RST010N04SD10

N-MOSFET TOLL 40V,395A,0.85mΩ

Features

- Uses advanced SGT technology
- Extremely low on-resistance RDS(on)
- Excellent gate charge x RDS(on) product(FOM)

Application

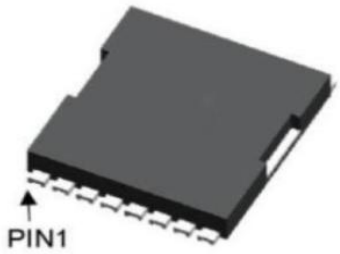
- Motor control and drive
- Battery management
- DC/DC

Product Summary

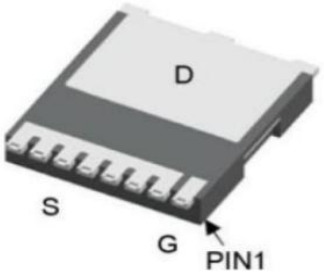
Package	TOLL
V_{DS}	40V
$R_{DS(on)@VGS=10V}$	0.85mΩ
I_D	395A

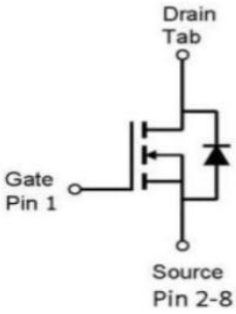
Package Marking

TOLL Top View



TOLL Bottom View





Type	Package	Marking	Reel Size	Tape Width	Packing	Qty
RST010N04SD10	TOLL	LR010N04SD10	330*28.5mm	24mm	Reel&Tape	2000

Maximum Ratings (TC=25℃unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous drain current T_c=25℃（Silicon limit） T_c=100℃（Silicon limit）	I_D	 395 250	A
Pulsed Drain Current	I_{DM}	1580	A
Maximum Power Dissipation	P_d	272	W
Single pulse avalanche energy	E_{AS}	1369	mJ
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Case	R_{thJC}	0.46	℃/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	40	-	-	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}=40V,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	-	0.85	1.0	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=100A	-	312	-	S
Dynamic Characteristic						
Input Capacitance	C_{iss}	V_{DS}=20V,V_{GS}=0V, f=1MHz	-	7120	-	pF
Output Capacitance	C_{oss}		-	3429	-	
Reverse Transfer Capacitance	C_{rss}		-	270	-	
Gate resistance	Rg	f=1MHz	-	2	-	Ω
Gate Total Charge	Q_G	V_{DS}=20V,I_D=100A, V_{GS}=10V	-	112	-	nC
Gate-Source charge	Q_{gs}		-	41	-	
Gate-Drain charge	Q_{gd}		-	19	-	
Turn-on delay time	$t_{d(on)}$	V_{GS}=10V, V_{DS}=20V, R_G=1.6Ω	-	32	-	ns
Rise time	t_r		-	65	-	
Turn-off delay time	$t_{d(off)}$		-	75	-	
Fall time	t_f		-	40	-	

Body Diode Characteristic

Diode Forward Voltage	V_{SD}	V_{GS}=0V,IS=20A	-	-	1.2	v
Reverse Recovery Time	t_{rr}	I_F =20A di/dt = 100A/μs	-	68	-	ns
Reverse Recovery Charge	Q_{rr}		-	120	-	nC

Typical Performance Characteristics

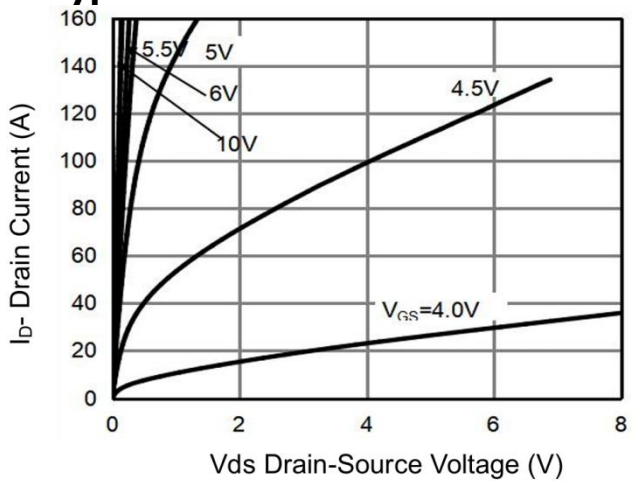


Figure 1 Output Characteristics

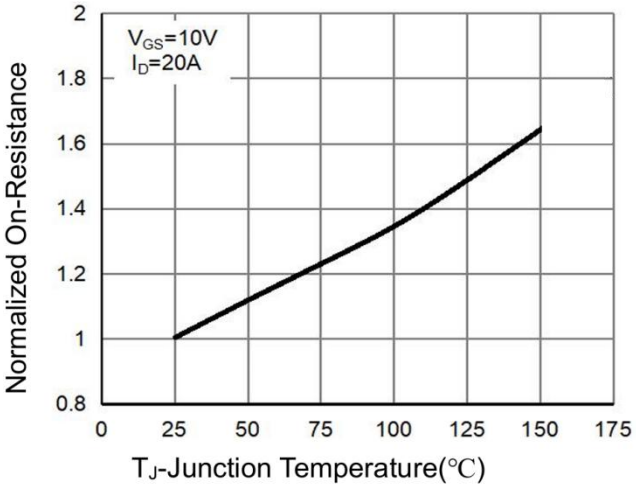


Figure 4 Rdson-Junction Temperature

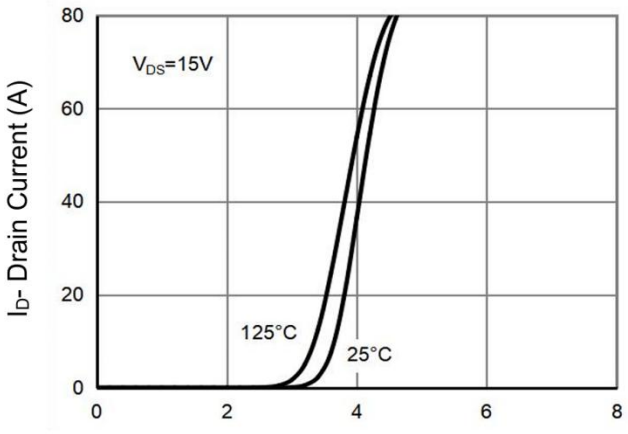


Figure 2 Transfer Characteristics

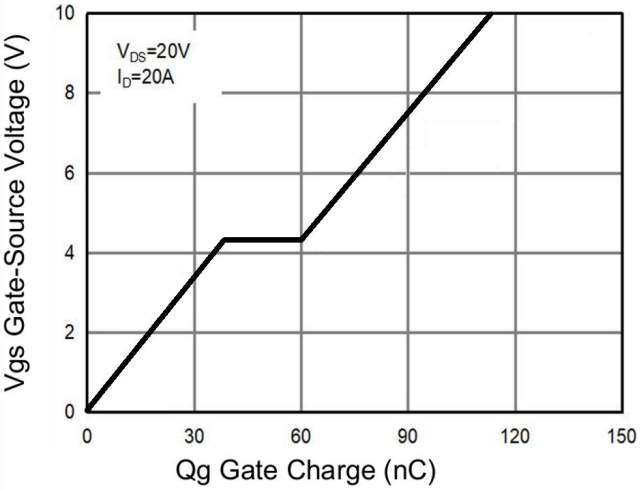


Figure 5 Gate Charge

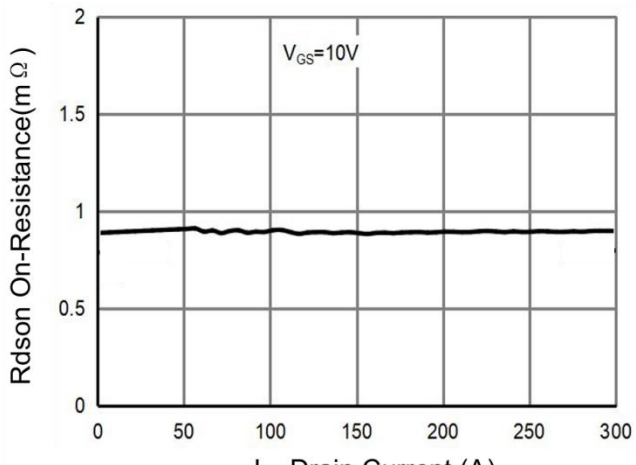


Figure 3 Rdson- Drain Current

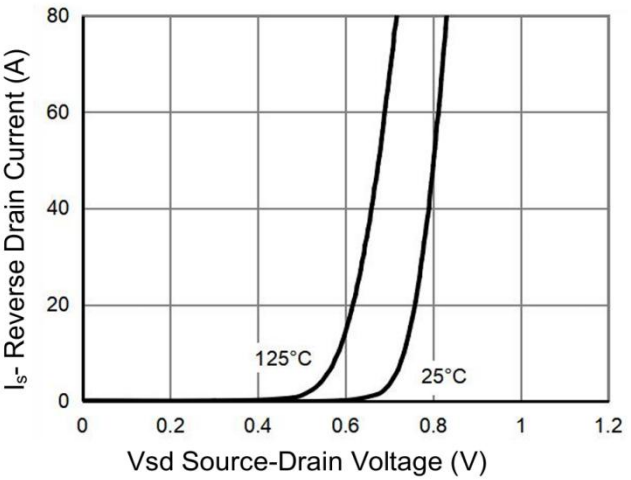


Figure 6 Source- Drain Diode Forward

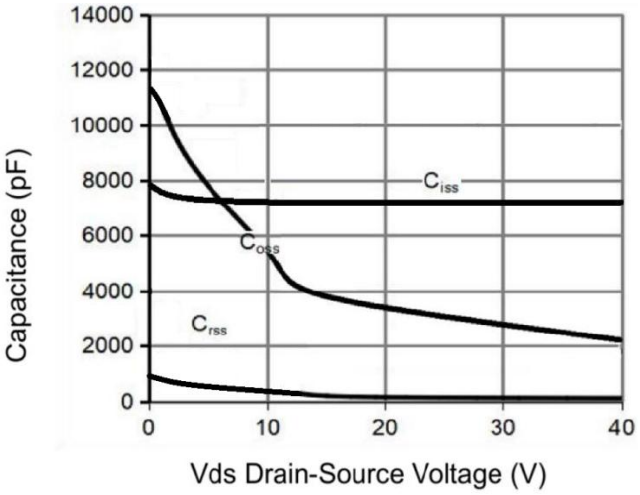


Figure 7 Capacitance vs Vds

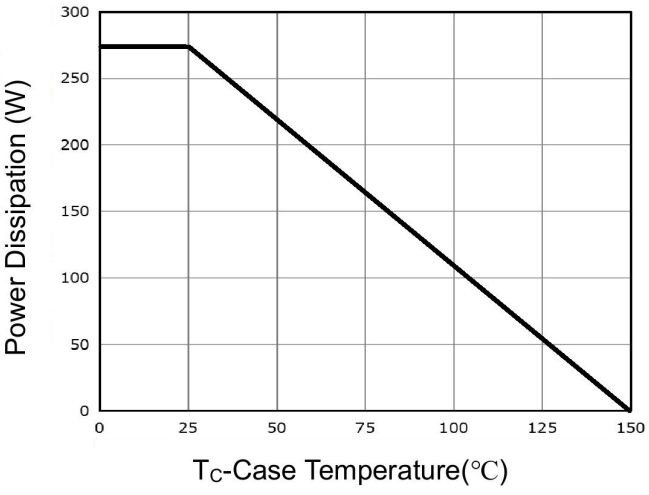


Figure 9 Power De-rating

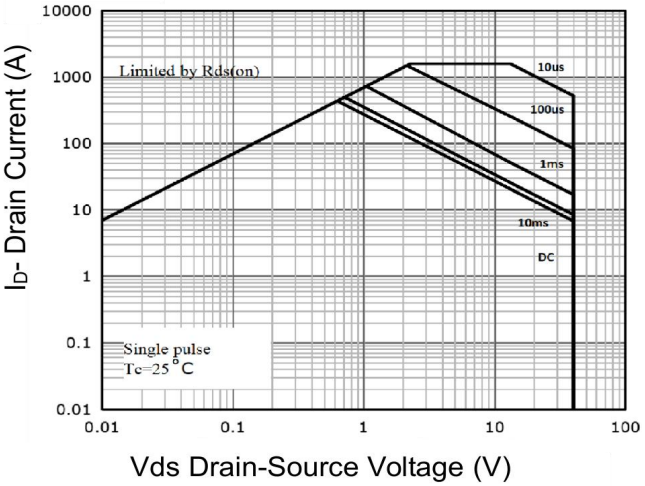


Figure 8 Safe Operation Area

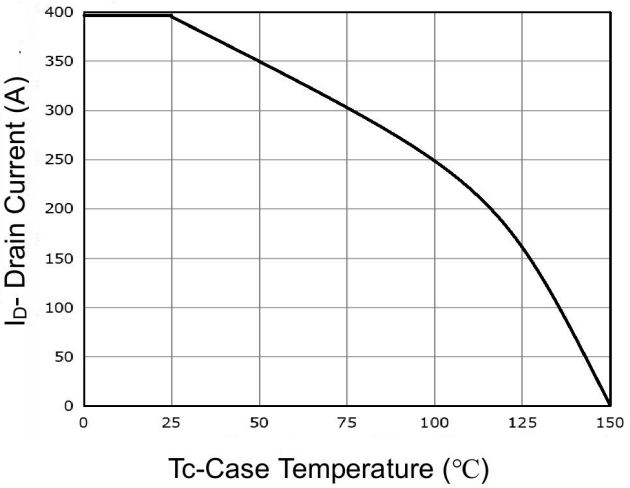


Figure 10 Current De-rating

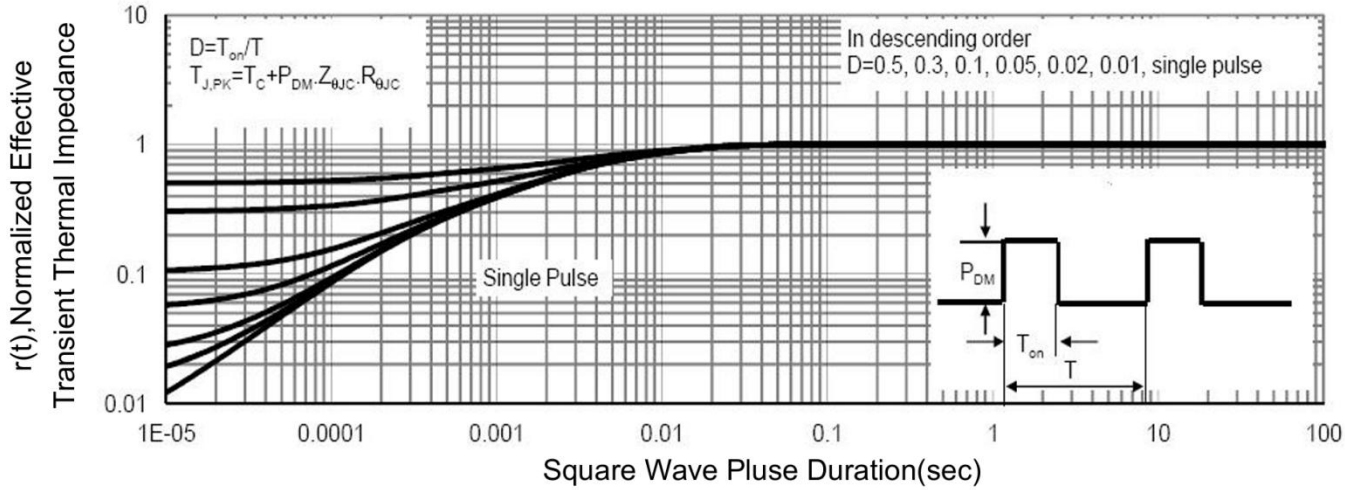
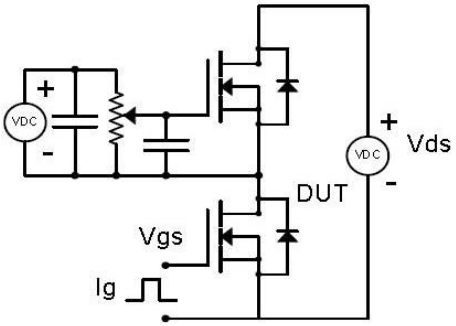
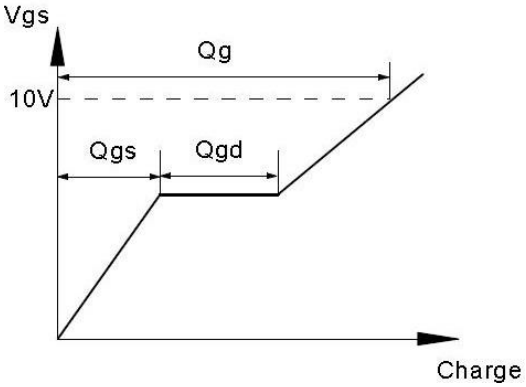


Figure 11 Normalized Maximum Transient Thermal Impedance

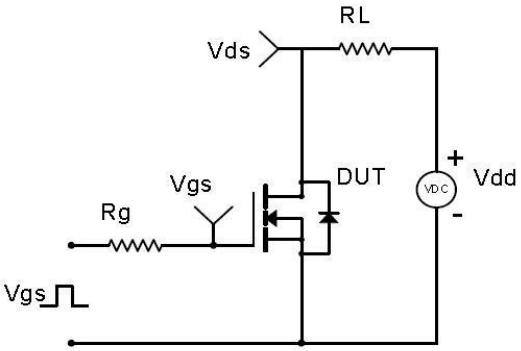
Test Circuit & Waveform

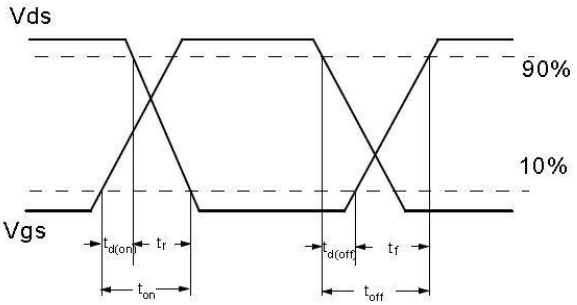
Gate Charge Test Circuit & Waveform



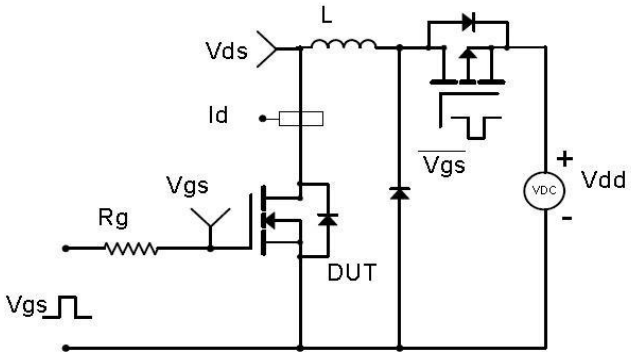


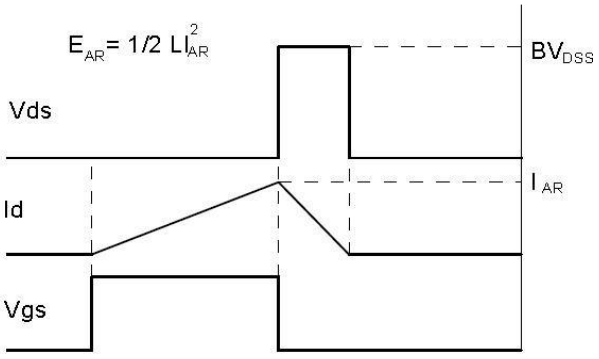
Resistive Switching Test Circuit & Waveforms



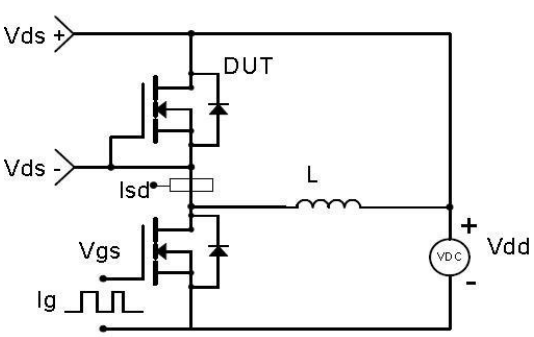


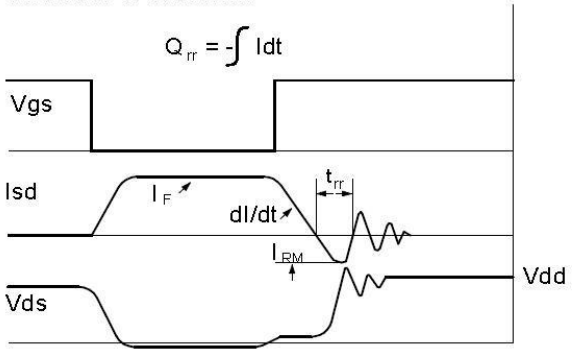
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



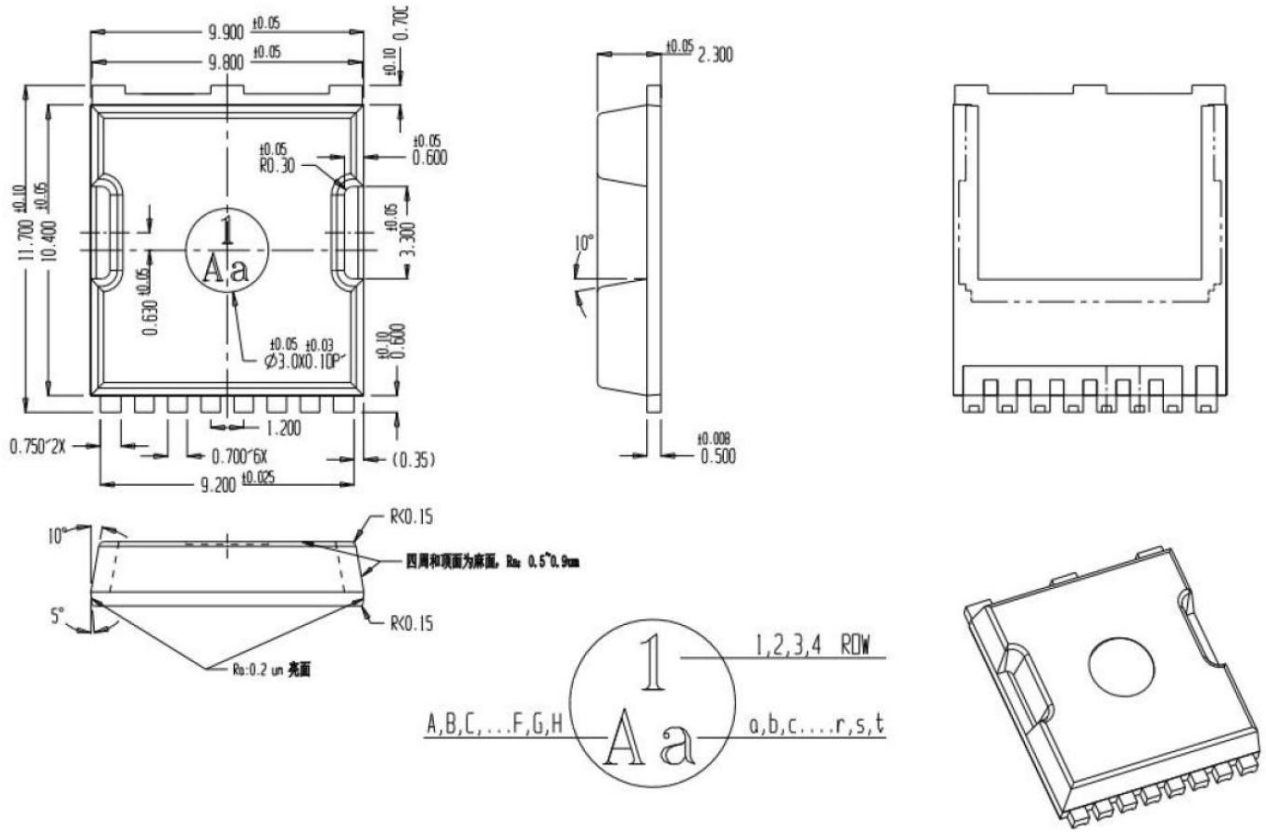


Diode Recovery Test Circuit & Waveforms





Package Outline:TOLL



Revision History:

Revision	Date	Major changes
1.0	2025/7/18	Release of Preliminary version.
2.0	2025/11/6	Update Qg Qgs Qgd and g_{FS}.
3.0	2026/04/01	Update Ciss Coss and Crss.