RST038N15S10

N-MOSFET 150V, 210A, 3.1mΩ

Features

- Excellent gate charge x $R_{DS(on)}$ product(FOM)
- $R_{DS(on).typ}$=3.1mΩ@V_{GS}=10V
- High Reliability Capability

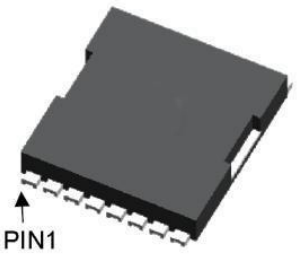
Product Summary

V_{DS}	150V
$R_{DS(on).typ}$@V_{GS}=10V	3.1mΩ
I_D	210A

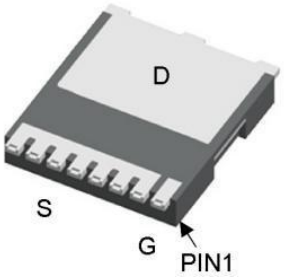
Application

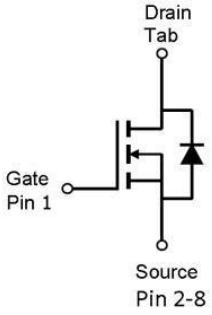
- Charger
- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

TOLL Top View



TOLL Bottom View





Package Marking and Ordering Information

Type	Package	Marking	Reel Size	Qty
RST038N15S10	TOLL	LR038N15S10	330*28.5mm	5000

Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source Voltage	V_{DS}	150	V
Continuous Drain Current T_C = 25°C T_C = 100°C	I_D	 210 178	A
Pulsed Drain Current	$I_{D\ pulse}$	800	A
Avalanche Energy, Single Pulse	E_{AS}	2025	mJ
Gate-emitter Voltage	V_{GS}	±20	V
Power Dissipation, T_C = 25℃	P_D	265	W
Operating Junction And Storage Temperature	T_j , T_{stg}	-55~150	℃

Thermal Resistance

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance, Junction to Case	R_{thJC}	-	0.47	℃/W
Thermal Resistance, Junction to Ambient	R_{thJA}	-	40	℃/W

Electrical Characteristic, at Tj = 25 °C, unless otherwise specified

Parameter	Symbol	Test Condition	Value			Unit
			min.	typ.	max.	
Static Characteristic						
Drain-source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250uA	150	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	2.0	3.0	4.0	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=150V, V_{GS}=0V	-	-	1	μA
Gate-source leakage current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Drain-source on-state Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=40A	-	3.1	3.8	mΩ
Dynamic Characteristic						
Input Capacitance	C_{iss}	V_{GS}=0V,	-	10704	-	pF
Output Capacitance	C_{oss}	V_{DS}=40V,	-	2223	-	
Reverse Transfer Capacitance	C_{rss}	f=1MHz	-	30	-	
Gate Total Charge	Q_g	V_{GS}=10V,	-	150	-	nC
Gate-Source charge	Q_{gs}	V_{DS}=75V,	-	58	-	
Gate-Drain charge	Q_{gd}	I_D=40A	-	30	-	
Turn-on Delay Time	$t_{d(on)}$	V_{GS}=10V,	-	40	-	ns
Turn-on Rise Time	t_r	V_{DD}=75V,	-	69	-	
Turn-off Delay Time	$t_{d(off)}$	I_D=40A,	-	88	-	
Turn-off Fall Time	t_f	R_G=3Ω	-	33	-	

Body Diode Characteristic

Body Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_{SD}=40A	-	-	1.2	V
Reverse Recovery Time	t_{rr}	I_F=40A,	-	99	-	ns
Reverse Recovery Charge	Q_{rr}	dI_F/dt=100A/us	-	333	-	nC

Typical Performance Characteristics

Fig 1: Output Characteristics

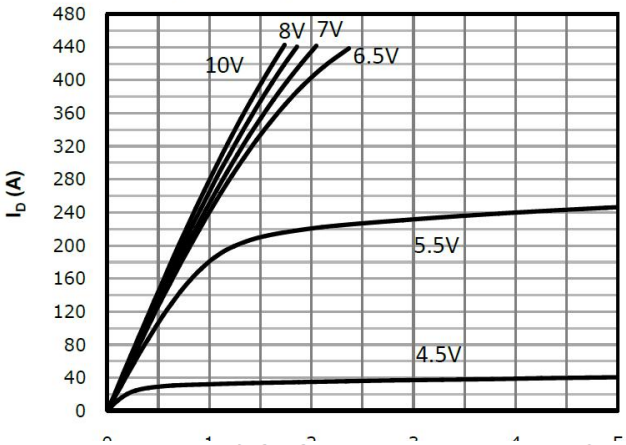


Fig 2: Transfer Characteristics

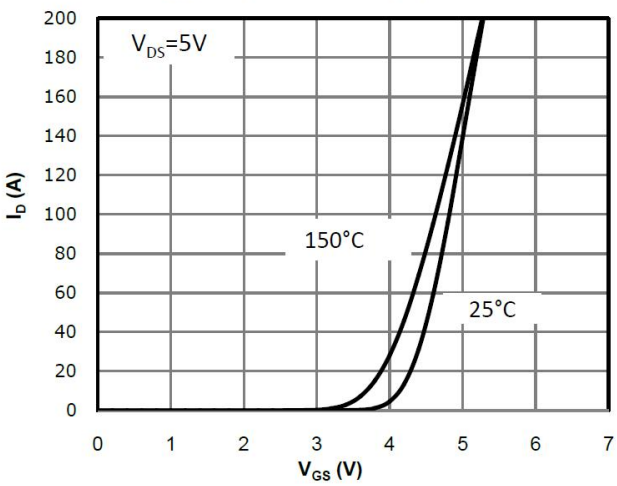


Fig 3: Rds(on) vs Drain Current and Gate Voltage

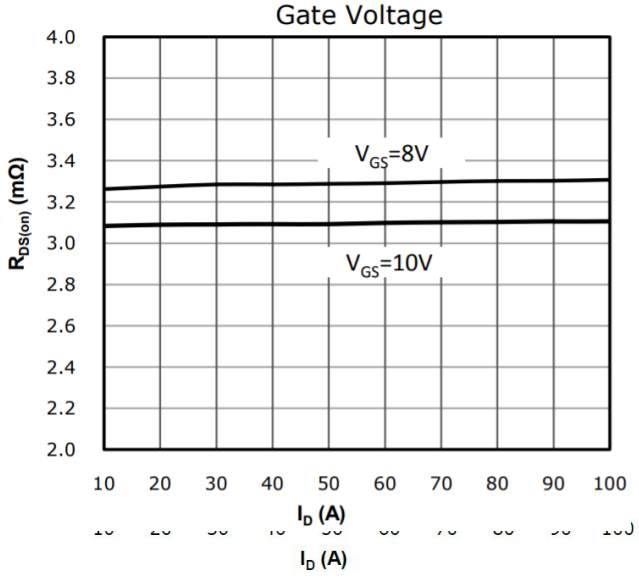


Fig 4: Rds(on) vs Gate Voltage

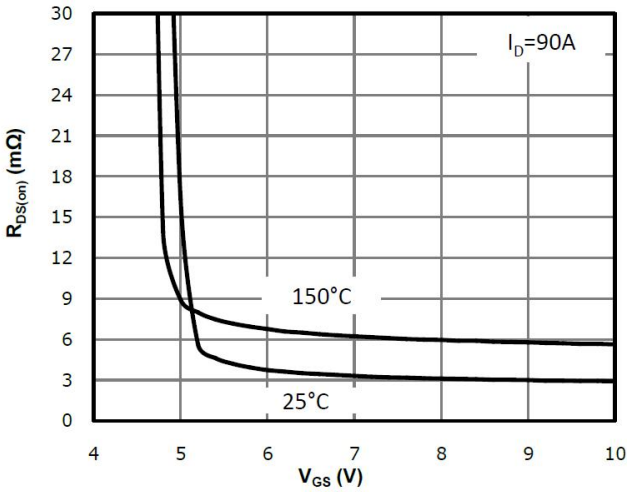


Fig 5: Rds(on) vs. Temperature

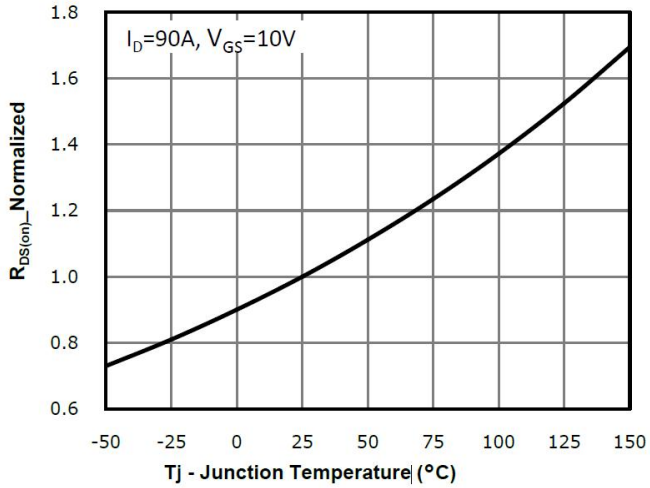


Fig 6: Vgs(th) vs. Temperature

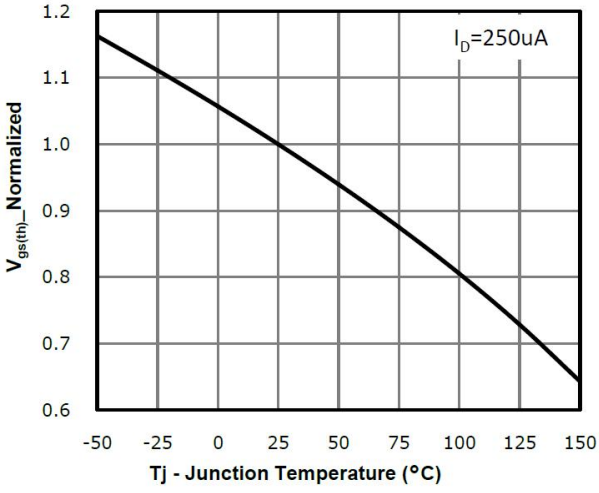


Fig 7: BVdss vs. Temperature

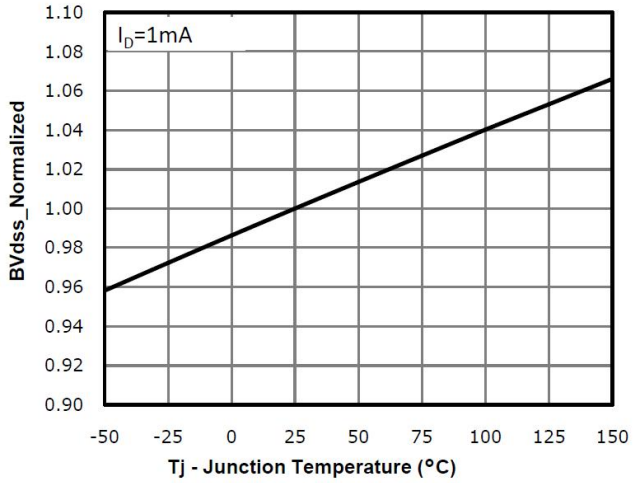


Fig 8: Capacitance Characteristics

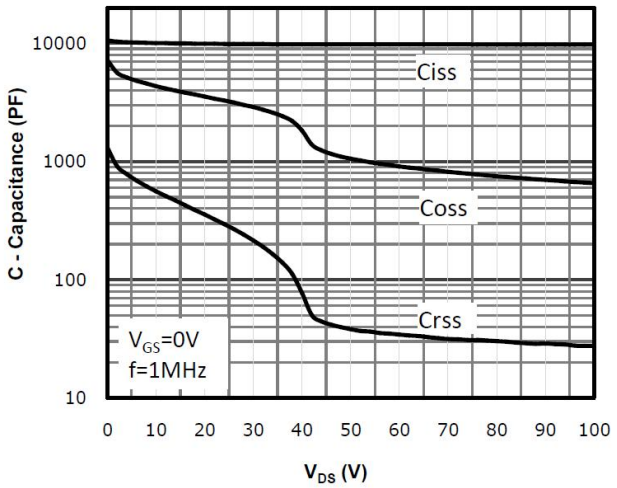


Fig 9: Gate Charge Characteristics

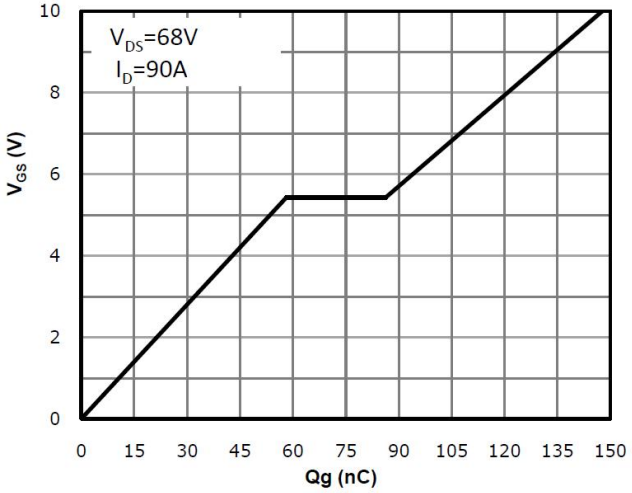


Fig 10: Body-diode Forward Characteristics

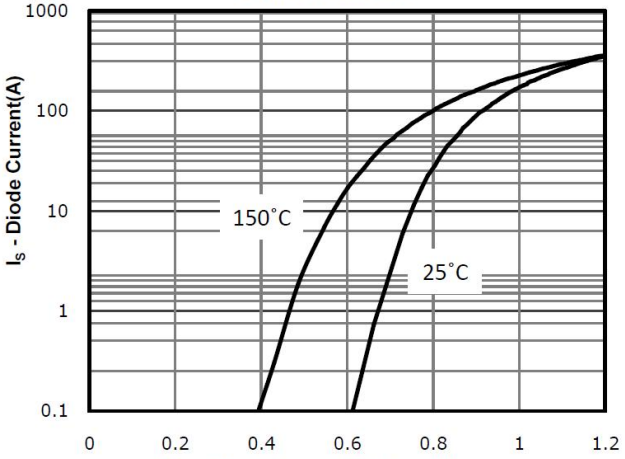
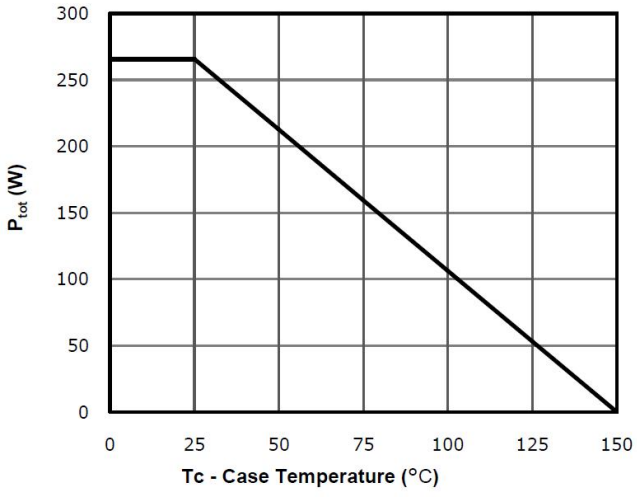


Fig 11: Power Dissipation



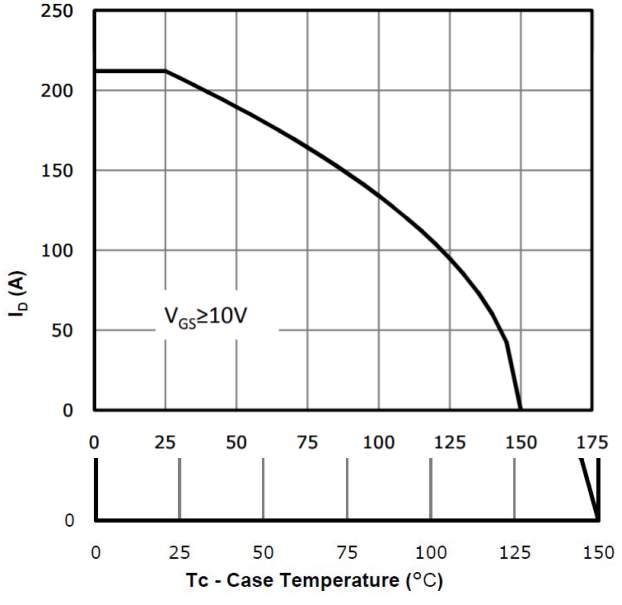


Fig 13: Safe Operating Area

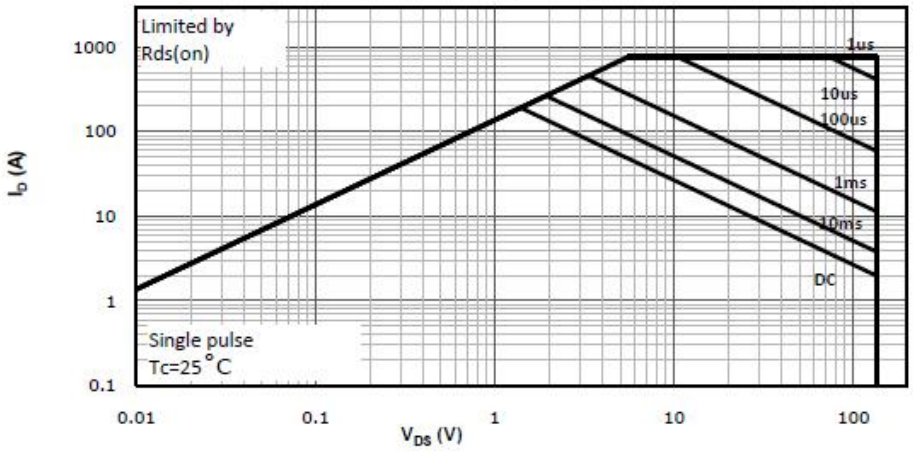
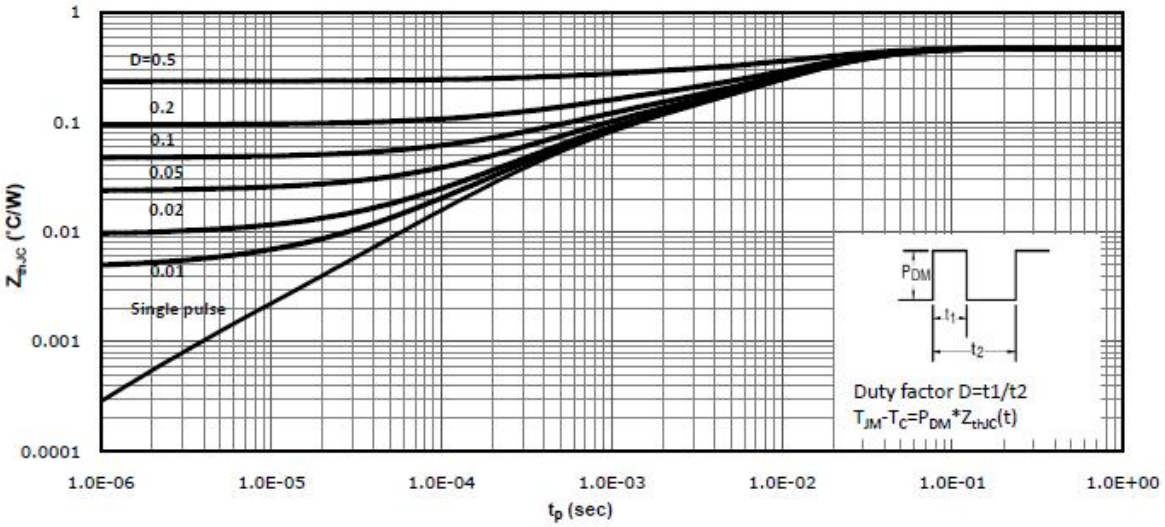
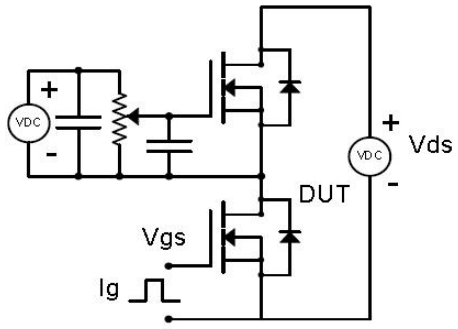


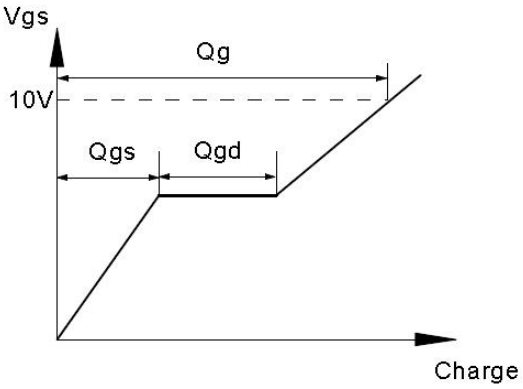
Fig 14: Max. Transient Thermal Impedance



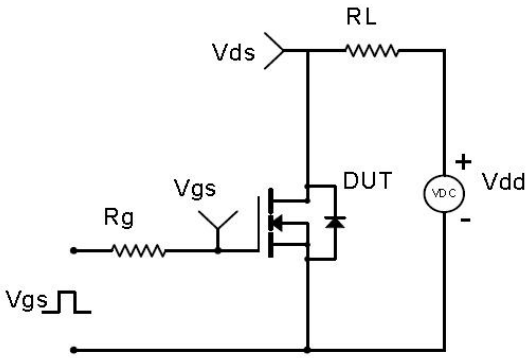
Test Circuit & Waveform

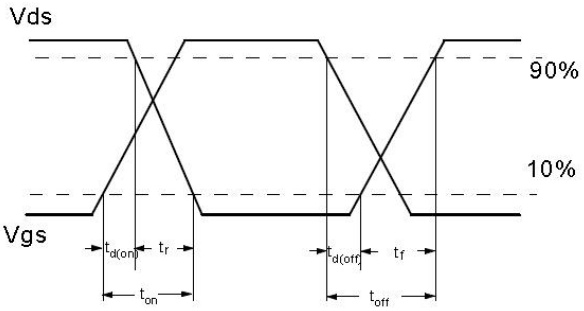
Gate Charge Test Circuit & Waveform



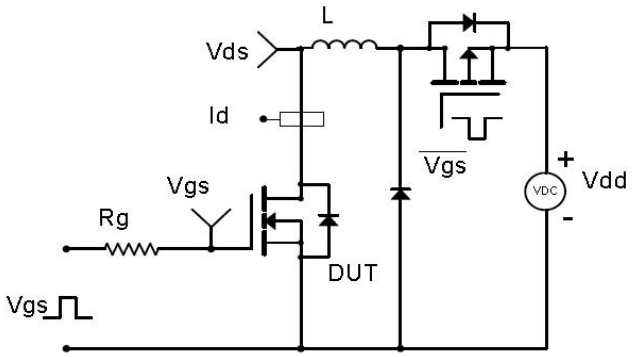


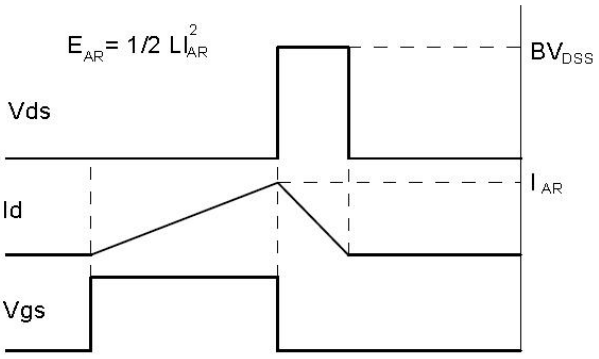
Resistive Switching Test Circuit & Waveforms



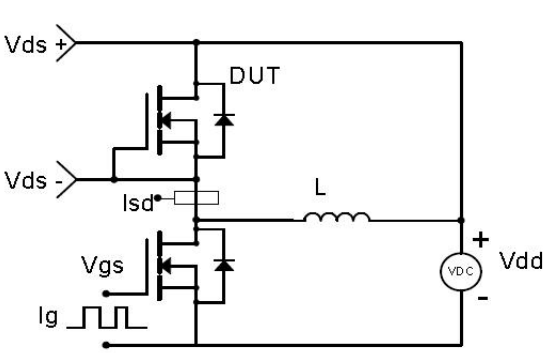


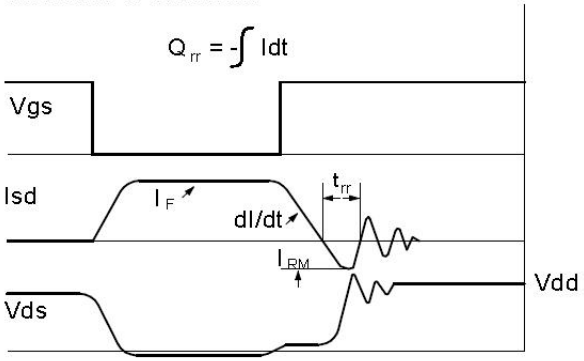
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms





Diode Recovery Test Circuit & Waveforms





Package Outline: TOLL

