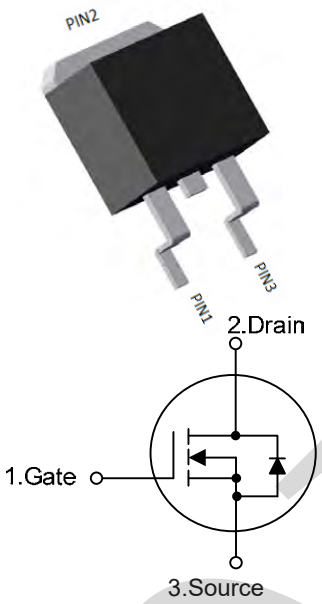
MTR7R5N15CTB

10-JUN-2019

SGT N-channel Power MOSFET

MTR7R5N15CTB

TO-263



V_{DS}	150	V
$R_{DS(on),TYP}$@ V_{GS}=10 V	6.5	mΩ
I_D	140	A

Features

1、Low on – resistance

2、Package TO-263

3、SGT N-channel Power MOSFET

4、Halogen free

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		150	V
V_{GS}	Gate-Source voltage		±20	V
I_D	Continuous drain current @VGS=10V	T_C=25°C	140	A
		T_C=100°C	90	A
I_{DM}	Pulse drain current tested	T_C=25°C	500	A
EAS	Avalanche energy, single pulsed		506	mJ
P_D	Maximum power dissipation	T_C=25°C	210	W
T_{STG},T_J	Storage and Junction Temperature Range		-55 to 150	°C

1) mited by T_j max. Maximum duty cycle D=0.75.
2) lse width t_p limited by T_j,max.
3) V_{DD}=50V, L=0.5mH, R_G=25Ω, Starting T_j=25°C.

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.5	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	60	°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	150	--	--	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	--	6.5	7.5	mΩ
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=75V,V_{GS}=0V , f=1MHz	--	5242	--	pF
C_{oss}	Output Capacitance		--	415	--	pF
C_{rss}	Reverse Transfer Capacitance		--	10	--	pF
Q_g (10V)	Total Gate Charge	V_{DS}=75V,I_D=20A , V_{GS}=10V	--	72	--	nC
Q_{gs}	Gate-Source Charge		--	18	--	nC
Q_{gd}	Gate-Drain Charge		--	10	--	nC

Switching Characteristics

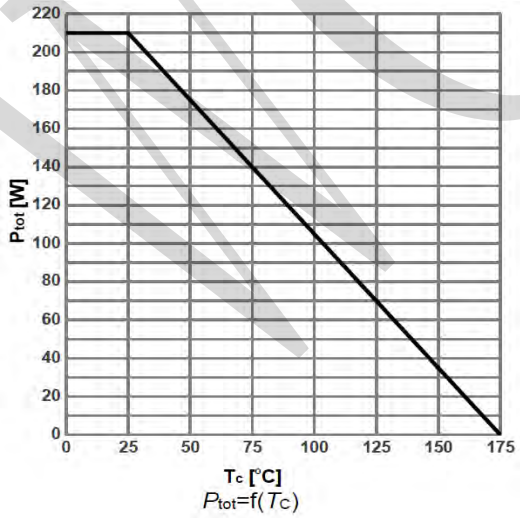
Td(on)	Turn-on Delay Time	V_{DD}=75V, I_D=100A, V_{GS}=10V R_L=1.6Ω,	--	22	--	ns
Tr	Turn-on Rise Time		--	115	--	ns
Td(off)	Turn-Off Delay Time		--	45	--	ns
Tf	Turn-Off Fall Time		--	105	--	ns

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

I_{SD}	Source-drain Current(Body Diode)		--	140	--	A
I_{SM}	Pulsed Source-Drain Current (Body Diode)		--	500	--	A
V_{SD}	Forward on voltage (Note1)	I_F=10A, V_{GS}=0V	--	--	0.76	V
Trr	Reverse Recovery Time (Note1)	I_F=100A, di/dt=100A/μs	--	45	--	ns
Qrr	Reverse Recovery Charge (Note1)		--	12	--	nC
Ton	Forward Turn-on Time	Intrinsic turn-on time is negligible(turn-on is dominated by L_S+L_D)				

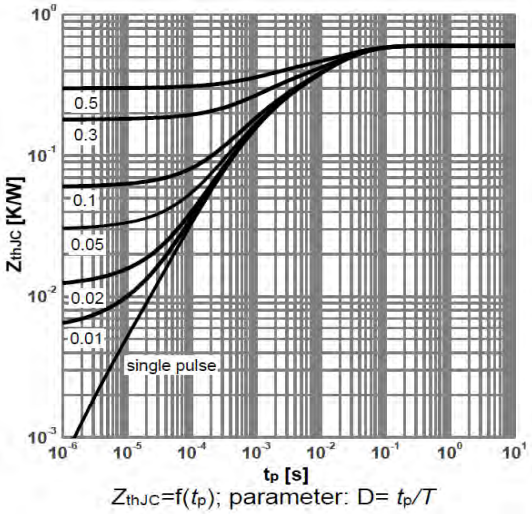
Typical Characteristics

Diagram 1: Power dissipation



P_{tot}=f(T_C)

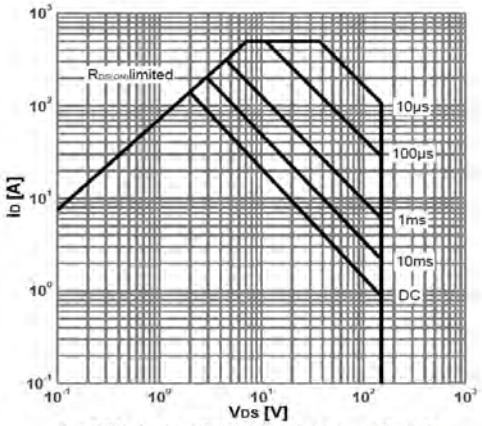
Diagram 2: Max. transient thermal impedance



Z_{thJC}=f(t_p); parameter: D= t_p/T

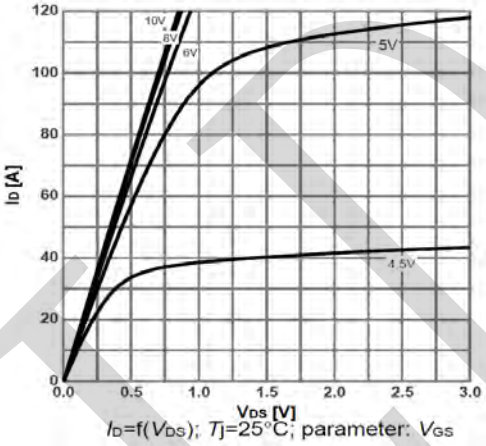
Typical Characteristics

Diagram 3: Safe operating area



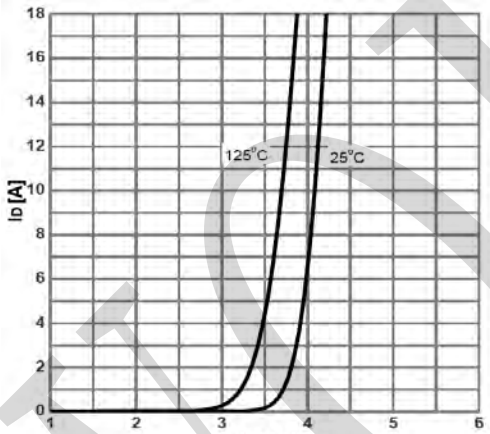
$I_D=f(V_{DS})$; $T_j=25°C$; D=0; parameter: t_p

Diagram 4: Typ. output characteristics



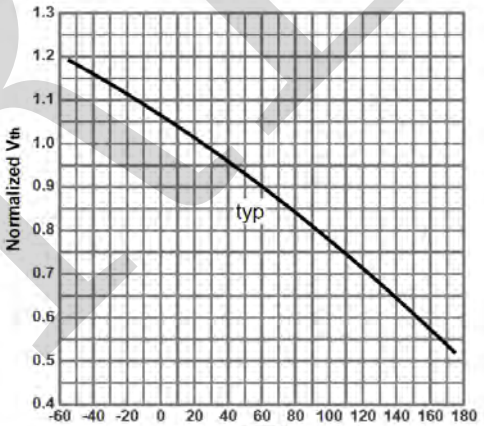
$I_D=f(V_{DS})$; $T_j=25°C$; parameter: V_{GS}

Diagram 5: Typ. transfer characteristics



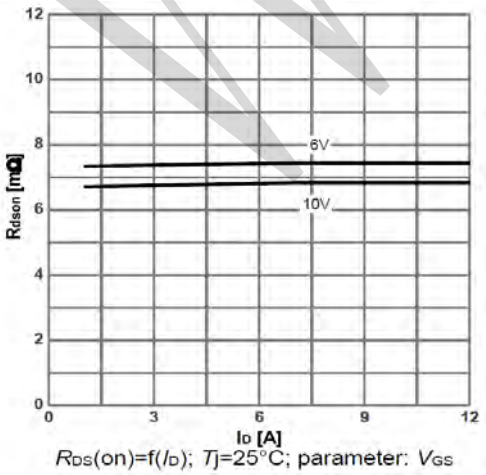
$I_D=f(V_{GS})$; $V_{DS}=5V$; parameter: T_j

Diagram 6: Gate threshold voltage vs. Junction temperature



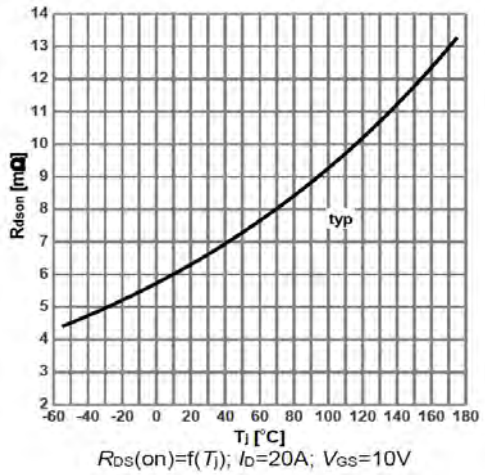
$V_{th}=f(T_j)$; $I_D=250\mu A$

Diagram 7: On-state resistance vs. Drain current



$R_{DS}(on)=f(I_D)$; $T_j=25°C$; parameter: V_{GS}

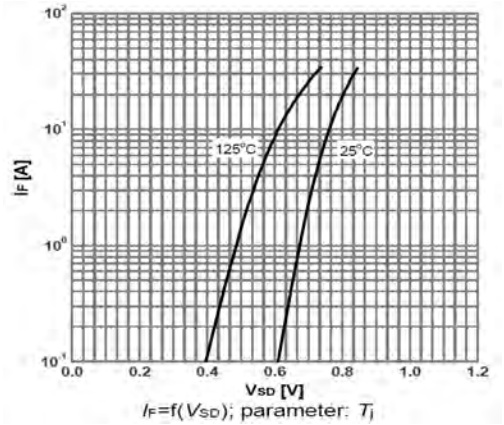
Diagram 8: On-state resistance vs. Junction temperature



$R_{DS}(on)=f(T_j)$; $I_D=20A$; $V_{GS}=10V$

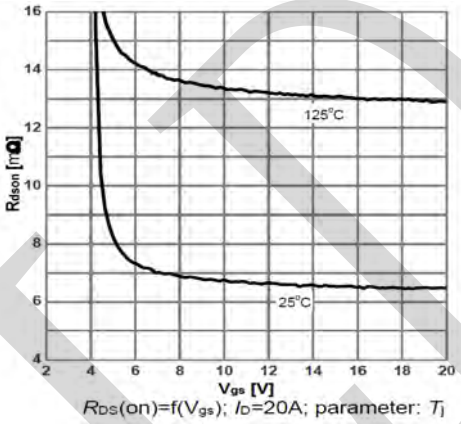
Typical Characteristics

Diagram 9: Forward characteristics of reverse diode



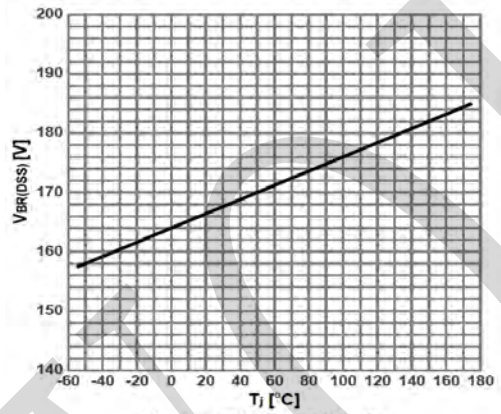
$I_F=f(V_{SD})$; parameter: T_j

Diagram 10: On-state resistance vs. Vgs characteristics



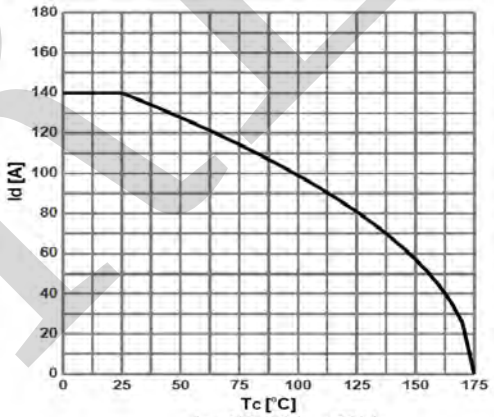
$R_{DS}(on)=f(V_{gs})$; I_D=20A; parameter: T_j

Diagram 11: Breakdown Voltage Variation vs. Temperature



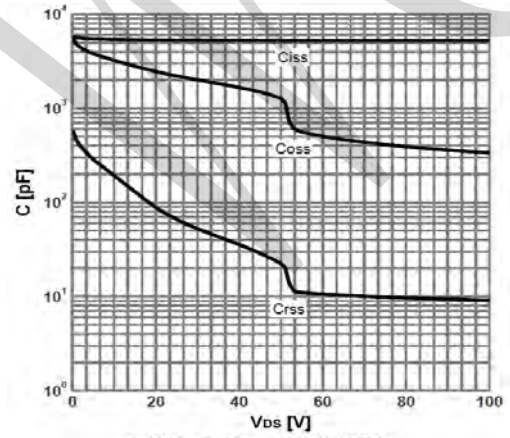
$V_{BR(DSS)}=f(T_j)$; I_D=250μA

Diagram 12: Maximum Drain Current



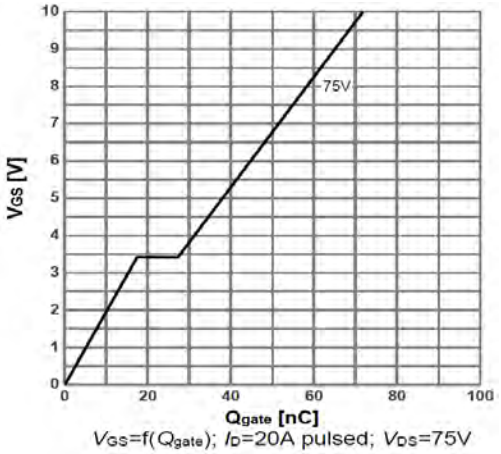
I_D= f(T_c); V_{GS}=10V

Diagram 13: Typ. capacitances



C=f(V_{DS}); V_{GS}=0V; f=1MHz

Diagram 14: Typ. gate charge



V_{GS}=f(Q_{gate}); I_D=20A pulsed; V_{DS}=75V

PACKAGE OUTLINE DIMENSIONS

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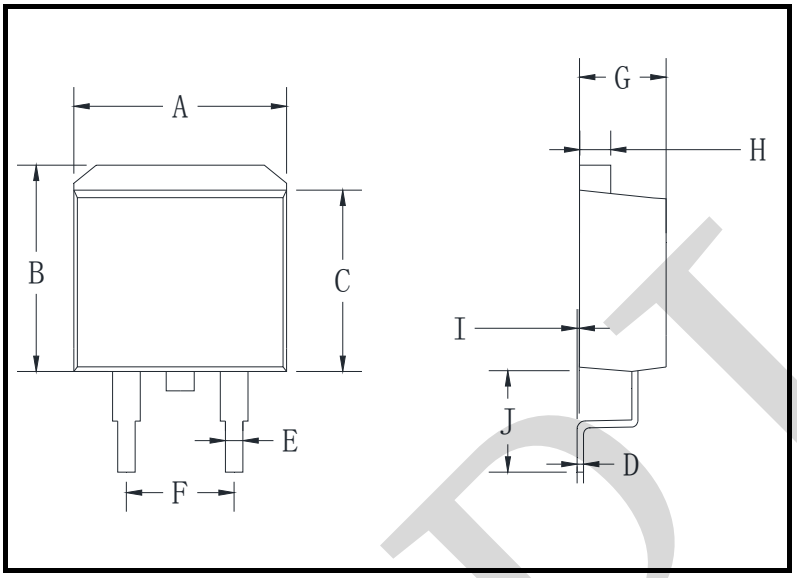
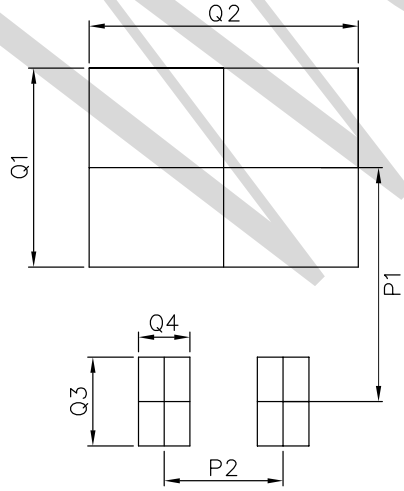


TO-263 mechanical data

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