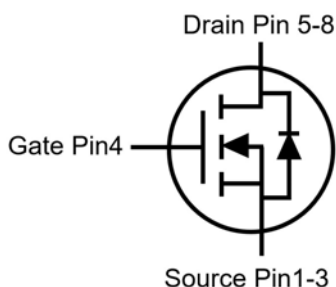
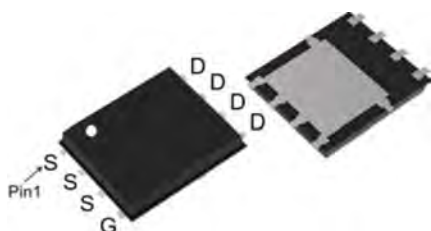


SGT N-channel Power MOSFET

PDFN5x6



V_{DS}	60	V
$R_{DS(on),TYP@ V_{GS}=10V}$	6.5	m Ω
I_D	55	A

Features

- 1、Low on – resistance
- 2、High power package (PDFN5X6)
- 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		60	V
VGS	Gate-Source voltage		±20	V
IS	Diode continuous forward current	T _C =25°C	55	A
ID	Continuous drain current @VGS=10V	T _C =25°C	55	A
		T _C =100°C	34	A
IDM	Pulse drain current tested ①	T _C =25°C	220	A
IDSM	Continuous drain current @VGS=10V	T _A =25°C	18	A
		T _A =70°C	15	A
EAS	Avalanche energy, single pulsed ②		20	mJ
PD	Maximum power dissipation	T _C =25°C	37	W
		T _C =100°C	15	W
PDSM	Maximum power dissipation ③	T _A =25°C	4.2	W
		T _A =70°C	2.7	W
TSTG,TJ	Storage and Junction Temperature Range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
R _{θJC}	Thermal Resistance, Junction-to-Case	3.4	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient	30	°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
IDSS	Zero Gate Voltage Drain Current	V _{DS} =60V, V _{GS} =0V	--	--	1	μA
	Zero Gate Voltage Drain Current (T _J =125°C)	V _{DS} =60V, V _{GS} =0V	--	--	100	μA
IGSS	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	1.3	1.9	2.5	V
RDS(on)	Drain-Source On-State Resistance ④	V _{GS} =10V, I _D =20A	--	6.5	7.5	mΩ
		V _{GS} =4.5V, I _D =20A	--	10	12	mΩ

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

C _{iss}	Input Capacitance	V _{DS} =30V, V _{GS} =0V, f=1MHz	995	1170	1345	pF
C _{oss}	Output Capacitance		500	585	670	pF
C _{rss}	Reverse Transfer Capacitance		--	20	30	pF
R _g	Gate Resistance	f=1MHz	--	1.3	--	Ω
Q _g (10V)	Total Gate Charge	V _{DS} =30V, I _D =30A, V _{GS} =10V	--	22	--	nC
Q _g (4.5V)	Total Gate Charge		--	12	--	nC
Q _{gs}	Gate-Source Charge		--	4.2	--	nC
Q _{gd}	Gate-Drain Charge		--	5.5	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V _{DD} =30V, I _D =30A, R _G =3Ω, V _{GS} =10V	--	7.4	--	ns
Tr	Turn-on Rise Time		--	43	--	ns
Td(off)	Turn-Off Delay Time		--	18	--	ns
Tf	Turn-Off Fall Time		--	6.2	--	ns

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

VSD	Forward on voltage	I _{SD} =20A, V _{GS} =0V	--	0.9	1.3	V
Trr	Reverse Recovery Time	T _J =25°C, I _{SD} =20A , V _{GS} =0V	--	26	--	ns
Qrr	Reverse Recovery Charge	di/dt=100A/μs	--	15	--	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

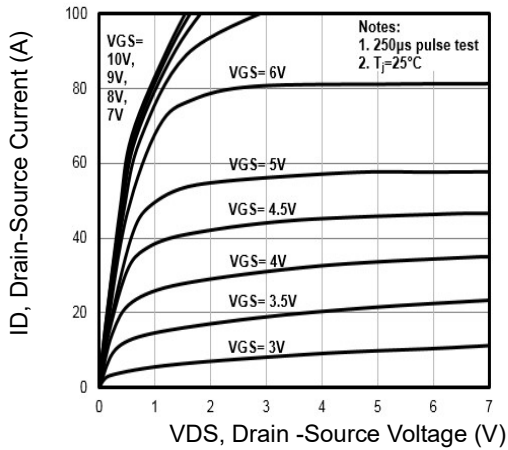


Fig1. Typical Output Characteristics

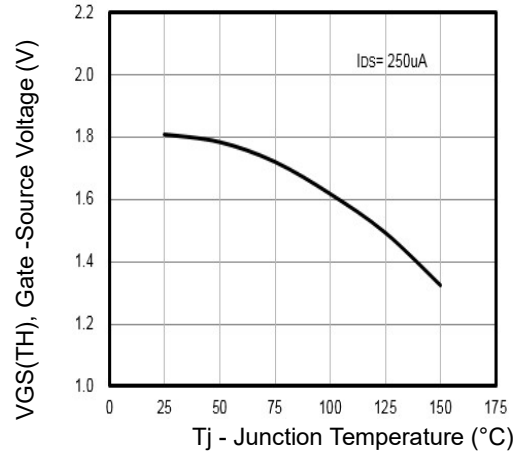


Fig2. $V_{GS(TH)}$ Gate-Source Voltage Vs. T_j

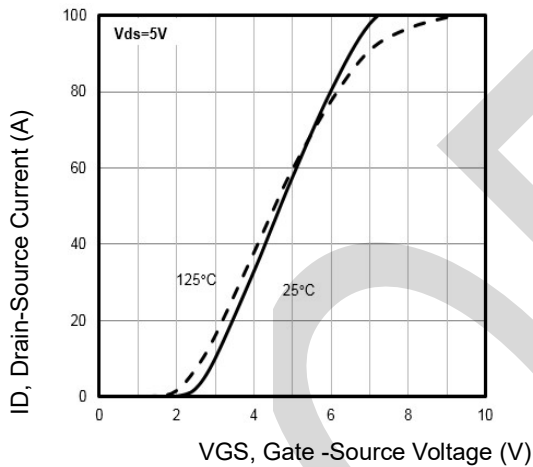


Fig3. Typical Transfer Characteristics

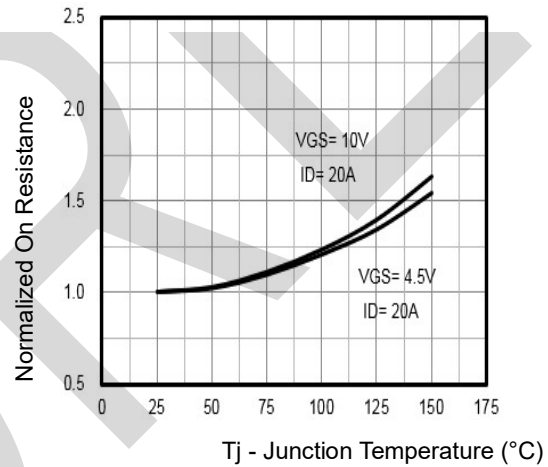


Fig4. Normalized On-Resistance Vs. T_j

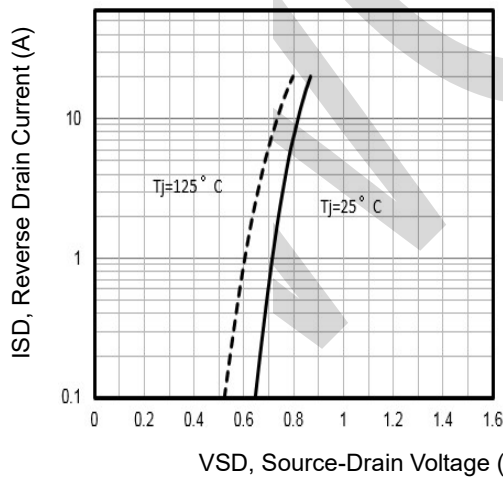


Fig5. Typical Source-Drain Diode Forward Voltage

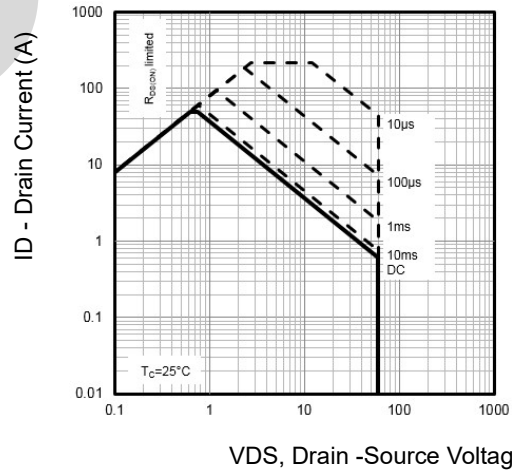


Fig6. Maximum Safe Operating Area

Typical Characteristics

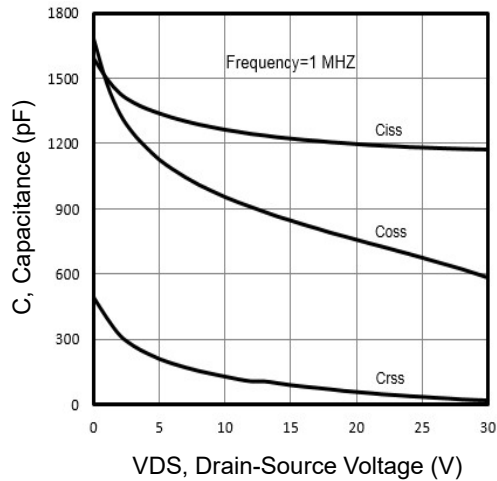


Fig7. Typical Capacitance Vs. Drain-Source Voltage

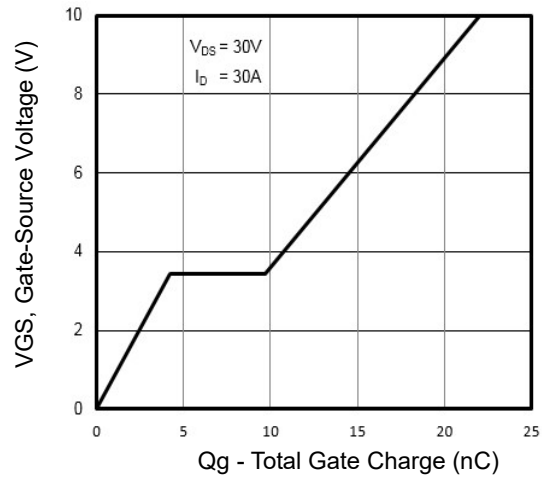


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

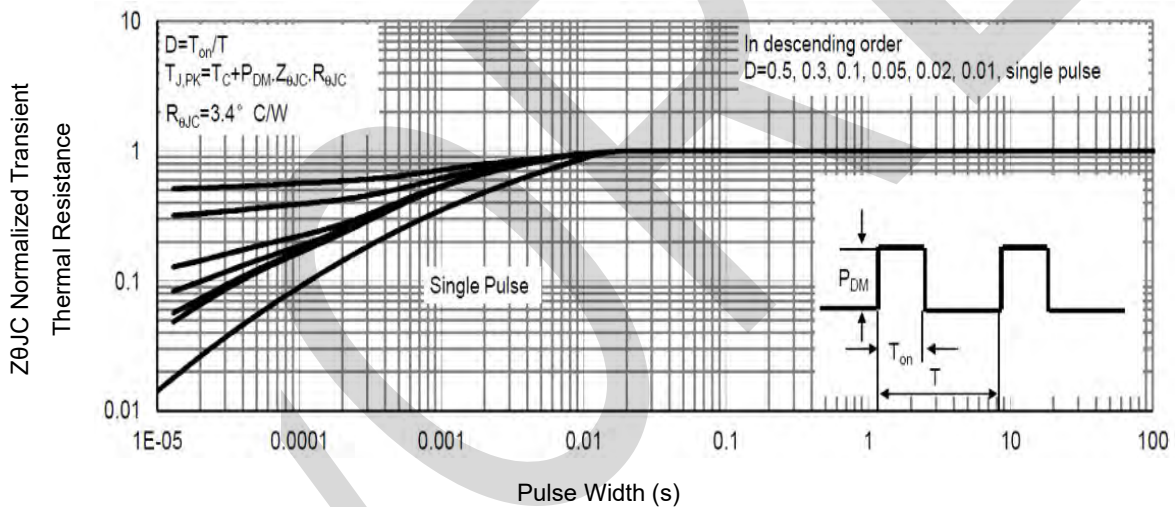


Fig9. Normalized Maximum Transient Thermal Impedance

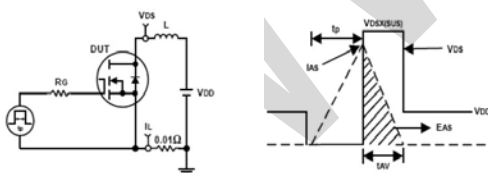


Fig10. Unclamped Inductive Test Circuit and waveforms

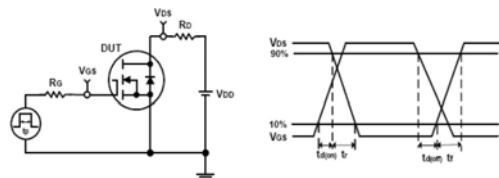
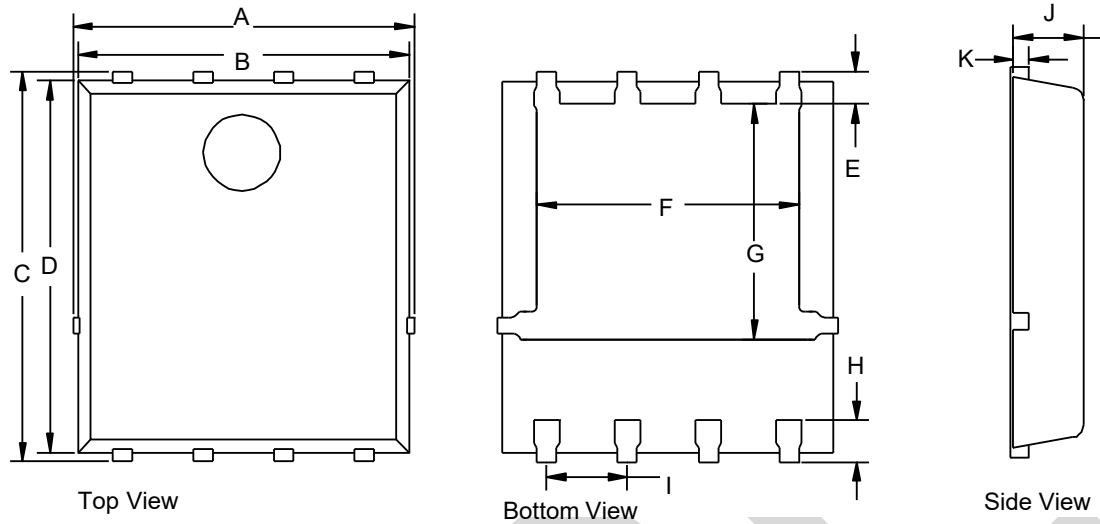


Fig11. Switching Time Test Circuit and waveforms

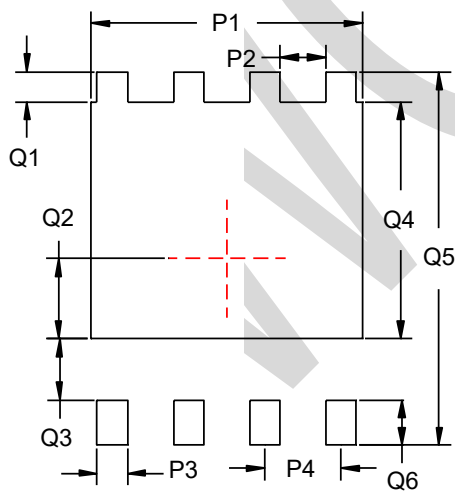
PACKAGE OUTLINE DIMENSIONS



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