RST036N09XD10

N-MOSFET TOLL 90V,193A,3mΩ

Features

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

Application

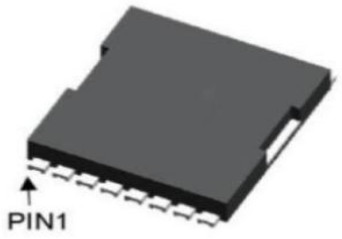
- Motor control and drive
- Battery management
- DC/DC

Product Summary

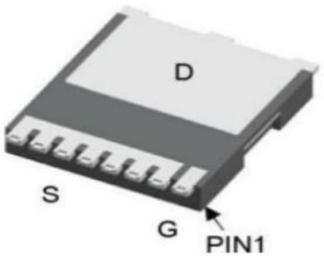
Package	TOLL
V_{DS}	90V
$R_{DS(on)@VGS=10V}$	3mΩ
I_D	193A

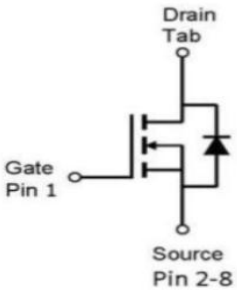
Package Marking

TOLL Top View



TOLL Bottom View





Type	Package	Marking	Reel Size	Tape Width	Packing	Qty
RST036N09XD10	TOLL	LR036N09XD10	330*28.5mm	24mm	Reel&Tape	2000

Maximum Ratings (TC=25℃unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	90	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous drain current T_c=25℃（Silicon limit） T_c=100℃（Silicon limit）	I_D	 193 122	A
Pulsed Drain Current	I_{DM}	596	A
Maximum Power Dissipation	P_d	227	W
Single pulse avalanche energy	E_{AS}	410	mJ
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Case	R_{thJC}	0.55	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Parameter	Symbol	Condition	min	typ	max	Unit
Static Characteristic						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250uA	90	-	-	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}=80V,V_{GS}=0V	-	-	1	μA
Gate-source leakage current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
Drain-source on-state resistance	$R_{DS(on)}$	I_D=30A,V_{GS}=10V	-	3	3.6	mΩ
Dynamic Characteristic						
Input Capacitance	C_{iss}	V_{DS}=40V,V_{GS}=0V, f=1MHz	-	3440	-	pF
Output Capacitance	C_{oss}		-	1642	-	
Reverse Transfer Capacitance	C_{rss}		-	51	-	
Gate resistance	Rg	f=1MHz	-	1	-	Ω
Gate Total Charge	Q_G	V_{DS}=50V,I_D=100A, V_{GS}=10V	-	47	-	nC
Gate-Source charge	Q_{gs}		-	17	-	
Gate-Drain charge	Q_{gd}		-	7	-	
Turn-on delay time	$t_{d(on)}$	V_{GS}=10V, V_{DS}=50V, R_G=1.8Ω	-	18	-	ns
Rise time	t_r		-	11	-	
Turn-off delay time	$t_{d(off)}$		-	43	-	
Fall time	t_f		-	9	-	

Body Diode Characteristic

Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=30A	-	-	1.2	v
Reverse Recovery Time	t_{rr}	I_F =30A di/dt = 100A/μs	-	80	-	ns
Reverse Recovery Charge	Q_{rr}		-	147	-	nC

Typical Performance Characteristics

Fig 1: Output Characteristics

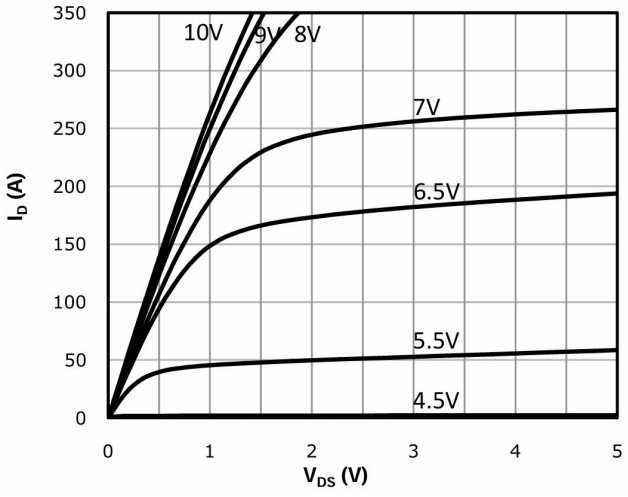


Fig 2: Transfer Characteristics

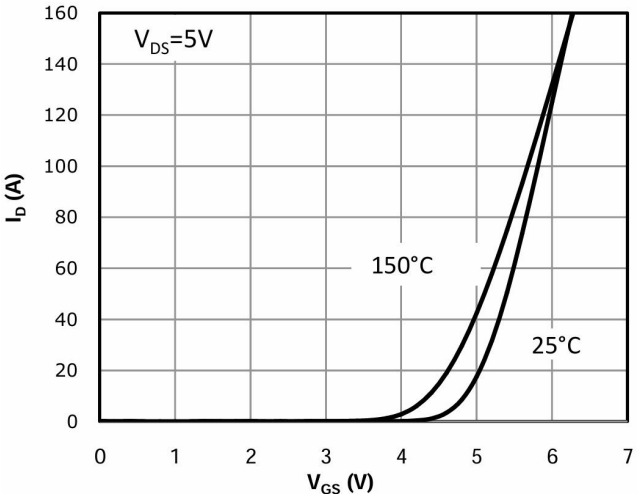


Fig 3: Rds(on) vs Drain Current and Gate Voltage

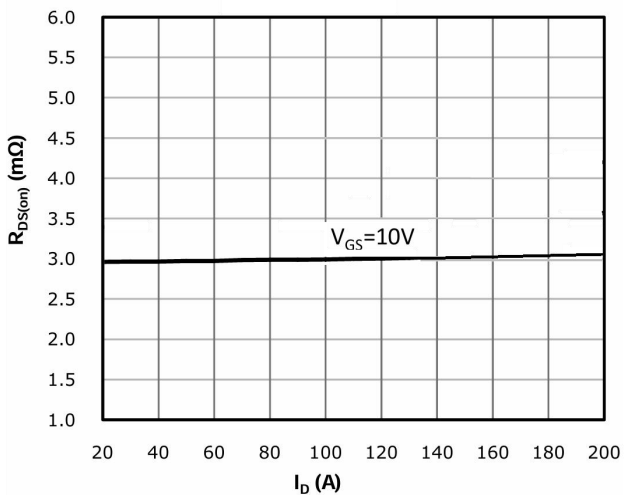


Fig 4: Rds(on) vs Gate Voltage

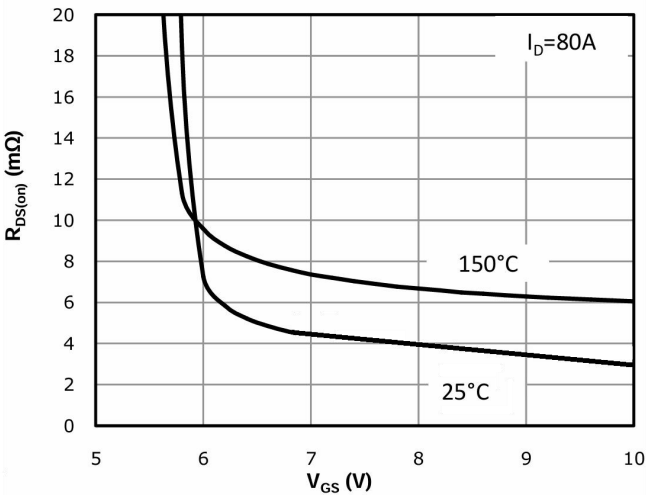


Fig 5: Rds(on) vs. Temperature

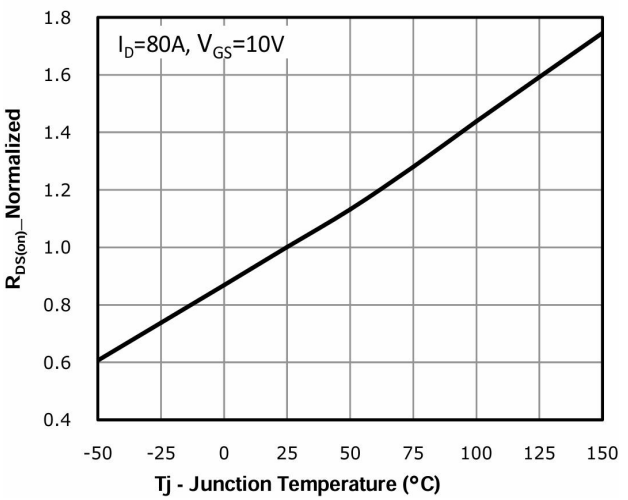


Fig 6: Vgs(th) vs. Temperature

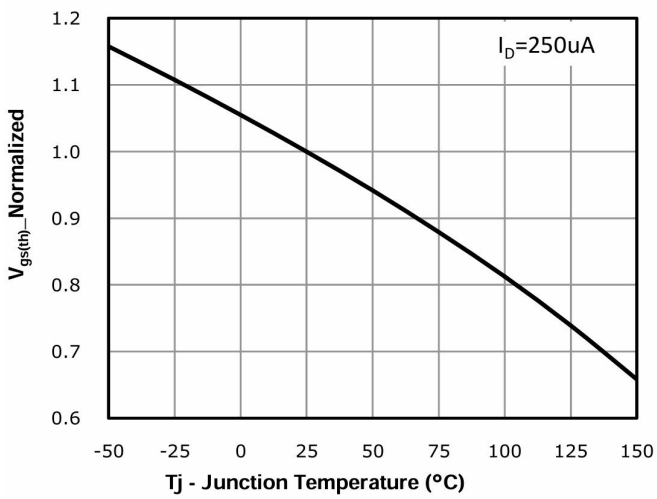


Fig 7: BVdss vs. Temperature

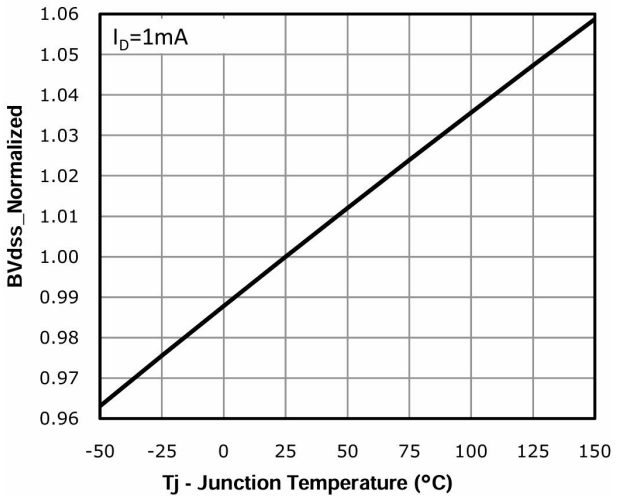


Fig 8: Capacitance Characteristics

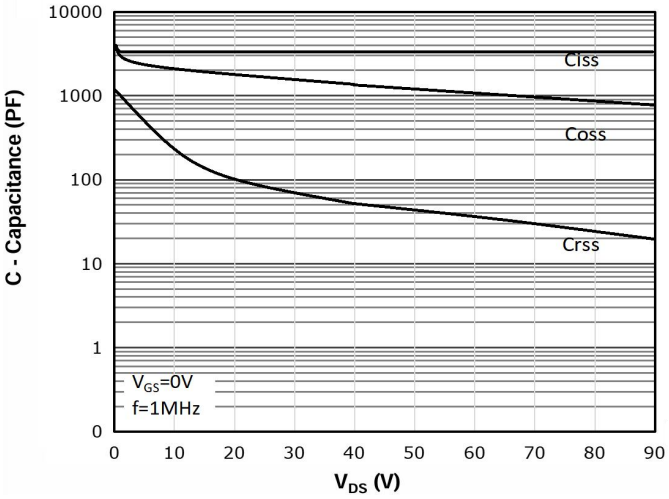


Fig 9: Gate Charge Characteristics

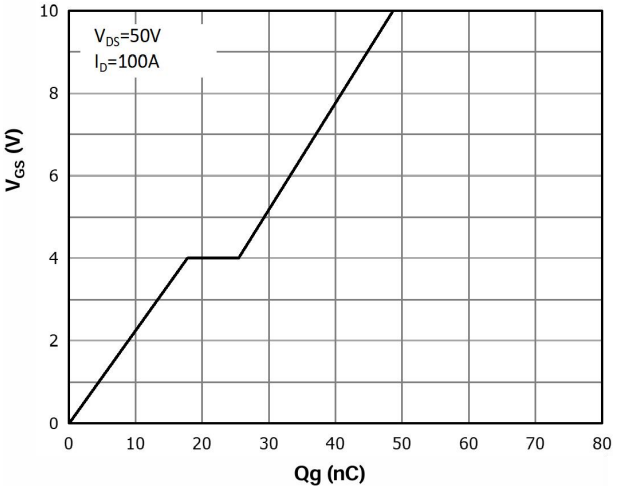


Fig 10: Body-diode Forward Characteristics

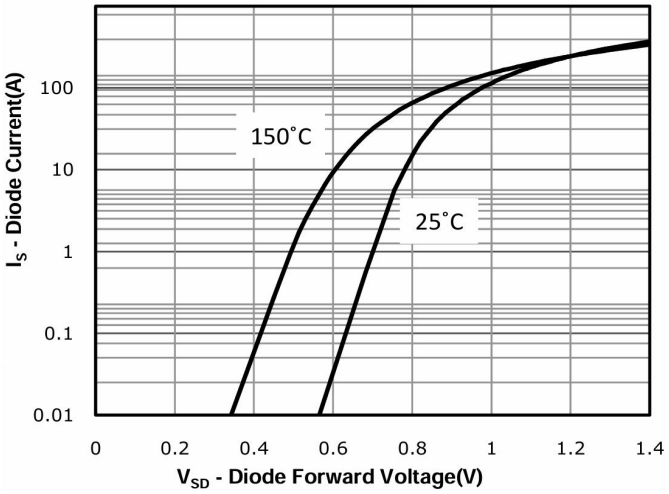


Fig 11: Power Dissipation

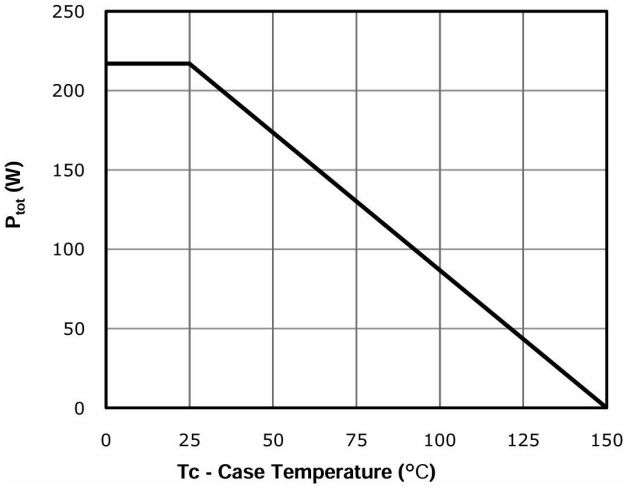


Fig 12: Drain Current Derating

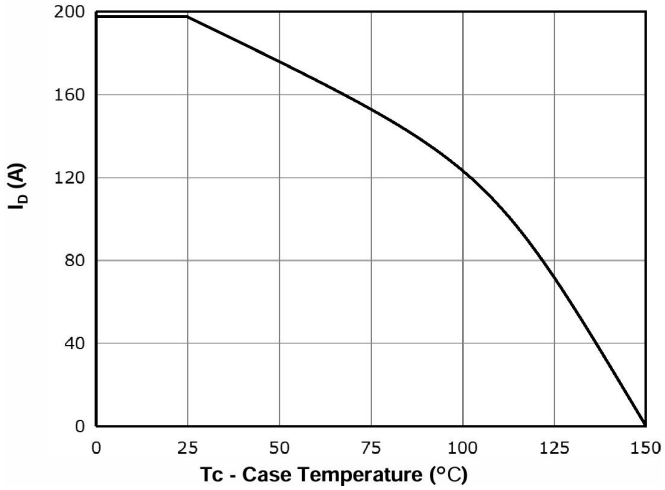


Fig 13: Safe Operating Area

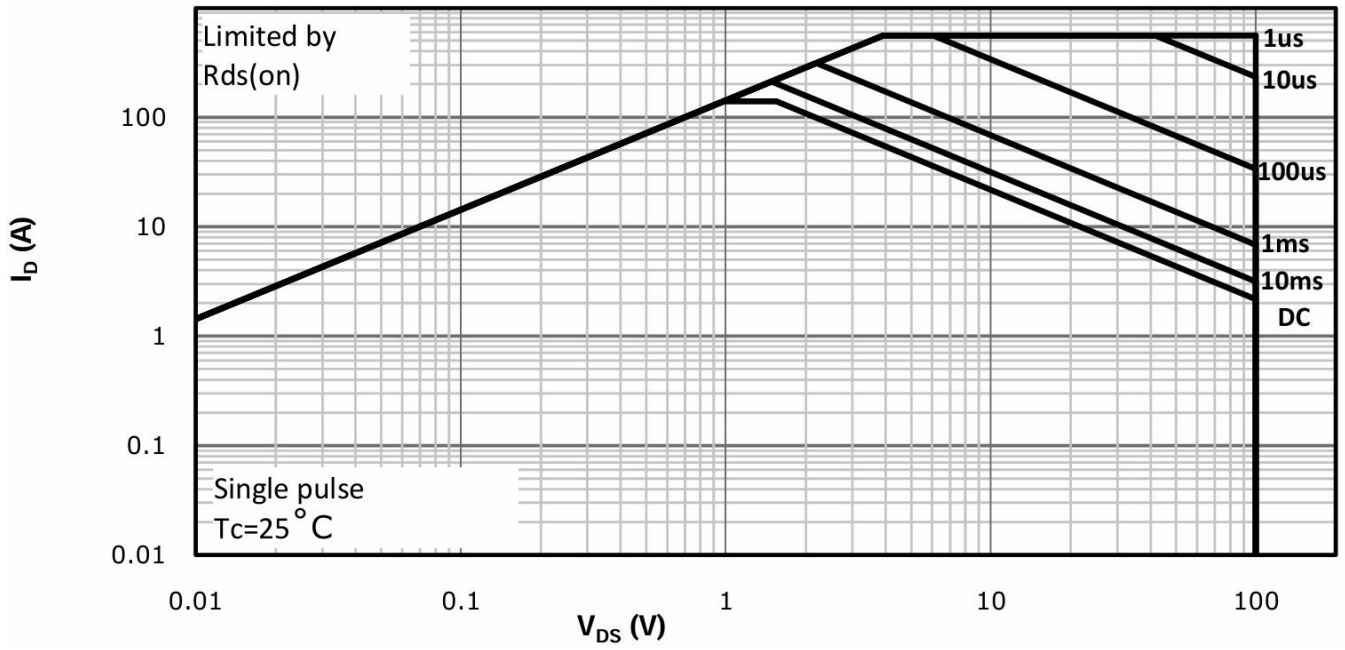
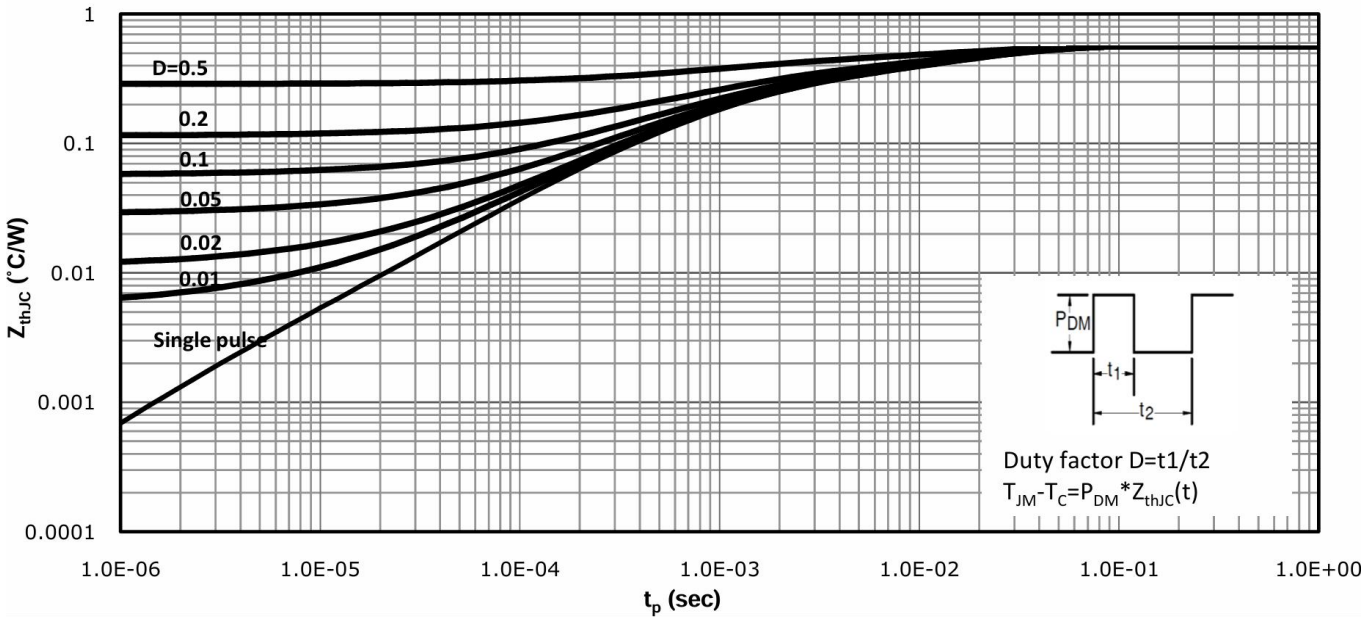
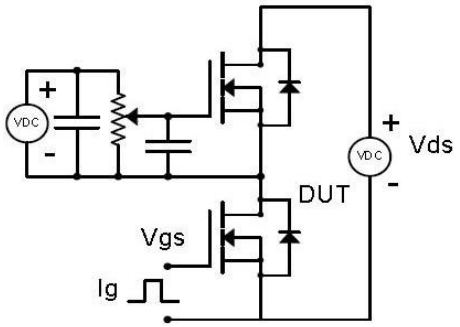


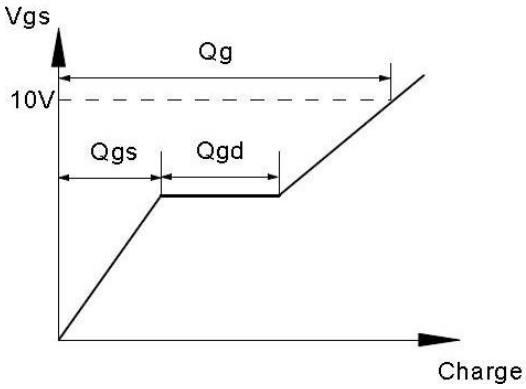
Fig 14: Max. Transient Thermal Impedance



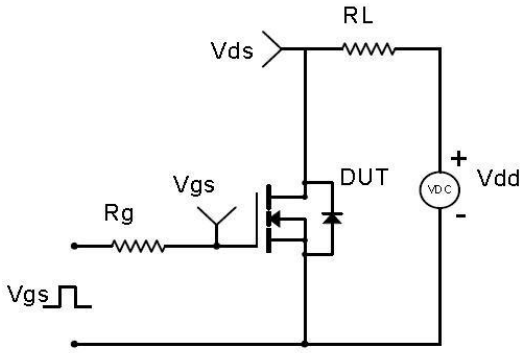
Test Circuit & Waveform

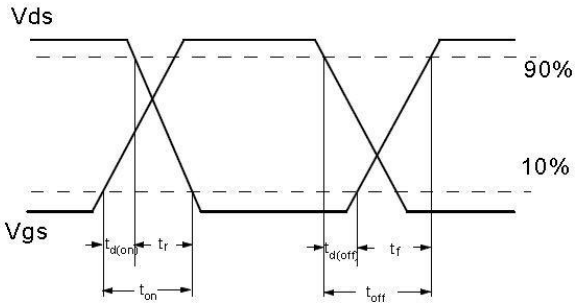
Gate Charge Test Circuit & Waveform



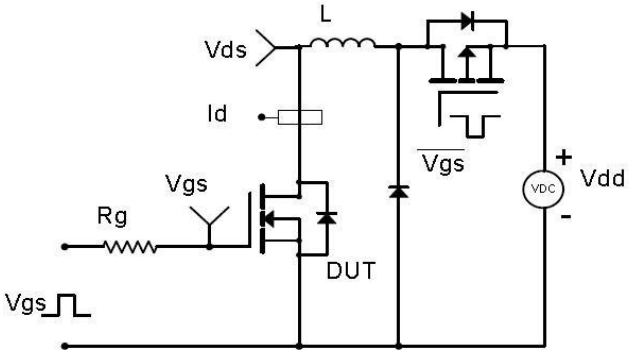


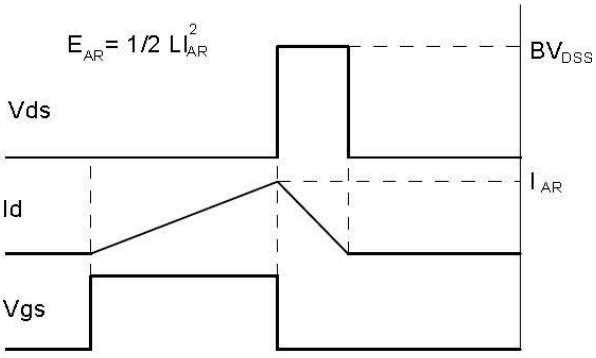
Resistive Switching Test Circuit & Waveforms



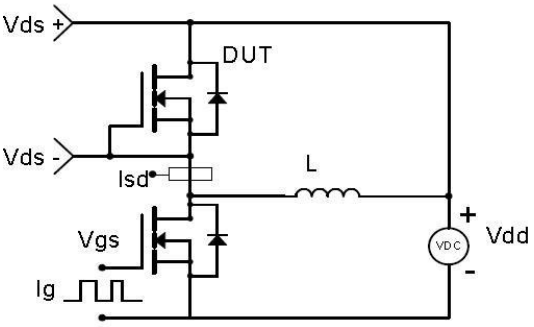


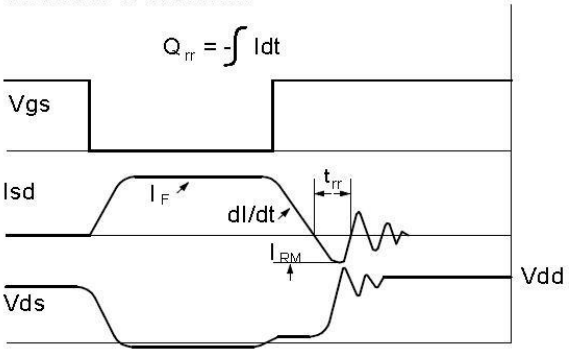
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



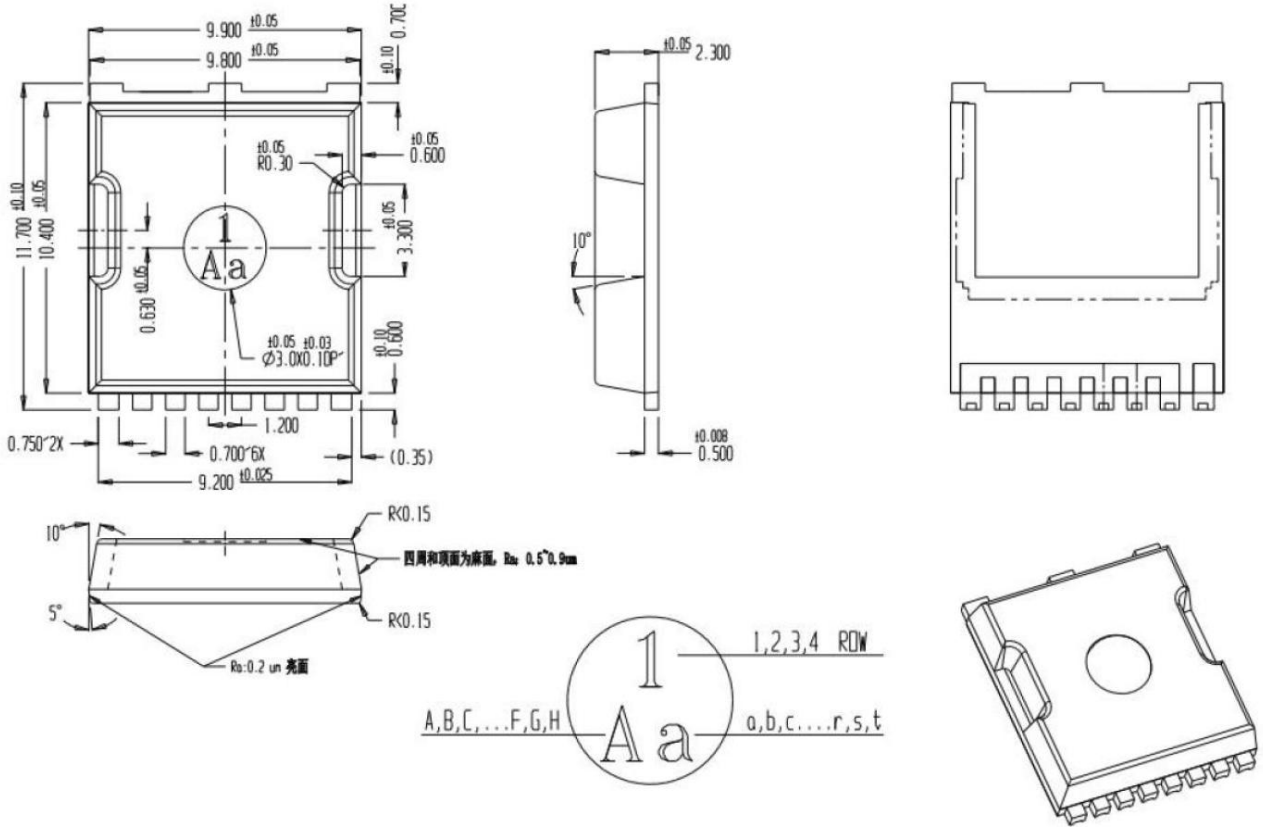


Diode Recovery Test Circuit & Waveforms





Package Outline:TOLL



Revision History:

Revision	Date	Major changes
1.0	2026/3/18	Release of Preliminary version.
2.0	2026/4/27	Update Typical Performance Characteristics.