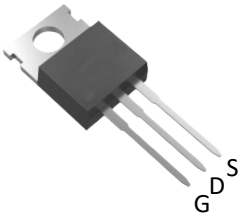
MTR5R5N06CT

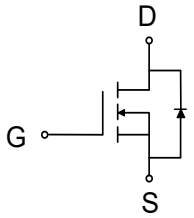
10-Jun-2023

SGT N-Channel Power MOSFET

MTR5R5N06CT

TO-220CB





Features

- Low on-resistance
- Low Crss, Fast switching
- Pb-free lead plating; RoHS compliant

Applications

- Synchronous Rectification for AC-DC Quick Charger
- DC/DC in Telecoms and Inductrial
- Hard Switching and High Speed Circuit

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_D	Continuous drain current	T_C =25°C	125	A
		T_C =100°C	80	A
I_{DM}	Pulse drain current tested ①	T_C =25°C	420	A
EAS	Avalanche energy, single pulsed ②		110	mJ
P_D	Maximum power dissipation	T_C =25°C	125	W
T_{STG}, T_J	Storage and Junction Temperature Range		-55 to 150	°C

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	60	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V,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	--	2.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance③	V_{GS}=10V, I_D=40A	--	4.5	5.5	mΩ
		V_{GS}=4.5V, I_D=40A	--	6.7	9.8	mΩ

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

C_{iss}	Input Capacitance	V_{DS}=30V,V_{GS}=0 V , f=1MHz	--	2458	--	pF
C_{oss}	Output Capacitance		--	590	--	pF
C_{rss}	Reverse Transfer Capacitance		--	35	--	pF
Q_g	Total Gate Charge	V_{DD}=48V, I_D=20A	--	58.4	--	nC
Q_{gs}	Gate-Source Charge		--	7.9	--	nC
Q_{gd}	Gate-Drain Charge		--	5.5	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V_{DD}=30V V_{GS}=10V R_D=5Ω R_G=10Ω	--	18	--	ns
Tr	Turn-on Rise Time		--	2	--	ns
Td(off)	Turn-Off Delay Time		--	56	--	ns
Tf	Turn-Off Fall Time		--	18	--	ns

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

V_{SD}	Forward on voltage	I_S=40A,V_{GS}=0V	--	--	1.3	V

NOTE: ① Repetitive Rating: Pulse width limited by maximum junction temperature.

② EAS Condition: L=0.5mH, Start T_J=25℃

③ Pulse test: Width≤300us, Duty Cycle≤2%

Typical Characteristics

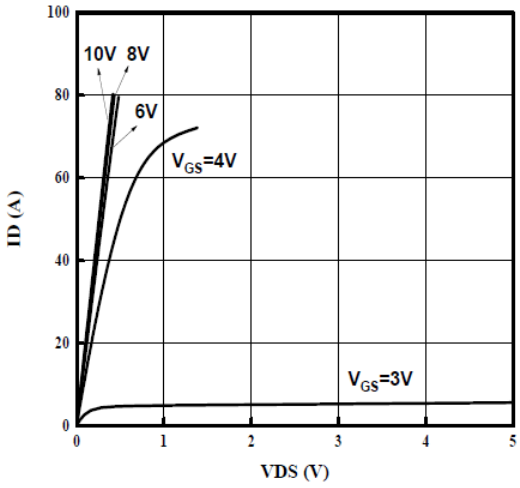


Fig1. Typical Output Characteristics

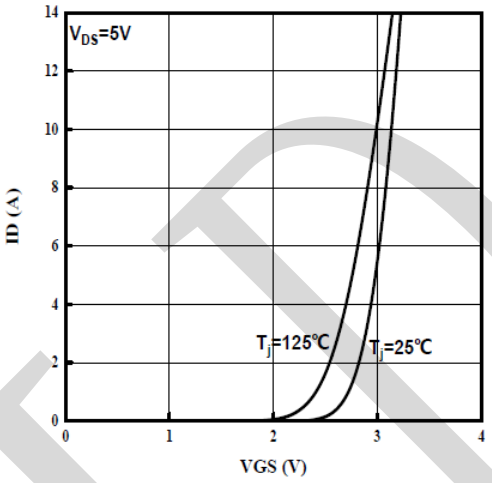


Fig2. Typical Transfer Characteristics

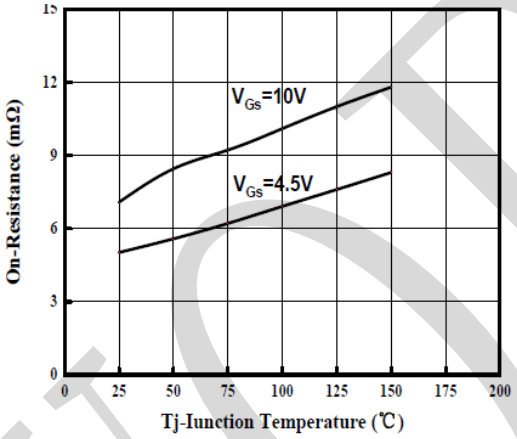


Fig3. On-Resistance Vs. Temperature

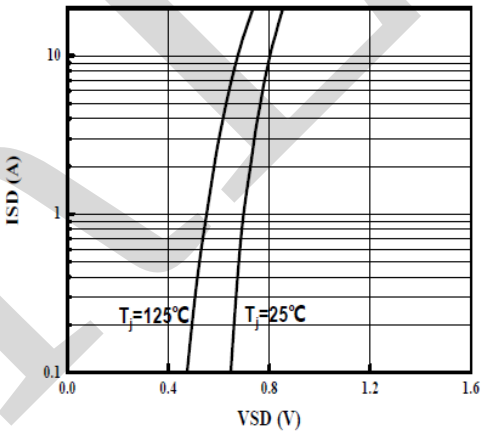


Fig4. Typical Source-Drain Diode Forward Voltage

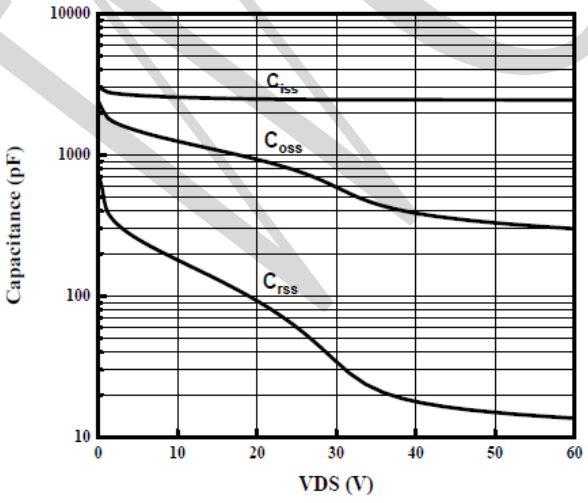


Fig5. Typical.Capacitance

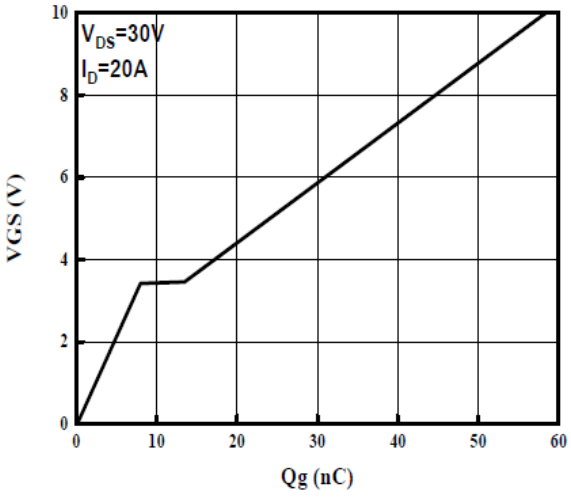


Fig6. Typical.Gate Charge

Typical Characteristics

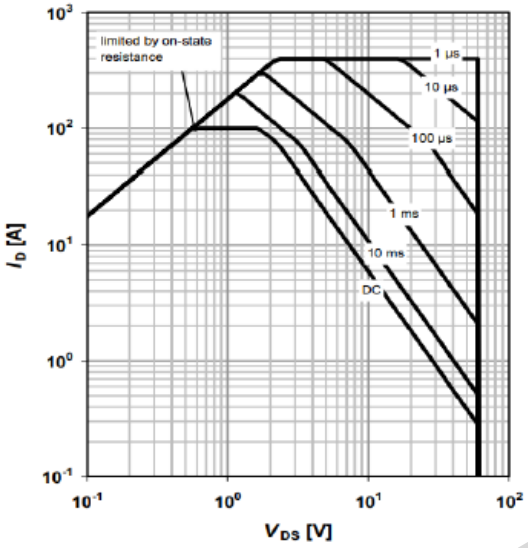


Fig7. Safe Operating Area

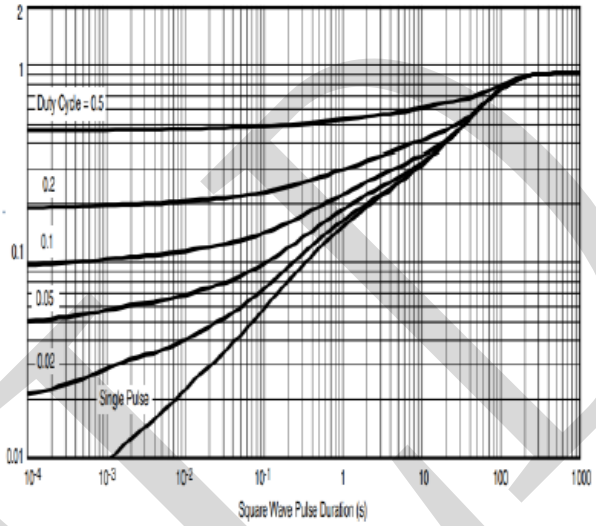
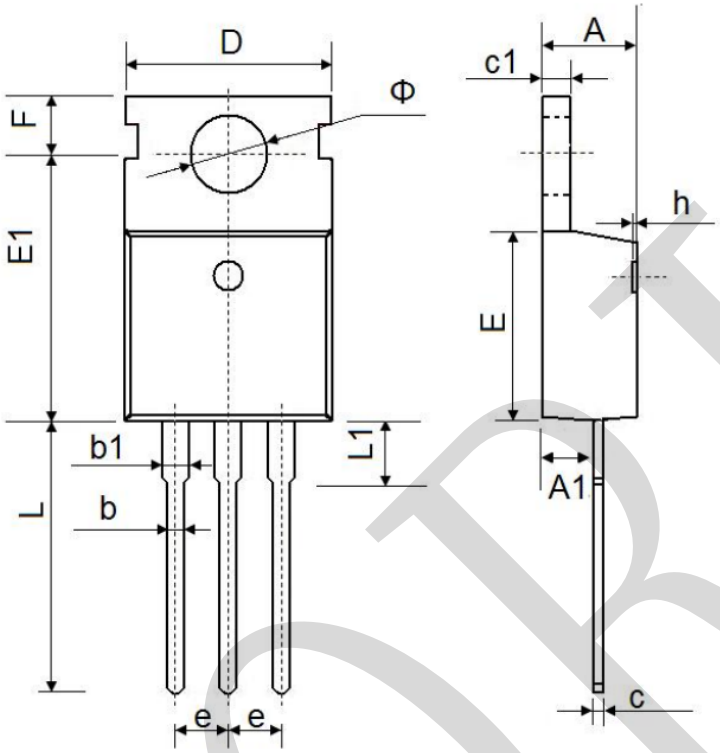


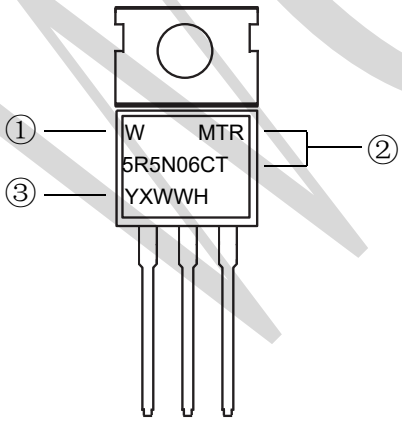
Fig8. Normalized transient thermal impedance

PACKAGE OUTLINE DIMENSIONS



TO-220CB Unit:mm		
DIM	MIN	MAX
A	4.47	4.67
A1	2.15	2.55
b	0.70	0.90
b1	1.17	1.37
c	0.40	0.60
c1	1.20	1.40
D	9.68	10.08
E	8.80	9.40
E1	12.56	12.86
e	2.34	2.74
F	2.64	2.94
h	0.00	0.03
L	12.96	13.56
L1	2.85	3.25
φ	3.40	3.80

Marking Information



①W : Company's trademark
②Product model : MTR5R5N06CT
③PDC information：

Y X WW H

- H:Halogen-free
- WW:Week code(01 to 53)
- X:Internal identification code
- Y:Year code(ex:0=2020)