Features

- Advanced SGT silicon technology utilized
- Extremely low on-resistance $R_{DS(on)}$
- 150°C operating temperature
- 100% avalanche screened
- Pb-Free plating / Halogen-Free / RoHS compliant
- Low Crss & Low gate Charge

Key Parameters

V_{DS}	40V
$R_{DS(on)_typ}$	0.8mΩ
I_D	389A
$Vth_{_typ}$	2.8V
Ciss	9,295pF
Q_{GD}	14nC

Applications

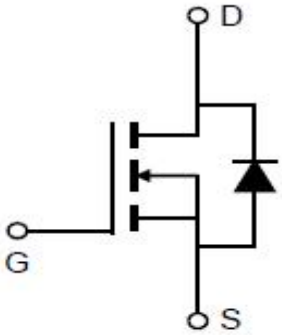
- Motor Control and Drive
- Charge/Discharge for Battery Management System
- DC/DC Converter

100% DVDS Tested

100% Avalanche Tested

TOLL-8L





Marking & Packing Information

Part #	Package	Marking	Tube/Reel	Qty(pcs)
RST010N04NLB2	TOLL-8L	RST010N04NLB2	Tape&Reel	2000

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	40	V
Gate-Source voltage	V_{GS}	±20	V
Continuous drain current T_C = 25°C T_C = 100°C	I_D	 389 246	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	1,556	A
Avalanche energy, single pulse (L=0.5mH, Rg=25Ω)	E_{AS}	653	mJ
Power dissipation (T_C = 25°C)	P_{tot}	250	W
Operating junction and storage temperature	T_j , T_{stg}	150	°C

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R_{thJC}	0.50	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	40	

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

Static Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Drain-source breakdown voltage	BV_{DSS}	40	-	-	V	V_{GS}=0V, I_D=250uA
Gate threshold voltage	$V_{GS(th)}$	2.0	2.8	4.0	V	V_{DS}=V_{GS},I_D=250uA
Zero gate voltage drain current	I_{DSS}	 - -	 - -	 1 100	μA	V_{DS}=40V,V_{GS}=0V T_j=25°C T_j=125°C
Gate-source leakage current	I_{GSS}	-	-	±100	nA	V_{GS}=±20V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	-	0.80	1.00	mΩ	V_{GS}=10V, I_D=70A

Dynamic Characteristic [1)]

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Input Capacitance	C_{iss}	-	9,295	-	pF	V_{GS}=0V, V_{DS}=20V, f=1MHz
Output Capacitance	C_{oss}	-	4,032	-		
Reverse Transfer Capacitance	C_{rss}	-	106	-		
Gate Total Charge	Q_G	-	94	-	nC	V_{GS}=10V, V_{DS}=20V, I_D=70A, f=1MHz
Gate-Source charge	Q_{gs}	-	38	-		
Gate-Drain charge	Q_{gd}	-	14	-		
Turn-on delay time	$t_{d(on)}$	-	25	-	ns	V_{GS}=10V, V_{DD}=20V, R_{G_ext}=3Ω
Rise time	t_r	-	48	-		
Turn-off delay time	$t_{d(off)}$	-	75	-		
Fall time	t_f	-	30	-		
Gate resistance	R_G	-	4.00	-	Ω	V_{GS}=0V, V_{DS}=0V, f=1MHz

Body Diode Characteristic [1)]

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Diode Max Current	I_S	-	-	389	A	-
Diode Forward Voltage	V_{SD}	-	0.79	1.4	V	V_{GS}=0V,I_{SD}=70A
Diode Reverse Recovery Time	t_{rr}	-	98	-	ns	I_F=70A dI/dt=100A/μs
Diode Reverse Recovery Charge	Q_{rr}	-	64	-	nC	

[1)] Defined by design. Not subject to full production test.

Typical Characteristics Diagram

Fig1.Output Characteristics

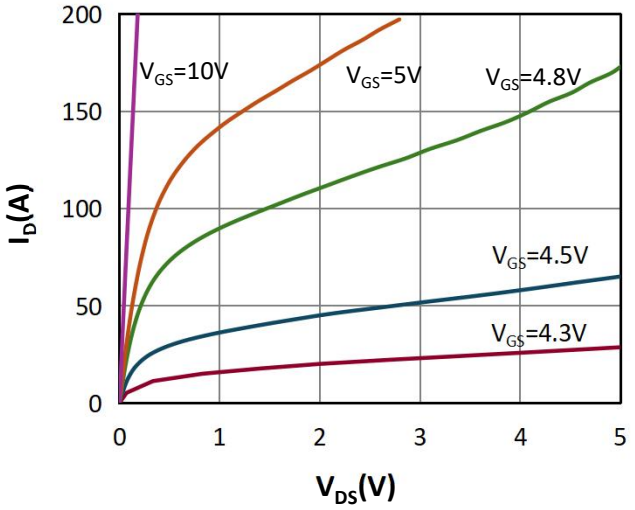


Fig2.Transfer Characteristics

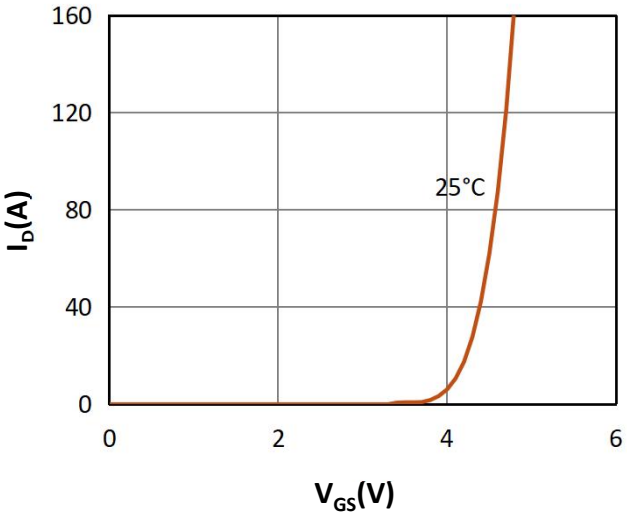


Fig3.Rds(on) vs Drain Current

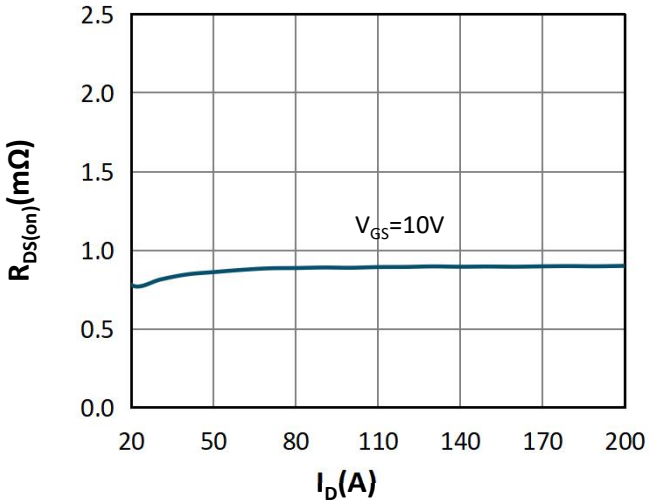


Fig4.Rds(on) vs Gate Voltage

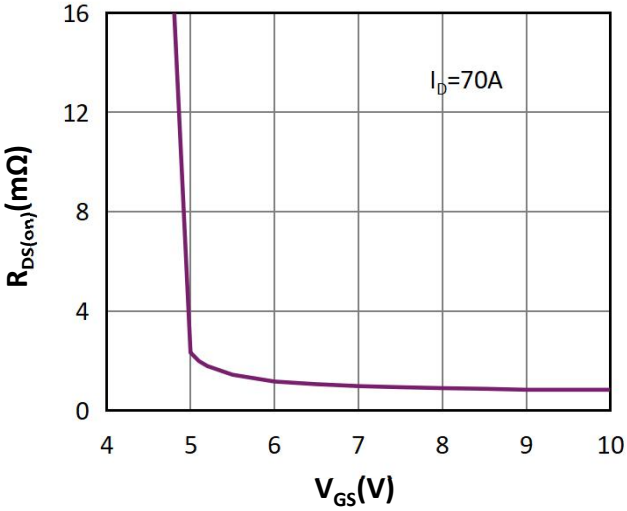


Fig5.Capacitance Characteristics

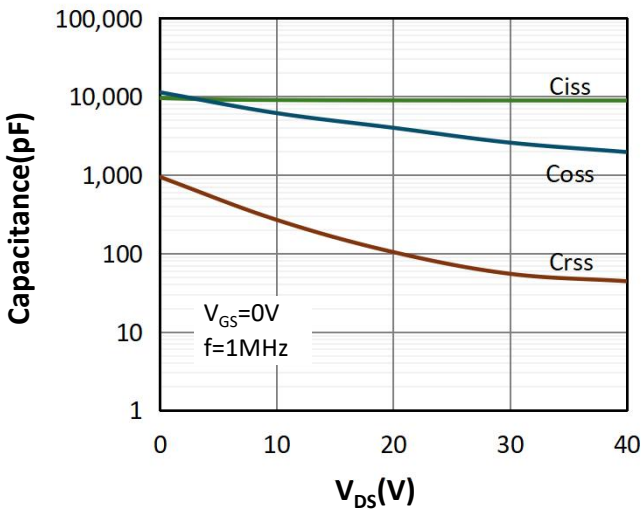
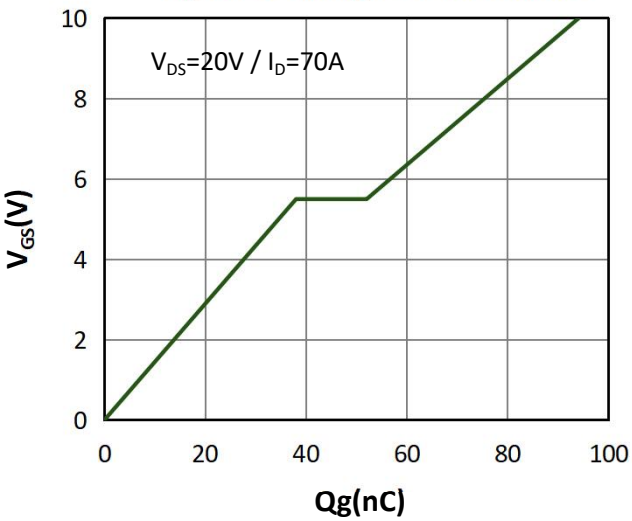


Fig6.Gate Charge Characteristics



Typical Characteristics Diagram

Fig7. Body-diode Forward Characteristics

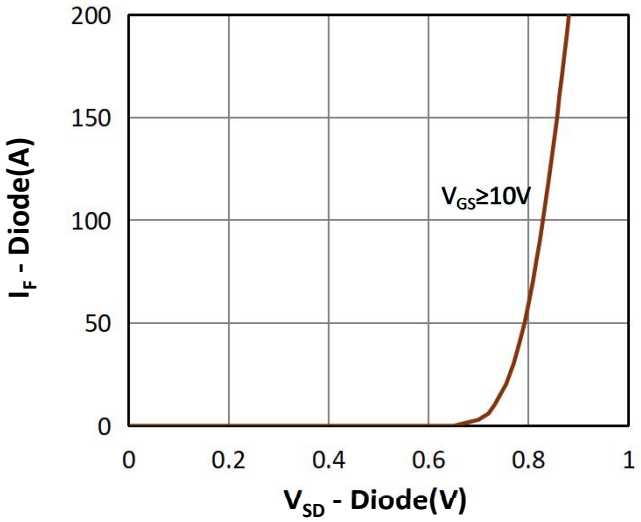


Fig8. Power De-rating

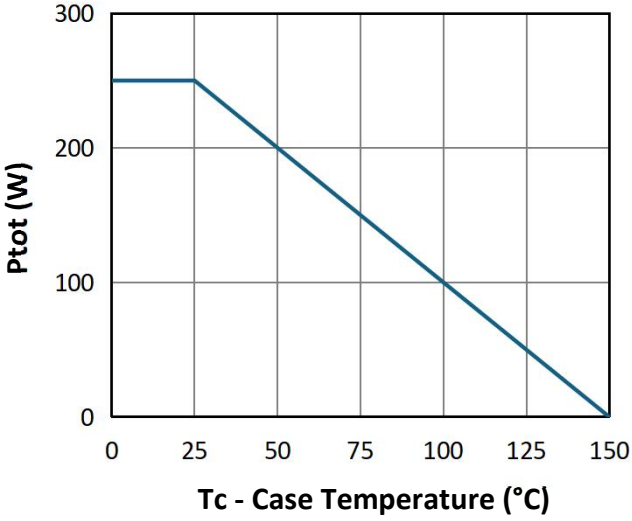


Fig9. Current De-rating

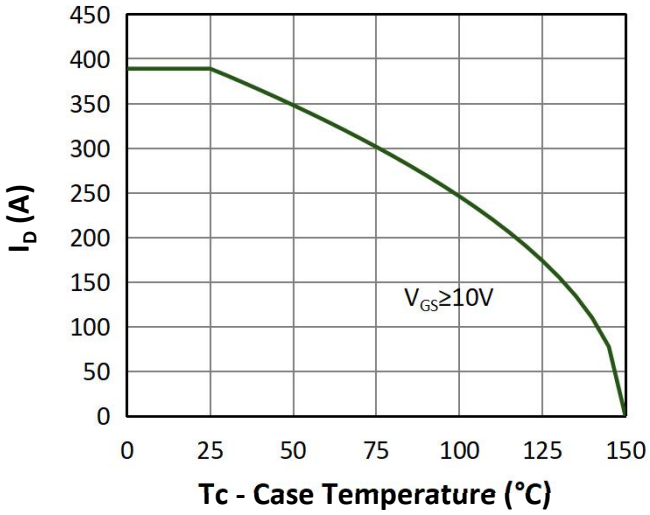


Fig10. Rds(on) vs. Temperature

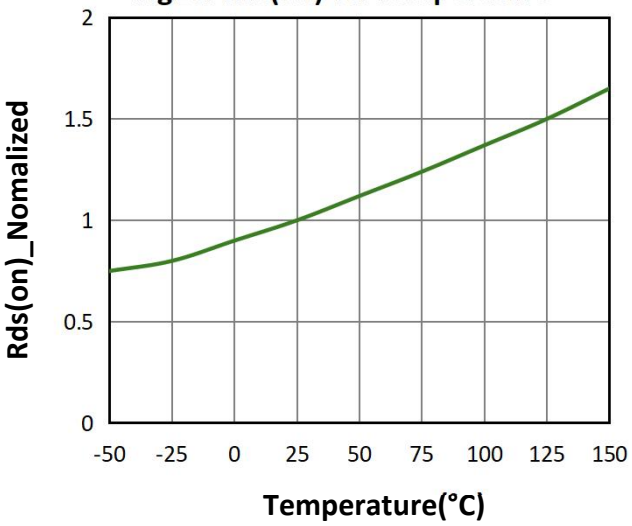


Fig11. Max. Transient Thermal Impedance

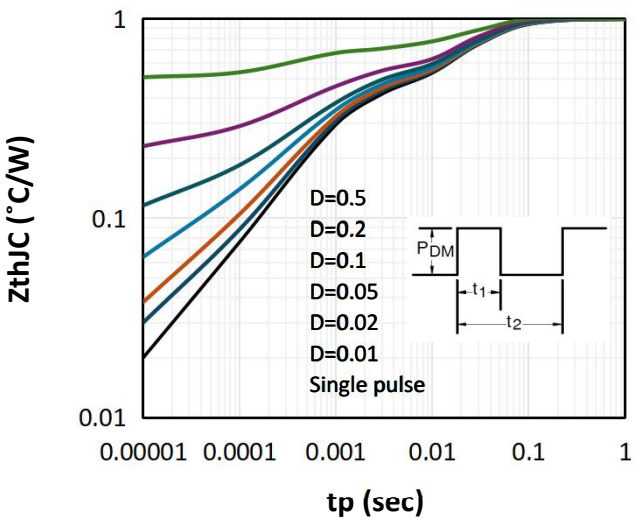
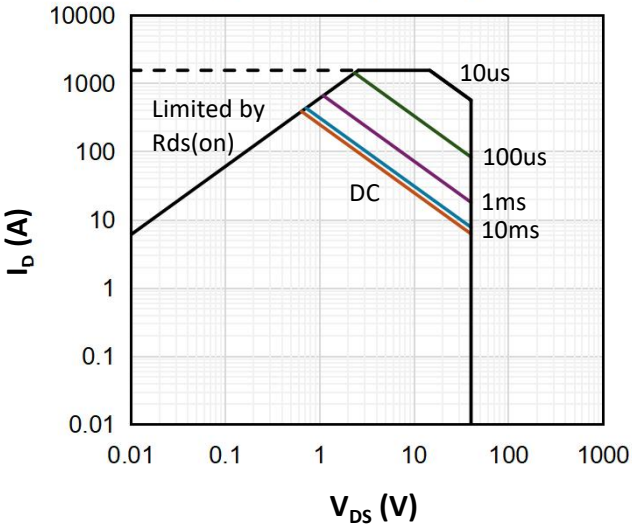
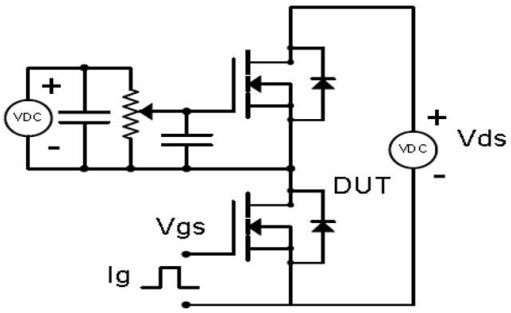
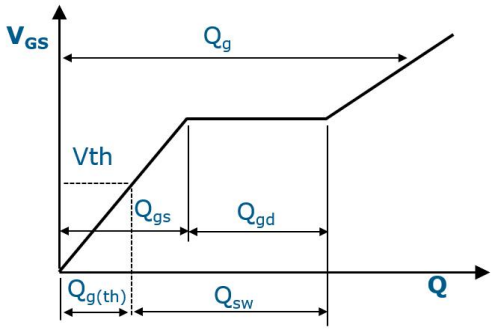


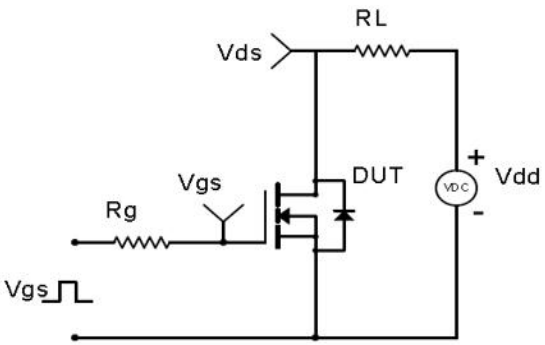
Fig12. Safe Operating Area

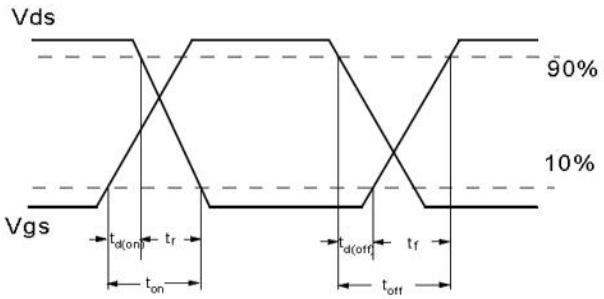


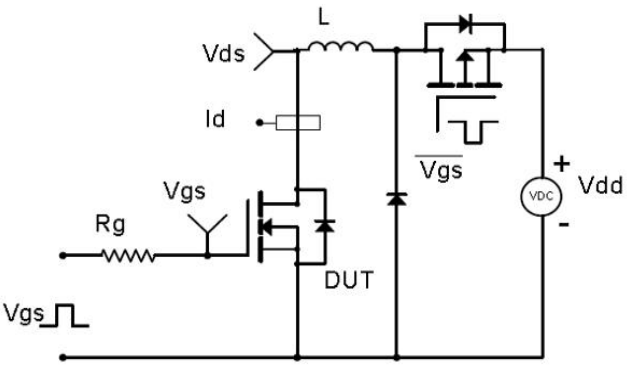
Test Circuit & Waveform

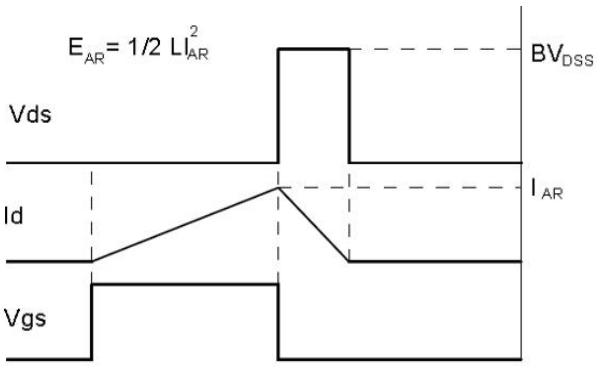


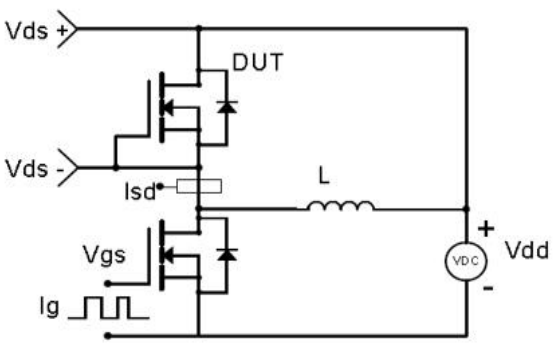


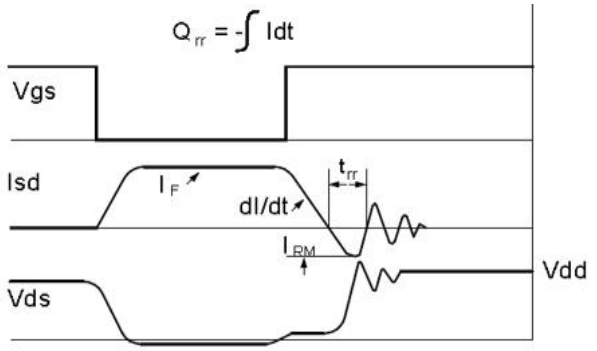












Package Outline： TOLL-8L（Dimensions in mm）

