

Features

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

Application

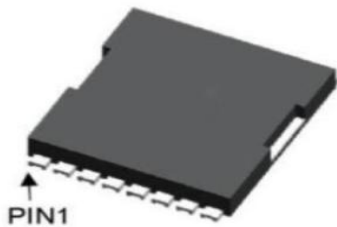
- Motor control and drive
- Battery management
- DC/DC

Product Summary

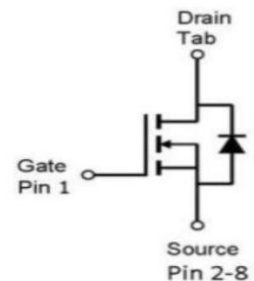
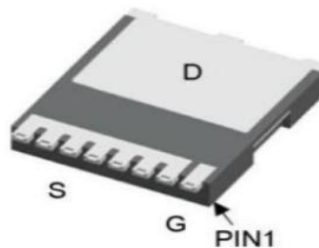
Package	TOLL
V_{DS}	100V
$R_{DS(on)}@V_{GS}=10V$	1.05mΩ
I_D	360A

Package Marking

TOLL Top View



TOLL Bottom View



Type	Package	Marking	Reel Size	Tape Width	Packing	Qty
LU012N10XD10	TOLL	LU012N10XD10	330*28.5mm	24mm	Reel&Tape	2000

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

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous drain current $T_c=25^\circ\text{C}$ (Silicon limit) $T_c=100^\circ\text{C}$ (Silicon limit)	I_D	360 280	A
Pulsed Drain Current	I_{DM}	1400	A
Maximum Power Dissipation	P_d	278	W
Single pulse avalanche energy (H=1mh)	E_{AS}	4802	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	°C

Thermal Characteristic

Thermal Resistance,Junction-to-Case	R_{thJC}	0.45	°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	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	100	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	3.0	4.0	
Zero gate voltage drain current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$	-	-	10	μA
Gate-source leakage current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$I_D=40A, V_{GS}=10V$	-	1.05	1.2	mΩ

Dynamic Characteristic

Input Capacitance	C_{iss}	$V_{DS}=40V, V_{GS}=0V,$ $f=1MHz$	-	12540	-	pF
Output Capacitance	C_{oss}		-	3855	-	
Reverse Transfer Capacitance	C_{rss}		-	152	-	
Gate resistance	R_g	$f=1MHz$	-	1.4	-	Ω
Gate Total Charge	Q_g	$V_{DS}=50V, I_D=100A,$ $V_{GS}=10V$	-	161	-	nC
Gate-Source charge	Q_{gs}		-	51	-	
Gate-Drain charge	Q_{gd}		-	32	-	
Turn-on delay time	$t_{d(on)}$	$V_{GS}=10V, V_{DS}=50V,$ $R_G=1.6\Omega$	-	25	-	ns
Rise time	t_r		-	65	-	
Turn-off delay time	$t_{d(off)}$		-	60	-	
Fall time	t_f		-	33	-	

Body Diode Characteristic

Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_{SD}=40A$	-	0.8	1.2	v
Reverse Recovery Time	t_{rr}	$I_F = 100A$ $di/dt = 100A/\mu s$	-	49	-	ns
Reverse Recovery Charge	Q_{rr}		-	437	-	nC

Typical Performance Characteristics

Diagram 1: Power dissipation

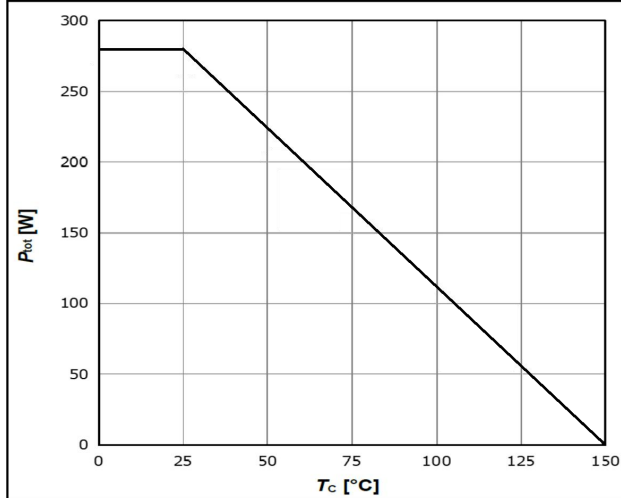


Diagram 2: Drain current

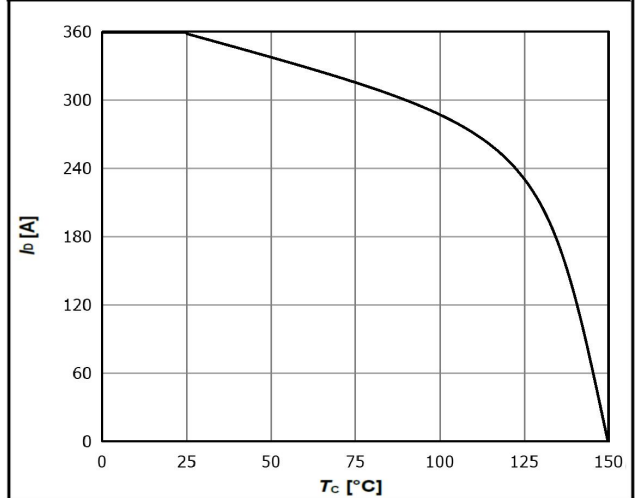


Diagram 3: Safe operating area

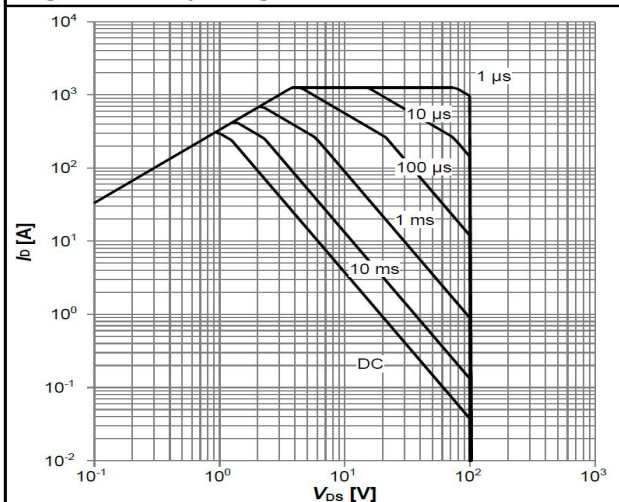


Diagram 4: Max. transient thermal impedance

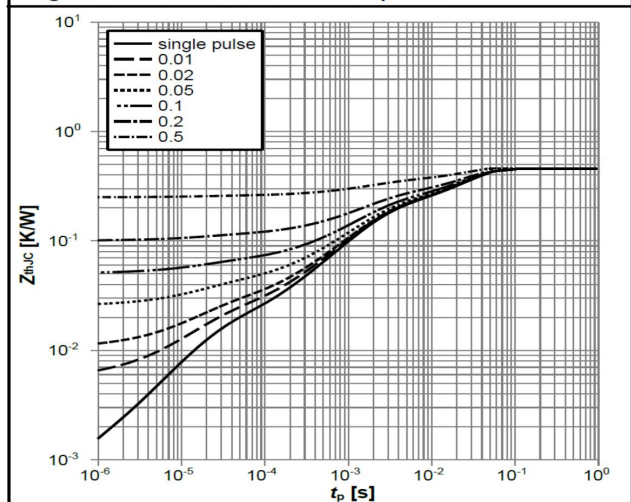


Diagram 5: Typ. output characteristics

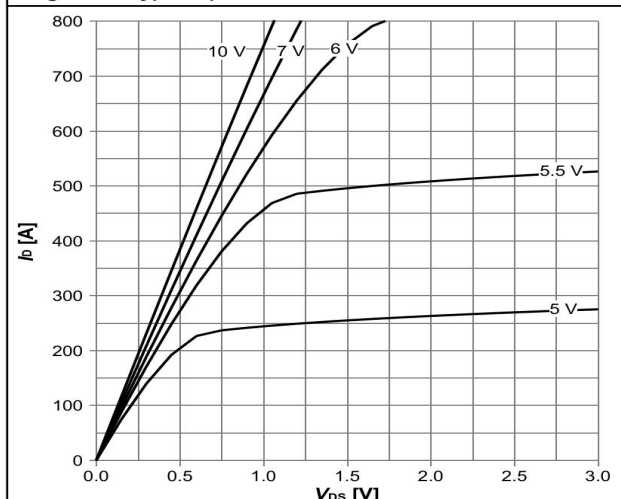


Diagram 6: Typ. drain-source on resistance

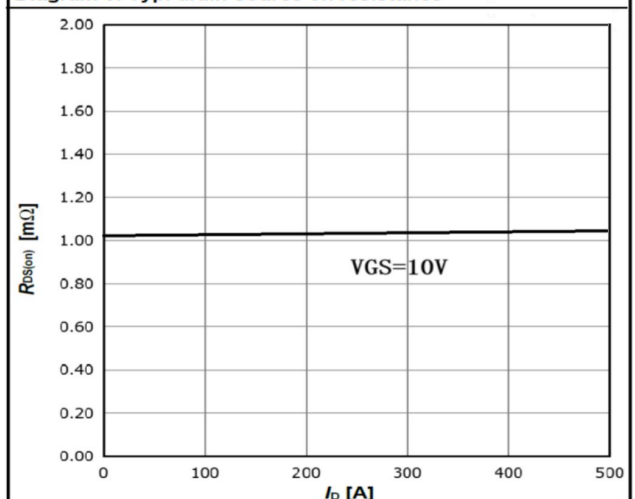


Diagram 7: Typ. transfer characteristics

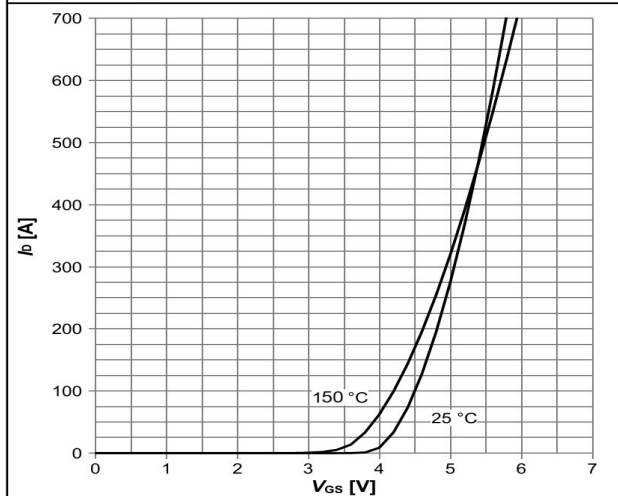


Diagram 8: Typ. drain-source on resistance

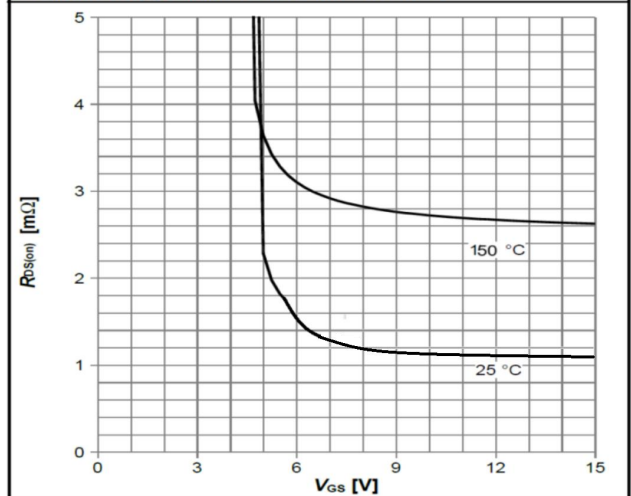


Diagram 9: Normalized drain-source on resistance

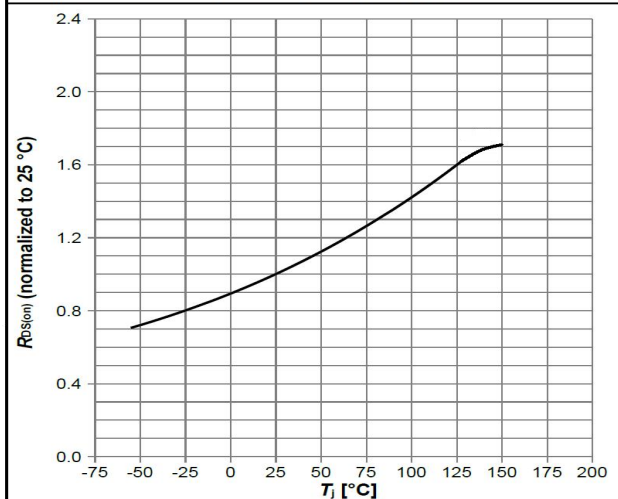


Diagram 10: Typ. forward characteristics of reverse diode

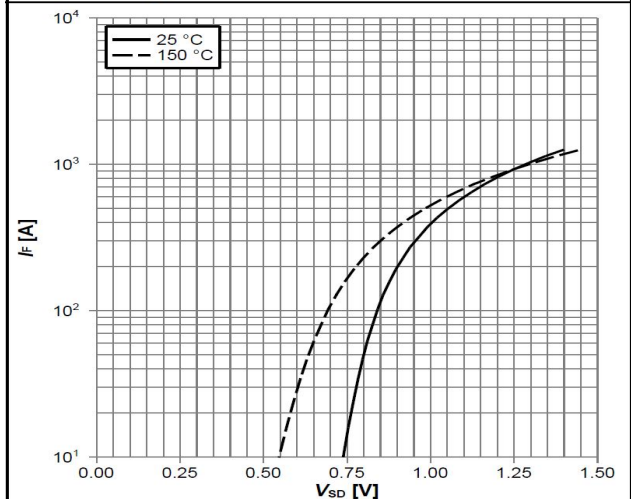


Diagram 11: Typ. gate charge

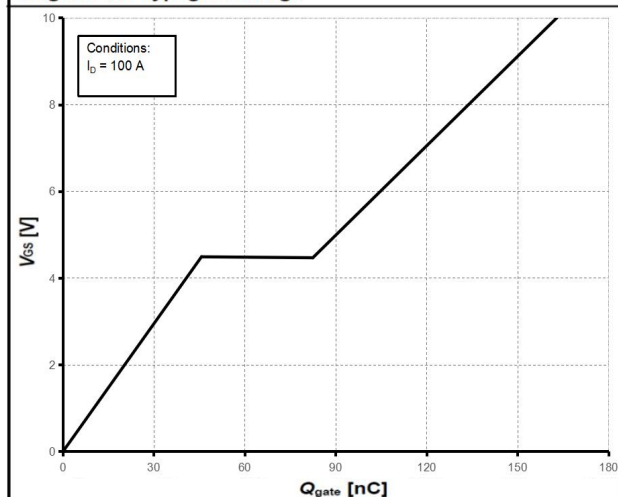
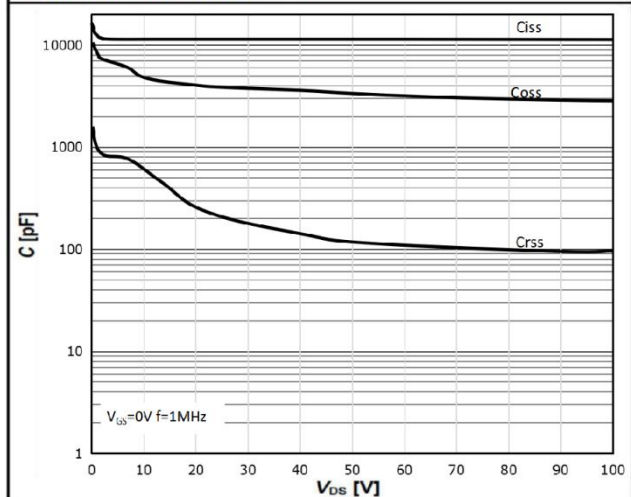
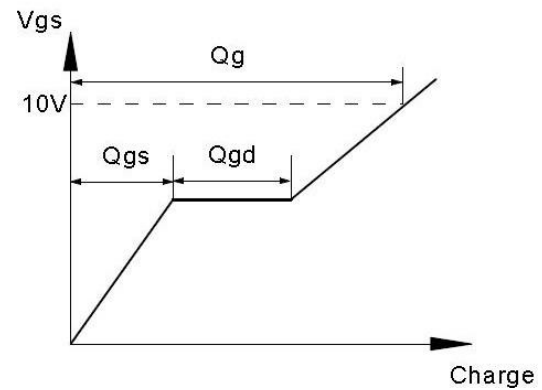
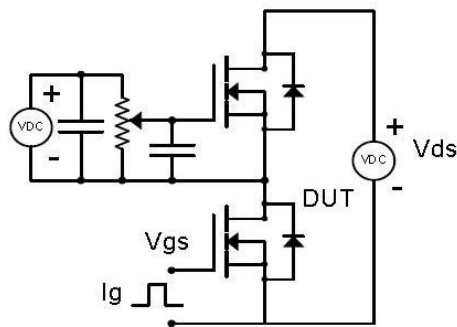


Diagram 12: Typ. capacitances

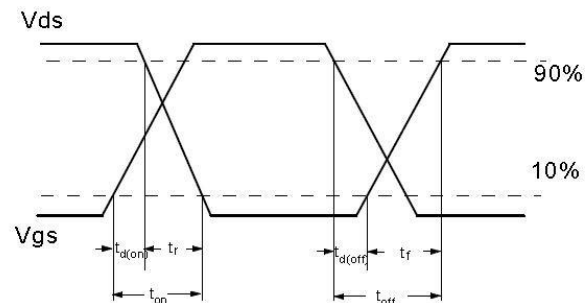
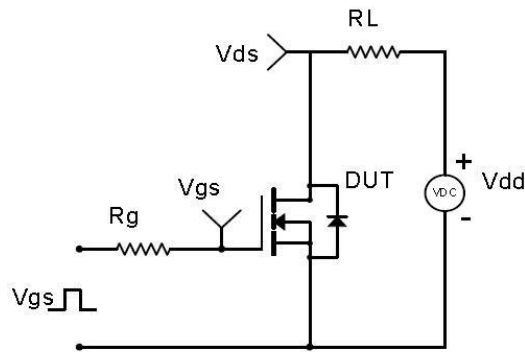


Test Circuit & Waveform

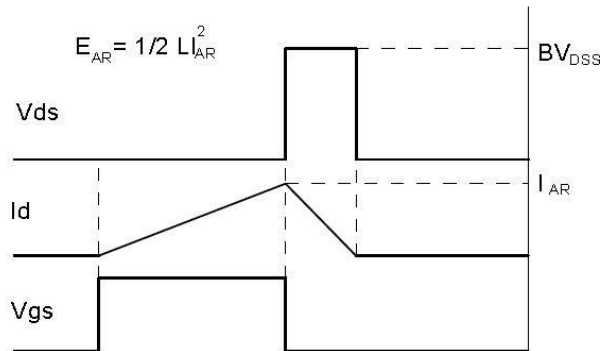
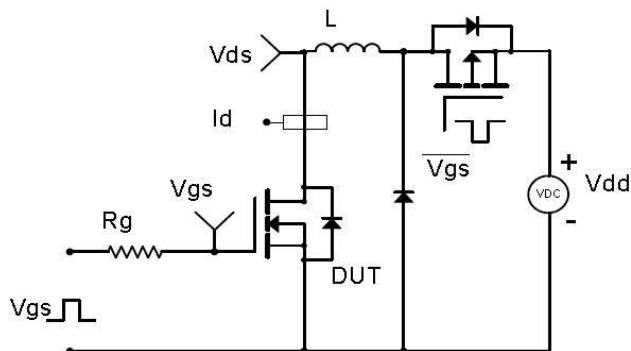
Gate Charge Test Circuit & Waveform



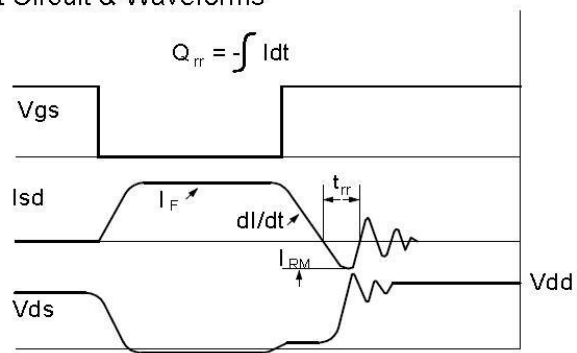
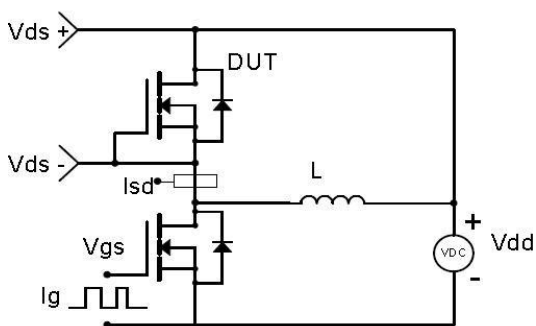
Resistive Switching Test Circuit & Waveforms



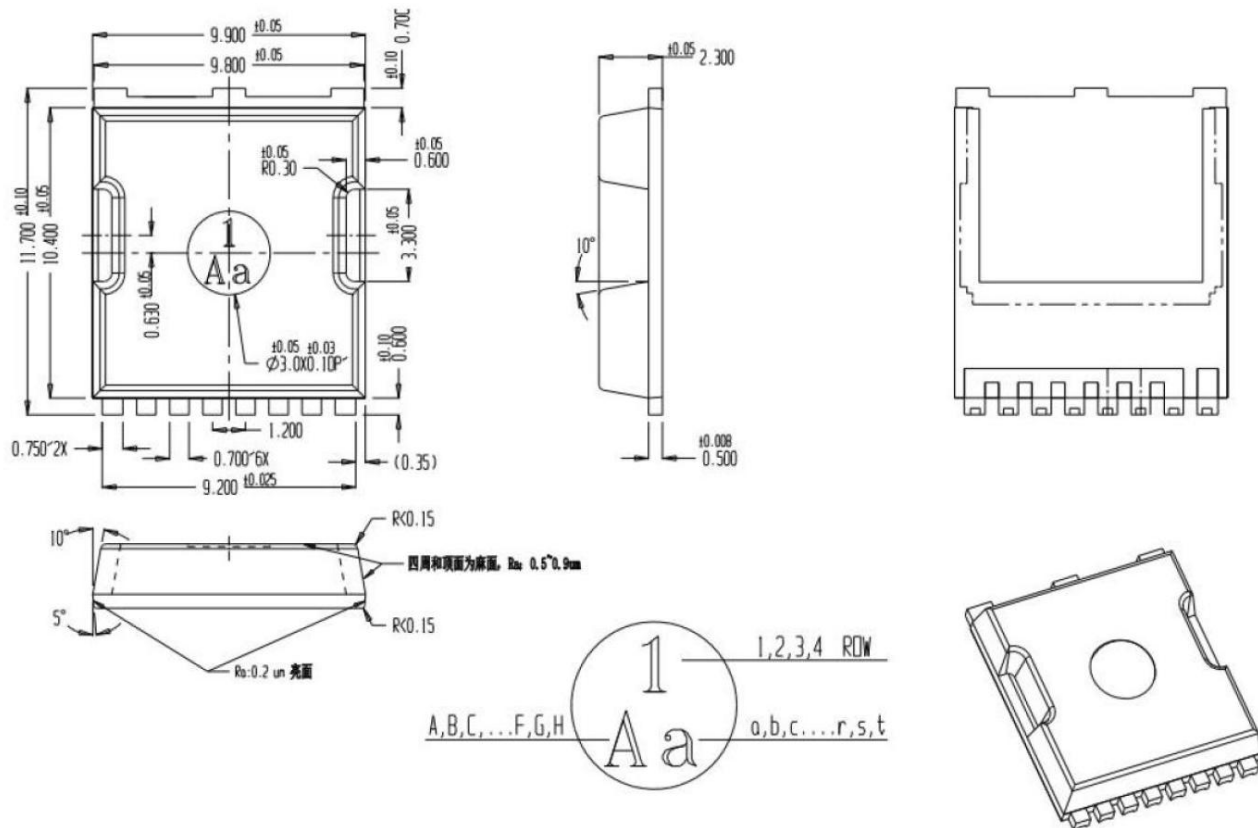
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Outline:TOLL



Revision History:

Revision	Date	Major changes
1.0	2025/11/6	Release of Preliminary version.
2.0	2026/5/9	Update ID Ron EAS.