



CS3205 A0

General Description:

CS3205 A0, the silicon N-channel Enhanced VDMOSFETs, is obtained by the self-aligned planar Technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The transistor can be used in various power switching circuit for system miniaturization and higher efficiency. The package form is TO-263, which accords with the RoHS standard.

Features:

- I Fast Switching
- I Low ON Resistance($R_{dson} \leq 8m\Omega$)
- I Low Gate Charge (Typical Data:75nC)
- I Low Reverse transfer capacitances(Typical:75pF)
- I 100% Single Pulse avalanche energy Test

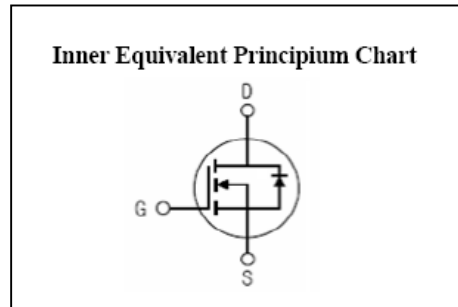
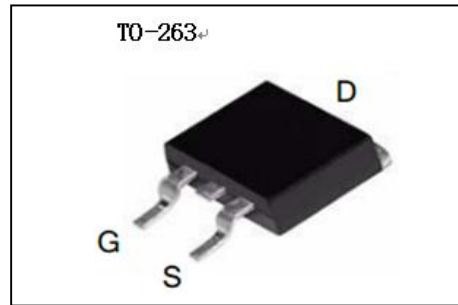
Applications:

Power switch circuit of adaptor and charger.

Absolute ($T_J = 25^\circ C$ unless otherwise specified):

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	60	V
I_D^{a1}	Continuous Drain Current $T_C = 25^\circ C$	120	A
	Continuous Drain Current $T_C = 100^\circ C$	84	A
I_{DM}^{a2}	Pulsed Drain Current	480	A
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}^{a3}	Single Pulse Avalanche Energy	1300	mJ
P_D	Power Dissipation $T_C = 25^\circ C$	230	W
	Derating Factor above $25^\circ C$	1.4	W/ $^\circ C$
T_J, T_{stg}	Operating Junction and Storage Temperature Range	150, -55 to 150	$^\circ C$
T_L	Maximum Temperature for Soldering	300	$^\circ C$

V_{DSS}	60	V
I_D (Silicon limited current)	120	A
P_D ($T_C=25^\circ C$)	230	W
$R_{DS(ON)Typ}$	7	m Ω



Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise specified):

OFF Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	60	--	--	V
I_{DSS}	Drain to Source Leakage Current	$V_{DS}=60V, V_{GS}=0V,$ $T_J=25^\circ\text{C}$	--		1	μA
		$V_{DS}=48V, V_{GS}=0V,$ $T_J=125^\circ\text{C}$	--		125	
$I_{GSS(F)}$	Gate to Source Forward Leakage	$V_{GS}=+20V$	--		100	nA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	$V_{GS}=-20V$	--		100	nA

ON Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	$V_{GS}=10V, I_D=50A$	--	7	8	$m\Omega$
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0		4.0	V
Pulse width $t_p \leq 300\mu s, \delta \leq 2\%$						

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g_{fs}	Forward Trans conductance	$V_{DS}=15V, I_D=50.0A$	--	80	--	S
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=25V$ $f=1.0MHz$	--	4000	--	pF
C_{oss}	Output Capacitance		--	750	--	
C_{rss}	Reverse Transfer Capacitance		--	75	--	

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$I_D=50.0A, V_{DD}=30V$ $V_{GS}=10V, R_G=3.6\Omega$	--	17	--	ns
t_r	Rise Time		--	82	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	58	--	
t_f	Fall Time		--	30	--	
Q_g	Total Gate Charge	$I_D=50.0A, V_{DD}=30V$ $V_{GS}=10V$	--	75		nC
Q_{gs}	Gate to Source Charge		--	18	--	
Q_{gd}	Gate to Drain ("Miller") Charge		--	26	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current (Body Diode)	$T_C = 25^\circ\text{C}$	--	--	120	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	480	A
V_{SD}	Diode Forward Voltage	$I_S=50.0\text{A}, V_{GS}=0\text{V}$	--	--	1.5	V
t_{rr}	Reverse Recovery Time	$I_S=50.0\text{A}, T_j = 25^\circ\text{C}$	--	135	--	ns
Q_{rr}	Reverse Recovery Charge	$dI_F/dt=100\text{A}/\mu\text{s}, V_{GS}=0\text{V}$	--	360	--	nC
Pulse width $t_p \leq 300\mu\text{s}, \delta \leq 2\%$						

Symbol	Parameter	Max.	Units
$R_{\theta JC}$	Junction-to-Case	0.65	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Junction-to-Ambient	62.5	$^\circ\text{C}/\text{W}$

^{a1}: Drain Current limited by Maximum Package Current Rating, 75 Amps

^{a2}: Repetitive rating; pulse width limited by maximum junction temperature

^{a3}: $L=260\mu\text{H}, I_D=101.5\text{A}, \text{Start } T_j=25^\circ\text{C}$

Characteristics Curve:

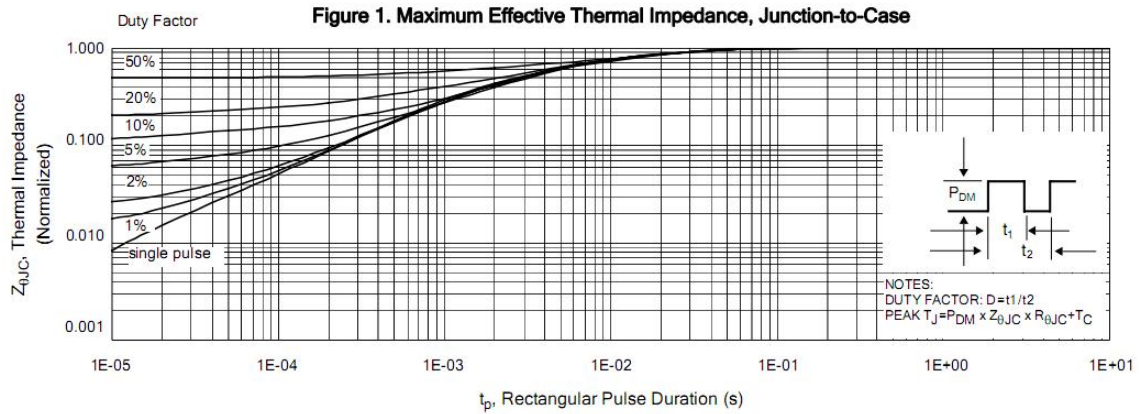


Figure 2. Maximum Power Dissipation vs Case Temperature

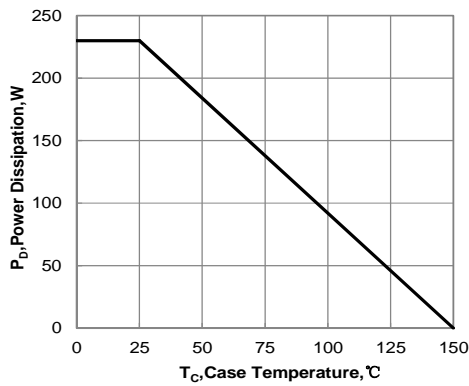


Figure3. Maximum Continuous Drain Current vs Case Temperature

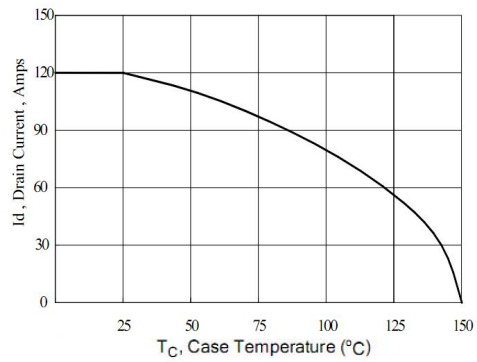


Figure 4. Typical Output Characteristics

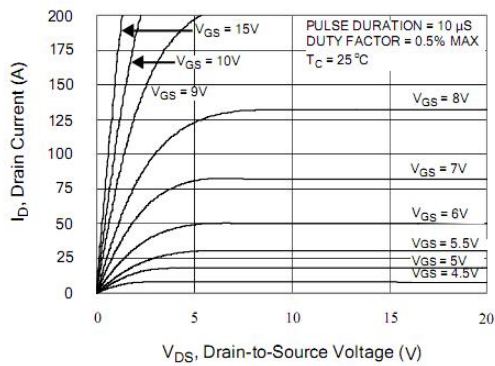


Figure5. Typical Drain-to-Source ON Resistance vs Gate Voltage and Drain Current

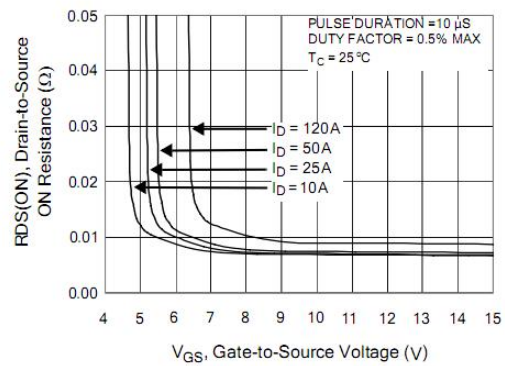


Figure 6. Maximum Peak Current Capability

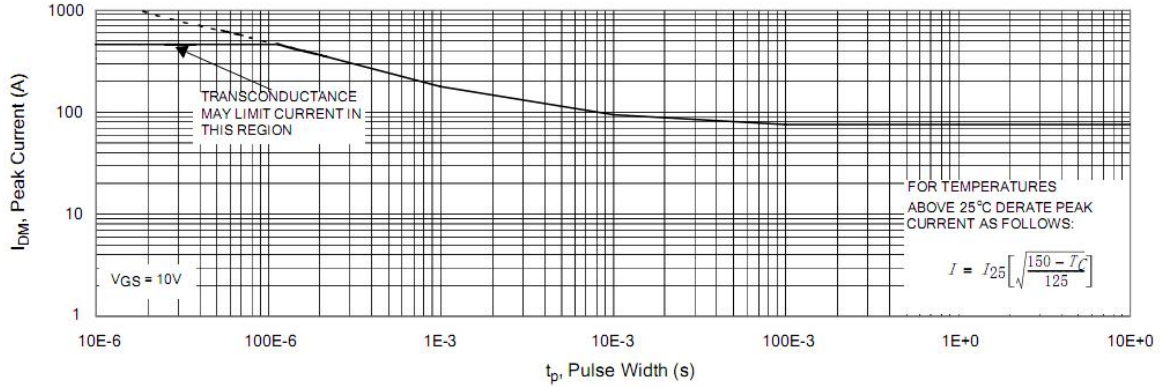


Figure 7. Typical Transfer Characteristics

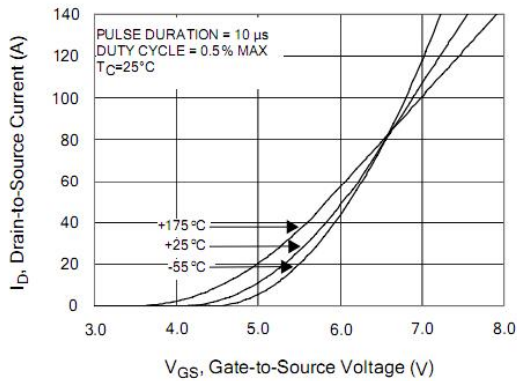


Figure 8. Unclamped Inductive Switching Capability

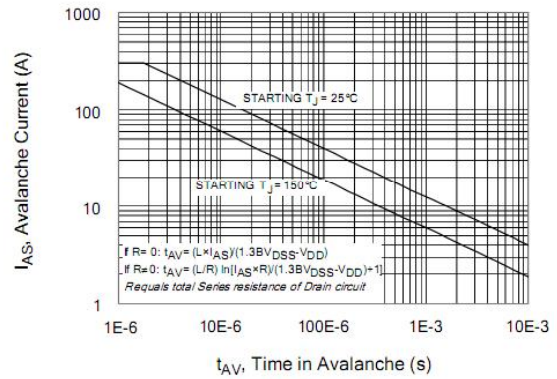


Figure 9. Typical Drain-to-Source ON Resistance vs Drain Current

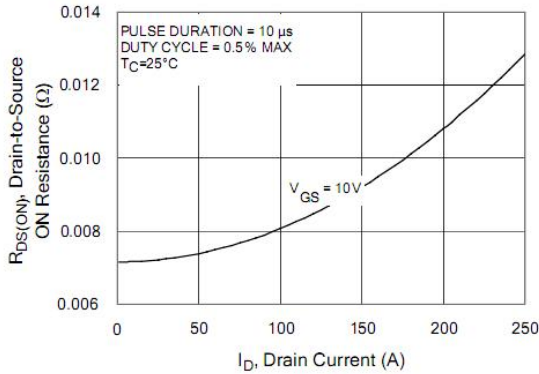


Figure 10. Typical Drain-to-Source ON Resistance vs Junction Temperature

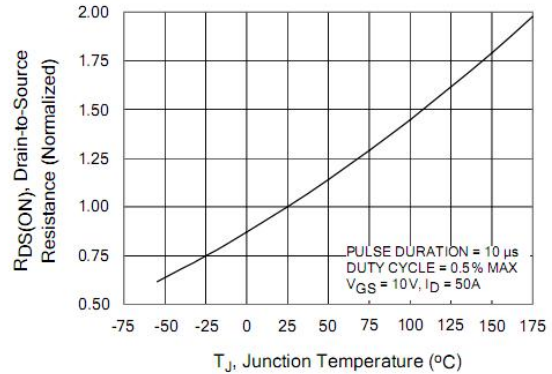


Figure 11. Typical Breakdown Voltage vs Junction Temperature

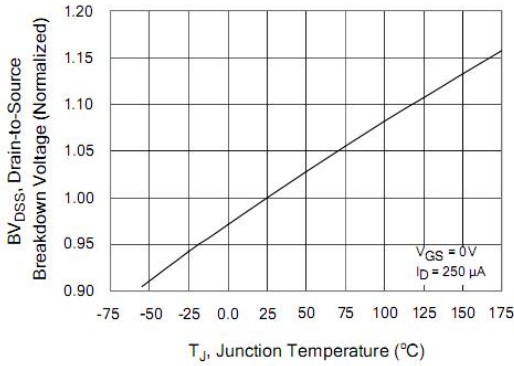


Figure 12. Typical Threshold Voltage vs Junction Temperature

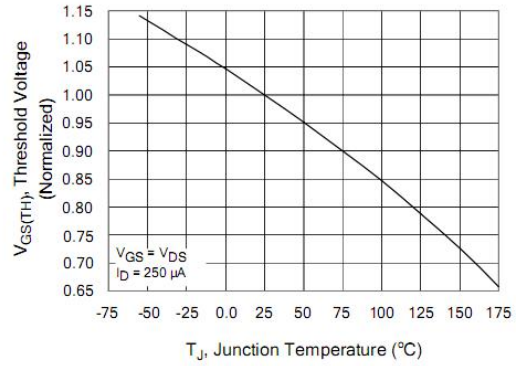


Figure 13. Maximum Forward Bias Safe Operating Area

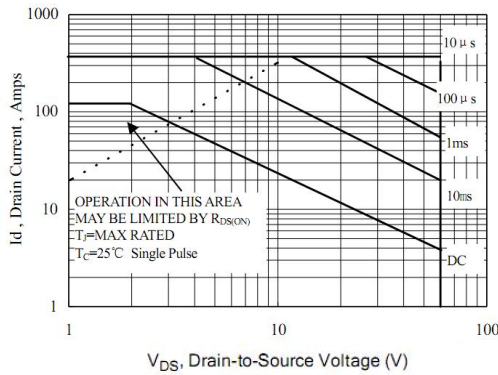


Figure 14. Typical Capacitance vs Drain-to-Source Voltage

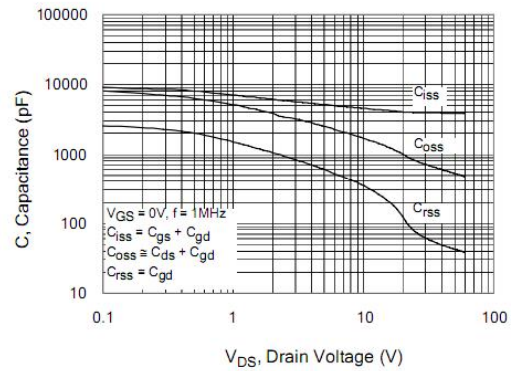


Figure 15. Typical Gate Charge vs Gate-to-Source Voltage

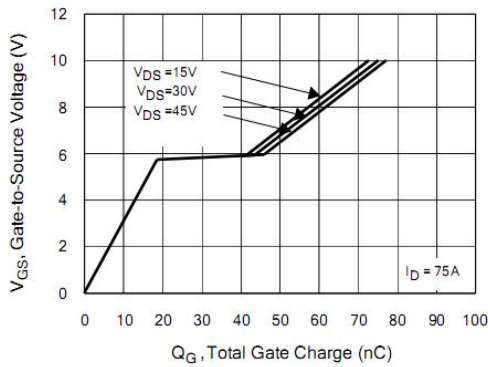
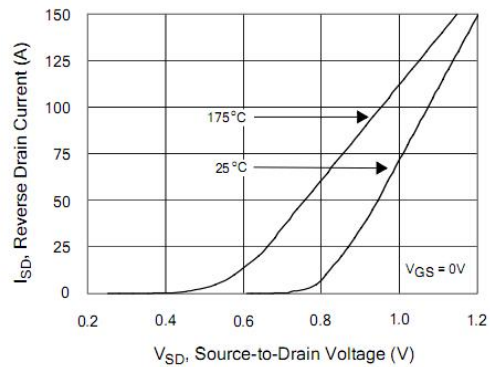


Figure 16. Typical Body Diode Transfer Characteristics



Test Circuit and Waveform

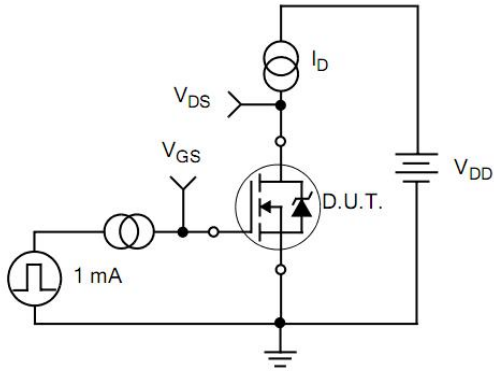


Figure 17. Gate Charge Test Circuit

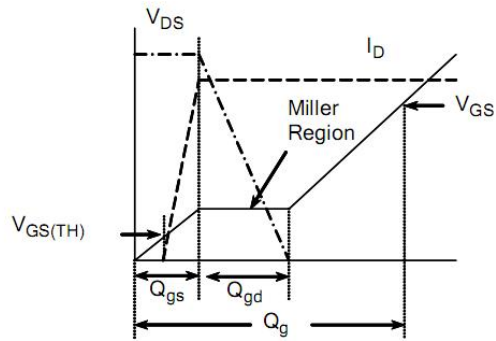


Figure 18. Gate Charge Waveform

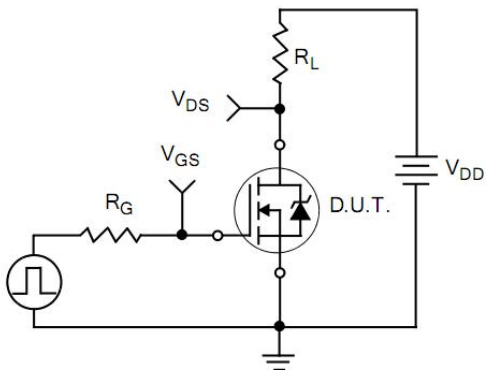


Figure 19. Resistive Switching Test Circuit

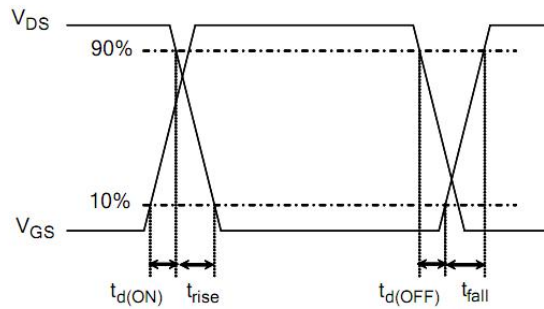


Figure 20. Resistive Switching Waveforms

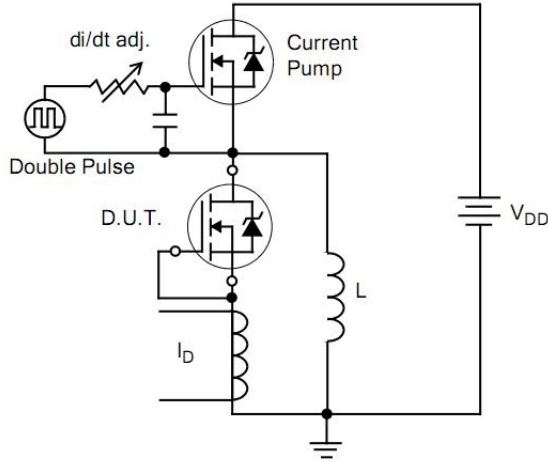


Figure 21. Diode Reverse Recovery Test Circuit

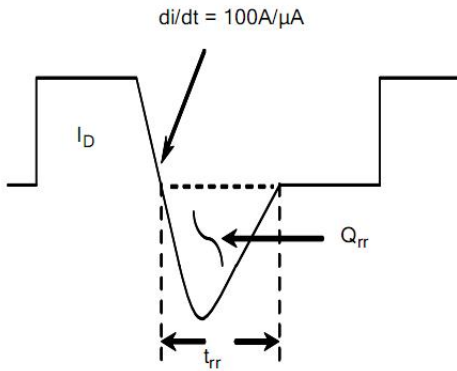


Figure 22. Diode Reverse Recovery Waveform

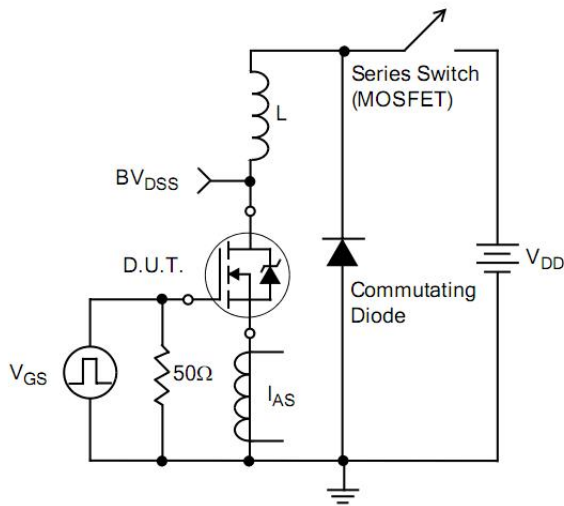


Figure 23. Unclamped Inductive Switching Test Circuit

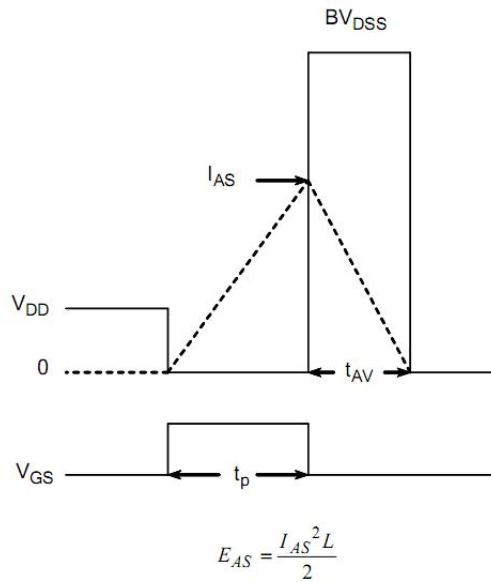
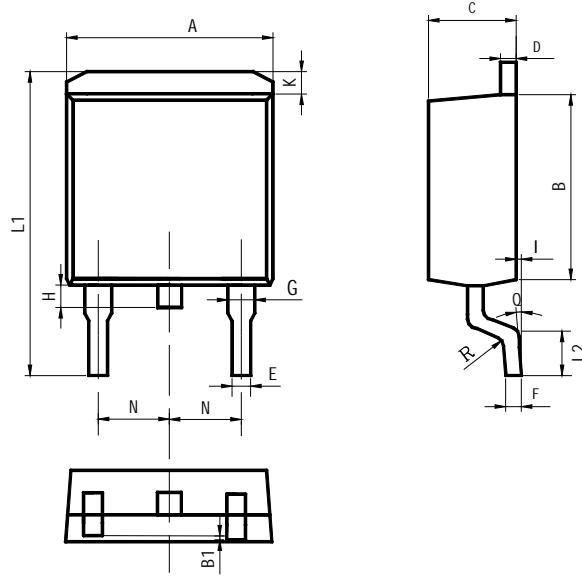


Figure 24. Unclamped Inductive Switching Waveforms

Package Information



Items	Values(mm)	
	MIN	MAX
A	9.80	10.40
B	8.90	9.50
B1	0	0.10
C	4.40	4.80
D	1.16	1.37
E	0.70	0.95
F	0.30	0.60
G	1.07	1.47
H	1.30	1.80
K	0.95	1.37
L1	14.50	16.50
L2	1.60	2.30
I	0	0.2
Q	0°	8°
R	0.4	
N	2.39	2.69

TO-263Package

