Lonten N-channel 100V, 145A, 4.35mΩ Power MOSFET

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.

Features

- 100V,145A,$R_{DS(on).max}$=4.35mΩ@V_{GS} = 10V
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green device available

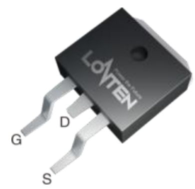
Applications

- Motor Drives
- UPS
- DC-DC Converter

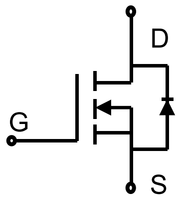
Product Summary

V_{DSS}	100V
$R_{DS(on).max}$@ V_{GS}=10V	4.35mΩ
I_D	145A

Pin Configuration



TO-263



N-Channel MOSFET

Absolute Maximum Ratings

T_C = 25°C unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	100	V
Continuous drain current (T_C = 25°C)	I_D	145	A
(T_C = 100°C)		92	A
Pulsed drain current [1)]	I_{DM}	480	A
Gate-Source voltage	V_{GSS}	±20	V
Avalanche energy [2)]	E_{AS}	272	mJ
Power Dissipation	P_D	156	W
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.8	°C/W
Thermal Resistance, Junction-to-Ambient [3)]	$R_{\theta JA}$	75	°C/W

Package Marking and Ordering Information

Device	Device Package	Marking	Units/Reel
LSGE10R042	TO-263	LSGE10R042	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	100	---	---	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}=100 V, V_{GS}=0 V, T_J = 25°C	---	---	1	μA
		V_{DS}=100V, V_{GS}=0 V, T_J = 150°C	---	---	100	μA
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=40 A, T_J = 25°C	---	4.0	4.35	mΩ
		T_J = 150°C	---	7.2	---	
Forward transconductance	g_{fs}	V_{DS} =20V , I_D=40A	---	120	---	S
Dynamic characteristics						
Input capacitance	C_{iss}	V_{DS} = 50V, V_{GS} = 0 V, f = 250kHz	---	3838	---	pF
Output capacitance	C_{oss}		---	1252	---	
Reverse transfer capacitance	C_{rss}		---	13.4	---	
Turn-on delay time	$t_{d(on)}$	V_{DD} = 40V,V_{GS}=15V, I_D =60 A	---	29.4	---	ns
Rise time	t_r		---	29.2	---	
Turn-off delay time	$t_{d(off)}$		---	80.2	---	
Fall time	t_f		---	30.8	---	
Gate resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz	---	2.0	---	Ω
Gate charge characteristics						
Gate to source charge	Q_{gs}	V_{DS}=80 V, I_D=80A, V_{GS}= 10 V	---	20.5	---	nC
Gate to drain charge	Q_{gd}		---	16	---	
Gate charge total	Q_g		---	65	---	
Gate plateau voltage	$V_{plateau}$		---	5.5	---	V
Output Charge	Q_{oss}	V_{DS}=80 V,V_{GS}= 0V	---	138	---	nC
Drain-Source diode characteristics and Maximum Ratings						
Continuous Source Current	I_S		---	---	111	A
Pulsed Source Current	I_{SM}		---	---	444	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=80A, T_J=25℃	---	---	1.4	V
Reverse Recovery Time	t_{rr}	I_S=80A, di/dt=100A/us, T_J=25℃	---	55.6	---	ns
Reverse Recovery Charge	Q_{rr}		---	233	---	nC

Notes:

1: Repetitive Rating: Pulse width limited by maximum junction temperature.

2: V_{DD}=50V, V_{GS}=10V, L=0.5mH, I_{AS}=33A, R_G=25Ω, Starting T_J=25℃.

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

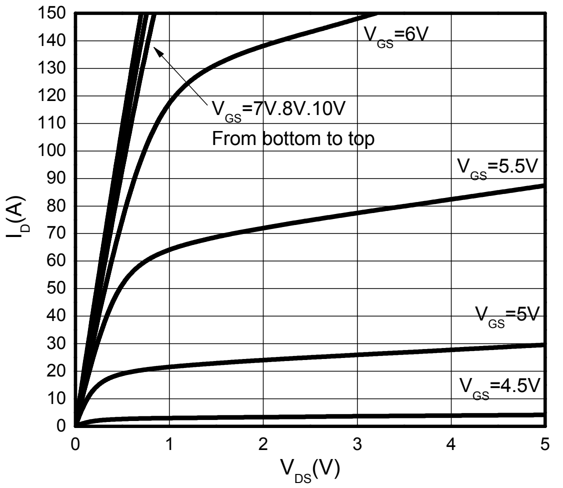


Figure 2. Transfer Characteristics

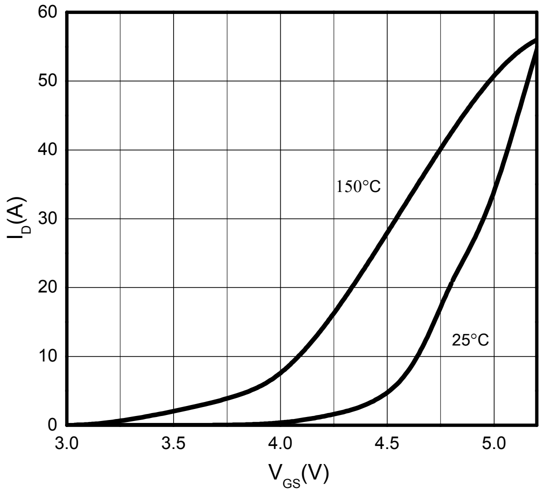


Figure 3. On-Resistance vs.Drain Current

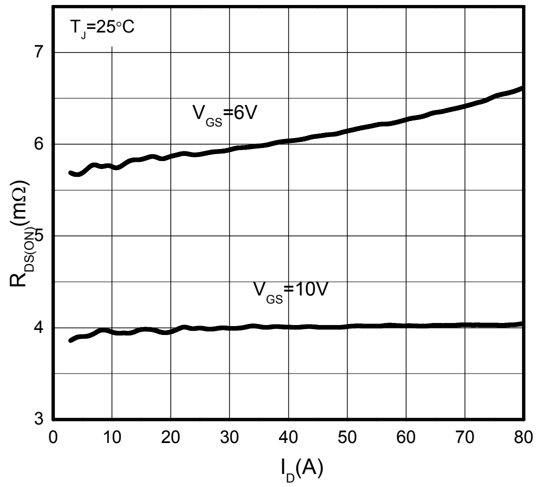


Figure 4.On-Resistance vs.Temperature

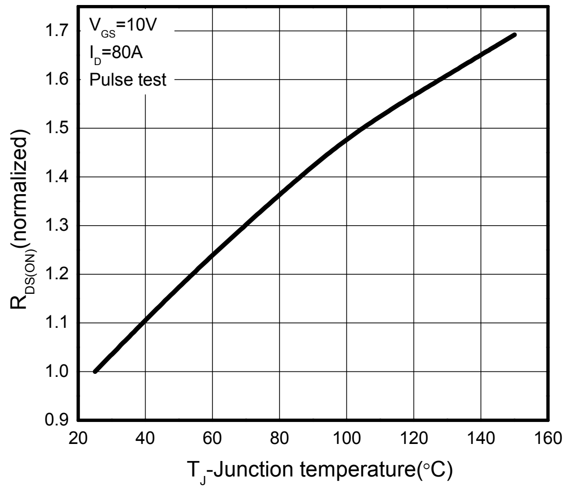


Figure 5.Breakdown Voltage vs.Temperature

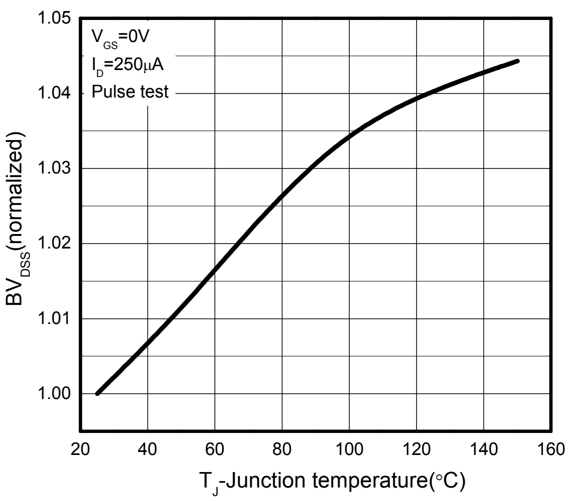


Figure 6.Threshold Voltage vs.Temperature

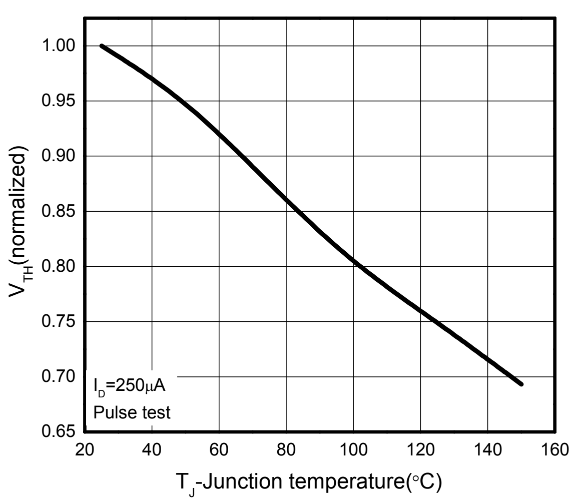


Figure 7.Rds(on) vs. Gate Voltage

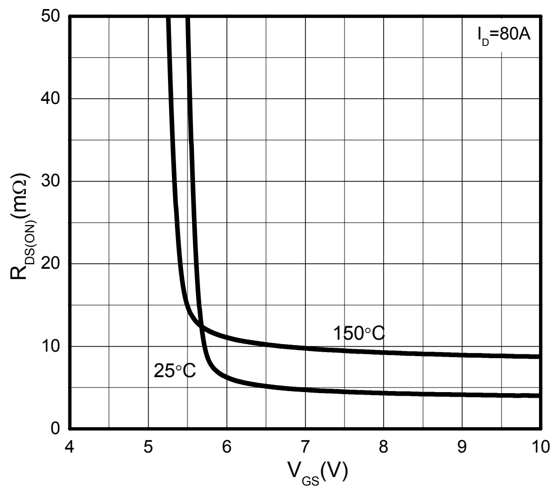


Figure 8.Body-Diode Characteristics

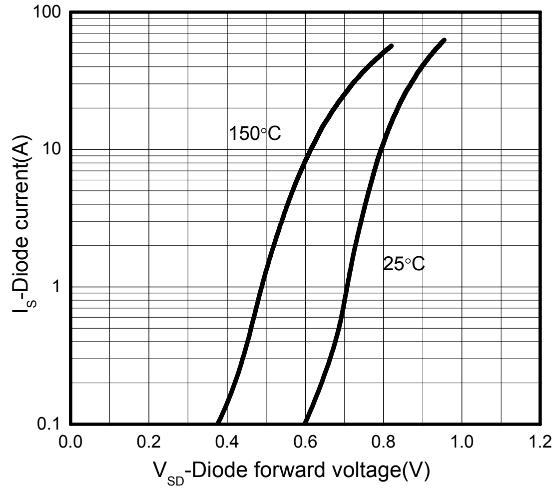


Figure 9.Capacitance Characteristics

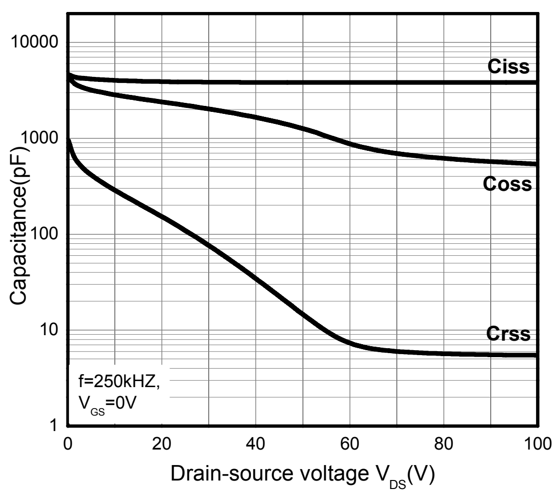


Figure 10.Gate Charge Characteristics

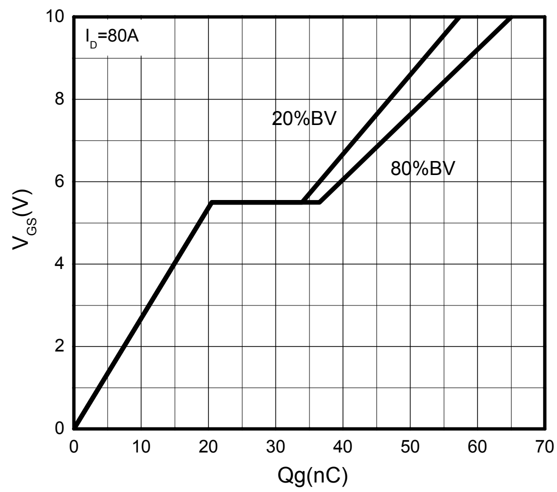


Figure 11.Drain Current Derating

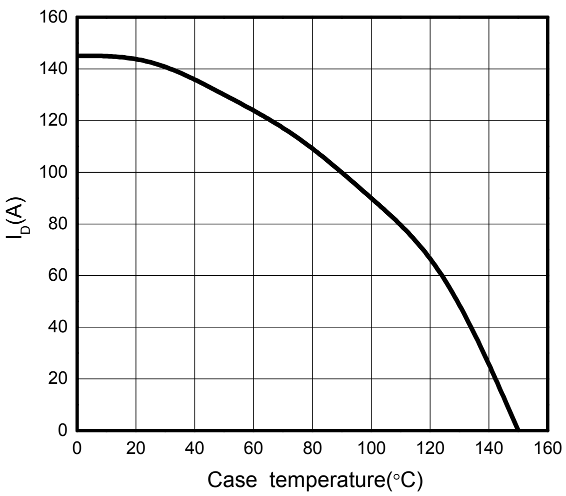


Figure 12.Power Dissipation vs.Temperature

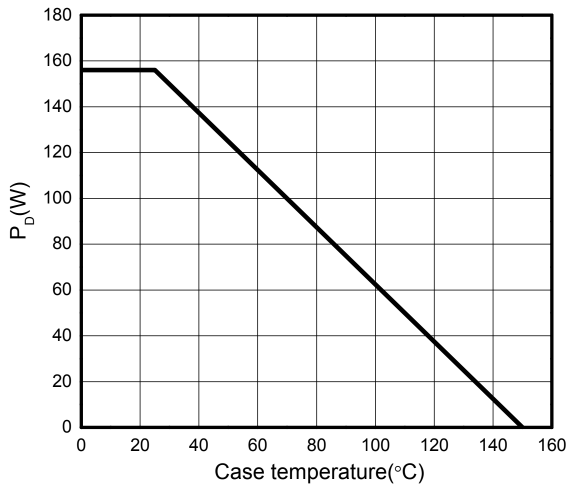


Figure 13: Safe Operating Area

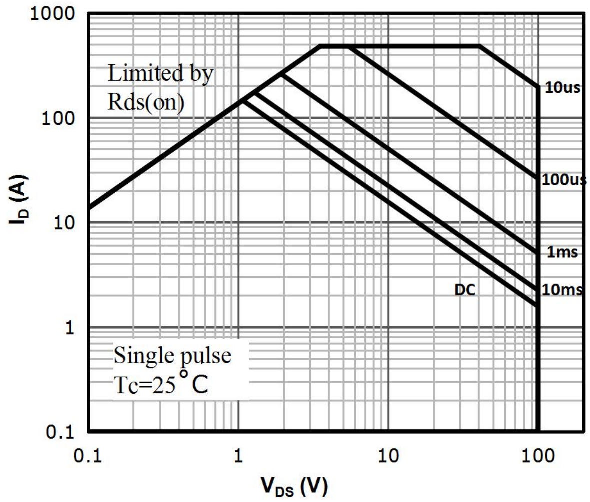
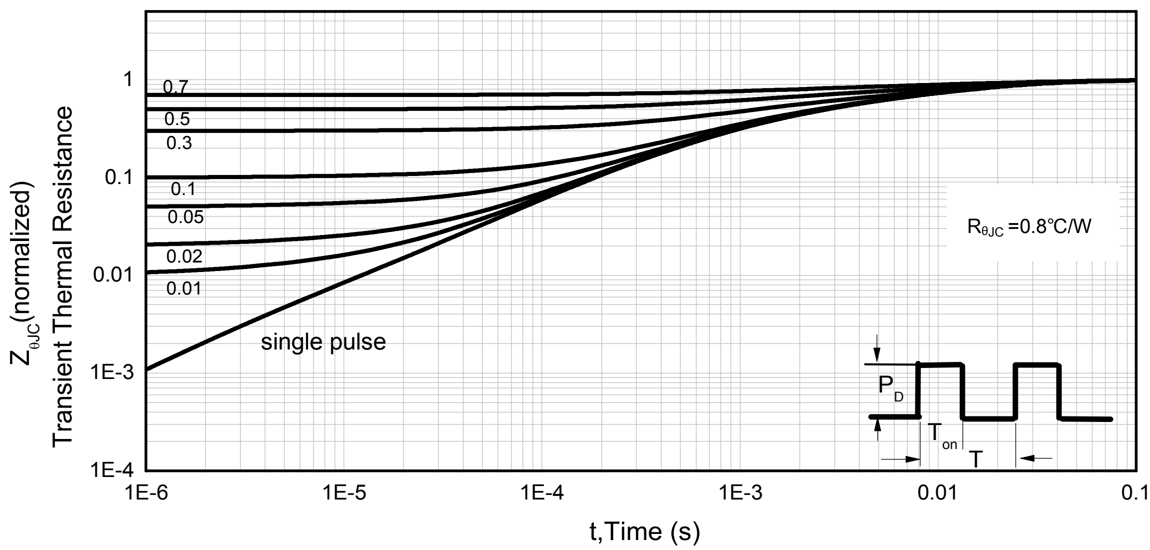
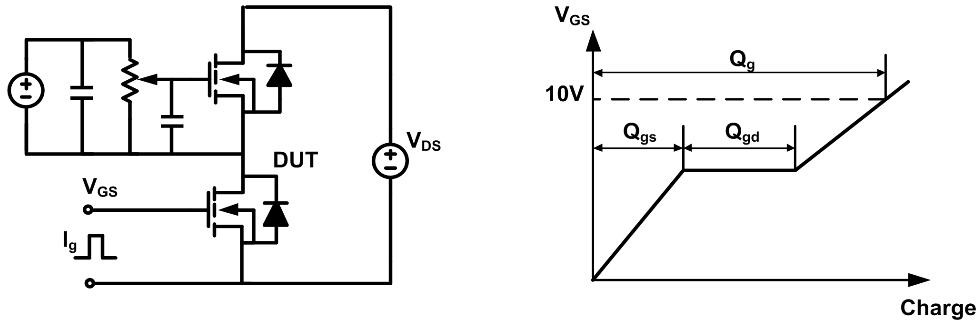


Figure 14. Normalized Maximum Transient Thermal Impedance (RthJC)

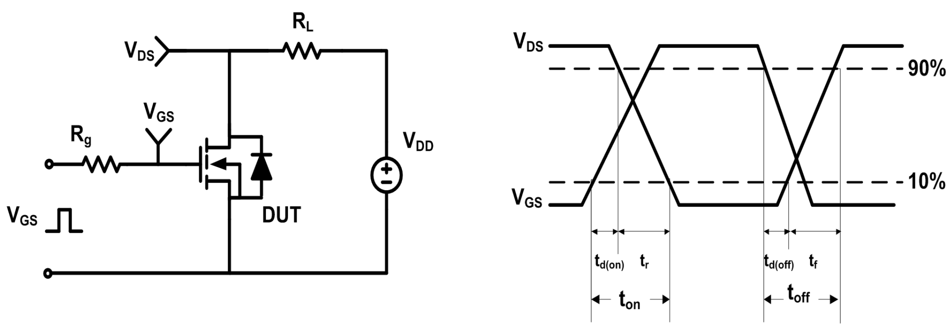


Test Circuit & Waveforms

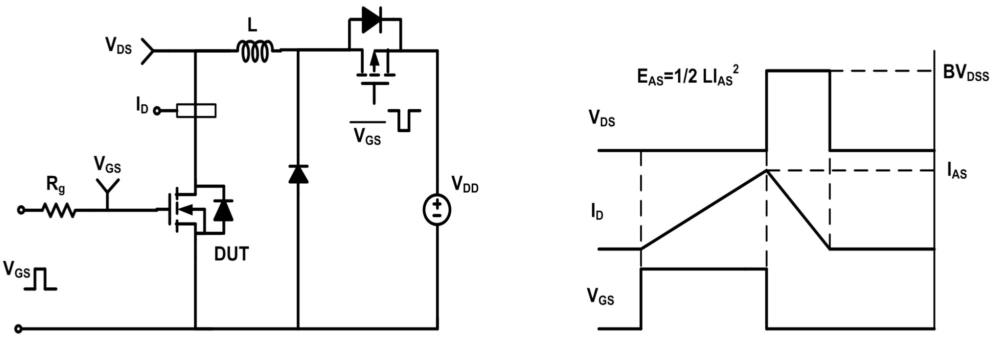
Gate Charge Test Circuit & Waveform



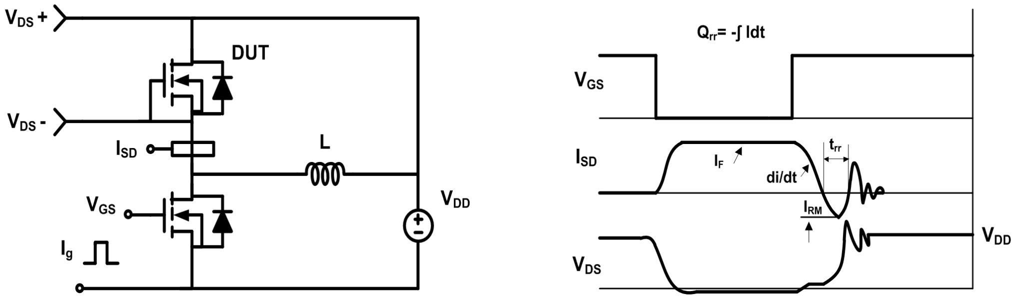
Resistive Switching Test Circuit & Waveform



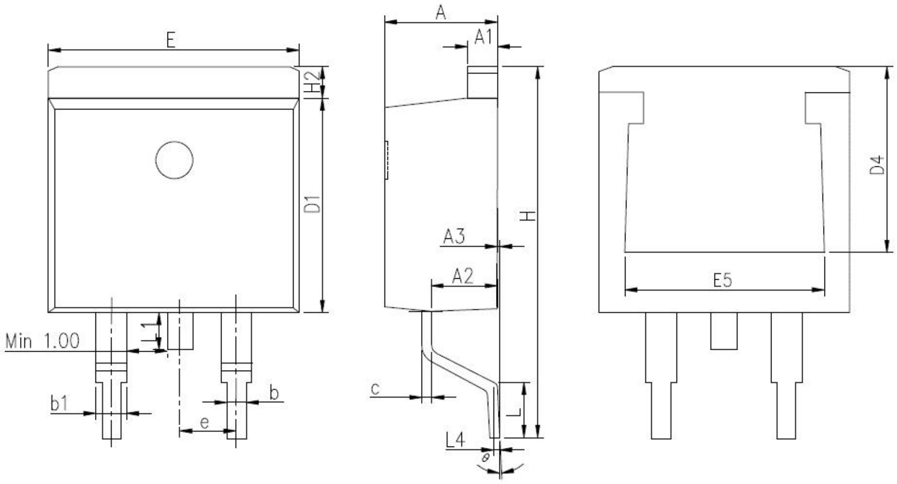
Unclamped Inductive Switching (UIS) Test Circuit & Waveform



Diode Recovery Test Circuit & Waveform



Mechanical Dimensions for TO-263



DIMENSIONS IN MILLITMETERS			DIMENSIONS IN INCHES	
SYMBOL	MIN	MAX	MIN	MAX
A	4.36	4.8	0.172	0.189
A1	1.19	1.42	0.047	0.056
A2	2.2	2.96	0.087	0.117
A3	0	0.25	0	0.010
b	0.7	0.96	0.028	0.038
b1	1.17	1.47	0.046	0.058
c	0.3	0.69	0.012	0.027
D1	8.5	9.5	0.335	0.374
D4	6.6	-	0.260	-
E	9.8	10.55	0.386	0.415
E5	7.06	8.7	0.278	0.343
e	2.54BSC		0.1BSC	
H	14.7	15.7	0.579	0.618
H2	0.95	1.65	0.037	0.065
L	1.9	2.8	0.075	0.110
L1	-	1.78	-	0.070
L4	0.25BSC		0.01BSC	
θ	0°	9°	0°	9°

Revision History

LSGE10R042

Revision:2020-12-30 ,Rev 1.1

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