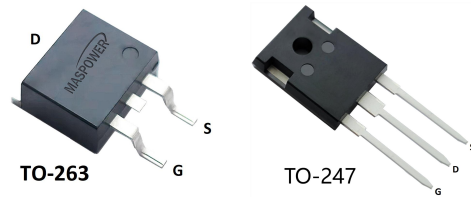


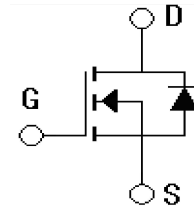
Features

- Low gate charge(typ. $Q_g=46\text{nC}$)
- Ultra fast switching
- 100% avalanche tested
- RoHS Compliant



Applications

- Power factor correction(PFC).
- Switched mode power supplies(SMPS).
- Uninterrupted Power Supply(UPS).
- Low Power chargers and Adapters.



Absolute Ratings ($T_c=25^\circ\text{C}$)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	800	V
Drain Current -continuous	I_D	24	A
Drain Current - pulse (note 1)	I_{DM}	96	A
Gate-Source Voltage	V_{GS}	± 30	V
Single Pulsed Avalanche Energy (note 2)	E_{AS}	690	mJ
Power Dissipation	PD $T_C=25^\circ\text{C}$ -Derate above 25°C	227	W
		1.67	W/ $^\circ\text{C}$
Operating and Storage Temperature Range	T_j, T_{STG}	$-55\sim+150$	$^\circ\text{C}$
Continuous diode forward current	I_S	24	A
Diode pulse current	I_S Pulse	96	A
Maximum lead temperature for soldering purposes	T_L	260	$^\circ\text{C}$

*Drain current limited by maximum junction temperature

Electrical Characteristics(T_{CASE}=25°C unless otherwise specified)

Parameter	Symbol	Tests conditions	Min	Type	Max	Units
Off-Characteristics						
Drain-Source Voltage	BV _{DSS}	I _D =250uA, V _{GS} =0V	800	-	-	V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_J$	I _D =250μA, referenced to 25°C	-	0.11	-	V/°C
Drain cut-off current	I _{DSS}	V _{DS} =800V, V _{GS} =0V T _j =25°C	-	-	1	μA
		T _j =150°C	-	-	100	
Gate-body leakage current, forward	I _{GSSF}	V _{DS} =0V, V _{GS} =30V	-	-	100	nA
Gate-body leakage current, reverse	I _{GSSR}	V _{DS} =0V, V _{GS} =-30V	-100	-	-	nA
On-Characteristics						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	2.5	3.5	4.5	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =10A T _j =25°C	-	0.205	0.24	Ω
Dynamic Characteristics						
Input capacitance	C _{iss}	V _{DS} =100V, V _{GS} =0V, f=10kHz	-	2030	-	pF
Output capacitance	C _{oss}		-	83	-	pF
Reverse transfer capacitance	C _{rss}		-	1.8	-	pF
Forward transconductance	g _{fs}	V _{DS} =30V, I _D =12A	-	24	-	S

Switching Characteristics						
Turn-On delay time	td(on)	V _{DD} =400V,I _D =24A, R _G =4.7Ω	-	20	-	ns
Turn-On rise time	t _r		-	39	-	ns
Turn-Off delay time	T _{d(off)}		-	56	-	ns
Turn-Off Fall time	t _f		-	19	-	ns
Total Gate Charge	Qg	V _{DD} =400V, I _D =24A, V _{GS} =10V	-	46	-	nC
Gate-Source charge	Qgs		-	13	-	nC
Gate-Drain charge	Qgd		-	21	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V,IF=1A (note 3)	-	0.7	1.2	V

Reverse recovery time	t_{rr}	VR=400V, IF=12A dIF/dt=130A/us	-	280	-	ns
Reverse recovery charge	Q_{rr}		-	4.8	-	uC
Peak reverse recovery current	I_{rrm}		-	24	-	A

Thermal Characteristic

Parameter	Symbol	Value		Unit
		TO-263	TO-247	
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.55		°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5		°C/W

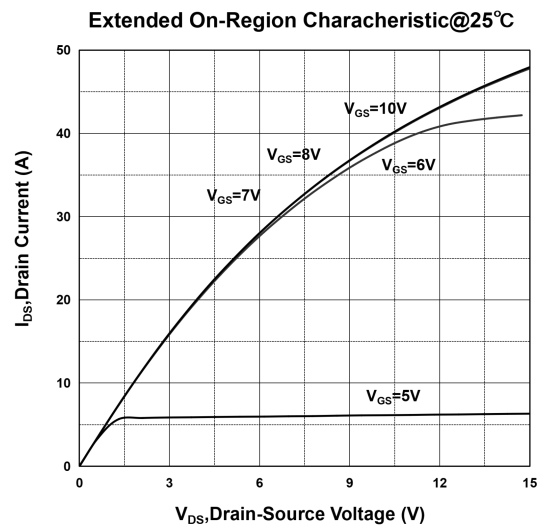
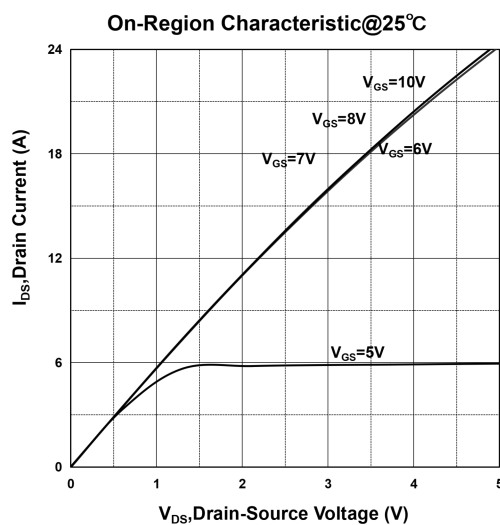
Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. ID = 10A, VDD = 50V, RG = 25Ω, Starting TJ = 25°C
3. Identical low side and high side switch with identical RG

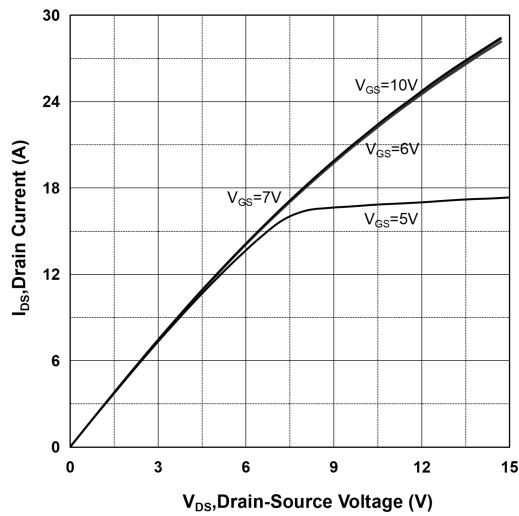
Order Information

Marking	Package
MS24N80HCE0	TO-263
MS24N80HCC0	TO-247

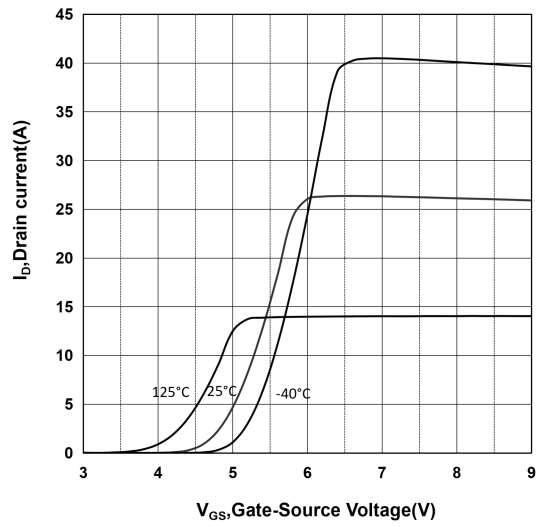
Electrical Characteristics



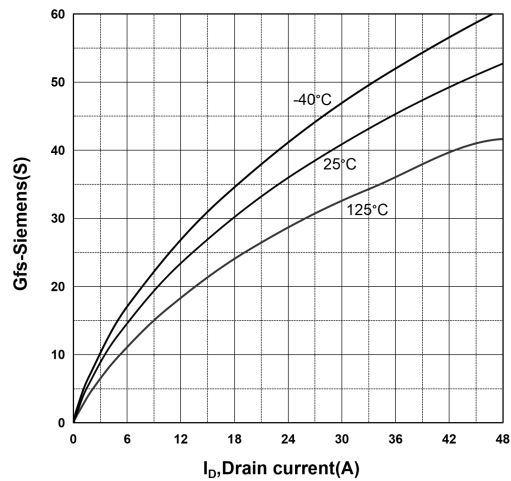
On-Region Characteristic@125°C



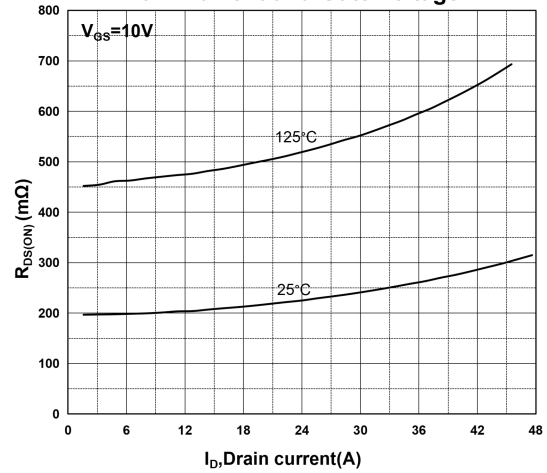
Transfer Characteristics



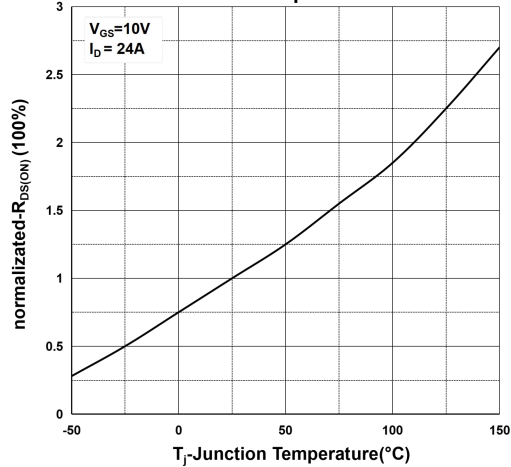
Transconductance



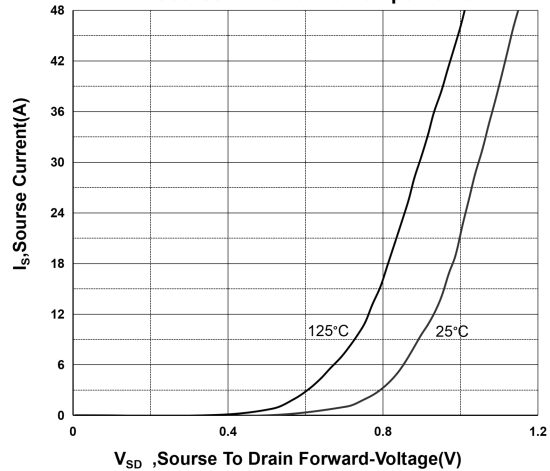
On-Resistance Variation vs Drain Current and Gate Voltage



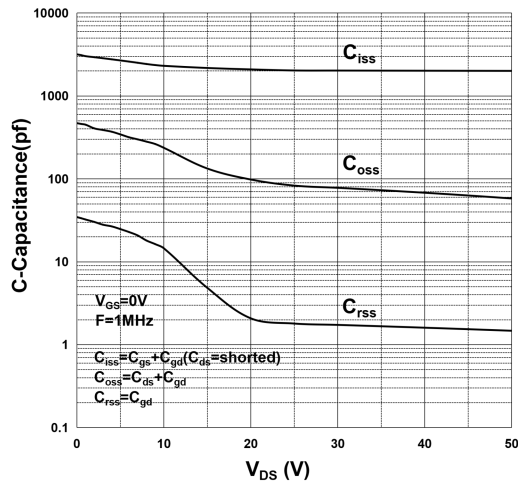
Normalized On-Resistance Variation vs Junction Temperature



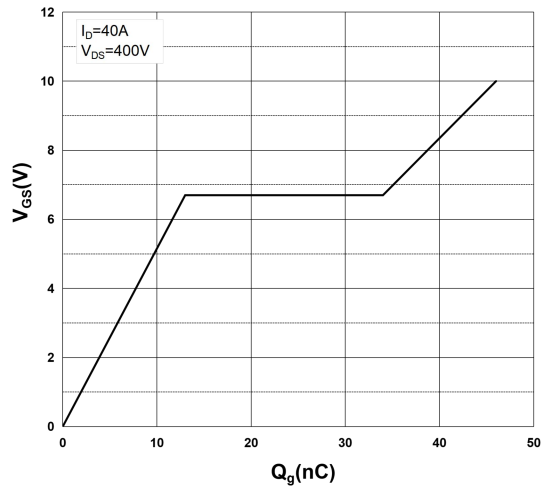
Body Diode Forward Voltage Variation with Source Current and Temperature



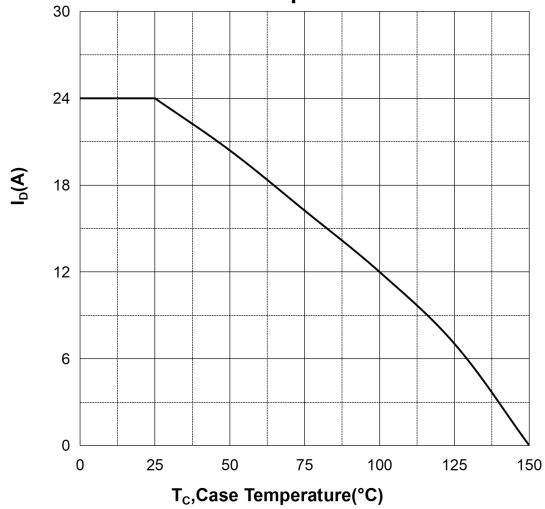
Capacitance



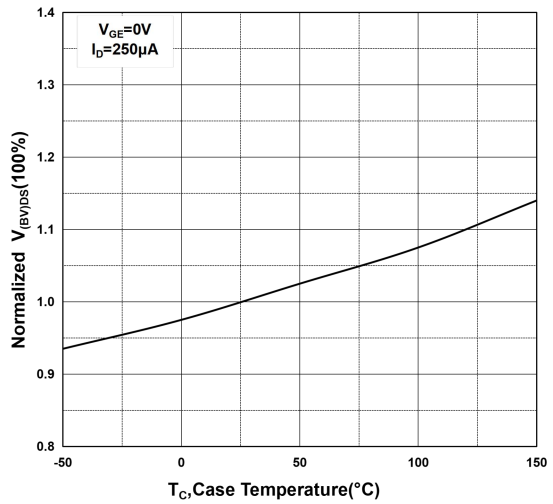
Gate Charge



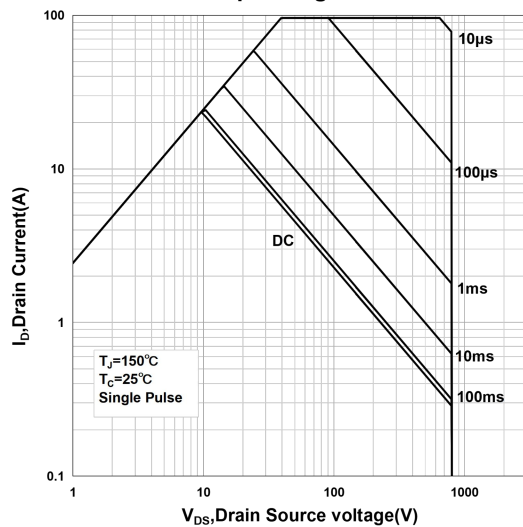
Maximum Drain Current vs Case Temperature



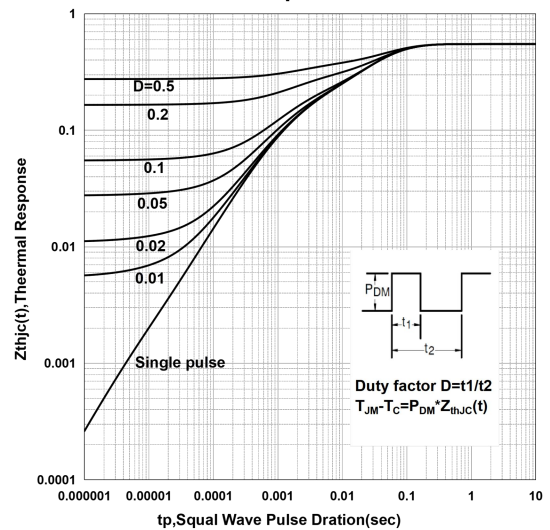
Normalized $V_{(BV)DS}$ vs temperature



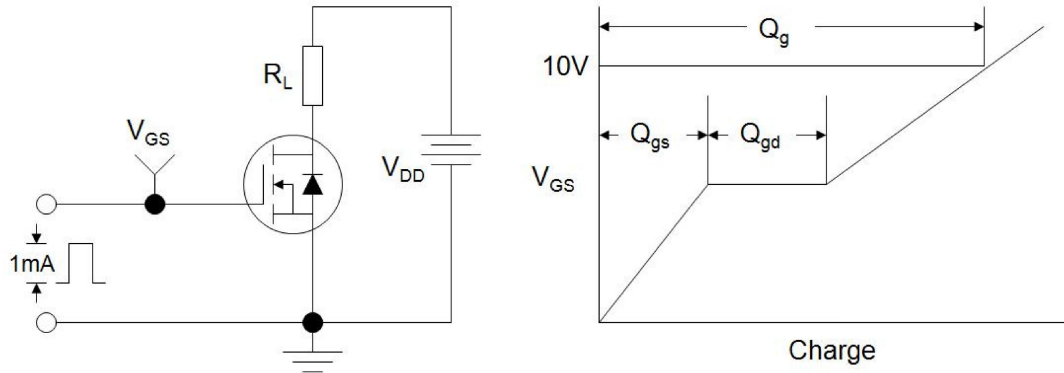
Safe Operating Area



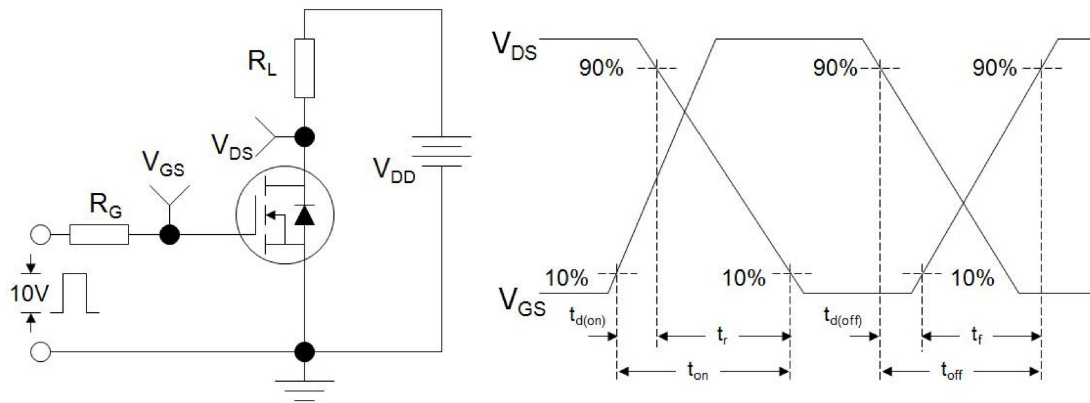
Transient response Curve



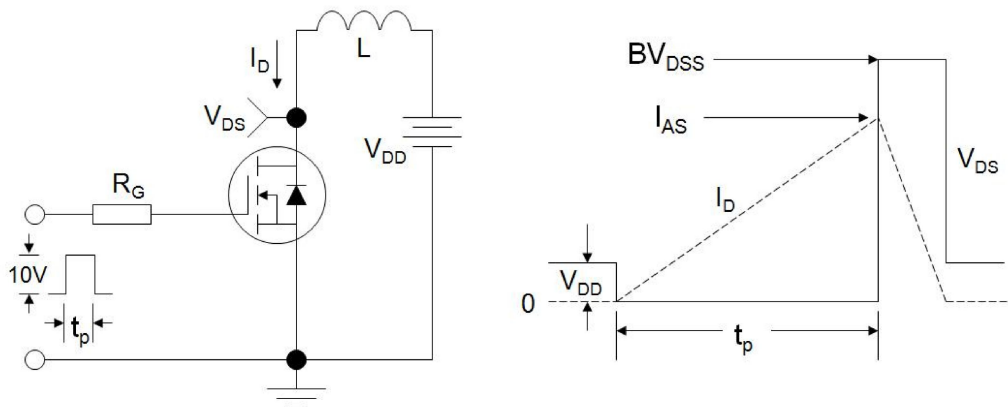
Gate Charge Test Circuit and Waveform



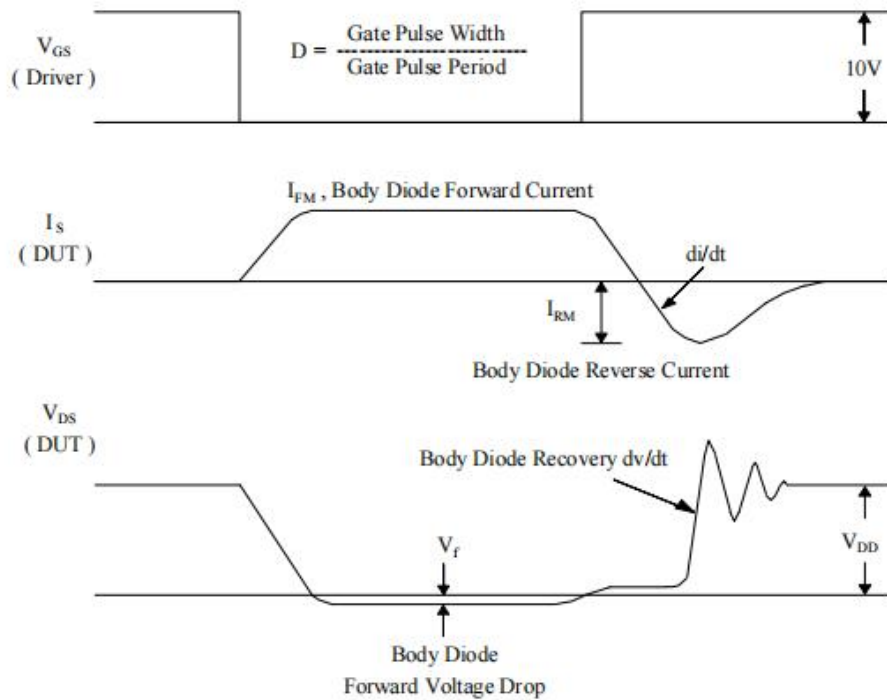
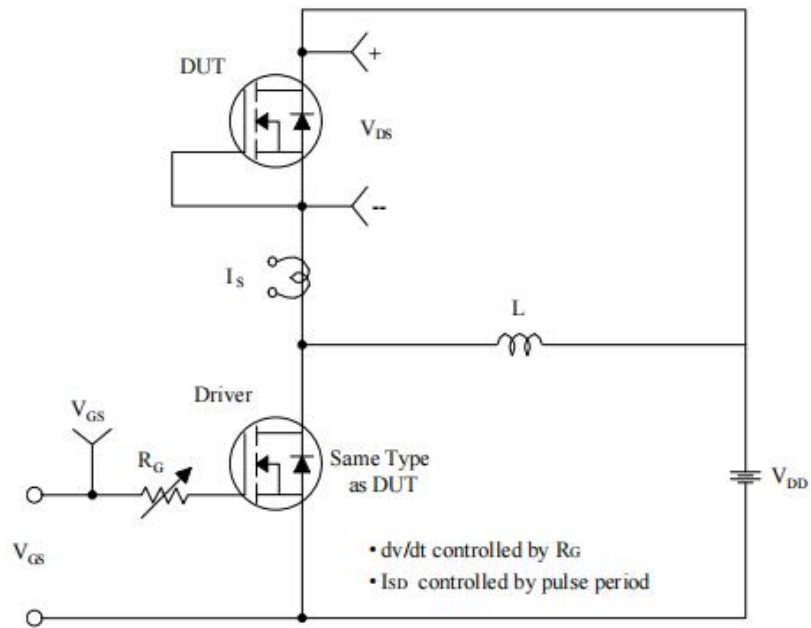
Resistive Switching Test Circuit and Waveform



Unclamped Inductive Switching Test Circuit and Waveform



Peak Diode Recovery dv/dt Test Circuit & Waveforms



Package Mechanical DATA

