

TO-252 Plastic-Encapsulate MOSFETS

Features

- $V_{DS}=60V$
- $I_D=60A$
- $R_{DS(on)}@V_{GS}=10V < 10m\Omega$
- $R_{DS(on)}@V_{GS}=4.5V < 14m\Omega$
- Fast Switching
- Low Gate Charge and R_{dson}
- Advanced Split Gate Trench Technology

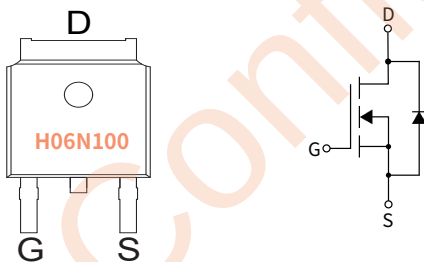
Applications

- Load switch
- PWM application
- Power management

Mechanical Data

- Case: TO-252
Molding compound meets UL 94V-0 flammability rating, RoHS-compliant, halogen-free
- Terminals: Solder plated, solderable per MIL-STD-750, Method 2026

Function Diagram



Ordering Information

PACKAGE	PACKAGE CODE	UNIT WEIGHT(g)	REEL(pcs)	BOX(pcs)	CARTON(pcs)	DELIVERY MODE
TO-252	R3	0.305	2500	5000	25000	13"

Maximum Ratings (Ta=25°C Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	VALUE
Drain-source Voltage	V_{DS}	V	60
Gate-source Voltage	V_{GS}	V	± 20
Drain Current	I_D	A	60
Pulsed Drain Current ⁽¹⁾	I_{DM}	A	232
Total Power Dissipation	P_D	W	70
Single pulse avalanche energy ⁽²⁾	EAS	mJ	115
Junction temperature	T_J	°C	-55 ~+150
Storage temperature	T_{stg}	°C	-55 ~+150
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	°C / W	1.79

Drain-source Voltage
60 V
Drain Current
60 Ampere



● Static Parameter Characteristics (Tj=25°C Unless otherwise specified)

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	V	60	—	—
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V$	μA	—	—	1.0
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	nA	—	—	± 100
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	V	1.0	1.5	2.5
Static Drain-Source On-Resistance ⁽³⁾	$R_{DS(on)}$	$V_{GS}=10V, I_D=30A$	m Ω	—	7	10
		$V_{GS}=4.5V, I_D=20A$		—	8.5	14

● Dynamic Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, f=1MHz$	pF	—	3018	—
Output Capacitance	C_{oss}			—	206	—
Reverse Transfer Capacitance	C_{rss}			—	198	—

● Switching Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=10V, V_{DD}=30V, I_D=30A, R_{GEN}=1.8\Omega$	nS	—	13	—
Turn-on Rise Time	t_r		nS	—	77	—
Turn-off Delay Time	$t_{D(off)}$		nS	—	50	—
Turn-off fall Time	t_f		nS	—	106	—
Total Gate Charge	Q_g	$V_{DS}=30V, I_D=30A, V_{GS}=10V$	nC	—	77	—
Gate-Source Charge	Q_{gs}		nC	—	14	—
Gate-Drain Charge	Q_{gd}		nC	—	15	—

● Drian-Source Diode Characteristics

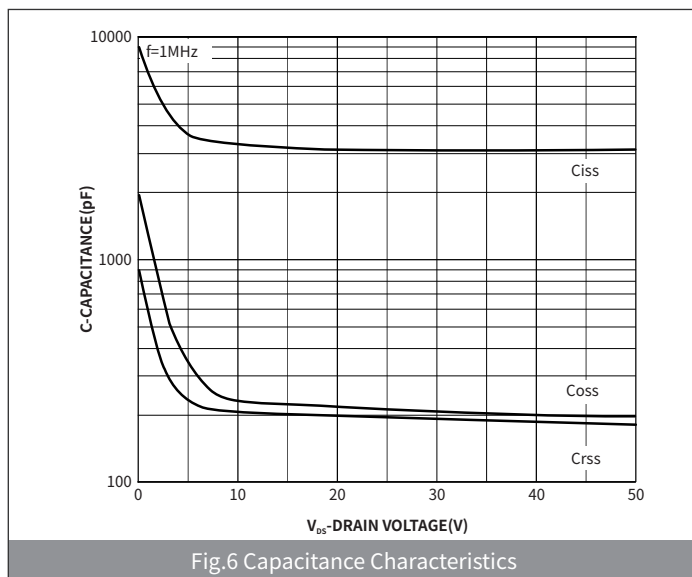
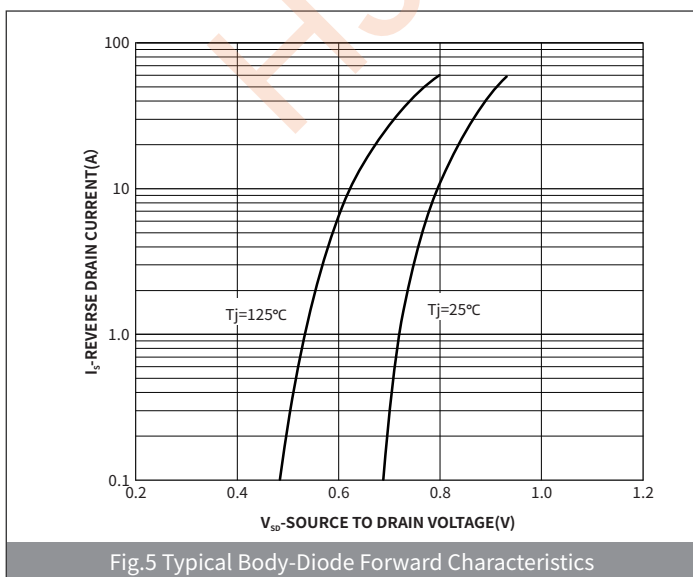
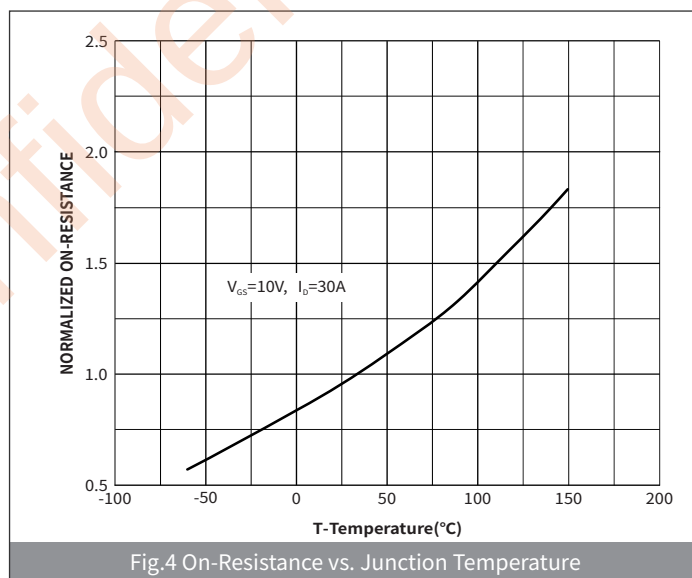
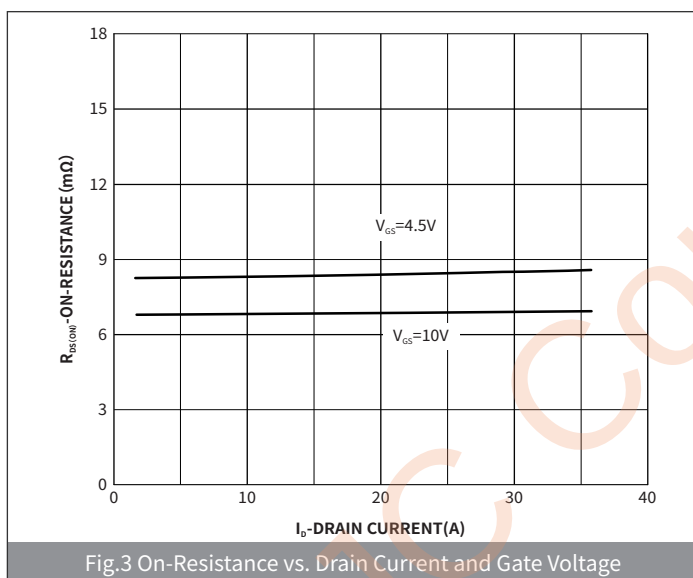
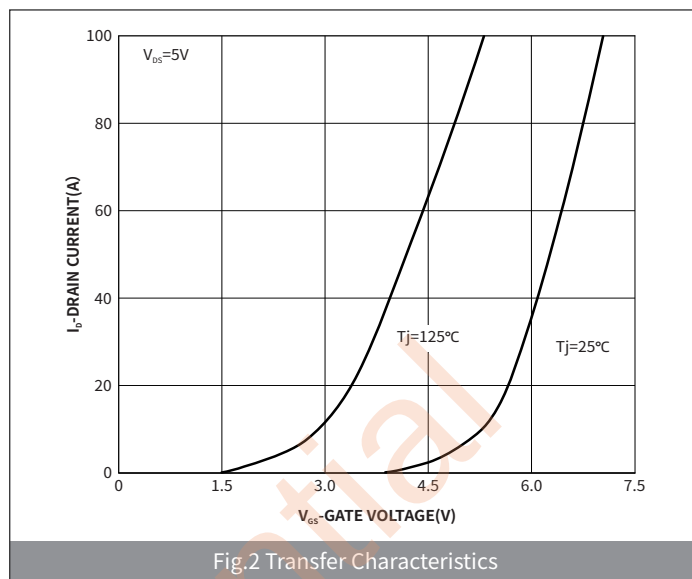
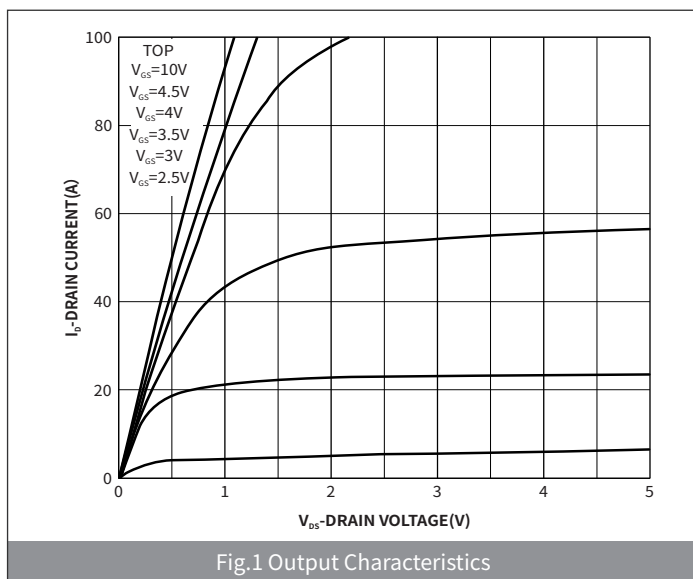
PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Diode Forward Voltage	V_{SD}	$I_S=60A, V_{GS}=0V$	V	—	—	1.2
Maximum Body-Diode Continuous Current	I_S	—	A	—	—	60

Note :

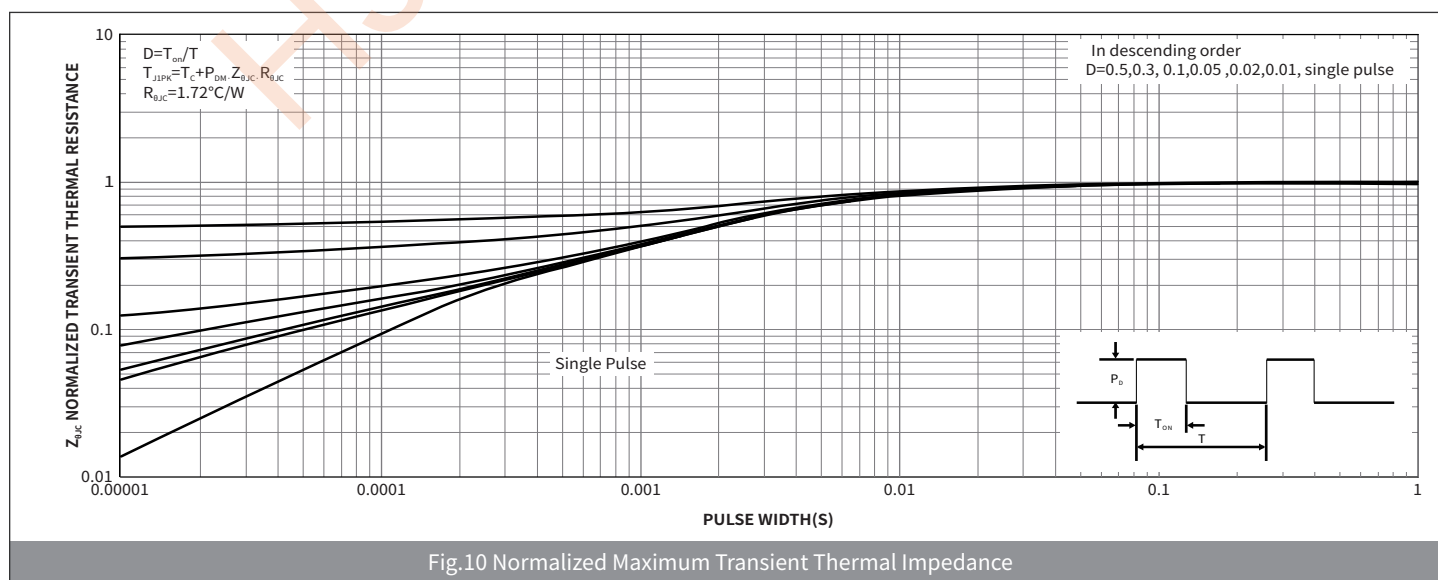
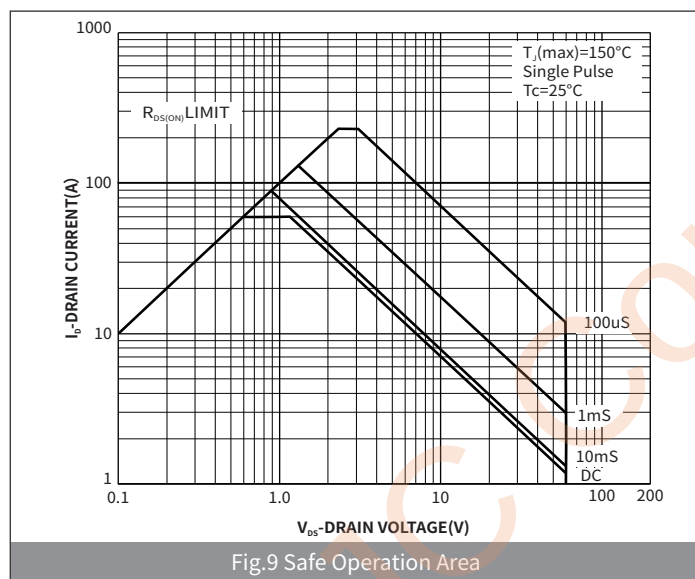
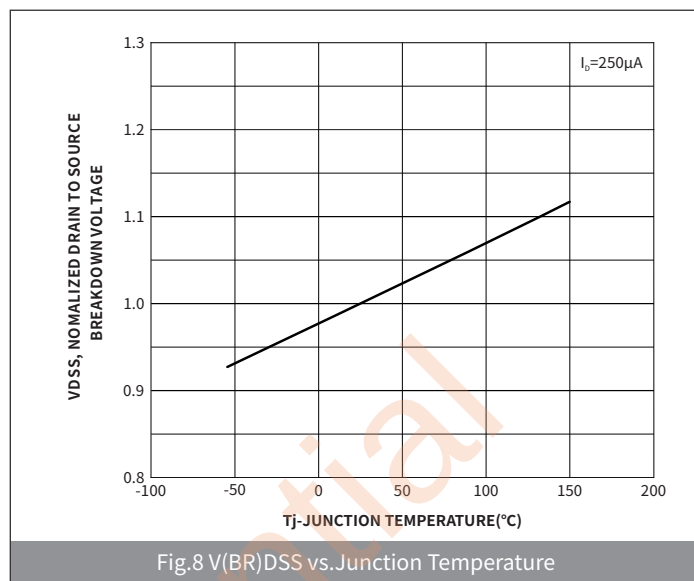
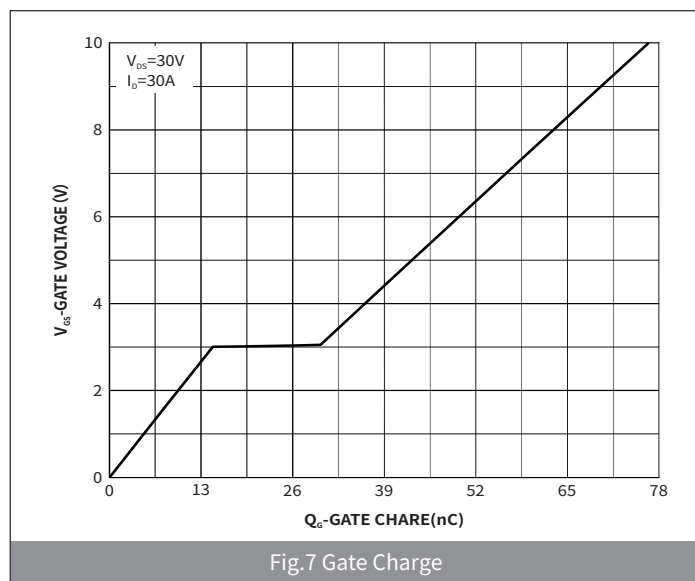
(1) Repetitive Rating: Pulse width limited by maximum junction temperature.

(2) EAS condition : Tj=25°C ,VDD=30V,VG=10V,L=0.5mH,IAS=21.5A,Rg=25 Ω .(3) Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$.

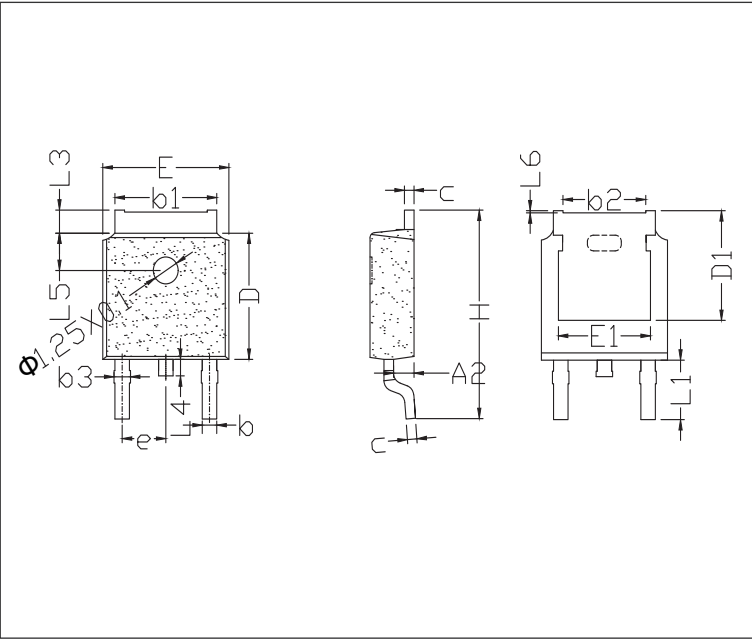
● Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)



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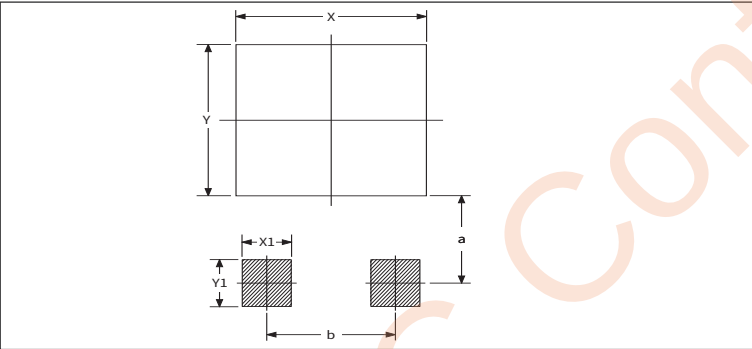


Package Outline Dimensions (TO-252)



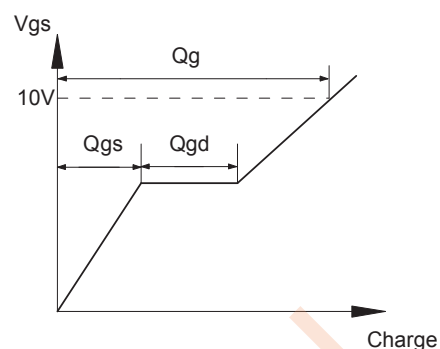
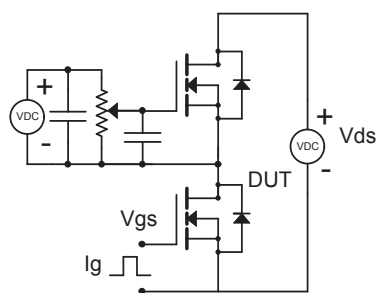
Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A2	0.90	1.10	0.035	0.043
b	0.66	0.86	0.026	0.034
b1	5.10	5.46	0.201	0.215
b2	4.27	4.37	0.168	0.172
b3	0.78	0.90	0.031	0.035
c	0.46	0.58	0.018	0.023
D	6.00	6.20	0.236	0.244
D1	5.35 REF.		0.211 REF.	
E	6.50	6.70	0.256	0.264
E1	4.83 REF.		0.190 REF.	
e	2.18	2.38	0.086	0.094
H	9.80	10.4	0.386	0.409
L1	2.90 REF.		0.114 REF.	
L3	0.90	1.20	0.035	0.047
L4	0.60	1.00	0.024	0.039
L5	1.6 REF.		0.063 REF.	
L6	-	0.12	-	0.005

Suggested Pad Layout

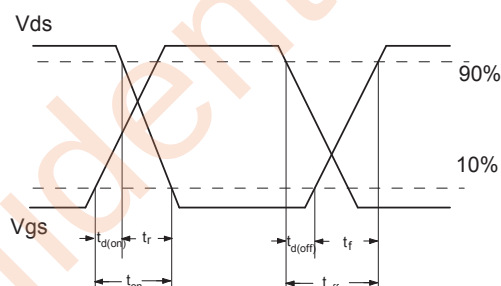
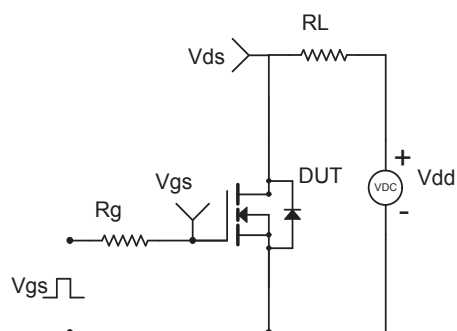


Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
a	3.70	-	0.146	-
b	4.37	-	0.172	-
X	-	5.80	-	0.228
X1	-	1.20	-	0.047
Y	-	5.85	-	0.230
Y1	-	2.00	-	0.079

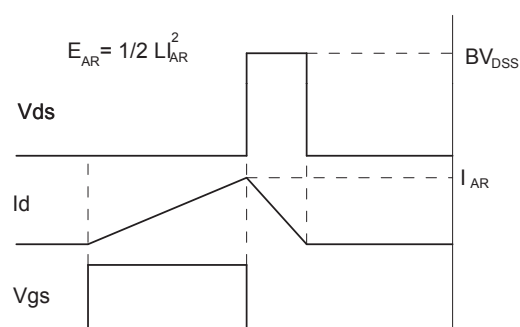
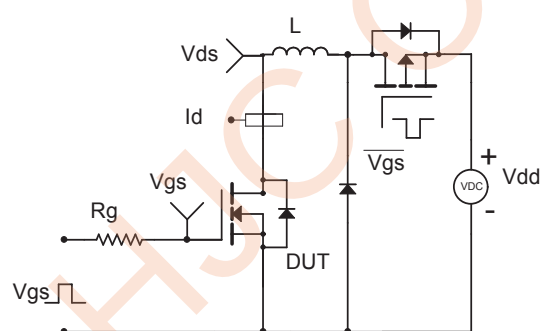
1. Gate Charge Test Circuit & Waveforms



2. Resistive Switching Test Circuit & Waveforms



3. Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



4. Diode Recovery Test Circuit & Waveforms

