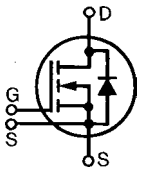
SMOS38N100S

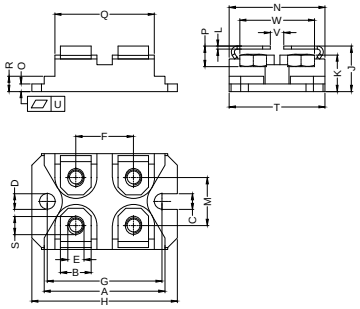
N Channel Enhancement Mode Power MOSFETs



G=Gate, D=Drain,
S=Source

V_{DSS}=1000V
I_{D25}=38A
$R_{DS(ON)}$ ≤ 0.250Ω

Dimensions SOT-227(ISOTOP)



Dim.	Millimeter		Dim.	Millimeter	
	Min.	Max.		Min.	Max.
A	31.30	31.65	M	12.00	13.00
B	7.80	8.40	N	25.15	25.65
C	4.00	4.30	O	1.95	2.15
D	Ø4.00	Ø4.30	P	5.60	6.60
E	4.00	4.30	Q	25.30	26.30
F	14.90	15.20	R	3.90	4.30
G	30.10	30.30	S	4.45	4.85
H	38.00	38.50	T	24.50	25.10
J	12.10	12.90	U	0.05	0.10
K	9.00	9.60	V	3.00	4.80
L	0.75	0.85	W	19.30	20.50

Symbol	Test Conditions	Maximum Ratings	Unit
V_{DSS}	T_J=25°C to 150°C	1000	V
V_{DGR}	T_J=25°C to 150°C; R_{GS}=1MΩ	1000	
V_{GS}	Continuous	±30	V
V_{GSM}	Transient	±40	
I_{D25}	T_C=25°C	38	A
I_{D25}	T_C=90°C	19	
I_{DM}	T_C=25°C; pulse width limited by T_{JM}	160	A
I_{AR}	T_C=25°C	38	A
E_{AR}	T_C=25°C	60	mJ
dv/dt	$I_S \le I_{DM}$; di/dt≤100A/us; $V_{DD} \le V_{DSS}$, $T_{JS} \le 150$°C; R_G=2Ω	20000	V/us
P_D	T_C=25°C	900	W
T_J		-55...+150	°C
T_{JM}		150	
T_{stg}		-55...+150	
V_{ISOL}	50/60Hz,RMS t=1 min	2500	V~
	I_{ISOL}≤1mA t=1 s	3000	
M_d	Mounting torque Terminal	1.5/13	Nm/lb.in.
	connection torque	1.5/13	
Weight	typical	30	g

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(T_J=25°C, unless otherwise specified)

Symbol	Test Conditions	Characteristic Values			Unit
		min.	typ.	max.	
V_{DSS}	V_{GS}=0V; I_D=1 mA	1000			V
$V_{GS(th)}$	V_{DS}=V_{GS}; I_D=8 mA	3		5.5	V
I_{GSS}	V_{GS}=±20V_{DC}; V_{DS}=0			±100	nA
I_{DSS}	V_{DS}=0.8V_{DSS}; T_J=25°C V_{GS}=0V; T_J=125°C		50	20	uA uA
$R_{DS(on)}$	V_{GS}=10V; I_D=0.5I_{D25} Pulse test, t≤300us, duty cycle d≤2%			0.250	Ω

(T_J=25°C, unless otherwise specified)

Symbol	Test Conditions	Characteristic Values			Unit
		min.	typ.	max.	
g_{ts}	V_{DS}=10V; I_D=0.5I_{D25}; pulse test	24	40		S
C_{ies} C_{oes} C_{res}	V_{GS}=0V; V_{DS}=25V; f=1MHz		13500 1030 185		pF
$Q_{g(on)}$ Q_{gs} Q_{gd}	V_{GS}=10V; V_{DS}=0.5V_{DSS}; I_D=0.5I_{D25}		250 58 105		nC
$t_{d(on)}$ t_r $t_{d(off)}$ t_f	V_{GS}=10V; V_{DS}=0.5V_{DSS}; I_D=0.5I_{D25} R_G=1Ω (External)		25 28 57 15		ns ns ns ns
R_{thJC}				0.14	K/W
R_{thCK}			0.05		K/W

Source-Drain Diode

(T_J=25°C, unless otherwise specified)

Symbol	Test Conditions	Characteristic Values			Unit
		min.	typ.	max.	
I_S	V_{GS}=0V			38	A
I_{SM}	Repetitive; pulse width limited by T_{JM}			160	A
V_{SD}	I_F=I_S; V_{GS}=0V; Pulse test, t≤300us, duty cycle d≤2%			1.4	V

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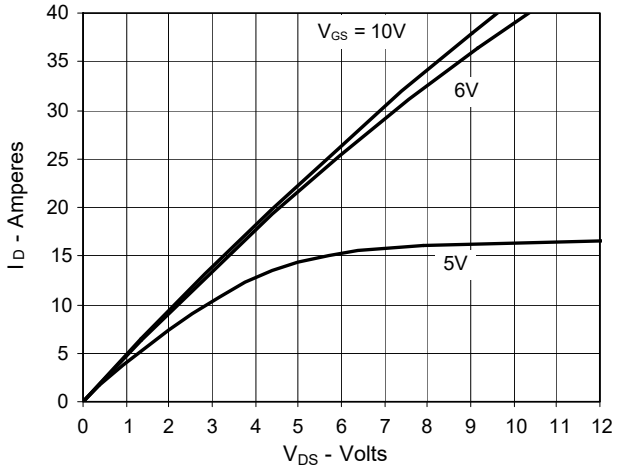

Fig. 1. Output Characteristics @ 25ºC

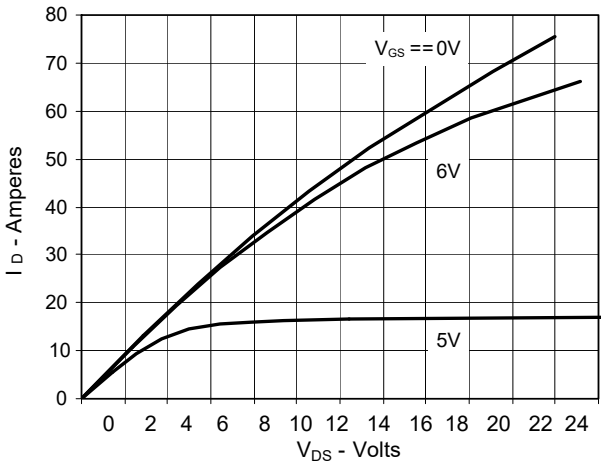

Fig. 2. Extended Output Characteristics @ 25ºC

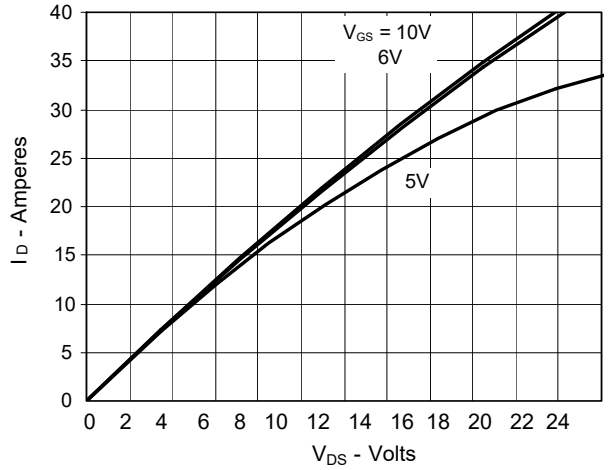

Fig. 3. Output Characteristics @ 125ºC

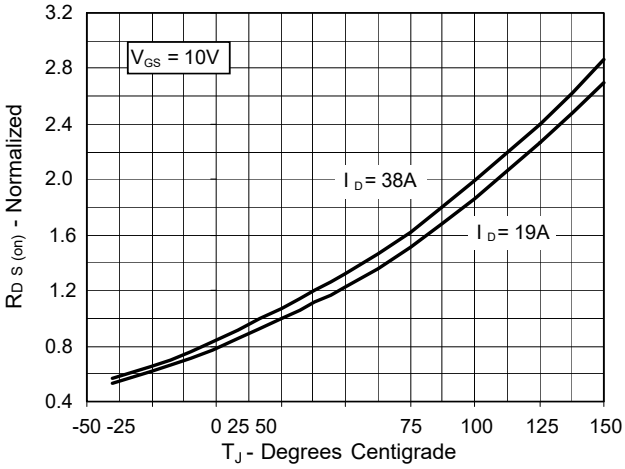

Fig. 4. $R_{DS(on)}$ Normalized to I_D = 19A Value vs. Junction Temperature

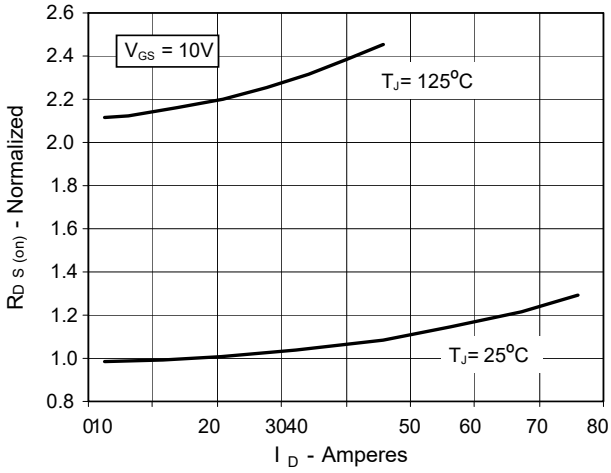

Fig. 5. $R_{DS(on)}$ Normalized to I_D = 19A Value vs. Drain Current

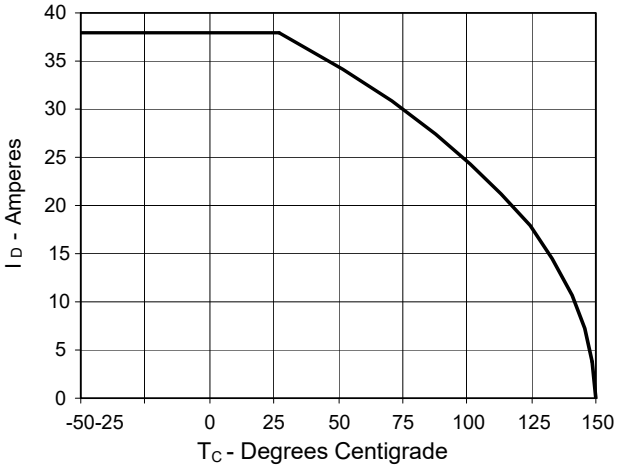

Fig. 6. Drain Current vs. Case Temperature

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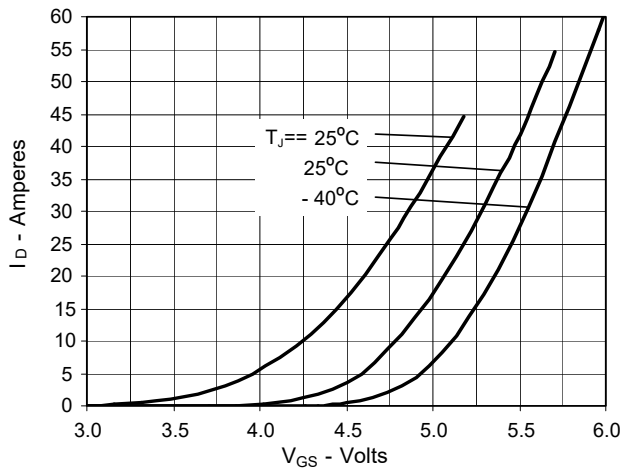

Fig. 7. Input Admittance

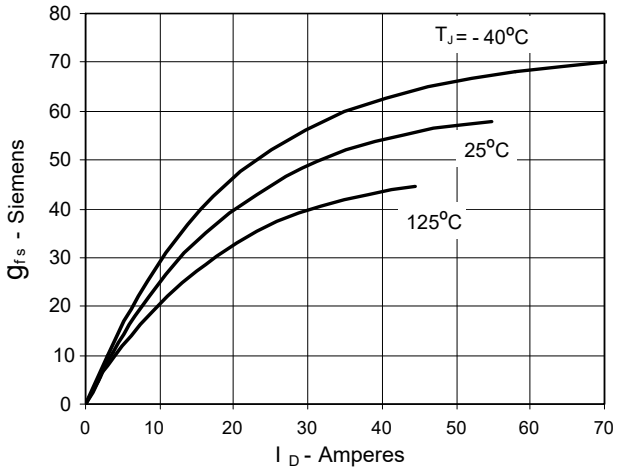

Fig. 8. Transconductance

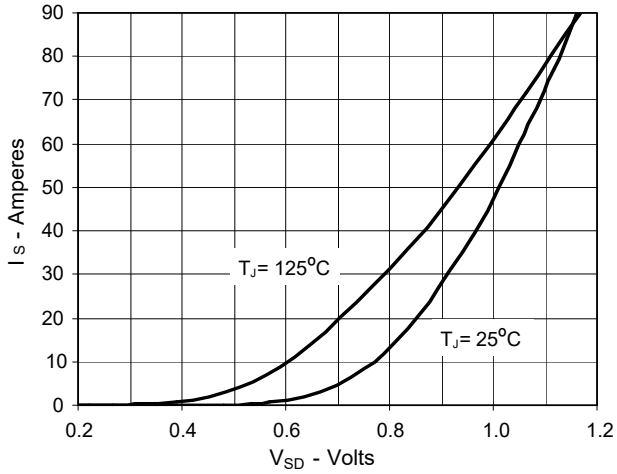

Fig. 9. Source Current vs. Source-To-Drain Voltage

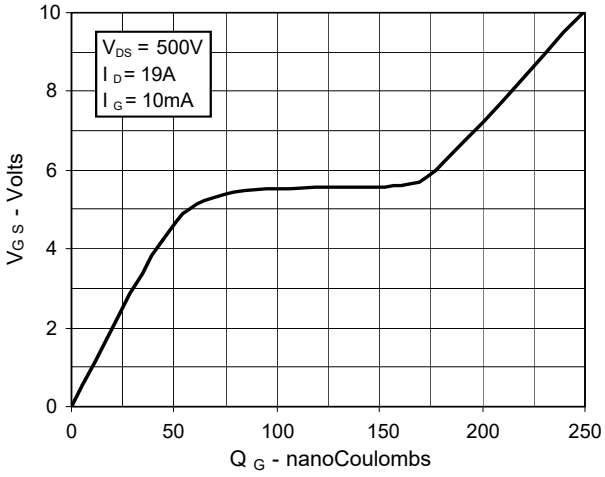

Fig. 10. Gate Charge

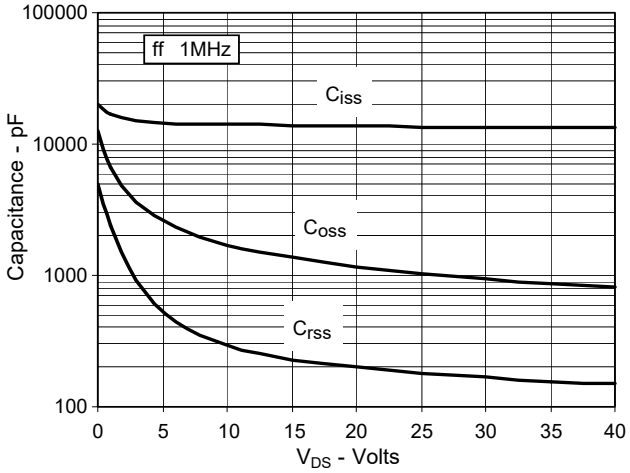

Fig. 11. Capacitance

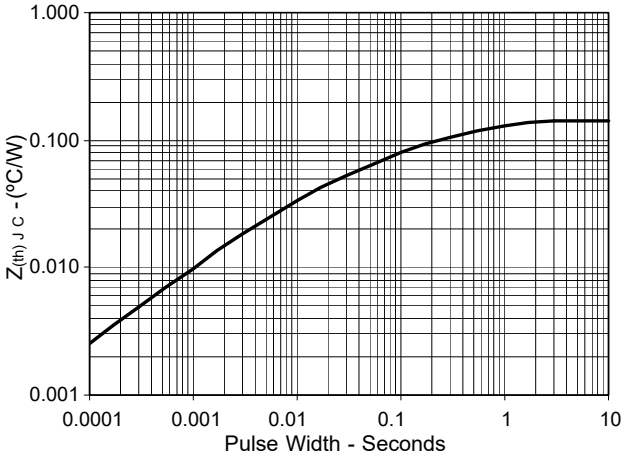

Fig. 12. Maximum Transient Thermal Impedance

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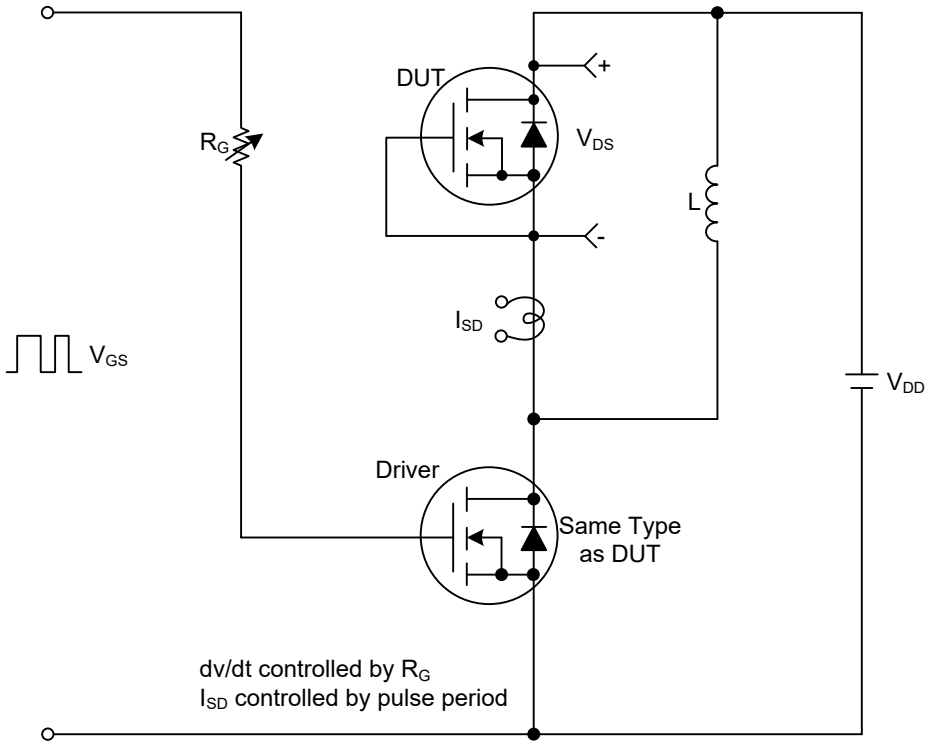
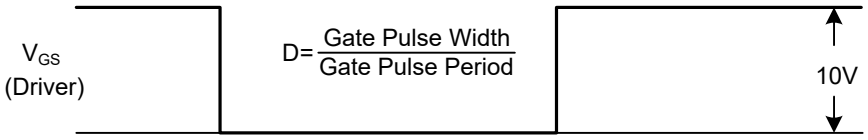
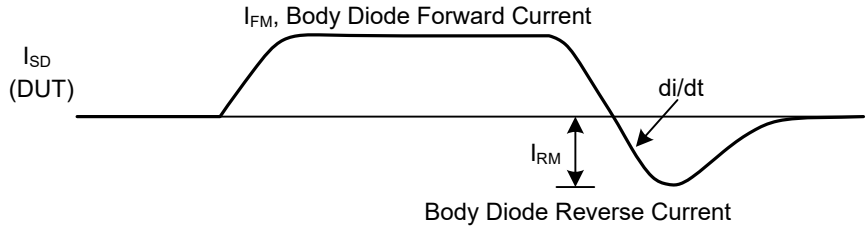
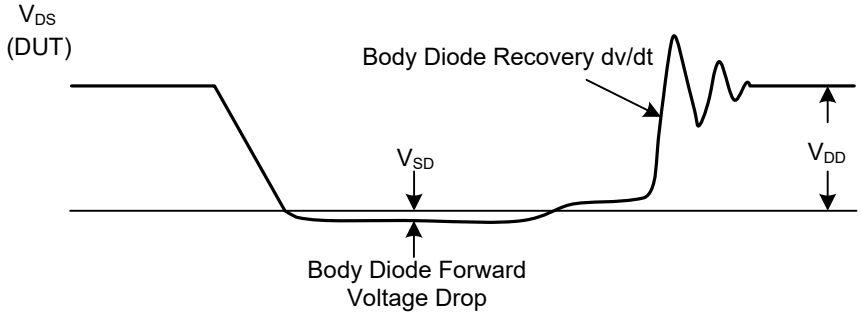
■ TEST CIRCUITS AND WAVEFORMS

Peak Diode Recovery dv/dt Test Circuit & Waveforms









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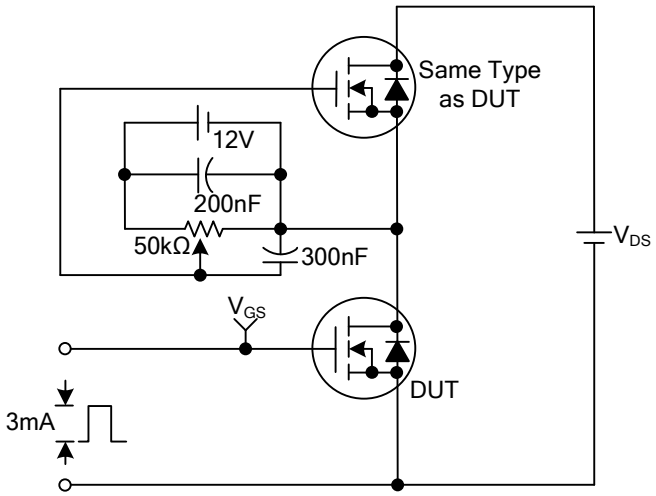
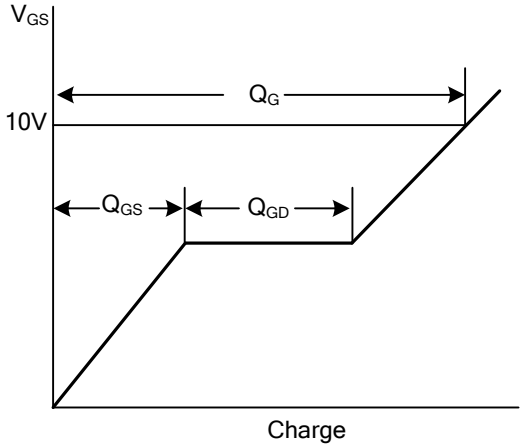
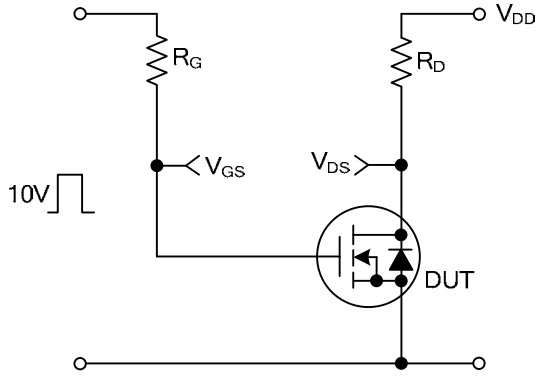


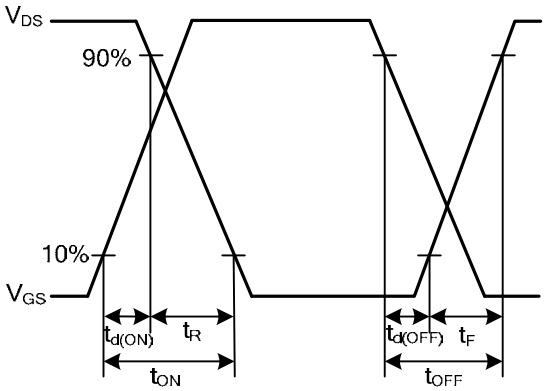
Gate Charge Test Circuit



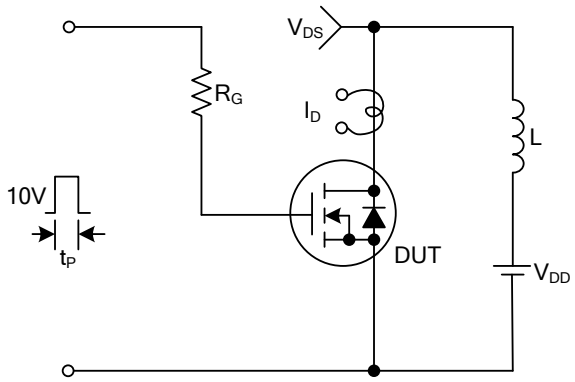
Gate Charge Waveforms



Resistive Switching Test Circuit

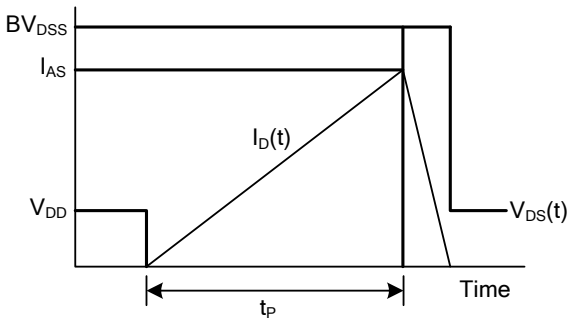


Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit

$$E_{AS}=\frac{1}{2}LI_{AS}^{2}\frac{BV_{DSS}}{BV_{DSS}-V_{DD}}$$



Unclamped Inductive Switching Waveforms

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