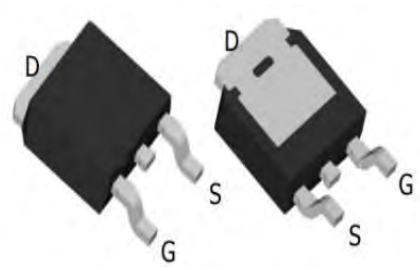
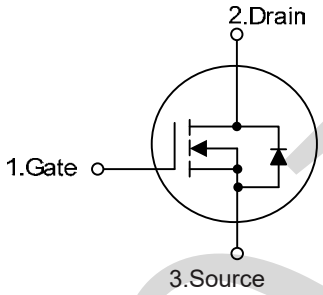
SGT N-channel Power MOSFET

MTR9R2N10D

TO-252





V_{DS}	100	V
$R_{DS(on),TYP}$@ V_{GS}=10 V	7.2	mΩ
I_D	62	A

Features

1、Low on – resistance

2、Package TO-252

3、SGT Power MOSFET

Applications

1、Load Switch for Portable Devices

2、DC/DC Converter

Maximum ratings, at TA =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		62	A
I_D	Continuous drain current @VGS=10V	T_C =25°C	62	A
		T_C =70°C	50	A
I_{DM}	Pulse drain current tested ①	T_C =25°C	220	A
EAS	Avalanche energy, single pulsed ②		211	mJ
P_D	Maximum power dissipation	T_C =25°C	75	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	2.0	°C/W

Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @Tj=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	1.0	1.6	2.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance ③	V_{GS}=10V, I_D=15A	--	7.2	9.2	mΩ
		V_{GS}=4.5V, I_D=8A	--	10.8	14	mΩ

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

C_{iss}	Input Capacitance	V_{DS}=50V,V_{GS}=0V , f=1MHz	--	2330	--	pF
C_{oss}	Output Capacitance		--	465	--	pF
C_{rss}	Reverse Transfer Capacitance		--	21	--	pF
R_g	Gate Resistance	V_{DS}=0V,V_{GS}=0V , f=1MHz	--	3	--	Ω
Q_g (10V)	Total Gate Charge	V_{DS}=50V,I_D=20A , V_{GS}=10V	--	39.7	--	nC
Q_{gs}	Gate-Source Charge		--	6.8	--	nC
Q_{gd}	Gate-Drain Charge		--	9.2	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V_{DD}=50V, V_{GS}=10V, I_D=10A, R_G=6Ω	--	14.6	--	ns
Tr	Turn-on Rise Time		--	8	--	ns
Td(off)	Turn-Off Delay Time		--	22.2	--	ns
Tf	Turn-Off Fall Time		--	6.4	--	ns

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

VSD	Forward on voltage ③	ISD=10A,VGS=0V	--	0.78	1.2	V
Trr	Reverse Recovery Time	IF=20A , di/dt=100A/μs	--	45	--	ns
Qrr	Reverse Recovery Charge		--	185	--	nC

Notes: ① Pulse width limited by maximum allowable junction temperature

② Limited by TJmax, starting TJ = 25°C, L = 0.1mH,RG = 25Ω, IAS = 65A, VGS =10V. Part not recommended for use above this value

③ Pulse width ≤ 300μs; duty cycle≤ 2%.

Typical Characteristics

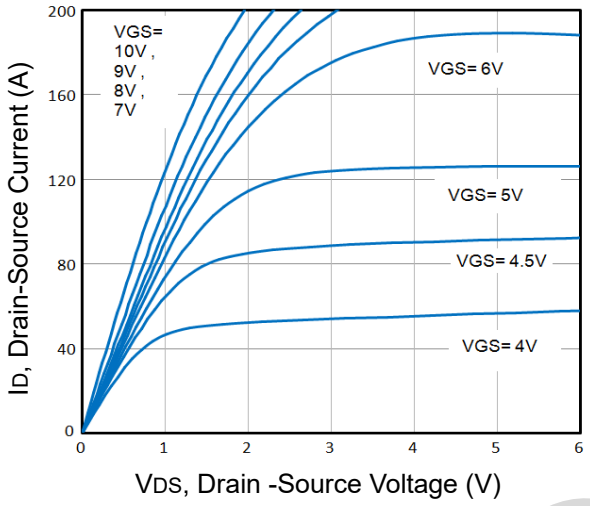


Fig1. Typical Output Characteristics

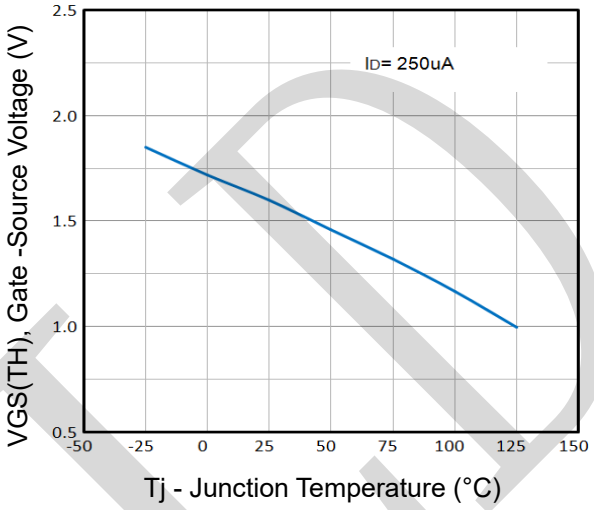


Fig2. VGS(TH) Voltage Vs. Temperature

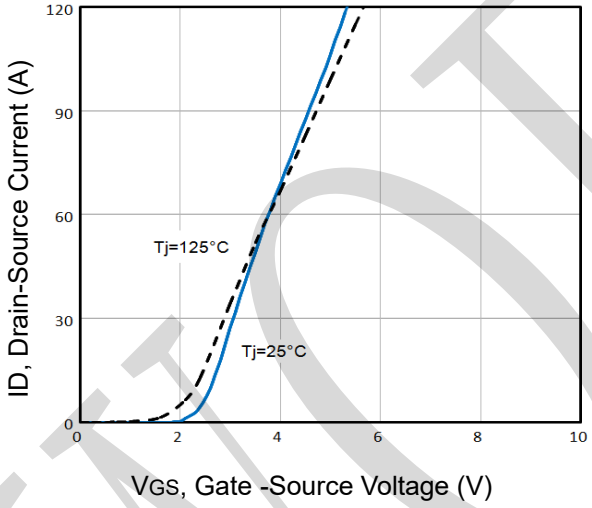


Fig3. Typical Transfer Characteristics

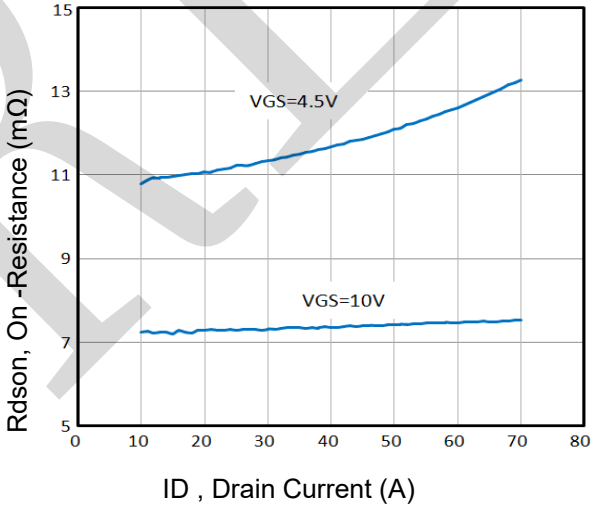


Fig4. On-Resistance vs. Drain Current and Gate Voltage

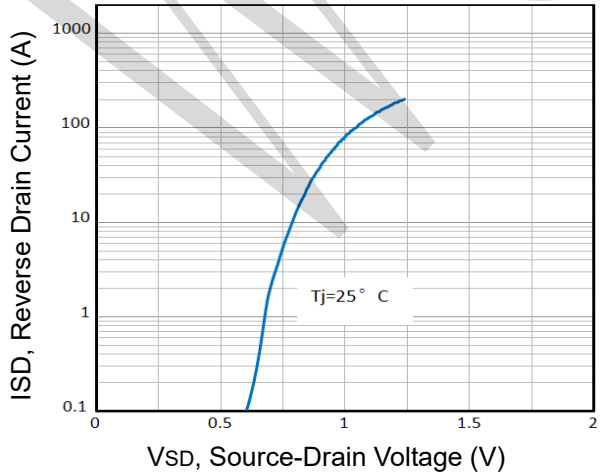


Fig5. Typical Source-Drain Diode Forward Voltage

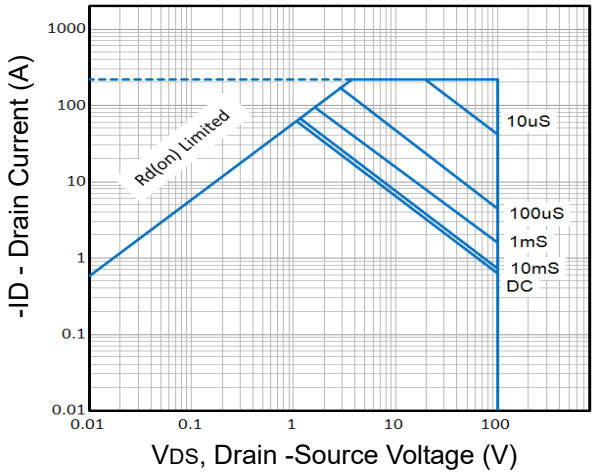


Fig6. Maximum Safe Operating Area

Typical Characteristics

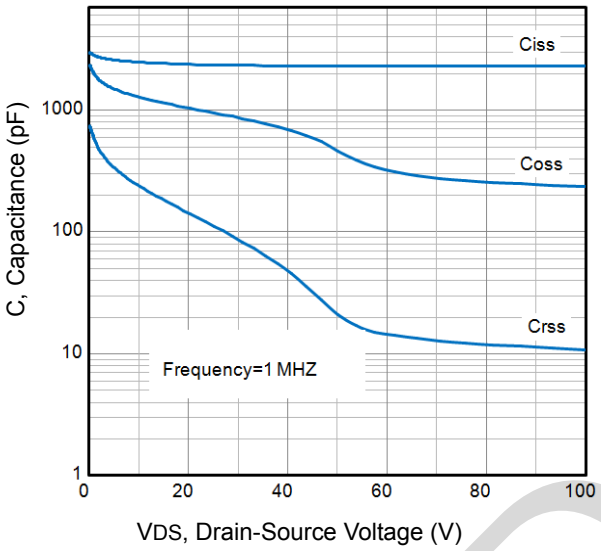


Fig7. Typical Capacitance Vs. Drain-Source Voltage

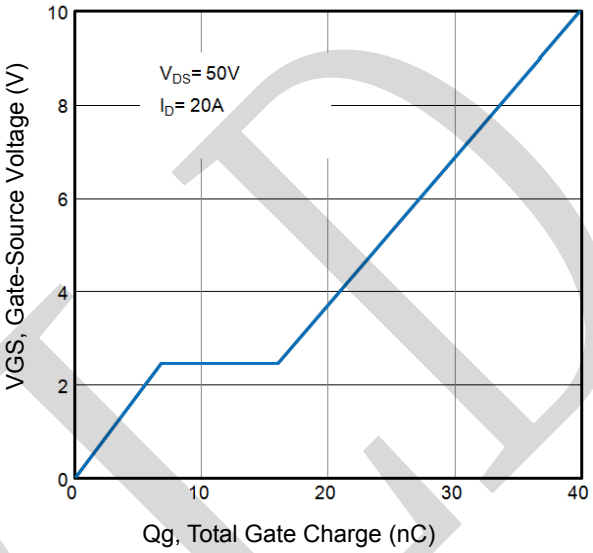


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

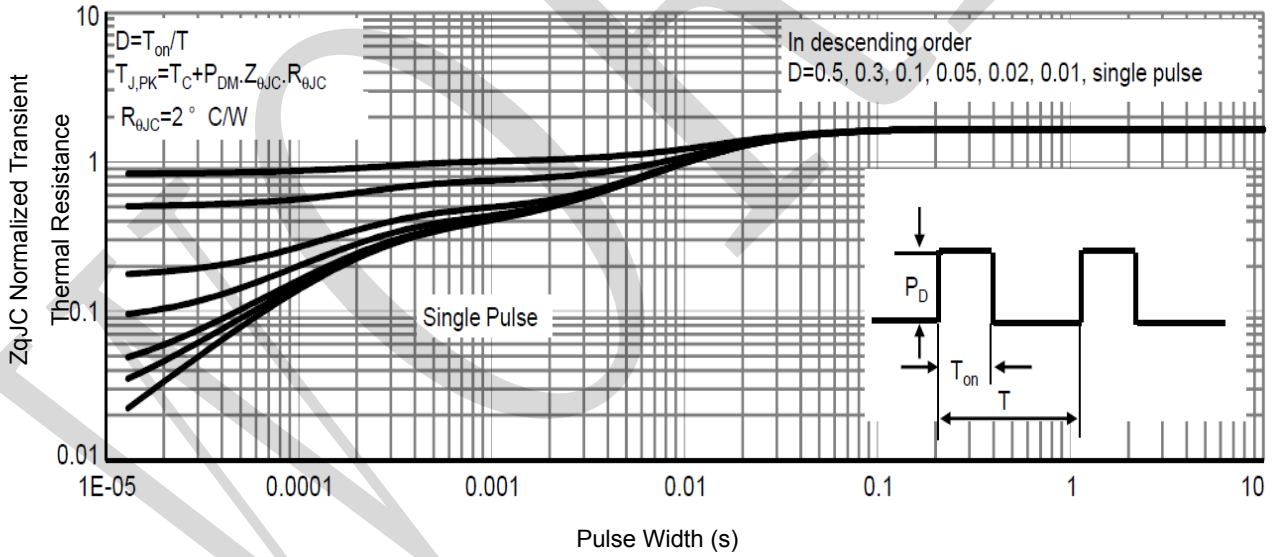
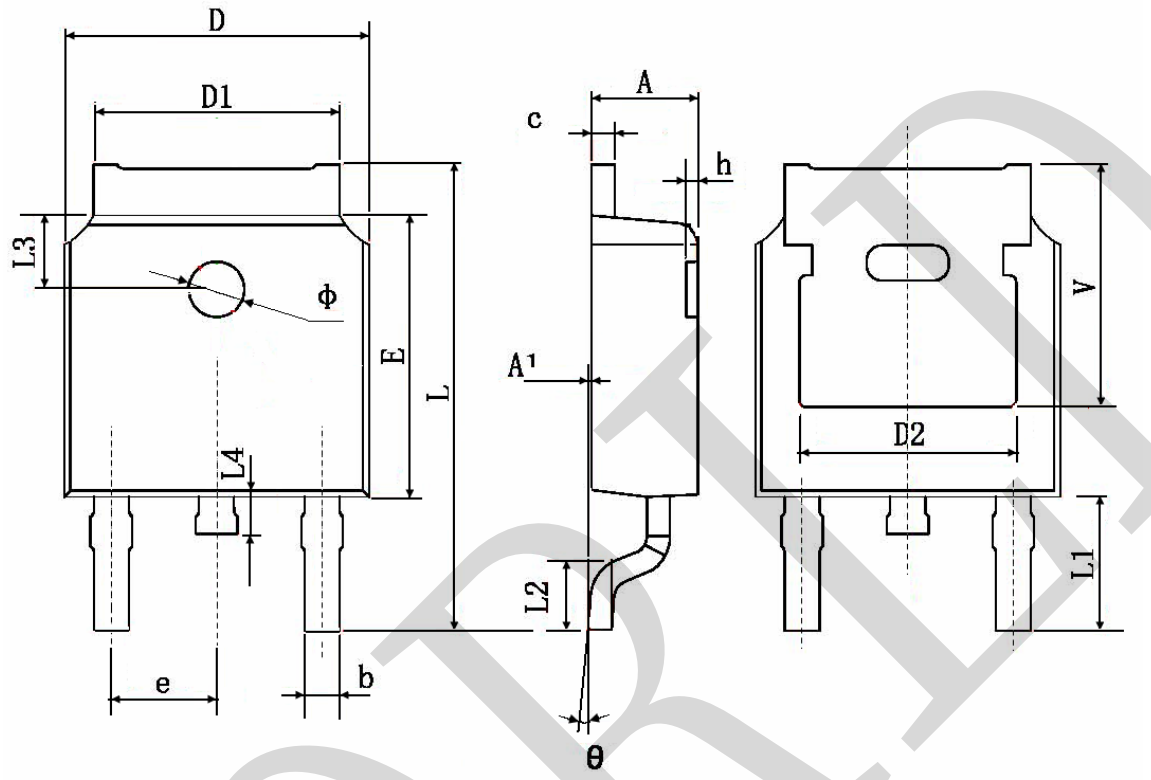


Fig9. Normalized Maximum Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	