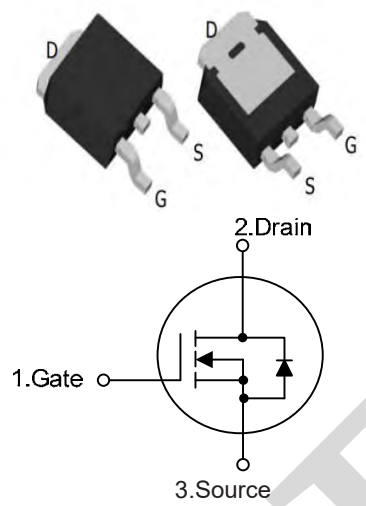
MTR7R5N06D

10-JUN-2021

SGT N-channel Power MOSFET

MTR7R5N06D

TO-252



V_{DS}	60	V
$R_{DS(on),TYP}$@ V_{GS}=10 V	6.5	mΩ
I_D	55	A

Features

1、Low on – resistance

2、High power package (TO-252)

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		60	V
V_{GS}	Gate-Source voltage		±20	V
I_S	Diode continuous forward current	T_C=25°C	55	A
I_D	Continuous drain current @VGS=10V	T_C=25°C	55	A
		T_C=100°C	34	A
I_{DM}	Pulse drain current tested ①	T_C=25°C	220	A
I_{DSM}	Continuous drain current @VGS=10V	T_A=25°C	18	A
		T_A=70°C	15	A
EAS	Avalanche energy, single pulsed ②		20	mJ
P_D	Maximum power dissipation	T_C=25°C	37	W
		T_C=100°C	15	W
P_{DSM}	Maximum power dissipation ③	T_A=25°C	4.2	W
		T_A=70°C	2.7	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	3.4	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	30	°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	60	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V,V_{GS}=0V	--	--	1	μA
	Zero Gate Voltage Drain Current (T_j =125℃)	V_{DS}=60V,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	1.3	1.9	2.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance ④	V_{GS}=10V, I_D=20A	--	6.5	7.5	mΩ
		V_{GS}=4.5V, I_D=20A	--	10	12	mΩ
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=30V,V_{GS}=0V, f=1MHz	995	1170	1345	pF
C_{oss}	Output Capacitance		500	585	670	pF
C_{rss}	Reverse Transfer Capacitance		--	20	30	pF
R_g	Gate Resistance	f=1MHz	--	1.3	--	Ω
Q_g (10V)	Total Gate Charge	V_{DS}=30V,I_D=30A, V_{GS}=10V	--	22	--	nC
Q_g (4.5V)	Total Gate Charge		--	12	--	nC
Q_{gs}	Gate-Source Charge		--	4.2	--	nC
Q_{gd}	Gate-Drain Charge		--	5.5	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V_{DD}=30V, I_D=30A, R_G=3Ω, V_{GS}=10V	--	7.4	--	ns
Tr	Turn-on Rise Time		--	43	--	ns
Td(off)	Turn-Off Delay Time		--	18	--	ns
Tf	Turn-Off Fall Time		--	6.2	--	ns

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

V_{SD}	Forward on voltage	I_{SD}=20A,V_{GS}=0V	--	0.9	1.3	V
Trr	Reverse Recovery Time	T_j=25℃,I_{sd}=20A , V_{GS}=0V di/dt=100A/μs	--	26	--	ns
Qrr	Reverse Recovery Charge		--	15	--	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

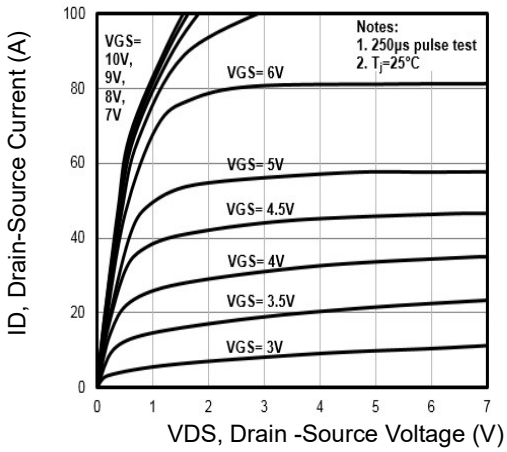


Fig1. Typical Output Characteristics

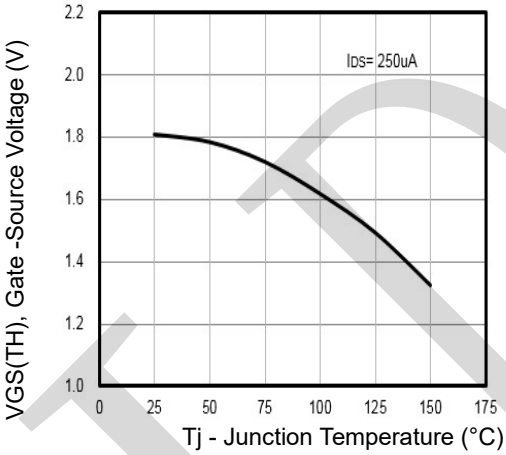


Fig2. $V_{GS(TH)}$ Gate -Source Voltage Vs. Tj

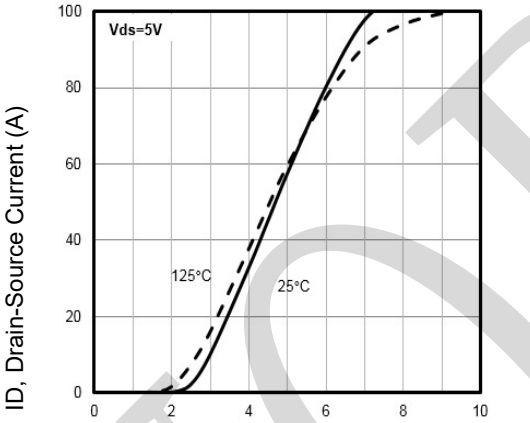


Fig3. Typical Transfer Characteristics

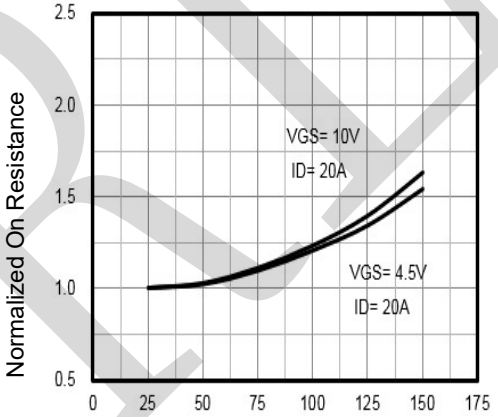


Fig4. Normalized On-Resistance Vs. Tj

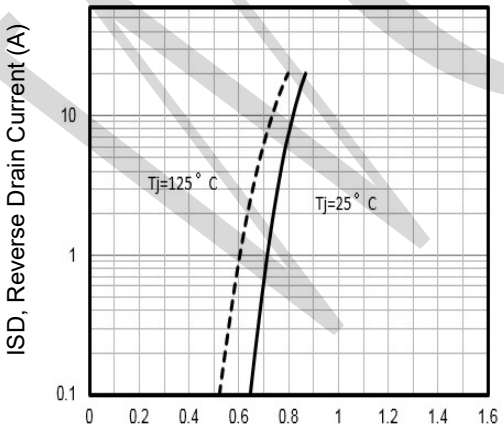


Fig5. Typical Source-Drain Diode Forward Voltage

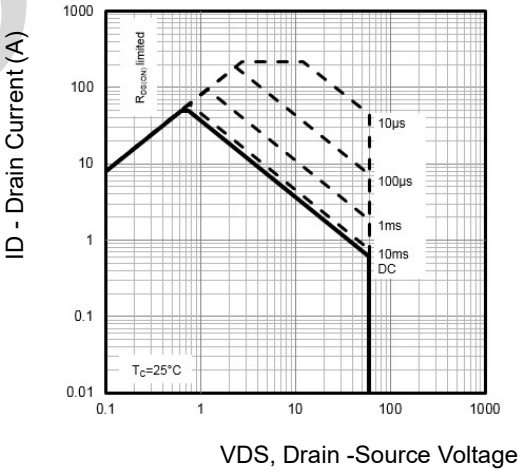


Fig6. Maximum Safe Operating Area

Typical Characteristics

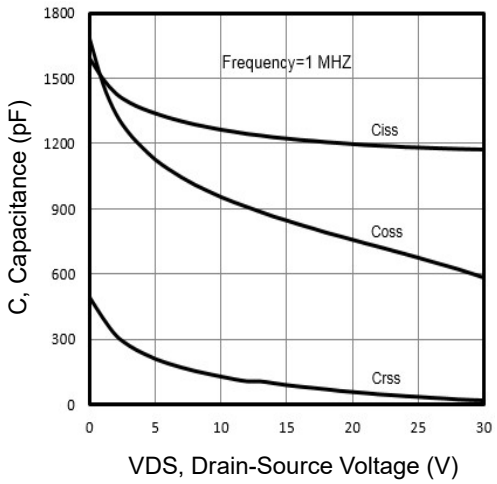


Fig7. Typical Capacitance Vs. Drain-Source Voltage

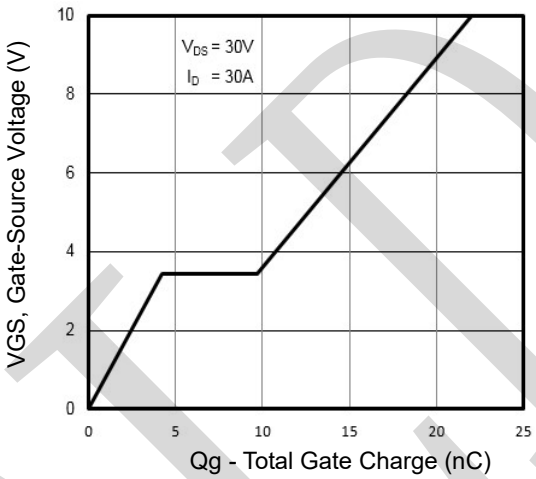


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

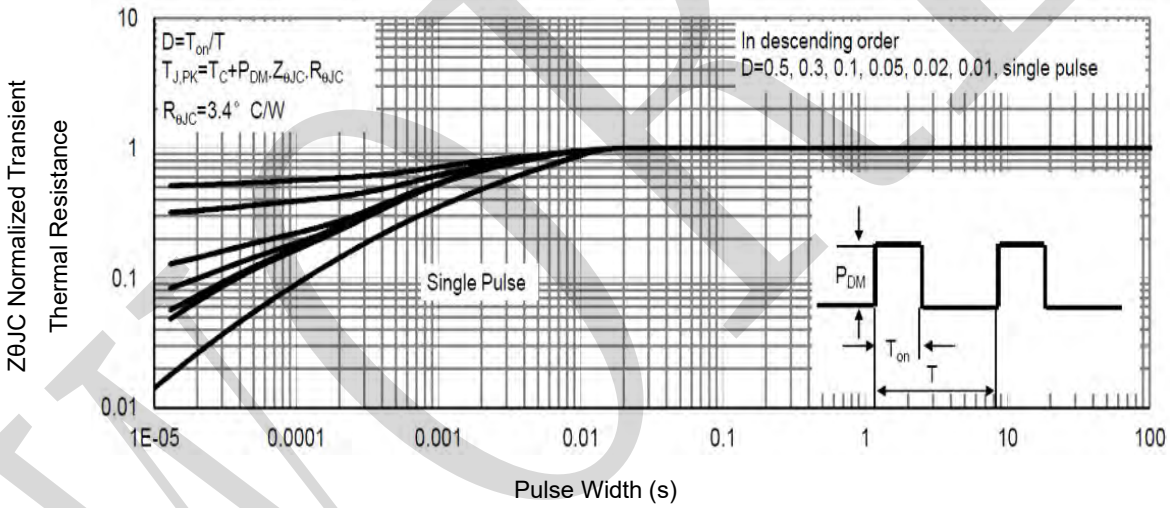


Fig9. Normalized Maximum Transient Thermal Impedance

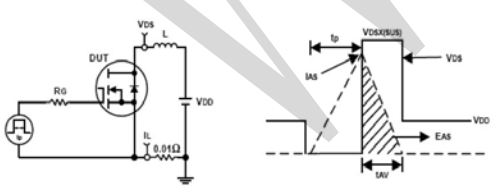


Fig10. Unclamped Inductive Test Circuit and waveforms

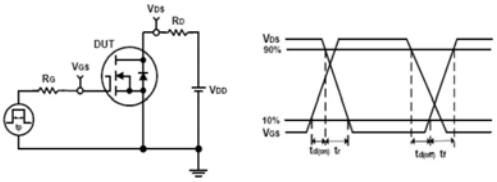
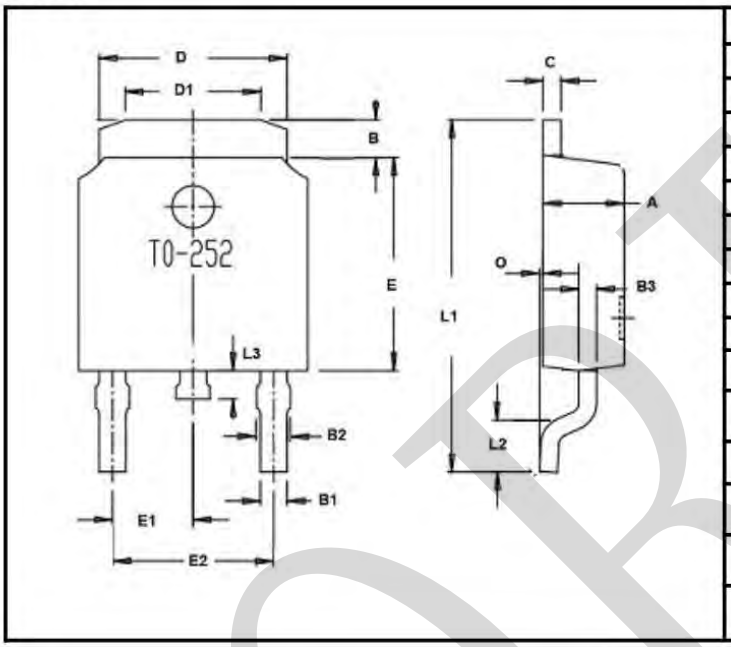


Fig11. Switching Time Test Circuit and waveforms

PACKAGE OUTLINE DIMENSIONS

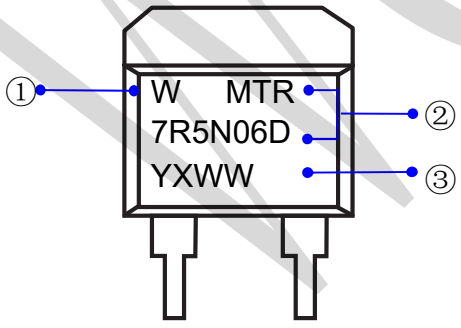
Note:unit mm

TO-252



Dim.	Min.	Max.
A	2.15	2.45
B	0.96	1.42
C	Typ0.5	
D	5.33	5.53
D1	3.65	4.05
E	6.0	6.2
E1	Typ2.29	
E2	Typ4.58	
B1	0.74	0.86
B2	0.74	0.94
O	0	0.15
L1	9.9	10.5
L2	Typ1.65	
L3	0.6	1.0
All Dimensions in millimeter		

Marking Information



①W : Company's trademark

②Product model : MTR7R5N06D

③PDC information：