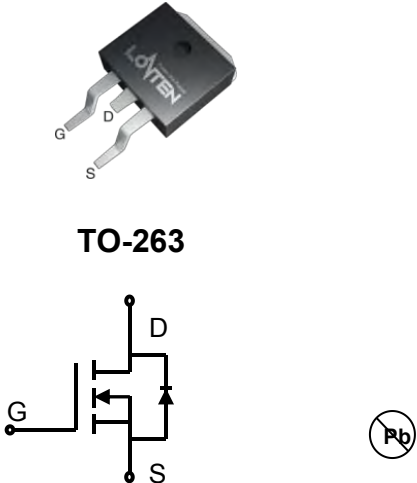


Lonten N-channel 85V, 110A, 5.2mΩ Power MOSFET

<p>Description These N-Channel enhancement mode power field effect transistors are using shielded gate trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and with stand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.</p> <p>Features</p> <ul style="list-style-type: none"> ◆ 85V, 110A, $R_{DS(on),max}=5.2m\Omega@V_{GS} = 10V$ ◆ Improved dv/dt capability ◆ Fast switching ◆ 100% EAS Guaranteed ◆ Green device available <p>Applications</p> <ul style="list-style-type: none"> ◆ Motor Drives ◆ UPS ◆ DC-DC Converter 	<p>Product Summary</p> <table> <tr> <td>V_{DSS}</td> <td>85V</td> </tr> <tr> <td>$R_{DS(on),max}@ V_{GS}=10V$</td> <td>5.2mΩ</td> </tr> <tr> <td>I_D</td> <td>110A</td> </tr> </table> <p>Pin Configuration</p>  <p style="text-align: center;">TO-263</p> <p style="text-align: center;">N-Channel MOSFET</p>	V_{DSS}	85V	$R_{DS(on),max}@ V_{GS}=10V$	5.2mΩ	I_D	110A
V_{DSS}	85V						
$R_{DS(on),max}@ V_{GS}=10V$	5.2mΩ						
I_D	110A						

Absolute Maximum Ratings $T_C = 25^\circ C$ unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	85	V
Continuous drain current ($T_C = 25^\circ C$)	I_D	110	A
($T_C = 100^\circ C$)		70	A
Pulsed drain current ¹⁾	I_{DM}	440	A
Gate-Source voltage	V_{GSS}	± 20	V
Avalanche energy ²⁾	E_{AS}	361	mJ
Power Dissipation	P_D	125	W
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ C$
Operating Junction Temperature Range	T_J	-55 to +150	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.0	$^\circ C/W$
Thermal Resistance, Junction-to-Ambient ³⁾	$R_{\theta JA}$	75	$^\circ C/W$

Package Marking and Ordering Information

Device	Device Package	Marking	Units/Reel
LSGE085R052	TO-263	LSGE085R052	800

Electrical Characteristics

T_J = 25°C unless otherwise noted

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static characteristics						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0 V, I _D =250uA	85	---	---	V
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	2.0	---	4.0	V
Drain-source leakage current	I _{DSS}	V _{DS} =85 V, V _{GS} =0 V, T _J = 25°C	---	---	1	μA
		V _{DS} =85 V, V _{GS} =0 V, T _J = 150°C	---	---	10	mA
Gate leakage current, Forward	I _{GSSF}	V _{GS} =20 V, V _{DS} =0 V	---	---	100	nA
Gate leakage current, Reverse	I _{GSSR}	V _{GS} =-20V, V _{DS} =0 V	---	---	-100	nA
Drain-source on-state resistance	R _{DS(on)}	V _{GS} =10 V, I _D =50 A, T _J = 25°C	---	4.2	5.2	mΩ
		T _J = 150°C	---	8.3	---	
Forward transconductance	g _{fs}	V _{DS} =5V , I _D =50A	---	70	---	S
Dynamic characteristics						
Input capacitance	C _{iss}	V _{DS} = 40V, V _{GS} = 0 V, f = 250kHz	---	4527	---	pF
Output capacitance	C _{oss}		---	653	---	
Reverse transfer capacitance	C _{rss}		---	33	---	
Turn-on delay time	t _{d(on)}	V _{DD} = 40V, V _{GS} =10V, I _D =50 A	---	48	---	ns
Rise time	t _r		---	145	---	
Turn-off delay time	t _{d(off)}		---	74	---	
Fall time	t _f		---	38.7	---	
Gate resistance	R _g	V _{GS} =0V, V _{DS} =0V, f=1MHz	---	2.35	---	Ω
Gate charge characteristics						
Gate to source charge	Q _{gs}	V _{DS} =68 V, I _D =50A, V _{GS} = 10 V	---	24	---	nC
Gate to drain charge	Q _{gd}		---	22.6	---	
Gate charge total	Q _g		---	78.5	---	
Gate plateau voltage	V _{plateau}		---	5.3	---	V
Output Charge	Q _{oss}	V _{DS} =68 V, V _{GS} = 0V	---	80	---	nC
Drain-Source diode characteristics and Maximum Ratings						
Continuous Source Current	I _S		---	---	110	A
Pulsed Source Current	I _{SM}		---	---	440	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =50A, T _J =25°C	---	---	1.1	V
Reverse Recovery Time	t _{rr}	I _S =50A, di/dt=100A/us, T _J =25°C	---	36	---	ns
Reverse Recovery Charge	Q _{rr}		---	34.2	---	nC

Notes:

- 1: Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2: V_{DD}=40V, V_{GS}=10V, L=0.5mH, I_{AS}=38A, R_G=25Ω, Starting T_J=25°C.
- 3: The value of R_{thJA} is measured by placing the device in a still air box which is one cubic foot.

Electrical Characteristics Diagrams

Figure 1. Typ. Output Characteristics

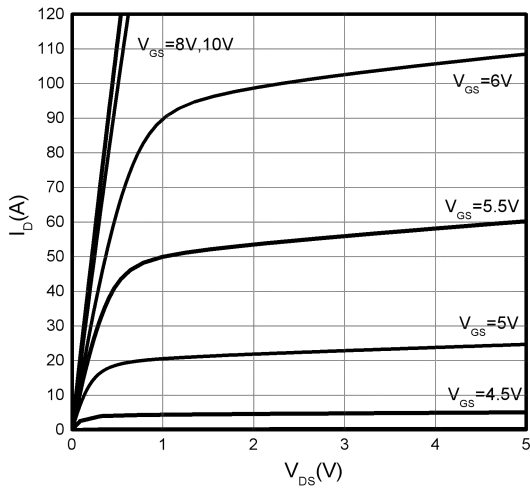


Figure 2. Transfer Characteristics

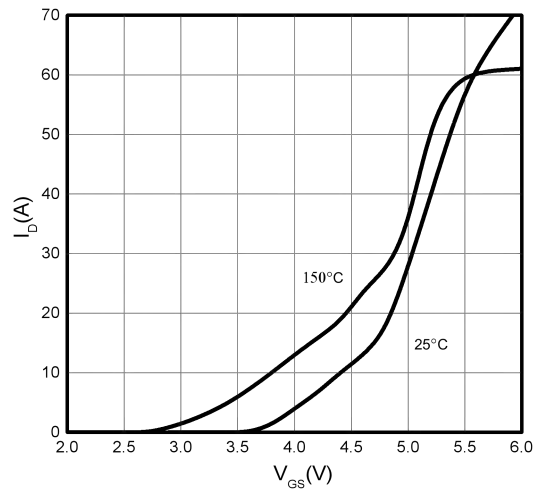


Figure 3. On-Resistance vs. Drain Current

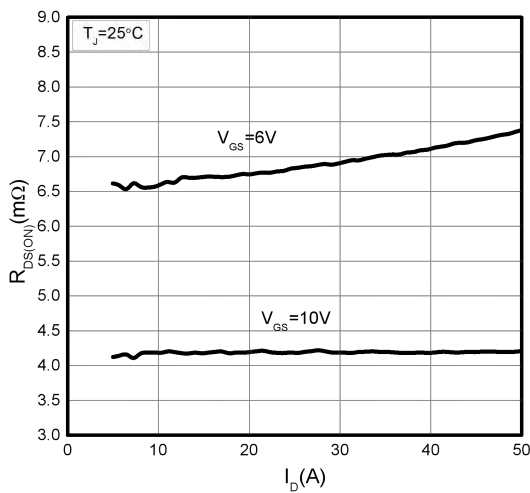


Figure 4. On-Resistance vs. Temperature

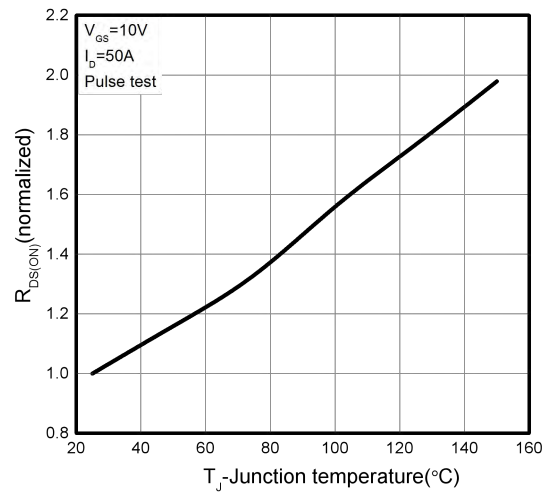


Figure 5. Breakdown Voltage vs. Temperature

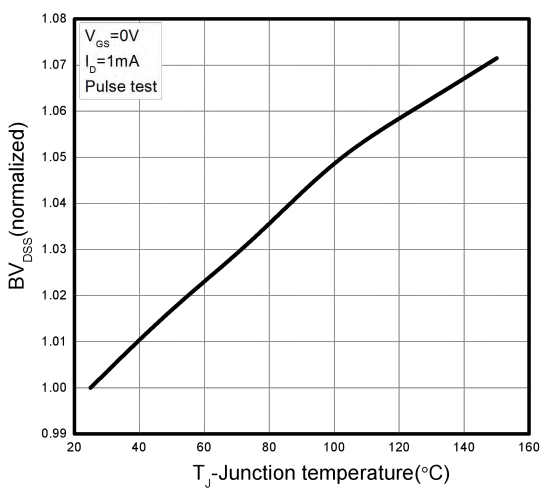


Figure 6. Threshold Voltage vs. Temperature

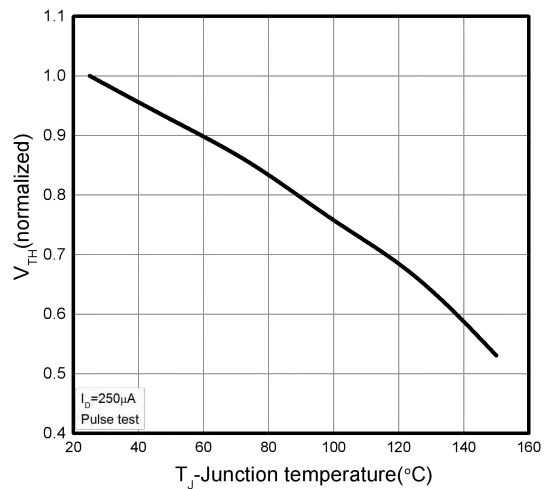


Figure 7. R_{DS(on)} vs. Gate Voltage

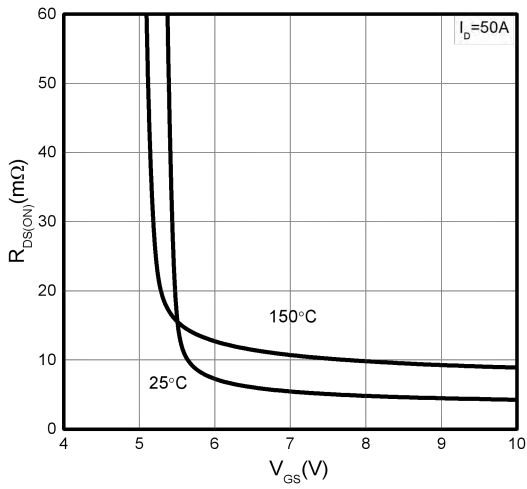


Figure 8. Body-Diode Characteristics

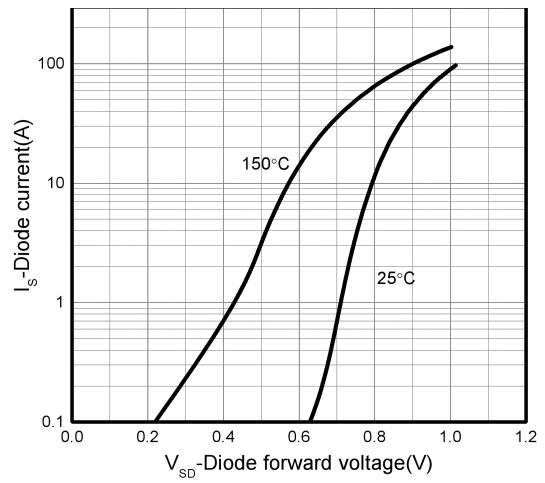


Figure 9. Capacitance Characteristics

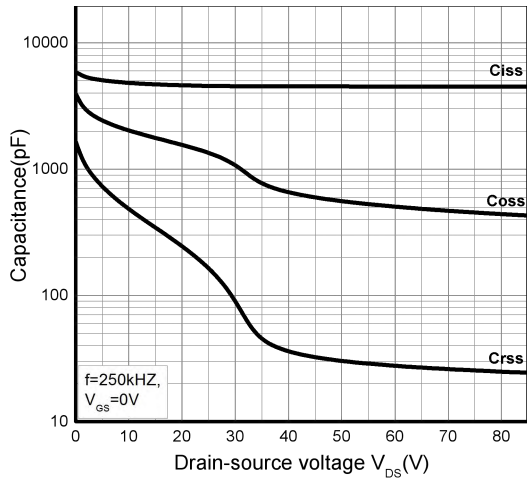


Figure 10. Gate Charge Characteristics

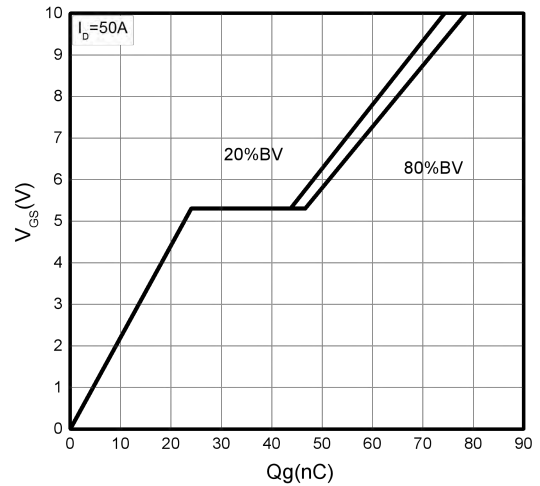


Figure 11. Drain Current Derating

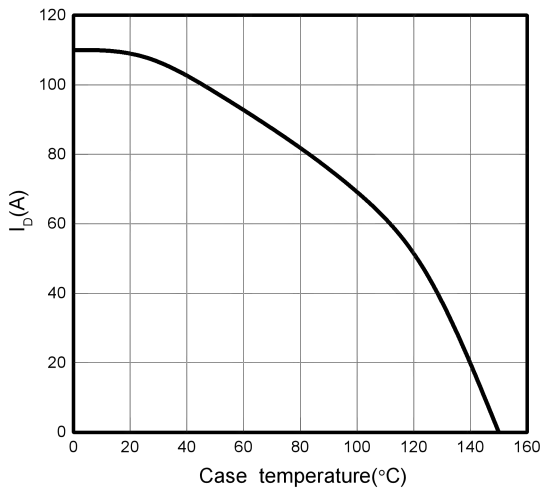


Figure 12. Power Dissipation vs. Temperature

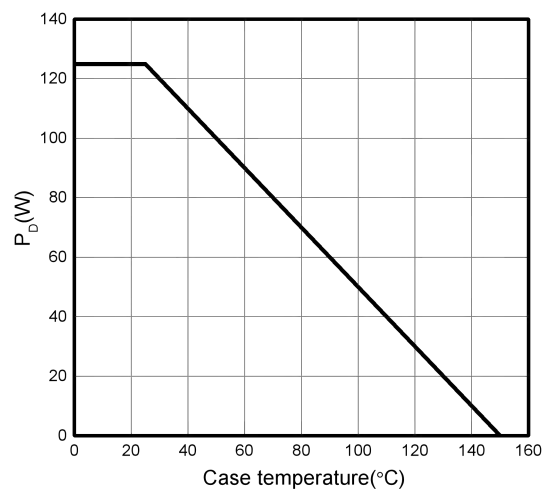


Figure 13: Safe Operating Area

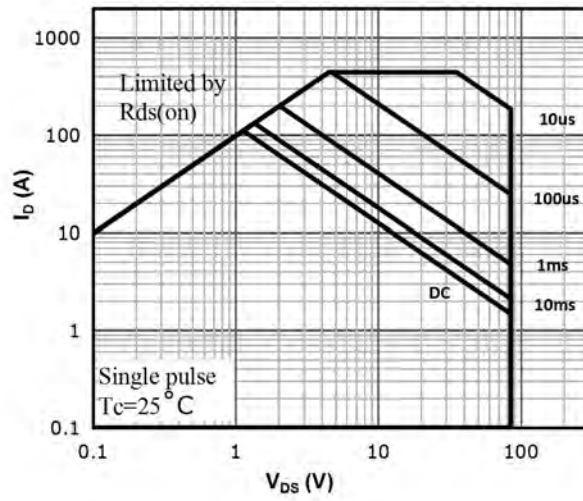
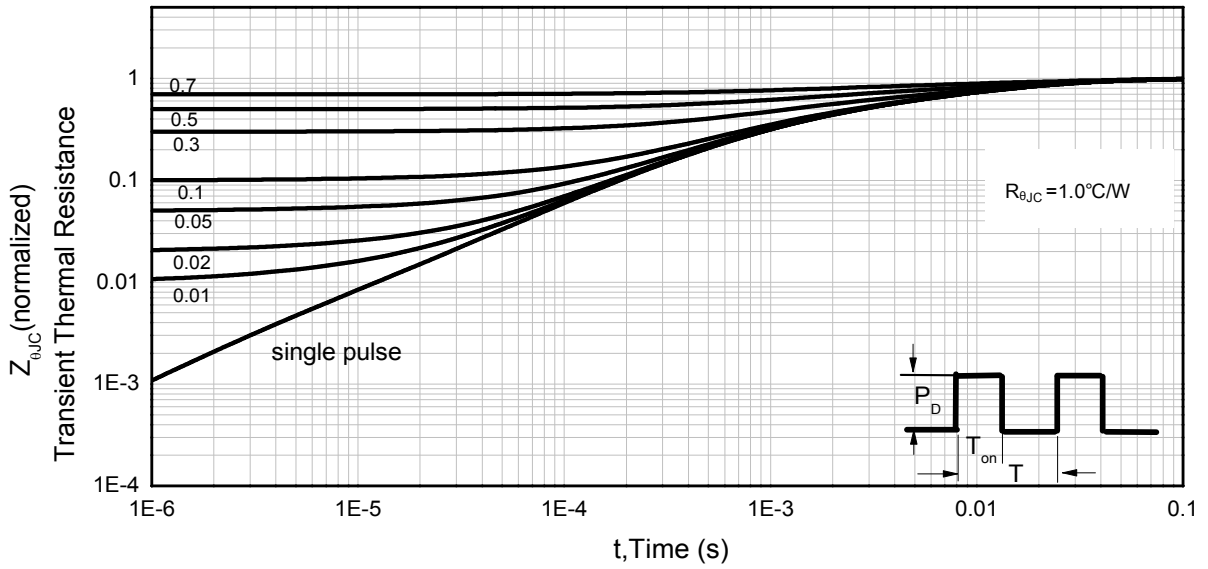
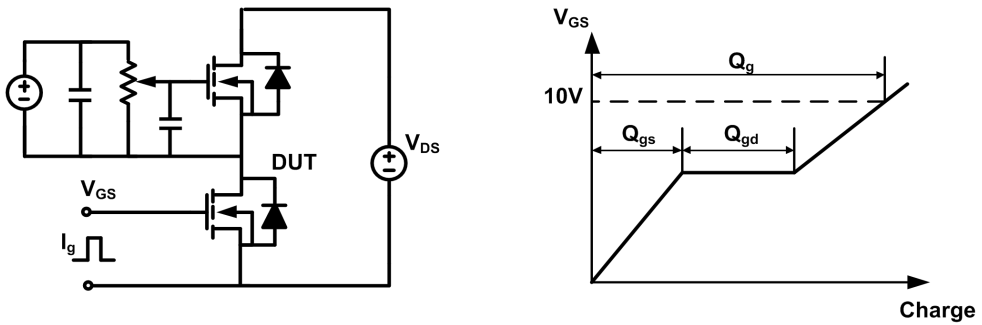


Figure 14. Normalized Maximum Transient Thermal Impedance (RthJC)

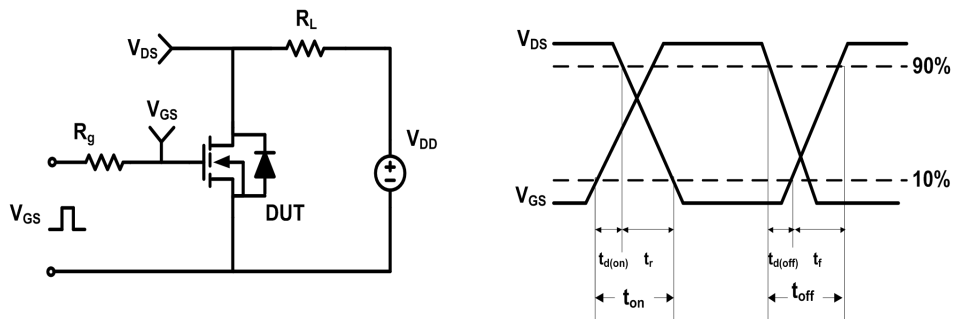


Test Circuit & Waveforms

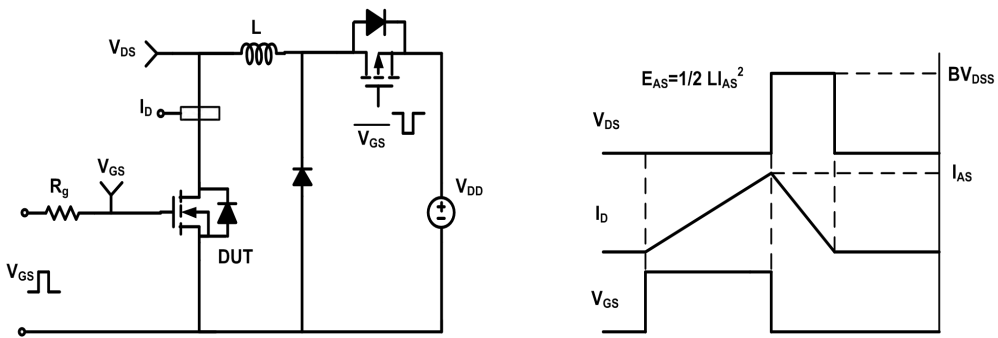
Gate Charge Test Circuit & Waveform



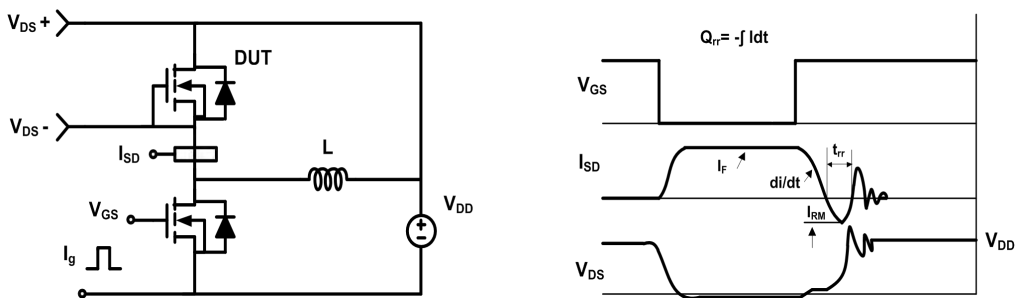
Resistive Switching Test Circuit & Waveform



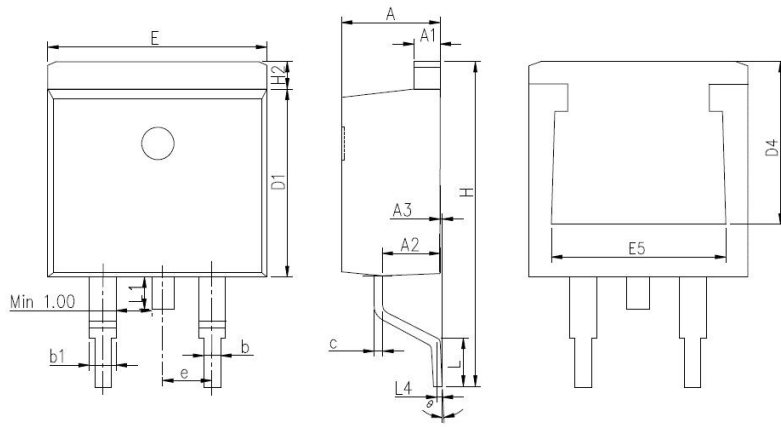
Unclamped Inductive Switching (UIS) Test Circuit & Waveform



Diode Recovery Test Circuit & Waveform



Mechanical Dimensions for TO-263



DIMENSIONS IN MILLIMETERS		
SYMBOL	MIN	MAX
A	4.36	4.8
A1	1.19	1.42
A2	2.2	2.96
A3	0	0.25
b	0.7	0.96
b1	1.17	1.47
c	0.3	0.69
D1	8.5	9.5
D4	6.6	-
E	9.8	10.55
E5	7.06	8.7
e	2.54BSC	
H	14.7	15.7
H2	0.95	1.65
L	1.9	2.8
L1	-	1.78
L4	0.25BSC	
θ	0°	9°