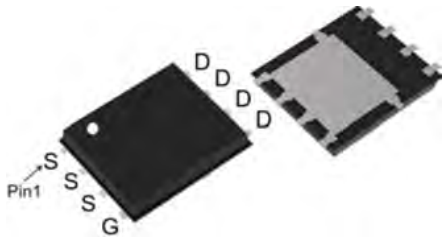
MTR005N10SD

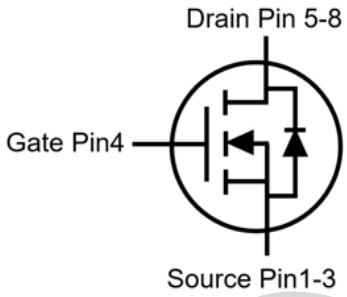
10-JUN-2019

SGT N-channel Power MOSFET

MTR005N10SD

PDFN5x6





V_{DS}	100	V
$R_{DS(on),TYP}$@ V_{GS}=10 V	4.5	mΩ
I_D	85	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		100	V
V_{GS}	Gate-Source voltage		±20	V
I_D	Continuous drain current @VGS=10V	T_C =25°C	85	A
		T_C =100°C	60	A
I_{DM}	Pulse drain current tested ①	T_C =25°C	340	A
EAS	Avalanche energy, single pulsed ②		625	mJ
P_D	Maximum power dissipation	T_C =25°C	100	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	1.5	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62	°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	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=75V,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	1.5	--	2.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance ④	V_{GS}=10V, I_D=40A	--	4.5	5.0	mΩ
		V_{GS}=4.5V, I_D=40A	--	7.5	9.0	mΩ

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

C_{iss}	Input Capacitance	V_{DS}=25V,V_{GS}=0V , f=1MHz	--	4080	--	pF
C_{oss}	Output Capacitance		--	1161	--	pF
C_{rss}	Reverse Transfer Capacitance		--	138	--	pF
gfs	Forward Transconductance	VDS = 10V, ID = 15A	20	--	--	S
Q_g (10V)	Total Gate Charge	V_{DS}=50V, I_D=40A , V_{GS}=10V	--	60	--	nC
Q_{gs}	Gate-Source Charge		--	18	--	nC
Q_{gd}	Gate-Drain Charge		--	14	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V_{DD}=30V, V_{GS}=10V I_D=40A, R_L=15Ω, R_G=2.5Ω,	--	15	--	ns
Tr	Turn-on Rise Time		--	32.3	--	ns
Td(off)	Turn-Off Delay Time		--	24	--	ns
Tf	Turn-Off Fall Time		--	15	--	ns

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

V_{SD}	Forward on voltage	I_{SD}=40A,V_{GS}=0V	--	0.87	0.99	V
Trr	Reverse Recovery Time	I_F=75A di/dt=100A/μs	--	36	--	ns
Qrr	Reverse Recovery Charge		--	63	--	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, V_{GS} = 10V. 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

Figure1. Output Characteristics

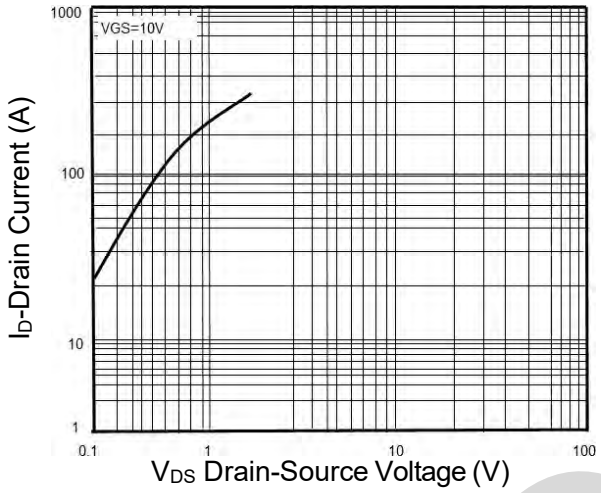


Figure2. Transfer Characteristics

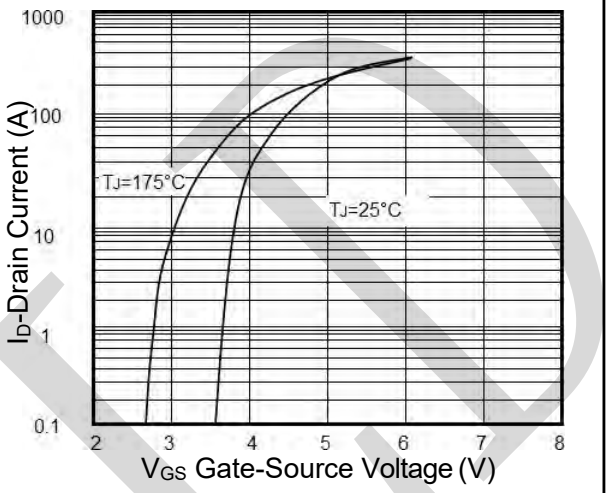


Figure3. ID vs Junction Temperature

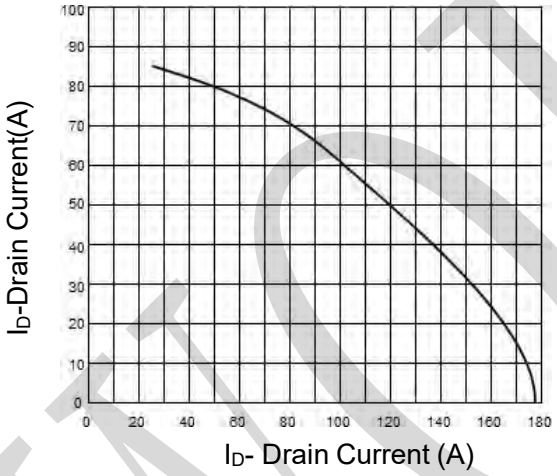


Figure4. Rdson Vs Junction Temperature

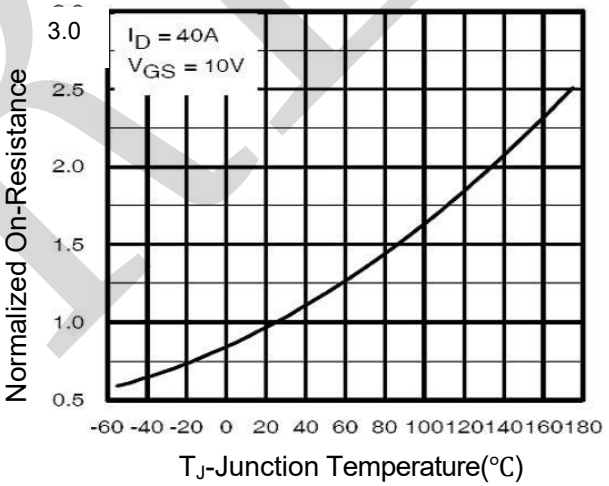


Figure5. BVDSS vs Junction Temperature

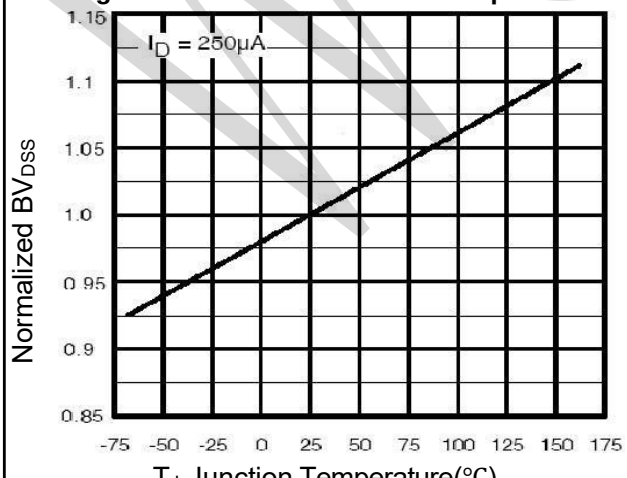
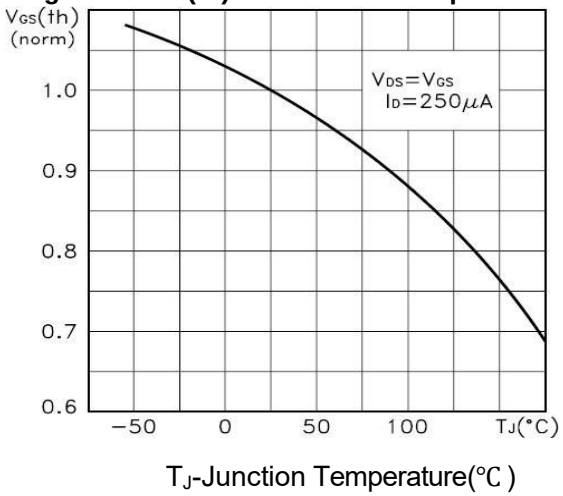


Figure6. VGS(th) vs Junction Temperature



Typical Characteristics

Figure7. Gate Charge

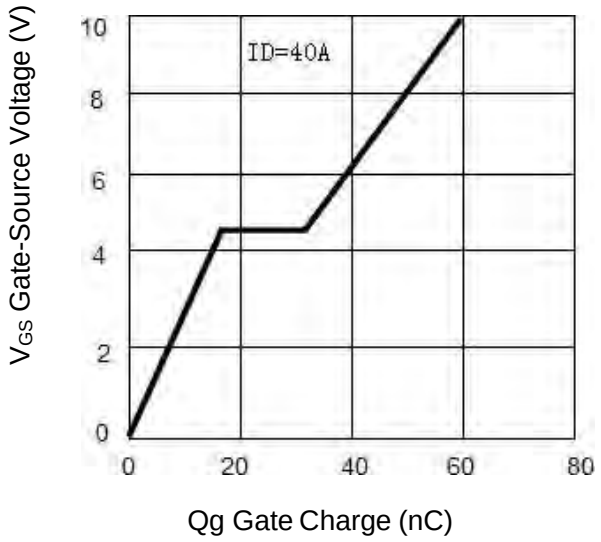


Figure8. Capacitance vs Vds

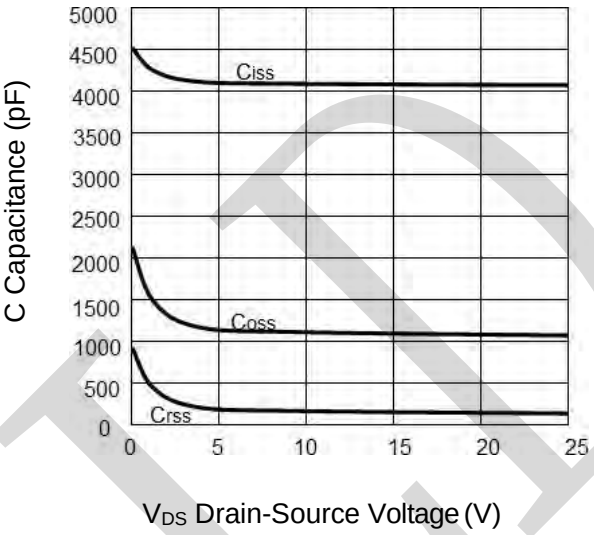


Figure9. Source- Drain Diode Forward

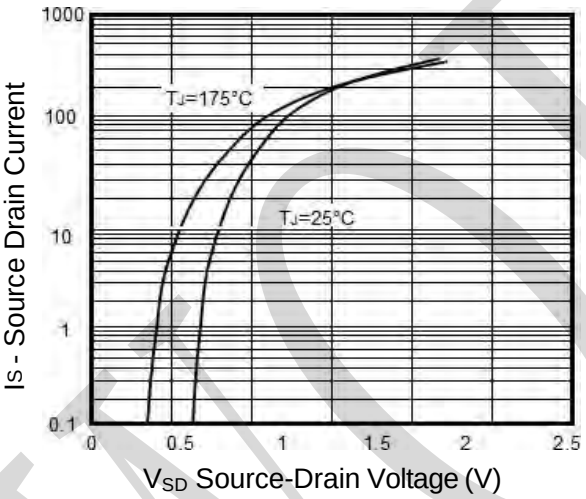


Figure10. Safe Operation Area

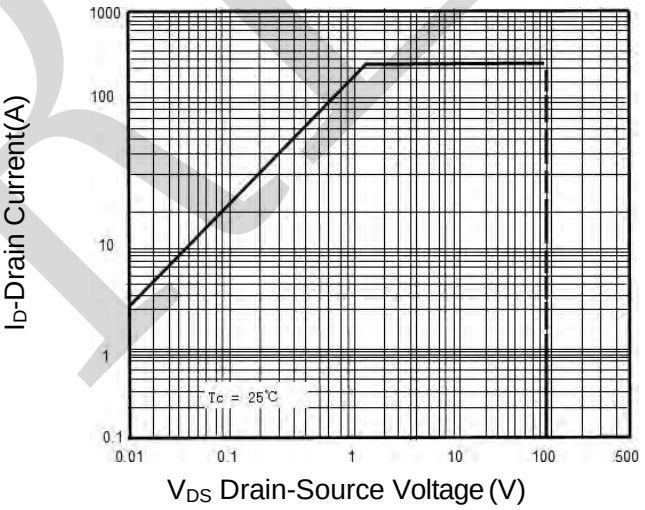
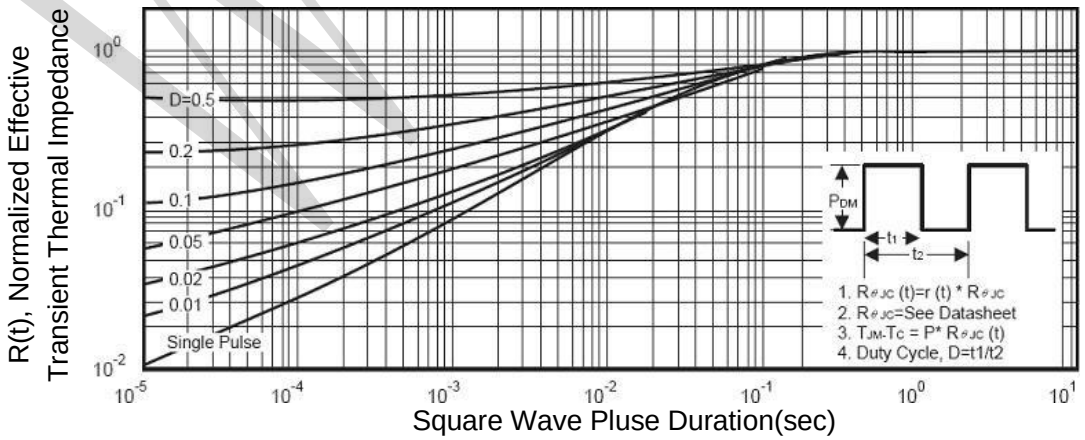
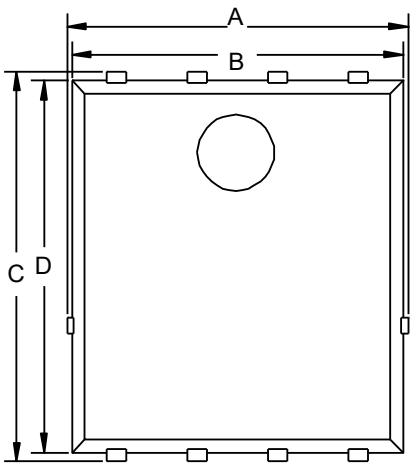


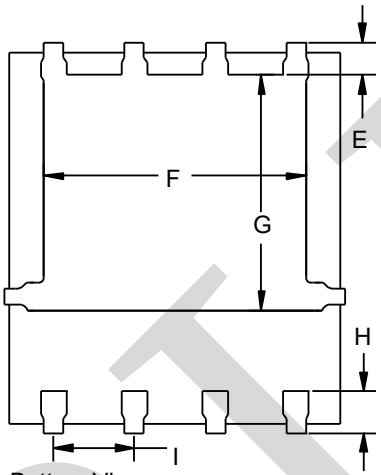
Figure11. Normalized Maximum Transient Thermal Impedance



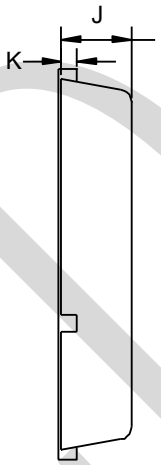
PACKAGE OUTLINE DIMENSIONS



Top View



Bottom View

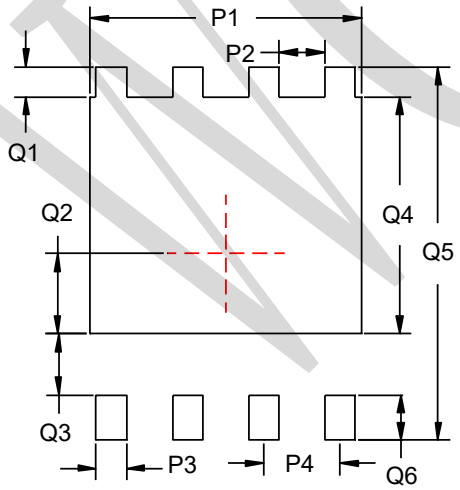


Side View

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