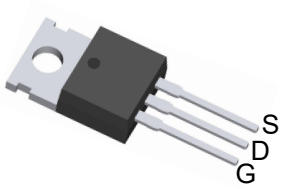
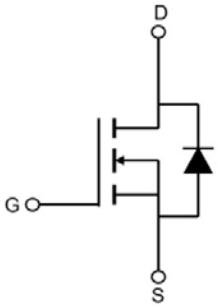
SGT N-channel Power MOSFET

MTR6R5N08CT
TO-220CB





V_{DS}	80	V
$R_{DS(on),TYP}$@ V_{GS}=10 V	6.5	mΩ
I_D	115	A

Features

1、Low on – resistance
2、Package TO-220CB
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		80	V
V_{GS}	Gate-Source voltage		±20	V
I_D	Continuous drain current @VGS=10V	T_C =25°C(Silicon Limited)	115	A
		T_C =100°C(Silicon Limited)	80	A
I_{DM}	Pulse drain current tested	T_C =25°C	400	A
EAS	Avalanche energy, single pulsed		242	mJ
P_D	Maximum power dissipation	T_C =25°C	167	W
		T_C =100°C	83	W
T_{STG},T_J	Storage and Junction Temperature Range		-55 to 175	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.9	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62.5	°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	82	85	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=80V,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	2.3	3.0	3.7	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=40A	--	5.4	6.5	mΩ
g_{FS}	Forward Transconductance	V_{DS}=10V, I_D=40A	--	80	--	S
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=40V,V_{GS}=0V , f=1MHz	--	2925	--	pF
C_{oss}	Output Capacitance		--	526	--	pF
C_{rss}	Reverse Transfer Capacitance		--	35	--	pF
Q_{gs}	Gate to source charge	V_{DD}=40V,I_D=40A , V_{GS}=0 to 10V	--	10	--	nC
$Q_{gs(th)}$	Gate charge at threshold		--	8	--	nC
Q_{gd}	Gate to drain charge		--	12	--	nC
Q_{sw}	Switching charge		--	14	--	nC
Q_g	Gate charge total		--	42	--	nC
$V_{plateau}$	Gate plateau voltage		--	4.5	--	V

Switching Characteristics

Td(on)	Turn-on Delay Time	V_{DD}=40V, RG.ext=3.0Ω, V_{GS}=10V, I_D=40A	--	18	--	ns
Tr	Turn-on Rise Time		--	12	--	ns
Td(off)	Turn-Off Delay Time		--	40	--	ns
Tf	Turn-Off Fall Time		--	13	--	ns

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

I_S	Diode Forward Current		--	--	115	A
$I_{S,pulse}$	Diode Pulse Current	pulsed; tp ≤ 10 μs	--	--	460	A
V_{SD}	Forward on voltage	VGS=0V,I_F=40A	--	0.9	1.2	V
Trr	Reverse Recovery Time	V_R=40V, I_F=20A, di/dt=100A/μs	--	85	--	ns
Qrr	Reverse Recovery Charge		--	180	--	nC

NOTE:

1.Surface mounted FR-4 board by JEDEC (jesd51-7).

2.Pulse width limited by Tjmax.

3.EAS is tested at starting Tj = 25℃, L = 1.0mH, IAS = 22A, VDD = 50V, VGS = 10V.

Typical Characteristics

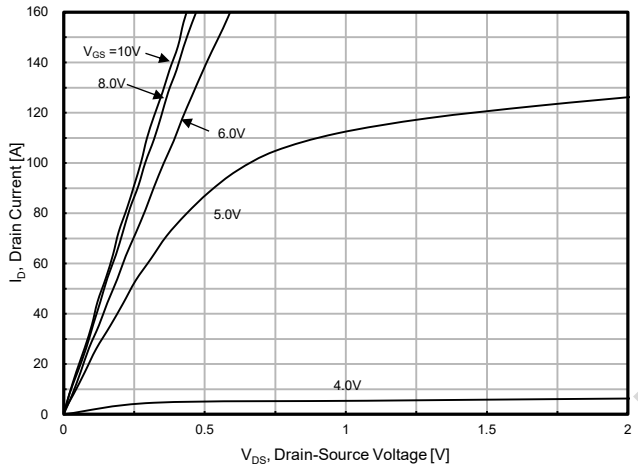


Fig. 1. On-Region Characteristics

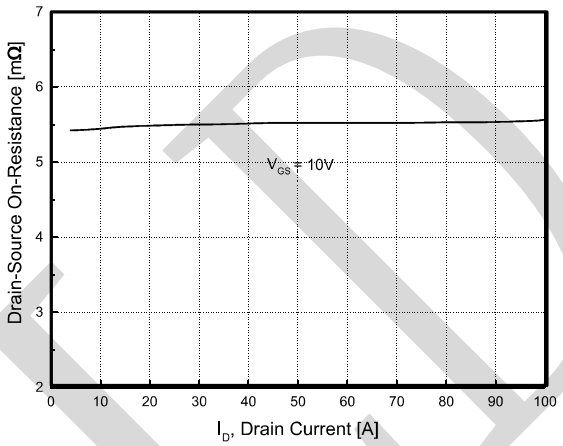


Fig. 2. On-Resistance vs. Drain Current and Gate Voltage

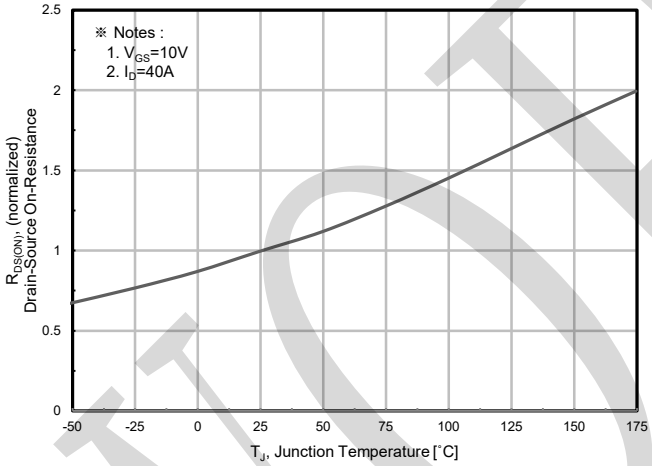


Fig. 3. On-Resistance vs. Junction Temperature

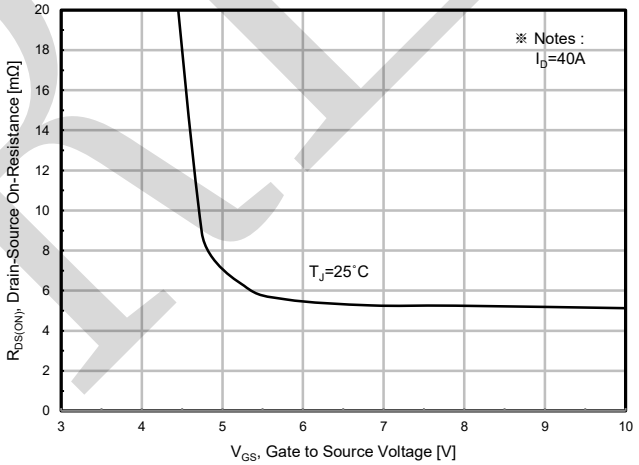


Fig. 4. On-Resistance vs. Gate to Source Voltage

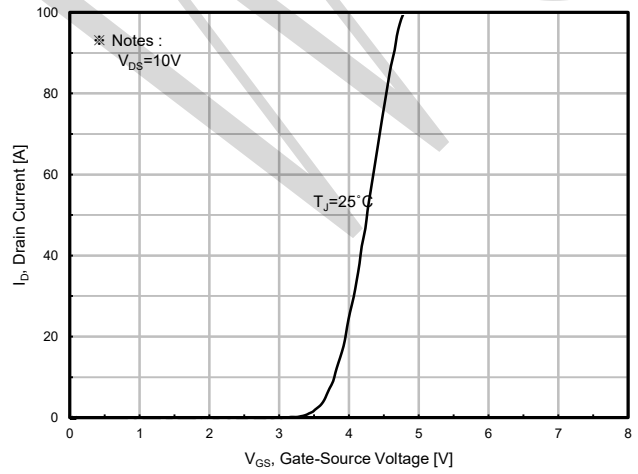


Fig. 5. Transfer Characteristics

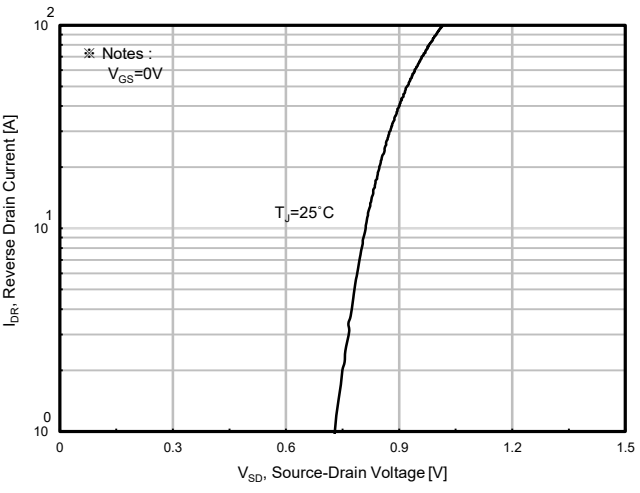


Fig. 6. Source-Drain Diode Forward Voltage

Typical Characteristics

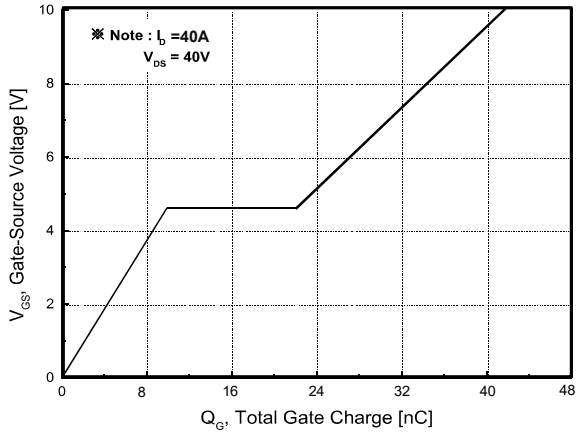


Fig. 7. Gate Charge

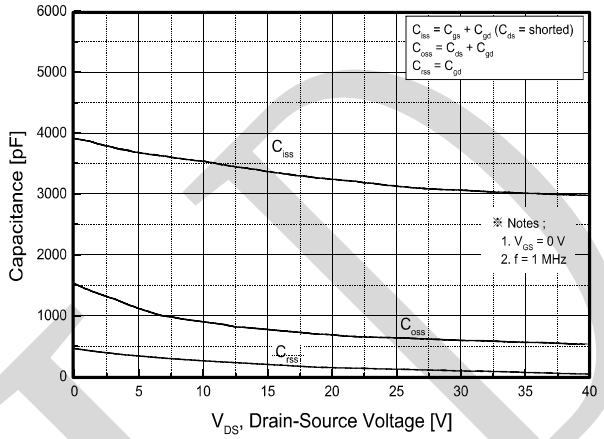


Fig. 8. Capacitance

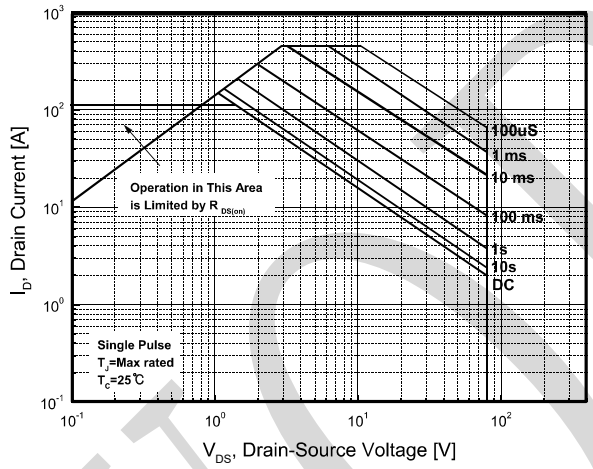


Fig. 9. Safe Operating Area, Junction-to-Ambient

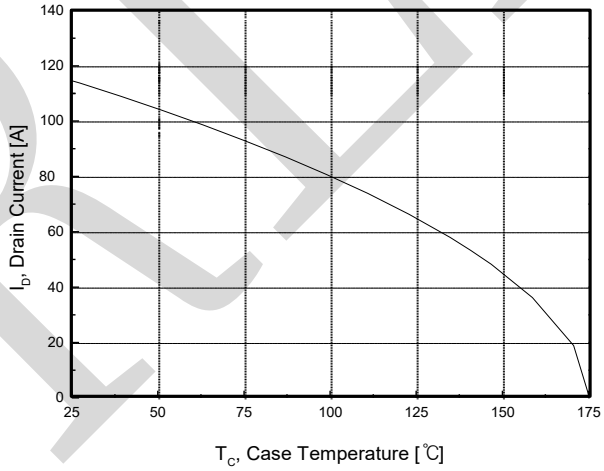


Fig. 10. Maximum Drain vs. Case Temperature

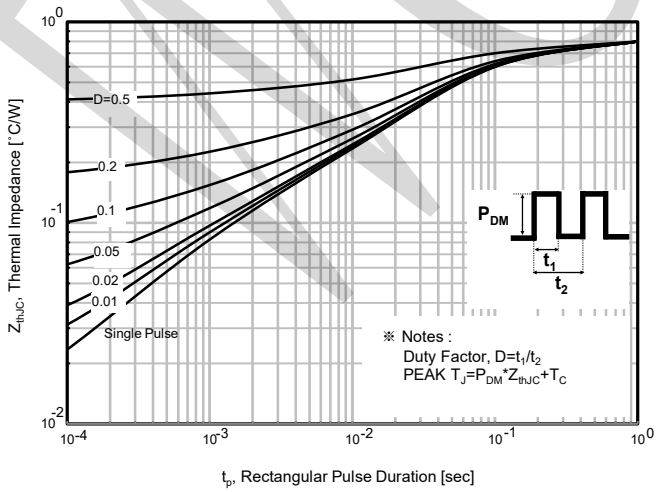
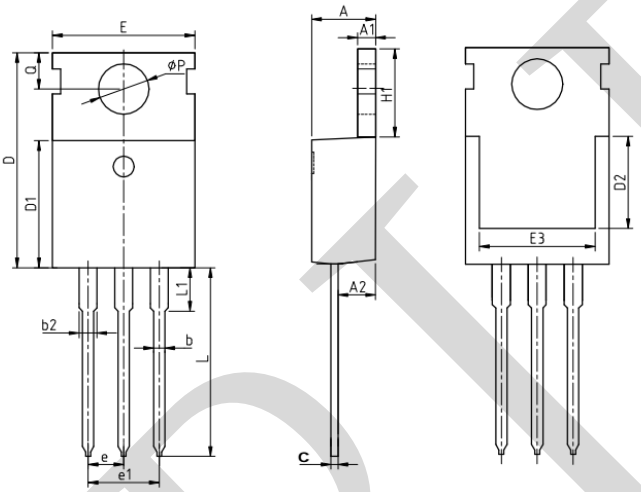


Fig. 11. Thermal Transient Impedance, Junction-to-Ambient

PACKAGE OUTLINE DIMENSIONS

Note:unit mm

TO-220CB



COMMON DIMENSIONS

SYMBOL	mm		
	MIN	NOM	MAX
A	4.37	4.57	4.77
A1	1.25	1.30	1.45
A2	2.20	2.40	2.60
b	0.70	0.80	0.95
b2	1.17	1.27	1.47
c	0.40	0.50	0.65
D	15.10	15.60	16.10
D1	8.80	9.10	9.40
D2	5.50		
E	9.70	10.00	10.30
E3	7.00		
e	2.54 BSC		
e1	5.08 BSC		
H1	6.25	6.50	6.85
L	12.75	13.50	13.80
L1		3.10	3.40
ΦP	3.40	3.60	3.80
Q	2.60	2.80	3.00