

Features

- Low $R_{DS(on)}$ SGT technology
- Low thermal impedance
- Fast switching speed
- 100% avalanche tested
- Halogen free and RoHS compliant

Applications

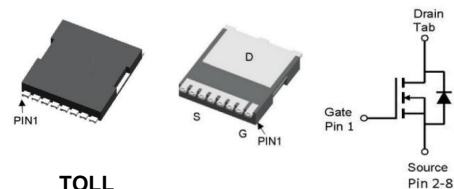
- Load Switch
- PWM Application
- Battery management

100% Avalanche Tested



Product Summary

Parameter	Value	Unit
V_{DS}	100	V
$R_{DS(on),typ}$	1.1	m Ω
I_D	367	A



Package Marking and Ordering Information

Device	Marking	Package	Packing	Qty
RSTGE014S10ALH	GE014S10ALH	TOLL	Tape&Reel	2000pcs

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Continuous Drain Current	I_D	-	A
$T_C = 25^\circ\text{C}^{(1)}$		367	
$T_C = 100^\circ\text{C}$		232	
Pulsed Drain Current ⁽²⁾	I_D pulse	1468	A
Avalanche Energy, Single Pulse ⁽³⁾	E_{AS}	1225	mJ
Gate-Source Voltage	V_{GS}	± 20	V
Power Dissipation	$T_C = 25^\circ\text{C}$	357	W
	$T_C = 100^\circ\text{C}$	143	
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}	34	$^\circ\text{C/W}$
Thermal Resistance, Junction – Case	R_{thJC}	0.35	

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	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	100	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.2	3.27	3.8	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 100V, V_{GS} = 0V$	-	-	1	μA
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 50A$	-	1.1	1.4	m Ω
Forward Transconductance	g_{FS}	$V_{DS} = 5V, I_D = 20A$	-	96	-	S
Gate Resistance	R_g	$f = 1\text{ MHz}$	-	1.6	-	Ω
Dynamic Characteristic						
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = 50V, f = 1\text{ MHz}$	-	13174	-	pF
Output Capacitance	C_{oss}		-	3083	-	pF
Reverse Transfer Capacitance	C_{rss}		-	119	-	pF
Gate Total Charge	Q_g	$V_{GS} = 10V, V_{DS} = 50V, I_D = 20A$	-	162	-	nC
Gate-Source charge	Q_{gs}		-	63	-	nC
Gate-Drain charge	Q_{gd}		-	34	-	nC
Turn-On DelayTime	$t_{d(on)}$	$V_{GS} = 10V, V_{DS} = 50V, I_D = 20A$ $R_G = 3\Omega$	-	38	-	ns
Turn-On Rise Time	t_r		-	45	-	ns
Turn-Off DelayTime	$t_{d(off)}$		-	117	-	ns
Turn-Off Fall Time	t_f		-	59	-	ns
Reverse Diode Characteristics ⁽⁵⁾						
Body Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_F = 50A$	-	0.82	1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 50A, V_{DS} = 50V$	-	114	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}	$dI/dt = 100A/\mu s$	-	293	-	nC

Notes:

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

Typical Electrical & Thermal Characteristics

Fig.1 Typ. output characteristics

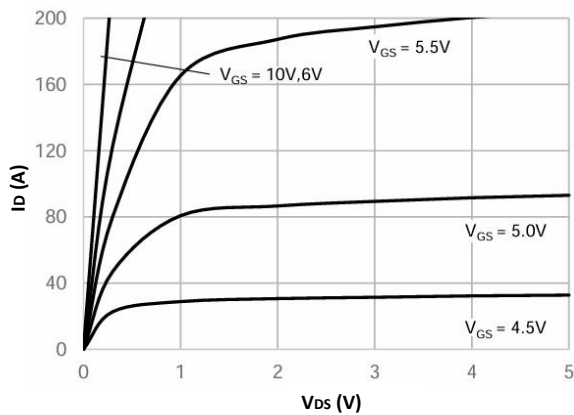


Fig.2 Typ. transfer characteristics

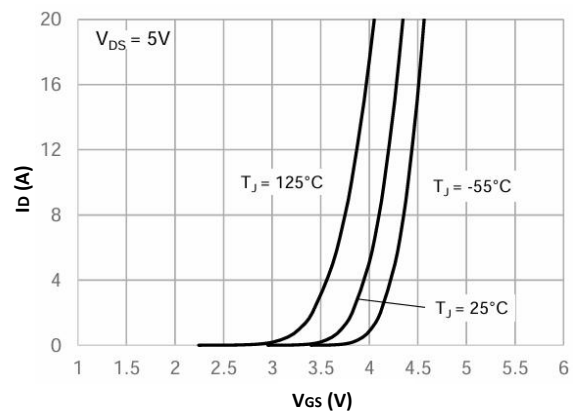


Fig.3 On-resistance vs. Drain Current

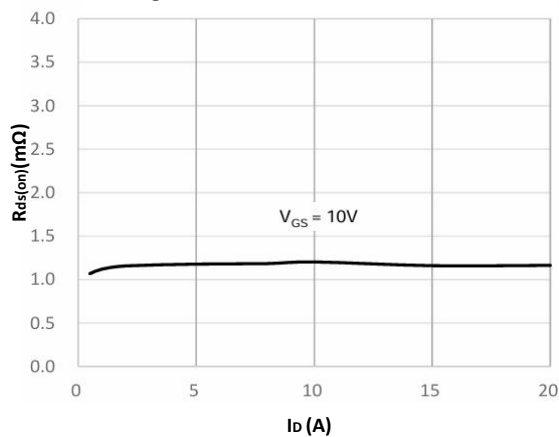


Fig.4 On-resistance vs. Gate Voltage

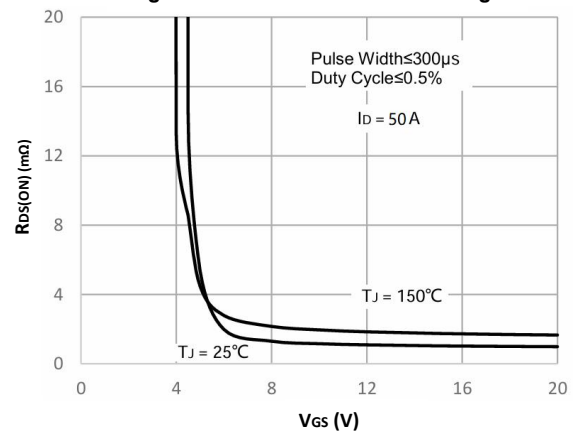


Fig.5 Typ. gate charge

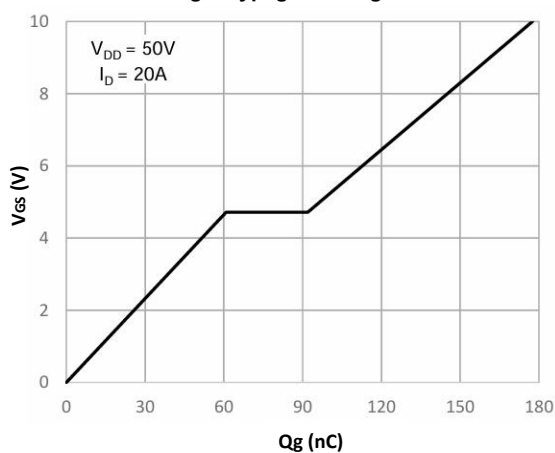
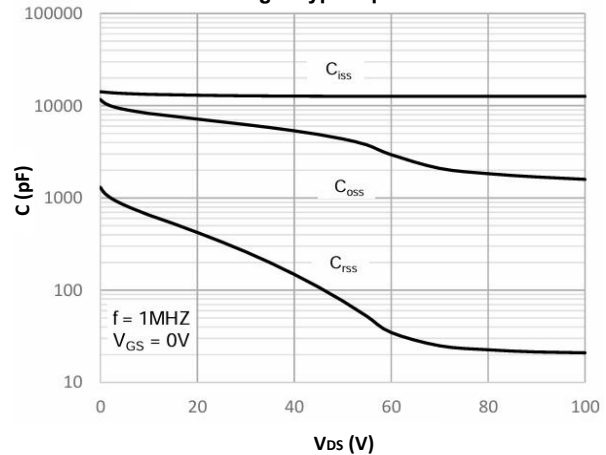


Fig.6 Typ. Capacitance



Typical Electrical & Thermal Characteristics

Fig.7 Body Diode Characteristics

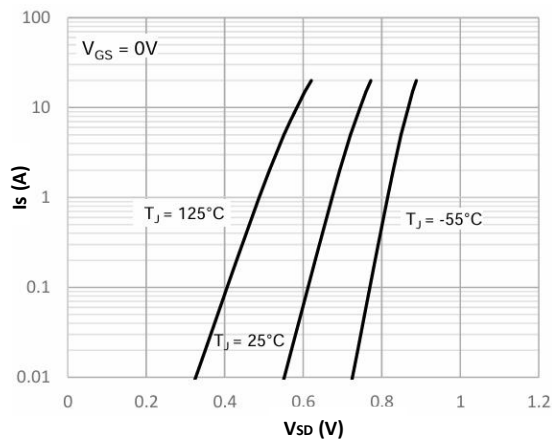


Fig.8 Normalized on Resistance vs junction temperature

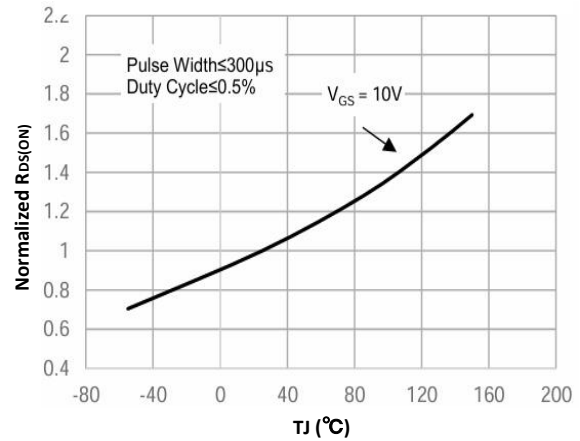


Fig.9 Normalized $V_{(BR)DSS}$ vs junction temperature

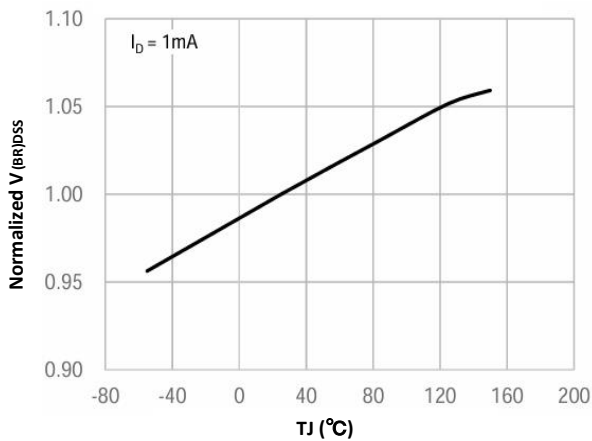


Fig.10 Normalized Threshold Voltage vs Junction Temperature

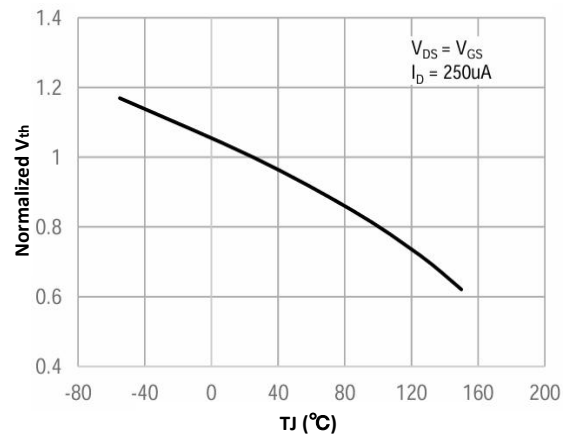


Fig.11 Power De-rating

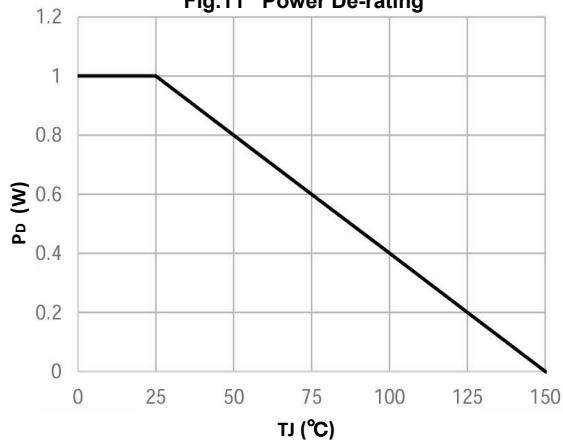
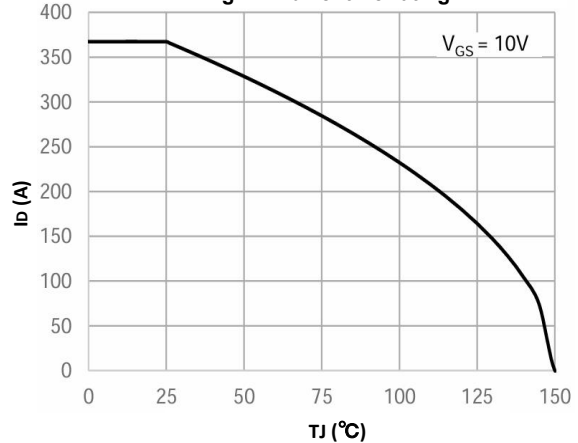


Fig.12 Current De-rating



Typical Electrical & Thermal Characteristics

Fig.13 Safe operating area

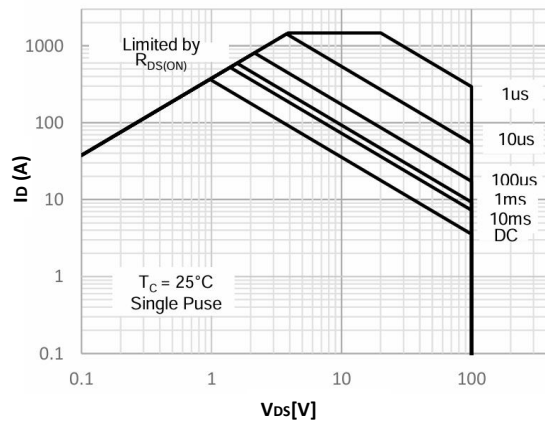
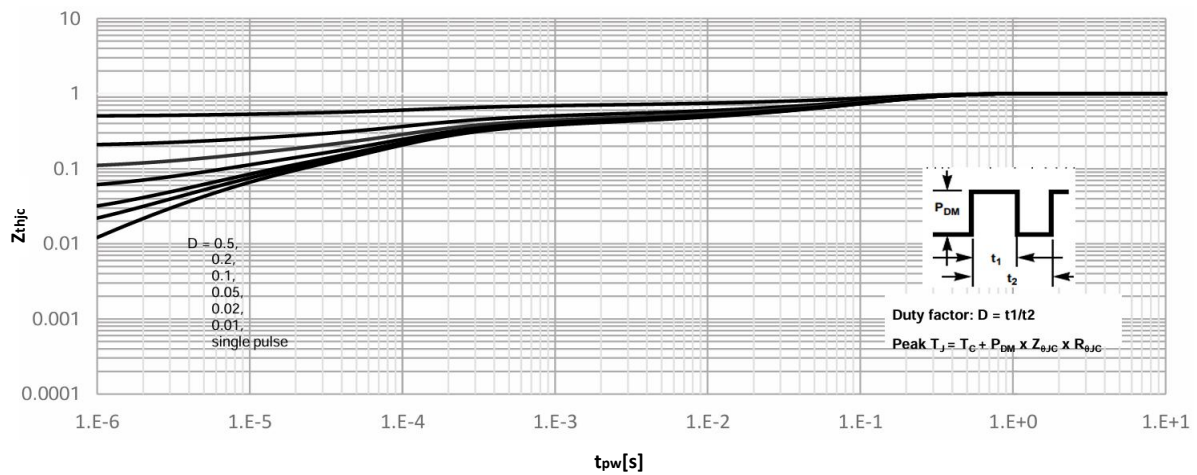
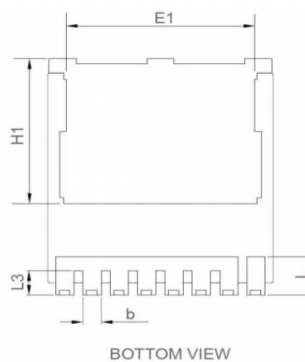
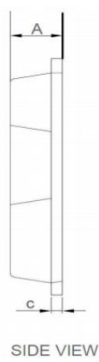
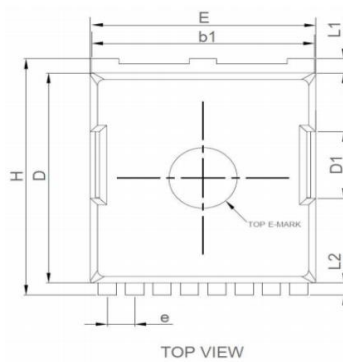


Fig.14 Transient thermal impedance from junction to case



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