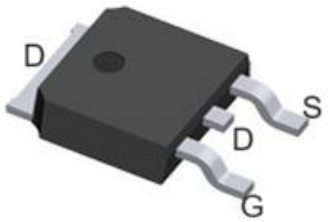
MTR010N10D

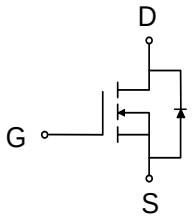
10-Jun-2024

SGT N-Channel Power MOSFET

MTR010N10D

TO-252





Features

- Uses advanced SGT technology
- Extremely low on-resistance RDS(on)
- Excellent gate charge x RDS(on) product(FOM)

Applications

- Motor Drives
- SR (Synchronous rectification)
- DC/DC converter
- General purpose applications

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_D	Continuous drain current	T_C =25°C	55	A
I_{DM}	Pulse drain current tested	T_C =25°C	220	A
EAS	Avalanche energy, single pulsed (L=0.5mH, Rg=25Ω)		55	mJ
P_D	Maximum power dissipation	T_C =25°C	6.9	W
T_{STG},T_J	Storage and Junction Temperature Range		-55 to 150	°C

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Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.0	°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	1.2	1.8	2.4	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=10A	--	9.2	10	mΩ
gfs	Transconductance	V_{DS}=3V, I_D=10A	--	53	--	S

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

C_{iss}	Input Capacitance	V_{DS}=25V,V_{GS}=0 V , f=1MHz	--	1600	--	pF
C_{oss}	Output Capacitance		--	720	--	pF
C_{rss}	Reverse Transfer Capacitance		--	92	--	pF
Q_g	Total Gate Charge	V_{DS}=80V, I_D=10A , V_{GS}=50V	--	33	--	nC
Q_{gs}	Gate-Source Charge		--	20	--	nC
Q_{gd}	Gate-Drain Charge		--	9.5	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V_{DS}=50V V_{GS}=10V R_L=2Ω	--	15.4	--	ns
Tr	Turn-on Rise Time		--	4	--	ns
Td(off)	Turn-Off Delay Time		--	55.6	--	ns
Tf	Turn-Off Fall Time		--	75.6	--	ns

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

V_{SD}	Forward on voltage	I_S=30A,V_{GS}=0V	--	--	1.3	V
trr	Reverse Recovery Time	I_F=25A, dIF/dt=100A/us	--	62	--	ns
Qrr	Reverse Recovery Charge		--	79.3	--	nC

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Typical Performance Characteristics

Figure 1. Typ. output characteristics

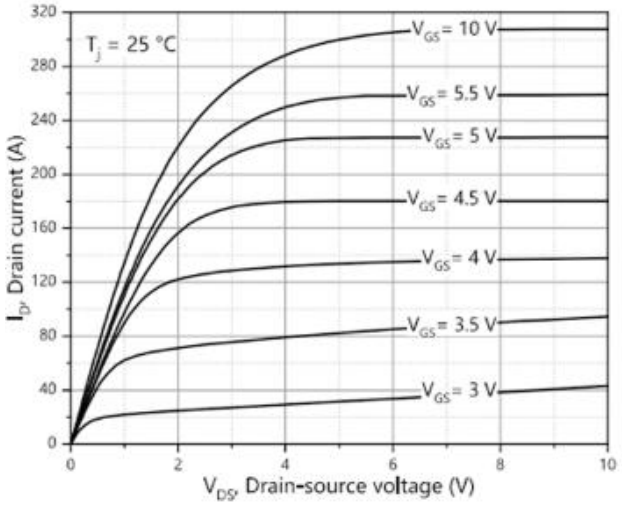

Figure 2. Typ. transfer characteristics

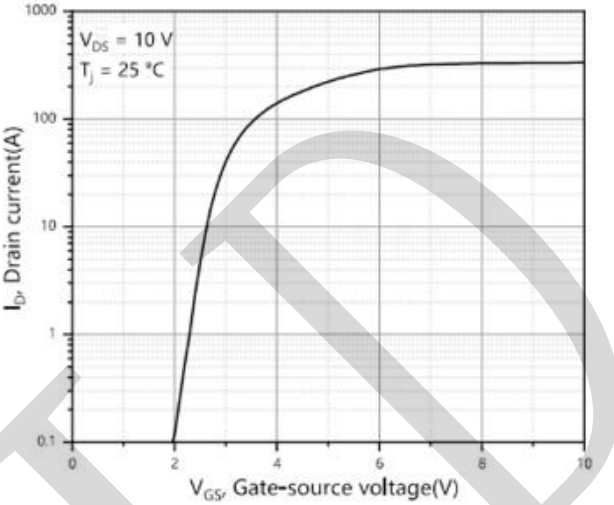

Figure 3. Typ. capacitances

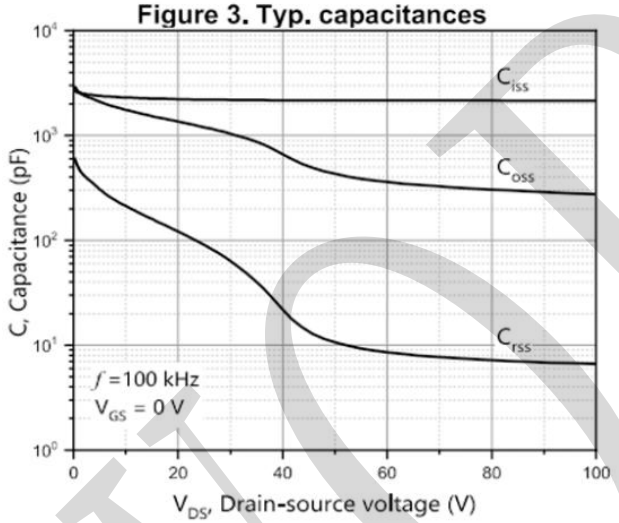

Figure 4. Typ. gate charge

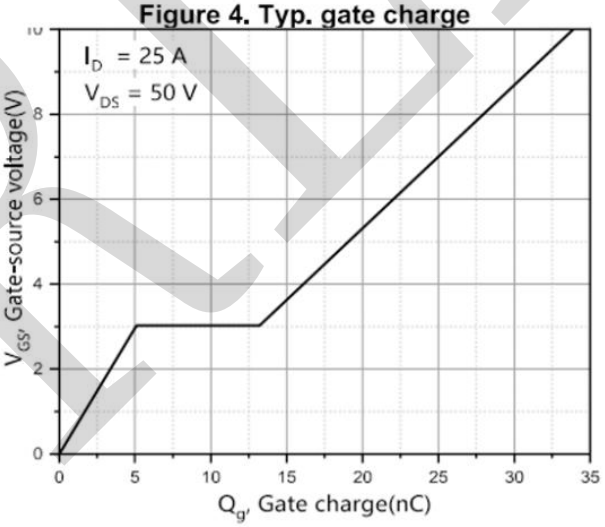

Figure 5. Drain-source breakdown voltage

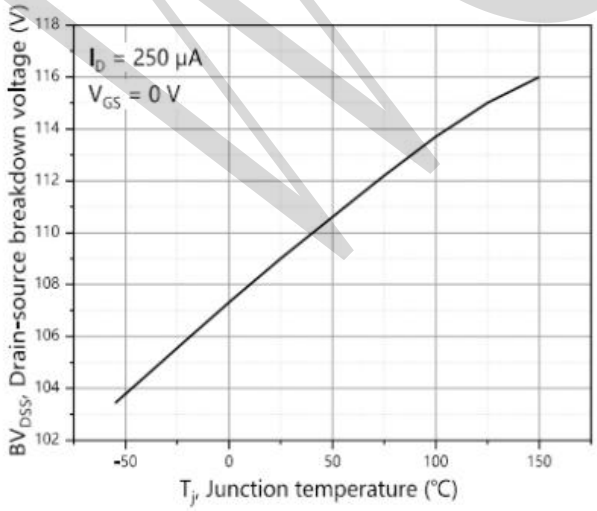

Figure 6. Drain-source on-state resistance

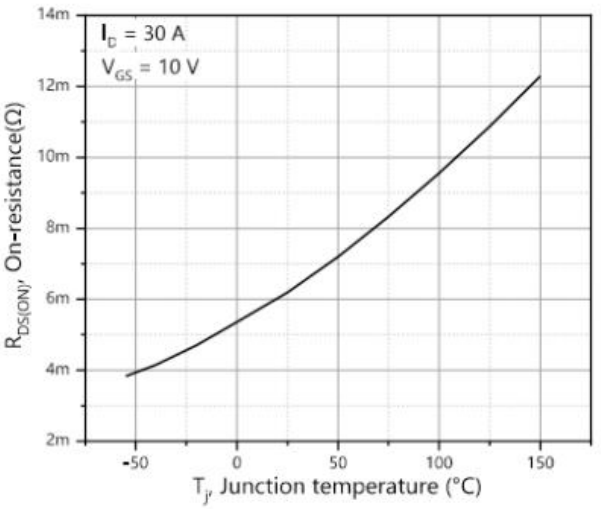

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Figure 7. Threshold voltage

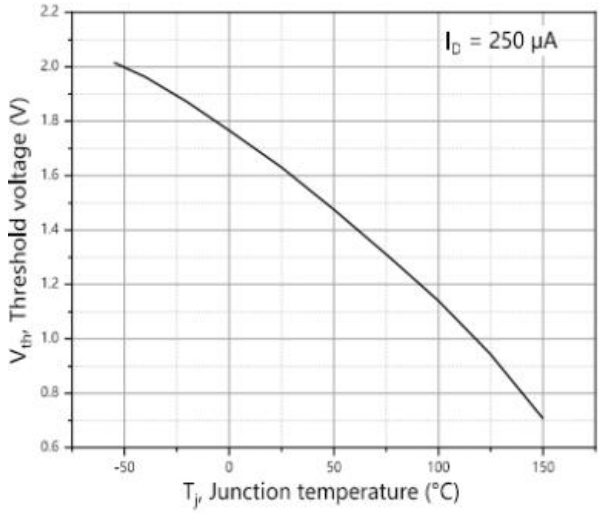


Figure 8. Forward characteristic of body diode

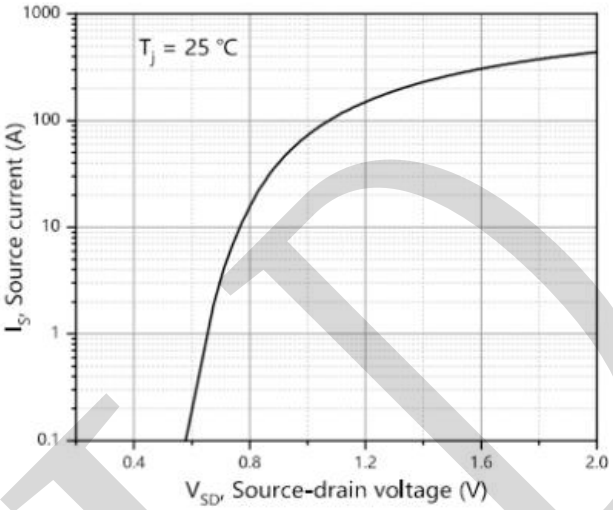


Figure 9. Drain-source on-state resistance

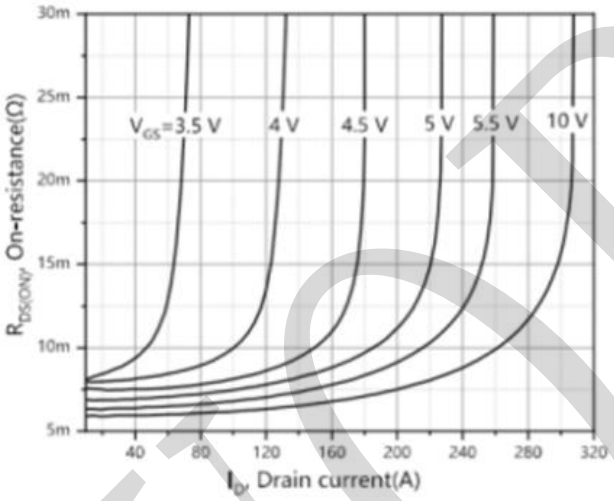


Figure 10. Drain current

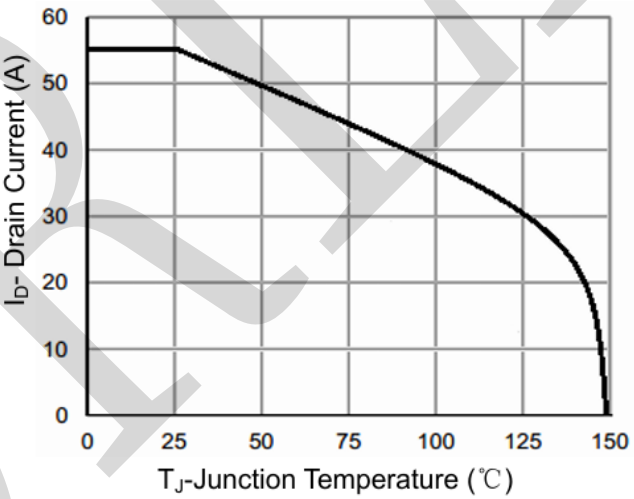


Figure 11, Safe operation area T_C=25 ℃

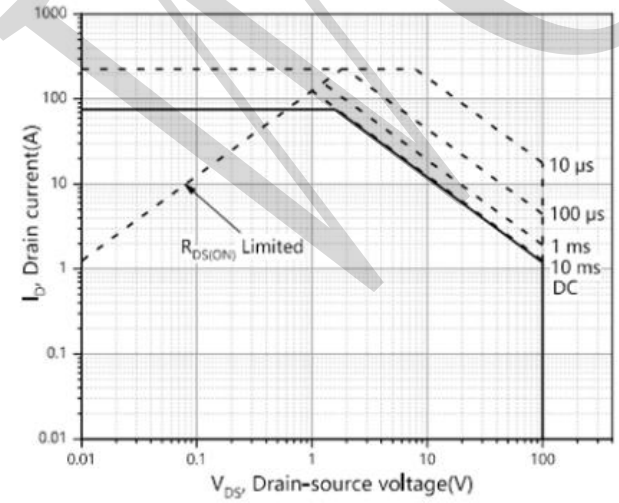
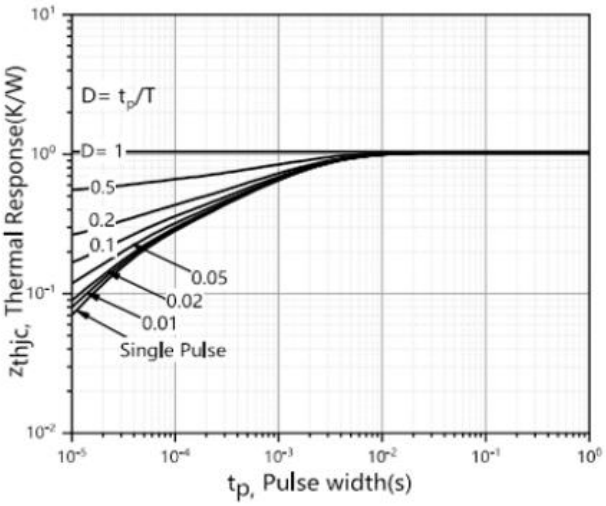
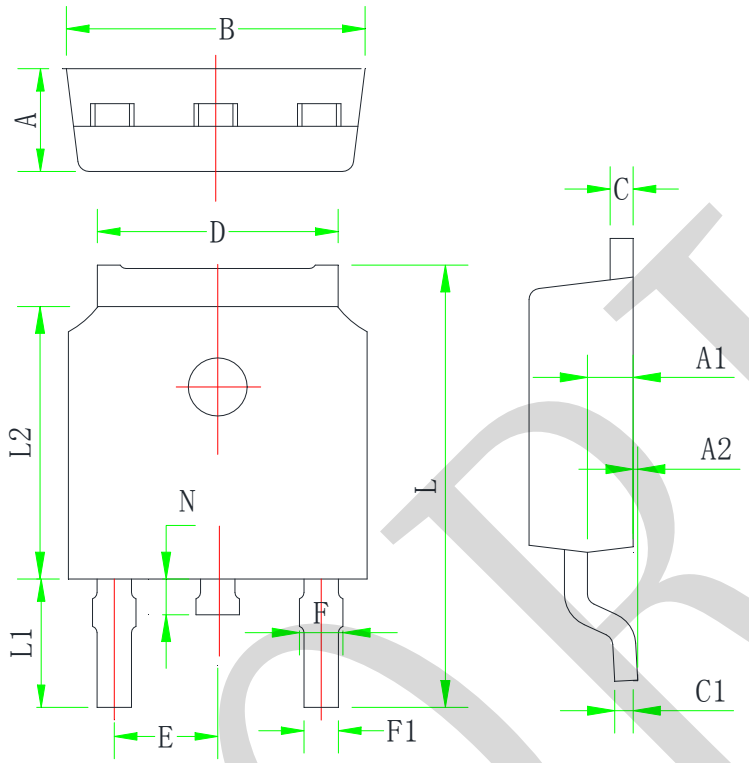


Figure 12, Max. transient thermal impedance

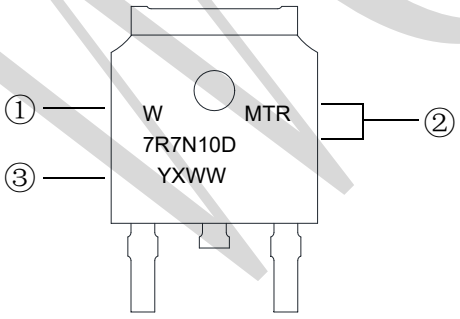


PACKAGE OUTLINE DIMENSIONS



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	2.200	2.300	2.400
A1	0.910	1.010	1.110
A2	0.050	0.150	0.250
B	6.500	6.600	6.700
C	0.460	0.500	0.580
C1	0.460	0.500	0.580
D	5.120	5.320	5.520
E	2.286 TYP		
F	0.780	0.860	1.020
F1	0.660	0.760	0.860
L	9.600	10.00	10.20
L1	2.600	2.800	3.000
L2	6.000	6.100	6.200
N	0.600	6.800	1.000

Marking Information



① W : Company's trademark

② Product model : MTR010N10D

③ information：

Y X WW

WW:Week code(01 to 53)

X:Internal identification code

Y:Year code(ex:0=2020)