

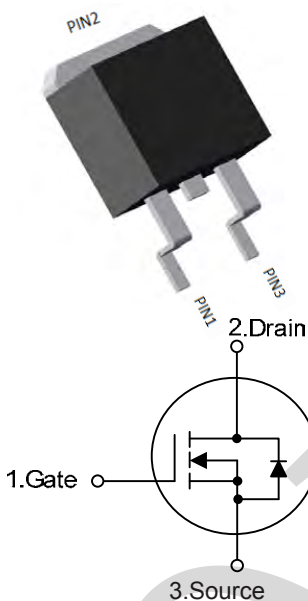
MTR4R2N10CTB

10-JUN-2021

SGT N-channel Power MOSFET

MTR4R2N10CTB

TO-263



V_{DS}	100	V
$R_{DS(on),TYP@ V_{GS}=10V}$	3.3	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_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
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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	--	3.3	4.2	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

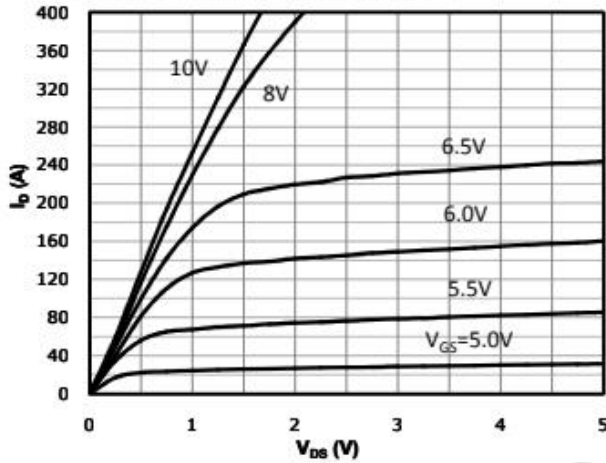


Fig 2: Transfer Characteristics

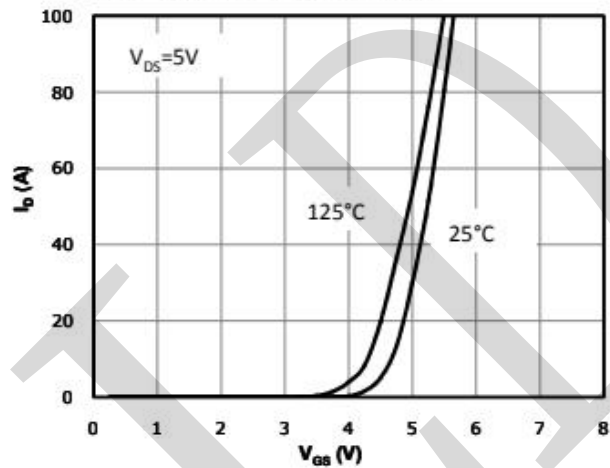


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

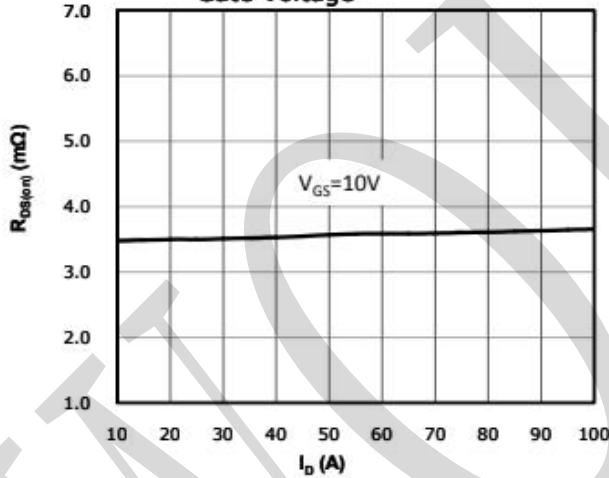


Fig 4: $R_{DS(on)}$ vs Gate Voltage

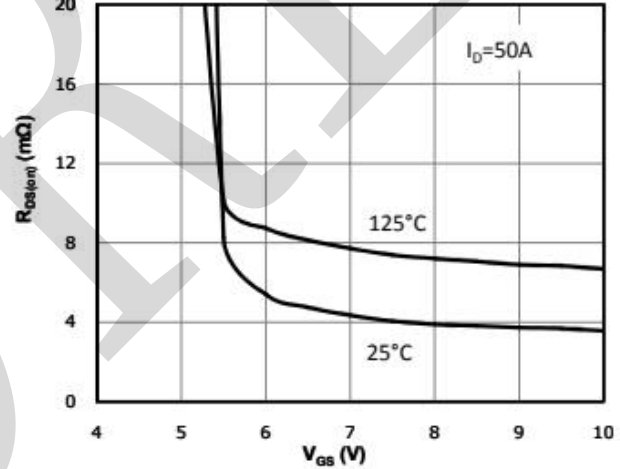


Fig 5: $R_{DS(on)}$ vs. Temperature

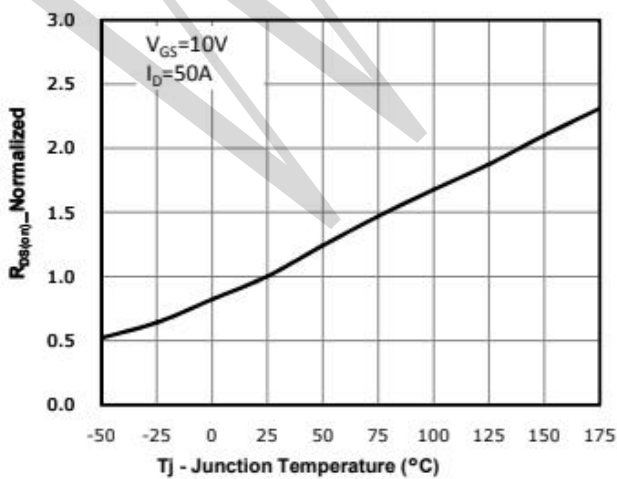
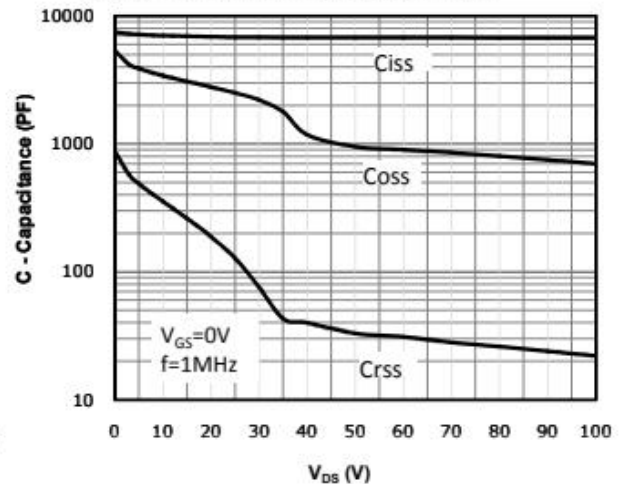


Fig 6: Capacitance Characteristics



Typical Characteristics

Fig 7: Gate Charge Characteristics

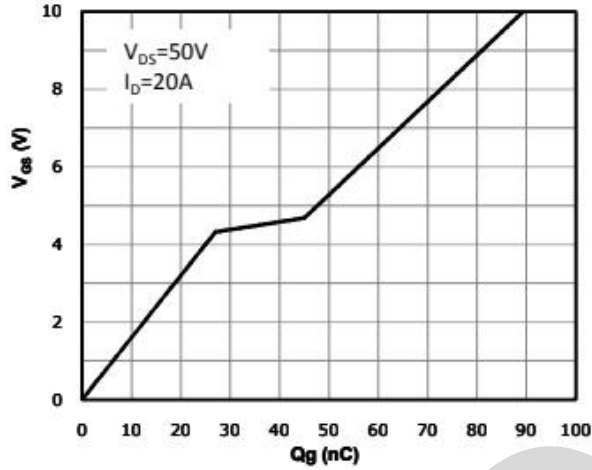


Fig 8: Body-diode Forward Characteristics

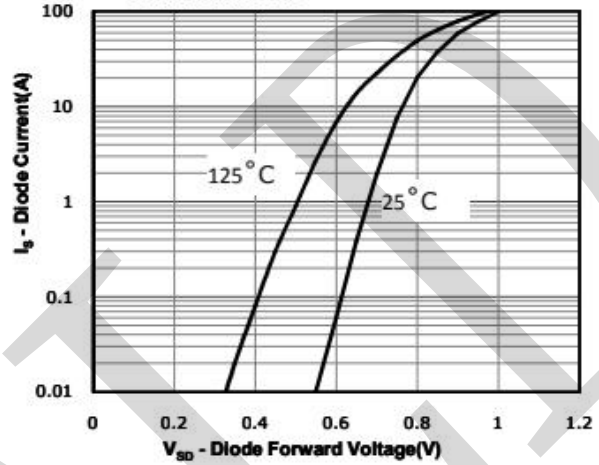


Fig 9: Power Dissipation

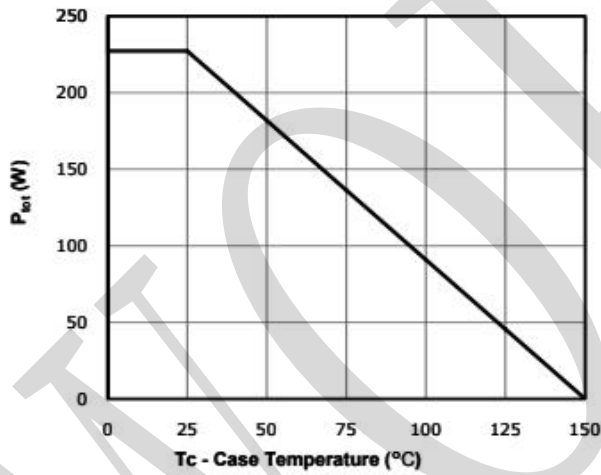


Fig 10: Drain Current Derating

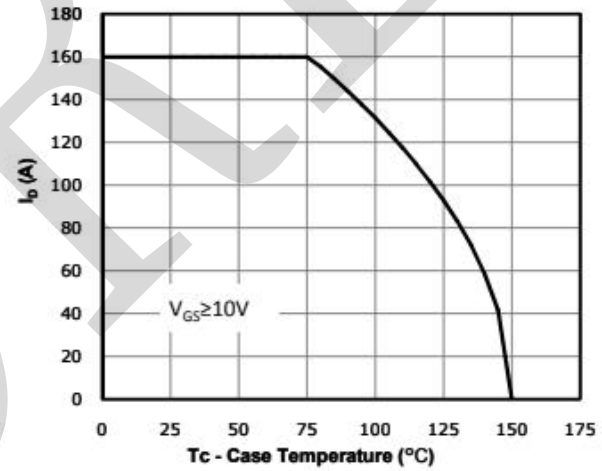
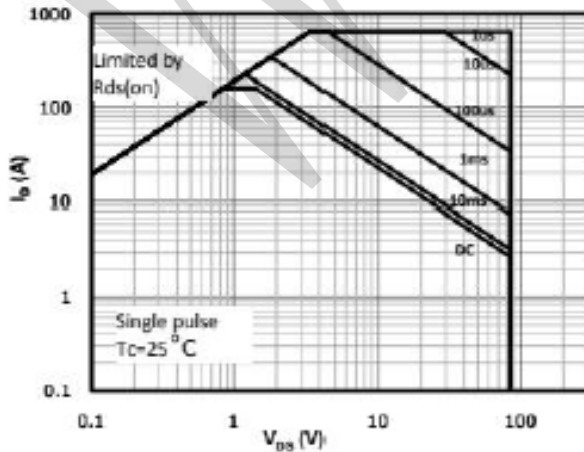
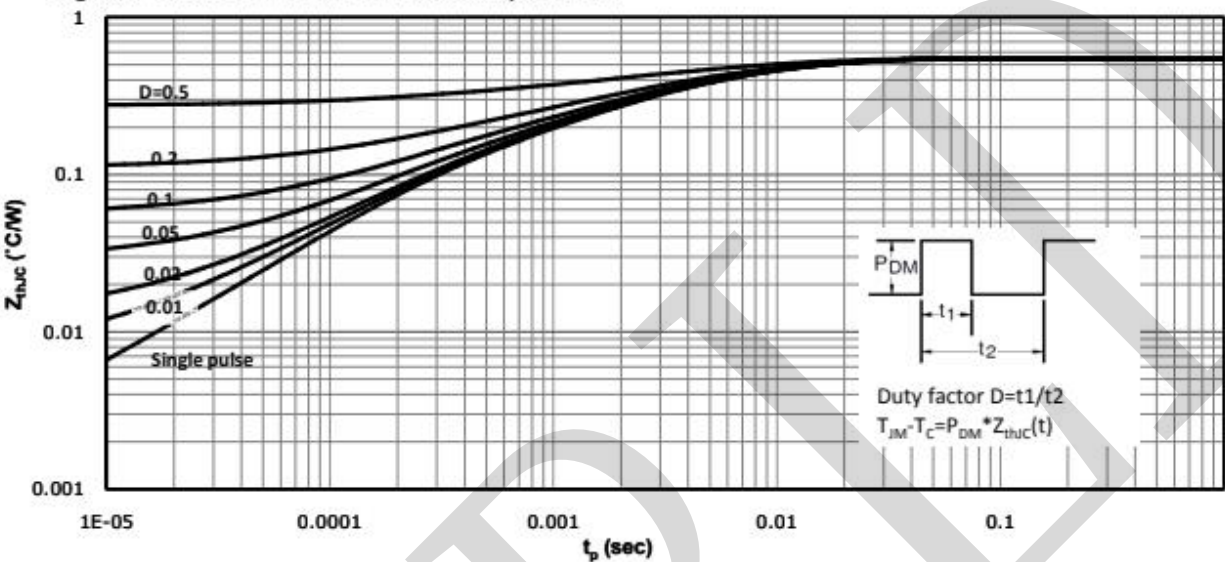


Fig 11: Safe Operating Area



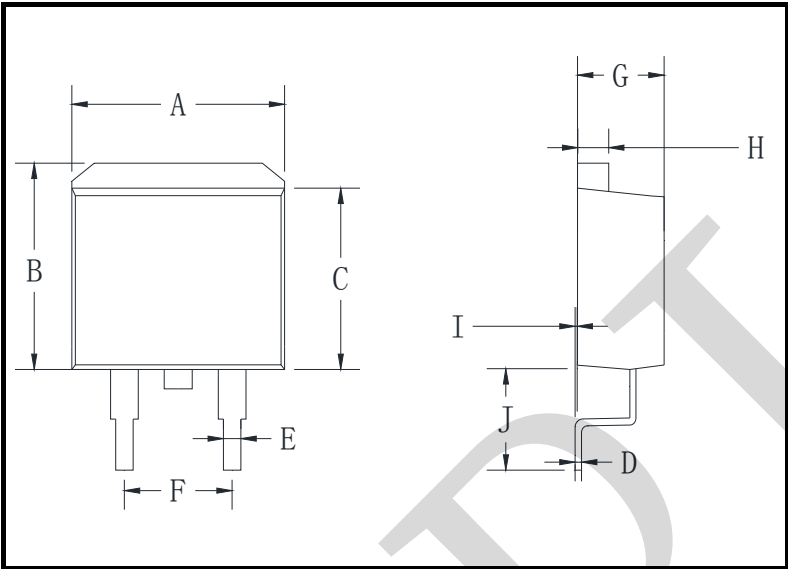
Typical Characteristics

Fig 12: Max. Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS

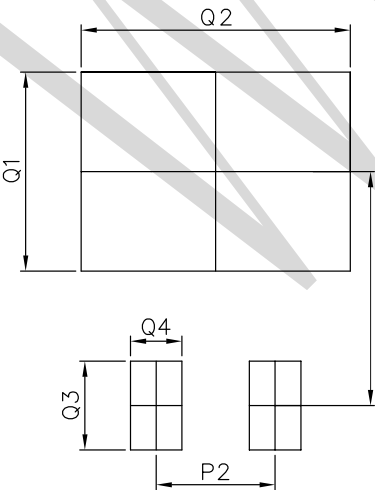
TO-263



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