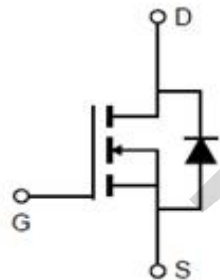
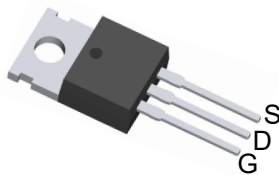


SGT N-channel Power MOSFET

MTR4R5N10CT
TO-220CB



V_{DS}	100	V
$R_{DS(on),TYP@ V_{GS}=10V}$	3.5	mΩ
I_D	160	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 $T_A = 25^\circ\text{C}$, 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 @ $V_{GS}=10V$	$T_C = 25^\circ\text{C}$ (Silicon limit)	220	A
		$T_C = 25^\circ\text{C}$ (Package limit)	160	A
		$T_C = 100^\circ\text{C}$ (Silicon limit)	108	A
I_{DM}	Pulse drain current tested ① $T_C = 25^\circ\text{C}$		480	A
E_{AS}	Avalanche energy, single pulsed ②		1056	mJ
P_D	Maximum power dissipation	$T_C = 25^\circ\text{C}$	225	W
T_{STG}, T_J	Storage and Junction Temperature Range		-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typical	Unit
R _{θJC}	Thermal Resistance, Junction-to-Case	0.55	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient	60	°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	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	2.0	3.0	4.0	V
R _{DS(on)}	Drain-Source On-State Resistance ④	V _{GS} =10V, I _D =50A	--	3.5	4.5	mΩ

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

C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V , f=1MHz	--	7300	--	pF
C _{oss}	Output Capacitance		--	2700	--	pF
C _{rss}	Reverse Transfer Capacitance		--	309	--	pF
R _g	Gate Resistance	V _{GS} =0V, f=1MHz V _{DS} =0V,	--	1.6	--	Ω
Q _g (10V)	Total Gate Charge	V _{DS} =50V, I _D =50A , V _{GS} =10V	--	95	--	nC
Q _{gs}	Gate-Source Charge		--	25	--	nC
Q _{gd}	Gate-Drain Charge		--	21	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V _{DS} =50V, V _{GS} =10V, R _L =3.0Ω, T _J =25°C	--	32	--	ns
Tr	Turn-on Rise Time		--	45	--	ns
Td(off)	Turn-Off Delay Time		--	52	--	ns
Tf	Turn-Off Fall Time		--	31	--	ns

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

VSD	Forward on voltage	I _{SD} =50A, V _{GS} =0V	--	0.9	1.2	V
Trr	Reverse Recovery Time	I _F =30A, di/dt=500A/μs	--	85	--	ns
Qrr	Reverse Recovery Charge	I _F =30A, di/dt=500A/μs	--	254	--	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_{θJA} and the maximum allowed junction temperature of 150°C.

④ Pulse width ≤ 380μs; duty cycle ≤ 2%.

Typical Characteristics

Fig 1: Output Characteristics

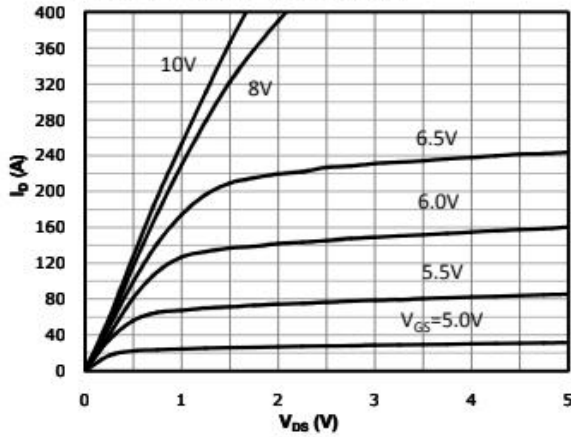


Fig 2: Transfer Characteristics

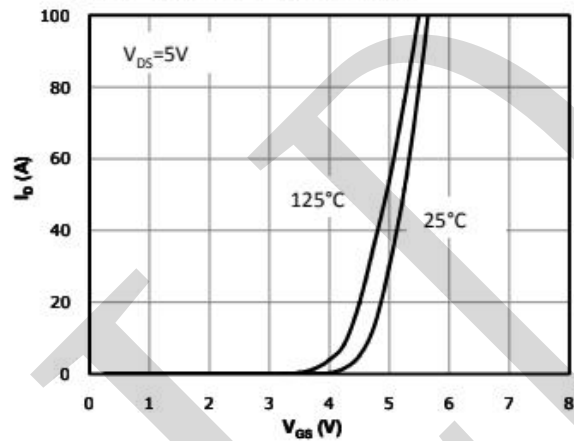


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

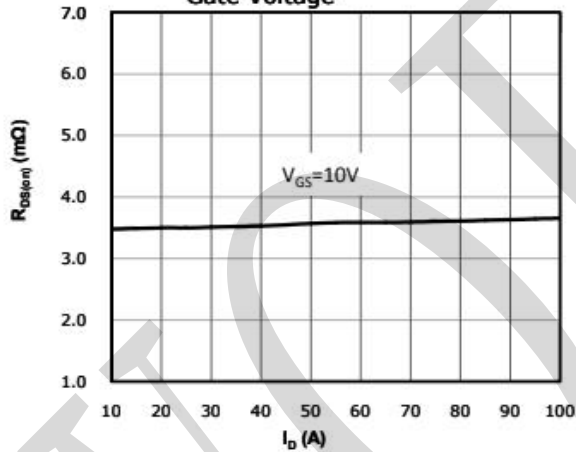


Fig 4: $R_{DS(on)}$ vs Gate Voltage

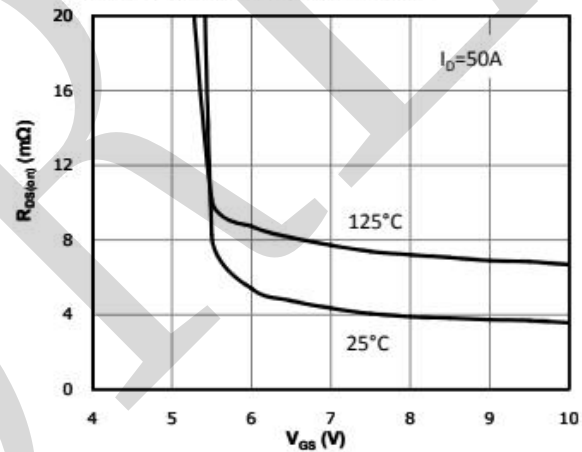


Fig 5: $R_{DS(on)}$ vs. Temperature

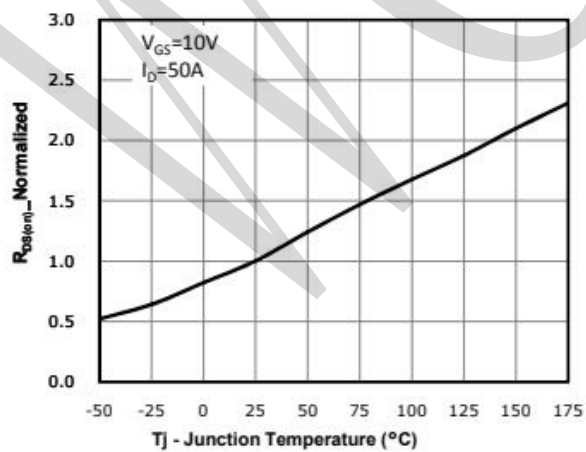
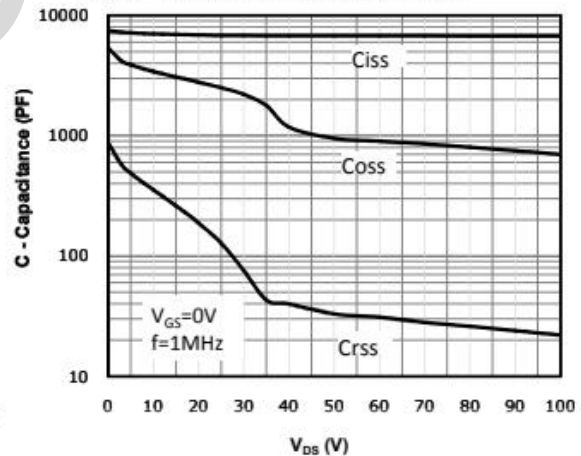


Fig 6: Capacitance Characteristics



Typical Characteristics

Fig 7: Gate Charge Characteristics

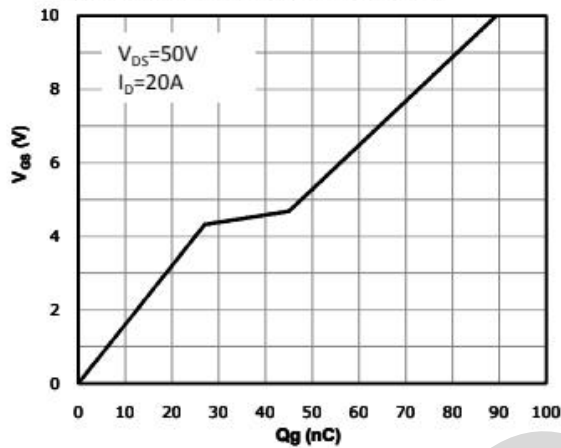


Fig 8: Body-diode Forward Characteristics

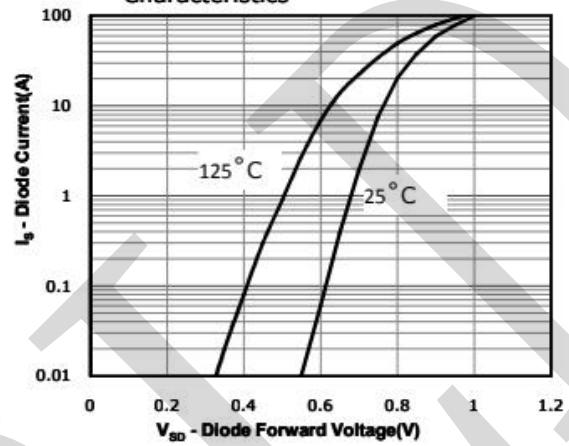


Fig 9: Power Dissipation

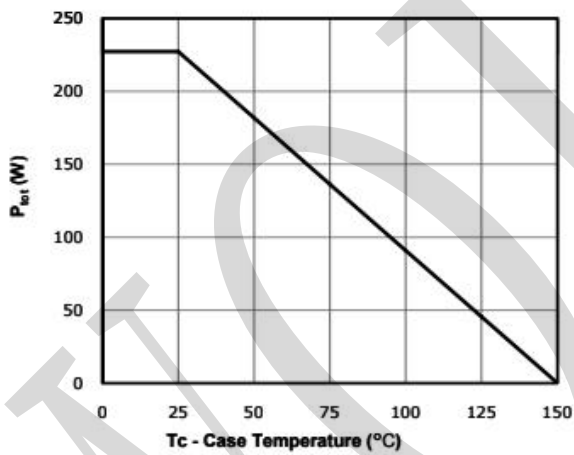


Fig 10: Drain Current Derating

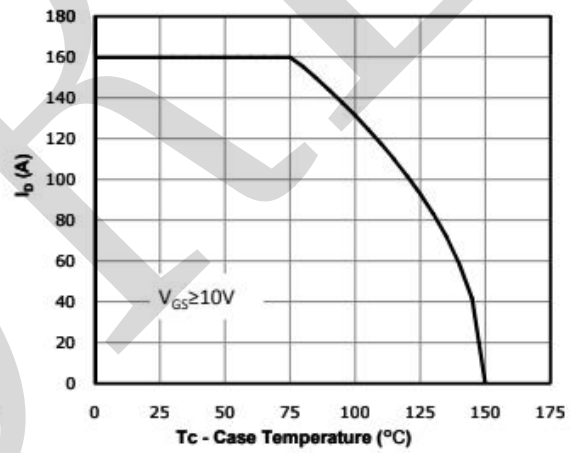
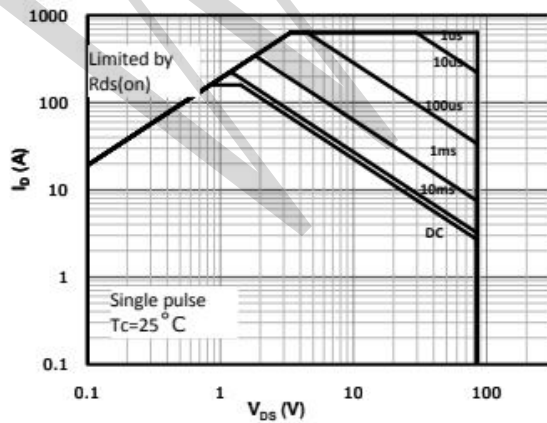
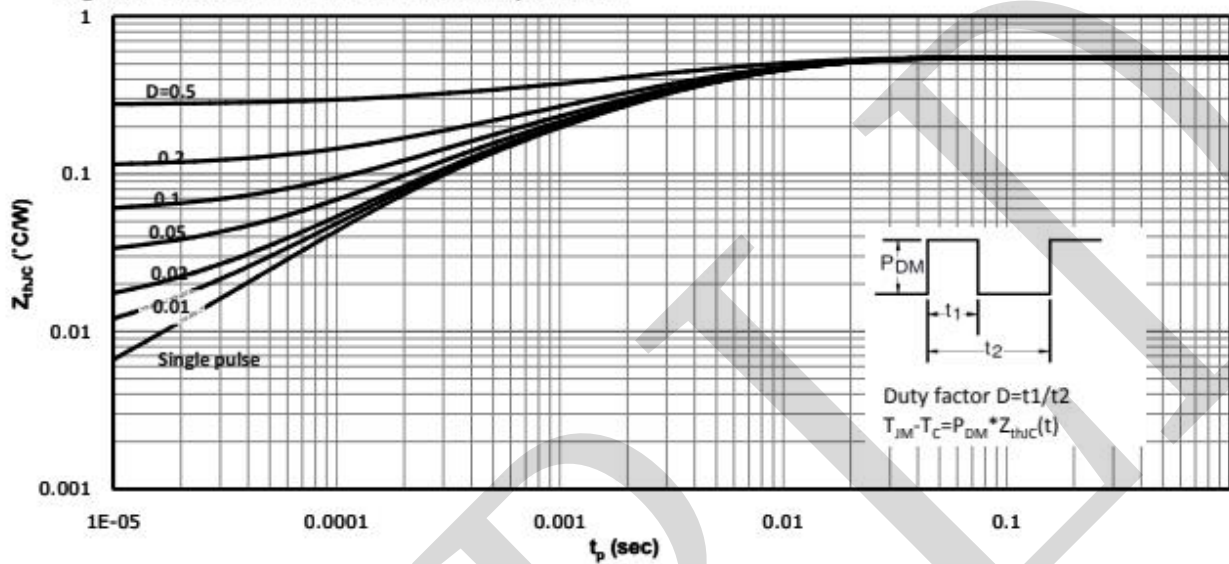


Fig 11: Safe Operating Area



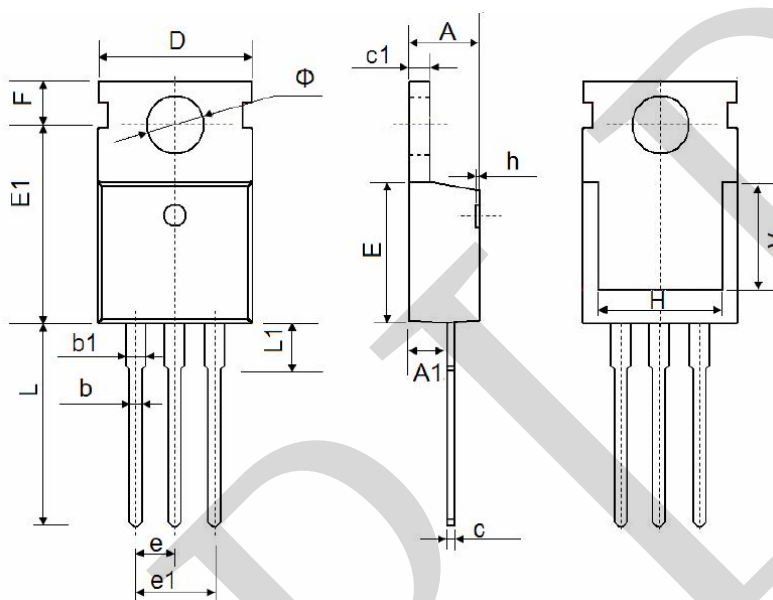
Typical Characteristics

Fig 12: Max. Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS

TO-220CB



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.9500	9.750	0.352	0.384
E1	12.650	12.950	0.498	0.510
e	2.540 Typ.		0.100 Typ.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	7.500 Ref.		0.295 Ref.	
Φ	3.400	3.800	0.134	0.150