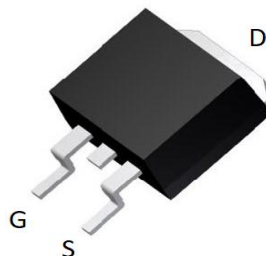


100V N-Channel SGT MOSFET

Features

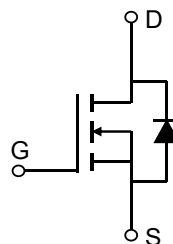
- 100V, 85A
 $R_{DS(ON)}$ Typ= 10m Ω @ V_{GS} = 10V
 $R_{DS(ON)}$ Typ= 13m Ω @ V_{GS} = 4.5V
- Advanced Split Gate Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge



TO-263-3L

Applications

- Load Switch
- PWM Application
- Power Management



Absolute Maximum Ratings (@ T_J = 25°C unless otherwise specified)

Symbol	Parameter		Value	Units
V_{DS}	Drain-to-Source Voltage		100	V
V_{GS}	Gate-to-Source Voltage		± 20	V
I_D	Continuous Drain Current	$T_C = 25^\circ\text{C}$	85	A
		$T_C = 100^\circ\text{C}$	51	
I_{DM}	Pulsed Drain Current ⁽¹⁾		340	A
E_{AS}	Single Pulsed Avalanche Energy ⁽²⁾		71	mJ
P_D	Power Dissipation	$T_C = 25^\circ\text{C}$	100	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		1.05	$^\circ\text{C/W}$
T_J, T_{STG}	Junction & Storage Temperature Range		-55 to 150	$^\circ\text{C}$



100V N-Channel SGT MOSFET

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	I _D = 250μA, V _{GS} = 0V	100	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 100V, V _{GS} = 0V	-	-	1.0	μA
I _{GSS}	Gate-Body Leakage Current	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	1.0	1.7	2.5	V
R _{DS(ON)}	Static Drain-Source ON-Resistance ⁽³⁾	V _{GS} = 10V, I _D = 30A	-	10.0	13.0	mΩ
		V _{GS} = 4.5V, I _D = 25A	-	13.0	17.0	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} = 0V, V _{DS} = 25V, f = 1MHz	-	1500	-	pF
C _{oss}	Output Capacitance		-	840	-	pF
C _{rss}	Reverse Transfer Capacitance		-	30	-	pF
Q _g	Total Gate Charge	V _{GS} = 0 to 10V V _{DS} = 50V, I _D = 15A	-	35	-	nC
Q _{gs}	Gate Source Charge		-	4.5	-	nC
Q _{gd}	Gate Drain("Miller") Charge		-	8	-	nC
Switching Characteristics						
t _{d(on)}	Turn-On DelayTime	V _{GS} = 10V, V _{DD} = 50V I _D = 15A, R _{GEN} = 3Ω	-	16	-	ns
t _r	Turn-On Rise Time		-	13	-	ns
t _{d(off)}	Turn-Off DelayTime		-	37	-	ns
t _f	Turn-Off Fall Time		-	17	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	85	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	340	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _S = 30A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I _F = 12A, di/dt = 100A/us	-	38	-	ns
Qrr	Body Diode Reverse Recovery Charge	I _F = 12A, di/dt = 100A/us	-	35	-	nC

- Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
 2. E_{AS} condition: Starting $T_J = 25^\circ\text{C}$, $V_{DD} = 50\text{V}$, $V_G = 10\text{V}$, $R_G = 25\Omega$, $L = 0.5\text{mH}$, $I_{AS} = 16\text{A}$
 3. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 0.5\%$.

100V N-Channel SGT MOSFET

Typical Performance Characteristics

Figure 1: Output Characteristics

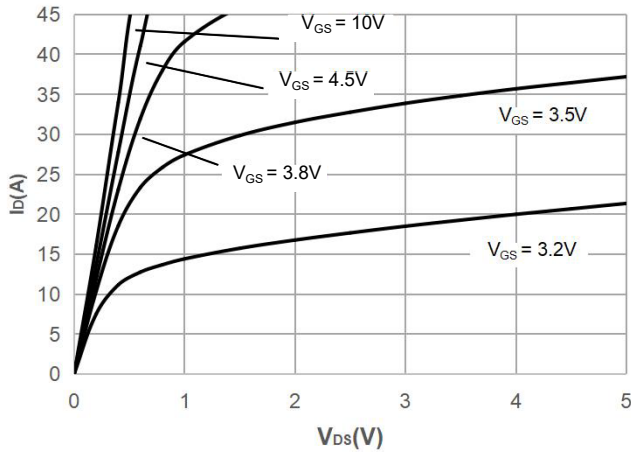


Figure 2: Typical Transfer Characteristics

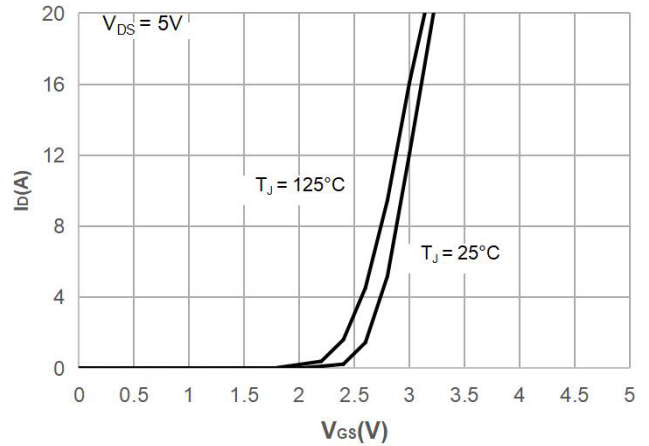


Figure 3: On-resistance vs. Drain Current

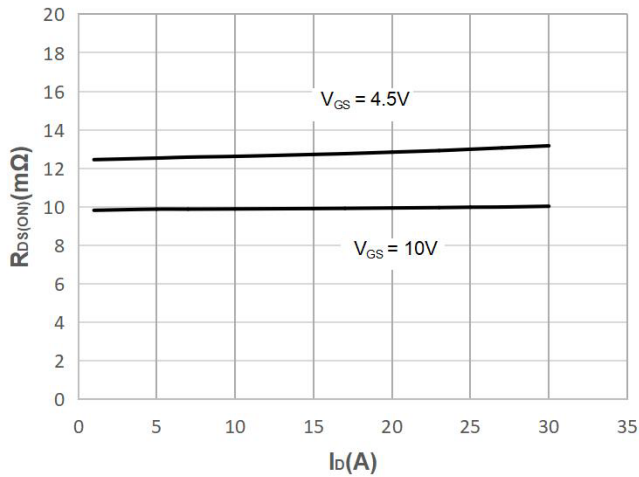


Figure 4: Body Diode Characteristics

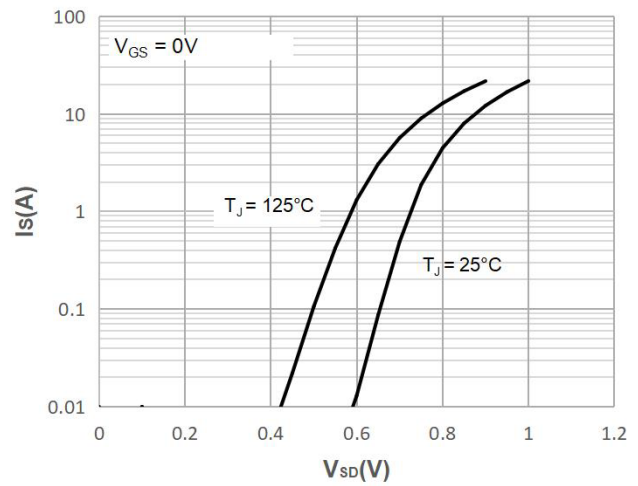


Figure 5: Gate Charge Characteristics

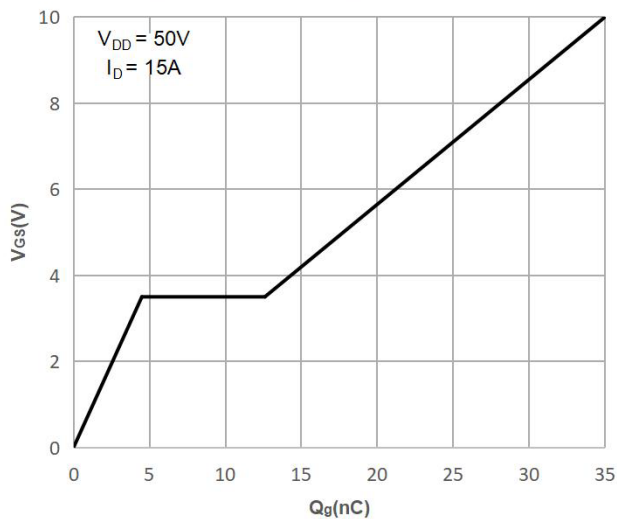
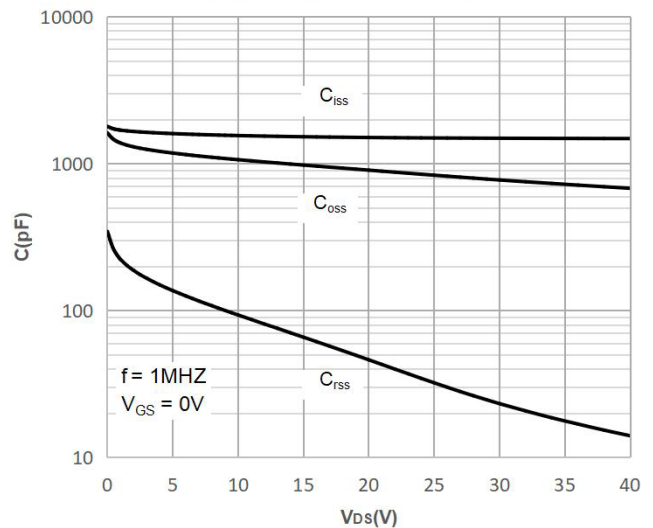


Figure 6: Capacitance Characteristics



100V N-Channel SGT MOSFET

Typical Performance Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

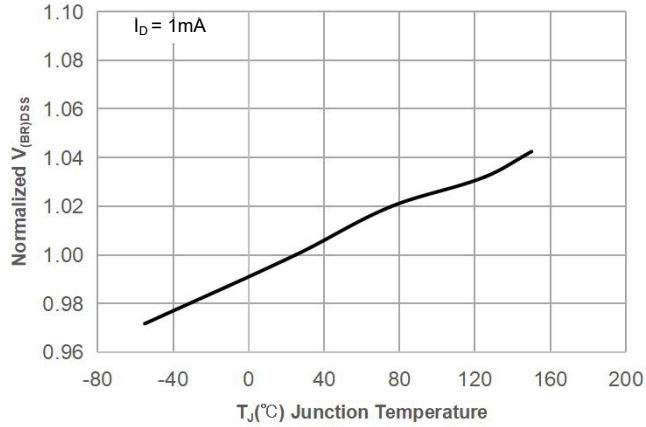


Figure 8: Normalized on Resistance vs. Junction Temperature

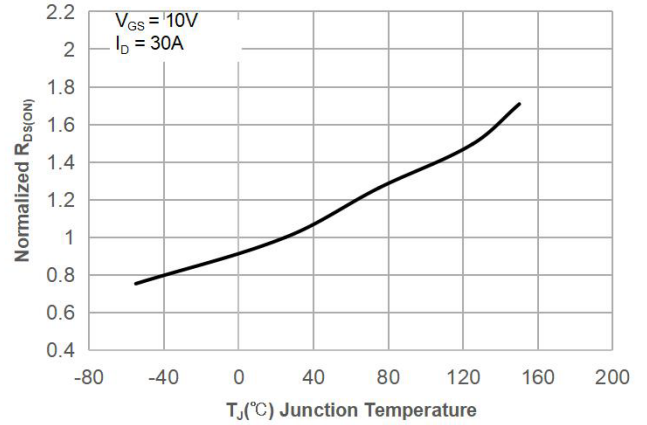


Figure 9: Maximum Safe Operating Area

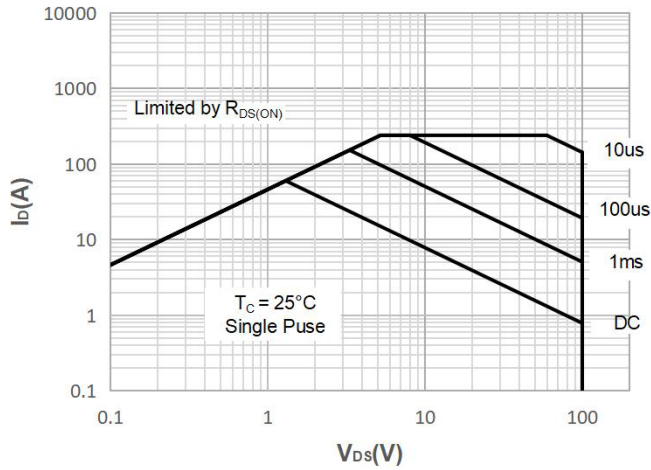


Figure 10: Current De-rating

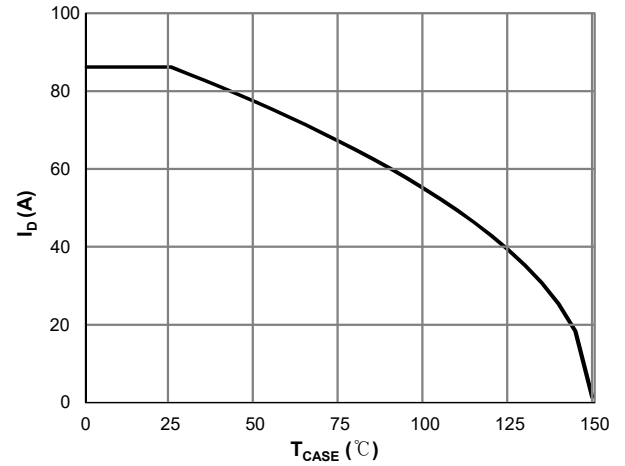


Figure 11: Normalized Maximum Transient Thermal Impedance

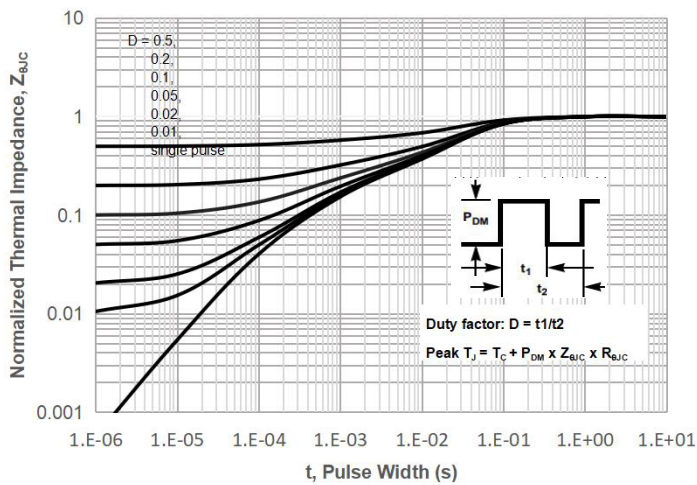
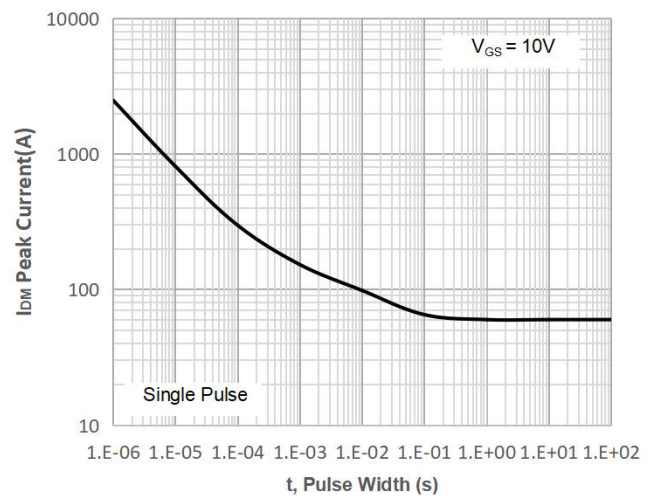


Figure 12: Peak Current Capacity



100V N-Channel SGT MOSFET

Test Circuit

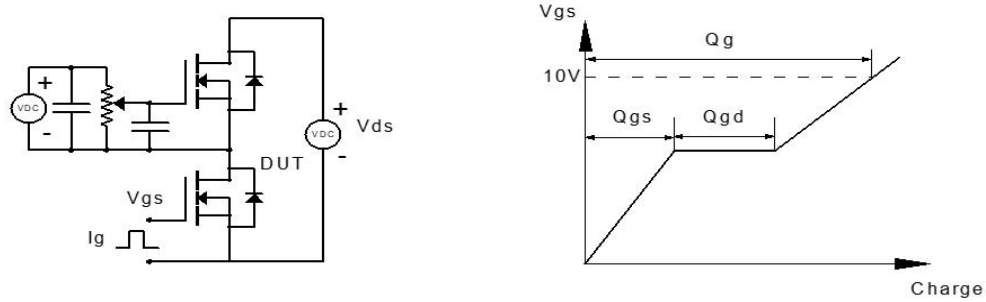


Figure 1: Gate Charge Test Circuit & Waveform

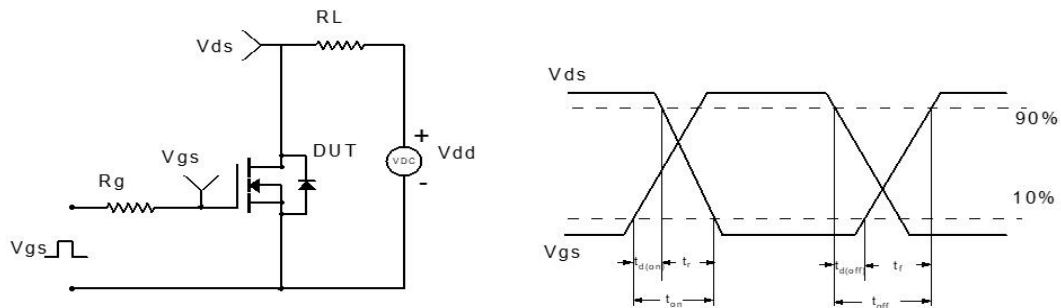


Figure 2: Resistive Switching Test Circuit & Waveform

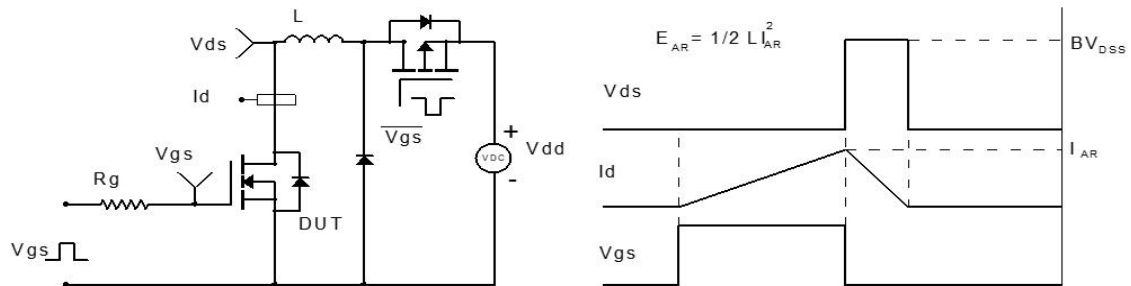


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

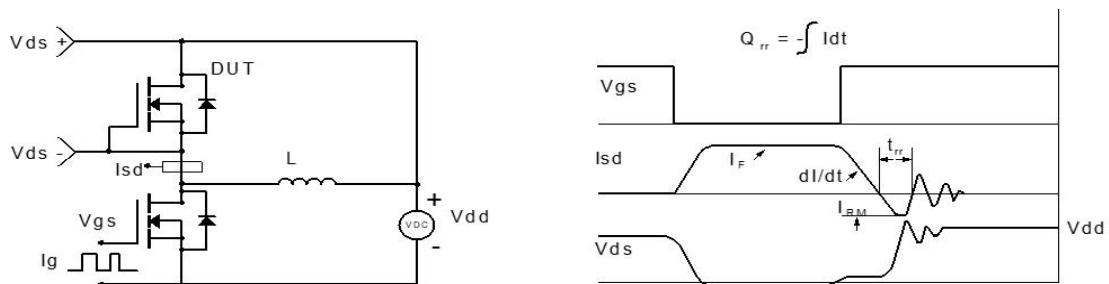
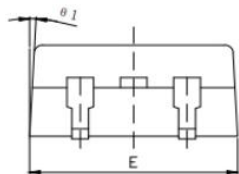
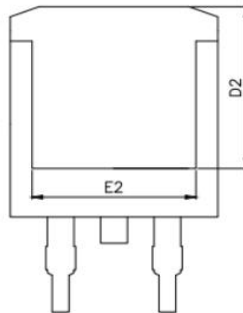
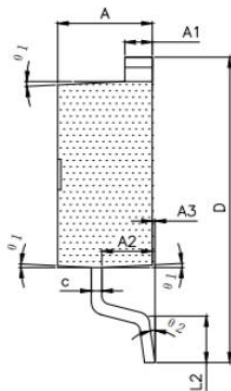
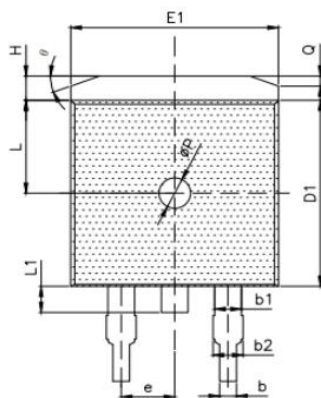


Figure 4: Diode Recovery Test Circuit & Waveform

100V N-Channel SGT MOSFET

Package Mechanical Data(TO-263-3L)



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	4.40	4.50	4.60
A1	1.20	1.30	1.40
A2	2.30	2.40	2.50
A3	0.03	0.13	0.23
b	0.70	0.80	0.90
b1	1.21	1.27	1.40
b2	1.25	1.35	1.45
c	0.40	0.50	0.60
D	14.80	15.10	15.40
D1	9.10	9.20	9.30
D2	8.00	—	—
E	9.70	9.90	10.20
E1	9.68	9.88	10.08
E2	7.80	—	—
e	2.54 (BSC)		
H	1.00	1.20	1.40
L	4.30	4.60	4.90
L1	1.10	1.30	1.50
L2	2.10	2.30	2.50
øP	1.40	1.50	1.60
Q	0.50 (REF)		
θ	16°	20°	24°
θ1	1°	3°	5°
θ2	0°	—	9°