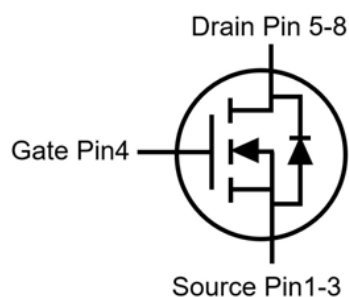
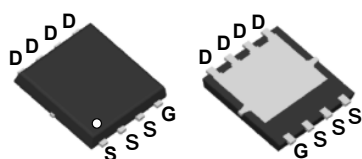


SGT N-channel Power MOSFET

MTR003N06SD PDFN5x6



V_{DS}	60	V
$R_{DS(on),TYP@ V_{GS}=10V}$	3	mΩ
I_D	125	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、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		60	V
VGS	Gate-Source voltage		±20	V
Is	Continuous Source Current	T _C =25°C	125	A
ID	Continuous drain current @VGS=10V	T _C =25°C	125	A
		T _C =100°C	79	A
IDM	Pulse drain current tested ①	T _C =25°C	500	A
EAS	Avalanche energy, single pulsed ②		304.2	mJ
PD	Maximum power dissipation	T _C =25°C	89.2	W
TSTG,TJ	Storage and Junction Temperature Range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Rating	Unit
R _{θJC}	Thermal Resistance, Junction-to-Case	1.4	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient	58	°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	60	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =60V, 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	1.2	1.8	2.5	V
R _{DS(on)}	Drain-Source On-State Resistance ④	V _{GS} =10V, I _D =20A	--	2.3	3	mΩ
		V _{GS} =4.5V, I _D =8A	--	3	4	mΩ

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

C _{iss}	Input Capacitance	V _{DS} =30V, V _{GS} =0V , f=1MHz	--	4550	--	pF
C _{oss}	Output Capacitance		--	1260	--	pF
C _{rss}	Reverse Transfer Capacitance		--	22	--	pF
g _{fs}	Forward Transconductance	V _{DS} = 10V, I _D = 20A	--	78	--	S
R _g	Gate Resistance	f =1MHz	--	2.3	--	Ω
Q _g	Total Gate Charge	V _{DS} =30V, I _D =20A , V _{GS} =10V	--	73.5	--	nC
Q _{gs}	Gate-Source Charge		--	12.5	--	nC
Q _{gd}	Gate-Drain Charge		--	16	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V _{DD} =30V, V _{GS} =10V I _D =20A, R _G =3Ω	--	20	--	ns
Tr	Turn-on Rise Time		--	17	--	ns
Td(off)	Turn-Off Delay Time		--	84	--	ns
Tf	Turn-Off Fall Time		--	25	--	ns

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

VSD	Forward on voltage	I _S =20A, V _{GS} =0V	--	--	1.2	V
Trr	Reverse Recovery Time	I _F =20A	--	25	--	ns
Qrr	Reverse Recovery Charge	di/dt=100A/μs	--	90	--	nC

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

② Limited by T_{Jmax}, starting T_J = 25°C, V_{DD}=25V, V_{GS}=10V, L=0.4mH, I_{AS}=39A. 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 ≤ 300μs; duty cycle ≤ 2%.

Typical Characteristics

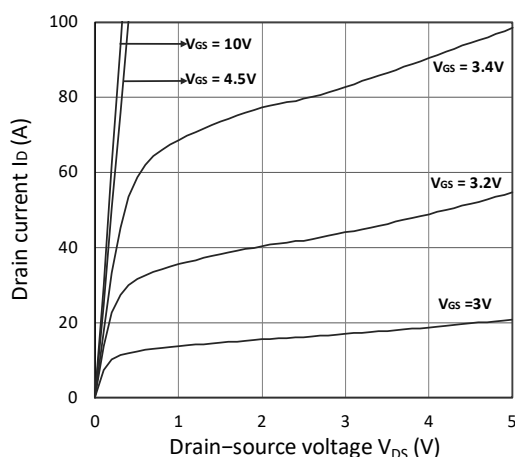


Figure 1. Output Characteristics

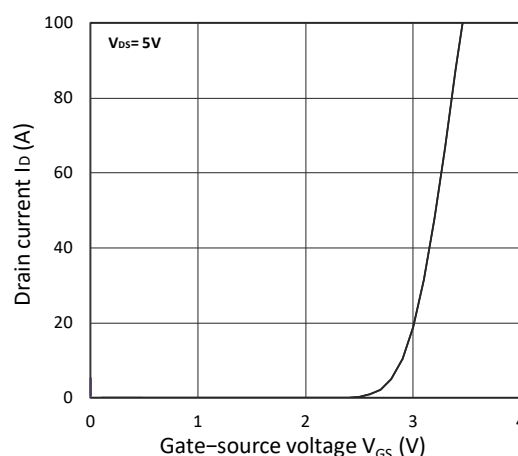


Figure 2. Transfer Characteristics

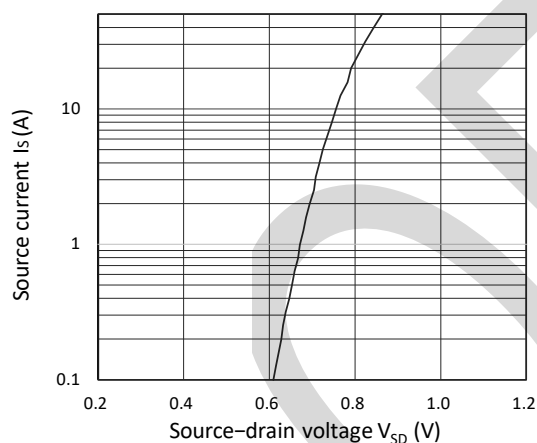


Figure 3. Forward Characteristics of Reverse

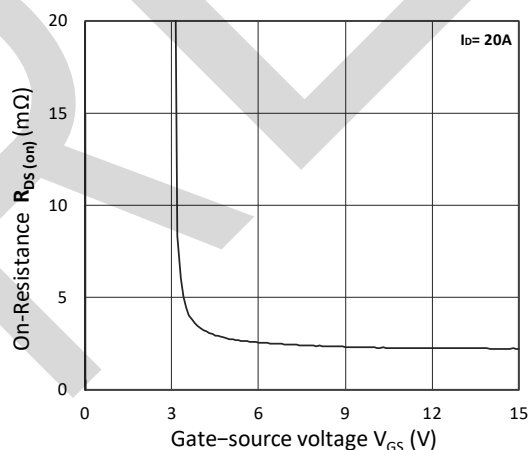


Figure 4. $R_{DS(on)}$ vs. V_{GS}

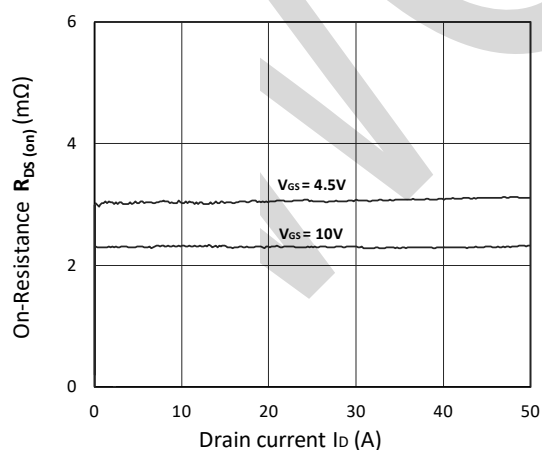


Figure 5. $R_{DS(on)}$ vs. I_D

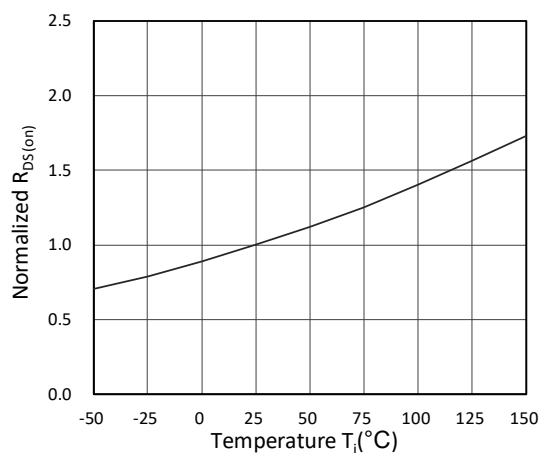


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

Typical Characteristics

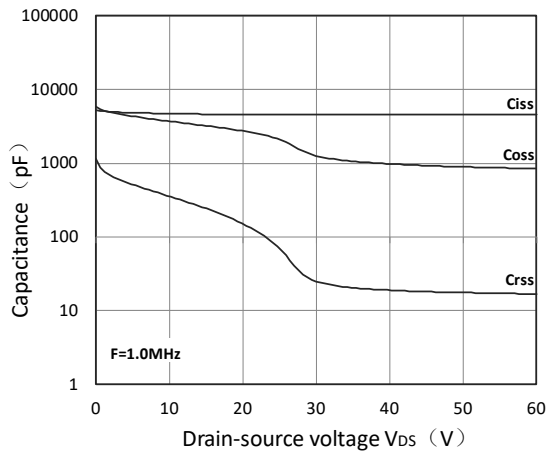


Figure 7. Capacitance Characteristics

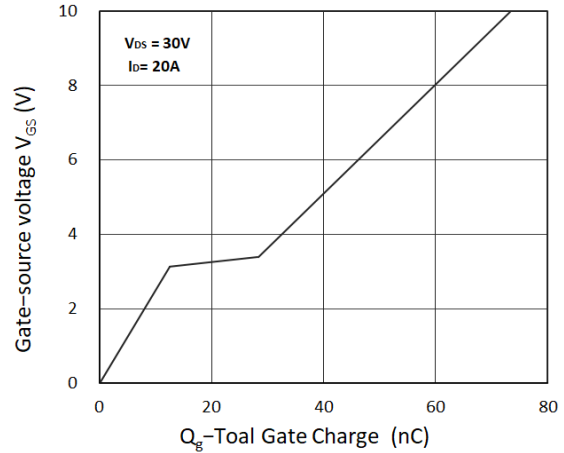


Figure 8. Gate Charge Characteristics

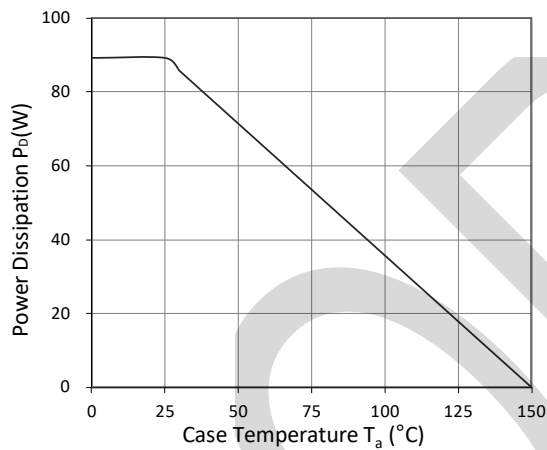


Figure 9. Power Dissipation

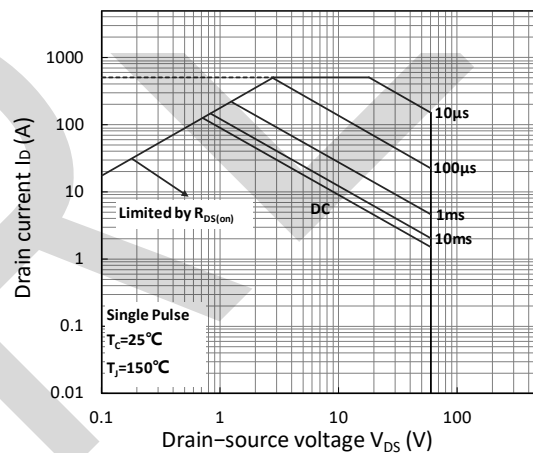


Figure 10. Safe Operating Area

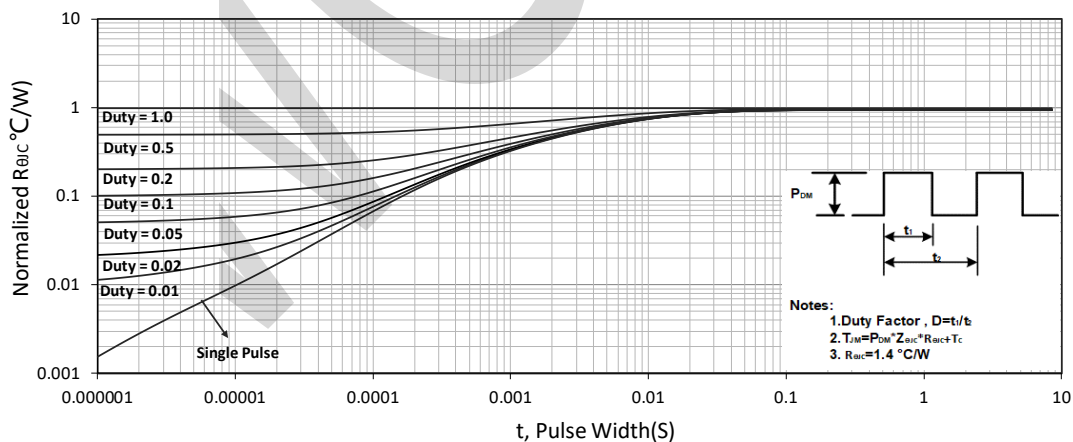
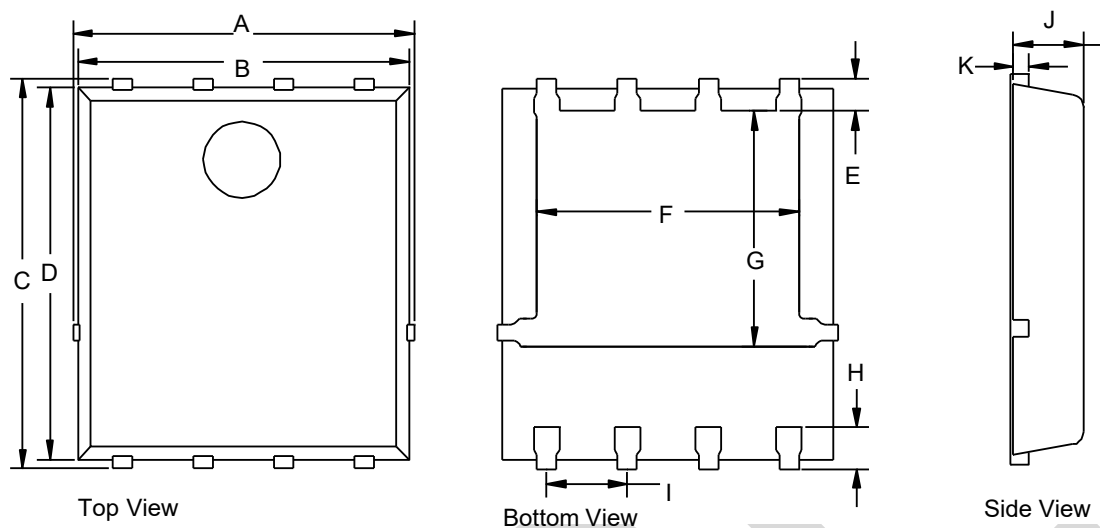


Figure 11. Normalized Maximum Transient Thermal Impedance

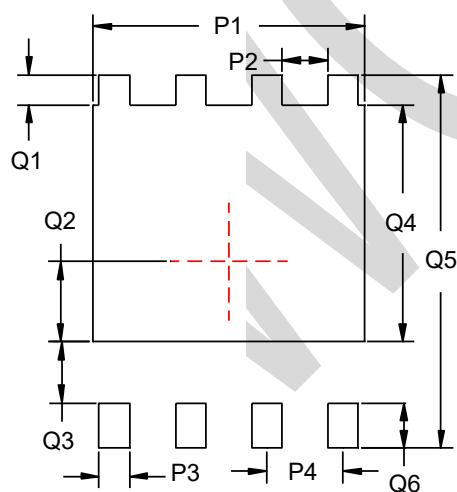
PACKAGE OUTLINE DIMENSIONS



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