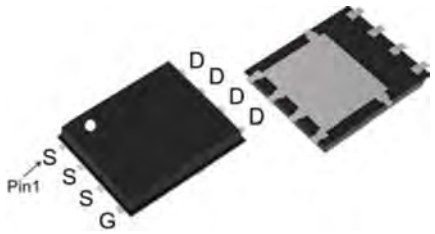
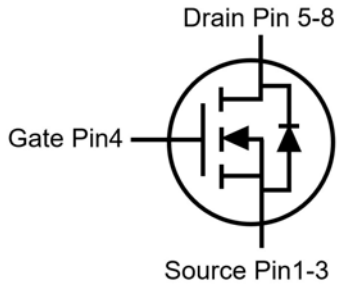
MTR5R0N06SD

10-JUN-2021

SGT N-channel Power MOSFET

PDFN5x6





V_{DS}	60	V
$R_{DS(on),TYP}$@ V_{GS}=10 V	4.4	mΩ
I_D	75	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°C, unless otherwise specified

Symbol	Parameter		Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage		60	V
V_{GS}	Gate-Source voltage		±20	V
I_S	Diode continuous forward current	T_C=25°C	75	A
I_D	Continuous drain current @VGS=10V	T_C=25°C	75	A
		T_C=100°C	47	A
I_{DM}	Pulse drain current tested ①	T_C=25°C	300	A
I_{DSM}	Continuous drain current @VGS=10V	T_A=25°C	23	A
		T_A=70°C	18	A
EAS	Avalanche energy, single pulsed ②		88	mJ
P_D	Maximum power dissipation	T_C=25°C	45	W
		T_C=100°C	18	W
P_{DSM}	Maximum power dissipation ③	T_A=25°C	4.2	W
		T_A=70°C	2.7	W
T_{STG},T_J	Storage and Junction Temperature Range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typical	Max	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	2.8	3.4	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	30	36	°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	60	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V,V_{GS}=0V	--	--	1	μA
	Zero Gate Voltage Drain Current(T_j=125℃)	V_{DS}=60V,V_{GS}=0V	--	--	100	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	--	2.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance ④	V_{GS}=10V, I_D=20A	--	4.4	5.5	mΩ
		V_{GS}=4.5V, I_D=20A	--	6.5	8.3	mΩ
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
Ciss	Input Capacitance	V_{DS}=30V,V_{GS}=0V, f=1MHz	1280	1705	2270	pF
Coss	Output Capacitance		710	945	1260	pF
Crss	Reverse Transfer Capacitance		25	35	50	pF
Rg	Gate Resistance	f=1MHz	0.1	1.2	5	Ω
Qg	Total Gate Charge	V_{DS}=30V,I_D=20A, V_{GS}=10V	--	26.5	35	nC
Qgs	Gate-Source Charge		--	9.3	12.4	nC
Qgd	Gate-Drain Charge		--	6.3	9.5	nC

Switching Characteristics						
Td(on)	Turn-on Delay Time	V_{DD}=30V, I_D=20A, R_G=3Ω, V_{GS}=10V	--	10.6	--	ns
Tr	Turn-on Rise Time		--	58	--	ns
Td(off)	Turn-Off Delay Time		--	17.4	--	ns
Tf	Turn-Off Fall Time		--	10.6	--	ns
Source- Drain Diode Characteristics@ T_j = 25°C (unless otherwise stated)						
VSD	Forward on voltage	I_{SD}=20A,V_{GS}=0V	--	--	1.3	V
Trr	Reverse Recovery Time	T_j=25℃,I_{SD}=20A, V_{GS}=0V di/dt=100A/μs	--	20	40	ns
Qrr	Reverse Recovery Charge		--	6.1	12.2	nC

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

② Limited by T_{Jmax}, starting T_J = 25°C, L = 0.1mH. 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 ≤ 380μs; duty cycle≤ 2%.

Typical Characteristics

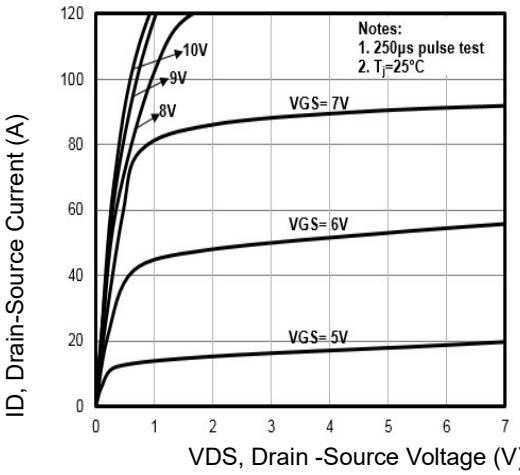


Fig1. Typical Output Characteristics

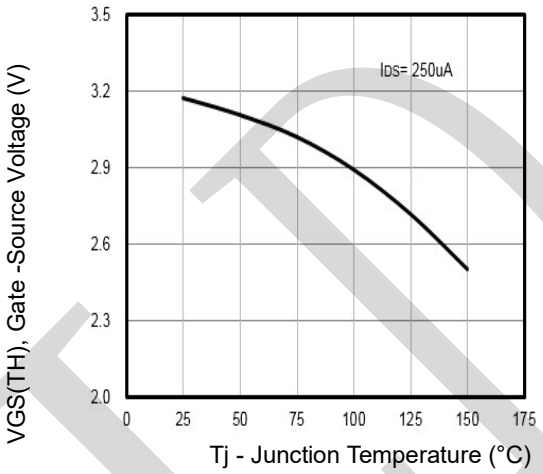


Fig2. $V_{GS(TH)}$ Gate -Source Voltage Vs. Tj

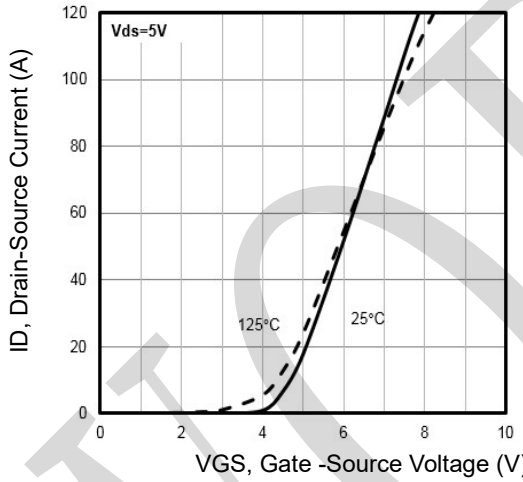


Fig3. Typical Transfer Characteristics

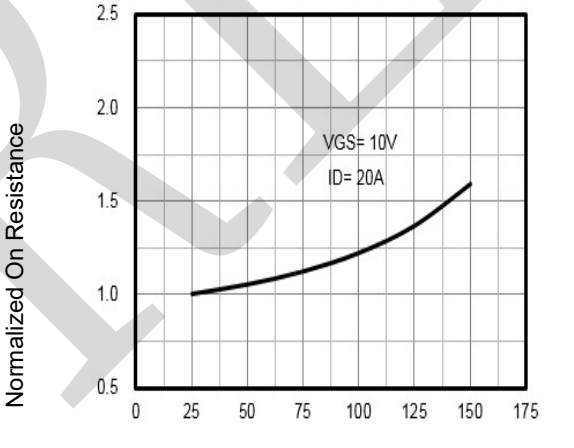


Fig4. Normalized On-Resistance Vs. Tj

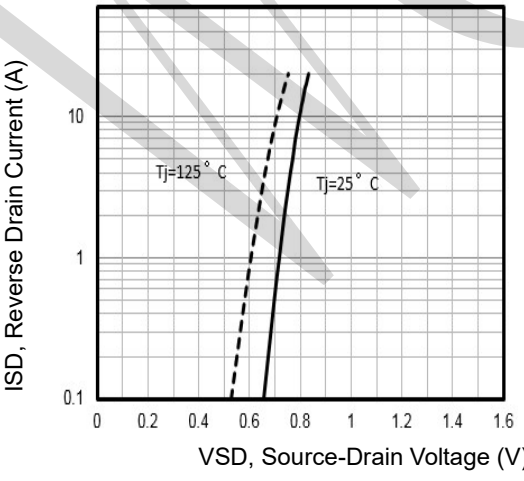


Fig5. Typical Source-Drain Diode Forward Voltage

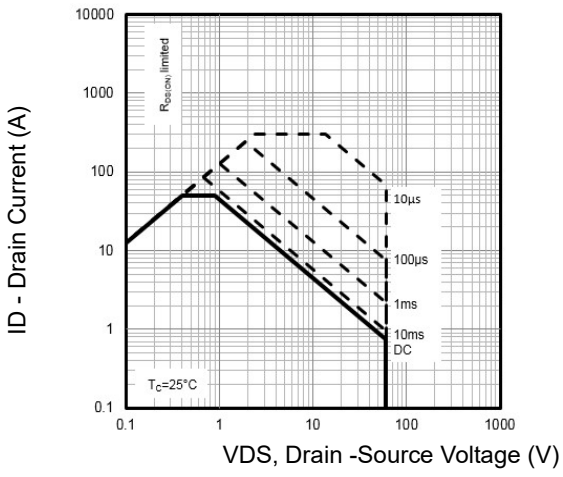
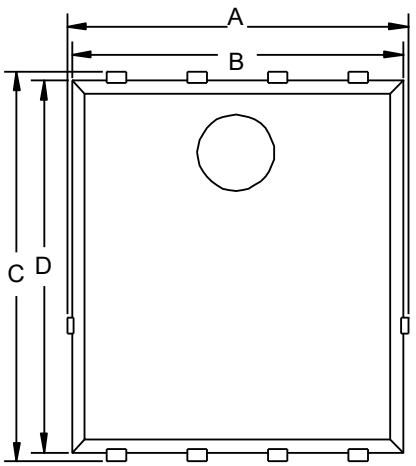
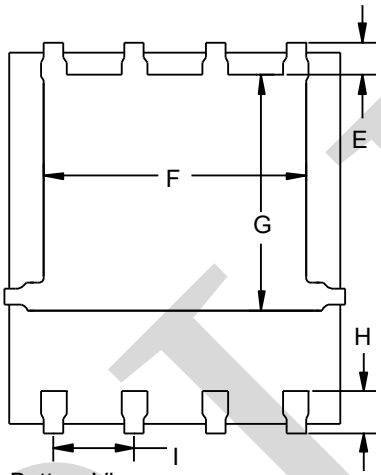


Fig6. Maximum Safe Operating Area

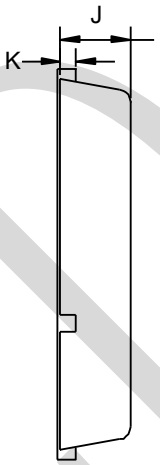
PACKAGE OUTLINE DIMENSIONS



Top View



Bottom View

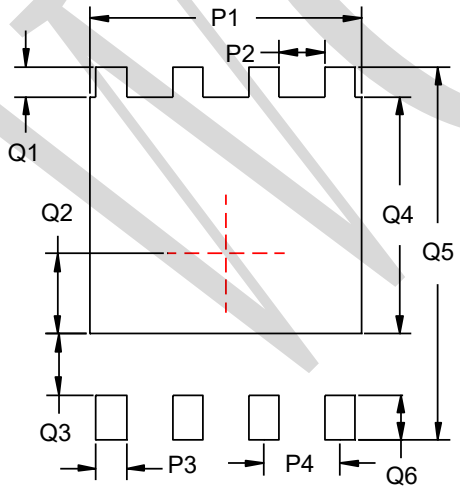


Side View

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