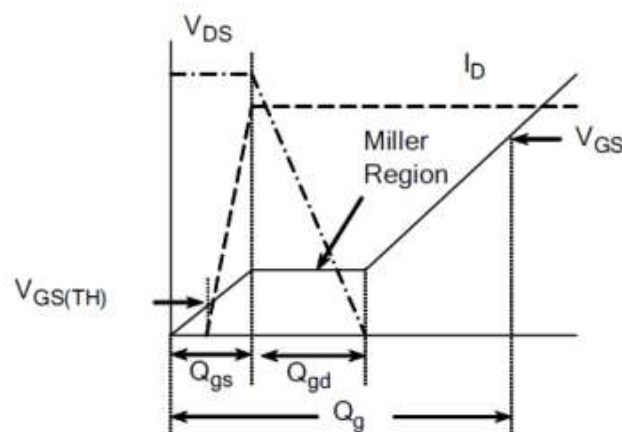


Figure 18. Diode Reverse Recovery Test Circuit

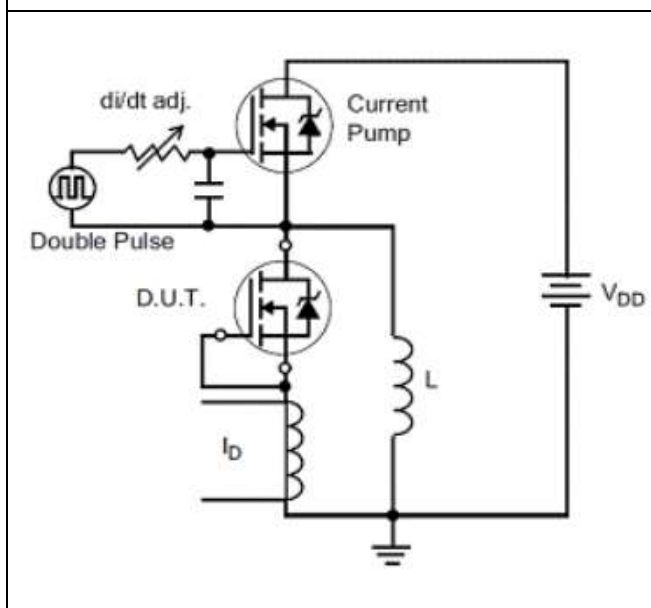


Figure 19. Diode Reverse Recovery Waveform

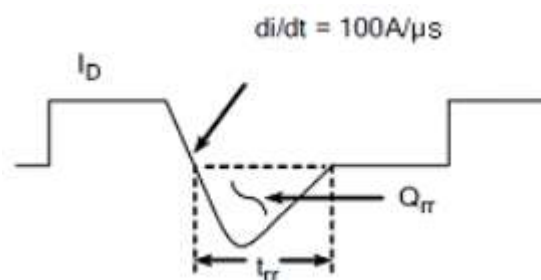


Figure 20. Unclamped Inductive Switching Test Circuit

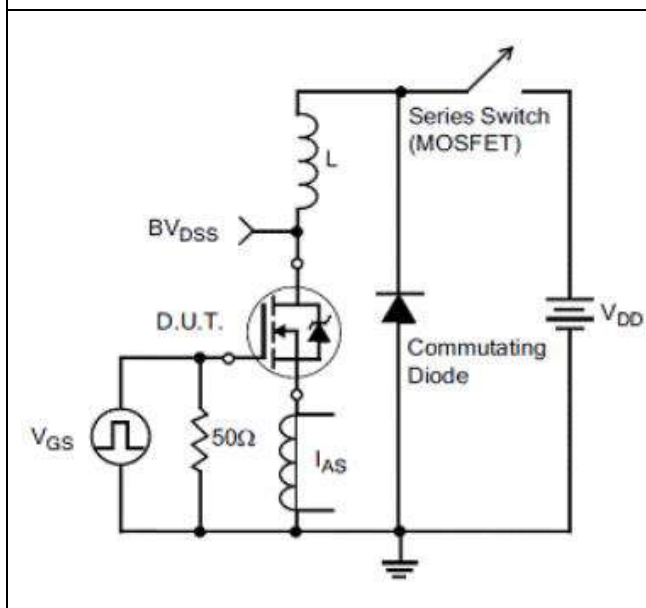
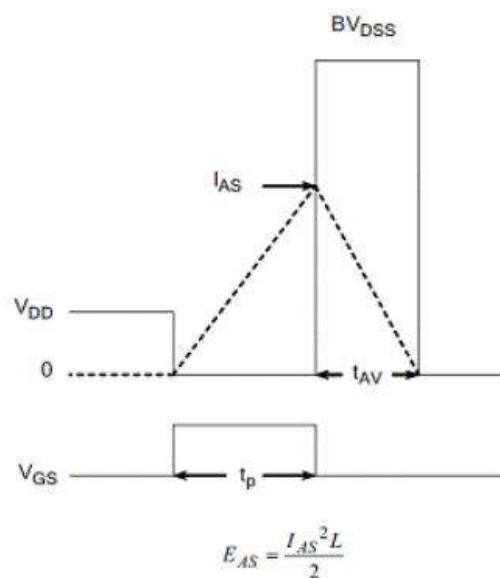
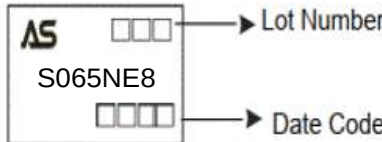


Figure 21. Unclamped Inductive Switching Waveform



Ordering and Marking Information

Ordering Device No.	Marking	Package	Packing	Quantity
ASS065NE8P3N-T	S065NE8	TO-220	Tube	50/Tube

PACKAGE	MARKING
TO-220	 The diagram shows a TO-220 package with the following markings: - AS logo - S065NE8 - Lot Number (indicated by two arrows pointing to the top right and bottom right of the package) - Date Code (indicated by two arrows pointing to the top left and bottom left of the package)

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