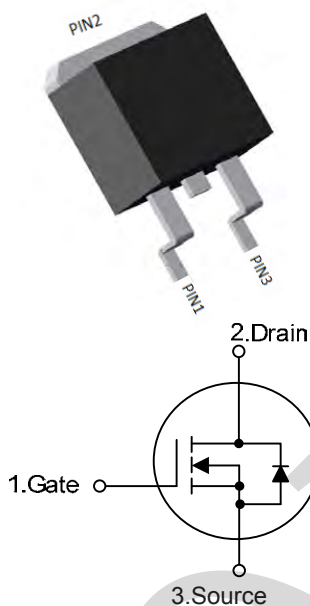


SGT N-channel Power MOSFET

MTR5R3N10CTB

TO-263



V_{DS}	100	V
$R_{DS(on),TYP@ V_{GS}=10V}$	4.7	m Ω
I_D	130	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	$T_C = 25^\circ\text{C}$ --	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	--	4.7	5.3	mΩ
g _{fs}	Transconductance	V _{DS} =5V, I _D =50A	--	55	--	S

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

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

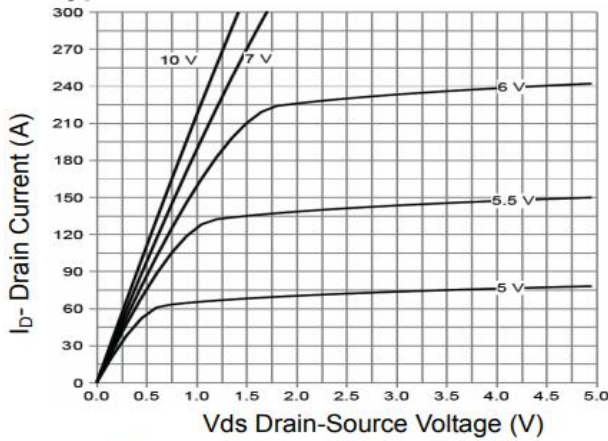


Figure 1 Output Characteristics

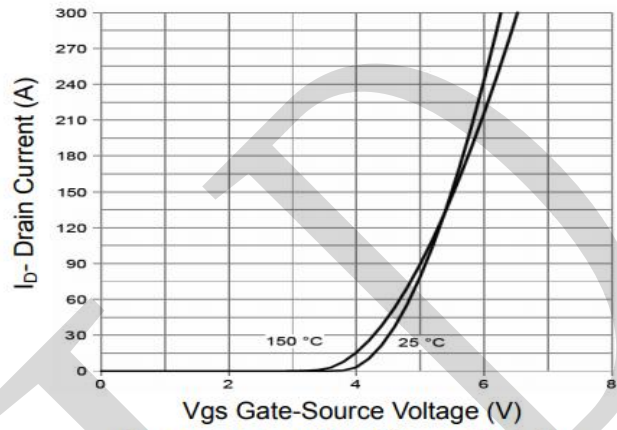


Figure 2 Transfer Characteristics

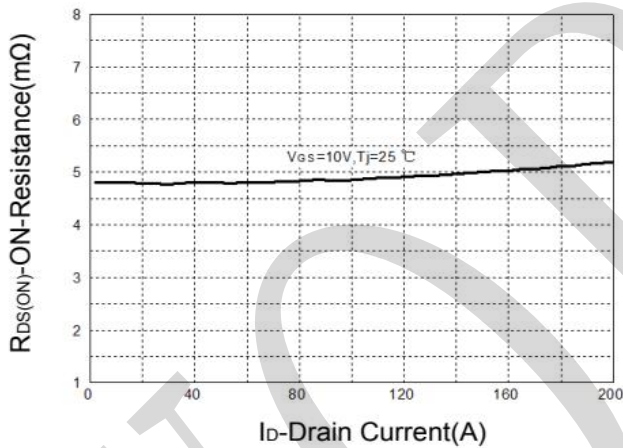


Figure 3 Rdson- Drain Current

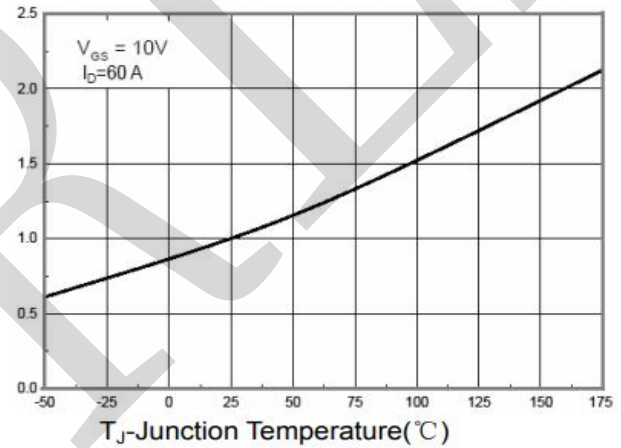


Figure 4 Rdson-Junction Temperature

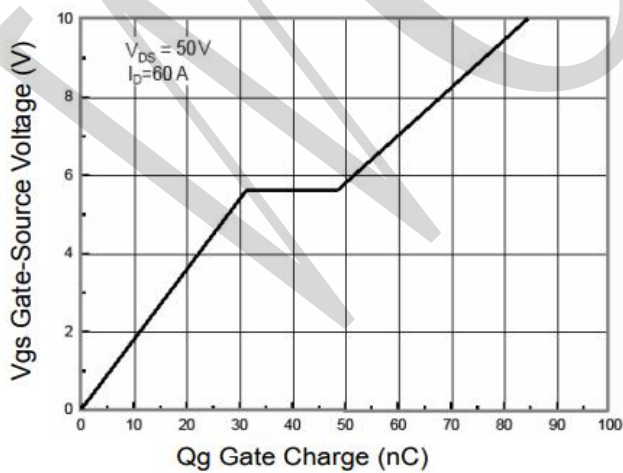


Figure 5 Gate Charge

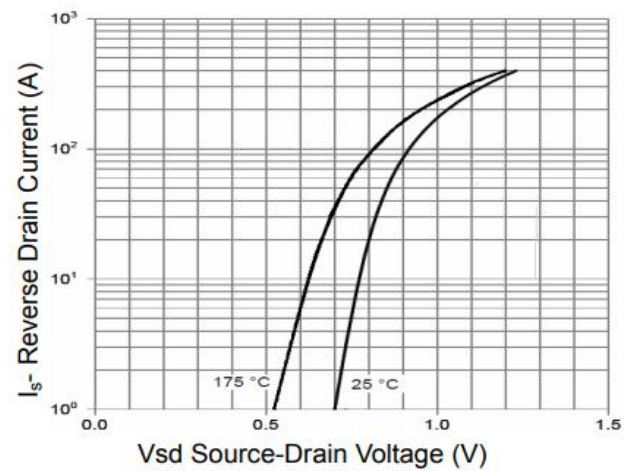


Figure 6 Source- Drain Diode Forward

Typical Characteristics

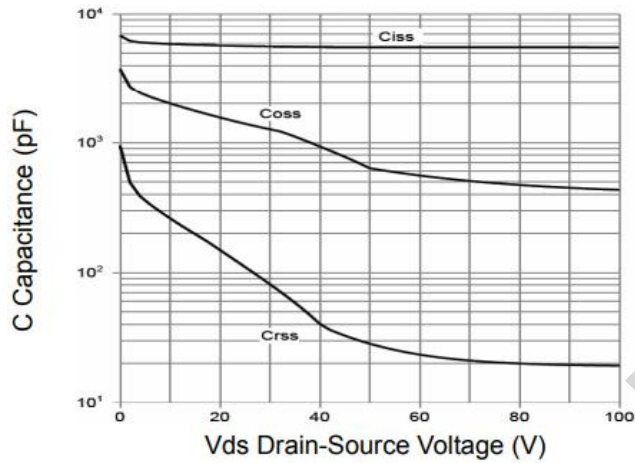


Figure 7 Capacitance vs Vds

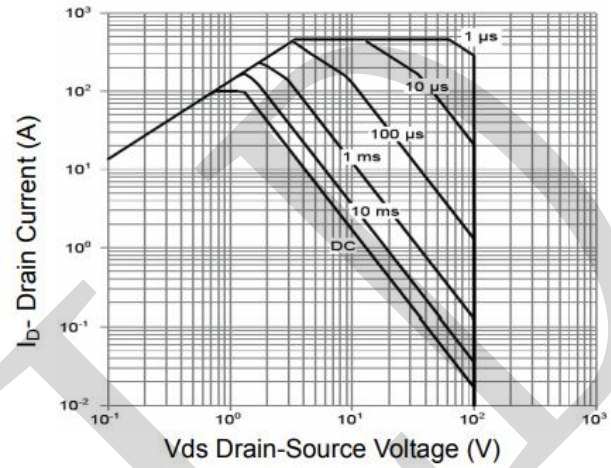


Figure 8 Safe Operation Area

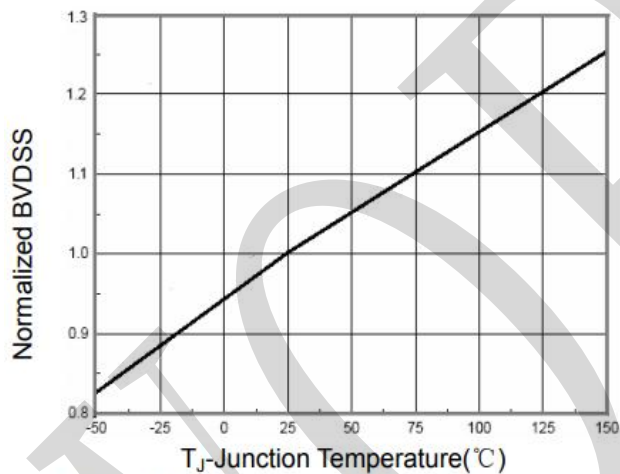


Figure 9 BV_{DSS} vs Junction Temperature

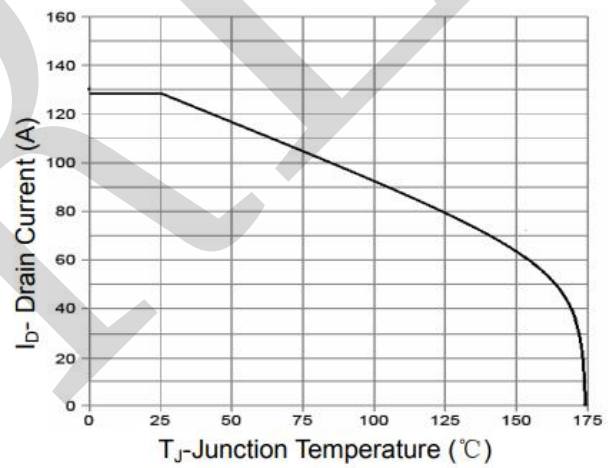


Figure 10 Current De-rating

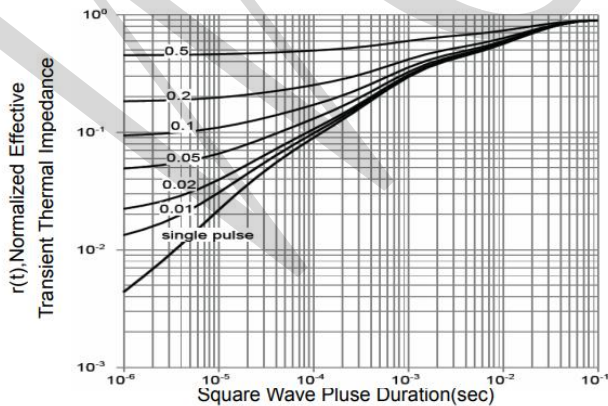
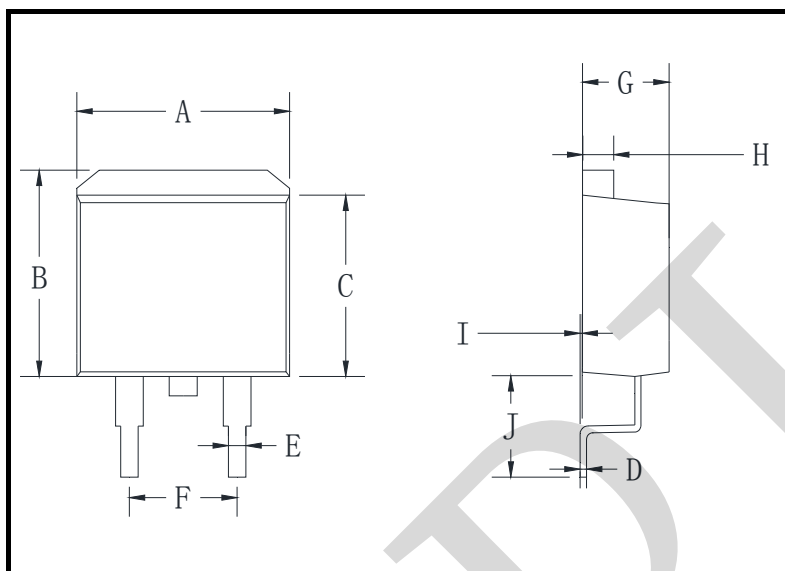


Figure 11 Normalized Maximum Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS

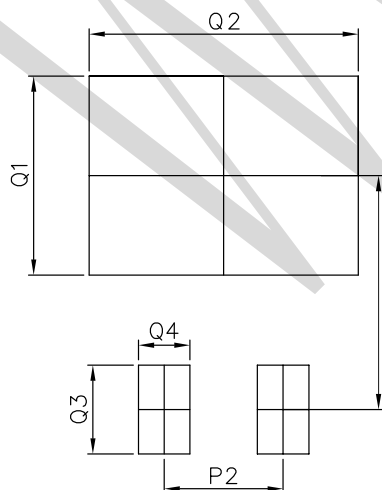
TO-263



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