

Features

- Uses advanced SGT technology
- Extremely low on-resistance $R_{DS(on)}$
- Excellent gate charge x $R_{DS(on)}$ product(FOM)

Application

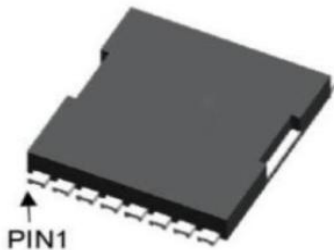
- Motor control and drive
- Battery management
- UPS

Product Summary

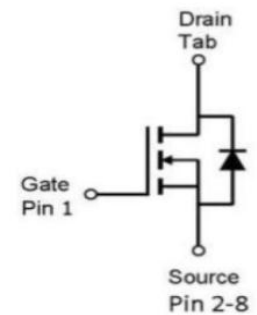
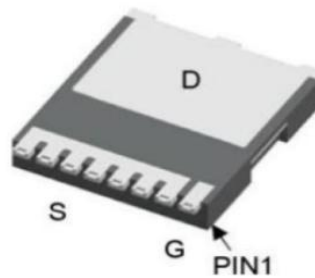
Package	TOLL
V_{DS}	250V
$R_{DS(on)}@V_{GS}=10V$	16.2mΩ
I_D	100A

Package Marking

TOLL Top View



TOLL Bottom View



Type	Package	Marking	Reel Size	Tape Width	Packing	Qty
LR175N25S10	TOLL	LR175N25S10	330*28.5mm	24mm	Reel&Tape	2000

Maximum Ratings (TC=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	250	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous drain current $T_c=25^{\circ}C$ (Silicon limit) $T_c=100^{\circ}C$ (Silicon limit)	I_D	100 63	A
Pulsed Drain Current	I_{DM}	400	A
Maximum Power Dissipation	P_d	338	W
Single pulse avalanche energy ^[1]	E_{AS}	1122	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	°C

1. EAS condition: $T_J=25^{\circ}C, I_{AS}=67A, V_{GS}=10V, L=0.5mH$

Thermal Characteristic

Thermal Resistance,Junction-to-Case	R_{thJC}	0.37	°C/W
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Electrical Characteristics (T_C=25°C unless otherwise noted)

Parameter	Symbol	Condition	min	typ	max	Unit
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Static Characteristic

Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	250	273	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3	4	
Zero gate voltage drain current	I_{DSS}	$V_{DS}=250V, V_{GS}=0V$	-	-	1	μA
Gate-source leakage current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	±100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$I_D=40A, V_{GS}=10V$	-	16.2	17.5	mΩ
Gate resistance	Rg	f=1MHz	-	3.6	-	Ω

Dynamic Characteristic

Input Capacitance	C_{iss}	$V_{DS}=40V, V_{GS}=0V,$ f=1MHz	-	4443	-	pF
Output Capacitance	C_{oss}		-	893	-	
Reverse Transfer Capacitance	C_{rss}		-	12	-	
Gate Total Charge	Q_G	$V_{DS}=125V, I_D=50A,$ $V_{GS}=10V$	-	61	-	nC
Gate-Source charge	Q_{gs}		-	26	-	
Gate-Drain charge	Q_{gd}		-	10	-	
Turn-on delay time	$t_{d(on)}$	$V_{GS}=10V, V_{DS}=125V,$ $R_G=2.7\Omega$	-	13	-	ns
Rise time	t_r		-	43	-	
Turn-off delay time	$t_{d(off)}$		-	56	-	
Fall time	t_f		-	25	-	

Body Diode Characteristic

Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=40A$	-	0.8	1.4	v
Reverse Recovery Time	t_{rr}	$I_F=50A$ $di/dt=100A/\mu s$	-	171	-	ns
Reverse Recovery Charge	Q_{rr}		-	1062	-	nC

Typical Performance Characteristics

Fig 1: Output Characteristics

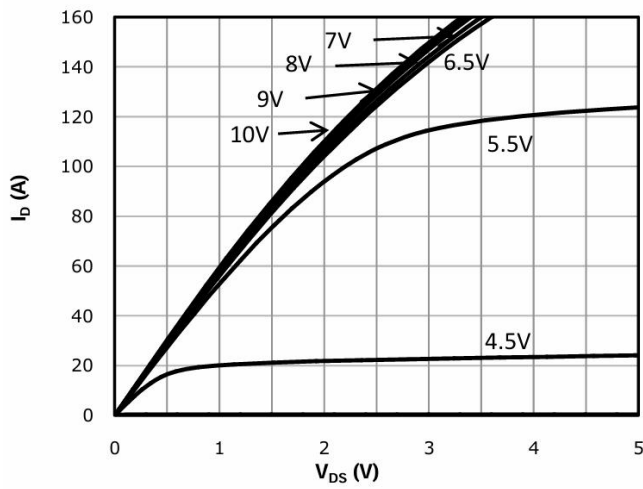


Fig 2: Transfer Characteristics

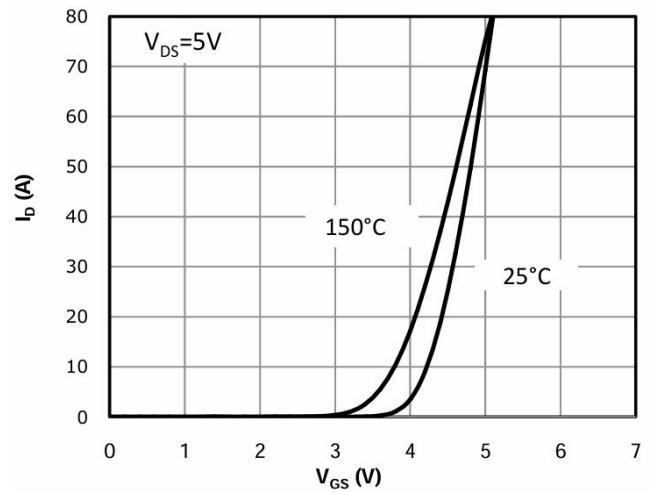


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

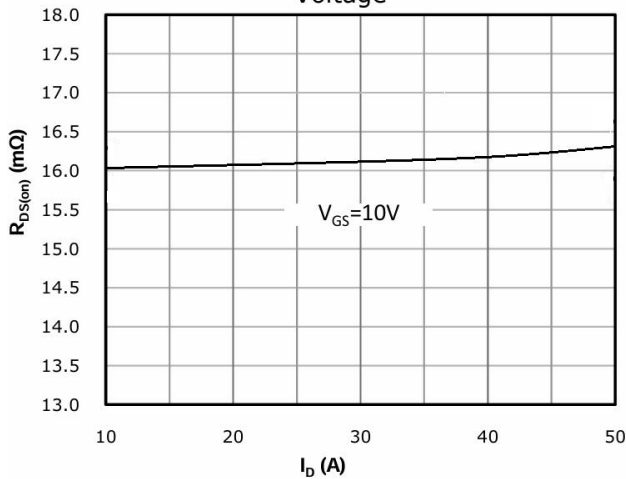


Fig 4: $R_{DS(on)}$ vs Gate Voltage

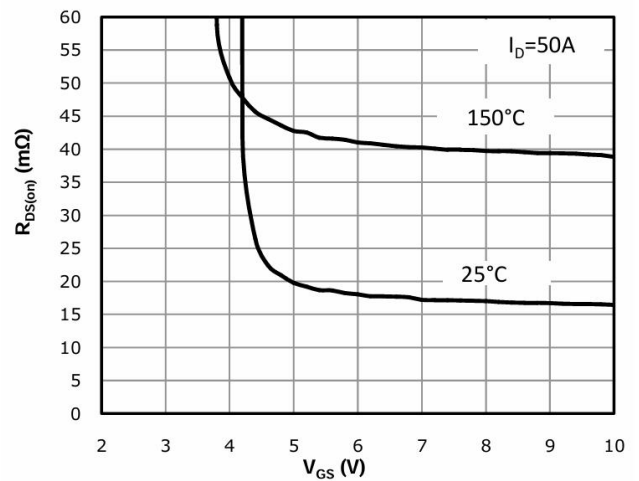


Fig 5: $R_{DS(on)}$ vs. Temperature

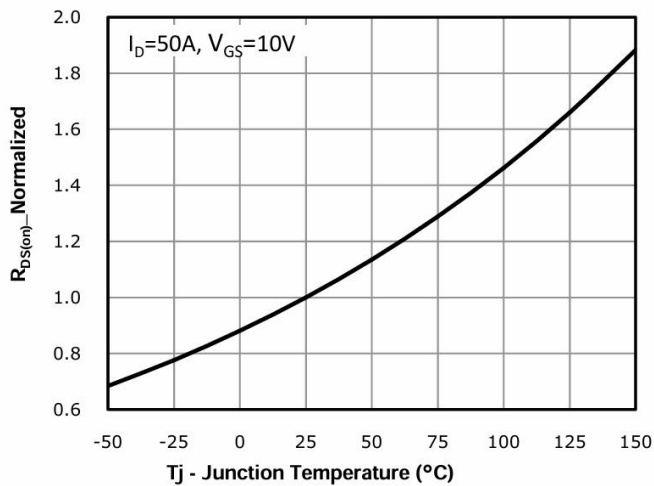


Fig 6: $V_{GS(th)}$ vs. Temperature

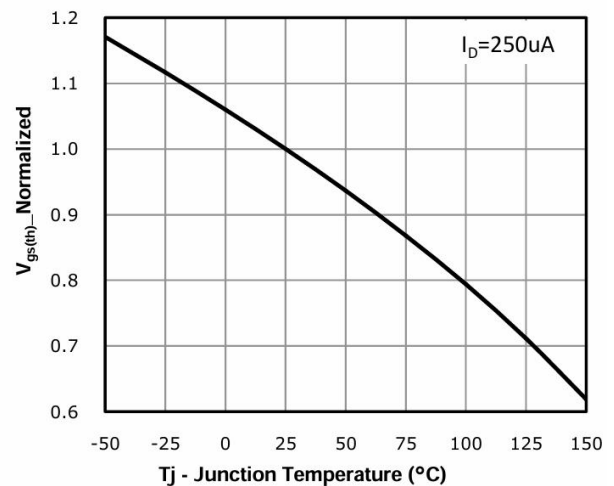


Fig 7: BVdss vs. Temperature

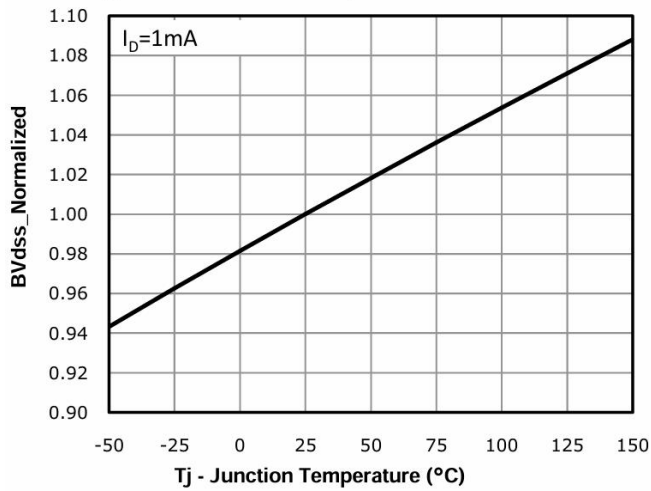


Fig 8: Capacitance Characteristics

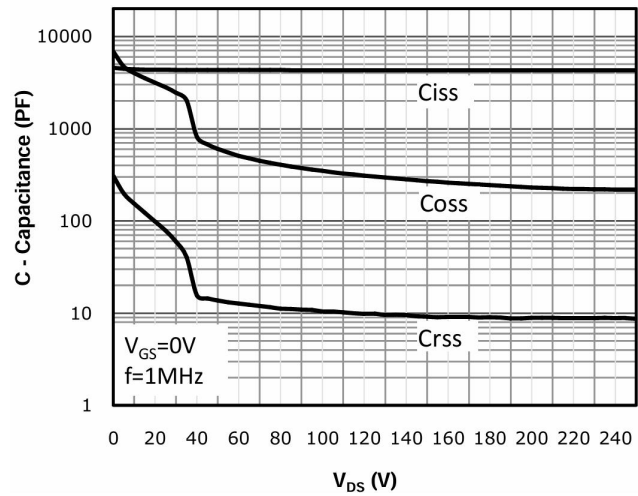


Fig 9: Gate Charge Characteristics

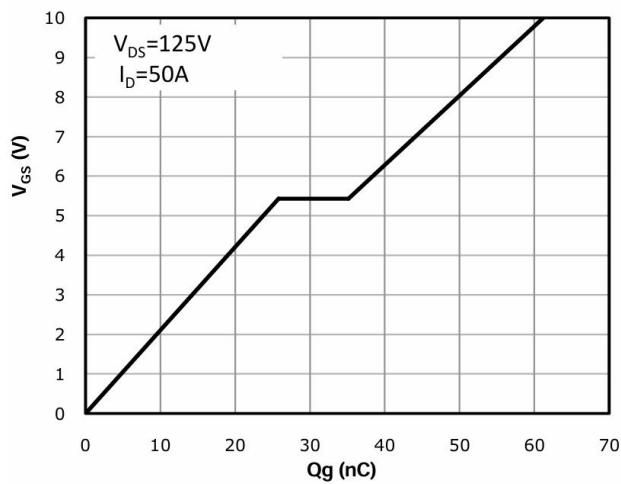


Fig 10: Body-diode Forward Characteristics

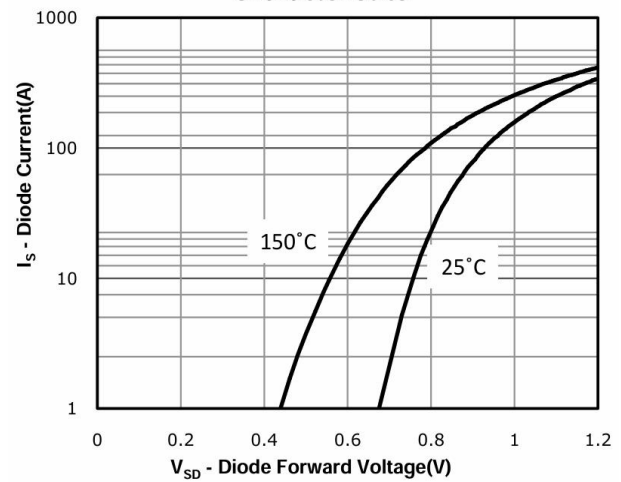


Fig 11: Power Dissipation

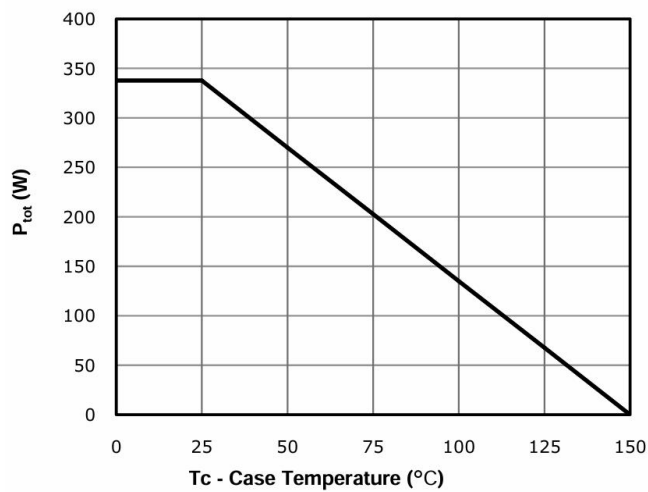


Fig 12: Drain Current Derating

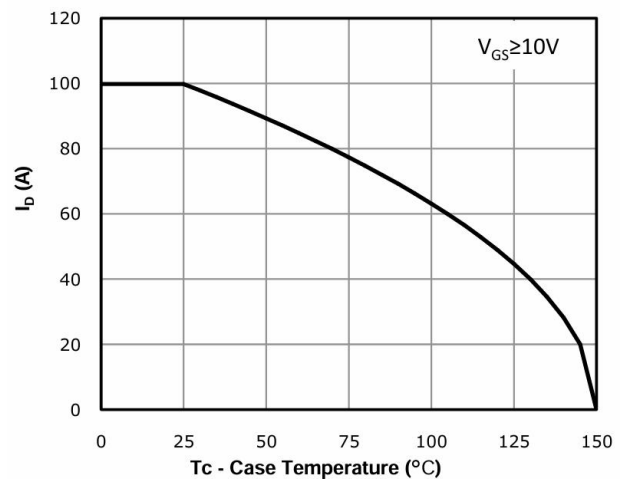


Fig 13: Safe Operating Area

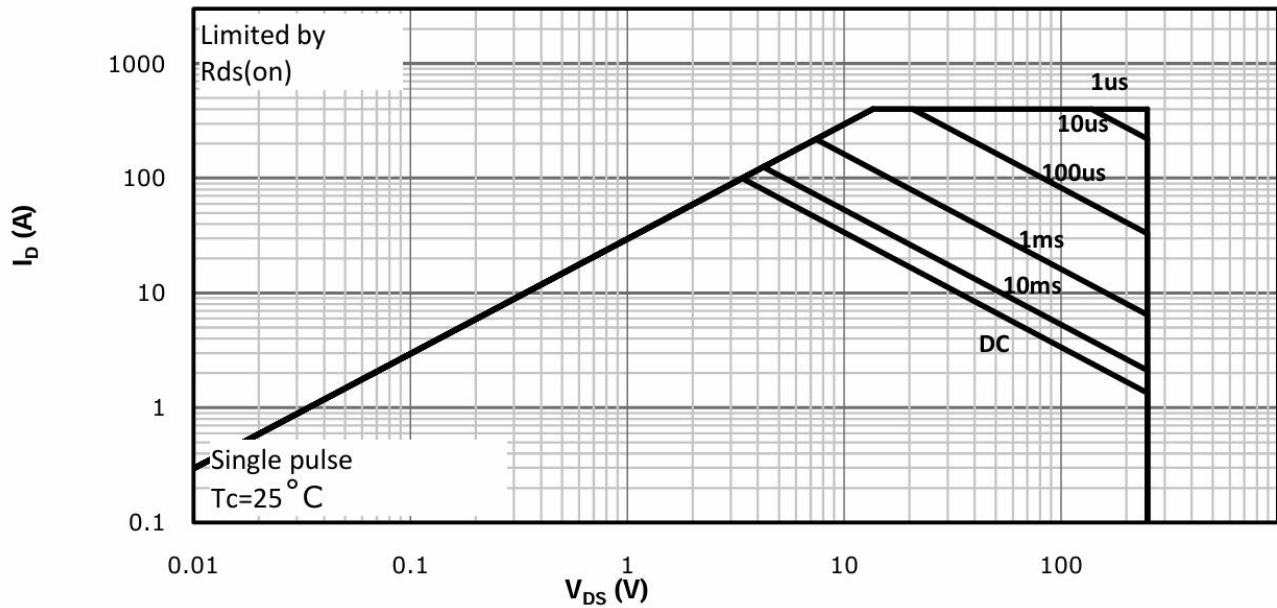
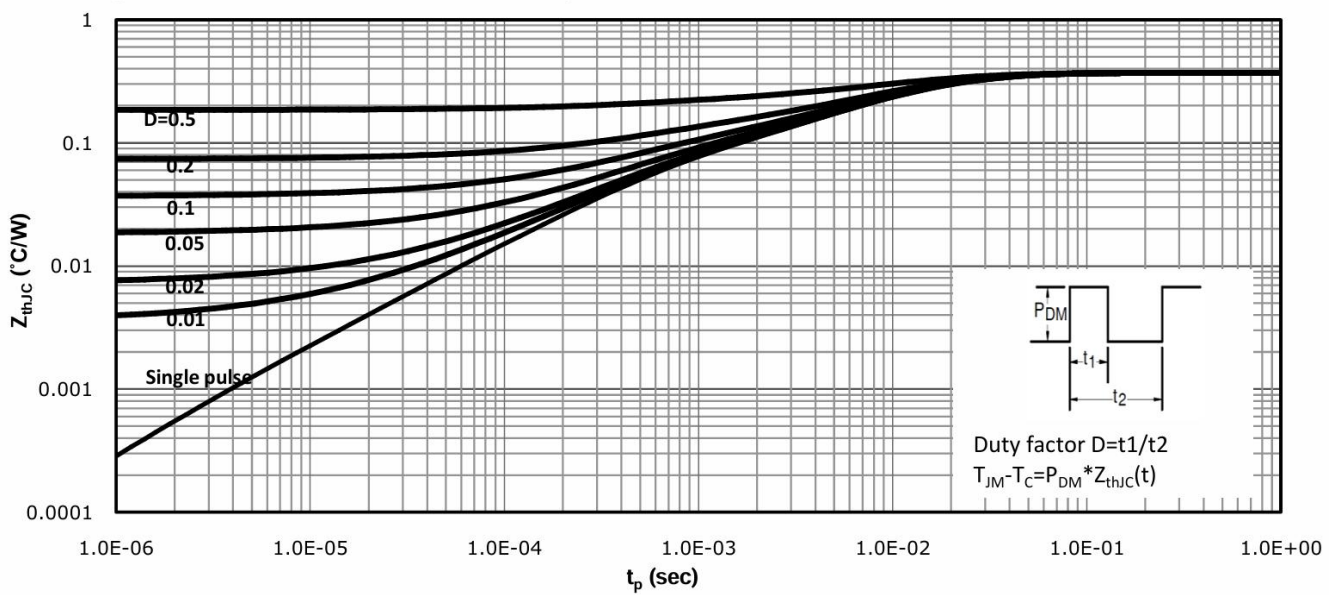
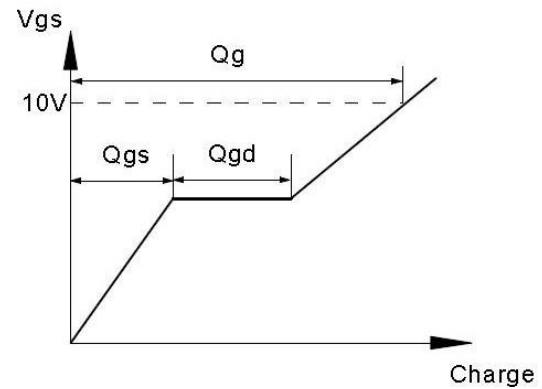
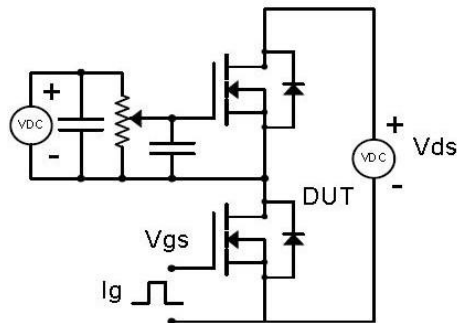


Fig 14: Max. Transient Thermal Impedance

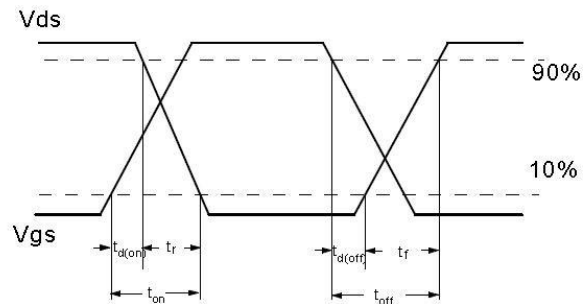
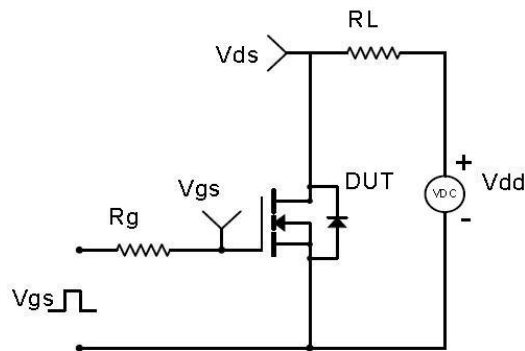


Test Circuit & Waveform

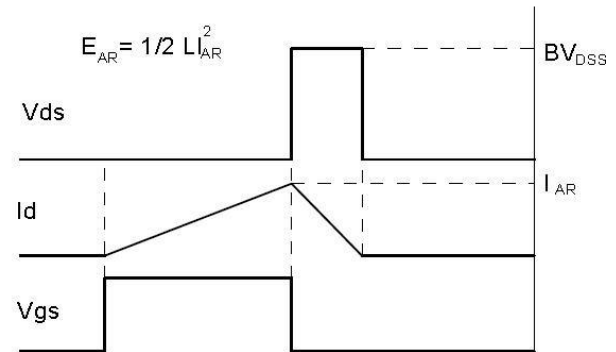
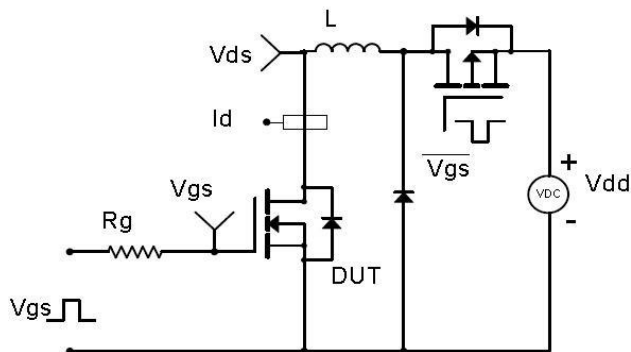
Gate Charge Test Circuit & Waveform



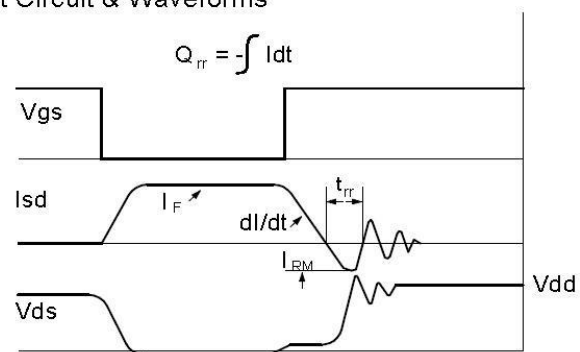
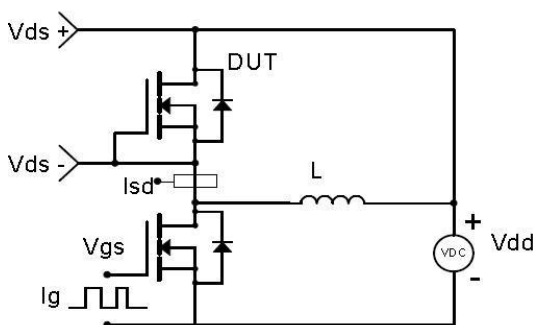
Resistive Switching Test Circuit & Waveforms



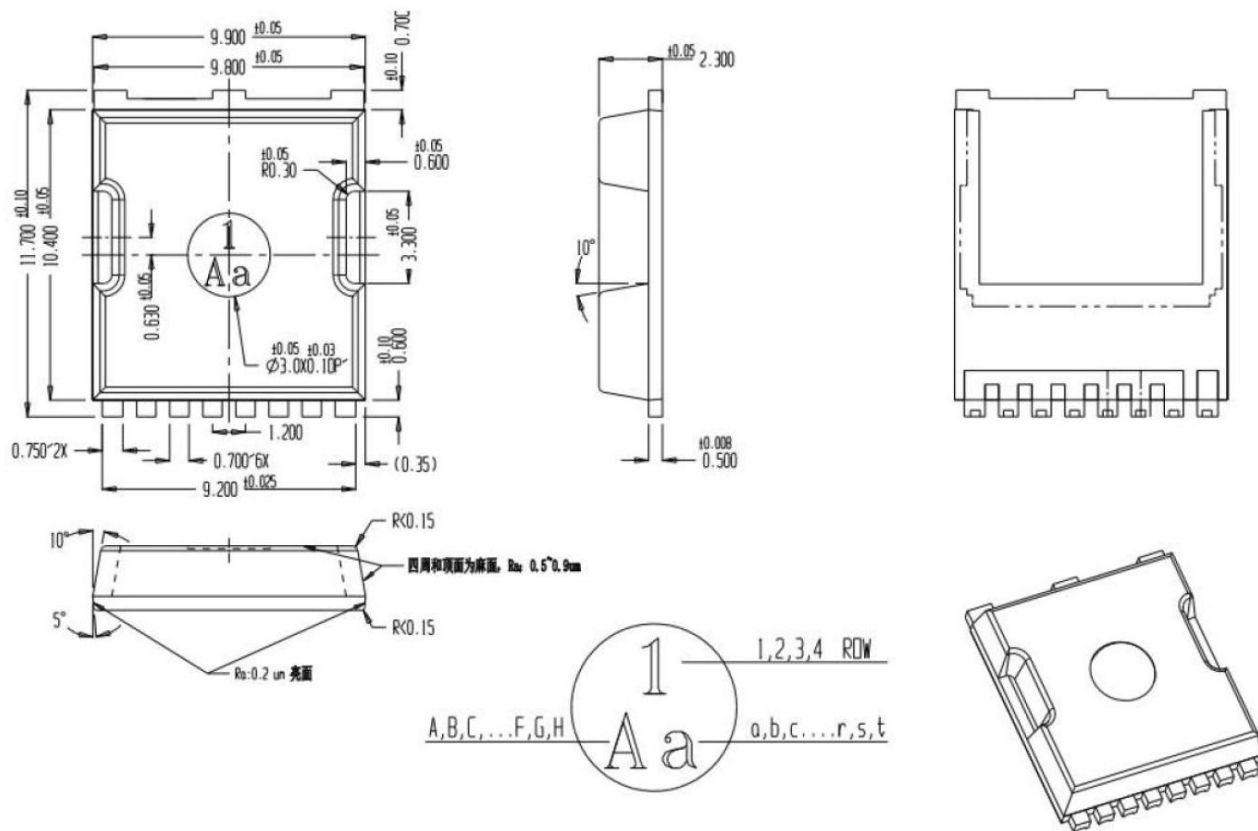
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Outline:TOLL



Revision History:

Revision	Date	Major changes
1.0	2025/5/26	Release of Preliminary version.