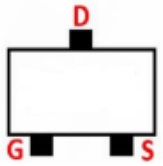
MSR020N02S23

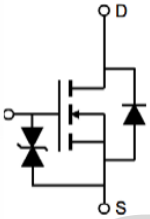
10-JUN-2021

SGT N-channel Power MOSFET

MSR020N02S23

SOT23





V_{DS}	20	V
$R_{DS(on),TYP}$@ V_{GS}=4.5 V	16.2	mΩ
$R_{DS(on),TYP}$@ V_{GS}=3.3 V	17.3	mΩ
I_D	6.5	A

Features

1、Low on – resistance
2、N Channel SOT23 Package
3、SGT N-channel Power MOSFET
4、Halogen free

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		20	V
V_{GS}	Gate-Source voltage		±8	V
I_D	Continuous drain current	T_C =25°C	6.5	A
		T_C =70°C	4.8	A
I_{DM}	Pulse drain current tested ①	T_C =25°C	26	A
P_D	Maximum power dissipation	T_C =25°C	1.56	W
		T_C =70°C	0.9	W
T_{STG},T_J	Storage and Junction Temperature Range		-50 to 150	°C

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	80	°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	20	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=20V,V_{GS}=0V	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±8V,V_{DS}=0V	--	--	±10	uA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	0.4	0.7	1.0	V
$R_{DS(on)}$	Drain-Source On-State Resistance ②	V_{GS}=4.5V, I_D=5A	--	16.2	20	mΩ
$R_{DS(on)}$	Drain-Source On-State Resistance ②	V_{GS}=3.3V, I_D=3A	--	17.3	22	mΩ
$R_{DS(on)}$	Drain-Source On-State Resistance ②	V_{GS}=2.5V, I_D=2A	--	20	25	mΩ

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

C_{iss}	Input Capacitance	V_{DS}=10V, V_{GS}=0V , f=1MHz	--	450	--	pF
C_{oss}	Output Capacitance		--	108	--	pF
C_{rss}	Reverse Transfer Capacitance		--	80	--	pF
Q_g	Total Gate Charge	V_{DS}=10V, I_D=5A , V_{GS}=4.5V	--	8.3	--	nC
Q_{gs}	Gate-Source Charge		--	1.4	--	nC
Q_{gd}	Gate-Drain Charge		--	4.7	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	Tj=25°C, V_{DD}=10V, I_D=1A, R_G=3.3Ω V_{GS}=4.5V,	--	285	--	ns
Tr	Turn-on Rise Time		--	345	--	ns
Td(off)	Turn-Off Delay Time		--	5.8	--	ns
Tf	Turn-Off Fall Time		--	4.2	--	ns

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

I_{SD}	Source drain current(Body Diode)	T_A=25°C	--	--	2	A
V_{SD}	Forward on voltage ②	I_{SD}=5A,V_{GS}=0V	--	0.78	1.2	V

NOTE: ① Repetitive rating; pulse width limited by max junction temperature.

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

Typical Characteristics

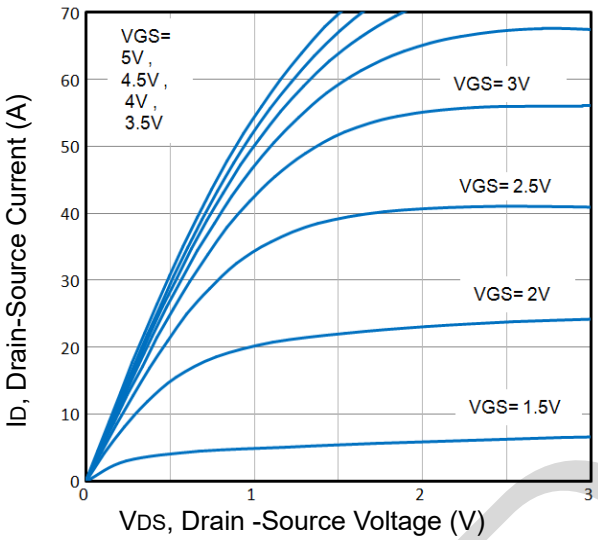


Fig1. Typical Output Characteristics

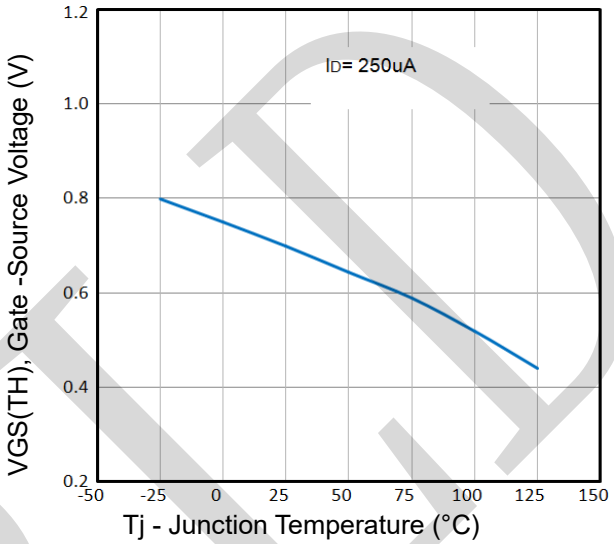


Fig2. VGS(TH) Voltage Vs. Temperature

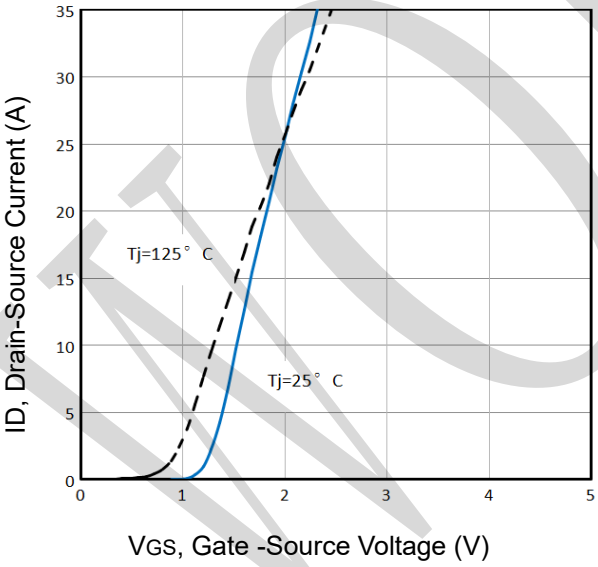


Fig3. Typical Transfer Characteristics

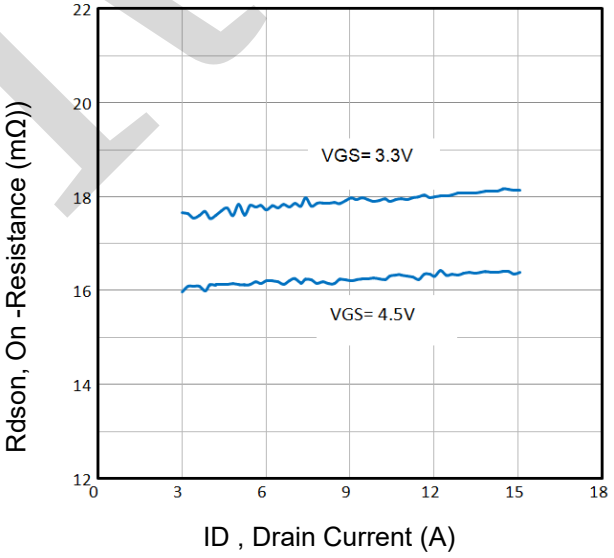


Fig4. On-Resistance vs. Drain Current and Gate

Typical Characteristics

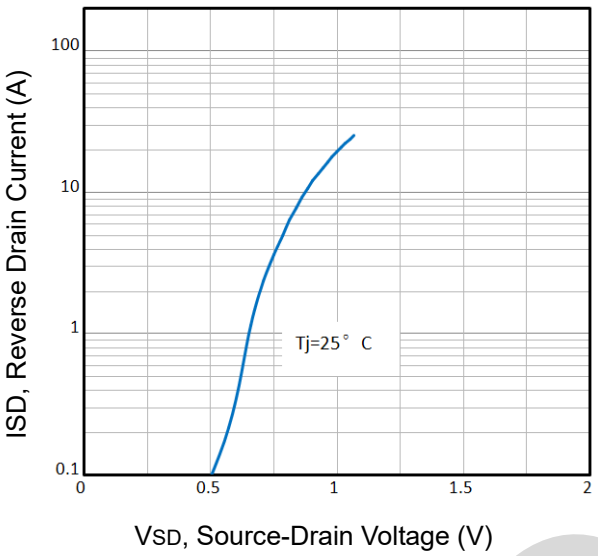


Fig5. Typical Source-Drain Diode Forward Voltage

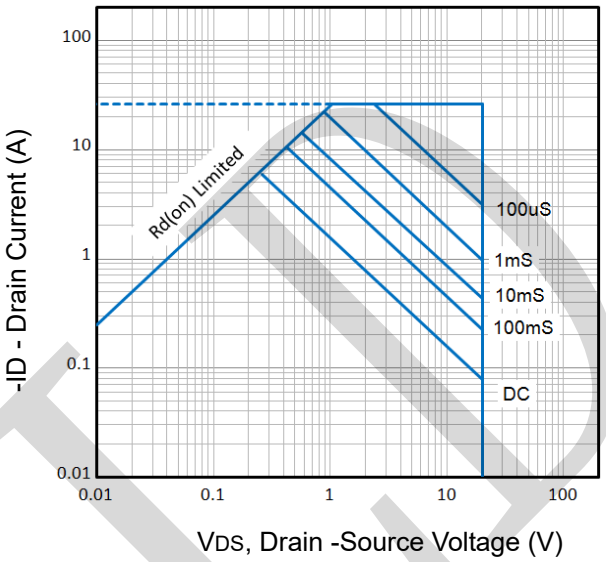


Fig6. Maximum Safe Operating Area

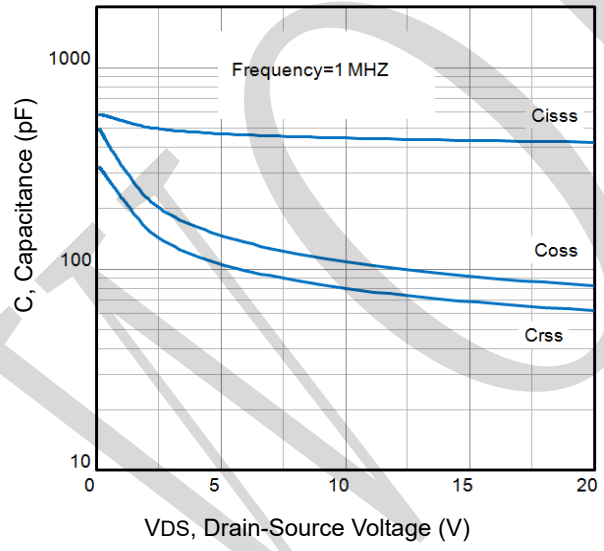


Fig7. Typical Capacitance Vs. Drain-Source Voltage

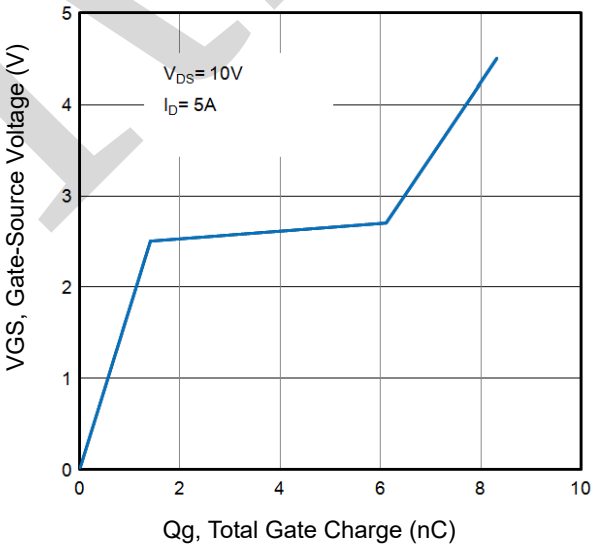


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

Typical Characteristics

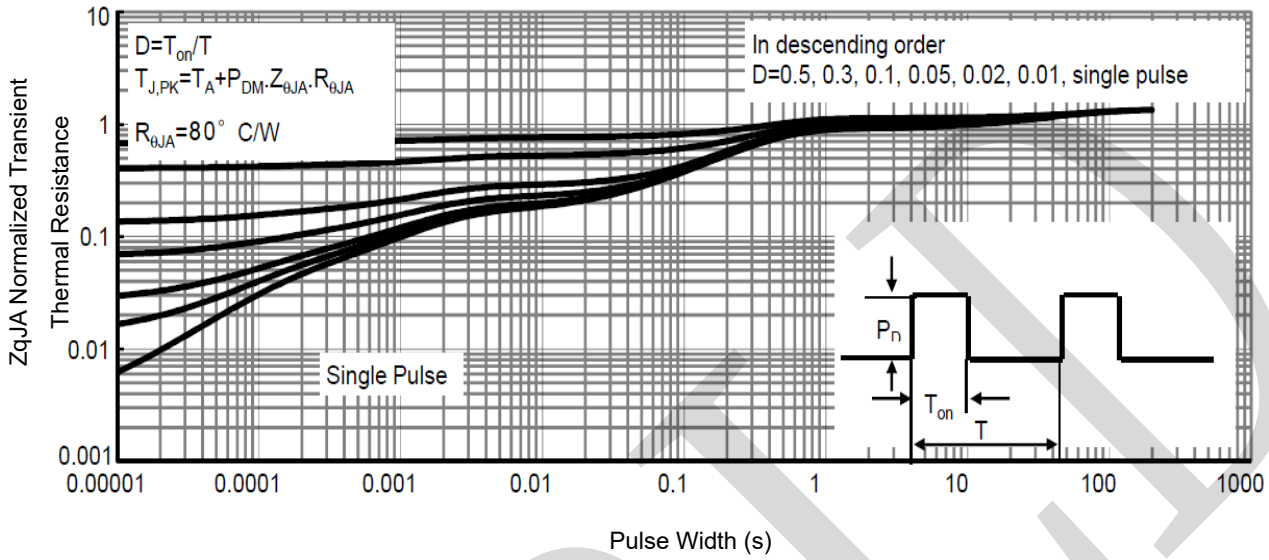
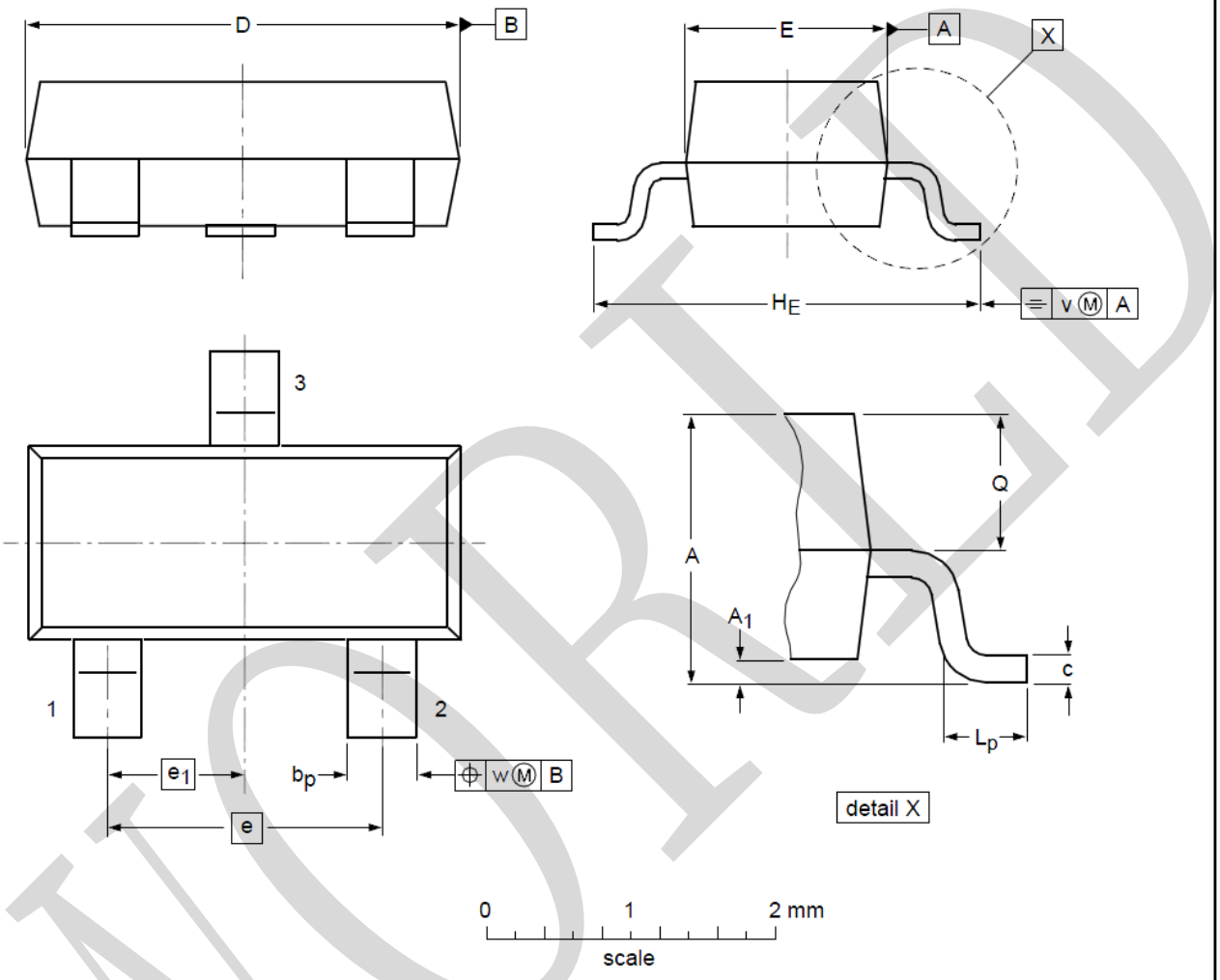


Fig9. Normalized Maximum Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.90	1.01	1.15	**A_1**	0.01	0.05	0.10
b_p	0.30	0.42	0.50	**c**	0.08	0.13	0.15
D	2.80	2.92	3.00	**E**	1.20	1.33	1.40
e	--	1.90	--	**e_1**	--	0.95	--
H_E	2.25	2.40	2.55	**L_p**	0.30	0.42	0.50
Q	0.45	0.49	0.55	**v**	--	0.20	--
w	--	0.10	--				