MTR7R7N10SD

10-JUN-2021

SGT N-channel Power MOSFET

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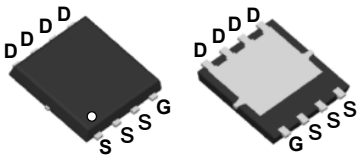
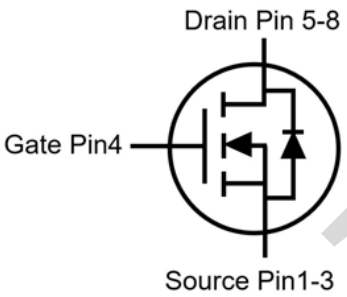
PDFN5x6





V_{DS}	100	V
$R_{DS(on),TYP}$@ V_{GS}=10 V	6.7	mΩ
I_D	80	A

Features

1、Low on – resistance
2、High power package (PDFN5X6)
3、SGT N-channel Power MOSFET
4、Halogen free

Applications

1、Load Switch for Portable Devices
2、Battery Management System

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	80	A
		T_C =100°C	63	A
I_{DM}	Pulse drain current tested ①	T_C =25°C	320	A
E_{AS}	Avalanche energy, single pulsed ②		156	mJ
P_D	Maximum power dissipation	T_C =25°C	85	W
T_{STG},T_J	Storage and Junction Temperature Range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.47	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	50	°C/W

Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @Tj=25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	100	109	--	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	2.3	3.0	3.8	V
$R_{DS(on)}$	Drain-Source On-State Resistance ④	V_{GS}=10V, I_D=40A	--	6.7	7.7	mΩ

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

C_{iss}	Input Capacitance	V_{DS}=50V,V_{GS}=0V , f=1MHz	--	3670	--	pF
C_{oss}	Output Capacitance		--	720	--	pF
C_{rss}	Reverse Transfer Capacitance		--	8.8	--	pF
R_g	Gate Resistance	V_{DS}=0V,f =1MHz	--	1.8	--	Ω
Q_g	Total Gate Charge	V_{DS}=50V, I_D=40A , V_{GS}=10V	--	54	--	nC
Q_{gs}	Gate-Source Charge		--	10.5	--	nC
Q_{gd}	Gate-Drain Charge		--	11	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	Tj=25°C, V_{DD}=50V, I_D=40A, V_{GS}=10V, R_G=3Ω	--	19	--	ns
Tr	Turn-on Rise Time		--	27	--	ns
Td(off)	Turn-Off Delay Time		--	35	--	ns
Tf	Turn-Off Fall Time		--	21	--	ns

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

I_S	Maximum Continuous Drain Source Forward Current		--	--	80	A
I_{SM}	Maximum Pulsed Drain Source Forward Current		--	--	320	A
V_{SD}	Forward on voltage	I_S=40A,V_{GS}=0V	--	--	1.2	V
Trr	Reverse Recovery Time	I_S=40A di/dt=500A/μs	--	58	--	ns
Qrr	Reverse Recovery Charge		--	103	--	nC

NOTE: ① Repetitive rating; pulse width limited by max junction temperature.

② Limited by T_{Jmax}, s tarting T_J = 2 5°C, L=0.5mH,Rg=25Ω. Part not recommended for use above this value

③ The power dissipation P_{DSM} is based on $R_{\theta JA}$ and the maximum allowed junction temperature of 150°C.

④ Pulse width ≤ 300μs; duty cycle≤ 2%.

Typical Characteristics

Figure 1. Safe Operating Area

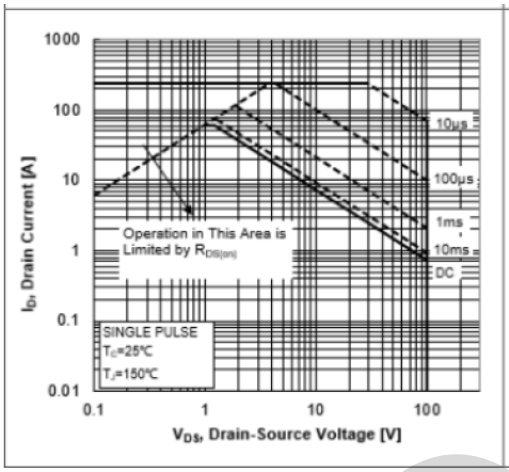


Figure 2. Maximum Power Dissipation vs Case Temperature

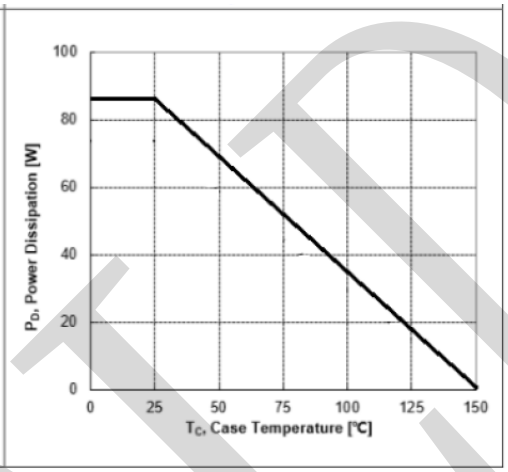


Figure 3. Maximum Continuous Drain Current vs Case Temperature

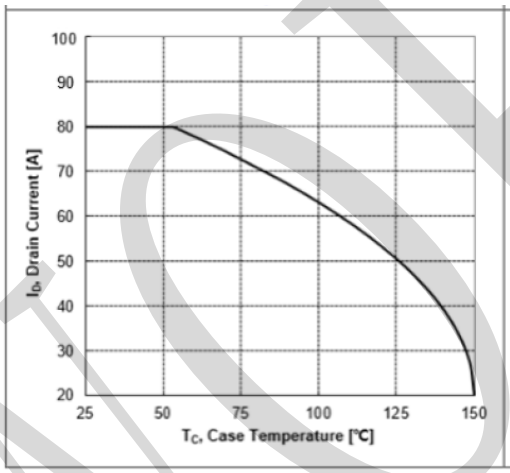


Figure 4. Typical Output Characteristics

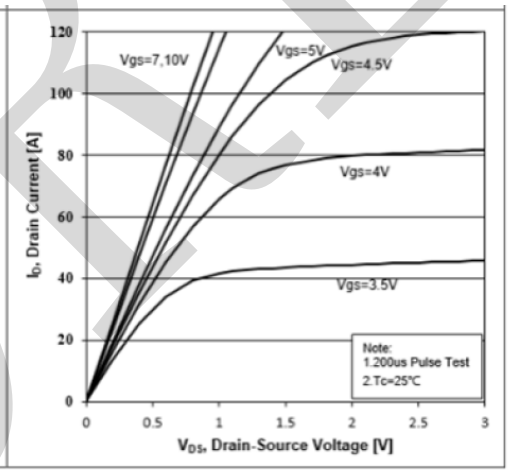
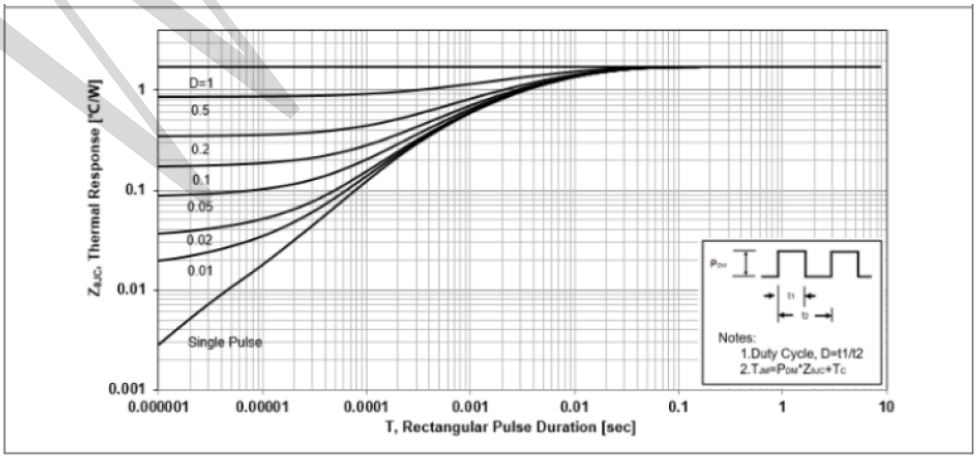


Figure 5. Transient Thermal Impedance



Typical Characteristics

Figure 6. Typical Transfer Characteristics

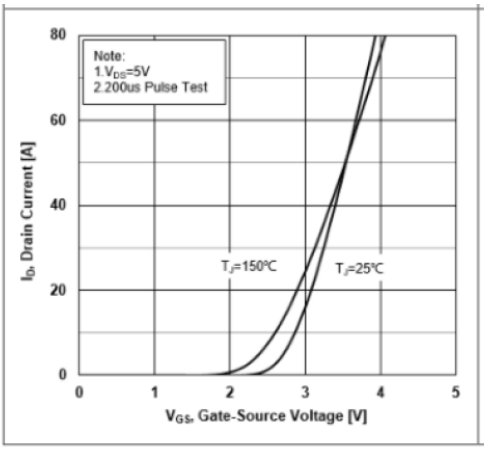


Figure 7. Source-Drain Diode Forward Characteristics

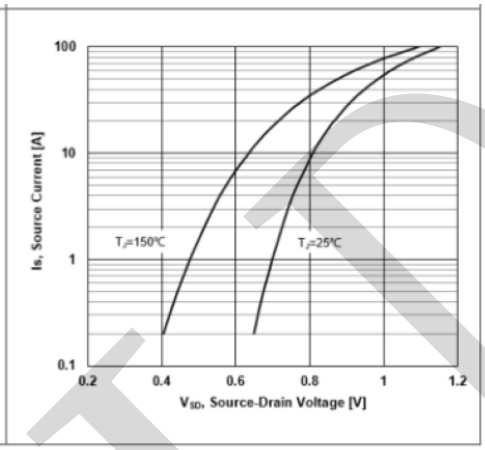


Figure 8. Drain-Source On-Resistance vs Drain Current

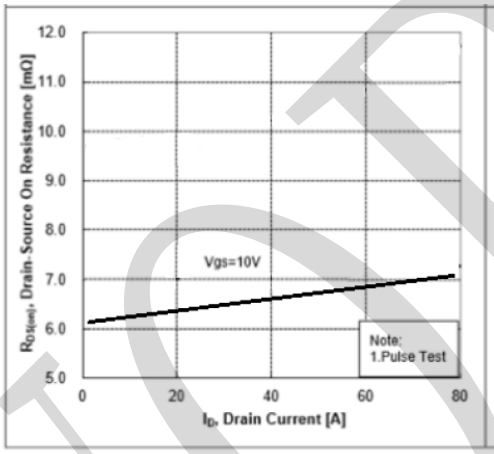


Figure 9. Normalized On-Resistance vs Juncton Temperature

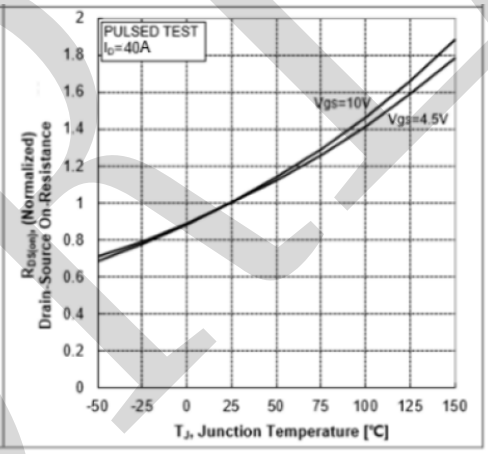


Figure 10. Normalized Threhold Voltage vs Juncton Temperature

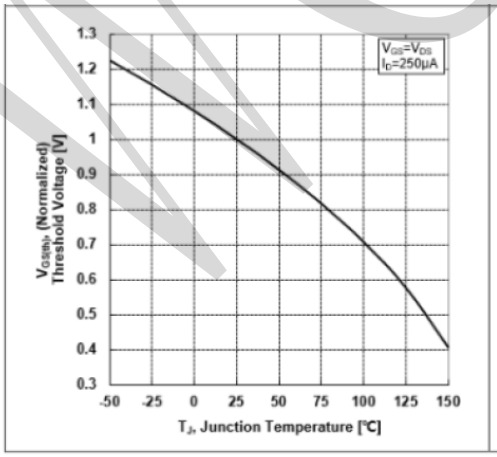
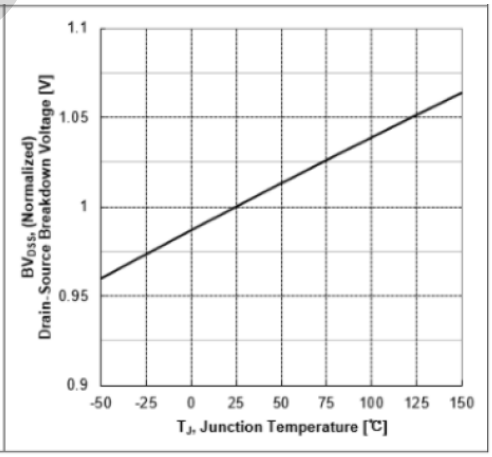


Figure 11. Normalized Breakdown Voltage vs Juncton Temperature



Typical Characteristics

Figure 12. Capacitance Characteristics

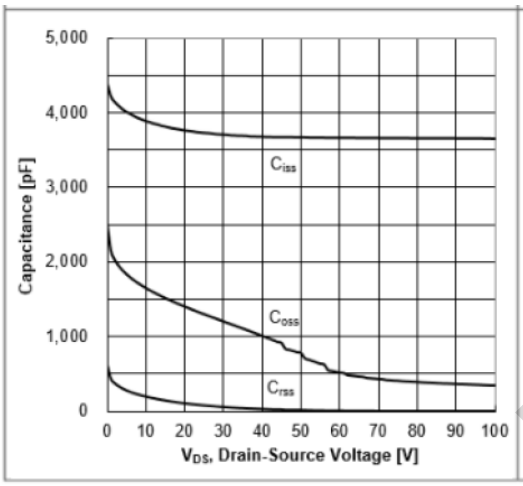
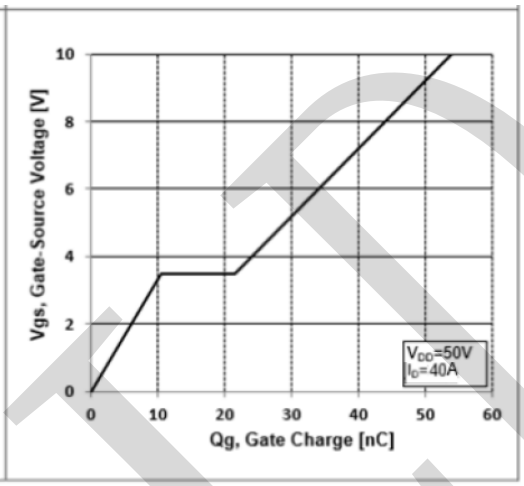
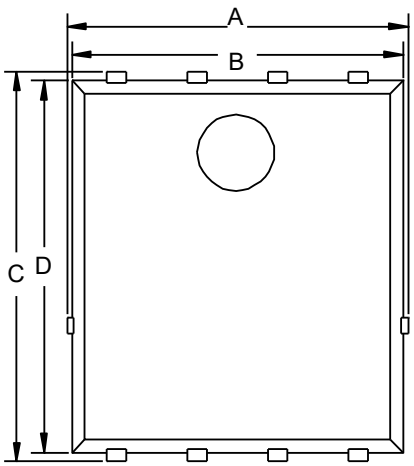


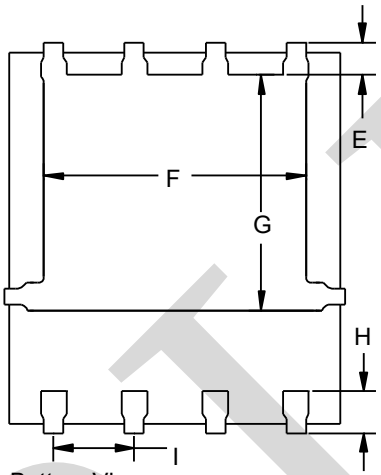
Figure 13. Typical Gate vs Gate-Source Voltage



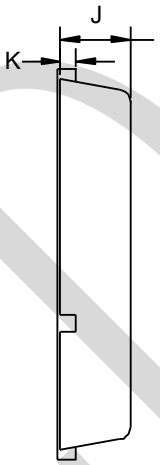
PACKAGE OUTLINE DIMENSIONS



Top View



Bottom View

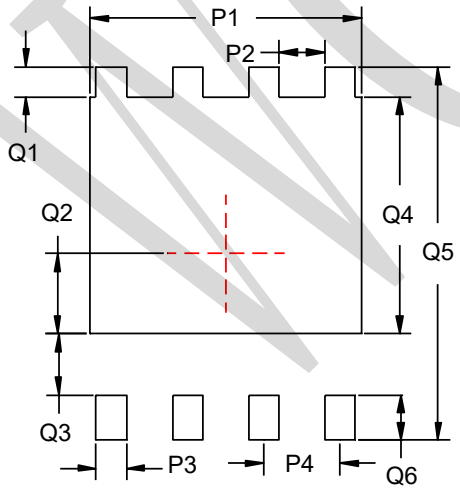


Side View

PDFN5x6 mechanical data

UNIT		A	B	C	D	E	F	G	H	I	J	K
mm	min	4.90	4.8	5.90	5.66	0.60	3.90	3.30	0.53	1.27	0.9	0.254
	max	5.55	5.4	6.35	6.06		4.32	3.92	0.76		1.2	
mil	min	192.9	188.9	232.3	222.8	23.6	153.5	129.9	20.8	50.0	35.4	10.0
	max	218.5	212.6	250.0	238.6		170.1	154.3	29.9		47.2	

PDFN5x6 Suggested Pad Layout



UNIT		P1	P2	P3	P4	Q1
mm	min	4.52	0.76	0.51	1.27	0.50
mil	min	177.9	29.9	20.07	50.0	20.0

UNIT		Q2	Q3	Q4	Q5	Q6
mm	min	1.34	1.02	3.97	6.25	0.76
mil	min	52.75	40.15	156.30	246.06	29.92