

Features

- Low on resistance
- Low gate charge
- Fast switching
- High avalanche current
- Low reverse transfer capacitances

Application

- Brushed and BLDC Motor drive systems
- Battery Management
- DC/DC and AC/DC Converter
- UPS

Product Summary

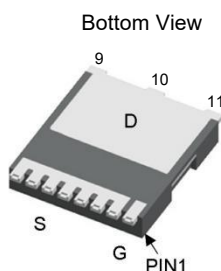
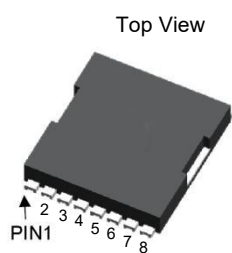
V_{DS}	100V
$R_{DS(on)typ.}$	2.1mΩ
I_D	260A

100% DVDS Tested

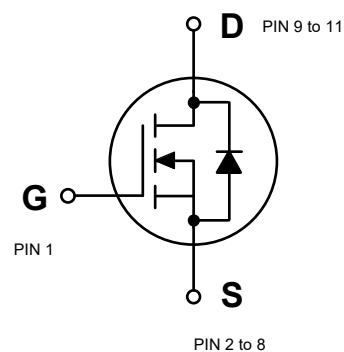
100% Avalanche Tested



TOLL



SFT025N100C3



Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
SFT025N100C3	025N100C3	TOLL	Reel&Tape	330×28.5mm	24mm	2000pcs

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain - Source Voltage	V_{DS}	100	V
Gate - Source Voltage	V_{GS}	±20	V
Continuous Drain Current	$T_C = 25^{\circ}\text{C}(\text{Silicon Limited})$	260	A
	$T_C = 100^{\circ}\text{C}(\text{Silicon Limited})$	175	
Pulsed Drain Current($T_C=25^{\circ}\text{C}, t_p$ limited by T_{Jmax})	$I_{D,Pulse}$	980	A
Single Pulsed Avalanche Energy($L=0.5\text{mH}, R_G=25\Omega, T_J=25^{\circ}\text{C}$)	E_{AS}	1480	mJ
Power Dissipation	$T_C = 25^{\circ}\text{C}$	275	W
Junction Temperature	T_J	-55 ~ 150	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-55 ~ 150	$^{\circ}\text{C}$

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance , junction – case	R_{thJC}	0.46	°C/W
Thermal resistance , junction – ambient(min. footprint)	R_{thJA}	46	°C/W

Electrical Characteristics ($T_J = 25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
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Static Characteristics

Drain - Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 100V, V_{GS} = 0V$ $T_C = 25^{\circ}\text{C}$ $T_C = 125^{\circ}\text{C}$	- - -	- - -	1 100	μA
Gate - Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2	3	4	V
Drain-source On-resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 40A$	-	2.1	2.5	mΩ

Dynamic Characteristics

Input Capacitance	C_{iss}	$V_{DS} = 50V, V_{GS} = 0V, f = 1\text{MHz}$	-	9118	-	pF
Output Capacitance	C_{oss}		-	2089	-	
Reverse Transfer Capacitance	C_{rss}		-	154	-	
Gate Resistance	R_g	$V_{DS} = 0V, V_{GS} = 0V, f = 1\text{MHz}$	-	1.1	-	Ω

Switching Characteristics

Total Gate Charge	Q_g	$V_{DS} = 50V, V_{GS} = 10V, I_D = 40A$	-	170	-	nC
Gate-source Charge	Q_{gs}		-	65	-	
Gate-drain Charge	Q_{gd}		-	31	-	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 50V, V_{GS} = 10V,$ $R_L = 3\Omega$	-	39	-	ns
Turn-on Rise Time	t_r		-	106	-	
Turn-off Delay Ttime	$t_{d(off)}$		-	81	-	
Turn-off Fall Time	t_f		-	115	-	

Body Diode Characteristic

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Diode continous forward current	I_S	-	-	-	260	A
Diode pulse current	$I_{S,pulse}$	Pulsed, $t_p \leq 10\mu s$	-	-	980	A
Body Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_{SD} = 50A$	-	-	1.2	V
Body Diode Reverse Recovery Time	T_{rr}	$I_F = 100A, di/dt = 100A/\mu s$	-	98	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F = 100A, di/dt = 100A/\mu s$	-	326	-	nC

Typical Performance Characteristics

Fig 1: Output Characteristics

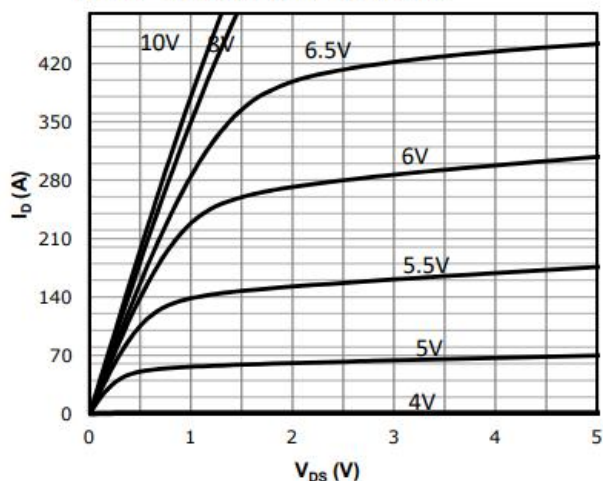
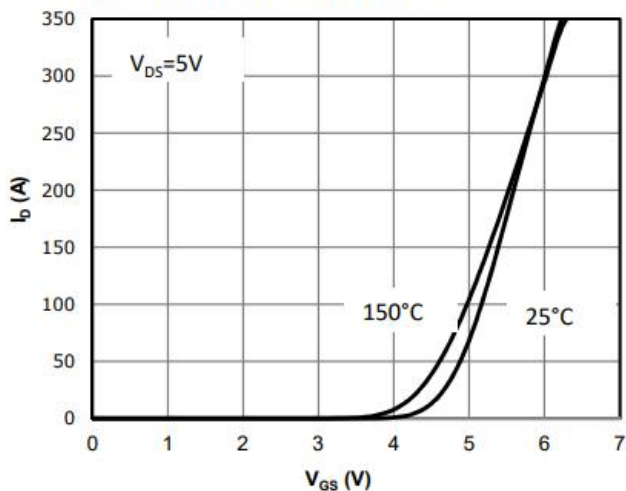


Fig 2: Transfer Characteristics



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

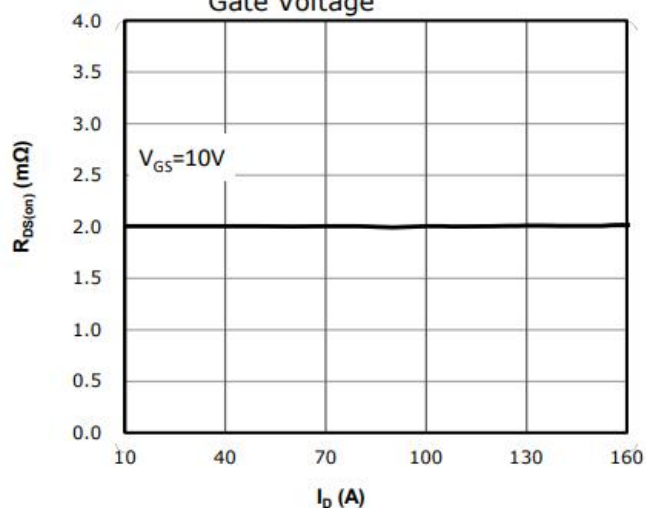


Fig 4: $R_{DS(on)}$ vs Gate Voltage

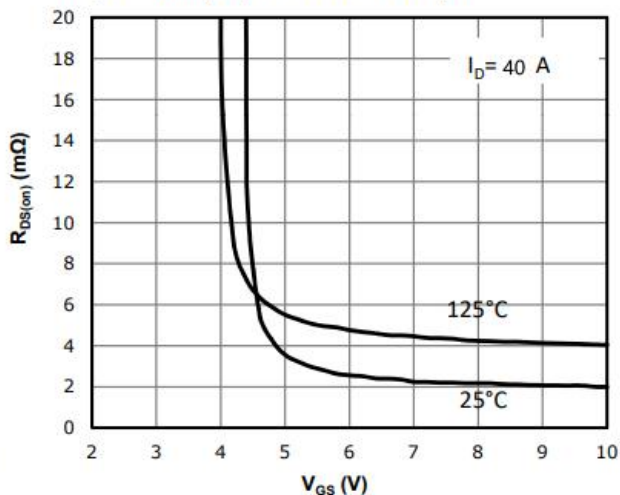


Fig 5: $R_{DS(on)}$ vs. Temperature

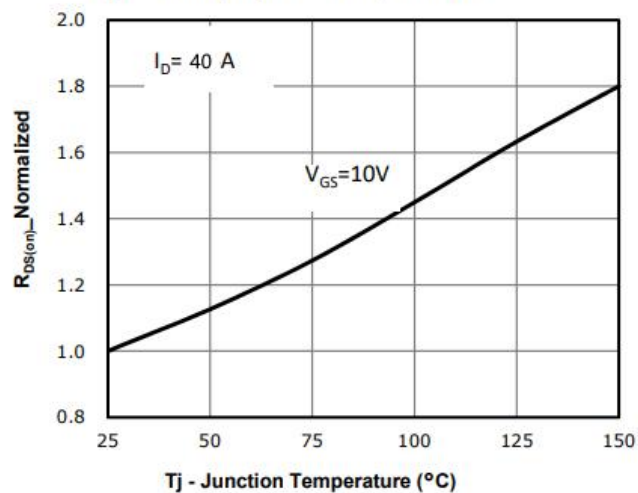


Fig 6: Capacitance Characteristics

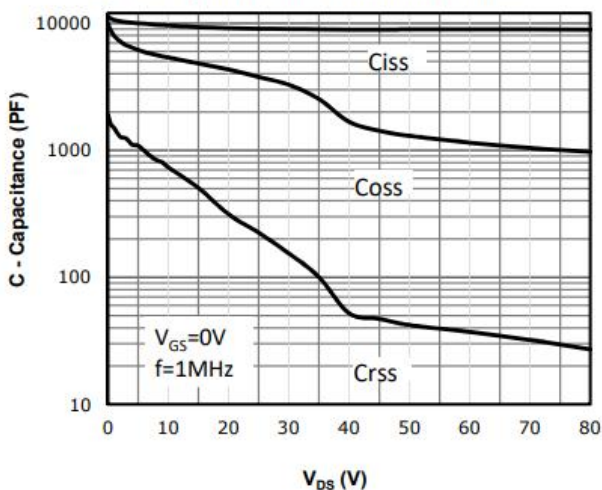


Fig 7: Gate Charge Characteristics

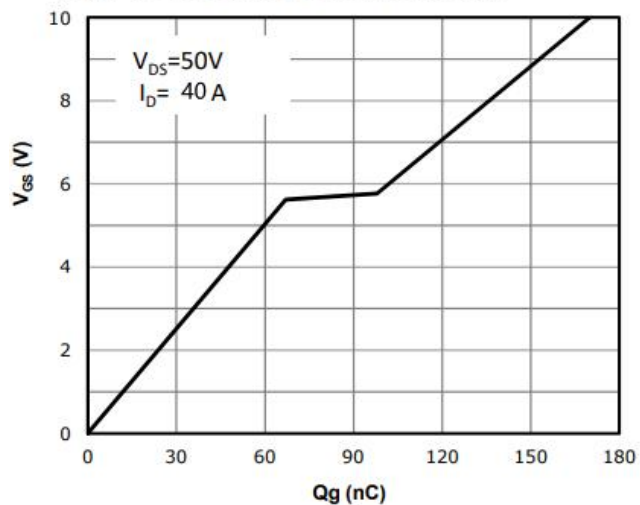


Fig 8: Body-diode Forward Characteristics

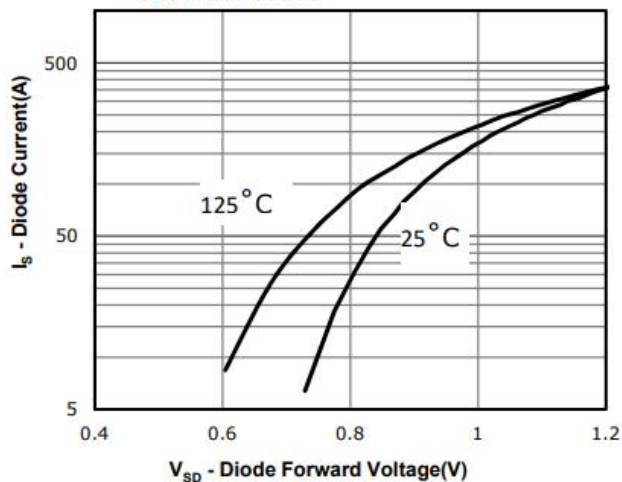


Fig 9: Power Dissipation

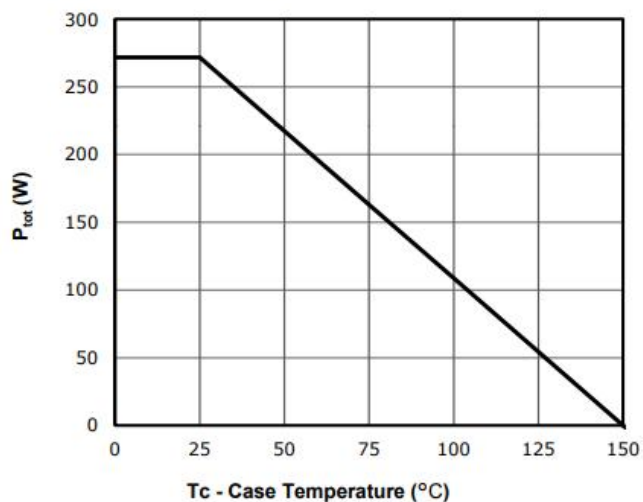


Fig 10: Drain Current Derating

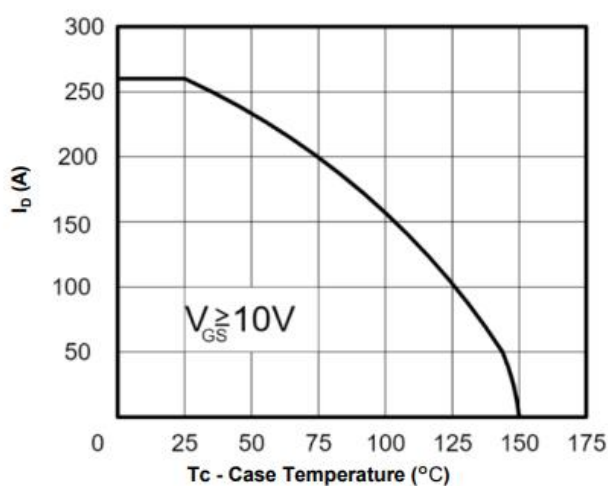


Fig 11: Safe Operating Area

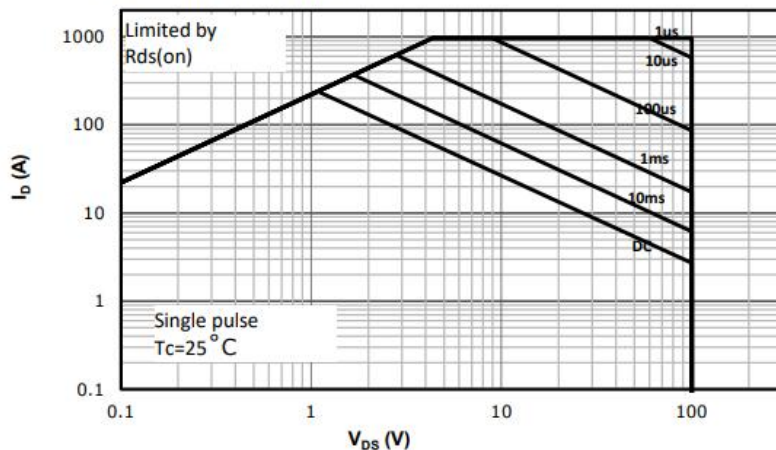
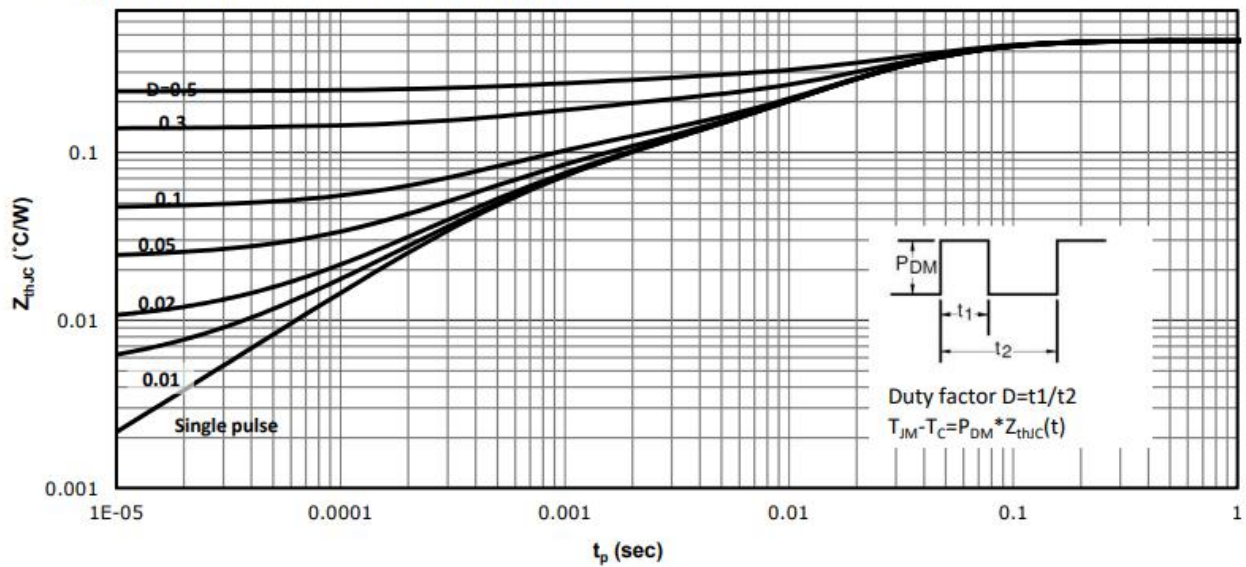
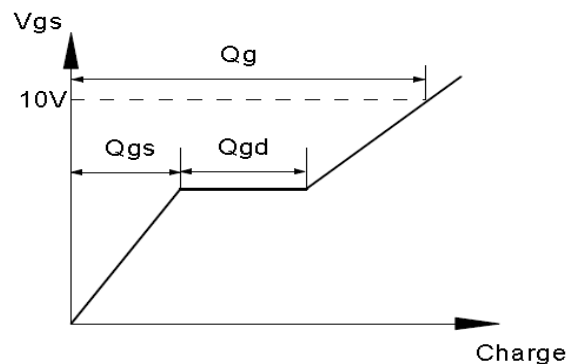
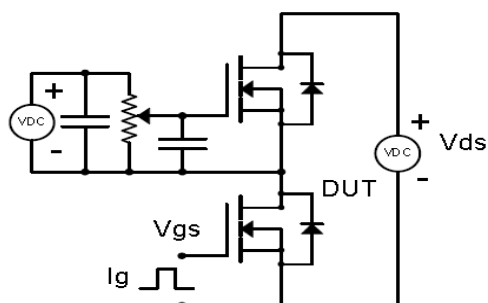


Fig 12: Max. Transient Thermal Impedance

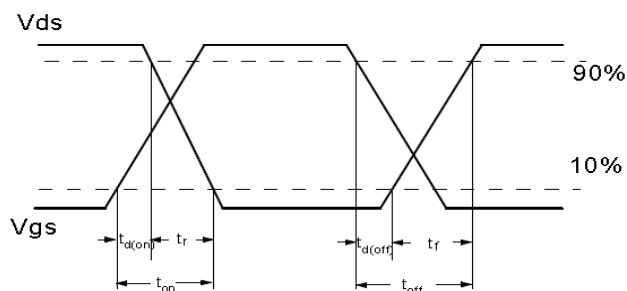
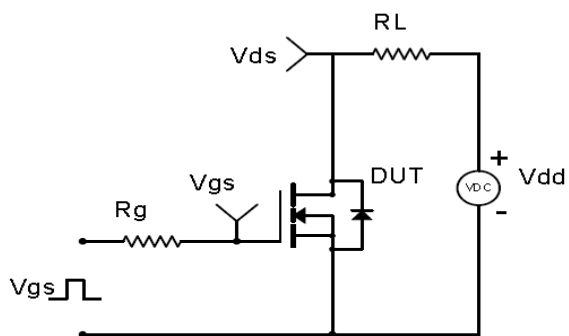


Test Circuit & Waveform

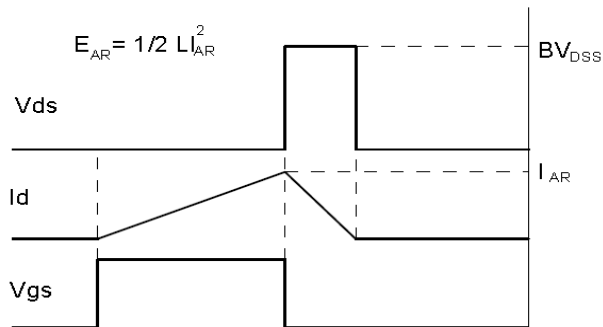
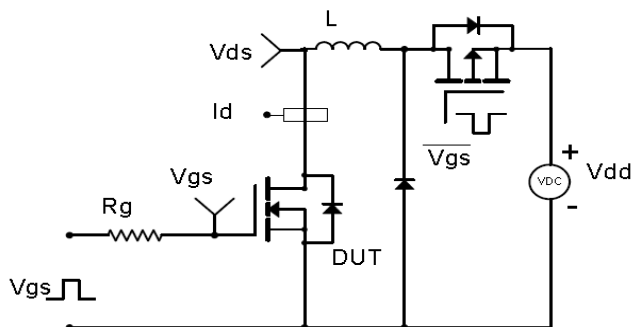
Gate Charge Test Circuit & Waveform



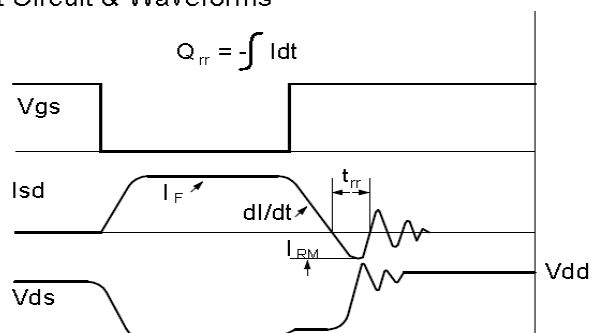
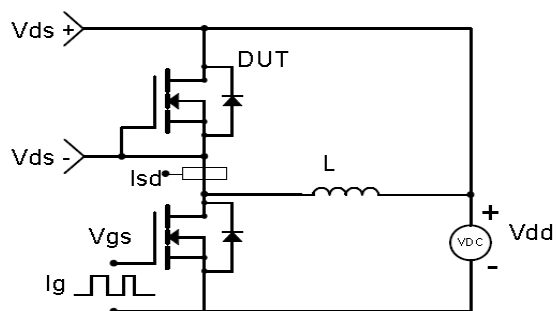
Resistive Switching Test Circuit & Waveforms



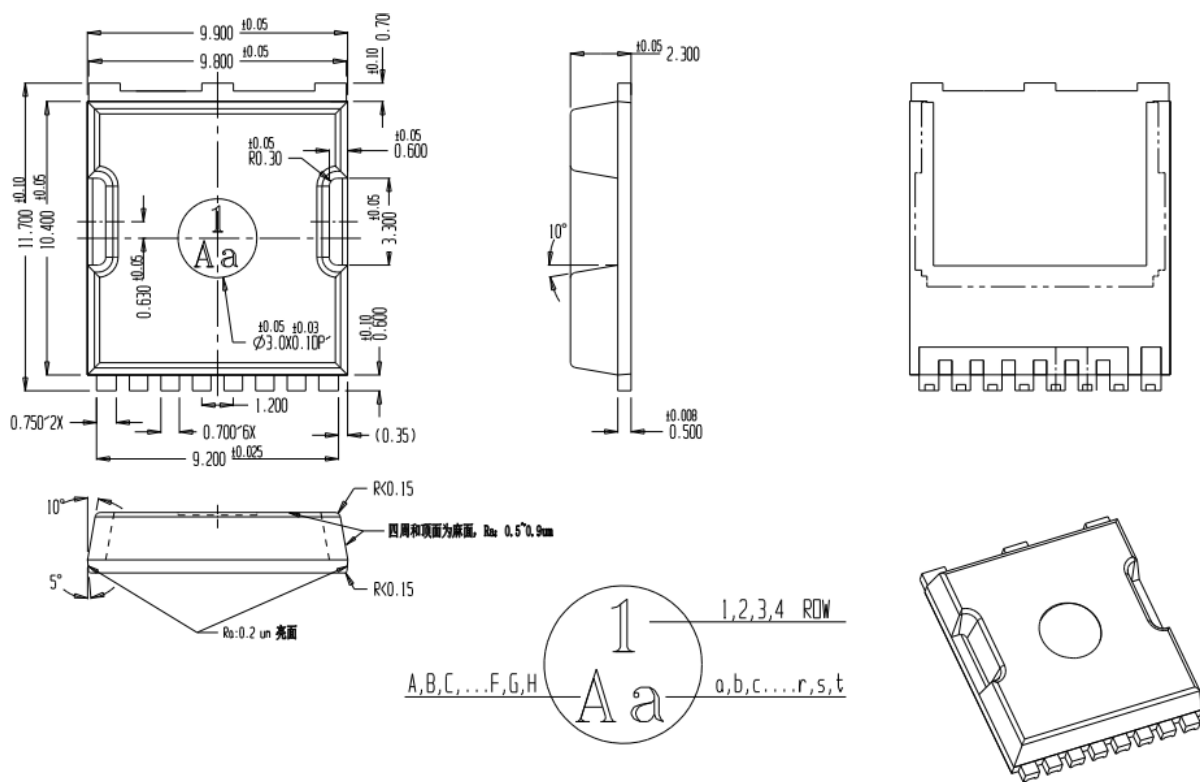
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Outline: TOLL



Revision History

Revision	Date	Major Changes
1.0	2023-11-10	Release of formal version

Disclaimer

Unless otherwise specified in the datasheet, the product is designed and qualified as a standard commercial product and is not intended for use in applications that require extraordinary levels of quality and reliability, such as automotive, aviation/aerospace and life-support devices or systems.

Any and all semiconductor products have certain probability to fail or malfunction, which may result in personal injury, death or property damage. Customer are solely responsible for providing adequate safe measures when design their systems.

Scilicon Electric reserves the right to improve product design,function and reliability without notice.