

Features

- Low $R_{DS(on)}$ SGT technology
- Low thermal impedance
- Fast switching speed
- Halogen-free and RoHS-compliant

Applications

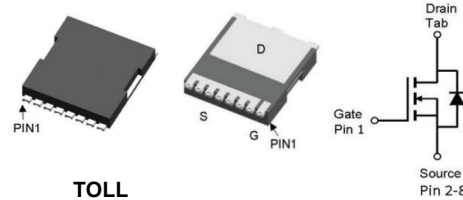
- Load Switch
- PWM Application
- Battery management

100% Avalanche Tested



Product Summary

Parameter	Value	Unit
V_{DS}	100	V
$R_{DS(on),max}$	1.15	m Ω
$I_D^{(1)}$	467	A



Package Marking and Ordering Information

Device	Marking	Package	Packing	Qty
RST012S10AL	RST012S10AL	TOLL	Tape&Reel	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	I_D	-	A
$T_C = 25^\circ\text{C}^{(1)}$		467	
$T_C = 100^\circ\text{C}$		295	
Pulsed Drain Current ⁽²⁾	$I_D \text{ pulse}$	1986	A
Avalanche Energy, Single Pulse ⁽³⁾	E_{AS}	1560	mJ
Power Dissipation	P_D	500	W
		200	
Operating Junction Temperature	T_J, T_{stg}	-55 to 150	$^\circ\text{C}$

Thermal Resistance

Parameter	Symbol	Max. Value	Unit
Thermal Resistance, Junction – Ambient ⁽⁴⁾	R_{thJA}	33	$^\circ\text{C/W}$
Thermal Resistance, Junction – Case	R_{thJC}	0.25	

Notes:

- 1.Package limited.
- 2.Pulse width limited by maximum junction temperature.
3. $V_{DS} = 50 \text{ V}$, $V_{GS} = 10 \text{ V}$, $L = 0.5 \text{ mH}$.
4. R_{thJA} is determined with the device mounted on a 1 in² pad 2 oz copper pad on a 1.5x1.5 in. board of FR-4 material.

Electrical Characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristic						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V , I _D = 250uA	100	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250uA	2	3	4	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 100V,V _{GS} = 0V	-	-	1	μA
Gate-Body Leakage	I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
Drain-Source On-State Resistance ⁽⁴⁾	R _{DS(on)}	V _{GS} = 10V,I _D = 20A	-	1.04	1.2	mΩ
Dynamic ⁽⁵⁾						
Gate Resistance	R _g	f = 1 MHz	-	3.62	-	Ω
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 50V, f = 1MHz	-	13382	-	pF
Output Capacitance	C _{oss}		-	5013	-	pF
Reverse Transfer Capacitance	C _{rss}		-	214	-	pF
Gate Total Charge	Q _g	V _{GS} =0-10V, V _{DS} = 50V, I _D = 20A	-	215	-	nC
Gate-Source charge	Q _{gs}		-	64	-	nC
Gate-Drain charge	Q _{gd}		-	52	-	nC
Turn-On DelayTime	t _{d(on)}	V _{GS} = 10V, V _{DS} = 50V, I _D = 20A,R _{GEN} = 3Ω	-	43	-	ns
Turn-On Rise Time	t _r		-	68	-	ns
Turn-Off DelayTime	t _{d(off)}		-	156	-	ns
Turn-Off Fall Time	t _f		-	93	-	ns
Reverse Diode Characteristics ⁽⁵⁾						
Body Diode Forward Voltage	V _{SD}	V _{GS} = 0V,I _F = 20A	-	0.85	1.2	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = 20A,dI/dt = 100A/μs	-	130	-	ns
Body Diode Reverse Recovery Charge	Q _{rr}		-	374	-	nC

Notes:

5. Guaranteed by design, not subject to production testing.

Typical Electrical & Thermal Characteristics

Fig.1 Typ. output characteristics

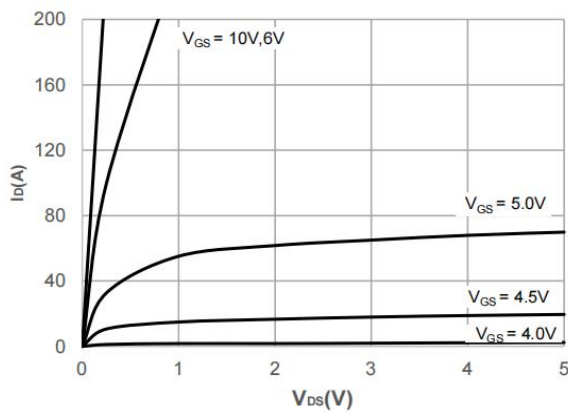


Fig.2 Typ. transfer characteristics

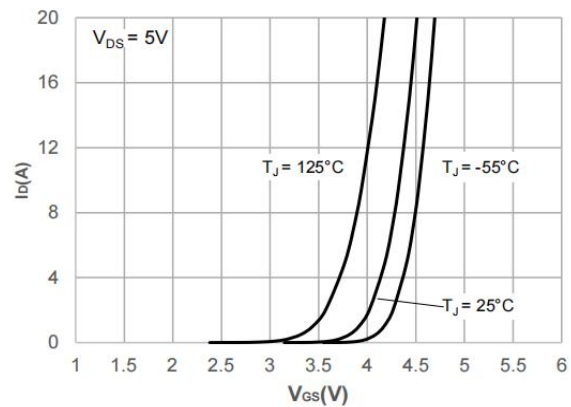


Fig.3 On-resistance vs. Drain Current

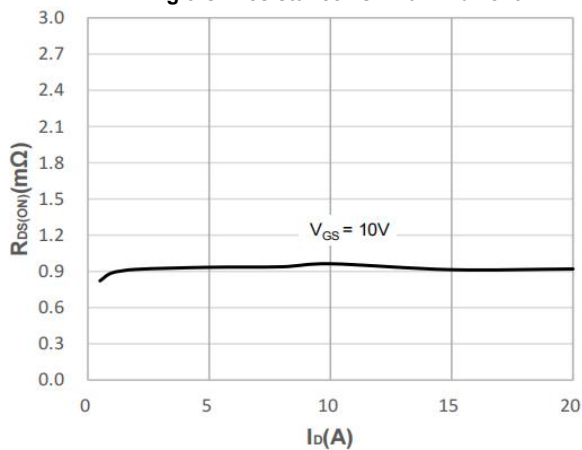


Fig.4 Body Diode Characteristics

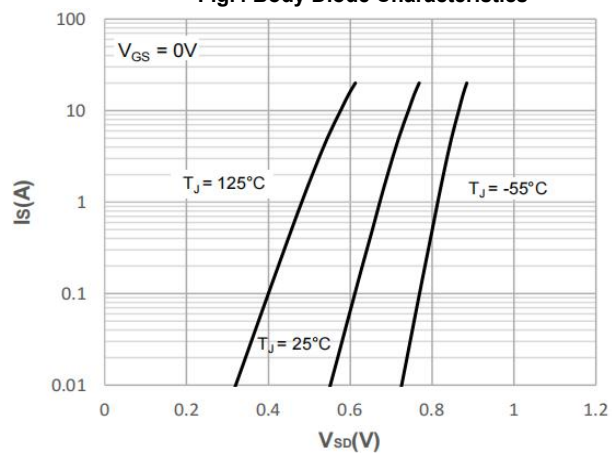


Fig.5 Typ. gate charge

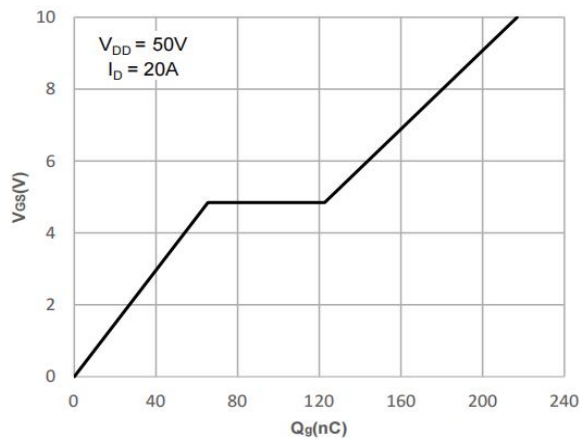
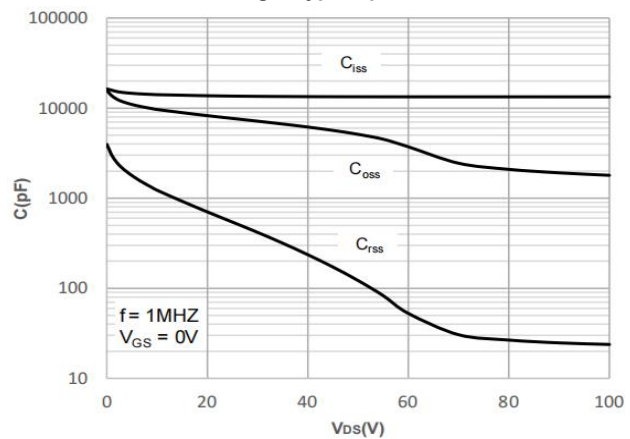


Fig.6 Typ. Capacitance



Typical Electrical & Thermal Characteristics

Fig.7 Normalized $V_{(BR)DSS}$ vs junction temperature

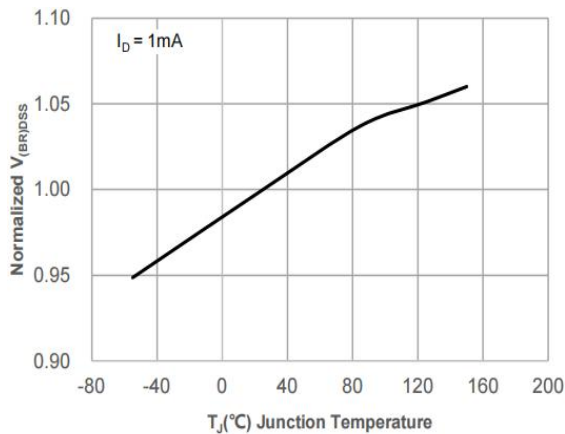


Fig.8 Normalized on Resistance vs junction temperature

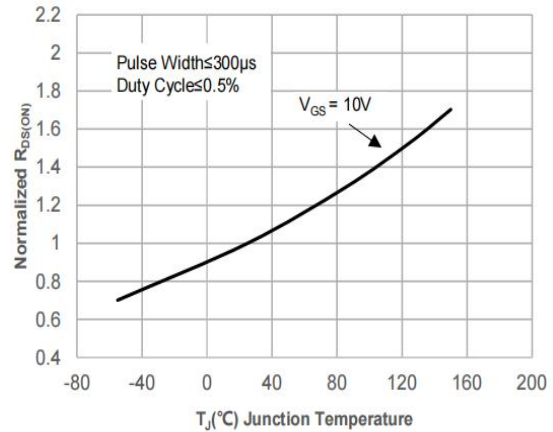


Fig.9 Normalized Threshold Voltage vs. Junction Temperature

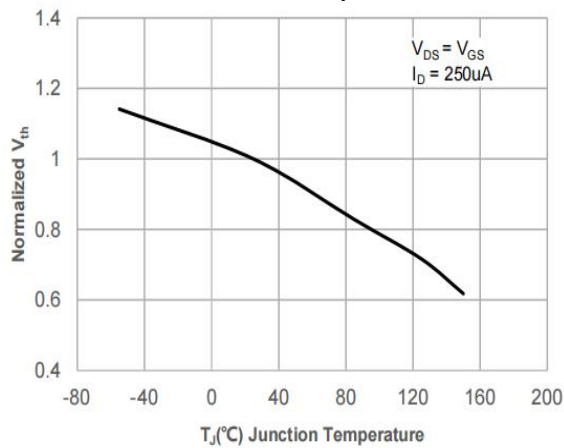


Fig.10 $R_{DS(ON)}$ vs. V_{GS}

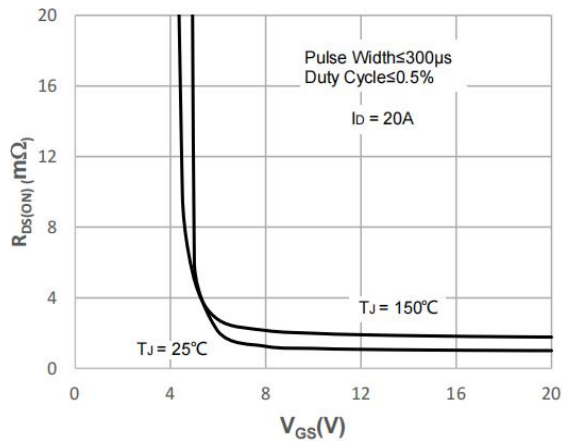


Fig.11 Power De-rating

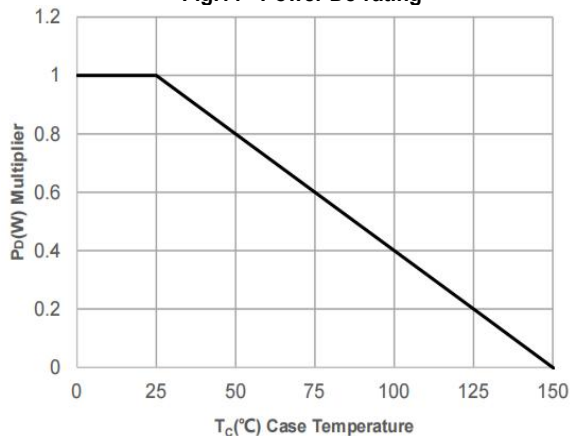
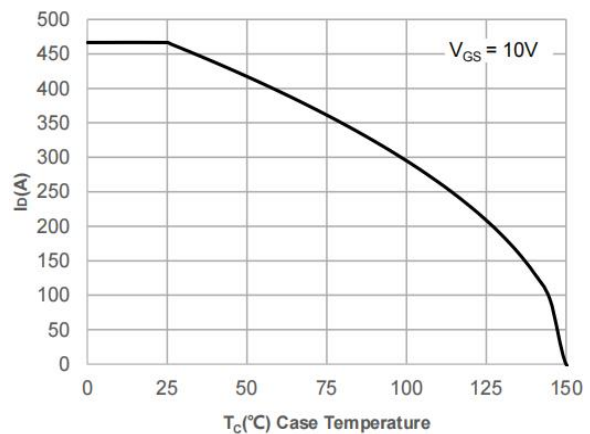


Fig.12 Current De-rating



Typical Electrical & Thermal Characteristics

Fig.13 Safe operating area

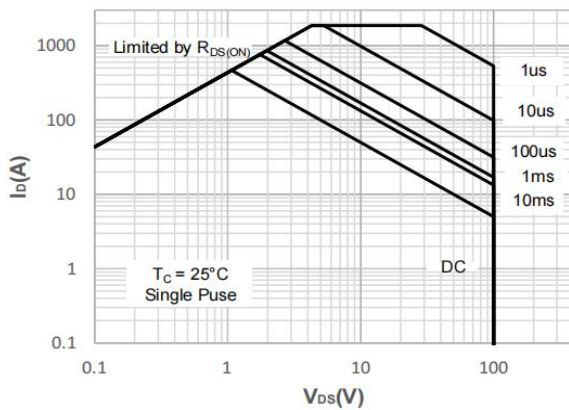
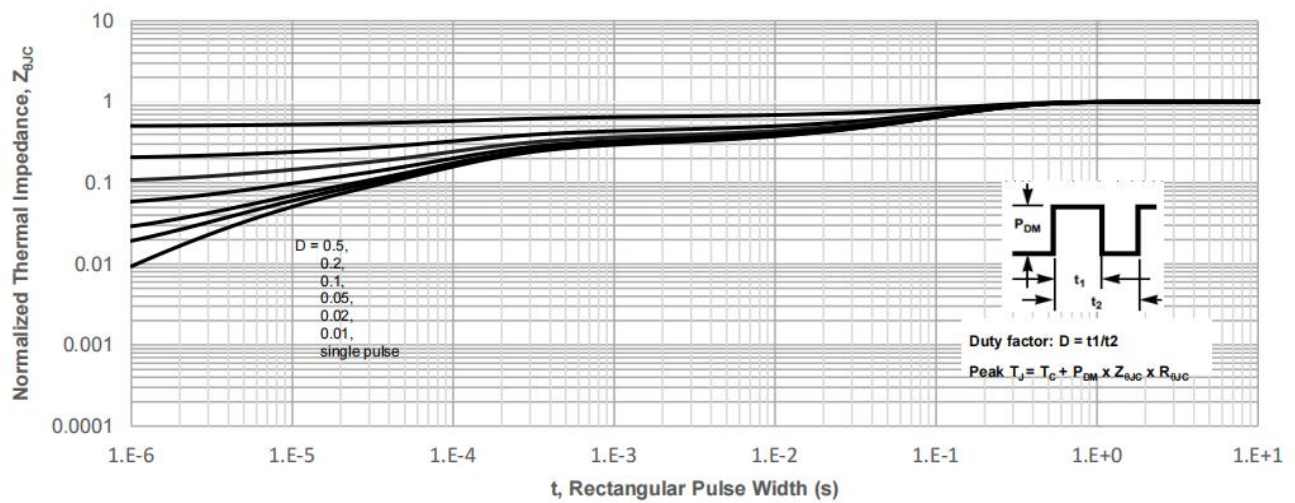
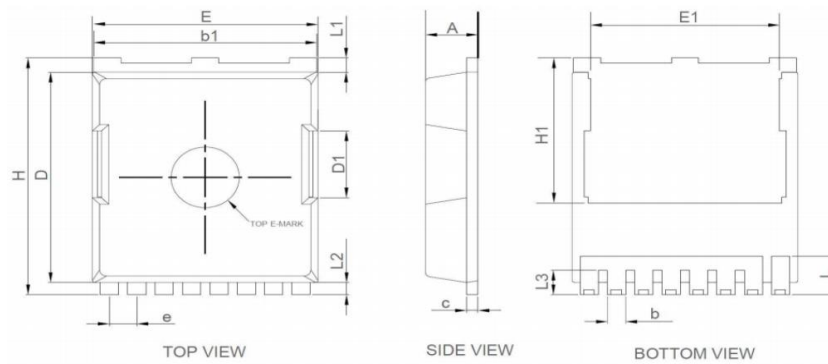


Fig.14 Transient thermal impedance from junction to case



Package Outline: TOLL



Symbol	Dimensions (Unit: mm)		
	Min.	Typ.	Max.
A	2.20	2.30	2.40
b	0.65	0.75	0.85
b1	9.70	9.80	9.90
c	0.40	0.50	0.60
D	10.28	10.38	10.48
D1	3.20	3.30	3.40
E	9.70	9.90	10.10
E1	7.35	---	8.45
e	1.20BSC		
H	11.48	11.68	11.88
H1	6.80	---	7.40
L	1.50	---	2.10
L1	0.50	---	0.90
L2	0.50	0.60	0.70
L3	1.00	---	1.30