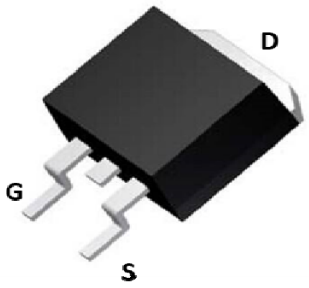
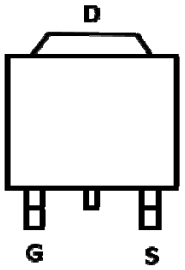
N-Channel Enhancement Mode Field Effect Transistor





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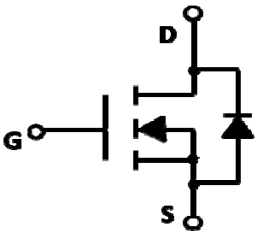


Product Summary

- V_{DS} 60V
- I_D 150A
- $R_{DS(ON)}$(at V_{GS}= 10V) ＜5.5mohm
- 100% UIS Tested
- 100% ▽V_{DS} Tested

General Description

- Trench Power MV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Part no. with suffix “Q” means AEC-Q101 qualified

Applications

- DC-DC Converters
- Power management functions
- Industrial and Motor Drive applications

■ Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	60	V
Gate-source Voltage		V_{GS}	±20	V
Drain Current	T_C=25℃	I_D	150	A
	T_C=100℃		105	
Pulsed Drain Current [A]		I_{DM}	500	A
Total Power Dissipation	T_C=25℃	P_D	225	W
	T_C=100℃		112	W
Single Pulse Avalanche Energy		E_{AS}	550	mJ
Thermal Resistance Junction-to-Case [B]		$R_{\theta JC}$	0.67	℃/ W
Junction and Storage Temperature Range		T_J ,T_{STG}	-55～+175	℃

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJB150N06BQ	F2	YJB150N06BQ	800	/	8000	13“ reel

■ Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameter		Symbol	Conditions	Min	Typ	Max	Units
Static Parameter							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS}= 0V, I_D=250μA	60			V
Zero Gate Voltage Drain Current	T_J=25℃	I_{DSS}	V_{DS}=60V,V_{GS}=0V			1	μA
	T_J=55℃					5	uA
Gate-Body Leakage Current		I_{GSS}	V_{GS}= ±20V, V_{DS}=0V			±100	nA
Gate Threshold Voltage		$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	2.0	3.0	4.0	V
Static Drain-Source On-Resistance		$R_{DS(ON)}$	V_{GS}= 10V, I_D=75A		4.6	5.5	mΩ
Diode Forward Voltage		V_{SD}	I_S=40A,V_{GS}=0V		0.8	1.2	V
Maximum Body-Diode Continuous Current		I_S				150	A
Dynamic Parameters							
Input Capacitance		C_{iss}	V_{DS}=30V,V_{GS}=0V,f=1MHZ		3135		pF
Output Capacitance		C_{oss}			521		
Reverse Transfer Capacitance		C_{rss}			306		
Switching Parameters							
Total Gate Charge		Q_g	V_{GS}=10V,V_{DS}=30V,I_D=55A		77		nC
Gate-Source Charge		Q_{gs}			18		
Gate-Drain Charge		Q_{gd}			30		
Reverse Recovery Charge		Q_{rr}	I_F=55A, di/dt=100A/us		31		
Reverse Recovery Time		t_{rr}			32		ns
Turn-on Delay Time		$t_{D(on)}$	V_{GS}=10V,V_{DD}=30V, R_{GEN}=3Ω		15		
Turn-on Rise Time		t_r			89		
Turn-off Delay Time		$t_{D(off)}$			36		
Turn-off fall Time		t_f			91		

A. Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.

B. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design, while $R_{\theta JA}$ is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper.

■ Typical Performance Characteristics

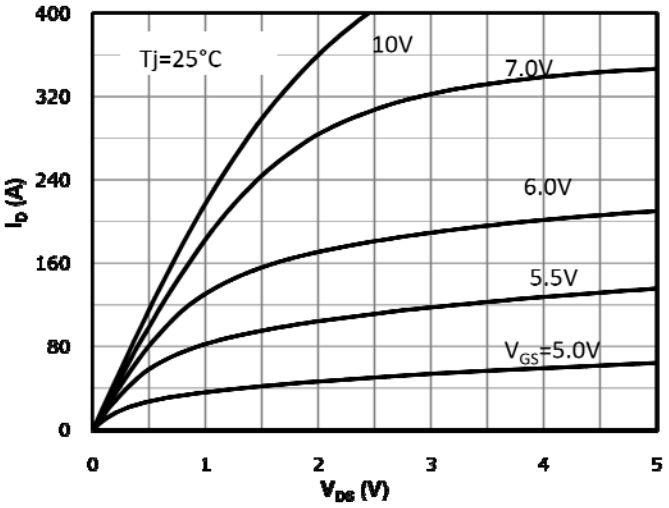


Figure 1. Output Characteristics

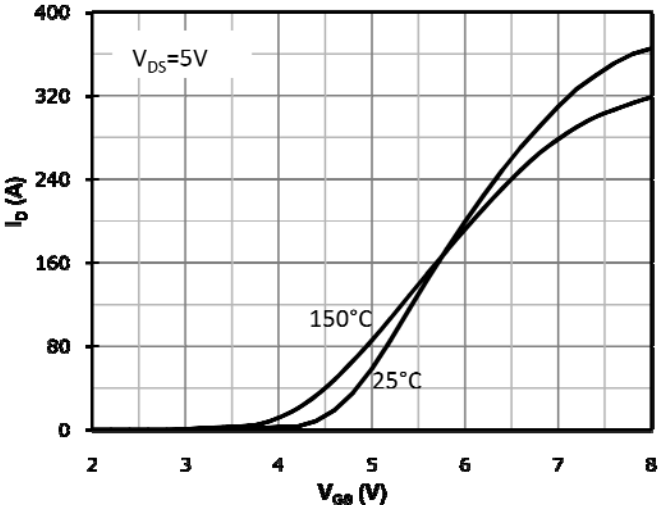


Figure 2. Transfer Characteristics

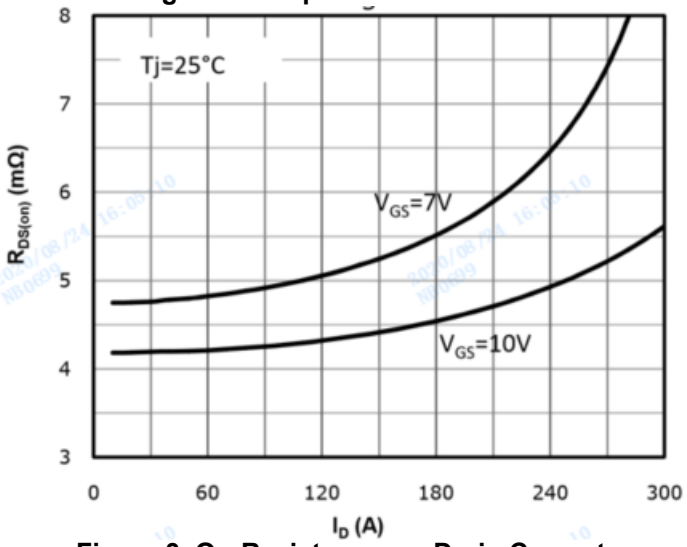


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

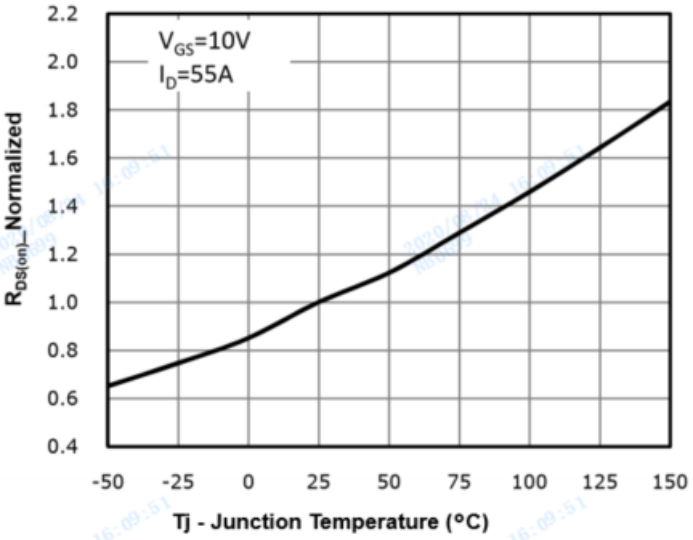


Figure 4. On-Resistance vs. Junction Temperature

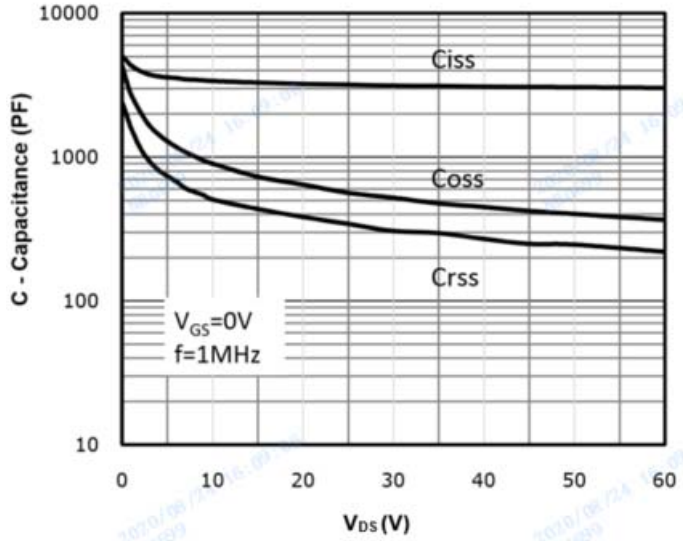


Figure 5. Capacitance Characteristics

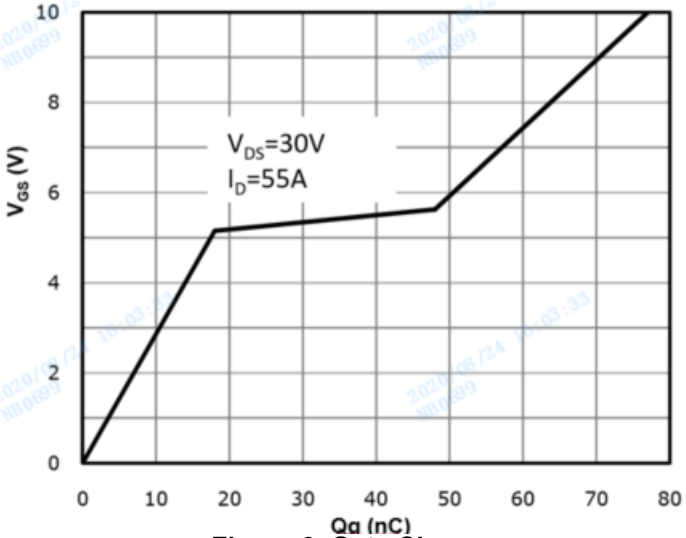


Figure 6. Gate Charge

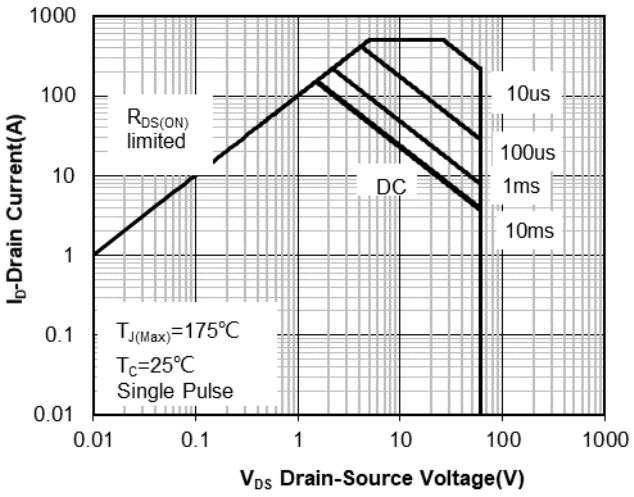


Figure 7. Safe Operation Area

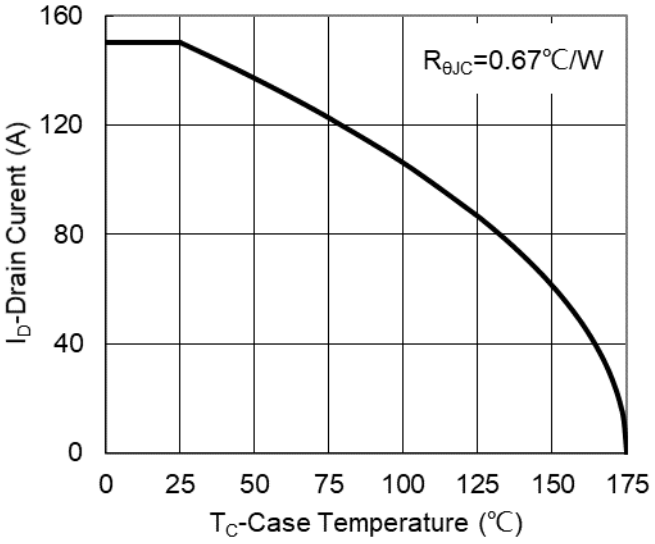


Figure 8. Maximum Continuous Drain Current vs Case Temperature

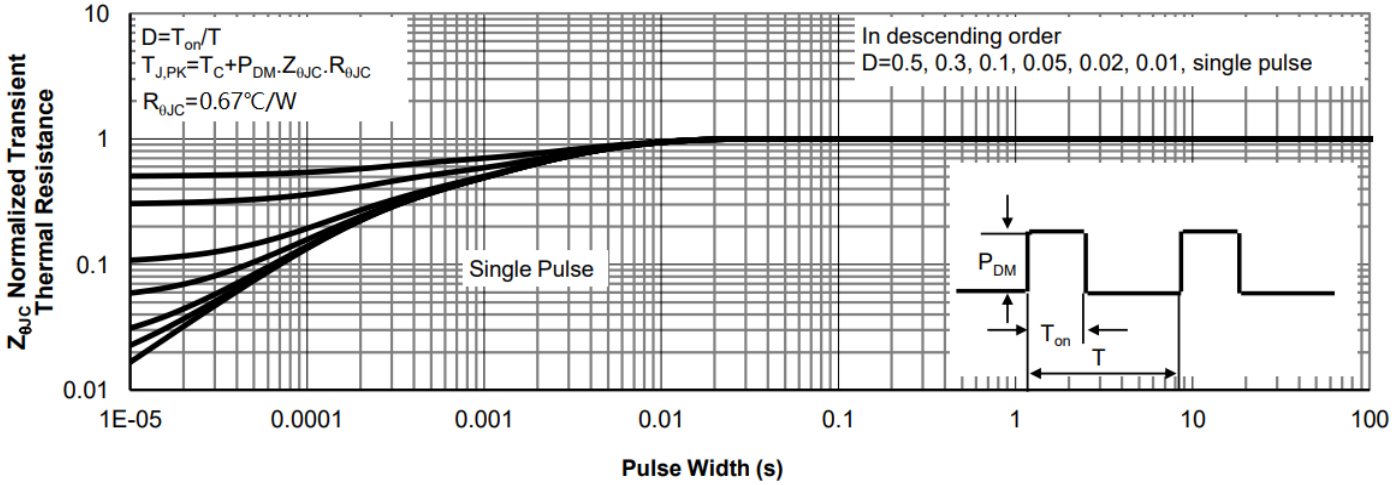
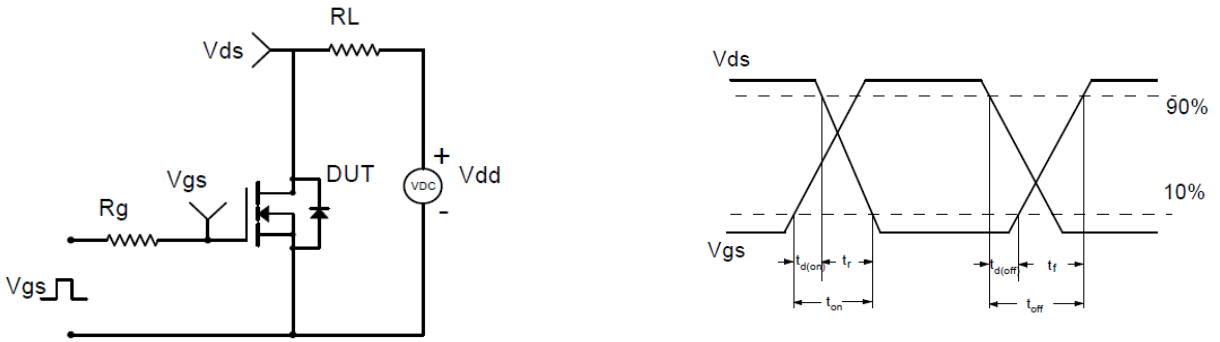
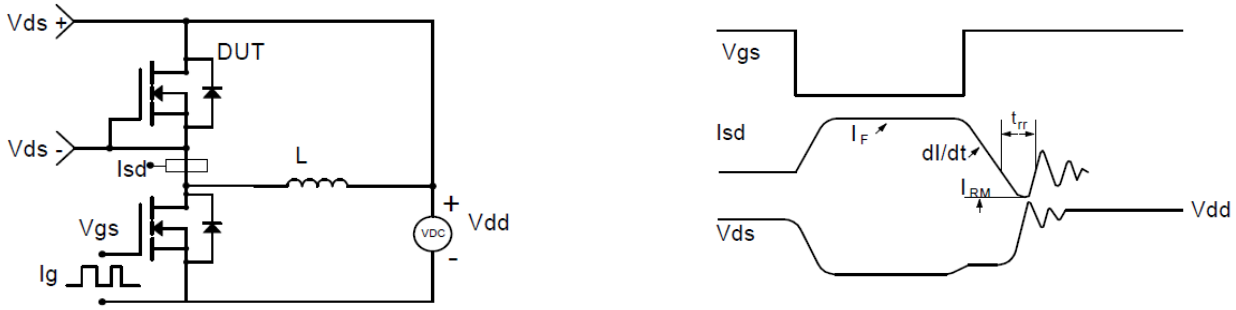


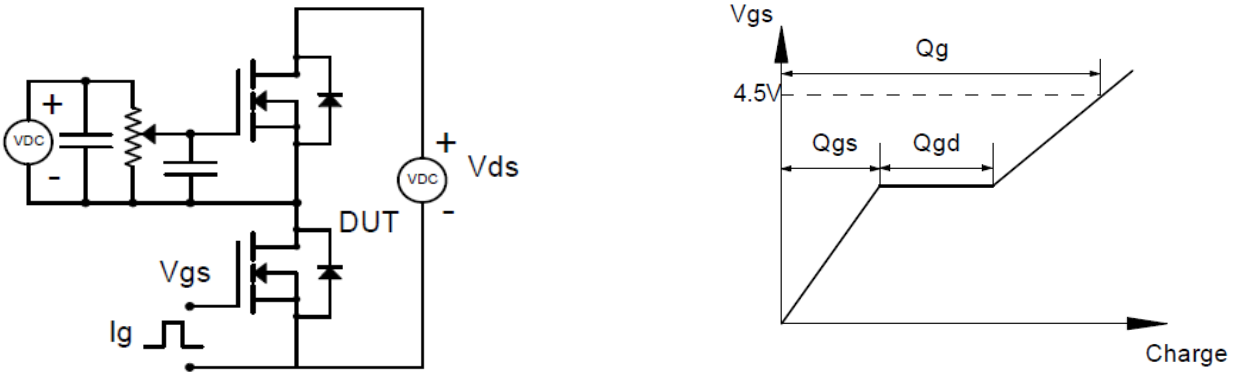
Figure 9. Normalized Maximum Transient Thermal Impedance



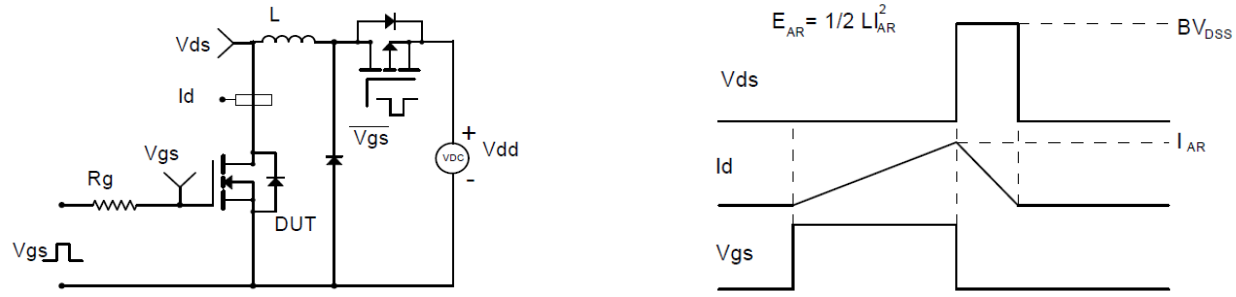
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

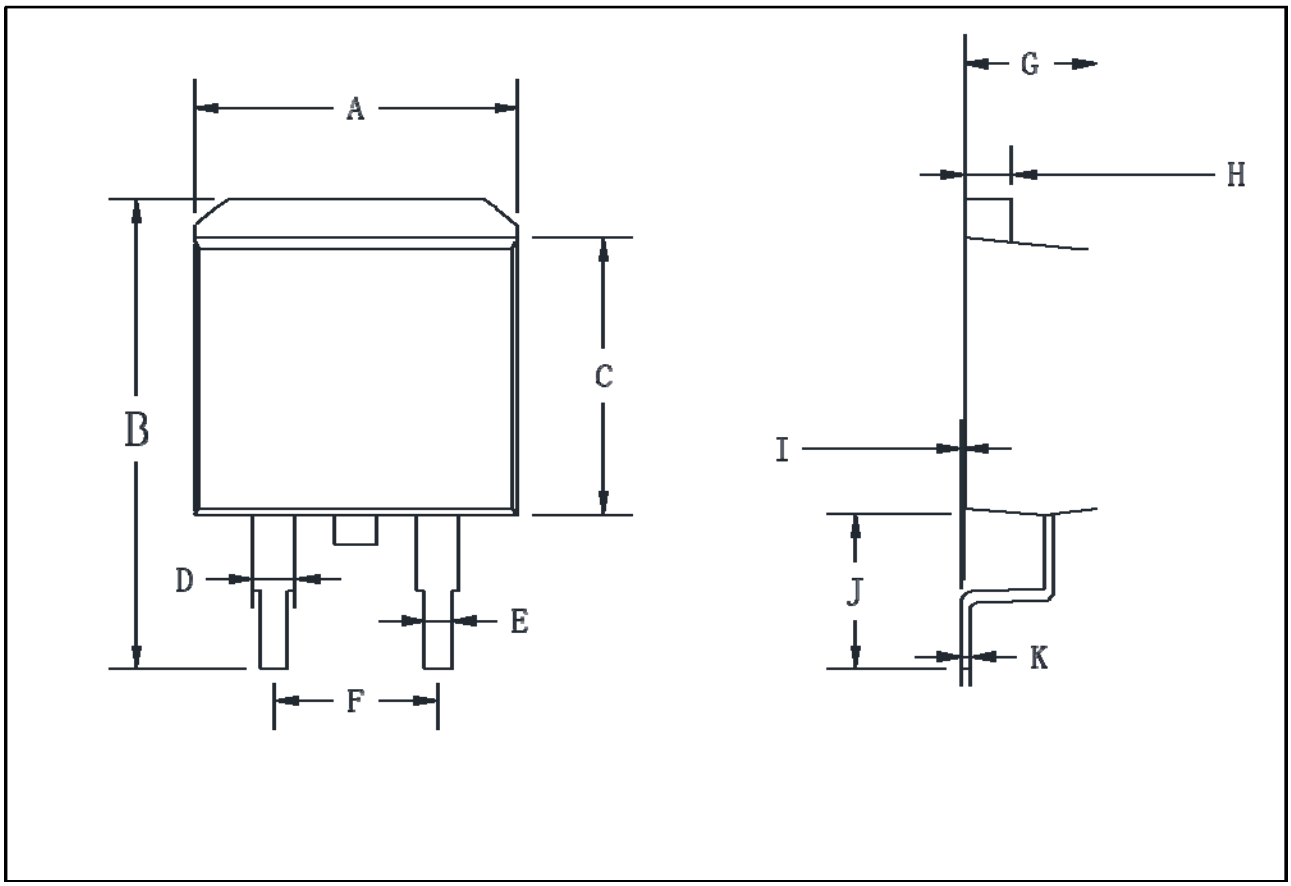


Gate Charge Test Circuit & Waveform



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

■ TO-263 Package information



A	B	C	D	E	F
10.15±0.05	15.0±0.1	8.7±0.05	1.28±0.03	0.82±0.03	5.06±0.03
G	H	I	J	K	
4.58±0.05	1.27±0.03	0-0.2	5.0±0.10	0.38±0.03	

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