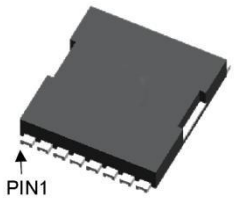
SGT N-channel Power MOSFET

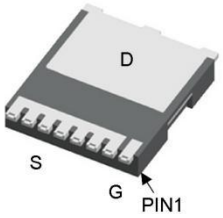
TOLL

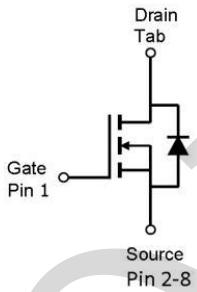
MTR2R2N10TL

TOLL Top View



TOLL Bottom View





V_{DS}	100	V
$R_{DS(on),TYP}$@ V_{GS}=10 V	1.6	mΩ
I_D	320	A

Features

1、Low on – resistance

2、Package TOLL

3、SGT N-channel Power MOSFET

Applications

1、Load Switch for Portable Devices

2、DC/DC Converter

Maximum ratings, at T_A =25°C, unless otherwise specified

Symbol	Parameter		Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage		100	V
V_{GS}	Gate-Source voltage		±20	V
I_S	Diode continuous forward current	T_C =25°C	320	A
I_D	Continuous drain current @VGS=10V	T_C =25°C	320	A
		T_C =100°C	208	A
I_{DM}	Pulse drain current tested ①	T_C =25°C	960	A
EAS	Avalanche energy, single pulsed ②		1936	mJ
P_D	Maximum power dissipation	T_C =25°C	313	W
T_{STG},T_J	Storage and Junction Temperature Range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.4	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	46	°C/W

Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T_j=25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	100	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=100V,V_{GS}=0V	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V,V_{DS}=0V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	2.0	3.0	4.0	V
$R_{DS(on)}$	Drain-Source On-State Resistance ④	V_{GS}=10V, I_D=50A	--	1.6	2.2	mΩ
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=40V,V_{GS}=0V , f=1MHz	--	15016	--	pF
C_{oss}	Output Capacitance		--	1472	--	pF
C_{rss}	Reverse Transfer Capacitance		--	1648	--	pF
R_g	Gate Resistance	VGS=0V, f=1MHz VDS=0V,	--	1.6	--	Ω
Q_g (10V)	Total Gate Charge	V_{DS}=50V,I_D=50A , V_{GS}=10V	--	165	--	nC
Q_{gs}	Gate-Source Charge		--	67	--	nC
Q_{gd}	Gate-Drain Charge		--	35	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V_{DS}=50V, VGS=10V, R_L=3.0Ω, Tj=25°C	--	37	--	ns
Tr	Turn-on Rise Time		--	112	--	ns
Td(off)	Turn-Off Delay Time		--	85	--	ns
Tf	Turn-Off Fall Time		--	115	--	ns

Source- Drain Diode Characteristics@ T_j = 25°C (unless otherwise stated)

VSD	Forward on voltage	I_{SD}=50A,V_{GS}=0V	--	0.85	1.2	V
Trr	Reverse Recovery Time	IF=30A, di/dt=500A/μs	--	100	--	ns
Qrr	Reverse Recovery Charge	IF=30A, di/dt=100A/μs	--	323	--	nC

NOTE: ① Repetitive rating; pulse width limited by max junction temperature.

② Limited by T_{Jmax}, starting T_J = 25°C, L = 0.5mH, R_G = 25Ω, I_{AS} = 9A, V_{GS} =10V. Part not recommended for use above this value

③ The power dissipation P_{DSM} is based on $R_{\theta JA}$ and the maximum allowed junction temperature of 150°C.

④ Pulse width ≤ 380μs; duty cycle≤ 2%.

Typical Performance Characteristics

Fig 1: Output Characteristics

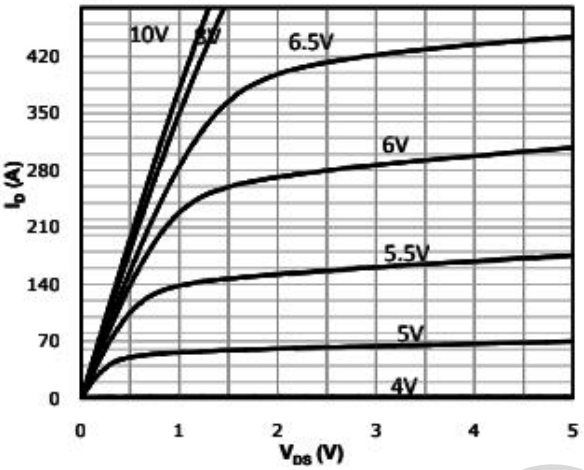
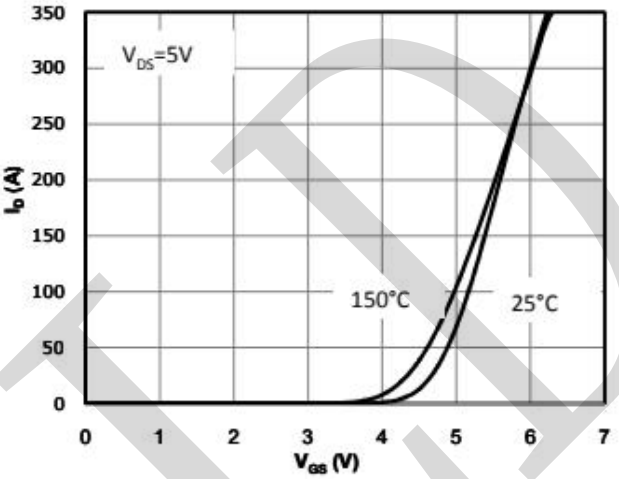


Fig 2: Transfer Characteristics



3: Rds(on) vs Drain Current and Gate Voltage

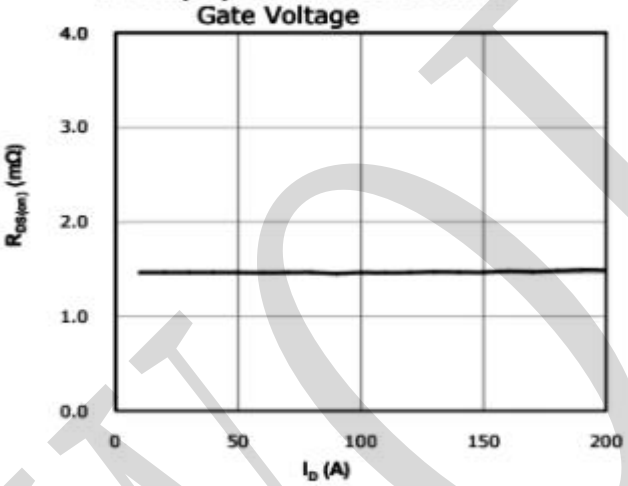


Fig 4: Rds(on) vs Gate Voltage

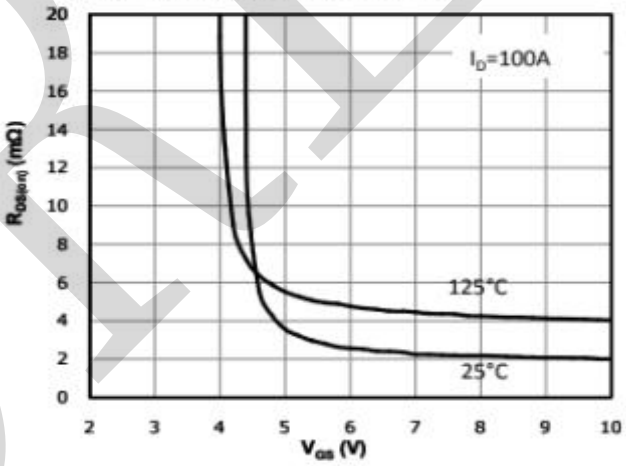


Fig 5: Rds(on) vs. Temperature

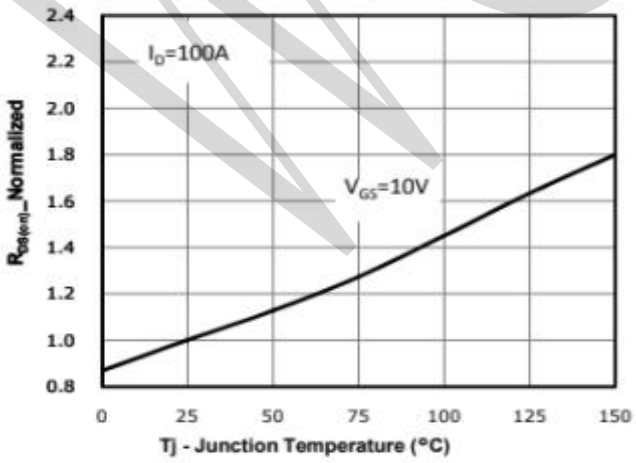


Fig 6: Capacitance Characteristics

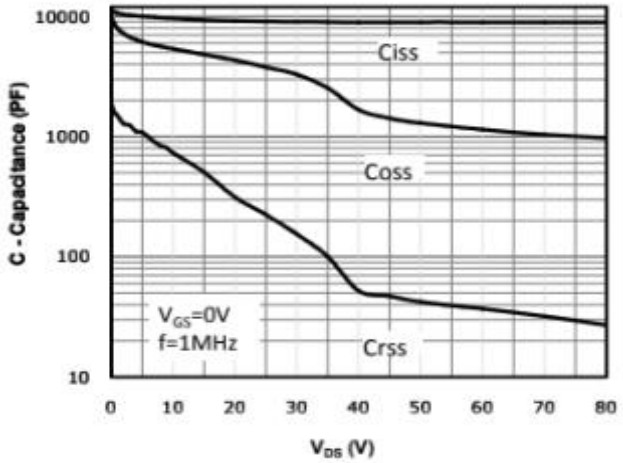


Fig 7: Gate Charge Characteristics

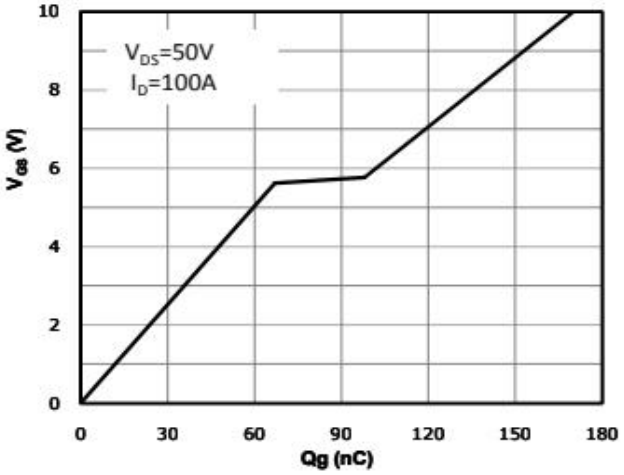


Fig 8: Body-diode Forward Characteristics

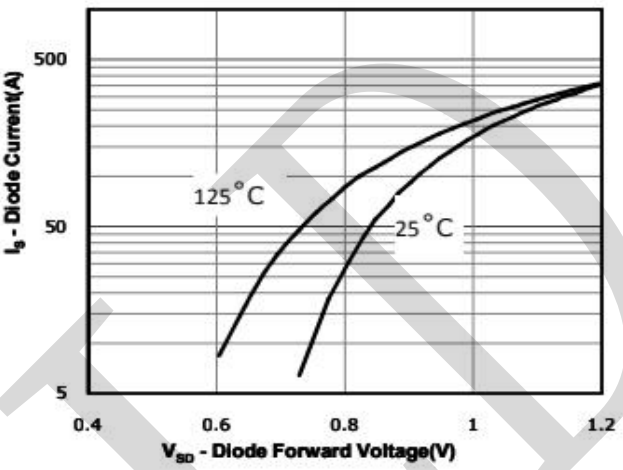


Fig 9: Power Dissipation

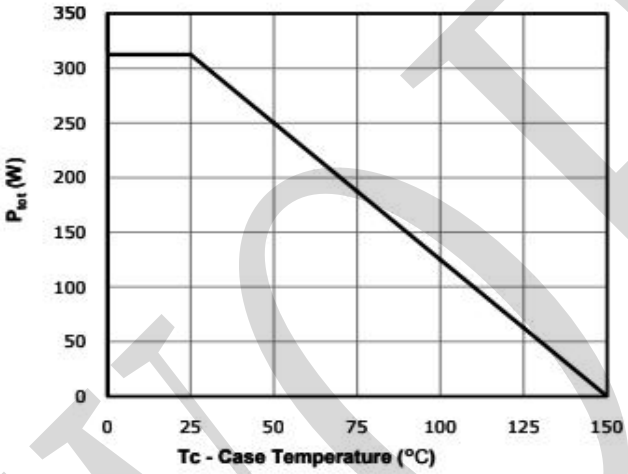


Fig 10: Drain Current Derating

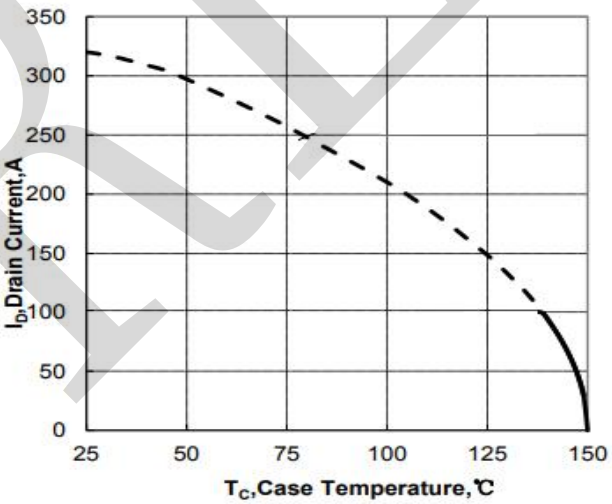


Fig 11: Safe Operating Area

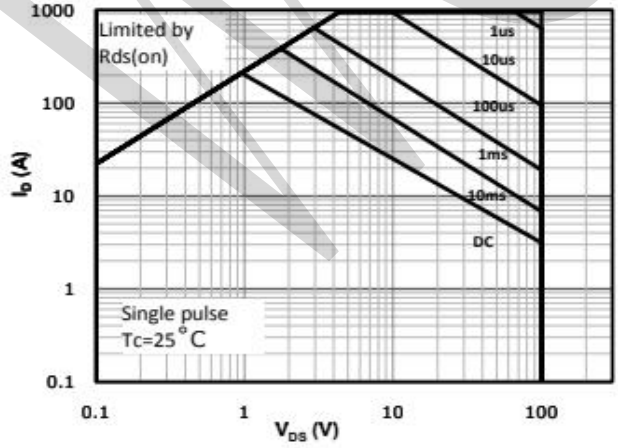
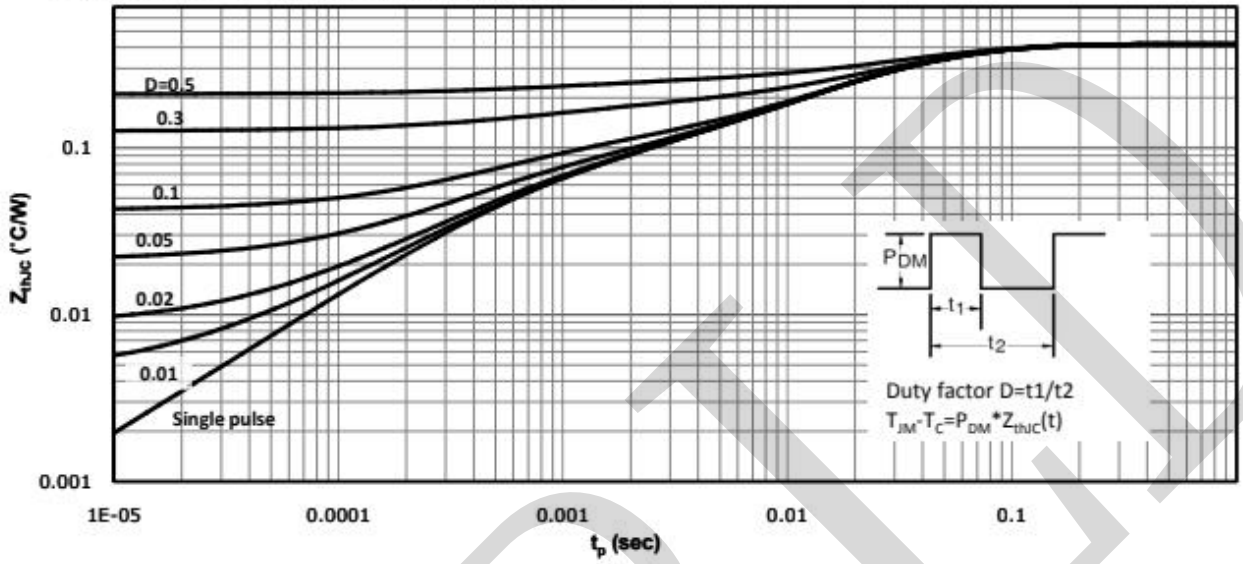


Fig 12: Max. Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS

TOLL:(MM)