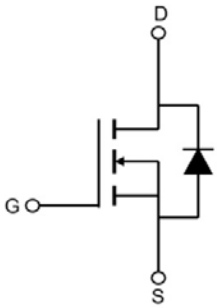
SGT N-channel Power MOSFET

MTR006N10CTB
TO-263



V_{DS}	100	V
$R_{DS(on),TYP}$@ V_{GS}=10 V	5.1	mΩ
I_D	120	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°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 @VGS=10V	T_C=25°C	120	A
		T_C=100°C	75	A
I_{DM}	Pulse drain current tested	T_C=25°C	345	A
EAS	Avalanche energy, single pulsed		130	mJ
I_{AS}	Avalanche Current		51	A
P_D	Maximum power dissipation	T_C=25°C	208	W
		T_C=100°C	83	W
T_{STG},T_J	Storage and Junction Temperature Range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	45	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.6	°C/W

Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T_j=25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	100	108	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=80V,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	V_{GS}=10V, I_D=20A	--	5.1	6.0	mΩ
g_{FS}	Forward Transconductance	V_{DS}=5V, I_D=20A	--	81	--	S
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=50V,V_{GS}=0V , f=1MHz	--	2369	--	pF
C_{oss}	Output Capacitance		--	545	--	pF
C_{rss}	Reverse Transfer Capacitance		--	11.6	--	pF
Rg	Gate Resistance	V_{DS}=0V,V_{GS}=0V , f=1MHz	--	2.0	--	Ω
Q_g (10V)	Total Gate Charge	V_{DS}=50V,I_D=20A , V_{GS}=10V	--	38	--	nC
Q_{gs}	Gate-Source Charge		--	7.9	--	nC
Q_{gd}	Gate-Drain Charge		--	9.2	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V_{DS}=50V, Rg=6.0Ω, V_{GS}=10V, R_L=2.5Ω	--	12.6	--	ns
Tr	Turn-on Rise Time		--	29	--	ns
Td(off)	Turn-Off Delay Time		--	40	--	ns
Tf	Turn-Off Fall Time		--	44	--	ns

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

I_S	Diode Forward Current		--	--	160	A
V_{SD}	Forward on voltage	VGS=0V,I_S=1A	--	0.7	1.0	V
Trr	Reverse Recovery Time	I_F=20A, di/dt=100A/μs	--	60	--	ns
Qrr	Reverse Recovery Charge		--	110	--	nC

NOTE:

1.Computed continuous current assumes the condition of TJ_Max while the actual continuous current depends on the thermal & electro-mechanical application board design.

2.This single-pulse measurement was taken under TJ_Max = 150°C.

3.This single-pulse measurement was taken under the following condition [L = 100μH, VGS = 10V, VDS = 50V] while its value is limited by TJ_Max = 150°C.

4.The power dissipation PD is based on TJ_Max = 150°C.

5.This value is guaranteed by design hence it is not included in the production test.

Typical Characteristics

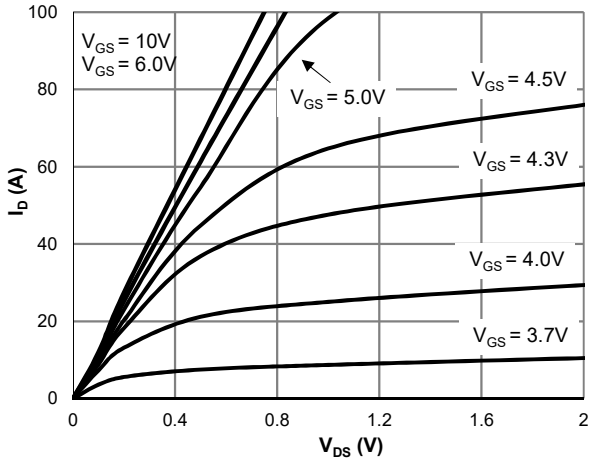


Figure 1: Saturation Characteristics

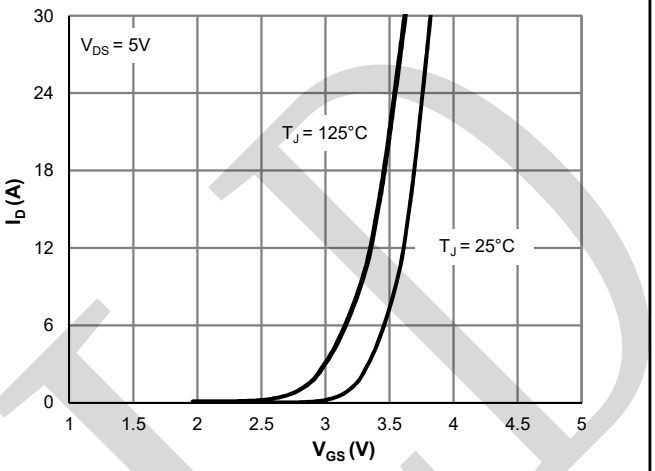


Figure 2: Transfer Characteristics

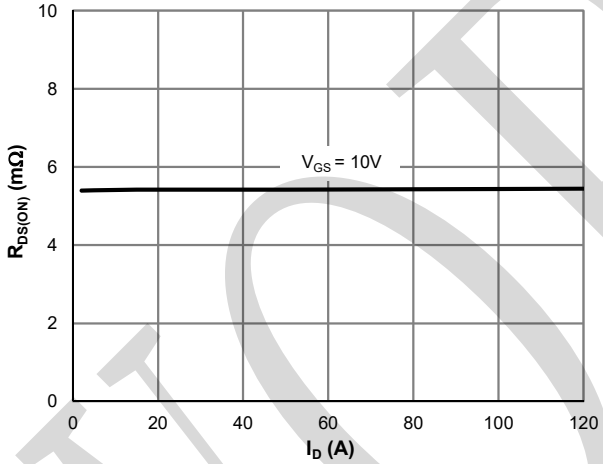


Figure 3: $R_{DS(ON)}$ vs. Drain Current

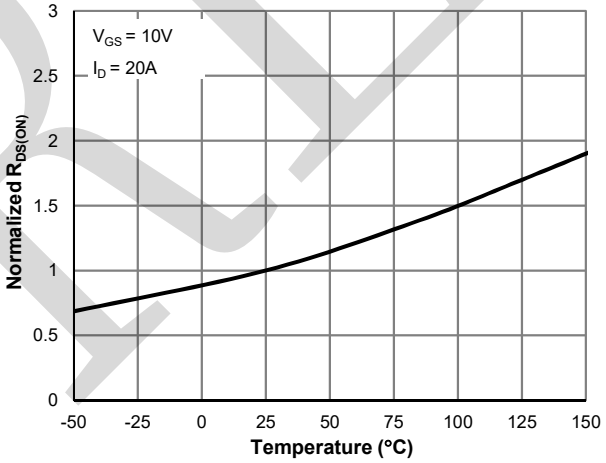


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

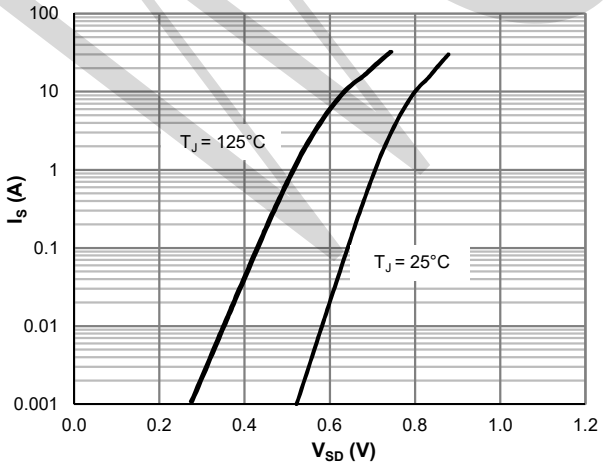


Figure 5: Body-Diode Characteristics

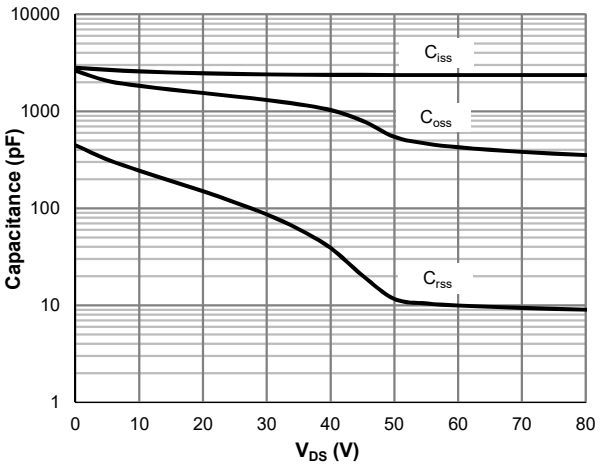


Figure 6: Capacitance Characteristics

Typical Characteristics

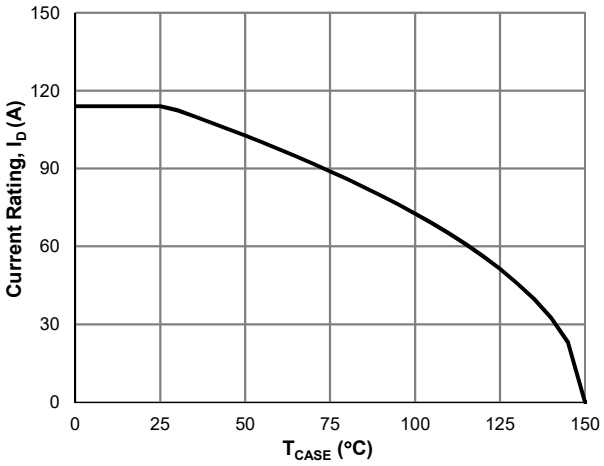


Figure 7: Current De-rating

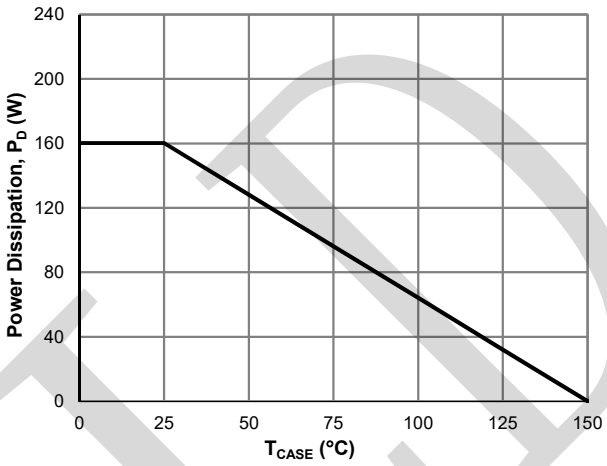


Figure 8: Power De-rating

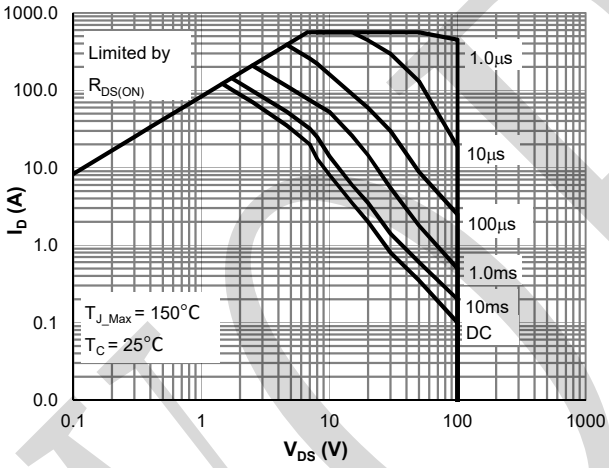


Figure 9: Maximum Safe Operating Area

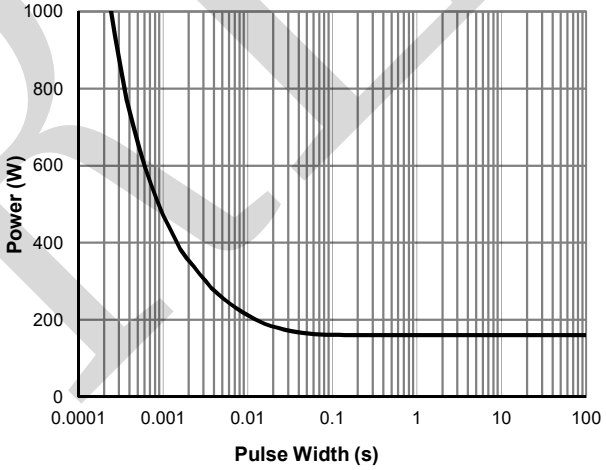


Figure 10: Single Pulse Power Rating, Junction-to-Case

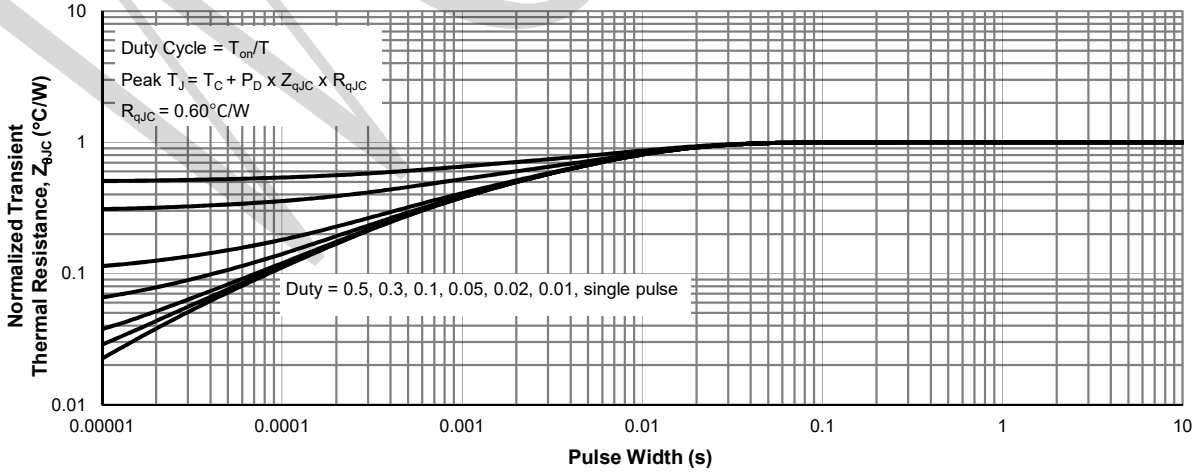


Figure 11: Normalized Maximum Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS

Note:unit mm

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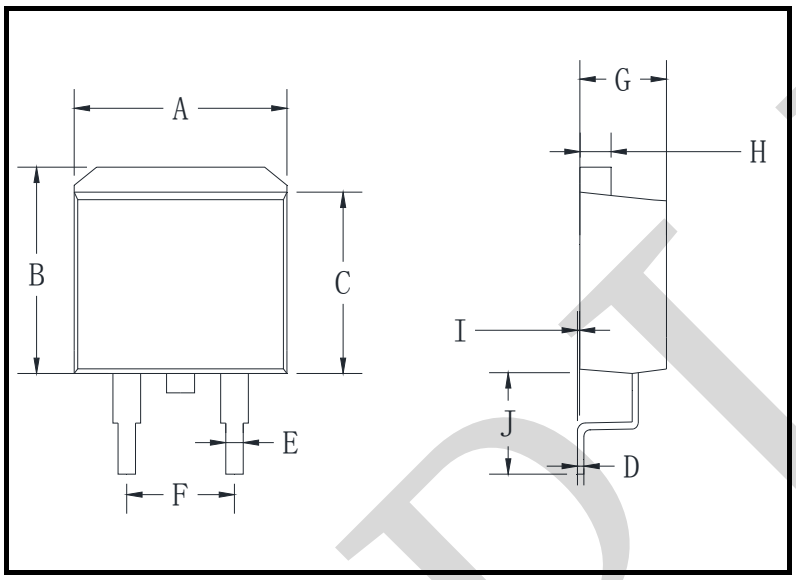
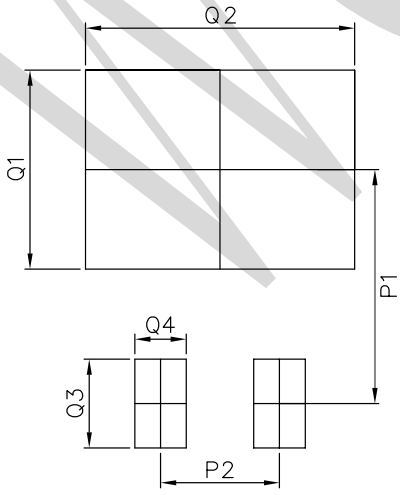


TO-263 mechanical data

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