

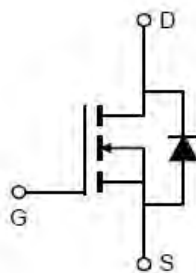
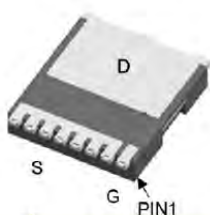
SGT N-channel Power MOSFET

TOLL MTR1R8N10TL

TOLL Top View



TOLL Bottom View



V_{DS}	100	V
$R_{DS(on),TYP@ V_{GS}=10V}$	1.55	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 $T_A = 25^\circ\text{C}$, unless otherwise specified

Symbol	Parameter		Rating	Unit
V(BR)DSS	Drain-Source breakdown voltage		100	V
VGS	Gate-Source voltage		±20	V
ID	Continuous drain current @VGS=10V	T _C =25°C	320	A
		T _C =100°C	208	A
IDM	Pulse drain current tested ①	T _C =25°C	1200	A
EAS	Avalanche energy, single pulsed ②		2601	mJ
PD	Maximum power dissipation	T _C =25°C	313	W
TSTG,TJ	Storage and Junction Temperature Range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
R _{θJC}	Thermal Resistance, Junction-to-Case	0.4	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient	46	°C/W

Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
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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	--	1.55	1.8	mΩ
g _{fs}	Transconductance	V _{DS} =5V, I _D =50A	125	--	--	S

Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)

C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V , f=1MHz	--	14510	--	pF
C _{oss}	Output Capacitance		--	1265	--	pF
C _{rss}	Reverse Transfer Capacitance		--	189	--	pF
R _g	Gate Resistance	V _{GS} =0V, f=1MHz V _{DS} =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, V _{GS} =10V, R _L =3.0Ω, T _J =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	--	0.8	1.2	V
Trr	Reverse Recovery Time	I _F =30A, di/dt=500A/μs	--	47	--	ns
Qrr	Reverse Recovery Charge	I _F =30A, di/dt=100A/μs	--	388	--	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_{θJA} and the maximum allowed junction temperature of 150°C.

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

Typical Characteristics

Fig 1: Output Characteristics

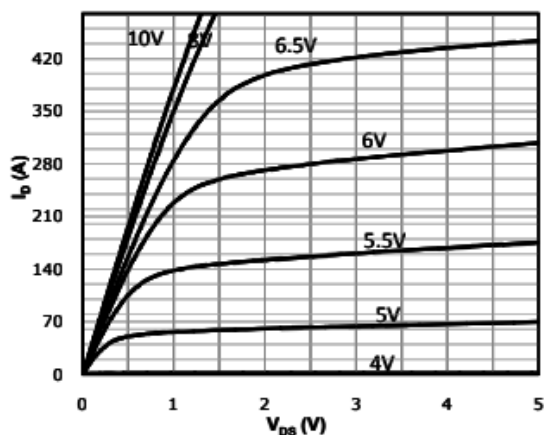


Fig 2: Transfer Characteristics

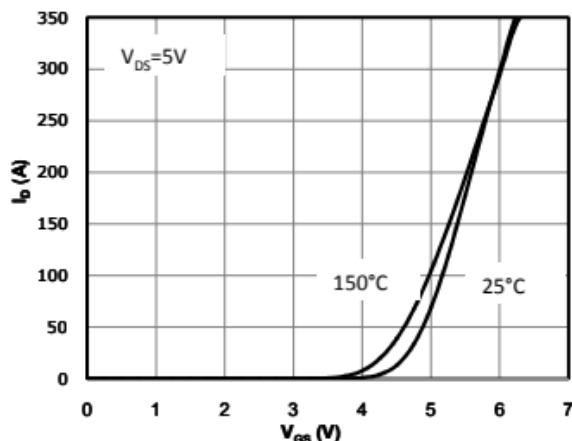


Fig 3: Rds(on) Vs Ids Characteristics ($T_c = 25^\circ\text{C}$)

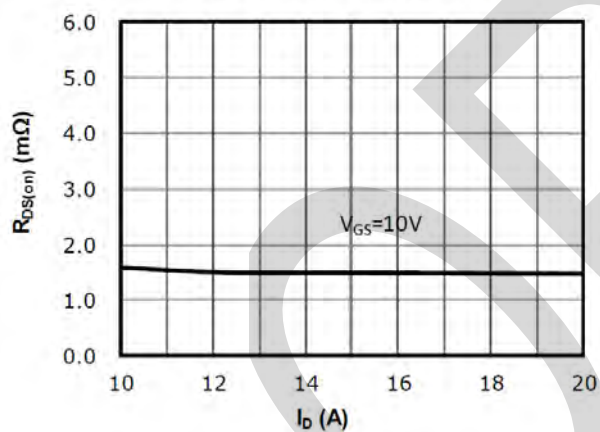


Fig 4: Rds(on) vs Gate Voltage

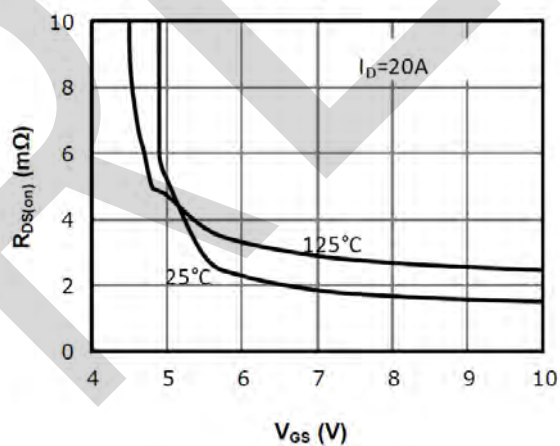


Fig 5: Rds(on) vs. Temperature

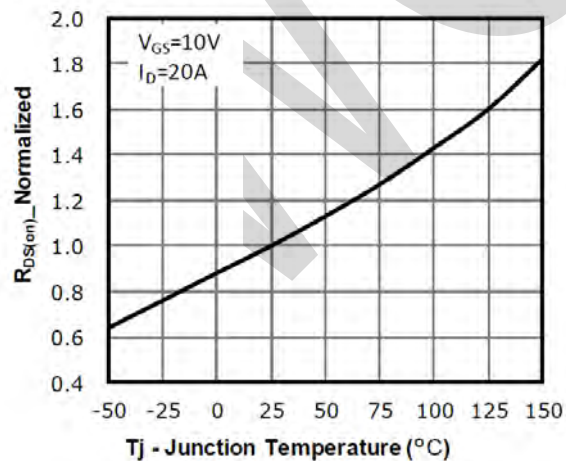
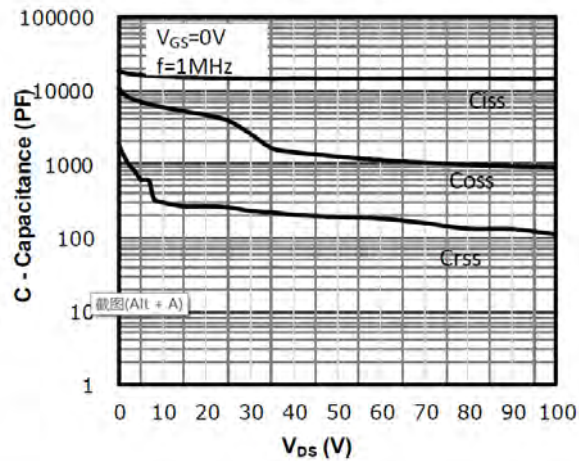


Fig 6: Capacitance Characteristics



Typical Characteristics

Fig 7: Gate Charge Characteristics

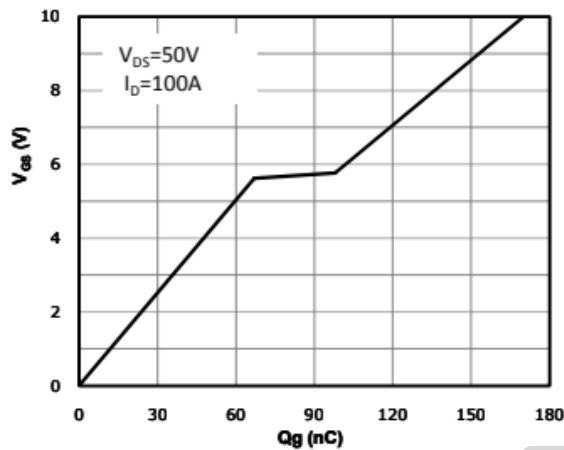


Fig 8: Body-diode Forward Characteristics

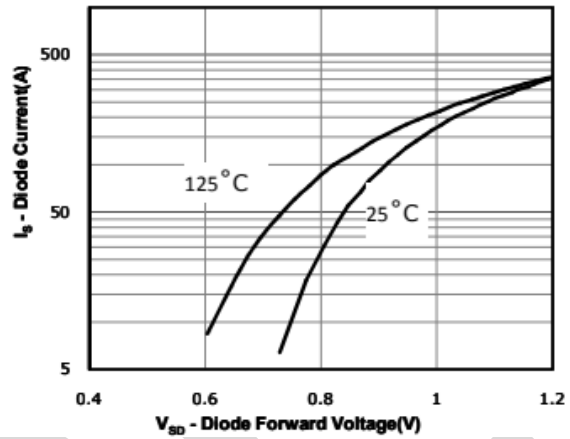


Fig 9: Power Dissipation

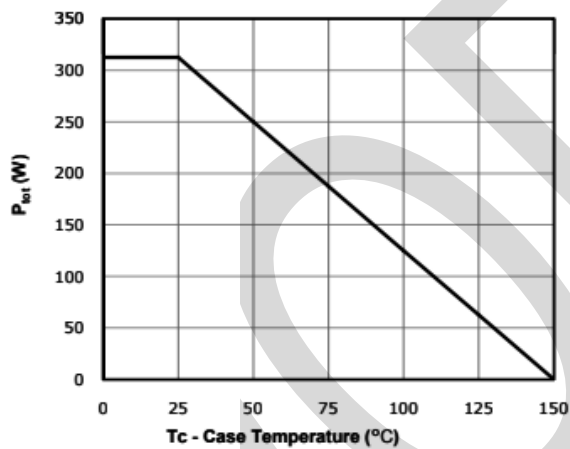


Fig 10: Drain Current Derating

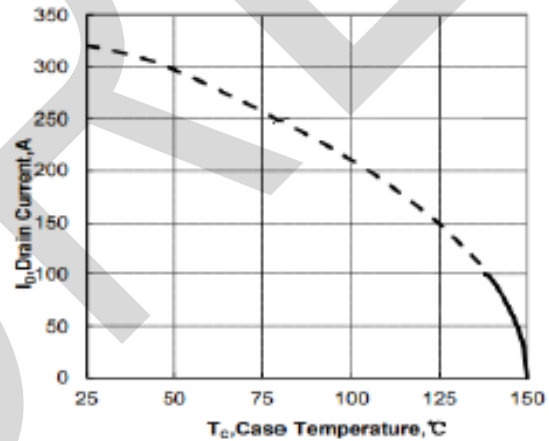


Fig 11: Safe Operating Area

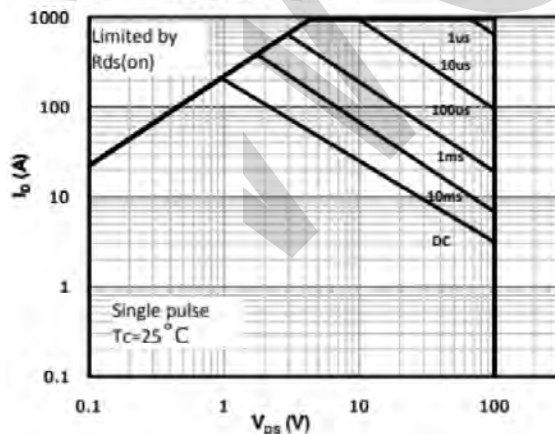
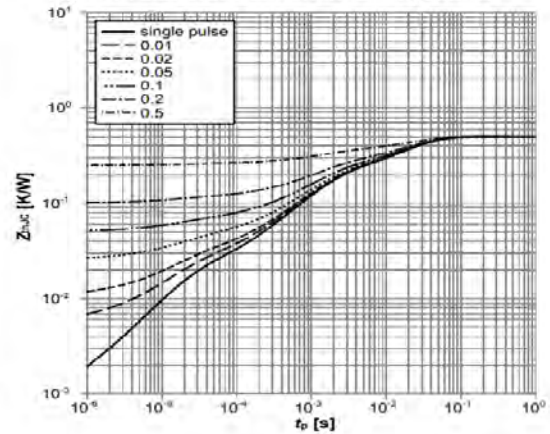


Fig 12: Max. Transient Thermal Impedance



TOLL:(MM)

