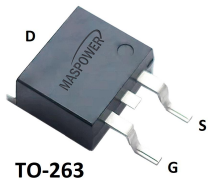
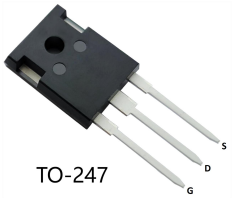
Features

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



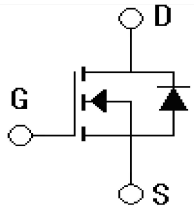
TO-263



TO-247

Applications

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



Absolute Ratings (Tc=25℃)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	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 TC=25℃	227	W
	-Derate above 25℃	1.82	W/℃
Operating and Storage Temperature Range	T_j,T_{STG}	-55~+150	℃
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	℃

*Drain current limited by maximum junction temperature

Electrical Characteristics(T_{CASE}=25℃ 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℃	-	0.11	-	V/℃
Drain cut-off current	I_{DSS}	V_{DS}=800V,V_{GS}=0V Tj=25℃	-	-	1	μA
		Tj=150℃	-	-	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=250uA	2.5	3.5	4.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V,I_D=10A Tj=25℃	-	0.205	0.24	Ω
Dynamic Characteristics						
Input capacitance	Ciss	V_{DS}=100V, V_{GS}=0V, f=10kHz	-	2030	-	pF
Output capacitance	Coss		-	83	-	pF
Reverse transfer capacitance	Crss		-	1.8	-	pF
Forward transconductance	gfs	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	trr	V_R=400V,I_F=12A dI_F/dt=130A/us	-	280	-	ns
Reverse recovery charge	Qrr		-	4.8	-	uC
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		℃/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5		℃/W

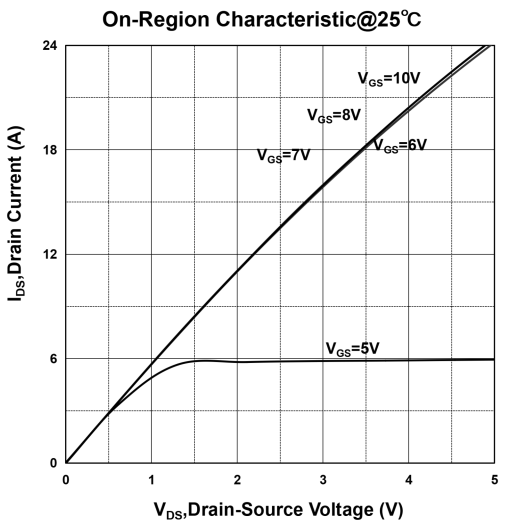
Notes:

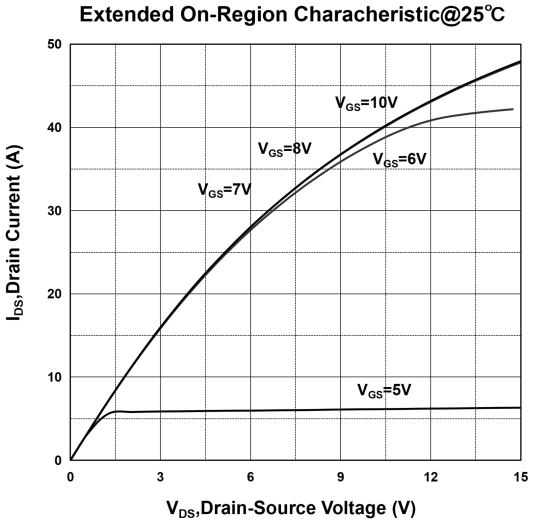
1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. I_D = 10A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C
3. Identical low side and high side switch with identical R_G

Order Information

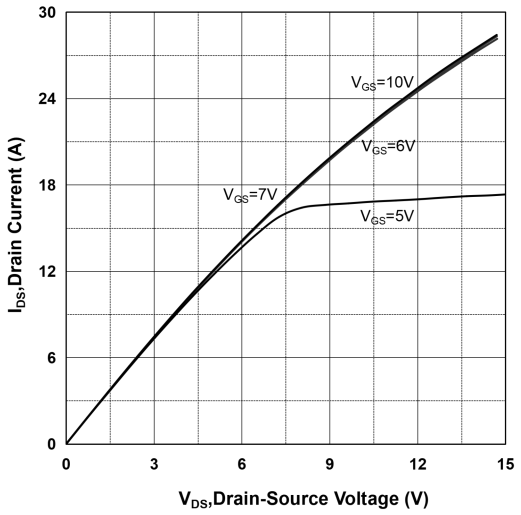
Marking	Package
MS24N80HCE0	TO-263
MS24N80HCC0	TO-247

Electrical Characteristics

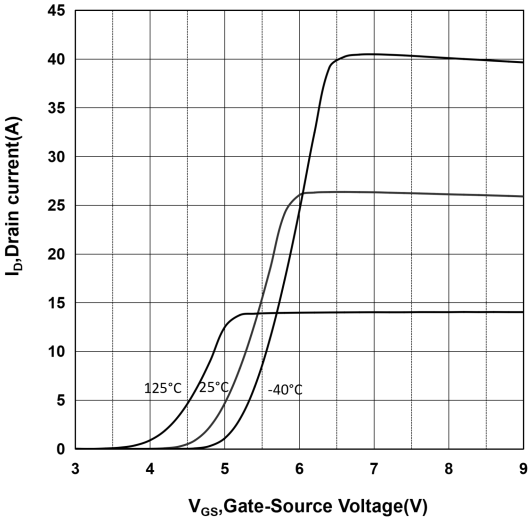




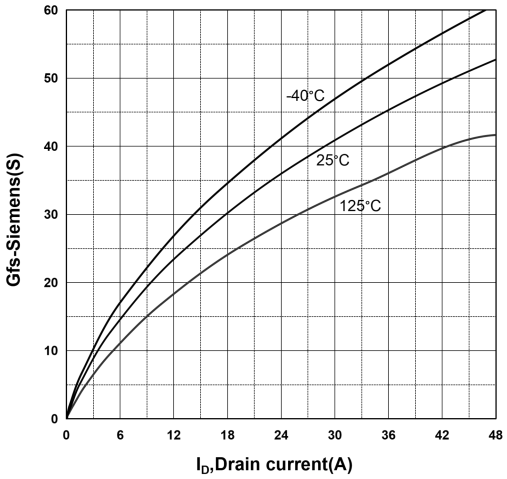
On-Region Characteristic@125℃



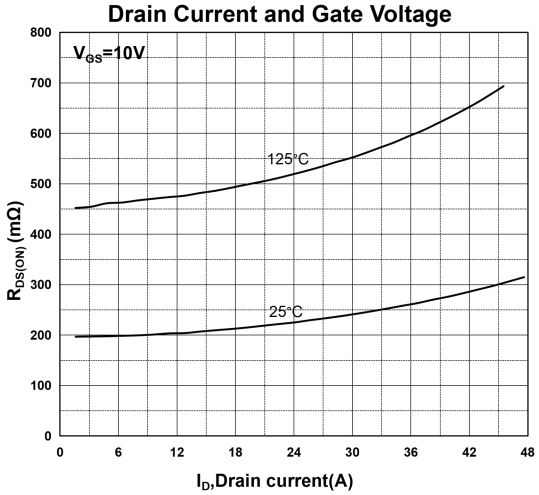
Transfer Characteristics



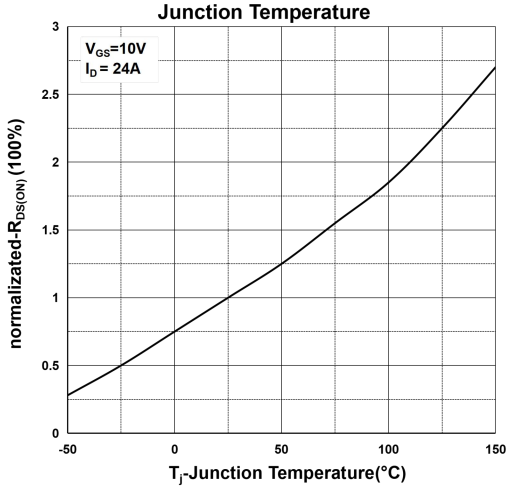
Transconductance



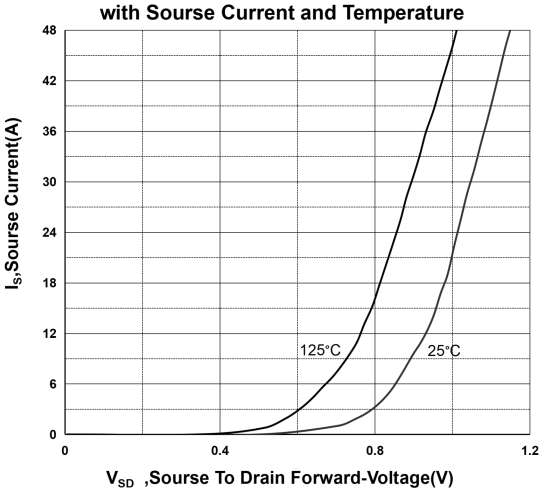
On-Resistance Variation vs Drain Current and Gate Voltage



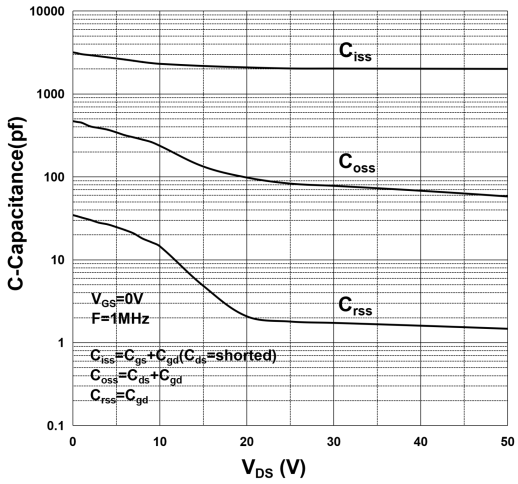
Normalizated On-Resistance Variation vs Junction Temperature



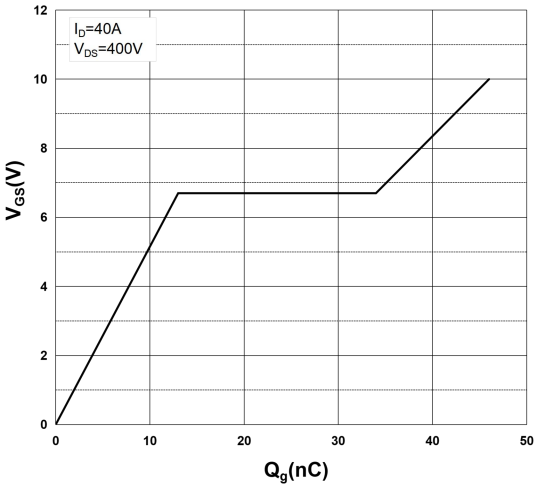
Body Diode Forward Voltage Variation with Sourse Current and Temperature



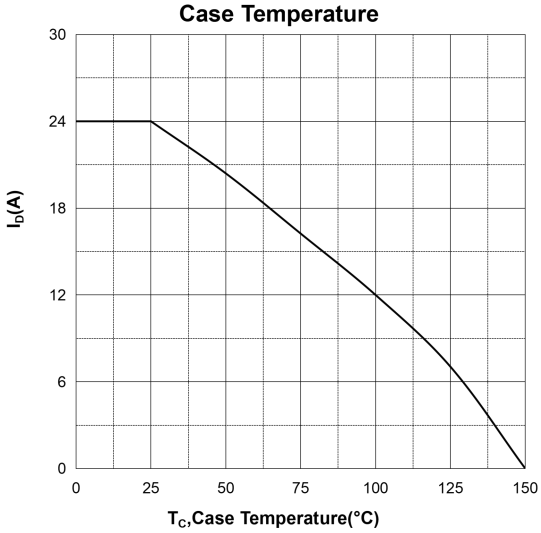
Capacitance



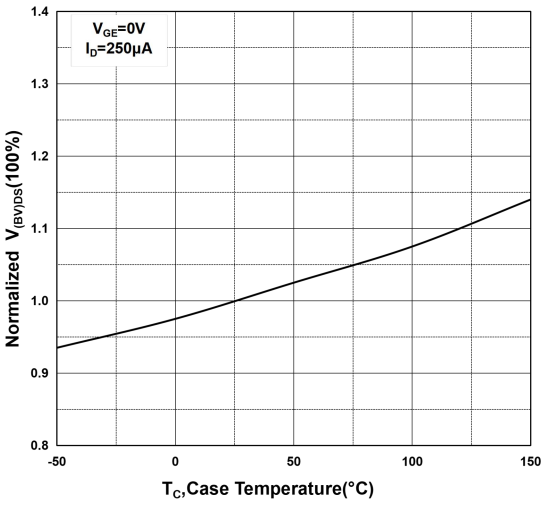
Gate Charge



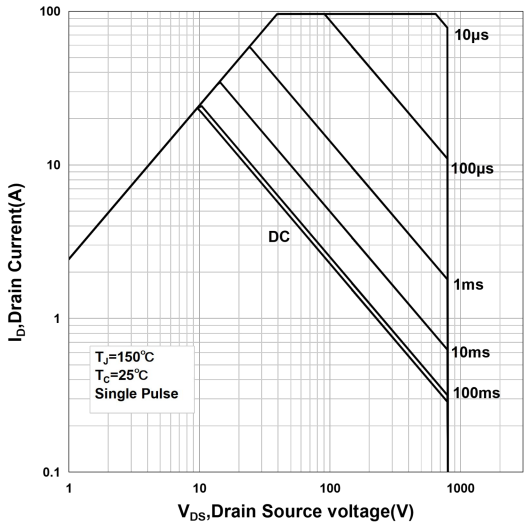
Maximum Drain Current vs Case Temperature



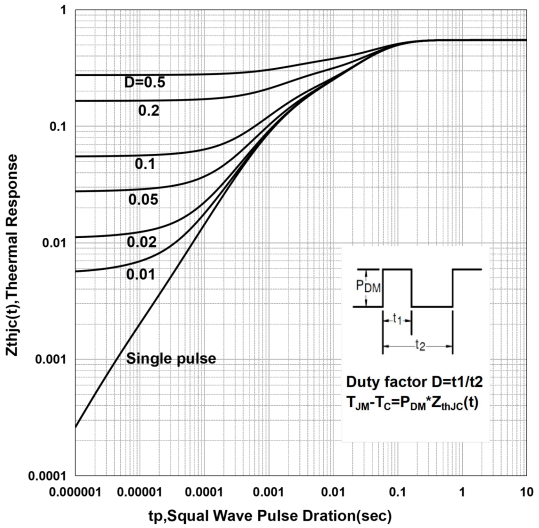
Normalized $V_{(BV)DS}$ vs temperature



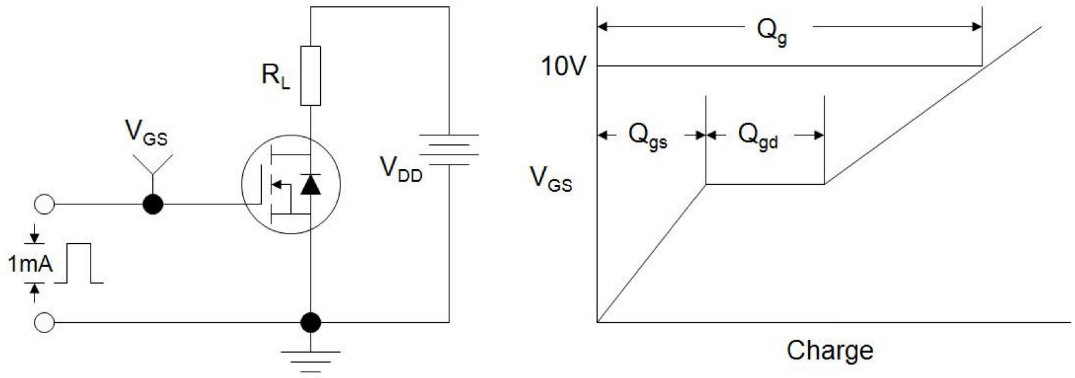
Safe Operating Area



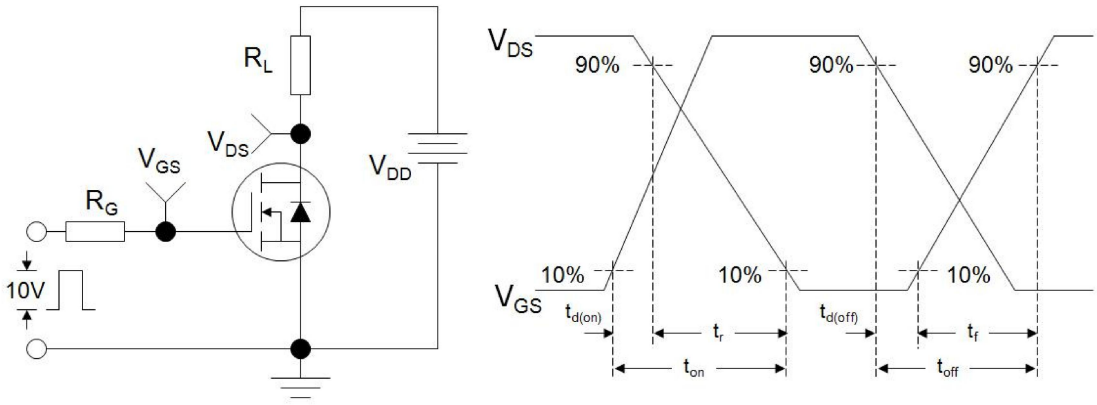
Transient response Curve



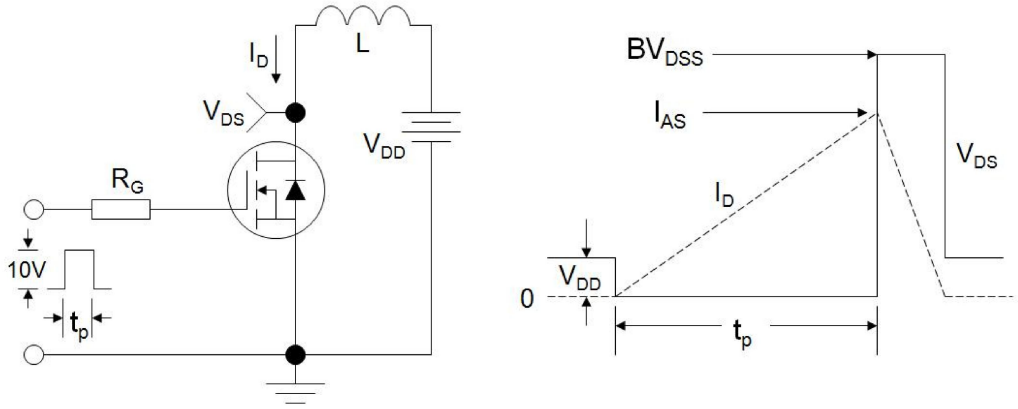
Gate Charge Test Circuit and Waveform



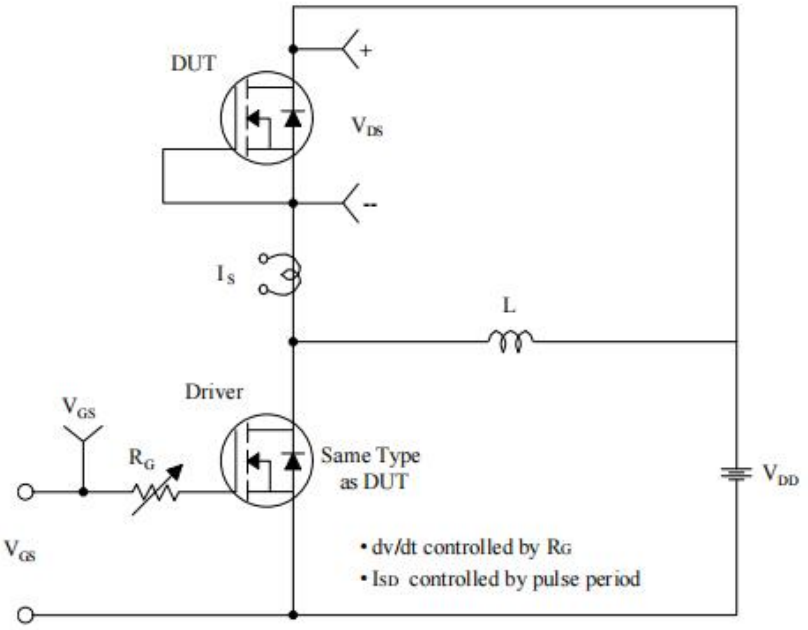
Resistive Switching Test Circuit and Waveform

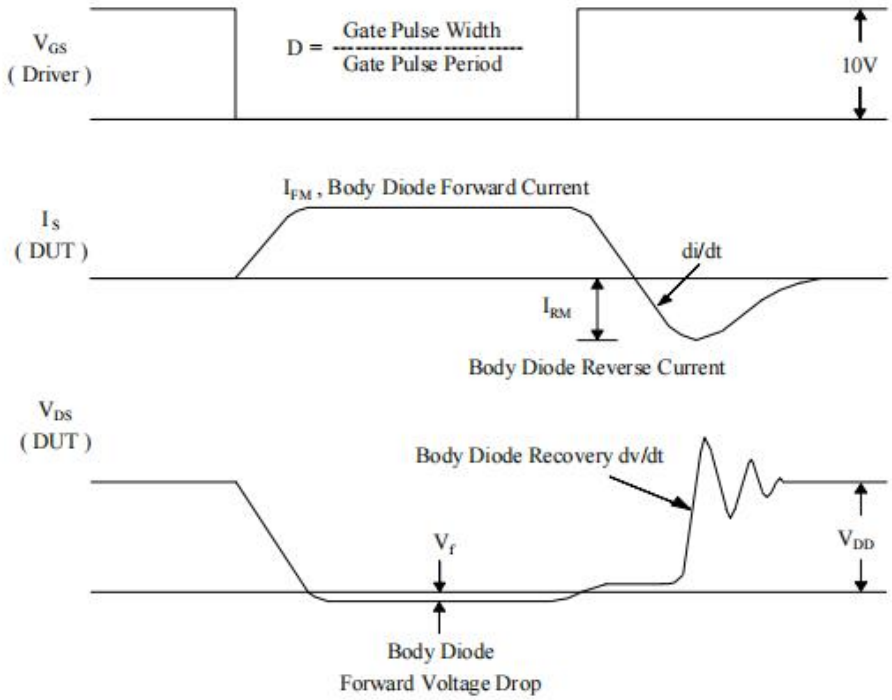


Unclamped Inductive Switching Test Circuit and Waveform

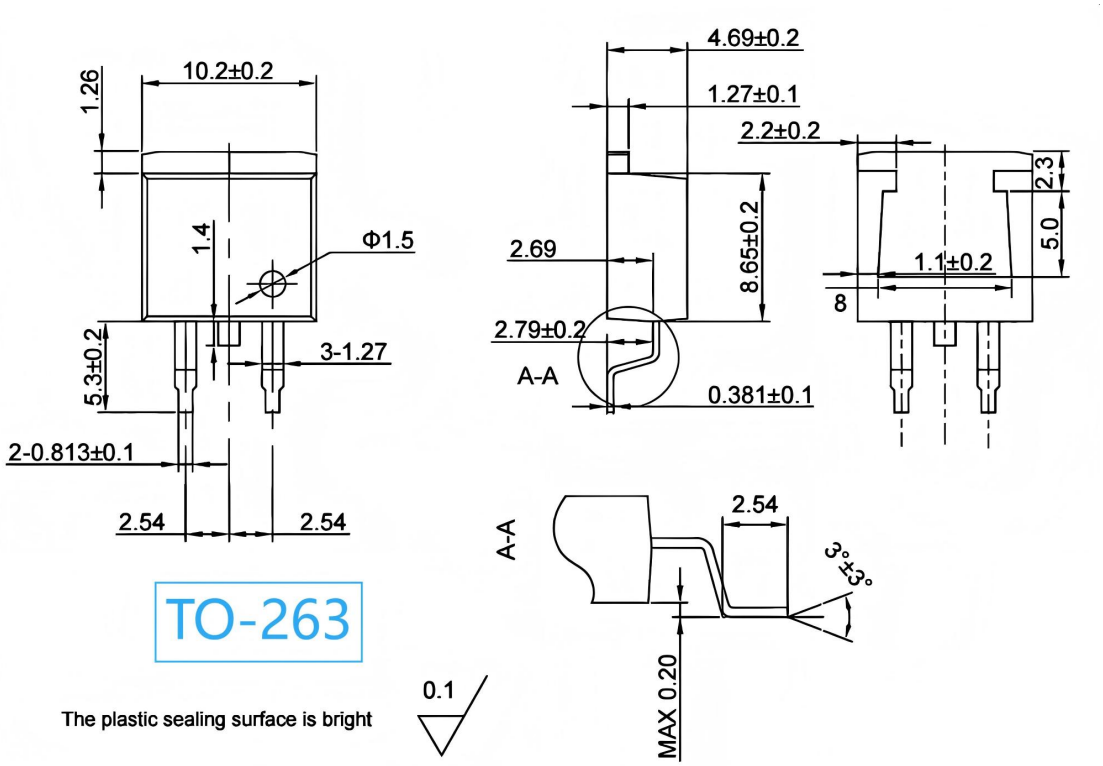


Peak Diode Recovery dv/dt Test Circuit & Waveforms



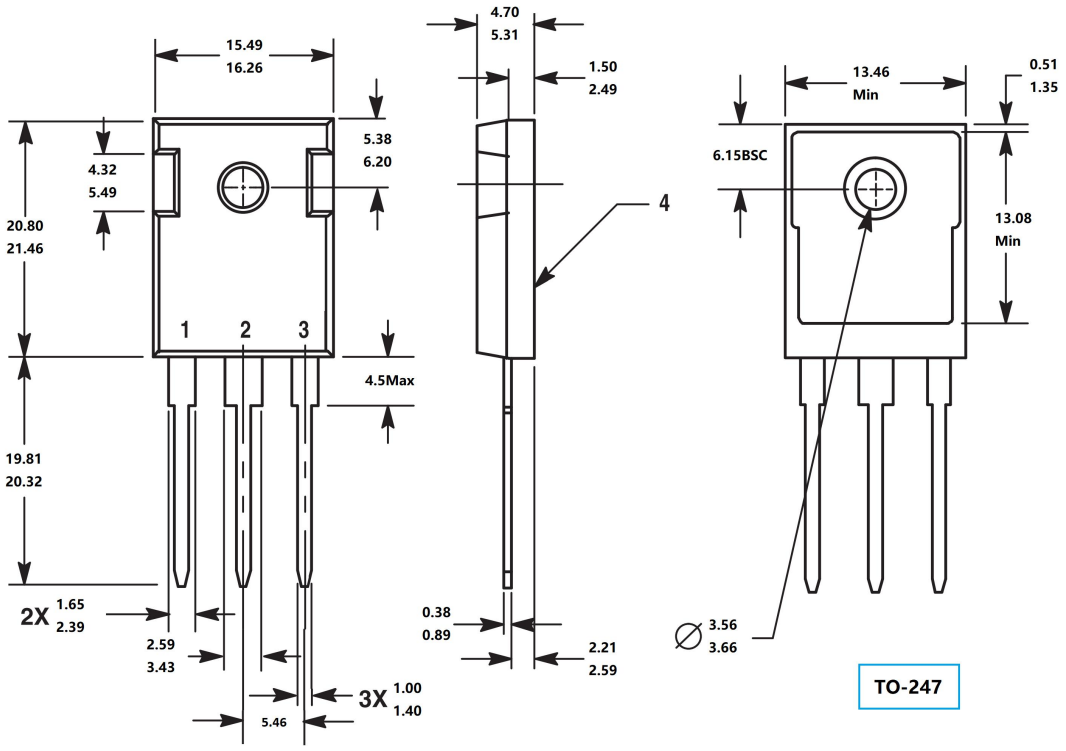


Package Mechanical DATA



Notes:

1. Unmarked tolerance±0.15mm;unmarked R<0.15mm
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


15.49
16.26
5.38
6.20
4.32
5.49
20.80
21.46
1
2
3
4.5Max
19.81
20.32
2X 1.65
2.39
2.59
3.43
3X 1.00
1.40
5.46
4.70
5.31
1.50
2.49
4
0.38
0.89
2.21
2.59
13.46
Min
0.51
1.35
6.15BSC
13.08
Min
3.56
3.66
TO-247

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