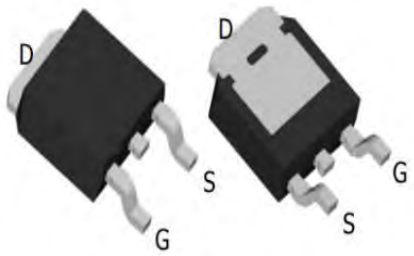
MTR7R8N10D

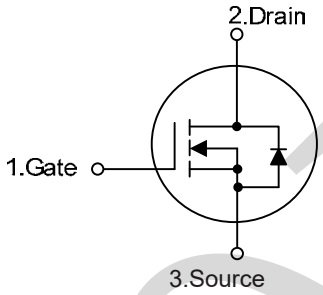
10-JUN-2021

SGT N-channel Power MOSFET

MTR7R8N10D

TO-252





V_{DS}	100	V
$R_{DS(on),TYP}$@ V_{GS}=10 V	6.7	mΩ
I_D	80	A

Features

1、Low on – resistance

2、Package TO-252

3、SGT N-channel Power MOSFET

Applications

1、Load Switch for Portable Devices

2、DC/DC Converter

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

Symbol	Parameter		Typical	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	80	A
I_D	Continuous drain current @VGS=10V	T_C =25°C	80	A
		T_C =100°C	50	A
I_{DM}	Pulse drain current tested ①	T_C =25°C	320	A
EAS	Avalanche energy, single pulsed ②		462	mJ
P_D	Maximum power dissipation	T_C =25°C	125	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	1.1	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	60	°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
	Zero Gate Voltage Drain Current (T_j =125℃)	V_{DS}=100V,V_{GS}=0V	--	--	100	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	2.9	4.0	V
$R_{DS(on)}$	Drain-Source On-State Resistance ④	V_{GS}=10V, I_D=50A	--	6.7	7.8	mΩ
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=40V,V_{GS}=0V, f=1MHz	--	3646	--	pF
C_{oss}	Output Capacitance		--	387	--	pF
C_{rss}	Reverse Transfer Capacitance		--	19	--	pF
R_g	Gate Resistance	VGS=0V, VDS=0V, f=1MHz	--	2.6	--	Ω
Q_g (10V)	Total Gate Charge	V_{DS}=50V,I_D=25A, V_{GS}=10V	--	15	--	nC
Q_{gs}	Gate-Source Charge		--	8	--	nC
Q_{gd}	Gate-Drain Charge		--	14	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V_{DD}=50V, R_G=3Ω, V_{GS}=10V	--	18	--	ns
Tr	Turn-on Rise Time		--	42	--	ns
Td(off)	Turn-Off Delay Time		--	31	--	ns
Tf	Turn-Off Fall Time		--	8	--	ns

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

V_{SD}	Forward on voltage	I_{SD}=50A,V_{GS}=0V	--	--	1.2	V
Trr	Reverse Recovery Time	IF=20A, dI/dt=500A/μs	--	71	--	ns
Qrr	Reverse Recovery Charge		--	123	--	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 Characteristics

Fig 1:Power dissipation

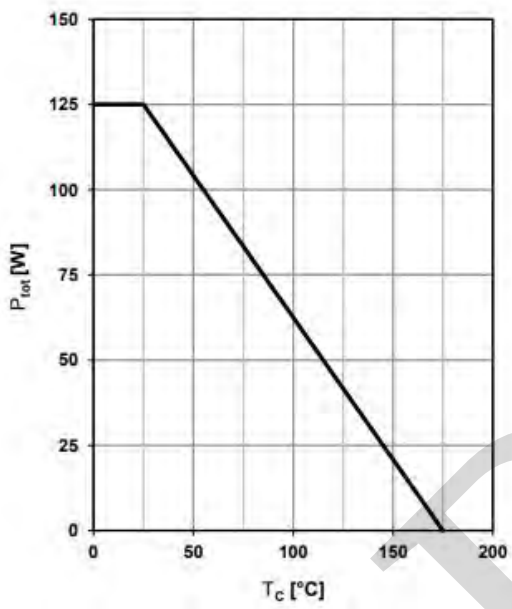


Fig 2:Drain current

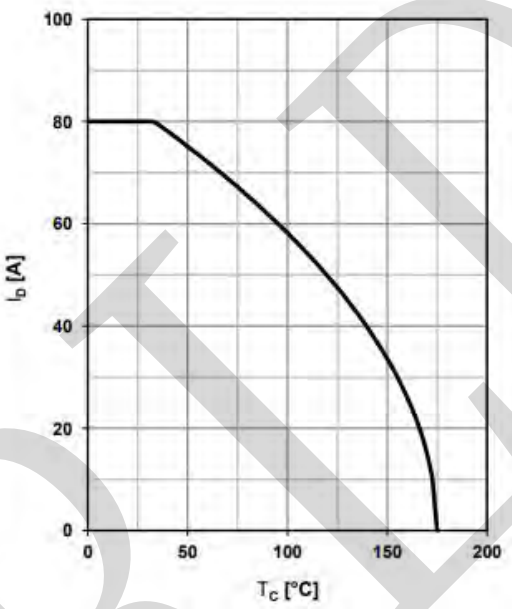


Fig 3:Safe operating area

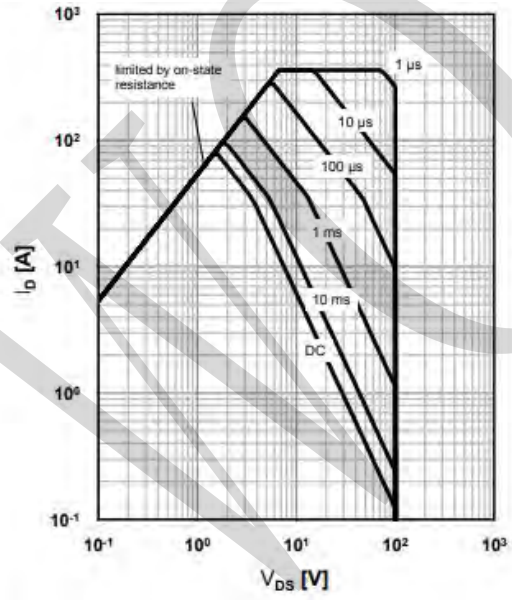
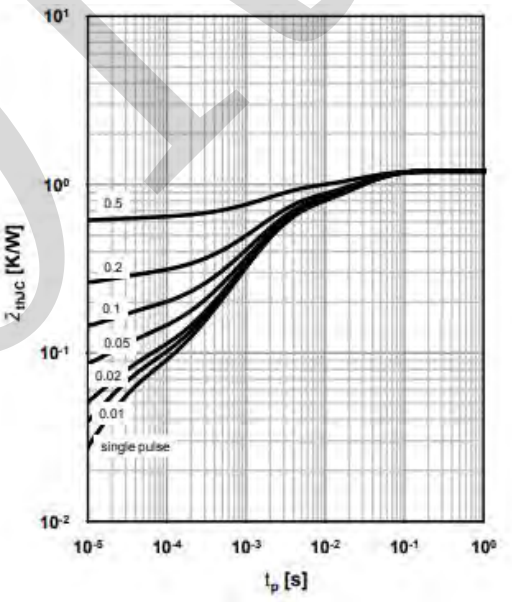


Fig 4 Max. transient thermal impedance



Typical Characteristics

Fig 5： Typ. output characteristics

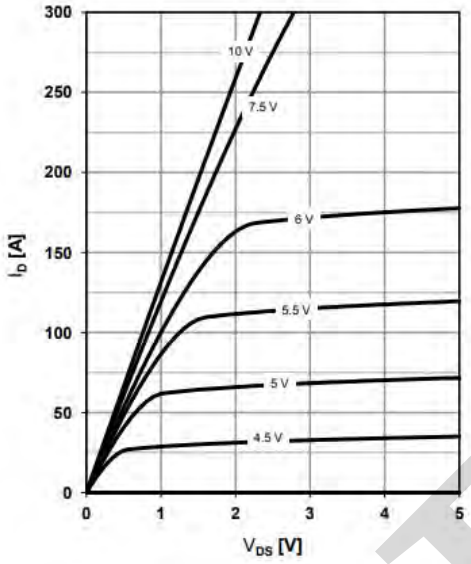


Fig 6： Typ. drain-source on resistance

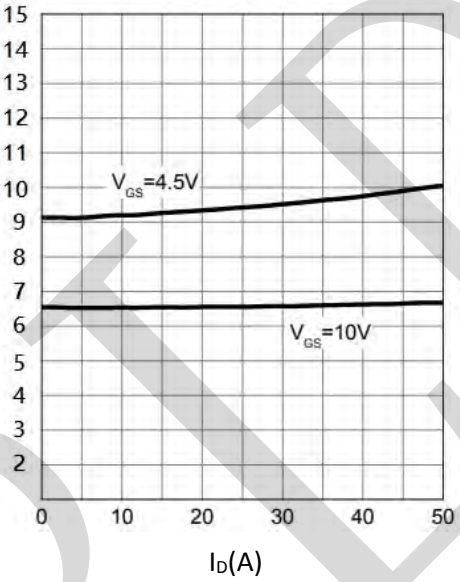


Fig 7： Typ. transfer characteristics

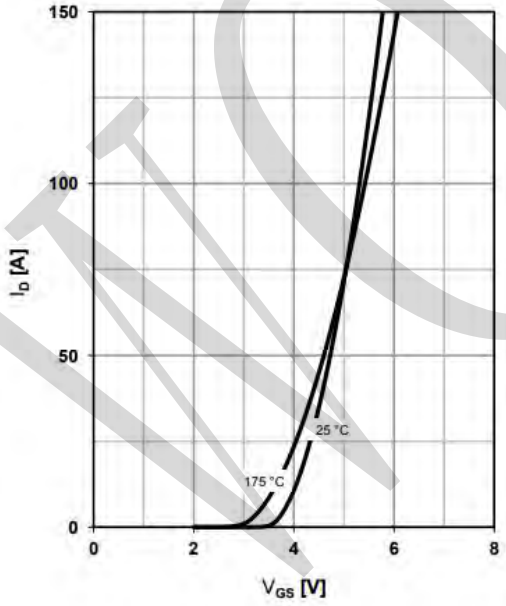
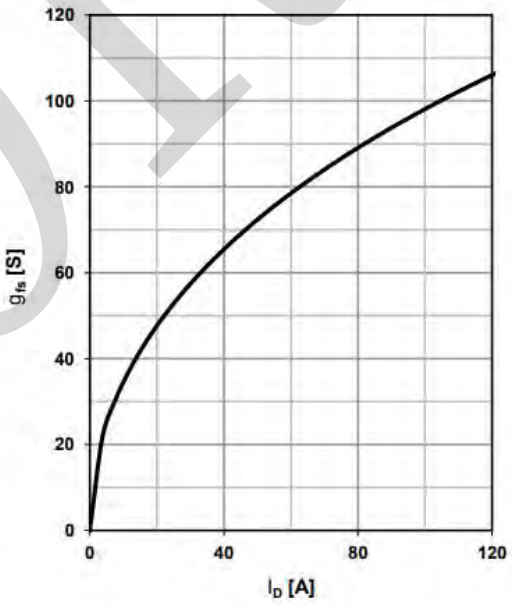


Fig 8： Typ. forward transconductance



Typical Characteristics

Fig 9： Drain-source on-state resistance

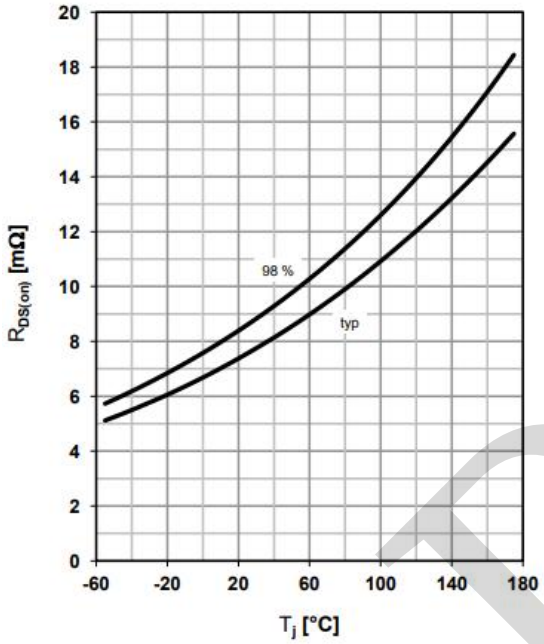


Fig 10： Typ. gate threshold voltage

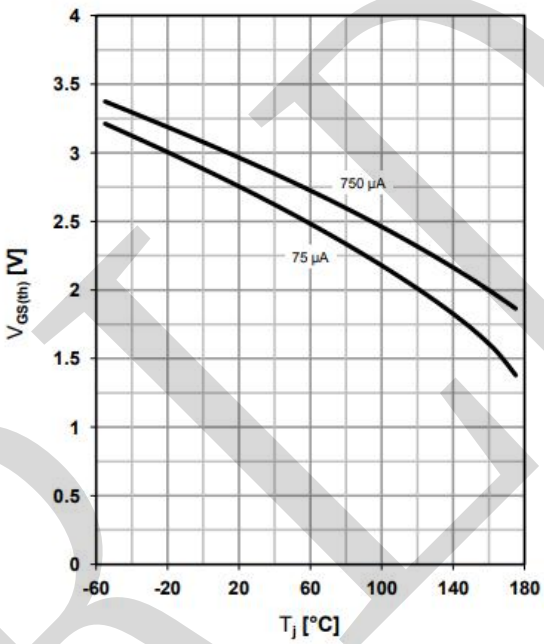


Fig 11： Typ. capacitances

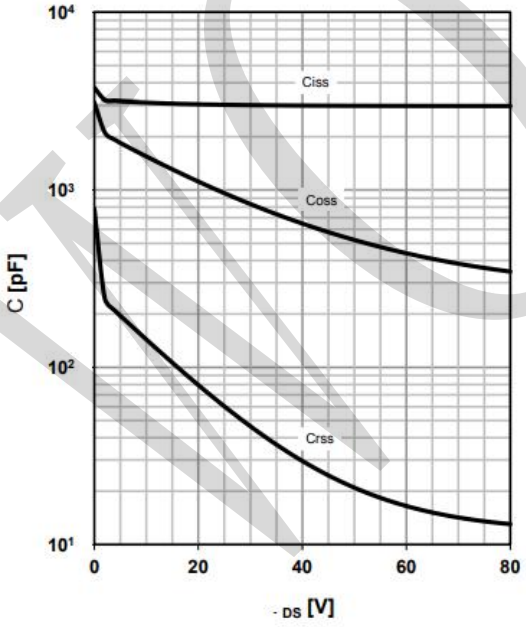
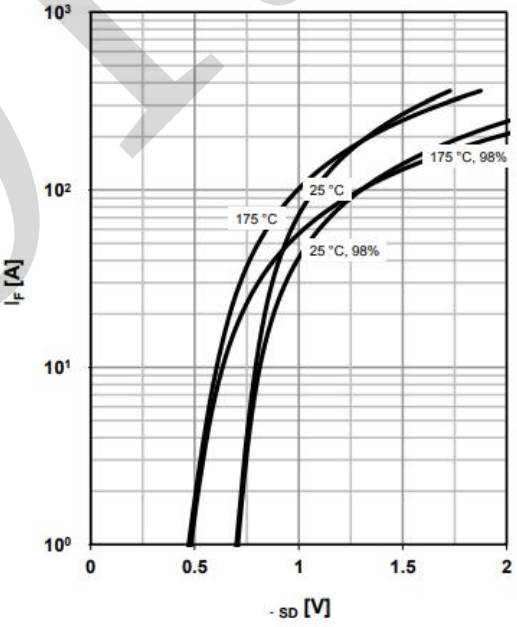
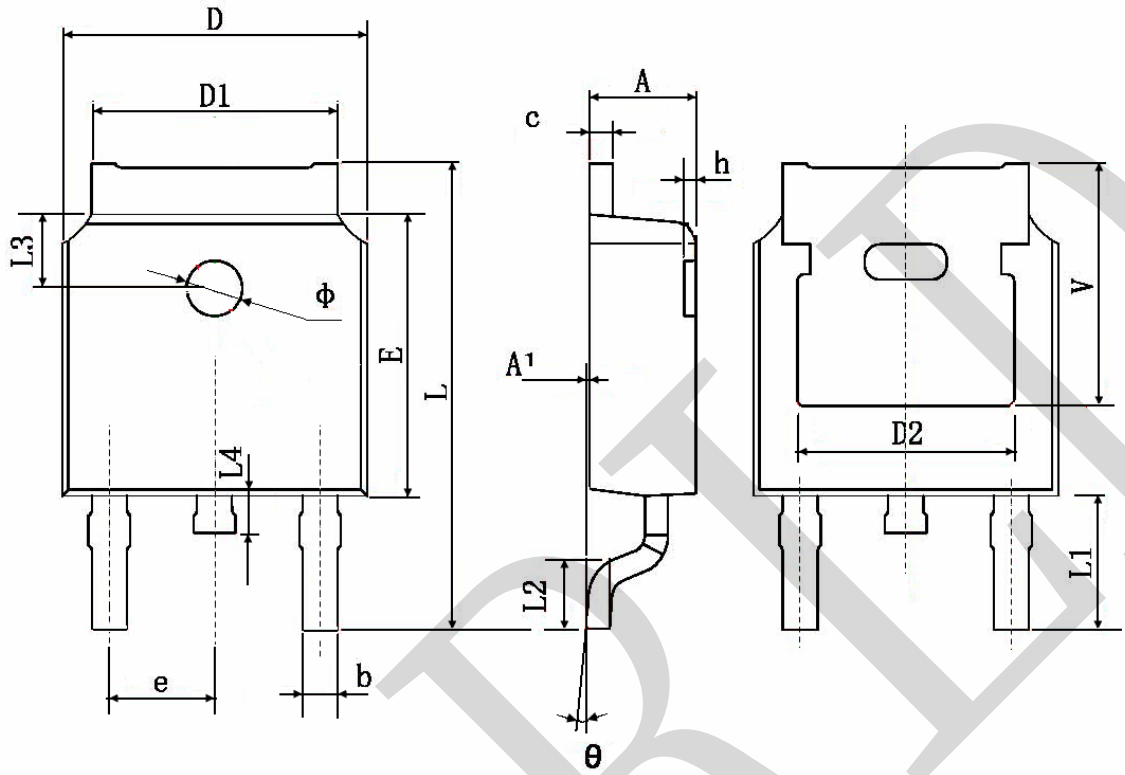


Fig 12： Forward characteristics of reverse diode



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.	