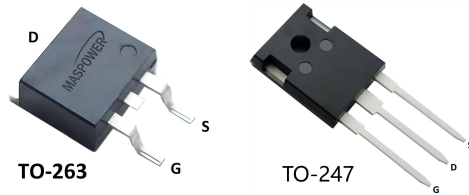


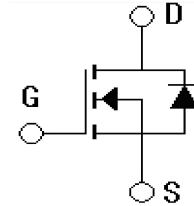
Features

- 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
Transient Gate-Source Voltage	V_{GSM}	± 30	V
Continuous Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current -continuous	I_D	24	A
Drain Current - pulse (note 1)	I_{DM}	96	A
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
		1.82	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($T_{CASE}=25^{\circ}C$ unless otherwise specified)

Parameter	Symbol	Tests conditions	Min	Type	Max	Units
Off-Characteristics						
Drain-Source Voltage	BV_{DSS}	$I_D=250\mu A, V_{GS}=0V$	800	-	-	V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_J$	$I_D=250\mu A$, referenced to $25^{\circ}C$	-	0.11	-	$V/^{\circ}C$
Drain cut-off current	I_{DSS}	$V_{DS}=800V, V_{GS}=0V$ $T_J=25^{\circ}C$	-	-	1	μA
		$T_J=150^{\circ}C$	-	-	100	
Gate-body leakage current, forward	I_{GSSF}	$V_{DS}=0V, V_{GS}=20V$	-	-	100	nA
Gate-body leakage current, reverse	I_{GSSR}	$V_{DS}=0V, V_{GS}=-20V$	-100	-	-	nA
On-Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.5	3.5	4.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=10A$ $T_J=25^{\circ}C$	-	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}	$V_{GS}=0V, I_F=1A$ (note 3)	-	0.7	1.2	V
Reverse recovery time	t_{rr}	$V_R=400V, I_F=12A$ $di_F/dt=130A/\mu s$	-	280	-	ns
Reverse recovery charge	Q_{rr}		-	4.8	-	μC
Peak reverse recovery current	I_{rrm}		-	24	-	A

Thermal Characteristics

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

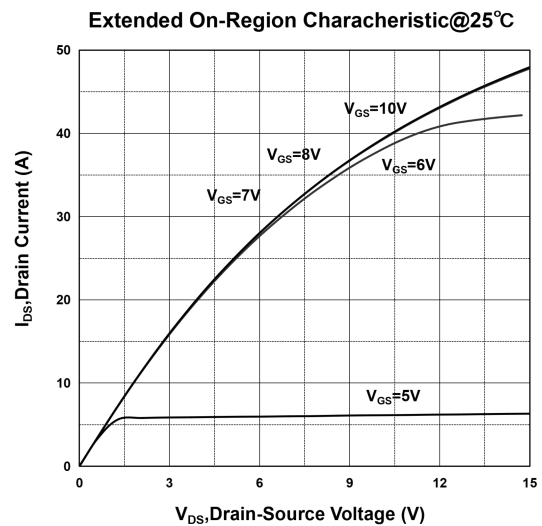
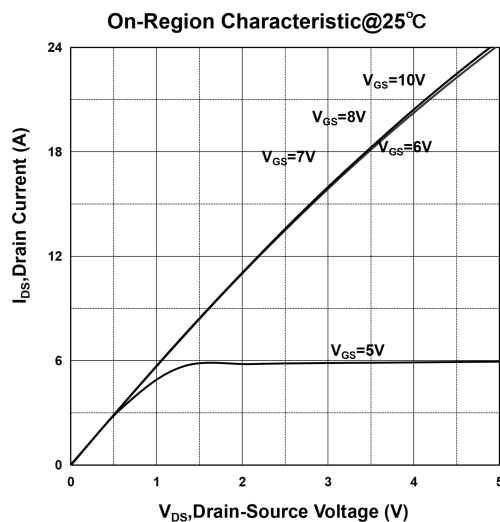
Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. $I_D = 10A$, $V_{DD} = 50V$, $R_G = 25\Omega$, Starting $T_J = 25^{\circ}C$
3. Identical low side and high side switch with identical R_G

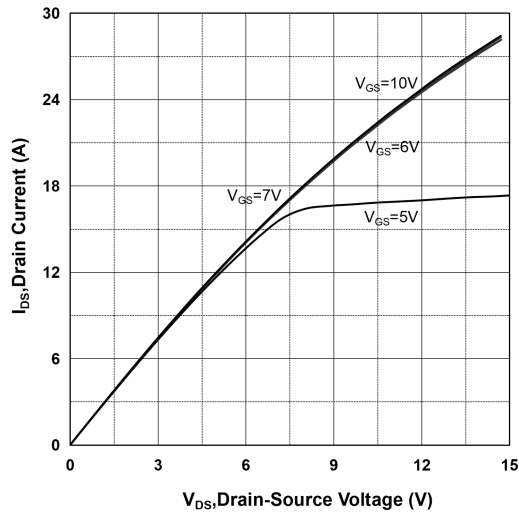
Order Information

Marking	Package
MS24N80HCE0	TO-263
MS24N80HCC0	TO-247

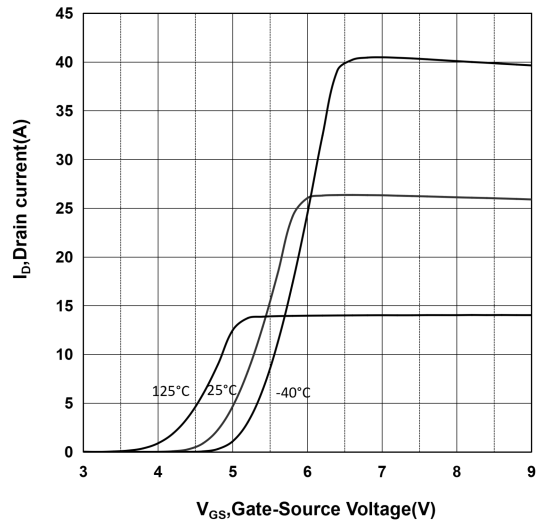
Electrical Characteristics



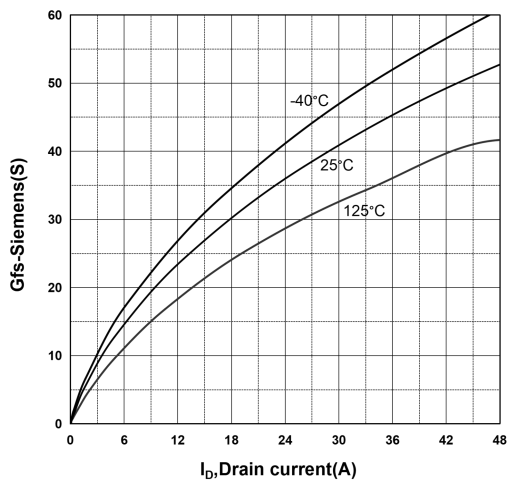
On-Region Characteristic@125°C



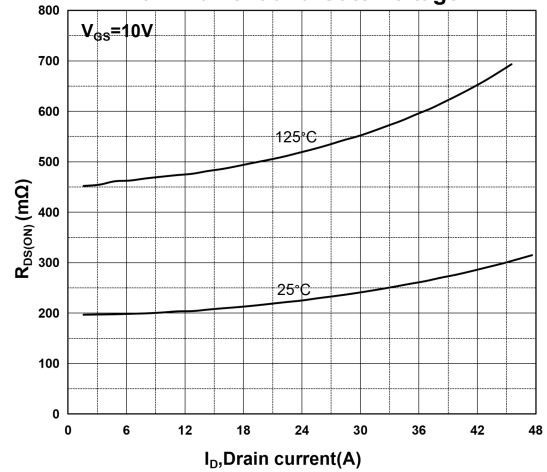
Transfer Characteristics



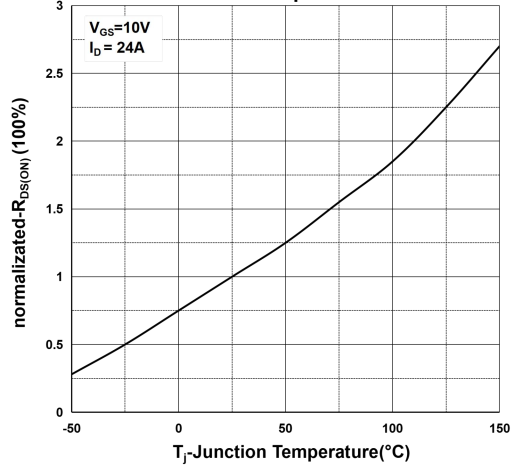
Transconductance



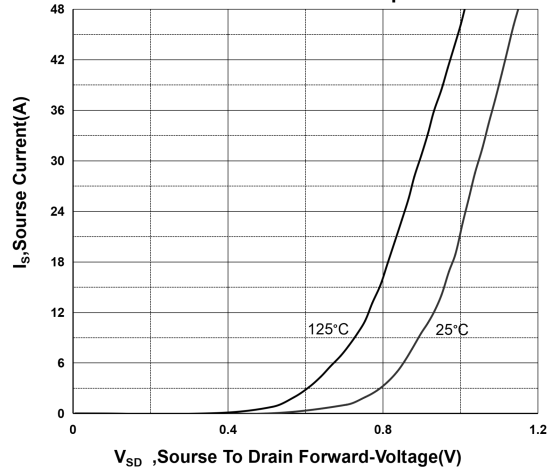
On-Resistance Variation vs Drain Current and Gate Voltage



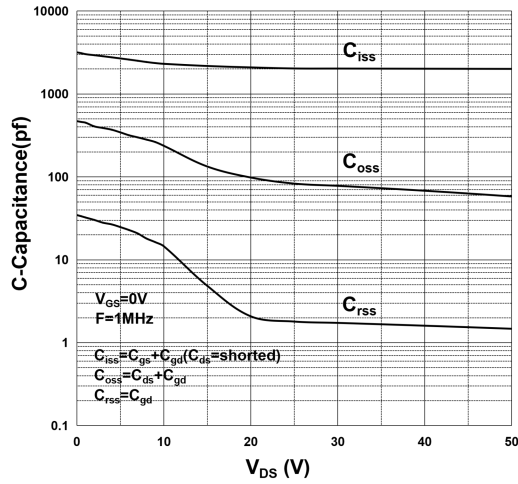
Normalized On-Resistance Variation vs Junction Temperature



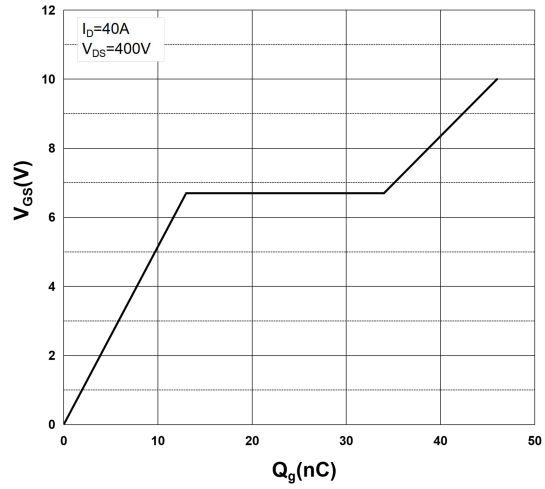
Body Diode Forward Voltage Variation with Source Current and Temperature



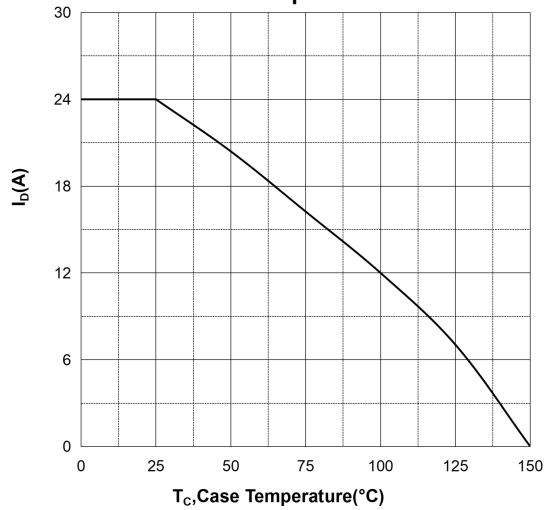
Capacitance



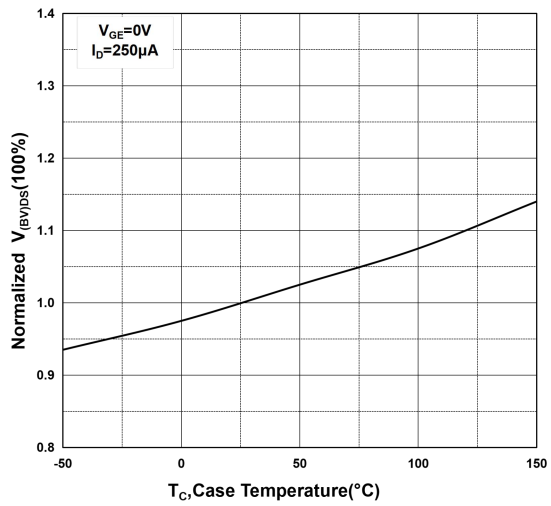
Gate Charge



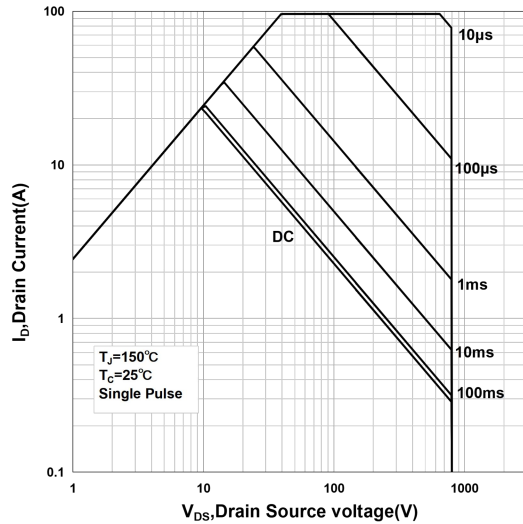
Maximum Drain Current vs Case Temperature



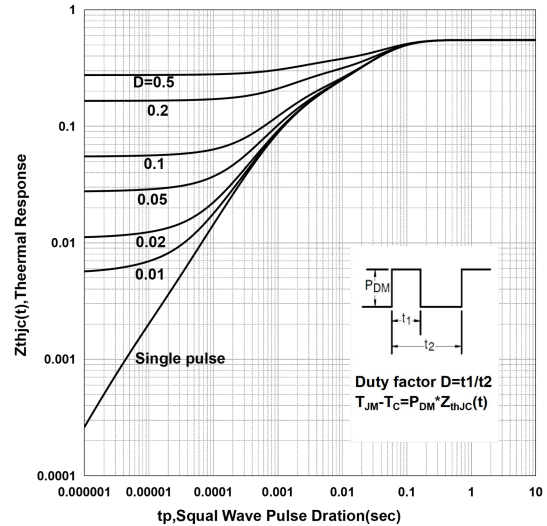
Normalized $V_{(BV)DS}$ vs temperature



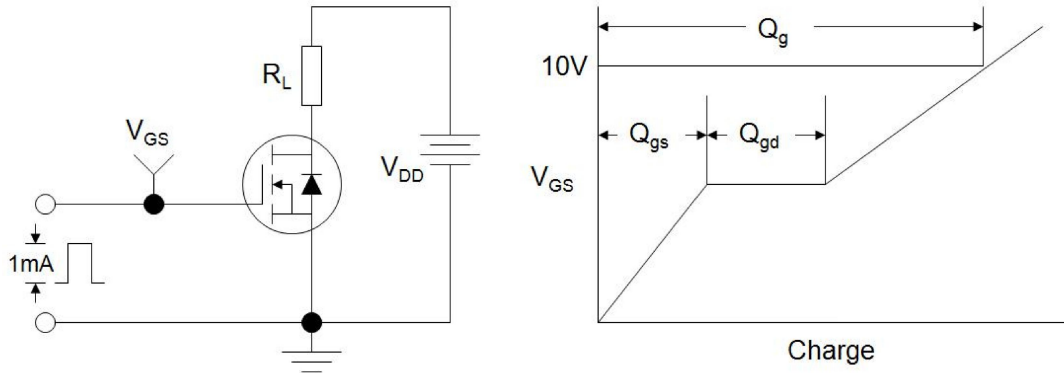
Safe Operating Area



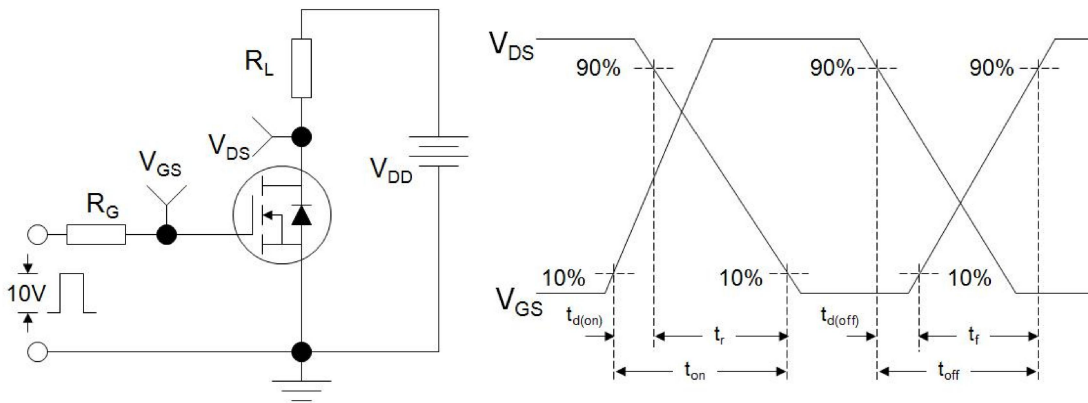
Transient response Curve



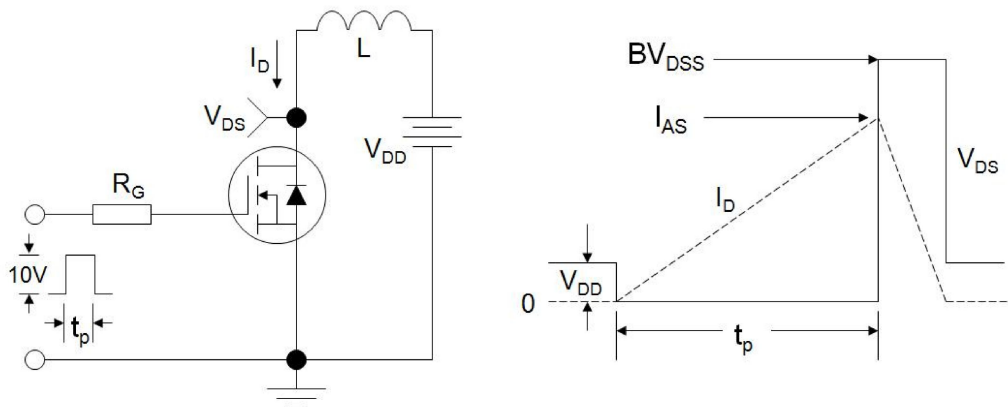
Gate Charge Test Circuit and Waveform



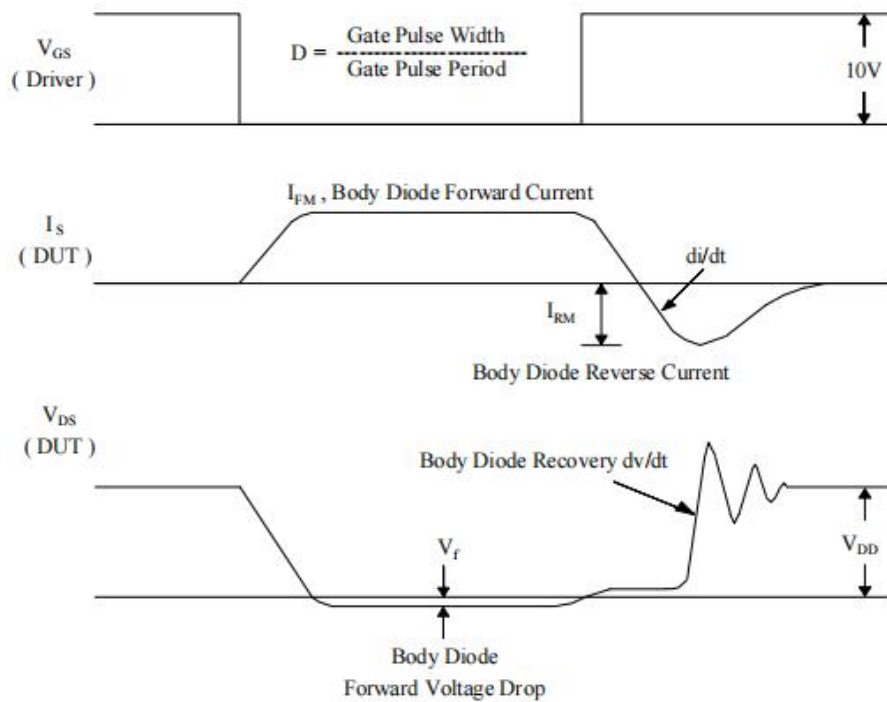
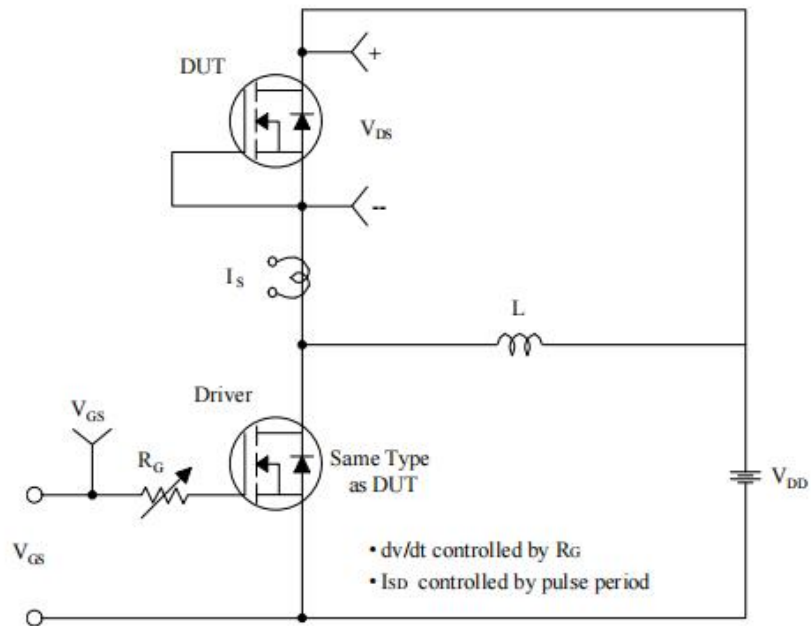
Resistive Switching Test Circuit and Waveform



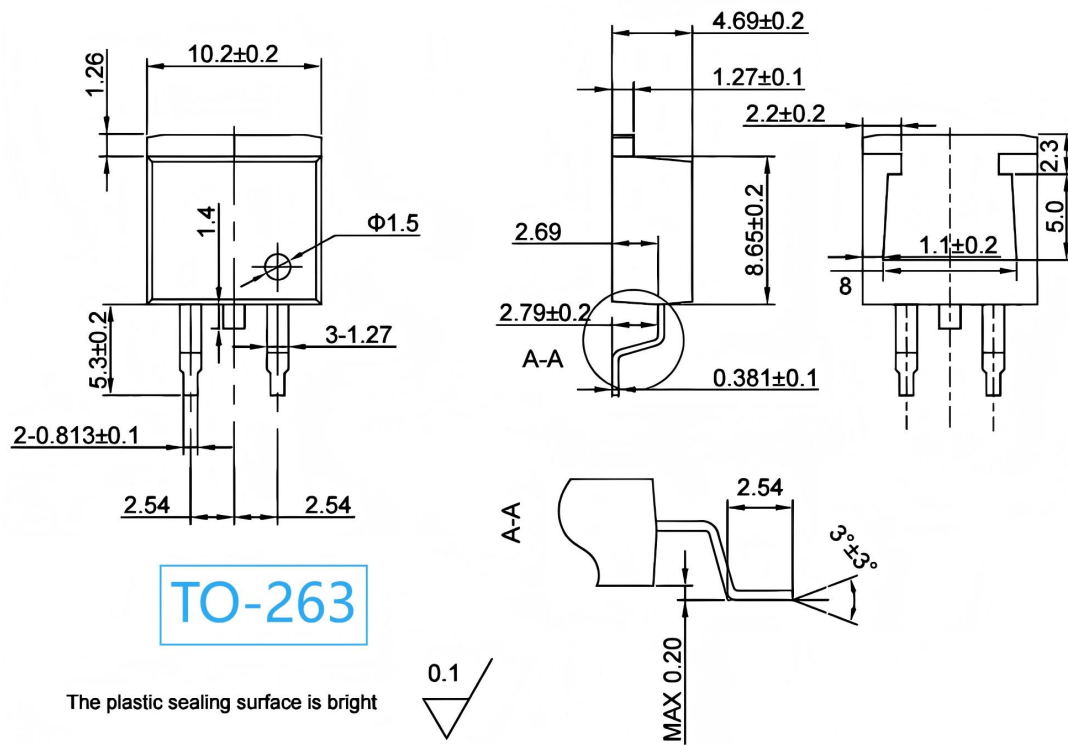
Unclamped Inductive Switching Test Circuit and Waveform



Peak Diode Recovery dv/dt Test Circuit & Waveforms



Package Mechanical DATA



Notes:

1. Unmarked tolerance ± 0.15 mm; unmarked $R < 0.15$ mm
2. The resin body is not allowed to have defects, shrinkage holes, cracks, bubbles and other harmful defects
3. The drawing indicates that the leg has reinforcement
4. Unit : mm

