

200V N-CHANNEL POWER MOSFET

MAIN CHARACTERISTICS

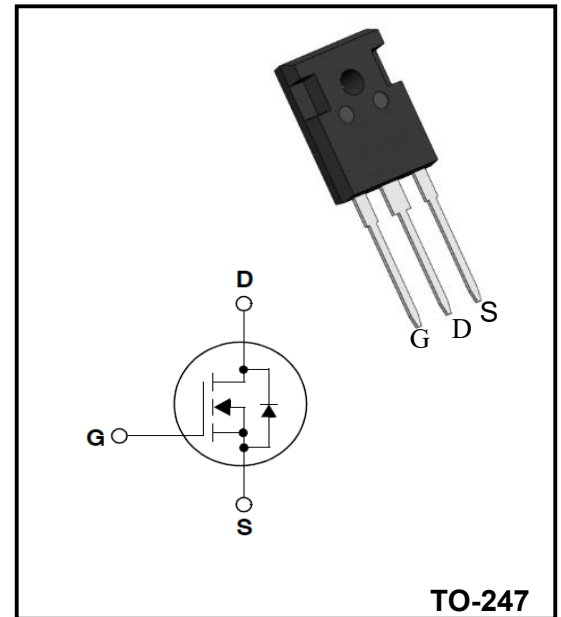
I_D	130A
V_{DSS}	200V
R_{DS(on)-typ(@V_{GS}=10V)}	<10mΩ(Type:9.1 mΩ)

Features

- ◆Low gate charge
- ◆Low Crss (typical 42 pF)
- ◆Fast switching
- ◆100% avalanche tested
- ◆100% DVDS tested
- ◆100% Rg tested
- ◆SGT technology
- ◆ROHS compliant

APPLICATIONS

- ◆High efficiency switch mode power supplies
- ◆DC-DC converter
- ◆Synchronous Rectification
- ◆Maximum Power Point Tracking controller



ABSOLUTE RATINGS (T_c=25°C)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	200	V
Drain Current -continuous *	I _D (T _c =25°C)	130	A
	I _D (T _c =100°C)	92	A
Drain Current – pulse (note 1)	I _{DM}	520	A
Gate-Source Voltage	V _{GS}	±20	V
Single Pulsed Avalanche Energy (note 2)	E _{AS}	364.5	mJ
Avalanche Current (note 1)	I _{AS}	27	A
Peak Diode Recovery dv/dt (note 3)	dv/dt	5.0	V/ns
Power Dissipation	P _D (TC=25°C)	375	W
	-Derate above 25°C	2.5	W/°C
Operating and Storage Temperature Range	T _J , T _{STG}	175, -55 to 175	°C
Maximum Lead Temperature for Soldering Purposes	T _L	260	°C

*Drain current limited by maximum junction temperature

ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Off –Characteristics						
Drain-Source Voltage	BV_{DSS}	$I_D=250\mu A, V_{GS}=0V$	200	-	-	V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	$I_D=250\mu A$, referenced to 25°C	-	0.1	-	V/°C
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=200V, V_{GS}=0V, T_C=25^\circ C$	-	-	1	μA
		$V_{DS}=160V, T_C=125^\circ C$	-	-	5	μA
Gate-body leakage current	$I_{GSS (F/R)}$	$V_{DS}=0V, V_{GS}=\pm 30V$	-	-	± 100	nA
On-Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D=250\mu A$	2.5	-	4.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D=81A$	-	9.1	10	m Ω
Dynamic Characteristics						
Gate Resistance	R_g	$f=1.0MHz, V_{DS} OPEN$	-	7.5	-	Ω
Input capacitance	C_{iss}	$V_{DS}=100V, V_{GS}=0V, f=1.0MHz$	-	3910	-	pF
Output capacitance	C_{oss}		-	405	-	
Reverse transfer capacitance	C_{rss}		-	42	-	
Switching Characteristics						
Turn-On delay time	$t_{d(on)}$	$V_{DS}=100V, I_D=81A, R_G=5\Omega, V_{GS}=10V$ (note 4, 5)	-	18.3	-	ns
Turn-On rise time	t_r		-	27	-	ns
Turn-Off delay time	$t_{d(off)}$		-	38	-	ns
Turn-Off Fall time	t_f		-	19.4	-	ns
Total Gate Charge	Q_g	$V_{DS} = 100V, I_D=81A, V_{GS} = 10V$ (note 4, 5)	-	70	-	nC
Gate-Source charge	Q_{gs}		-	12.5	-	nC
Gate-Drain charge	Q_{gd}		-	18.9	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain-Source Diode Forward Current		I_S	-	-	130	A
Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}	-	-	520	A
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_{SD}=81A$	-	-	1.3	V
Reverse recovery time	t_{rr}	$V_{GS}=0V, I_S=81A, di/dt=50A/\mu s$ (note 4)	-	130	-	ns
Reverse recovery charge	Q_{rr}		-	667	-	nC

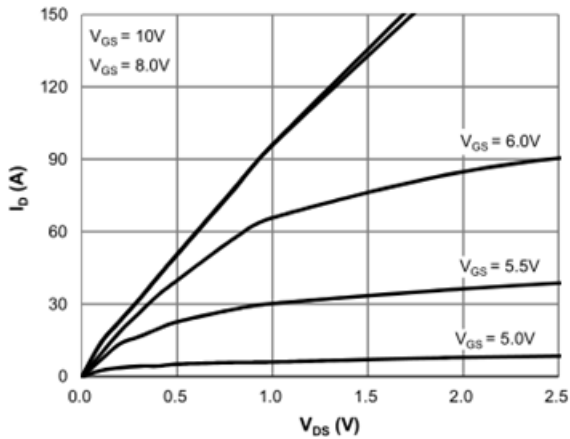
THERMAL CHARACTERISTIC

Parameter	Symbol	value	Unit
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	0.40	°C/W
Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	40	°C/W

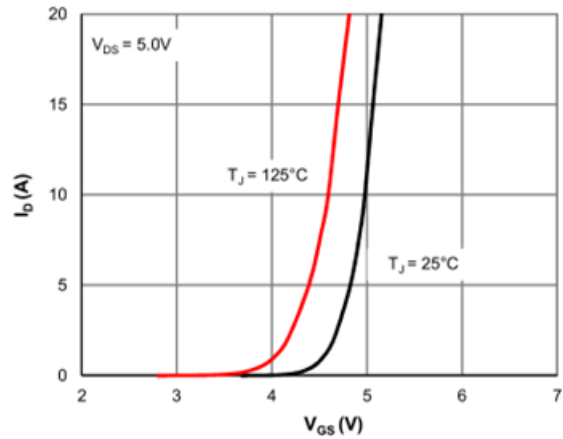
Notes:

- 1: Pulse width limited by maximum junction temperature
- 2: $L=1mH, I_{AS}=27A, V_{DD}=50V, R_G=25\Omega, Start T_J=25^\circ C$;
- 3: $I_{SD} \leq 130A, di/dt \leq 200A/\mu s, V_{DD} \leq BV_{DSS}$, Starting $T_J=25^\circ C$
- 4: Pulse Test: Pulse Width $\leq 300\mu s, Duty Cycles \leq 2\%$
- 5: Essentially independent of operating temperature

ELECTRICAL CHARACTERISTICS (curves)



Saturation Characteristics



Transfer Characteristics

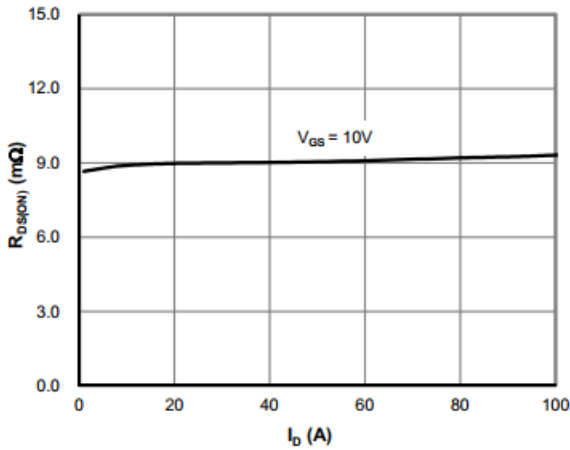
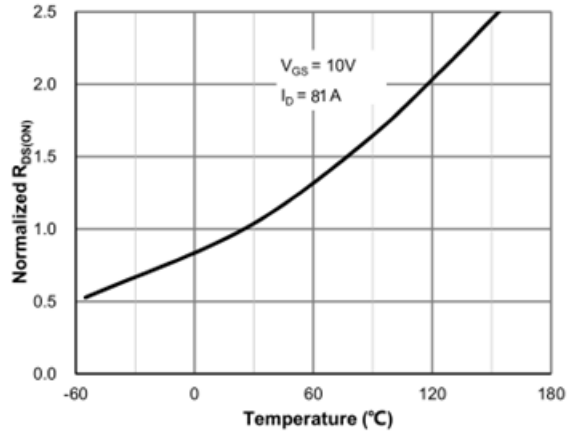
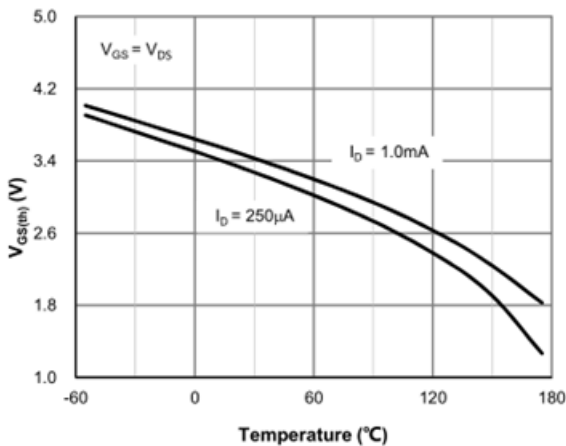


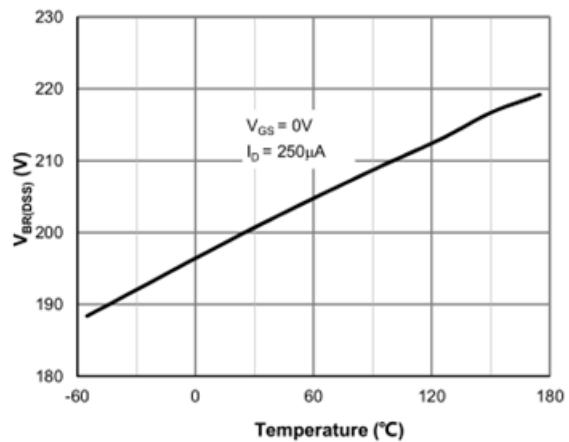
Figure 3: $R_{DS(ON)}$ vs. Drain Current



$R_{DS(ON)}$ vs. Junction Temperature



$V_{GS(th)}$ vs. Junction Temperature



$V_{BR(DSS)}$ vs. Junction Temperature

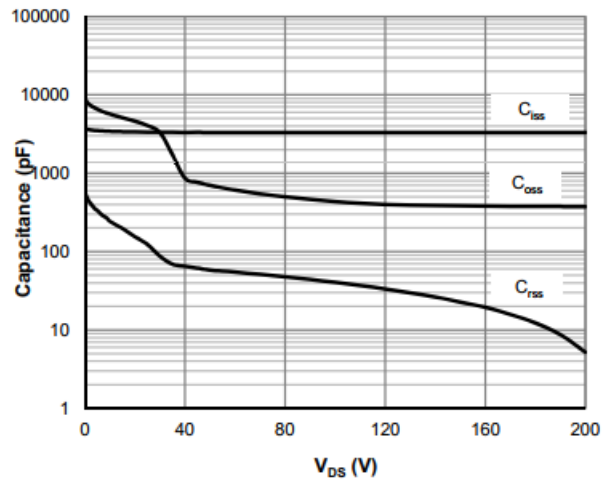
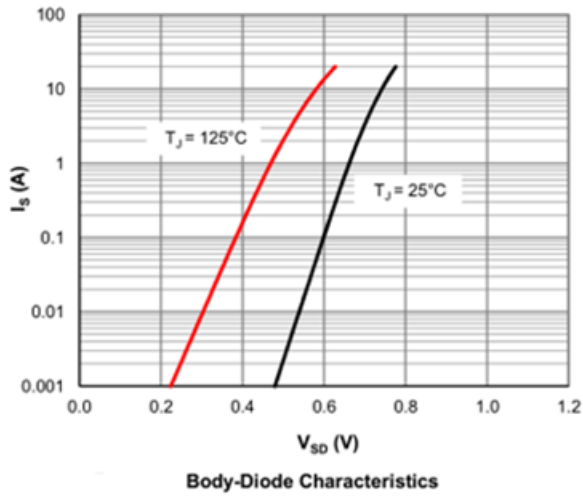
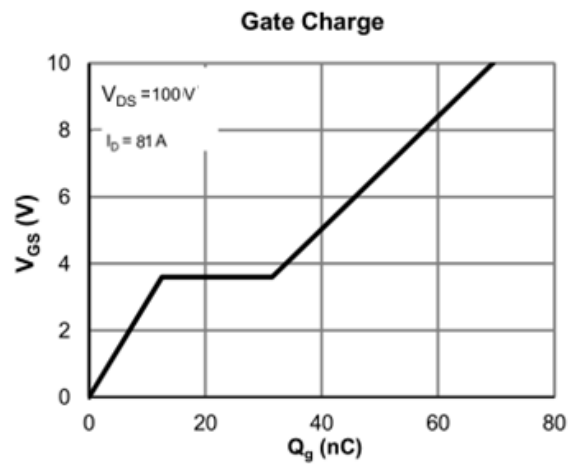
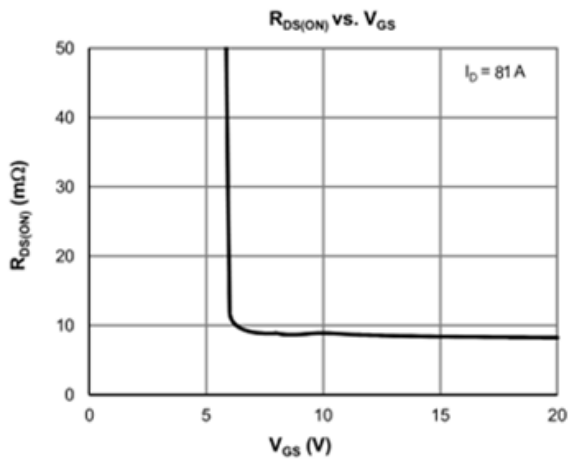
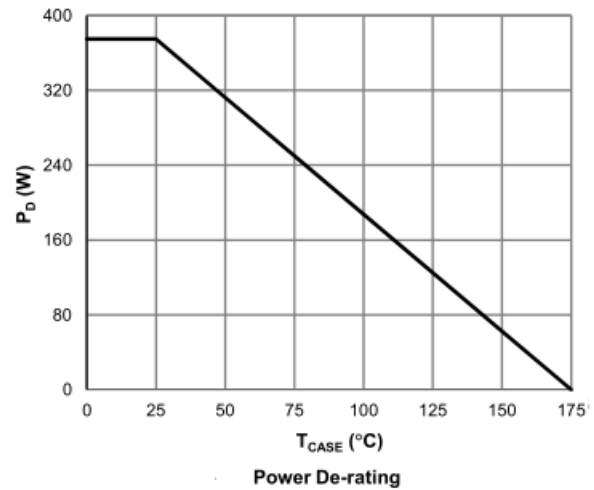
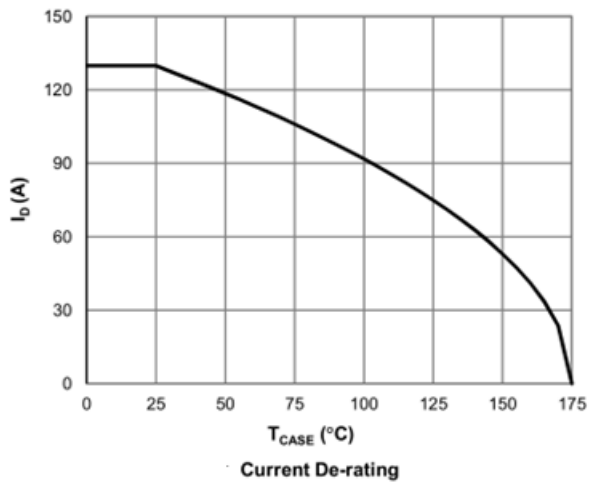
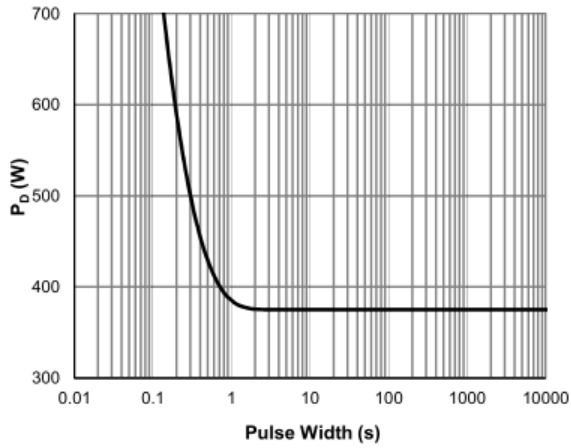
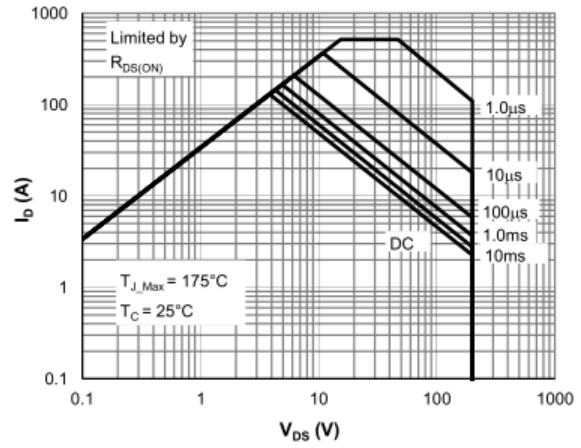


Figure 8: Capacitance Characteristics

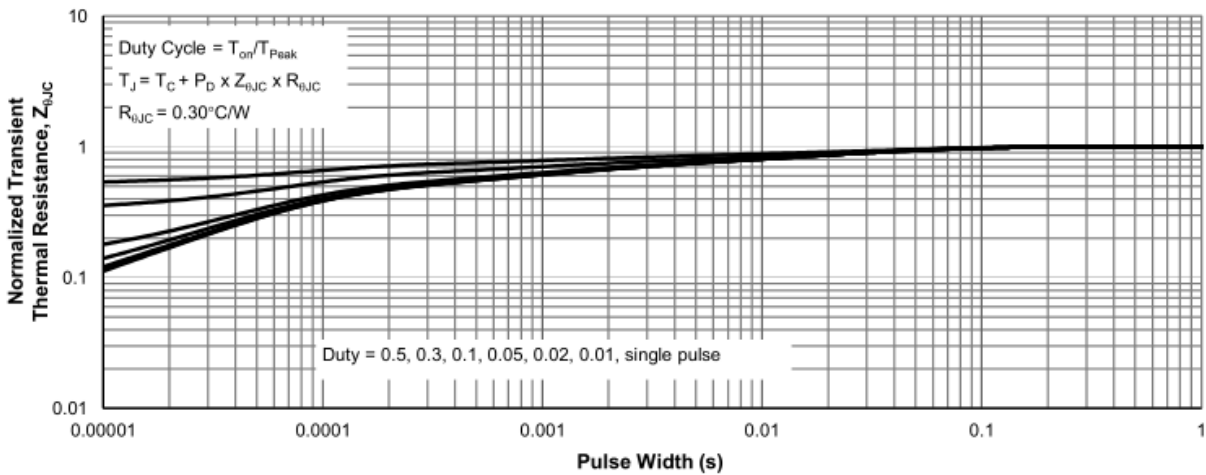




Single Pulse Power Rating, Junction-to-Case



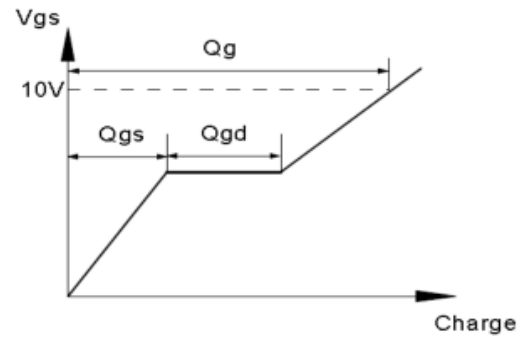
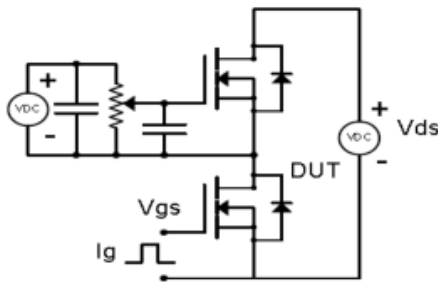
Maximum Safe Operating Area



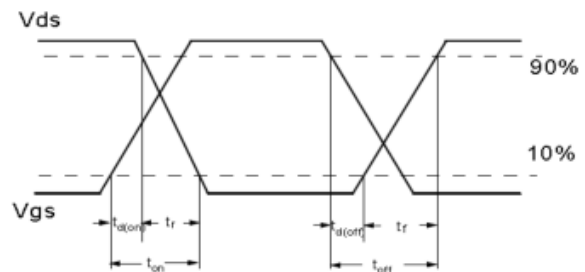
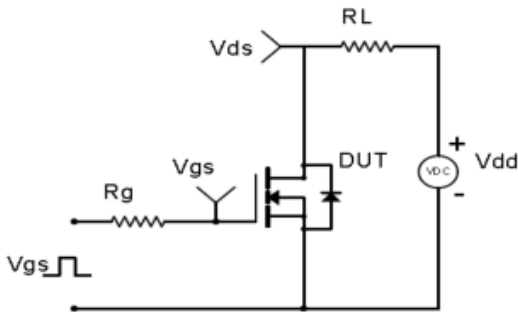
Normalized Maximum Transient Thermal Impedance

Test Circuit & Waveform

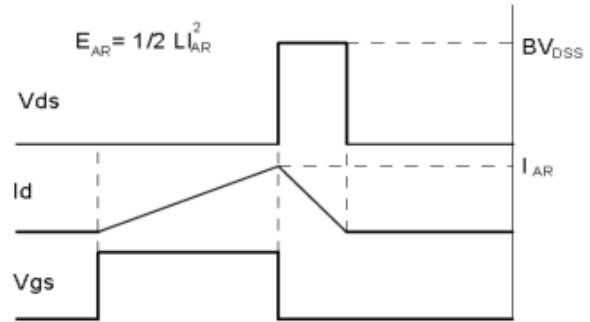
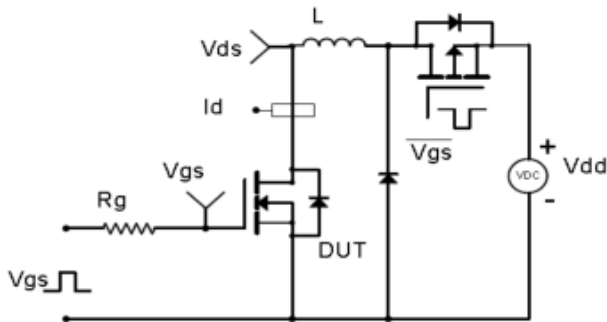
Gate Charge Test Circuit & Waveform



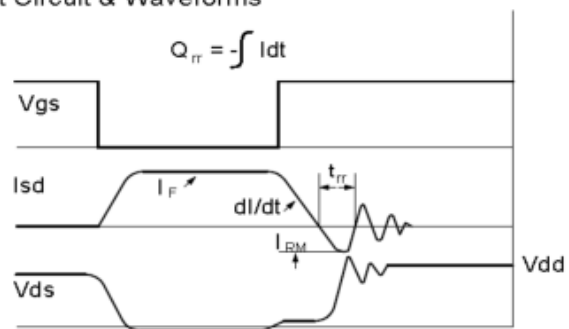
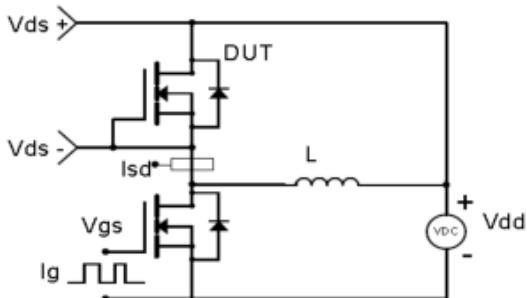
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

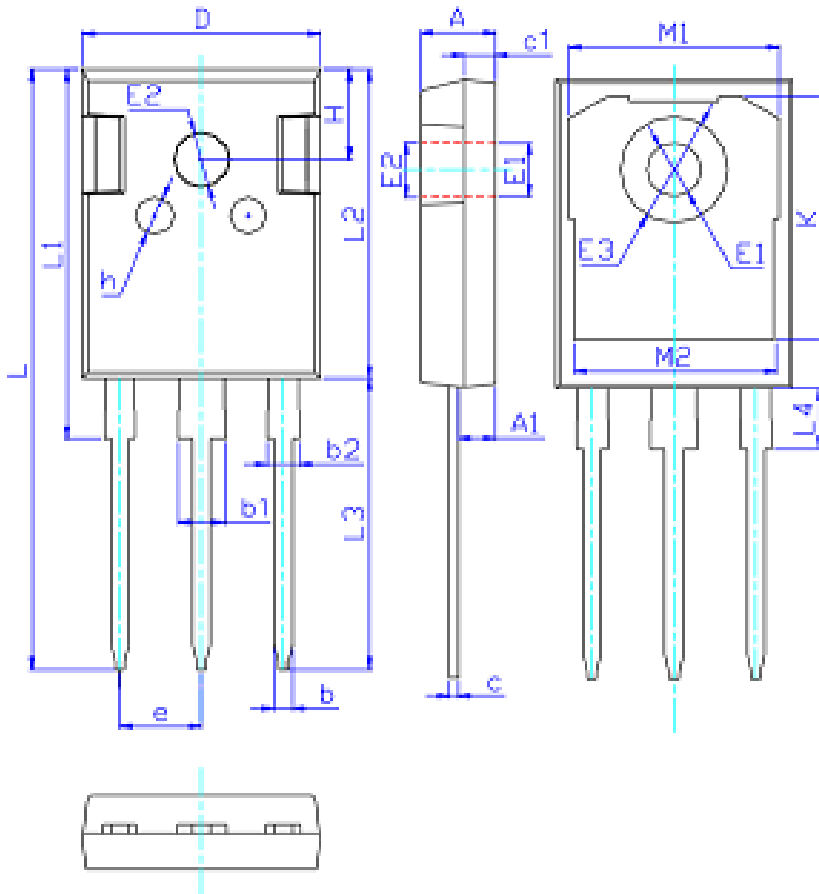


Diode Recovery Test Circuit & Waveforms



Package Outline

TO-247



标注	尺寸(mm)
A	5.00±0.05
A1	2.41±0.05
b	1.2±0.05
b1	3.05±0.05
b2	2.05±0.05
C	0.60±0.05
C1	2.00±0.05
D	15.80±0.10
E1	3.60±0.05
E2	3.70±0.05
E3	7.19±0.05
L	40.92 ±0.10
L1	24.95±0.10
L2	21.00±0.10
L3	19.92±0.10
L4	4.10±0.05
e	5.44±0.05
H	6.15±0.05
h	2.50±0.05
K	16.45±0.10
M1	14.00±0.10
M2	13.30±0.10