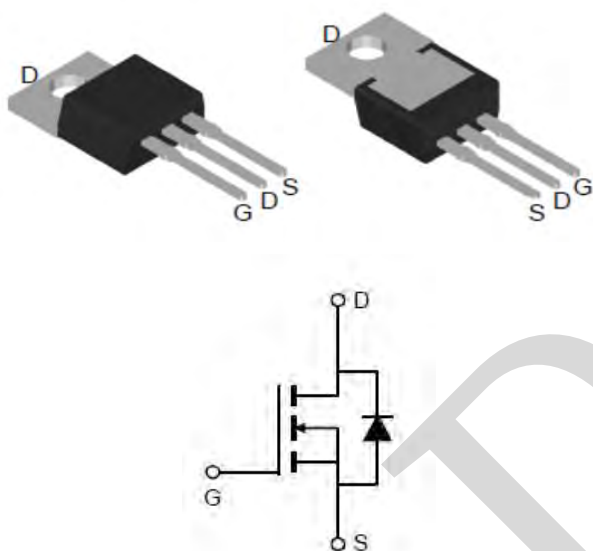


SGT N-channel Power MOSFET

TO-220AB
MTR5R5N10CT



V_{DS}	100	V
$R_{DS(on),TYP@ V_{GS}=10V}$	4.8	mΩ
I_D	130	A

Features

- 1、Low on – resistance
- 2、Package TO-220AB
- 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_S	Diode continuous forward current	$T_C = 25^\circ\text{C}$ --	A
I_D	Continuous drain current @ $V_{GS}=10V$	$T_C = 25^\circ\text{C}$ 130	A
		$T_C = 100^\circ\text{C}$ 82	A
I_{DM}	Pulse drain current tested ①	$T_C = 25^\circ\text{C}$ 520	A
E_{AS}	Avalanche energy, single pulsed ②	650	mJ
P_D	Maximum power dissipation	$T_C = 25^\circ\text{C}$ 208	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	0.6	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient	63	°C/W

Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
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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	--	4.8	5.5	mΩ
g _{fs}	Transconductance	V _{DS} =V _{GS} , I _D =250μA	--	55	--	S

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

C _{iss}	Input Capacitance	V _{DS} =40V, V _{GS} =0V, f=1MHz	--	5225	--	pF
C _{oss}	Output Capacitance		--	552	--	pF
C _{rss}	Reverse Transfer Capacitance		--	28	--	pF
R _g	Gate Resistance	V _{GS} =0V, f=1MHz V _{DS} =0V,	--	3.0	--	Ω
Q _g (10V)	Total Gate Charge	V _{DS} =50V, I _D =50A , V _{GS} =10V	--	85	--	nC
Q _{gs}	Gate-Source Charge		--	30	--	nC
Q _{gd}	Gate-Drain Charge		--	18	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V _{DS} =50V, V _{GS} =10V, R _L =3.0Ω, T _J =25°C	--	16	--	ns
Tr	Turn-on Rise Time		--	67	--	ns
Td(off)	Turn-Off Delay Time		--	45	--	ns
Tf	Turn-Off Fall Time		--	14	--	ns

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

VSD	Forward on voltage	I _{SD} =50A, V _{GS} =0V	--	--	1.2	V
Trr	Reverse Recovery Time	I _F =30A, di/dt=500A/μs	--	62	--	ns
Qrr	Reverse Recovery Charge	I _F =30A, di/dt=100A/μs	--	140	--	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

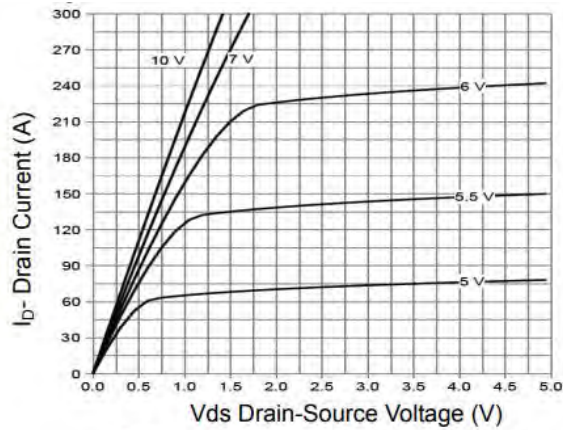


Figure 1 Output Characteristics

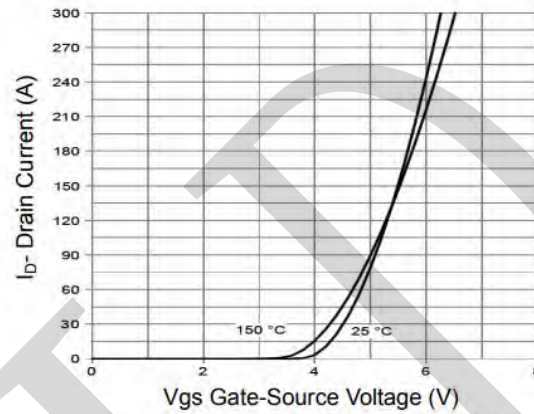


Figure 2 Transfer Characteristics

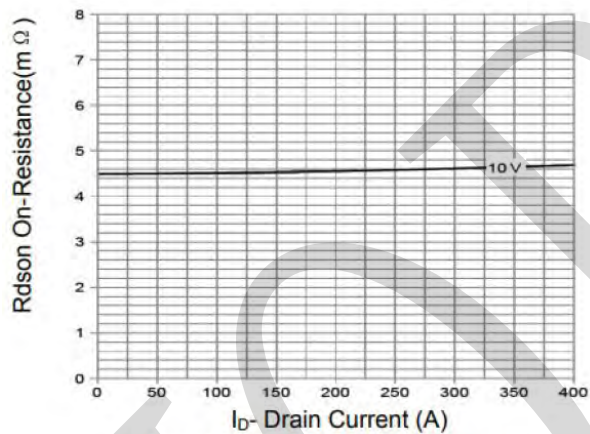


Figure 3 $R_{DS(on)}$ - Drain Current

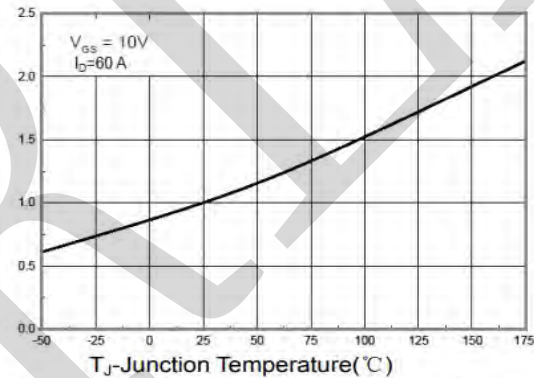


Figure 4 $R_{DS(on)}$ -Junction Temperature

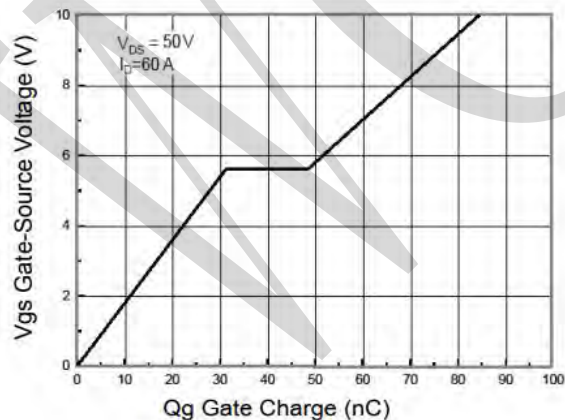


Figure 5 Gate Charge

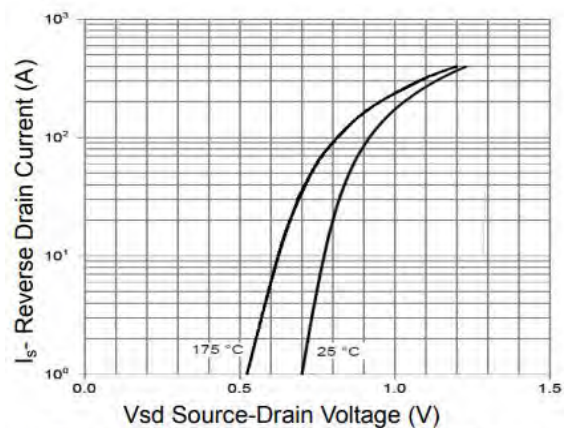


Figure 6 Source- Drain Diode Forward

Typical Characteristics

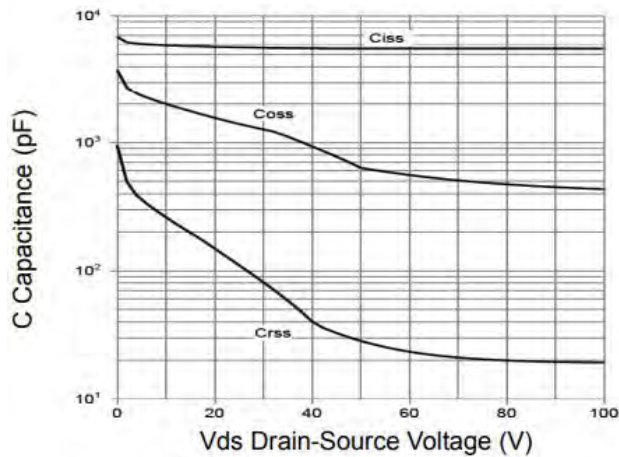


Figure 7 Capacitance vs Vds

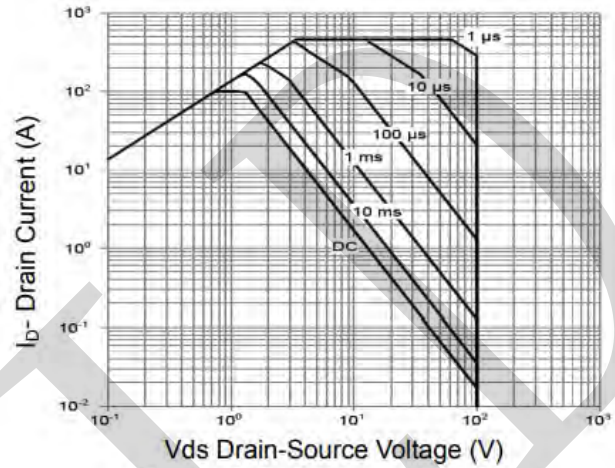


Figure 8 Safe Operation Area

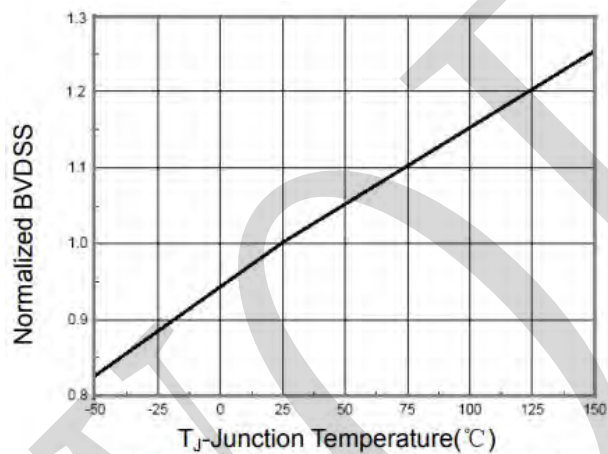


Figure 9 BV_{DS} vs Junction Temperature

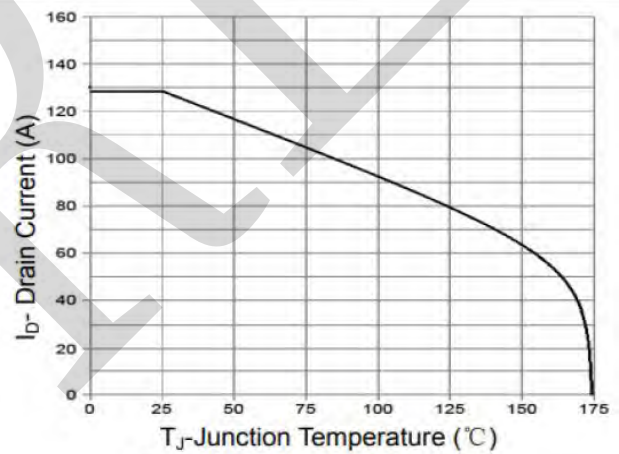


Figure 10 Current De-rating

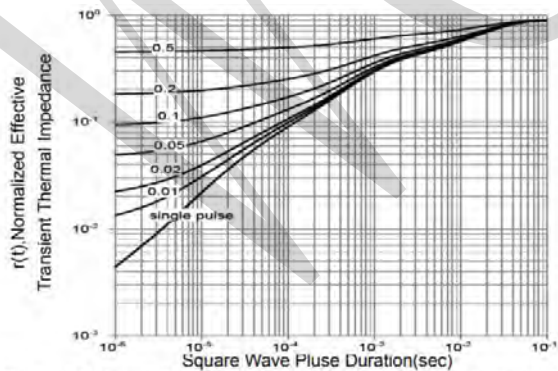
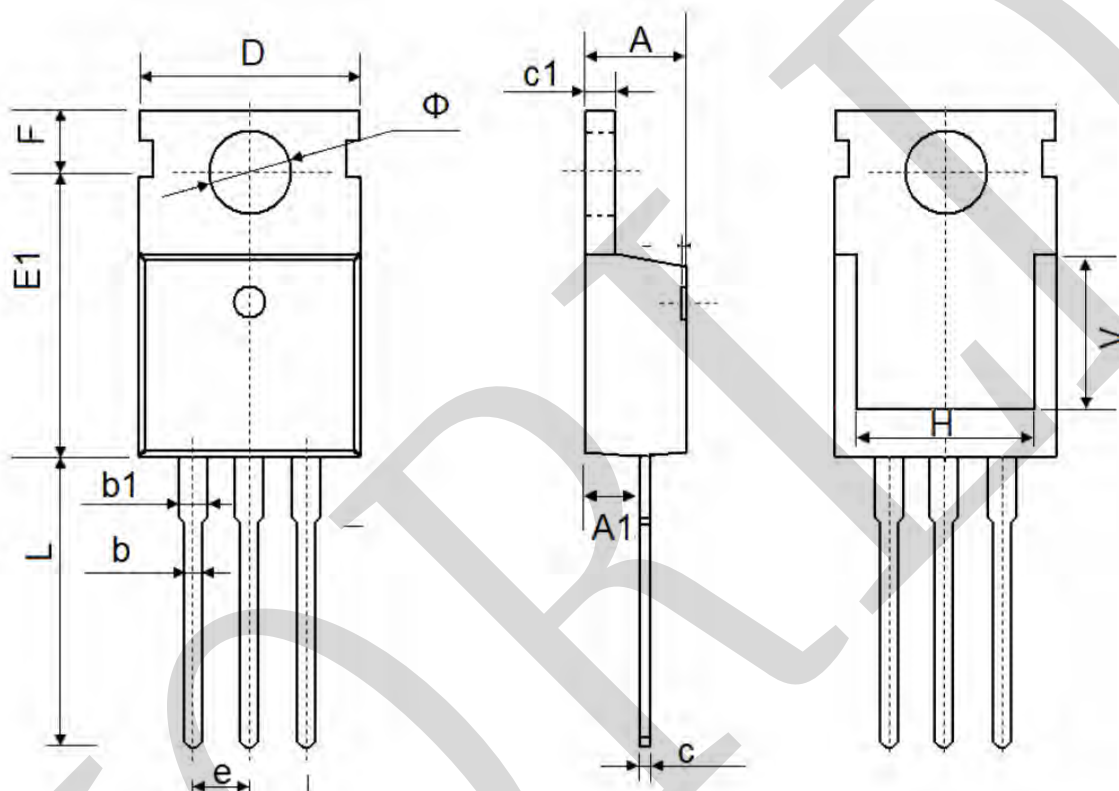


Figure 11 Normalized Maximum Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS

Note:unit mm

TO-220AB



TO-220AB mechanical data

UNIT		A	A1	b	b1	c	c1	D	E1	e	F	H	L	V	Φ
mm	min	4.2	2.1	0.6	1.1	0.30	1.1	9.8	12.5	2.54	2.5	7.8	12.8	6.9	3.3
	max	4.8	2.7	1.0	1.5	0.55	1.5	10.4	13.1	TYP	3.1	8.2	13.5	REF	3.9
mil	min	165.3	82.6	23.6	43.3	11.8	43.3	385.8	492.1	99.9	98.4	307.1	503.9	271.6	129.9
	max	199.1	106.3	39.4	59.1	21.7	59.1	409.5	515.8	TYP	122.1	322.9	531.5	REF	153.5