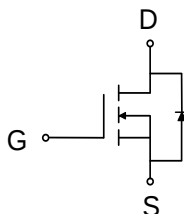
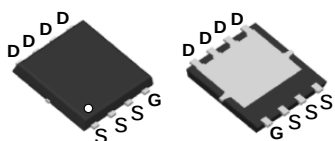


SGT N-Channel Power MOSFET

MTR3R9N10SD

PDFN5x6



Features

- Extremely low on-resistance $R_{DS(on)}$
- Excellent $Q_g \times R_{DS(on)}$ product(FOM)
- Uses advanced SGT technology

Applications

- Motor control and drive
- Battery management
- DC/DC converter
- General purpose applications

Maximum ratings, at $T_A = 25^\circ\text{C}$, 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	T _C =25°C	135	A
		T _C =100°C	85	A
I _{DM}	Pulse drain current tested	T _C =25°C	510	A
E _{AS}	Avalanche energy, single pulsed		320	mJ
P _D	Total power dissipation	T _C =25°C	132	W
T _{STG} , T _J	Storage and Junction Temperature Range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Rating	Unit
R _{θJC}	Thermal Resistance, Junction-to-Case	0.95	°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	100	--	--	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	1.2	1.7	2.4	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =20A	--	3.0	3.9	mΩ
		V _{GS} =4.5V, I _D =15A	--	5.3	6.2	

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

C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0 V , f=1MHz	--	5147	--	pF
C _{oss}	Output Capacitance		--	623	--	pF
C _{rss}	Reverse Transfer Capacitance		--	20	--	pF
Q _g	Total Gate Charge	V _{DD} =50V, I _D =40A , V _{GS} =10V	--	72	--	nC
Q _{gs}	Gate-Source Charge		--	16	--	nC
Q _{gd}	Gate-Drain Charge		--	13	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V _{DS} =50V V _{GS} =10V R _G =3Ω I _D =20A	--	26	--	ns
Tr	Turn-on Rise Time		--	44	--	ns
Td(off)	Turn-Off Delay Time		--	96	--	ns
Tf	Turn-Off Fall Time		--	38	--	ns

Source-Drain Diode Characteristics

V _{SD}	Diode Forward Voltage	I _S =20A V _{GS} =0V	--	--	1.2	V
t _{rr}	Reverse Recovery Time	di/dt=100A/us	--	64	--	ns
Q _{rr}	Reverse Recovery Charge	I _F =20A	--	98	--	nC

Typical Characteristics

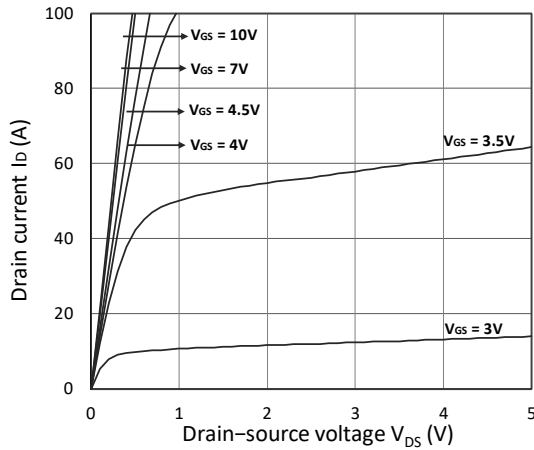


Figure 1. Output Characteristics

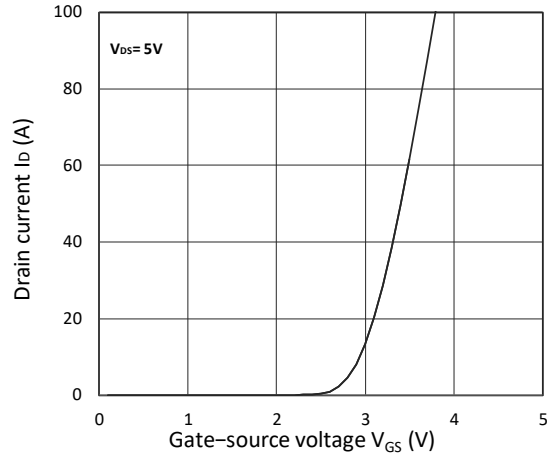


Figure 2. Transfer Characteristics

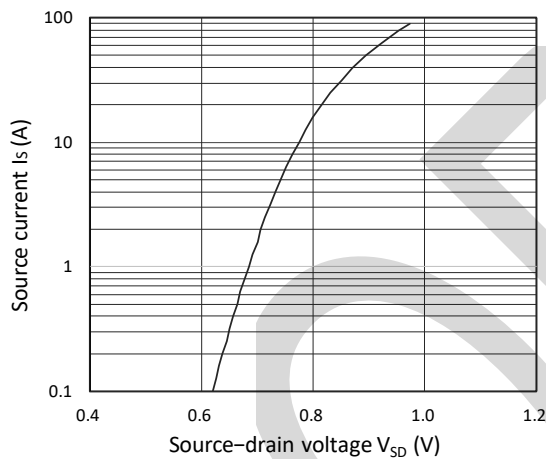


Figure 3. Forward Characteristics of Reverse

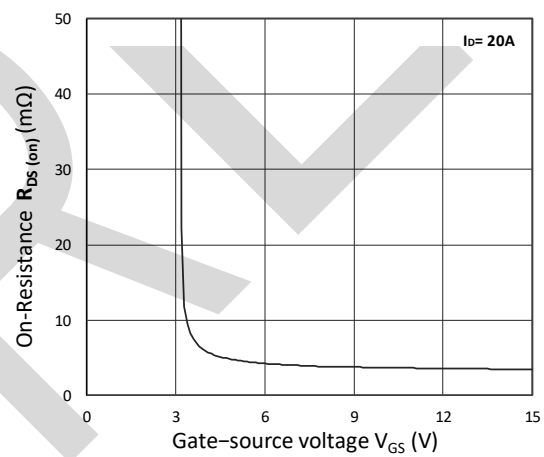


Figure 4. $R_{DS(on)}$ vs. V_{GS}

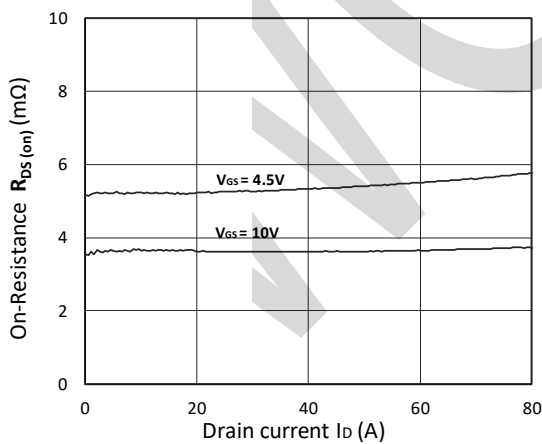


Figure 5. $R_{DS(on)}$ vs. I_D

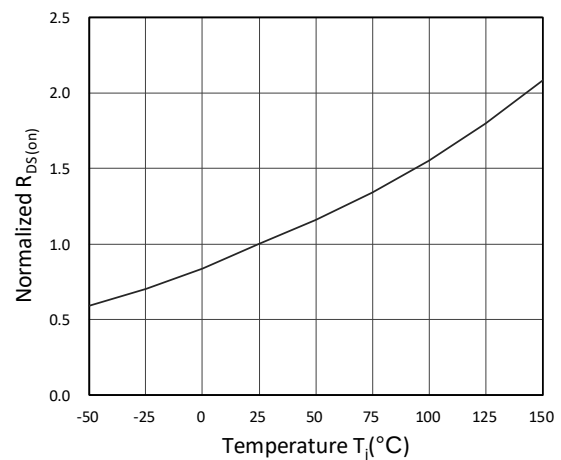


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

Typical Characteristics

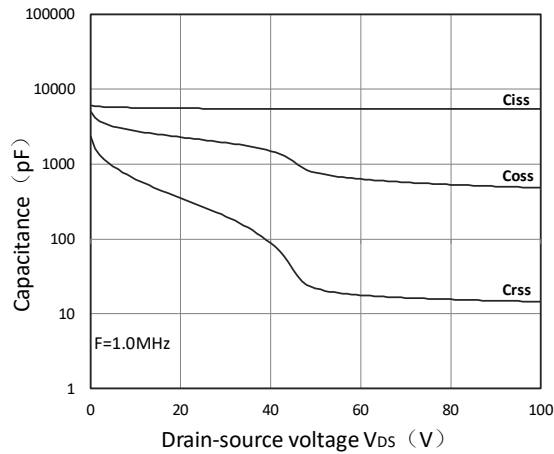


Figure 7. Capacitance Characteristics

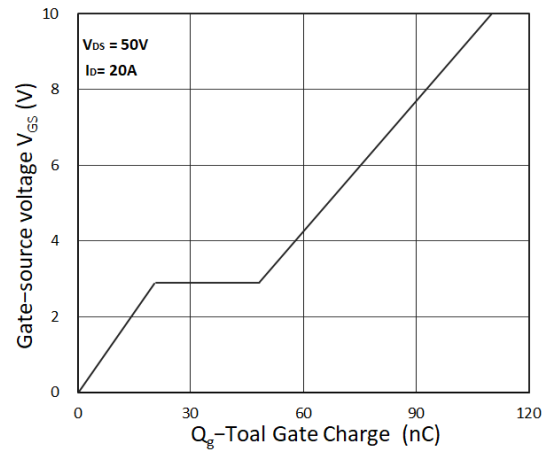


Figure 8. Gate Charge Characteristics

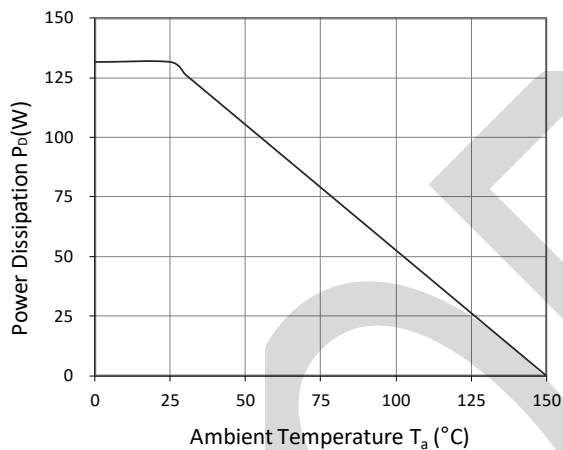


Figure 9. Power Dissipation

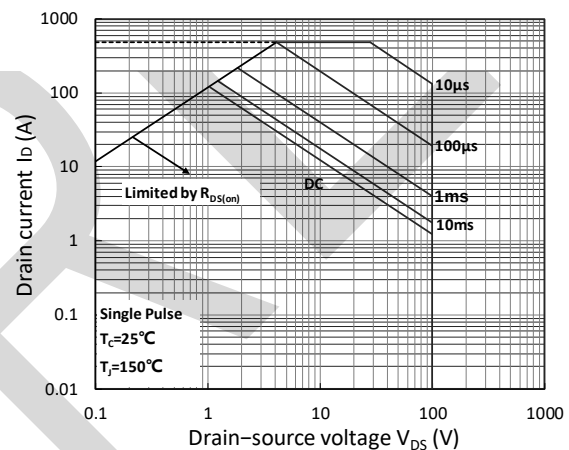


Figure 10. Safe Operating Area

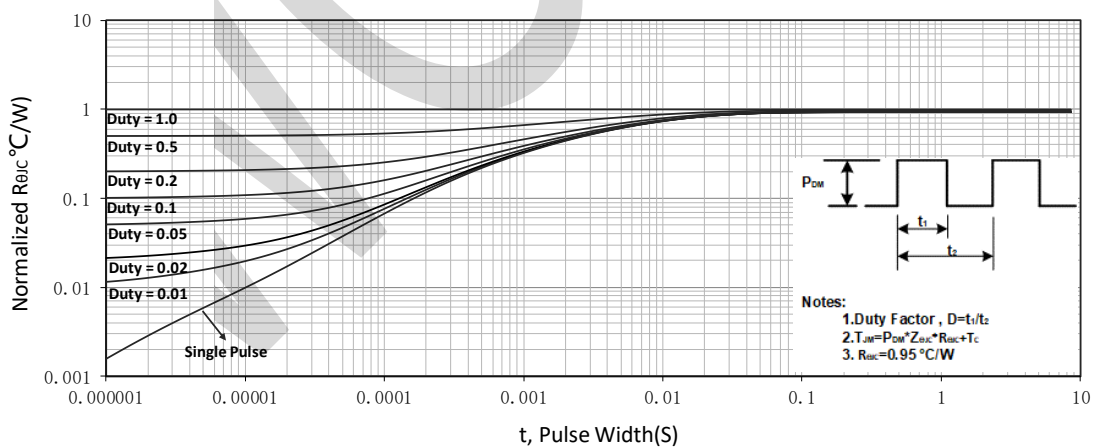
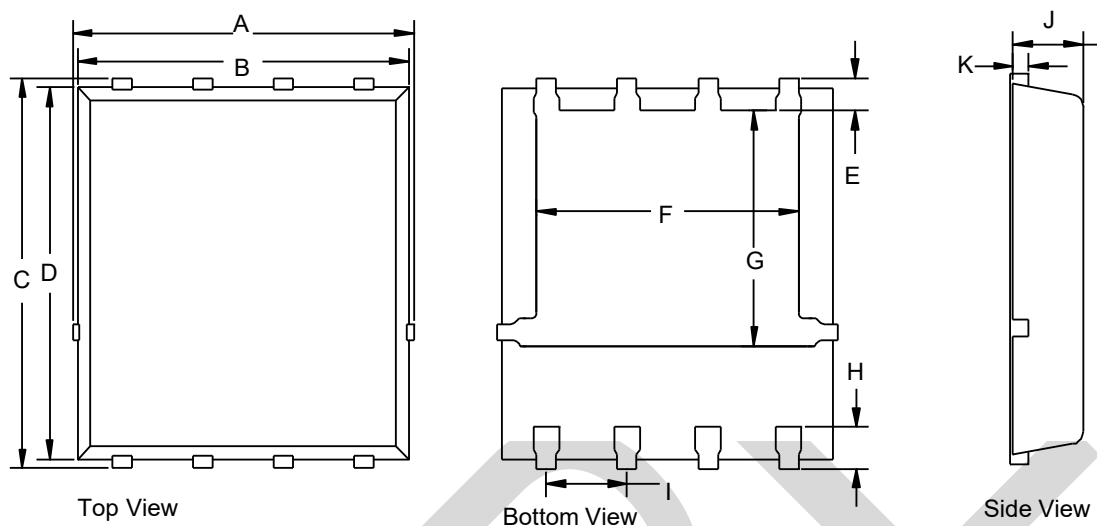


Figure 11. Normalized Maximum Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS

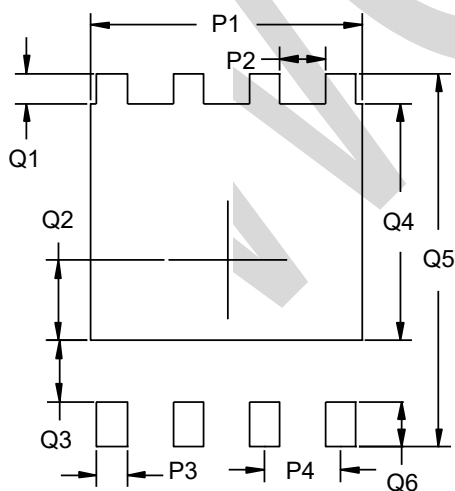
PDFN5X6



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

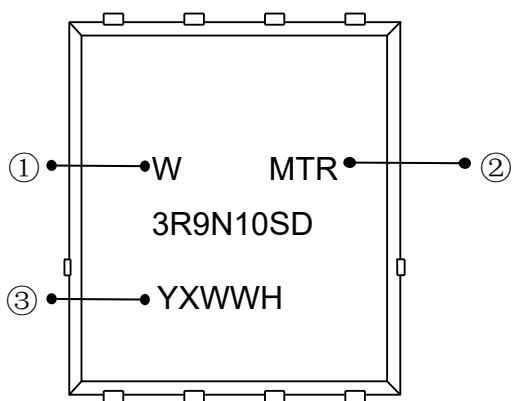


UNIT		P1	P2	P3	P4	Q1
mm	min	4.52	0.76	0.51	1.27	0.50
mil	min	177.9	29.9	20.07	50.0	20.0

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

PACKAGE OUTLINE DIMENSIONS

Marking Information



- ① W : Company's trademark
- ② Product model : MTR3R9N10SD

③ PDC information :

