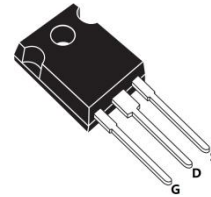


Features

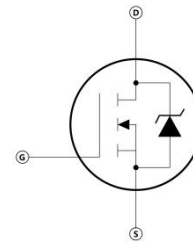
- 100% avalanche tested
- Improved dv/dt capability
- Gate charge minimized
- Very low intrinsic capacitances
- High speed switching
- Very low on-resistance



General Description

Applications

- Welder
- UPS
- PV Inverter
- Switching applications



Electrical ratings

Absolute maximum ratings			
Parameter	Symbol	Value	Unit
Drain-source voltage ($V_{GS} = 0$)	V_{DSS}	1500	V
Transient Gate- source voltage	V_{GSM}	± 30	
Continuous Gate- source voltage(DC)	V_{GSS}	± 20	
Drain current (continuous) at $T_C = 25\text{ }^{\circ}\text{C}$	I_D	9	A
Drain current (continuous) at $T_C = 100\text{ }^{\circ}\text{C}$		6	
Drain current (pulsed)	I_{DM}	27	
Power dissipation at $T_C = 25\text{ }^{\circ}\text{C}$	P_D	480	W
Power dissipation at $T_C = 100\text{ }^{\circ}\text{C}$		192	W
Operating junction temperature	T_J	-55 to 150	$^{\circ}\text{C}$
Storage temperature	T_{stg}		
Maximum lead temperature for soldering purpose	T_J	300	

Thermal data			
Parameter	Symbol	Value	Unit
Thermal resistance junction-case max	$R_{thj-case}$	0.26	$^{\circ}\text{C}/\text{W}$
Thermal resistance junction-ambient max	$R_{thj-amb}$	36	

Avalanche characteristics			
Parameter	Symbol	Max value	Unit
Avalanche current, repetitive or not-repetitive (pulse width limited by T_J max)	I_{AR}	6	A
Single pulse avalanche energy (starting $T_J = 25\text{ }^{\circ}\text{C}$, $I_D = I_{AR}$, $V_{DD} = 50\text{ V}$, $L=30\text{mH}$)	E_{AS}	540	mJ

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

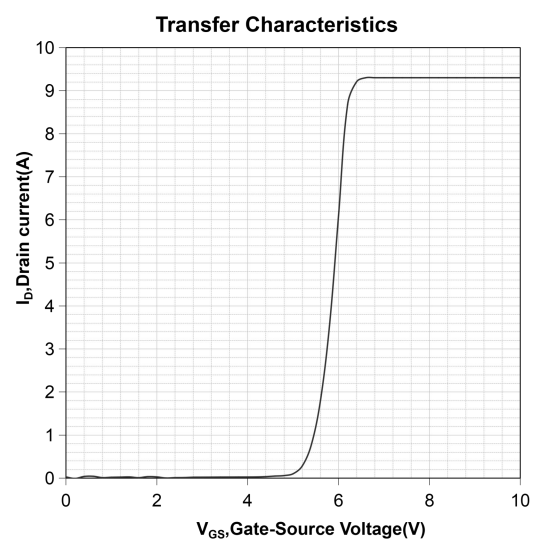
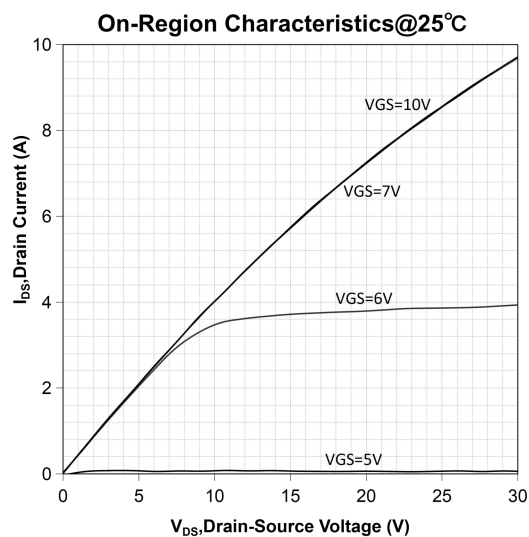
On /off states						
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D = 1\text{ mA}$, $V_{GS} = 0$	1500	1640		V
Zero gate voltage drain current ($V_{GS} = 0$)	I_{DSS}	$V_{DS} = \text{Max rating}$ $V_{DS} = \text{Max rating}$, $T_C = 125\text{ }^{\circ}\text{C}$		0.44 21.5	10 500	μA
Gate-body leakage current ($V_{DS} = 0$)	I_{GSS}	$V_{GS} = \pm 20\text{ V}$		± 1	± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\text{ }\mu\text{A}$	3	4.3	5.5	V
Static drain-source on resistance	$R_{DS(on)}$	$V_{GS} = 10\text{V}$, $I_D = 1\text{A}$	2	2.9	3.8	Ω

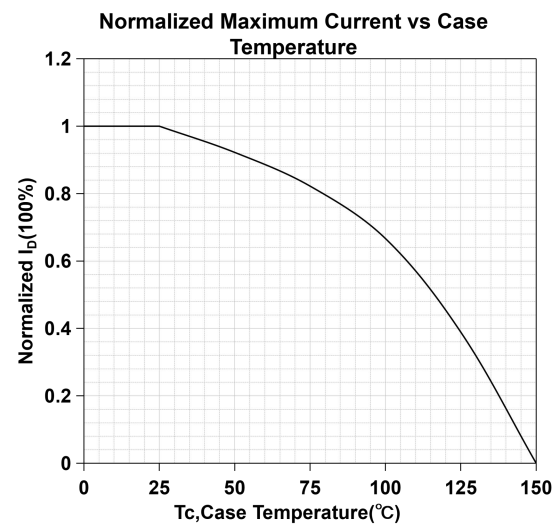
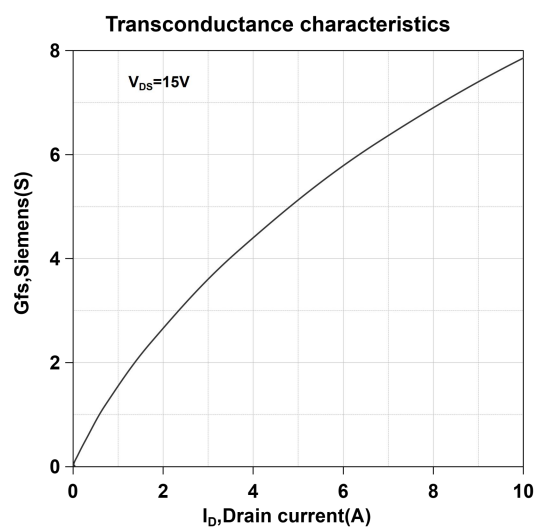
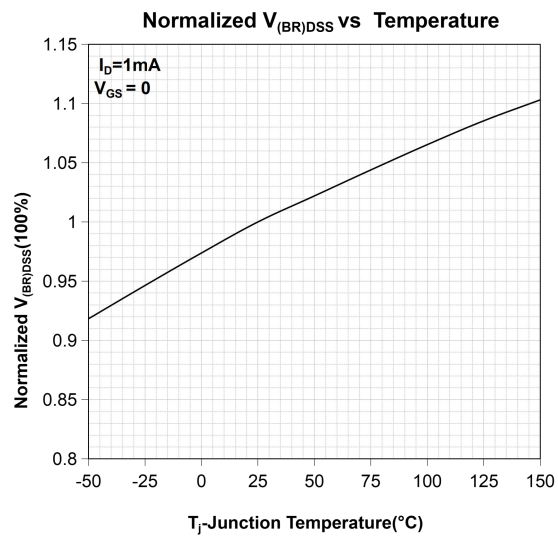
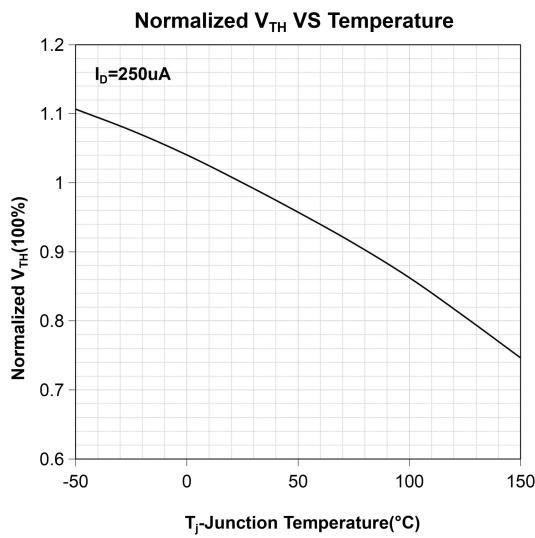
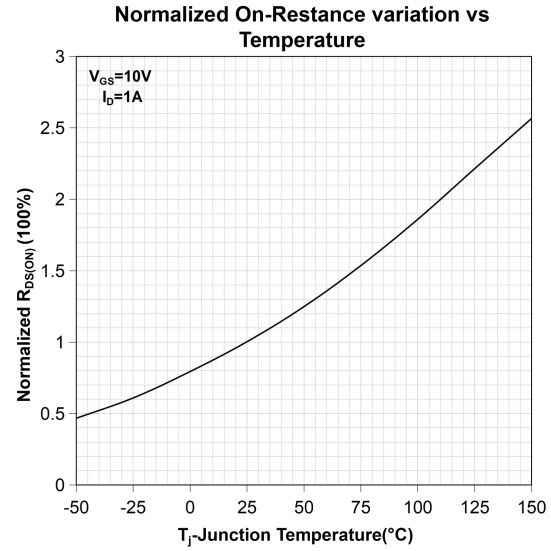
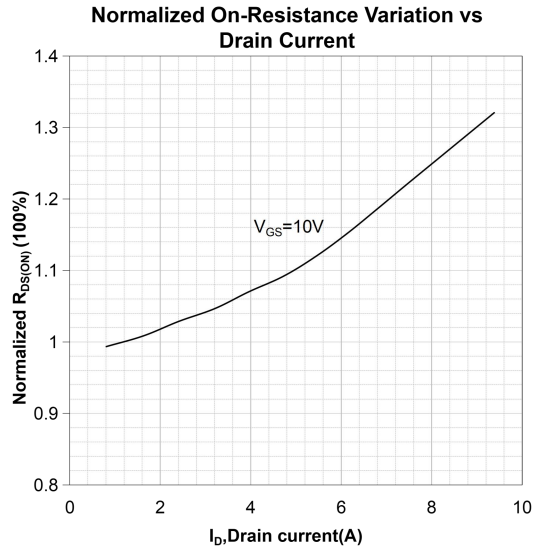
Dynamic						
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Forward transconductance	g_{fs}	$V_{DS} = 15\text{ V}$, $I_D = 4\text{A}$		4.5		S
Input capacitance	C_{iss}	$V_{DS}=25\text{V}$, $f=1\text{MHz}$, $V_{GS}=0$		1822		pF
Output capacitance	C_{oss}			205		
Reverse transfer capacitance	C_{rss}			31		
Equivalent Output capacitance	$C_{oss\text{ eq.}}$	$V_{GS}=0$, $V_{DS}=0$ to 1200V		84		
Gate input resistance	R_g	$f=1\text{MHz}$ Gate DC Bias=0 Test signal level=20mV open drain		1.6		Ω
Total gate charge	Q_g	$V_{DD}=1200\text{V}$, $I_D=8\text{A}$ $V_{GS}=10\text{V}$		77		nC
Gate-source charge	Q_{gs}			13		
Gate-drain charge	Q_{gd}			48		

Switching times						
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 750 \text{ V}, I_D = 4 \text{ A},$ $R_G = 1.6 \Omega, V_{GS} = 10 \text{ V}$		17		ns
Rise time	t_r			29		
Turn-off-delay time	$t_{d(off)}$			60		
Fall time	t_f			37		

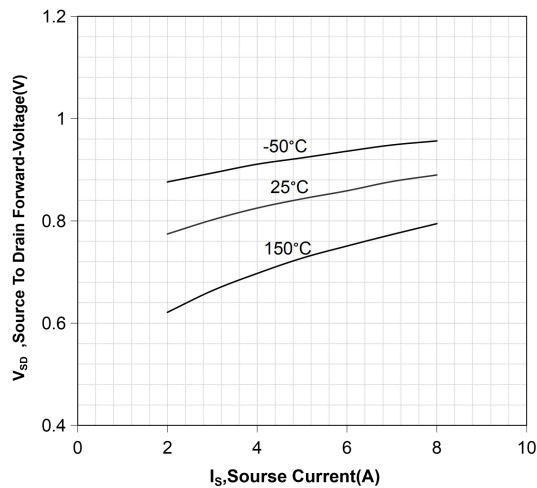
Source drain diode						
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Source-drain current	I_{SD}				9	A
Source-drain current (pulsed)	I_{SDM}				46	
Forward on voltage	V_{SD}	$I_{SD} = 8 \text{ A}, V_{GS} = 0$		0.9	1.2	V
Reverse recovery time	t_{rr}	$I_{SD} = 8 \text{ A}, di/dt = 100 \text{ A}/\mu\text{s}$ $V_{DD} = 60 \text{ V}$		550		ns
Reverse recovery charge	Q_{rr}			5.6		μC
Reverse recovery current	I_{RRM}			22		A
Reverse recovery time	t_{rr}	$S_D = 8 \text{ A}, di/dt = 100 \text{ A}/\mu\text{s}$ $V_{DD} = 60 \text{ V}, T_J = 150^\circ\text{C}$		620		ns
Reverse recovery charge	Q_{rr}			6.2		μC
Reverse recovery current	I_{RRM}			22		A

Electrical characteristics

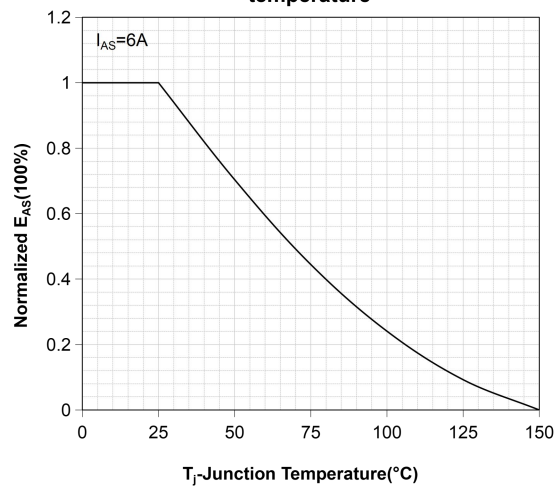




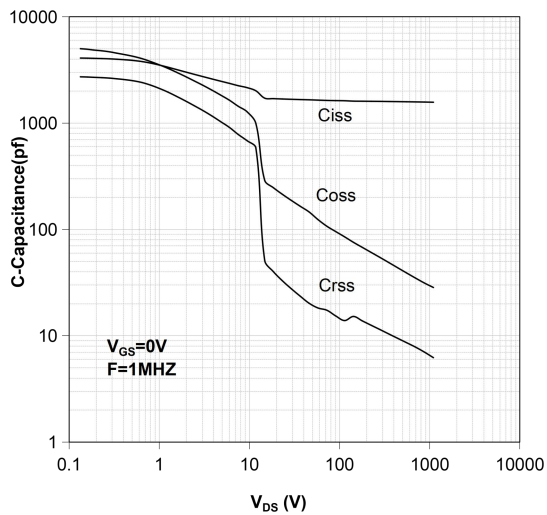
Source-drain diode forward characteristics



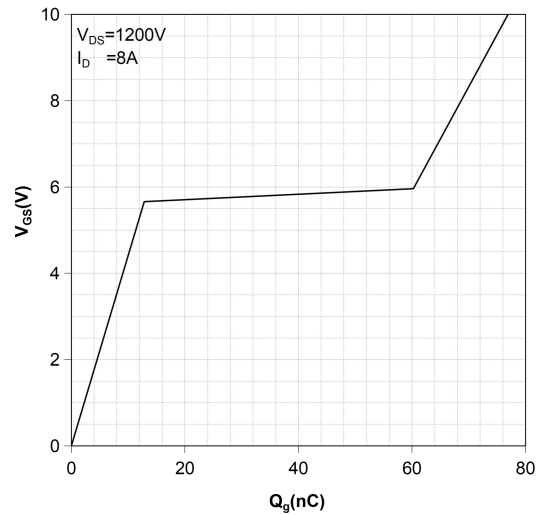
Normalized Maximum avalanche energy vs temperature



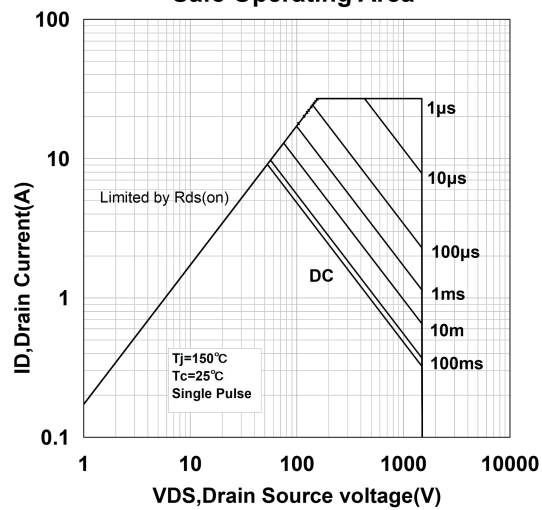
Capacitance variations



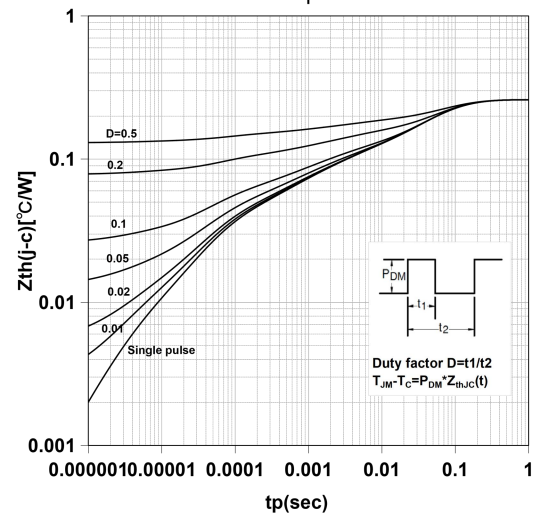
Gate charge vs gate-source voltage



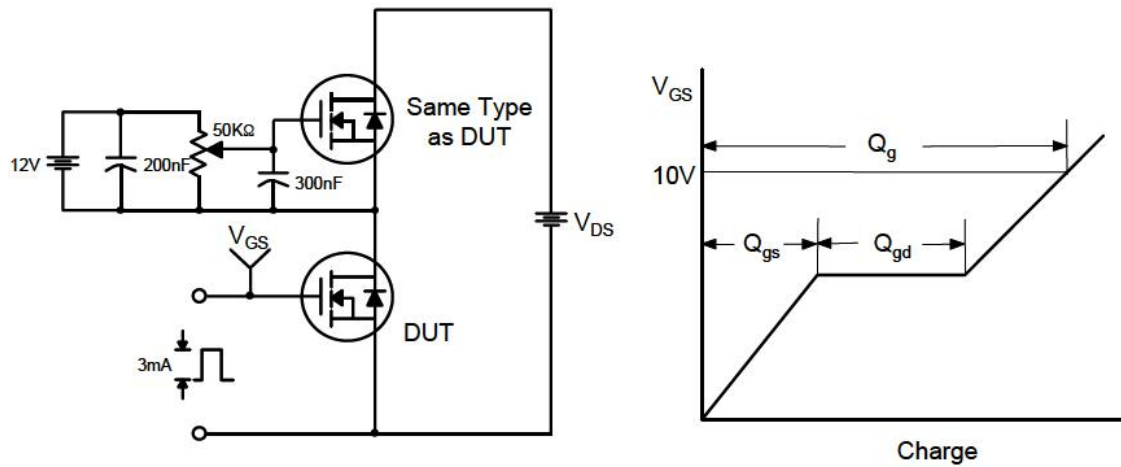
Safe Operating Area



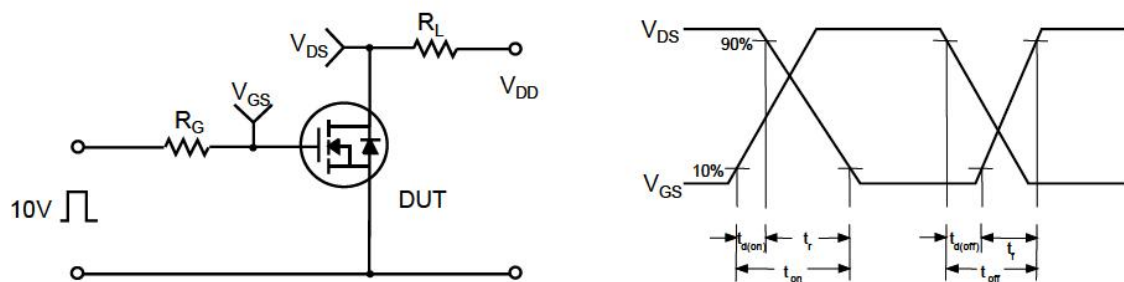
Thermal impedance



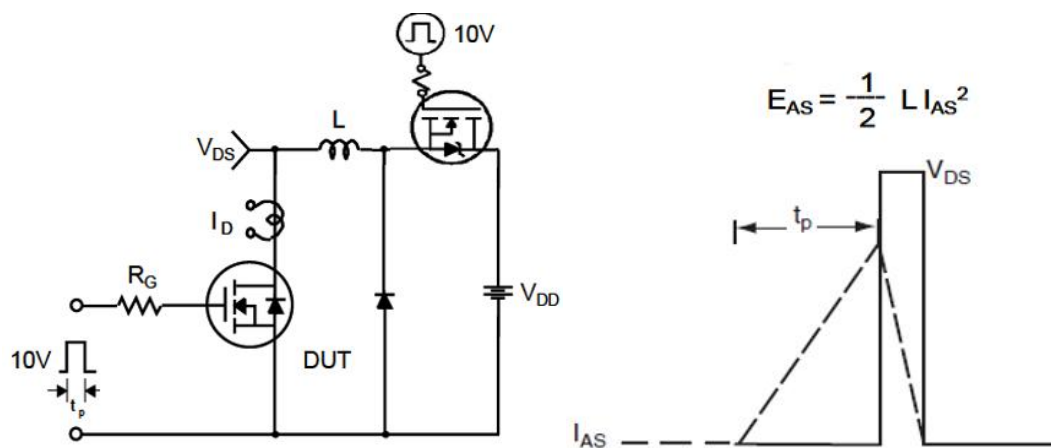
Gate Charge Test Circuit & Waveform



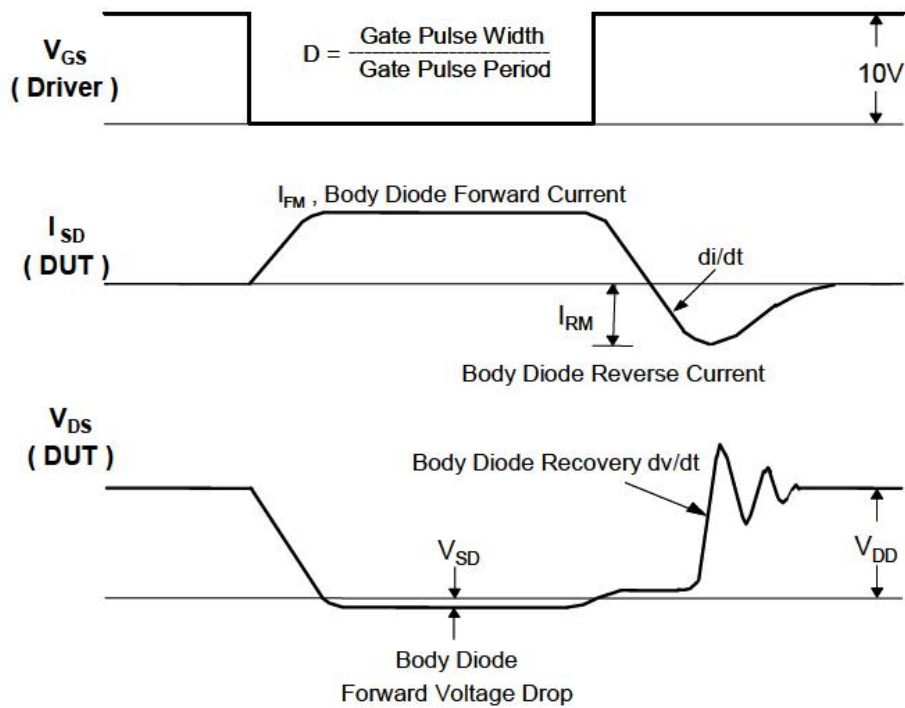
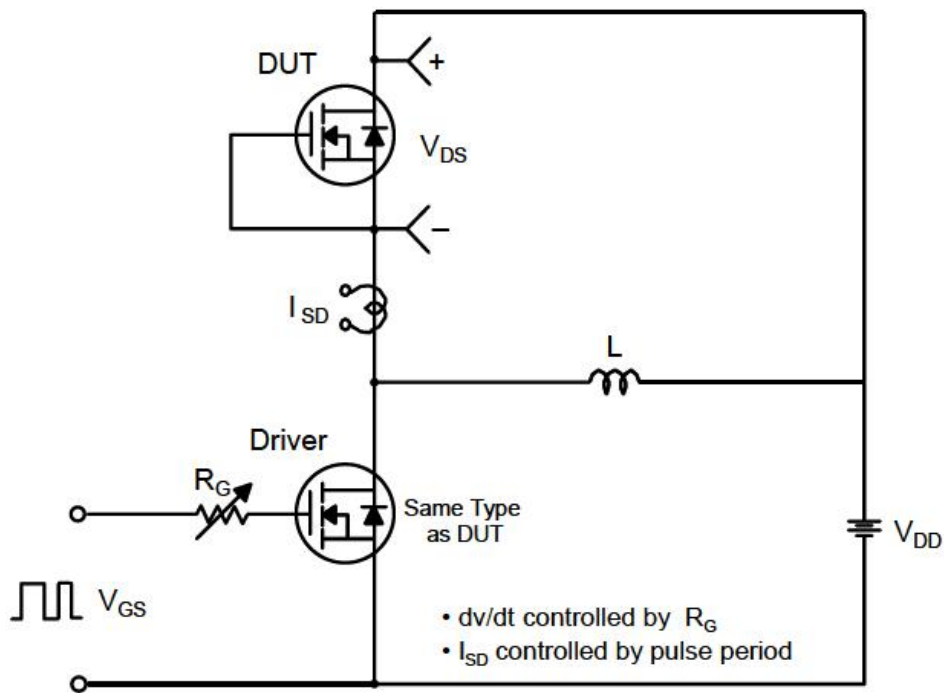
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



Peak Diode Recovery dv/dt Test Circuit & Waveforms



Package outline dimension

