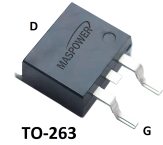


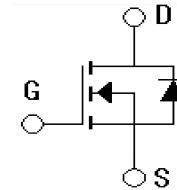
Features

- Low gate charge
- Low Crss (Typical 82pF)
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- RoHS product



Applications

- High efficiency switch mode power supplies
- Electronic lamp ballasts based on half bridge
- UPS



Absolute Ratings (Tc=25°C)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	250	V
Drain Current -continuous	$I_D, T=25^\circ\text{C}$	40	A
	$T=100^\circ\text{C}$	25	A
Drain Current - pulse (note1)	I_{DM}	160	A
Gate-Source Voltage	V_{GSS}	± 30	V
Single Pulsed Avalanche Energy (note 2)	E_{AS}	880	mJ
Power Dissipation	PD	158	W
	TC=25°C	1.265	W/°C
Operating and Storage Temperature Range	T_j, T_{STG}	-55~+150	°C
Maximum Lead Temperature for Soldering Purposes	T_L	300	°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}	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$	250	-	-	V
Drain cut-off current	I_{DSS}	$V_{DS}=250\text{V}, V_{GS}=0\text{V}$ $T_j=25^\circ\text{C}$	-	-	1	μA
		$V_{DS}=200\text{V}, T_j=125^\circ\text{C}$	-	-	10	
Gate-body leakage current, forward	I_{GSSF}	$V_{DS}=0\text{V}, V_{GS}=30\text{V}$	-	-	100	nA
Gate-body leakage	I_{GSSR}	$V_{DS}=0\text{V}, V_{GS}=-30\text{V}$	-	-	-100	nA

current,reverse						
On-Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	3.0	4.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=1A$	-	-	94	m Ω
Forward Transconductance	g_{fs}	$V_{DS}=40V, I_D=20A$ (note4)	-	27	-	S
Dynamic Characteristics						
Input capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, f=1.0MHz$ (Note 4)	-	3300	4000	pF
Output capacitance	C_{oss}		-	650	800	pF
Reverse transfer capacitance	C_{rss}		-	82	105	pF
Switching Characteristics						
Turn-On delay time	$t_{d(on)}$	$V_{DD}=125V, I_D=40A, R_G=25\Omega, V_{GS}=10V$ (Note 4,5)	-	80	115	ns
Turn-On rise time	t_r		-	600	930	ns
Turn-Off delay time	$t_{d(off)}$		-	145	185	ns
Turn-Off Fall time	t_f		-	180	234	ns
Total Gate Charge	Q_g	$V_{DS}=200V, I_D=40A, V_{GS}=10V$ (note 4,5)	-	87	110	nC
Gate-Source charge	Q_{gs}		-	25	-	nC
Gate-Drain charge	Q_{gd}		-	42	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=40A$ (note3)	-	-	1.5	V
Maximum Continuous Drain-Source Diode Forward Current		I_S	-	-	40	A
Reverse recovery time	t_{rr}	$V_{GS}=0V, I_F=40A, dI_F/dt=100A/\mu s$ (note 4)	-	210	-	ns
Reverse recovery charge	Q_{rr}		-	2.1	-	μC

Thermal Characteristic

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.79	$^{\circ}C/W$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	$^{\circ}C/W$

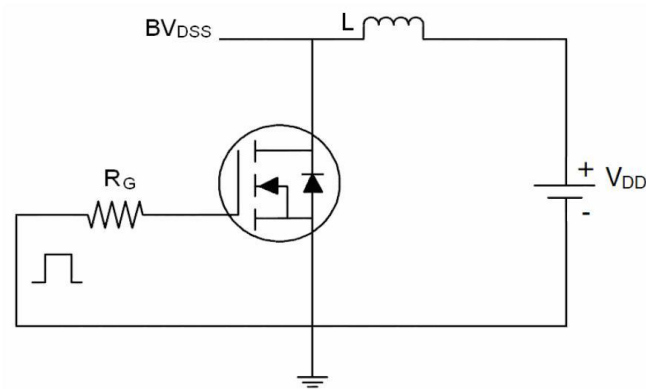
Notes:

1. Pulse width limited by maximum junction temperature
2. $L=1.1mH, I_{AS}=40A, V_{DD}=50V, R_G=25\Omega, \text{Starting } T_J=25^{\circ}C$
3. $I_{SD} \leq 40A, di/dt \leq 200A/\mu s, V_{DD} \leq BVDSS, \text{Starting } T_J=25^{\circ}C$
4. Pulse Test: Pulse Width $\leq 300\mu s, \text{Duty Cycle} \leq 2\%$

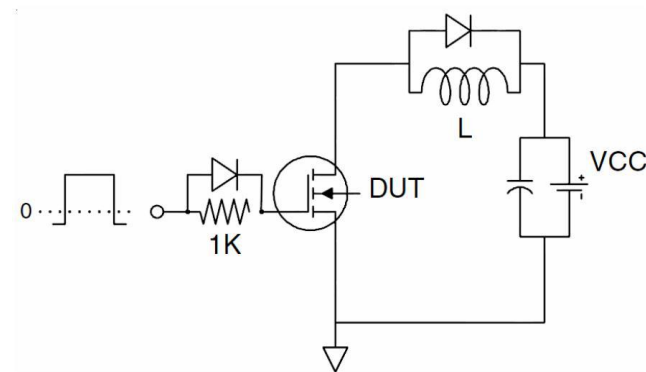
5. Essentially independent of operating temperature

Test Circuit

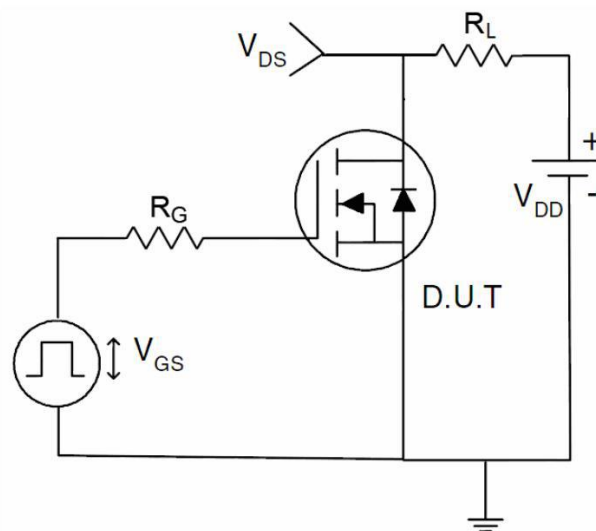
1) E_{AS} test Circuit



2) Gate charge test Circuit

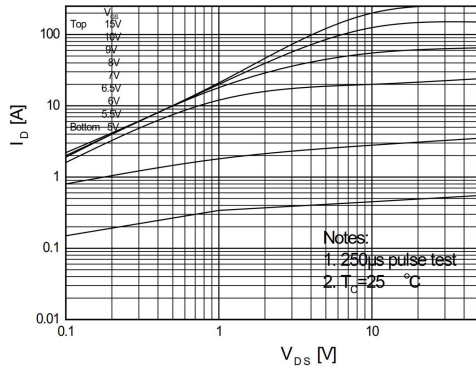


3) Switch Time Test Circuit

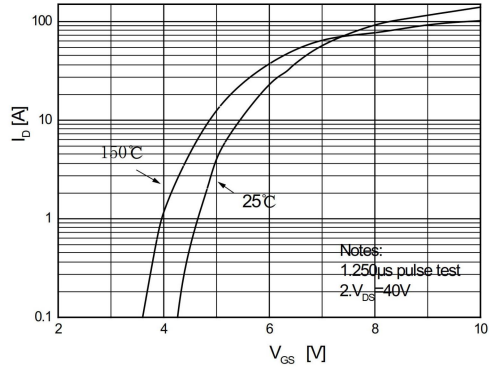


Typical Electrical and Thermal Characteristics (Curves)

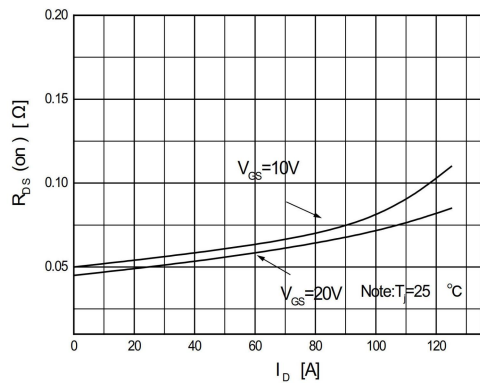
On-Region Characteristics



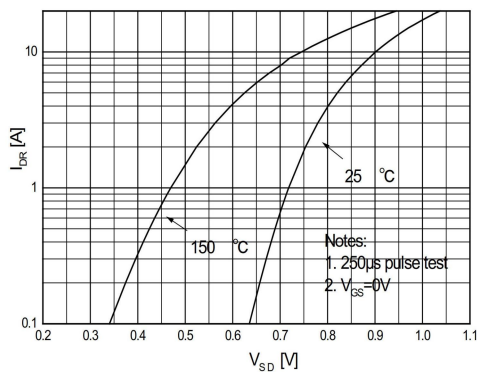
Transfer Characteristics



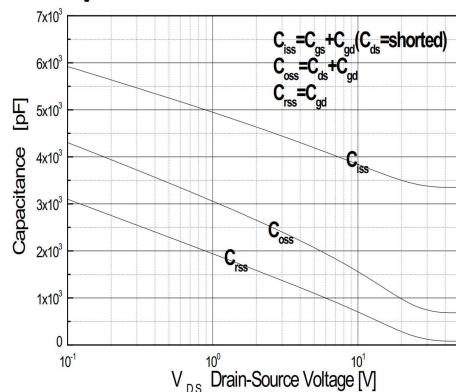
On-Resistance Variation vs. Drain Current and Gate Voltage



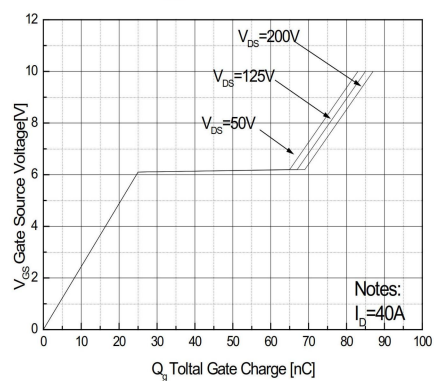
Body Diode Forward Voltage Variation vs. Source Current and Drain-Source Voltage



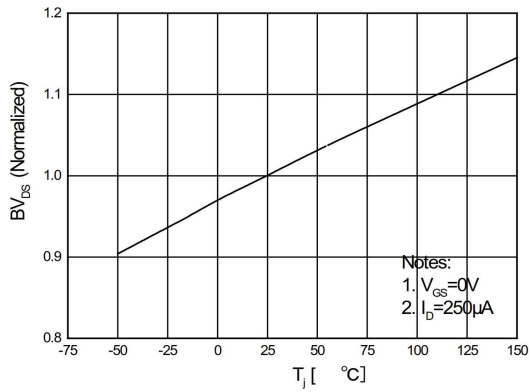
Capacitance Characteristics



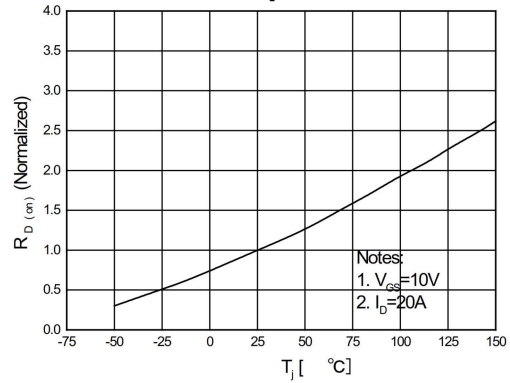
Gate Charge Characteristics



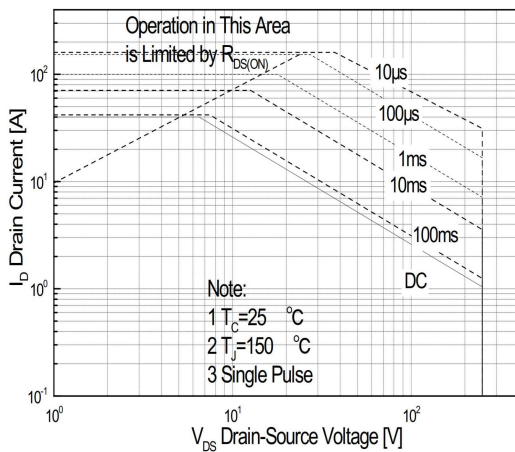
Breakdown Voltage Variation vs. Temperature



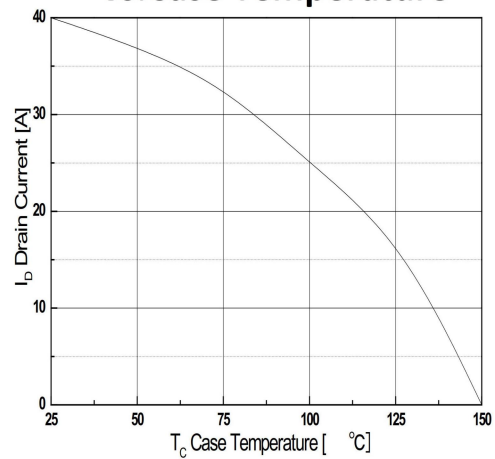
On-Resistance Variation vs. Temperature



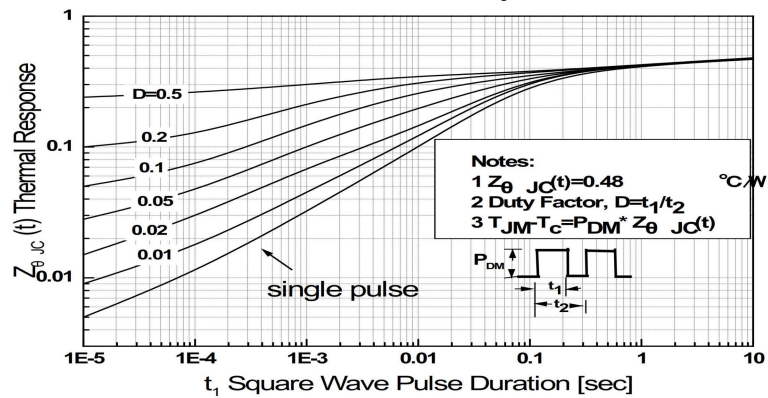
Maximum Safe Operating Area



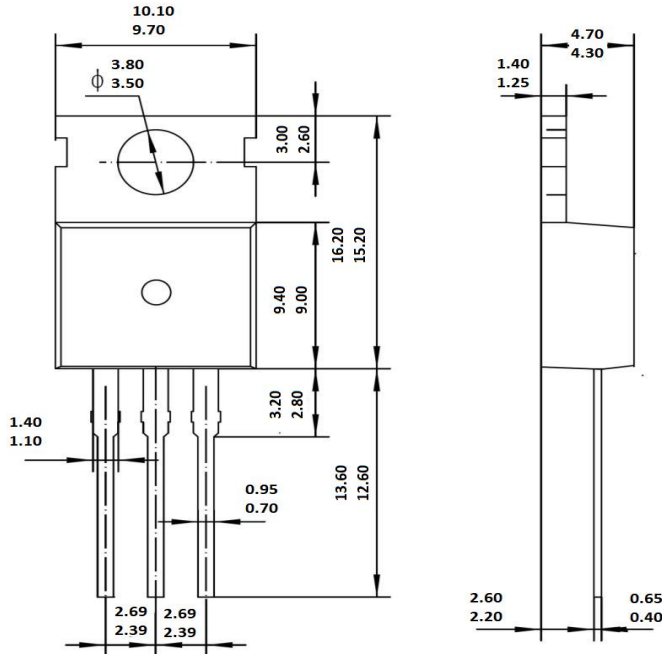
Maximum Drain Current vs. Case Temperature



Transient Thermal Response Curve

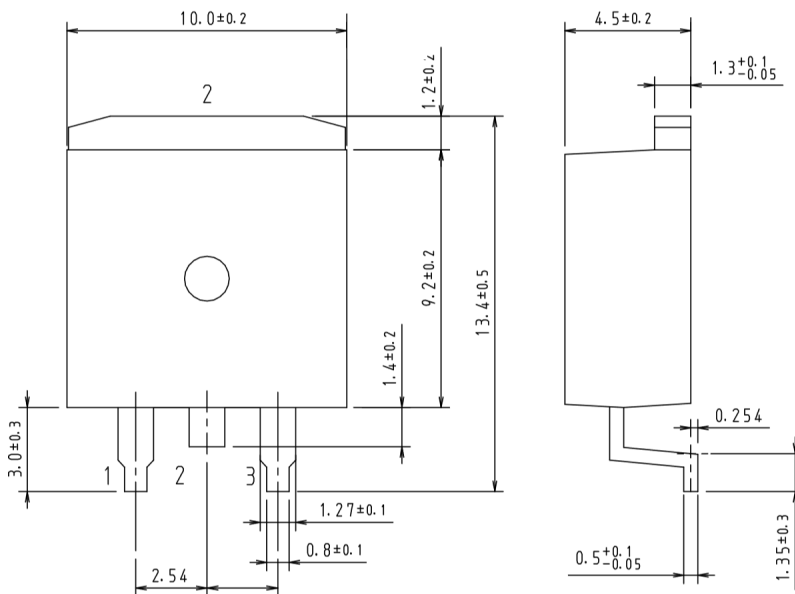


Package Mechanical DATA



TO-220

Unit: mm



TO-263

Unit:mm