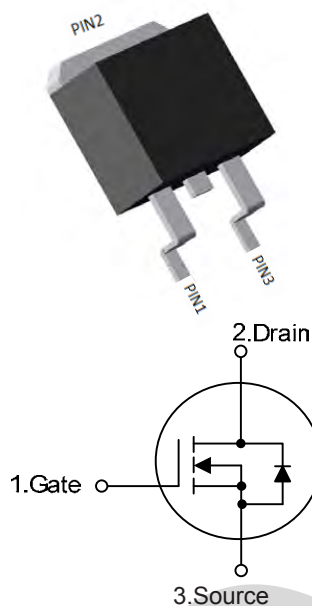


SGT N-channel Power MOSFET

MTR3R5N10CTB

TO-263



V_{DS}	100	V
$R_{DS(on),TYP}@ V_{GS}=10\text{ V}$	2.8	m Ω
I_D	160	A

Features

- 1、Low on – resistance
- 2、Package TO-263
- 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	$T_C = 25^\circ\text{C}$	--
I_D	Continuous drain current @ $V_{GS}=10\text{V}$	$T_C = 25^\circ\text{C}$	160
		$T_C = 100^\circ\text{C}$	128
I_{DM}	Pulse drain current tested ①	$T_C = 25^\circ\text{C}$	640
E_{AS}	Avalanche energy, single pulsed ②	600	mJ
P_D	Maximum power dissipation	$T_C = 25^\circ\text{C}$	183
T_{STG}, T_J	Storage and Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.75	$^{\circ}\text{C/W}$

Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
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Static Electrical Characteristics @ $T_j=25^{\circ}\text{C}$ (unless otherwise stated)

$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=100V, V_{GS}=0V$	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	--	--	± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2.4	3.0	3.6	V
$R_{DS(on)}$	Drain-Source On-State Resistance ④	$V_{GS}=10V, I_D=50A$	--	2.8	3.5	m Ω
g_{fs}	Transconductance	$V_{DS}=5V, I_D=50A$	--	100	--	S

Dynamic Electrical Characteristics @ $T_j = 25^{\circ}\text{C}$ (unless otherwise stated)

C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=50V,$ $f=1\text{MHz}$	--	7040	--	pF
C_{oss}	Output Capacitance		--	1010	--	pF
C_{rss}	Reverse Transfer Capacitance		--	35	--	pF
R_g	Gate Resistance	$V_{GS}=0V, V_{DS}=0V,$ $f=1\text{MHz}$	--	1.0	--	Ω
$Q_g(10V)$	Total Gate Charge	$V_{GS}=10V,$ $I_D=50A,$ $V_{DS}=50V$	--	122	--	nC
Q_{gs}	Gate-Source Charge		--	28	--	nC
Q_{gd}	Gate-Drain Charge		--	36	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V _{GS} =10V, V _{DS} =50V, R _G =3.0Ω, T _J =25°C	--	48	--	ns
Tr	Turn-on Rise Time		--	56	--	ns
Td(off)	Turn-Off Delay Time		--	75	--	ns
Tf	Turn-Off Fall Time		--	33	--	ns

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

VSD	Forward on voltage	I _{SD} =50A, V _{GS} =0V	--	0.9	1.1	V
Trr	Reverse Recovery Time	I _F =100A, di/dt=100A/μs	--	115	--	ns
Qrr	Reverse Recovery Charge	I _F =100A, di/dt=100A/μs	--	320	--	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. 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

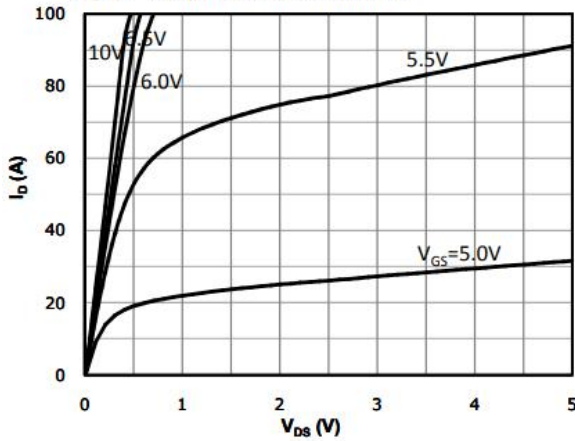


Fig 2: Transfer Characteristics

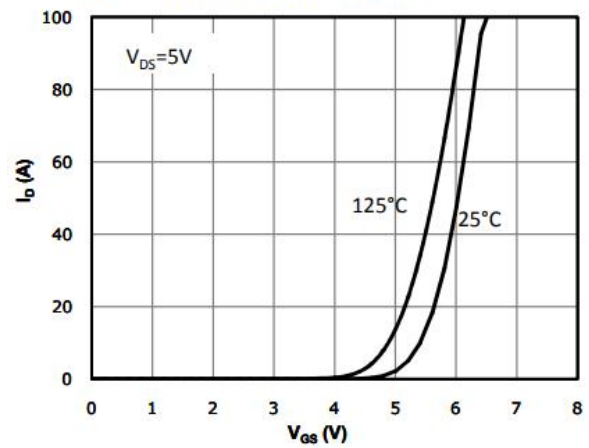


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

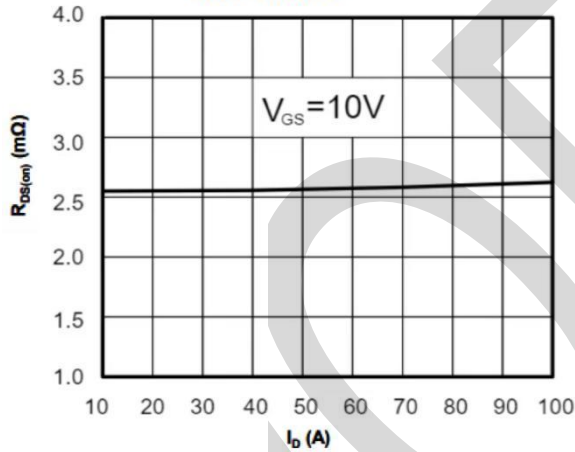


Fig 4: $R_{DS(on)}$ vs Gate Voltage

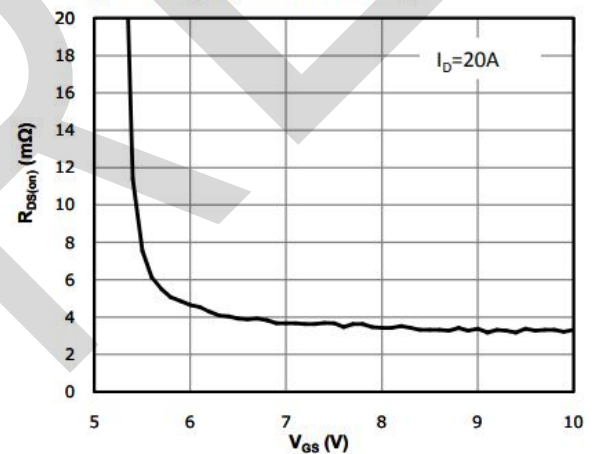


Fig 5: $R_{DS(on)}$ vs. Temperature

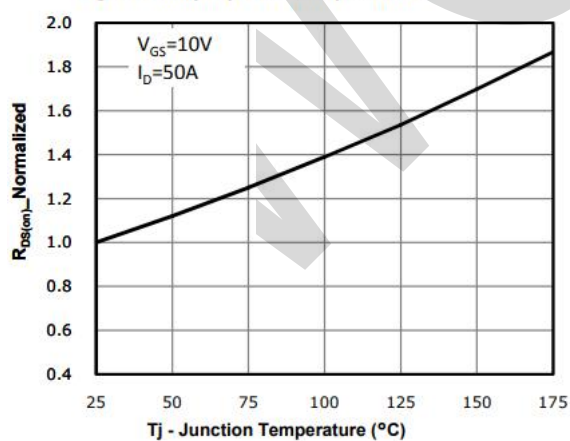
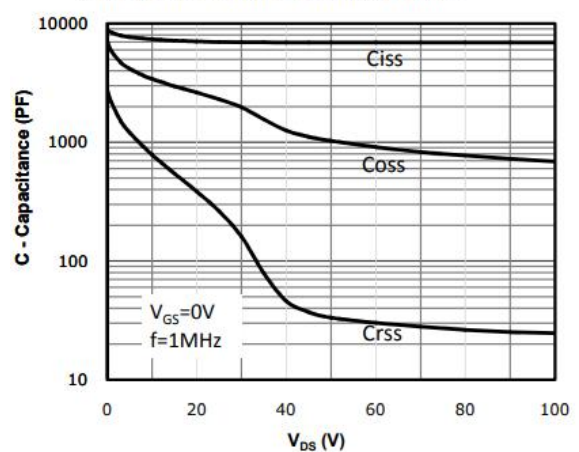


Fig 6: Capacitance Characteristics



Typical Characteristics

Fig 7: Gate Charge Characteristics

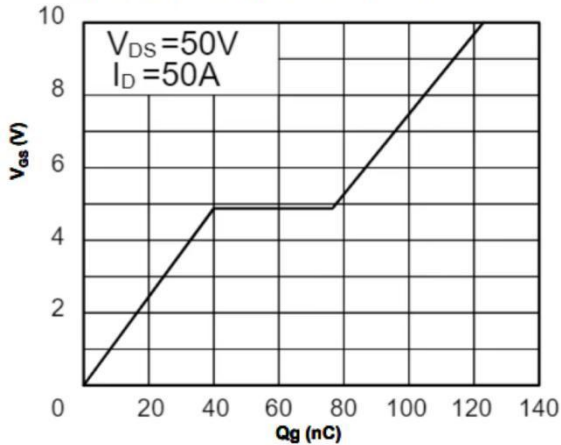


Fig 8: Body-diode Forward Characteristics

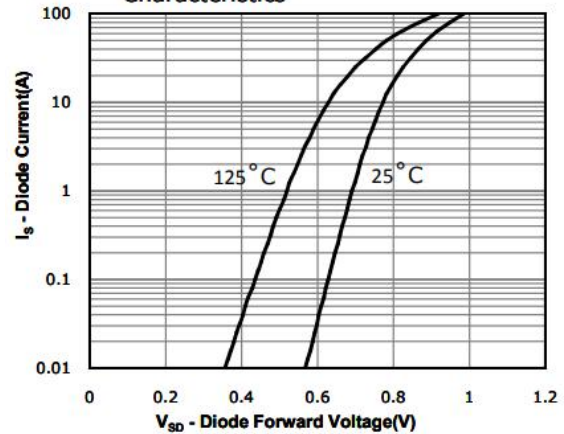


Fig 9: Power Dissipation

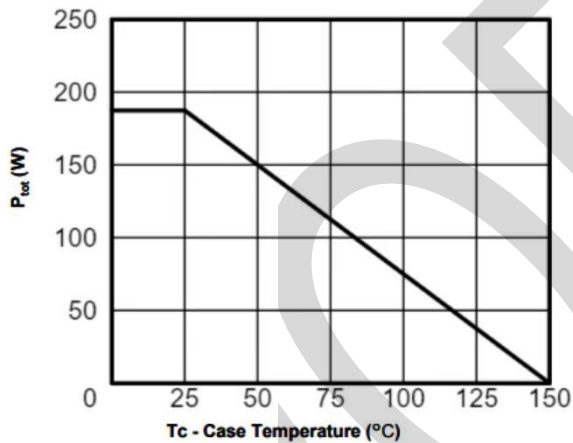


Fig 10: Drain Current Derating

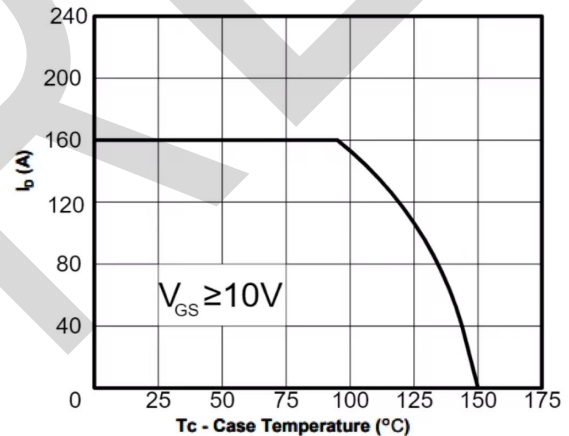
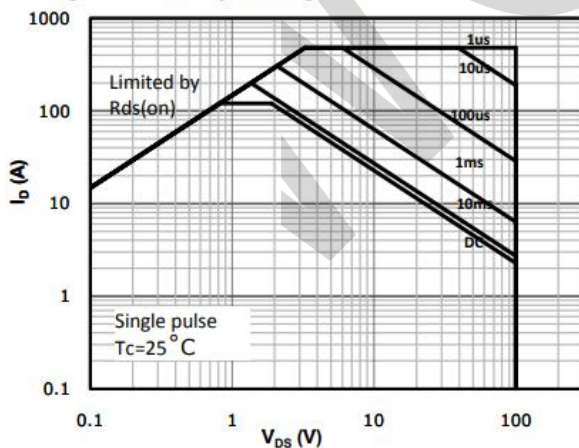
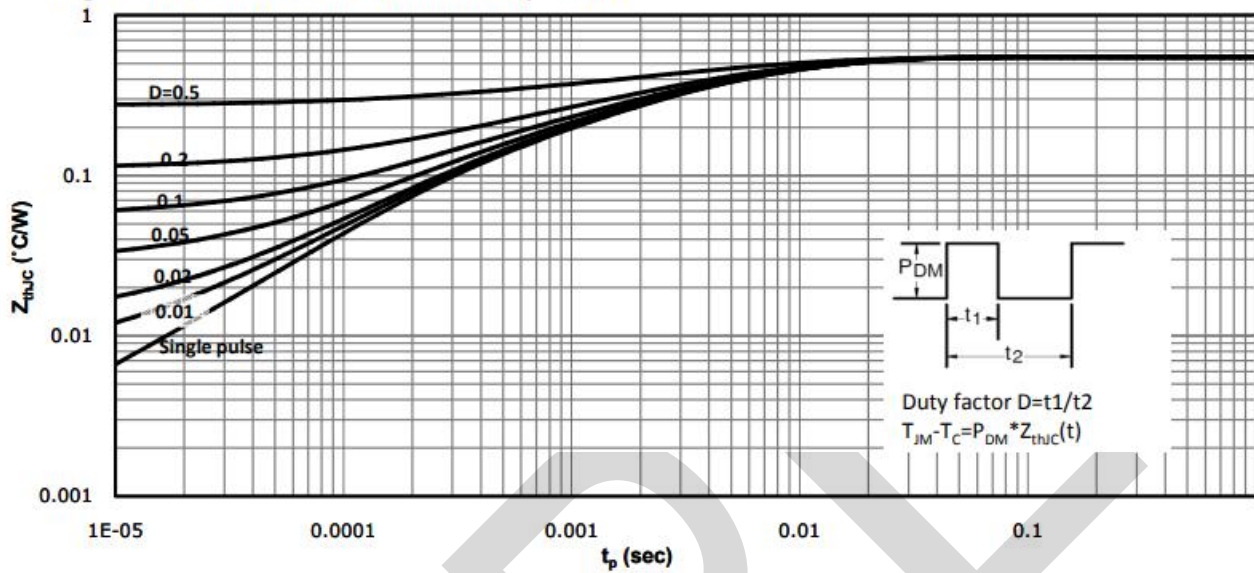


Fig 11: Safe Operating Area



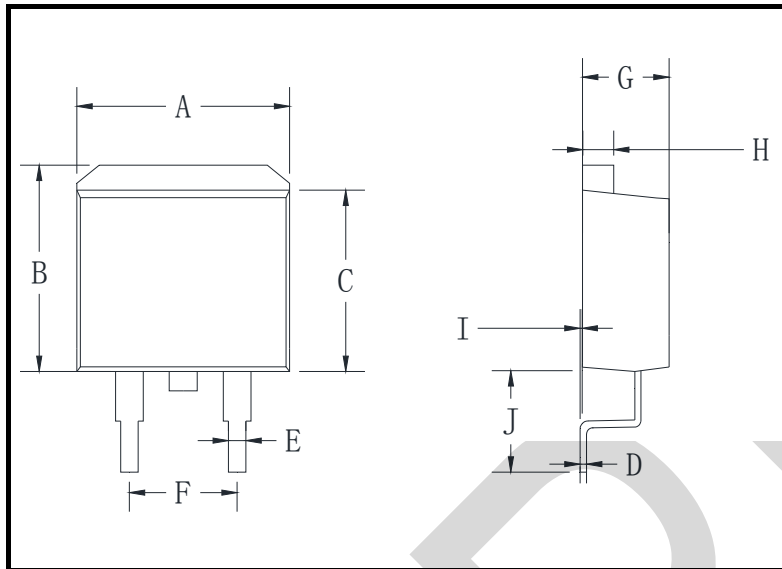
Typical Characteristics

Fig 12: Max. Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS

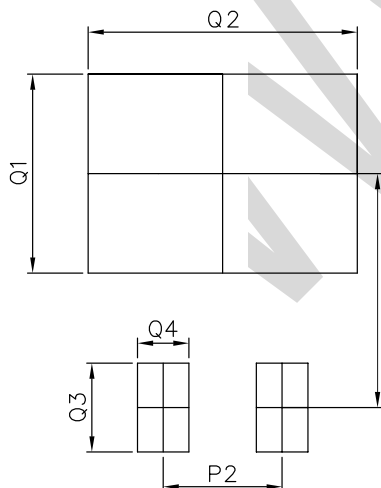
TO-263



TO-263 mechanical data

UNIT		A	B	C	D	E	F	G	H	I	J
mm	max	11.5	10.5	9.0	0.64	0.94	5.6	5.1	1.4	0.6	6.1
	min	9.5	9.7	8.4	0.28	0.68	4.5	4.0	1.1	0	4.9
mil	max	452.7	413.3	354.3	25.2	37.0	220.5	200.8	55.1	23.6	240.1
	min	374.0	381.8	330.7	11.0	26.7	177.2	157.5	43.3	0	192.9

TO-263 Suggested Pad Layout



UNIT		P1	P2	Q1	Q2	Q3	Q4
mm	min	10.0	4.00	8.5	11.5	3.8	2.1
mil	min	393.3	157.5	39.37	334.6	149.6	82.7