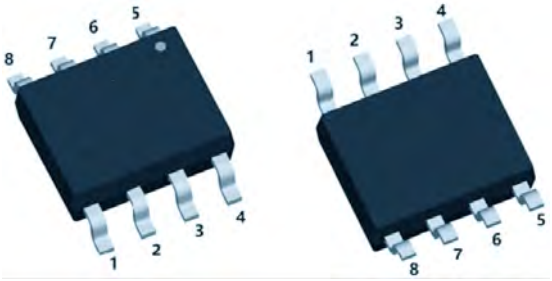
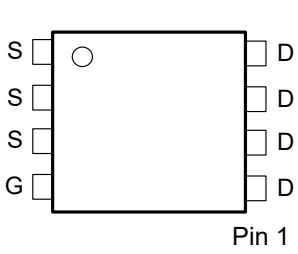
MTR7R5N06P8

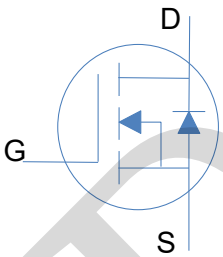
10-JUN-2022

SGT N-channel Power MOSFET

MTR7R5N06P8 SOP8







V_{DS}	60	V
$R_{DS(on),TYP}$@ V_{GS}=10 V	6.5	mΩ
I_D	18	A

Features

1、Low on – resistance

2、High power package (SOP8)

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	18	A
I_D	Continuous drain current @VGS=10V	T_C=25°C	18	A
		T_C=100°C	12	A
I_{DM}	Pulse drain current tested ①	T_C=25°C	70	A
I_{DSM}	Continuous drain current @VGS=10V	T_A=25°C	18	A
		T_A=70°C	12	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	68	--	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	1.0	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

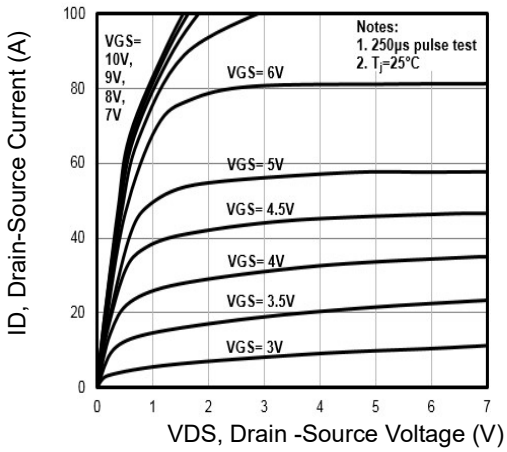


Fig1. Typical Output Characteristics

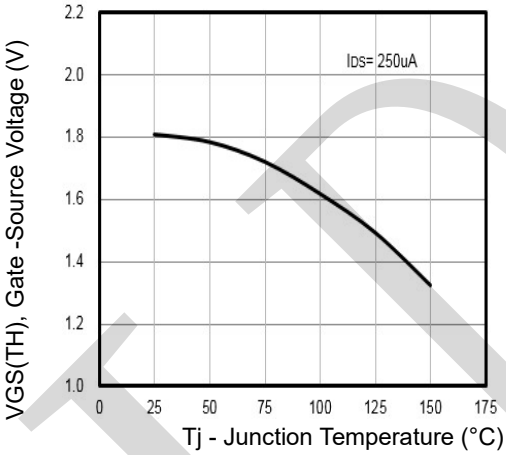


Fig2. $V_{GS(TH)}$ Gate -Source Voltage Vs. Tj

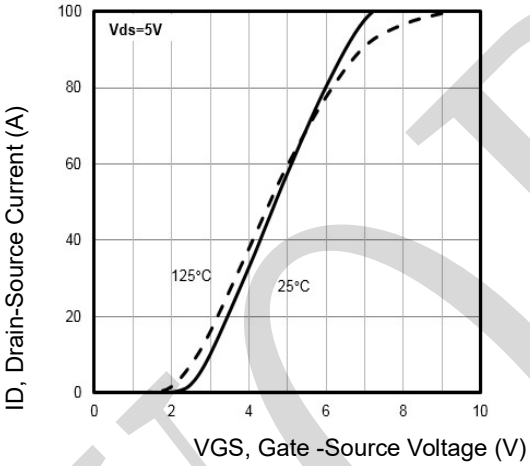


Fig3. Typical Transfer Characteristics

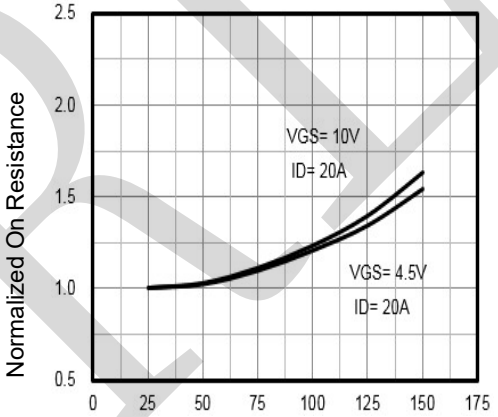


Fig4. Normalized On-Resistance Vs. Tj

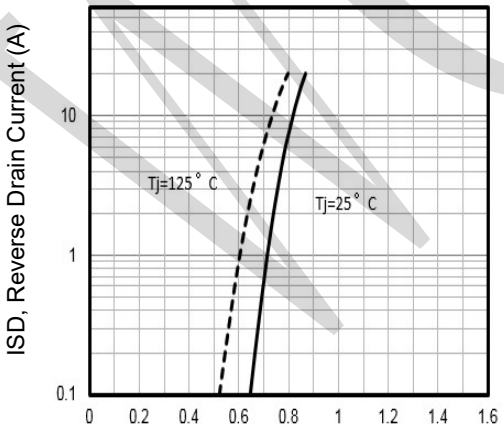


Fig5. Typical Source-Drain Diode Forward Voltage

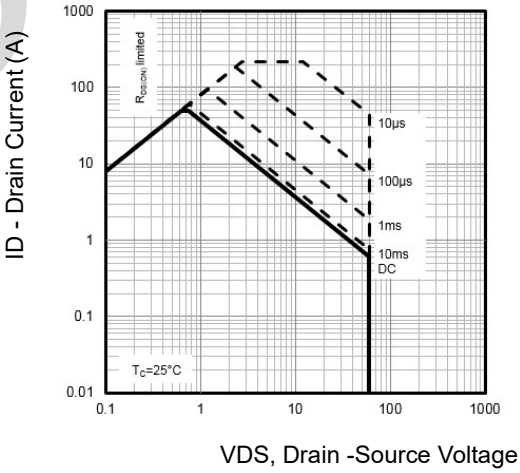


Fig6. Maximum Safe Operating Area

Typical Characteristics

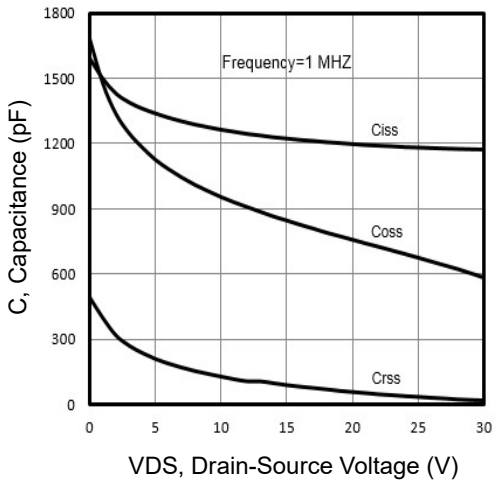


Fig7. Typical Capacitance Vs. Drain-Source Voltage

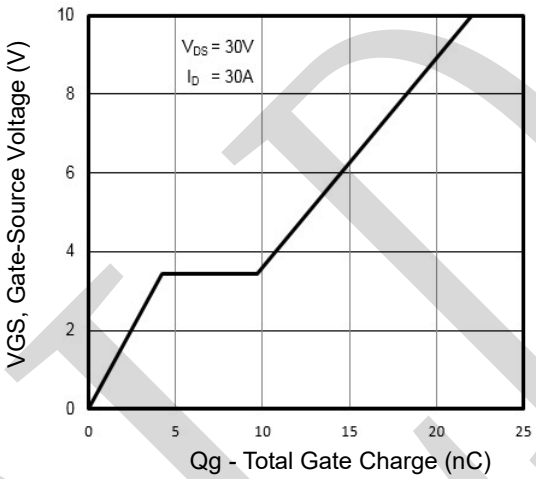


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

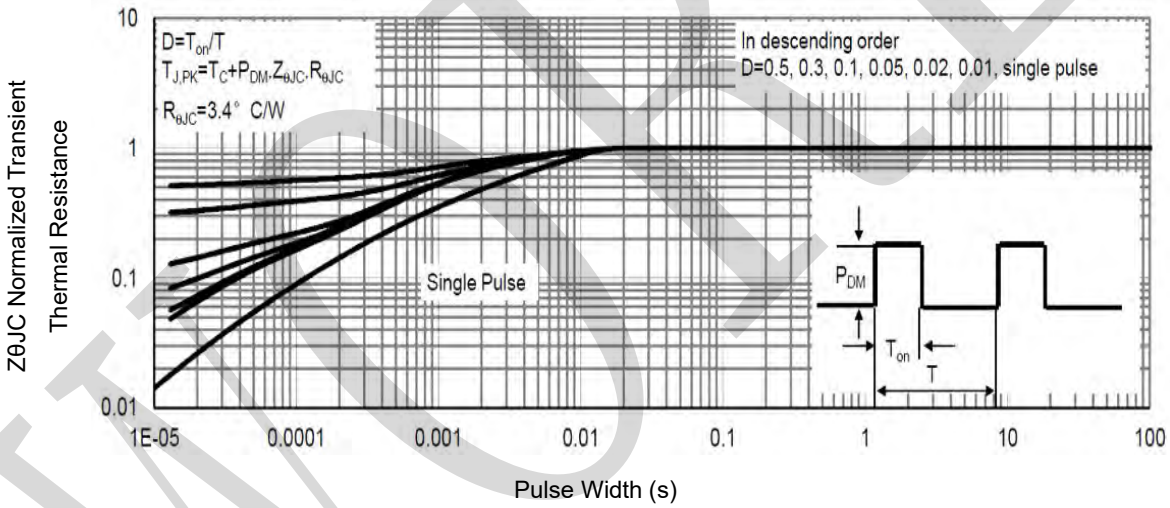


Fig9. Normalized Maximum Transient Thermal Impedance

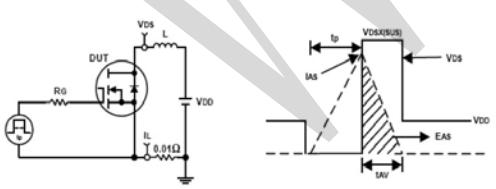


Fig10. Unclamped Inductive Test Circuit and waveforms

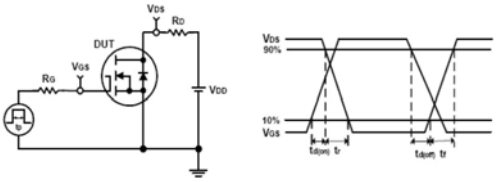
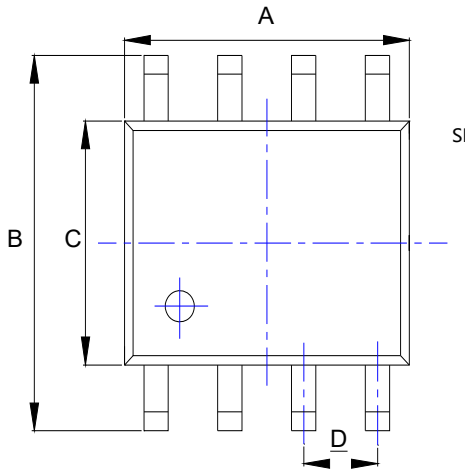
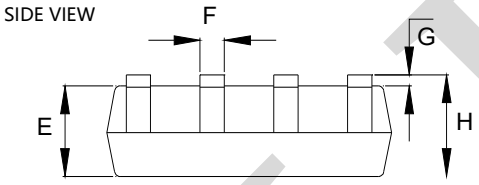


Fig11. Switching Time Test Circuit and waveforms

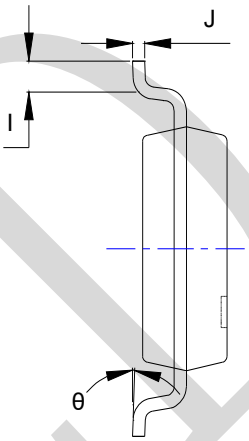
PACKAGE OUTLINE DIMENSIONS



Top View



Side View

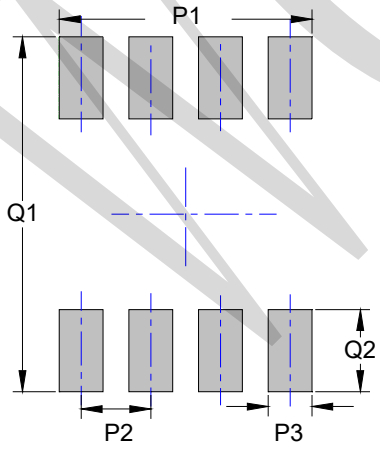


Side View

SOP8 mechanical data

UNIT		A	B	C	D	E	F	G	H	I	J	θ
mm	min	4.70	5.70	3.80	1.27 TYP	1.25	0.33	0.10	1.30	0.40	0.17	0°
	max	5.10	6.30	4.00		1.55	0.51	0.25	1.80	1.27	0.25	8°
mil	min	185.0	224.4	149.6	50.0 TYP	49.2	13.0	3.9	51.1	15.7	6.7	0°
	max	200.8	248.0	157.5		61.1	20.1	9.9	70.9	50.0	9.8	8°

SOP8 Suggested Pad Layout



UNIT		P1	P2	P3	Q1	Q2
mm	min	4.61	1.27	0.80	6.50	1.50
mil	min	181.5	50.0	31.5	255.9	59.0