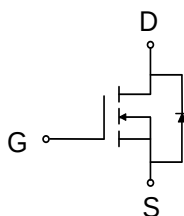
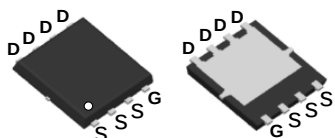


SGT N-Channel Power MOSFET

MTR5R6N03SD

PDFN5x6



Features

- Low on-resistance
- Low Crss, Fast switching
- Pb-free lead plating; RoHS compliant

Applications

- Synchronous Rectification for AC-DC Quick Charger
- DC/DC in Telecoms and Industrial
- Hard Switching and High Speed Circuit

Maximum ratings, at $T_A = 25^\circ\text{C}$, unless otherwise specified

Symbol	Parameter		Rating	Unit
V _{(BR)DSS}	Drain-Source breakdown voltage		30	V
V _{GS}	Gate-Source voltage		±20	V
I _D	Continuous drain current	T _C =25°C	50	A
		T _C =100°C	35	A
I _{DM}	Pulse drain current tested	T _C =25°C	120	A
EAS	Avalanche energy, single pulsed ¹		24	mJ
PD	Maximum power dissipation	T _C =25°C	50	W
T _{STG} , T _J	Storage and Junction Temperature Range		-55 to 150	°C

Notes: 1. L=0.05mH

Thermal Characteristics

Symbol	Parameter	Rating	Unit
R _{θJC}	Thermal Resistance, Junction-to-Case	4.7	°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	30	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V, 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	1.3	1.7	2.4	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =20A	--	4.5	5.6	mΩ
g _{fs}	Transconductance	V _{DS} =5V, I _D =20A	--	78	--	S

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

C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	--	908	--	pF
C _{oss}	Output Capacitance		--	343	--	pF
C _{rss}	Reverse Transfer Capacitance		--	28	--	pF
Q _g	Total Gate Charge	V _{DS} =15V, I _D =20A, V _{GS} =10V	--	16	--	nC
Q _{gs}	Gate-Source Charge		--	4	--	nC
Q _{gd}	Gate-Drain Charge		--	2.5	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V _{DS} =15V, V _{GS} =10V R _L =0.75Ω R _{GEN} =3.0Ω	--	4.5	--	ns
Tr	Turn-on Rise Time		--	23.8	--	ns
Td(off)	Turn-Off Delay Time		--	14.8	--	ns
Tf	Turn-Off Fall Time		--	6.7	--	ns

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

VSD	Forward on voltage	I _S =1A, V _{GS} =0V	--	--	1	V
trr	Body Diode Reverse Recovery Time	I _F =20A, dI/dt=100A/us	--	16.6	--	ns
Qrr	Body Diode Reverse Recovery Charge	I _F =20A, dI/dt=100A/us	--	3.8	--	nC

Typical Characteristics

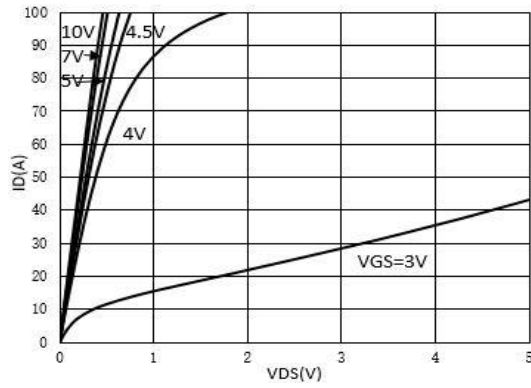


Figure1: On-Region Characteristics(Note E)

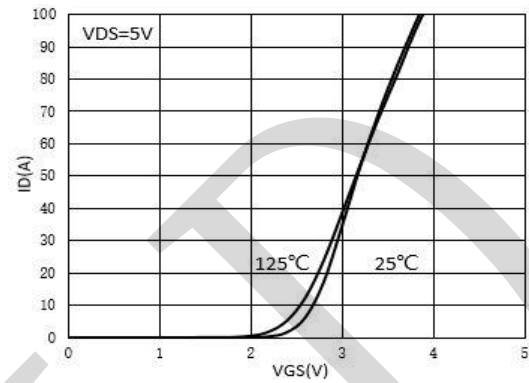


Figure 2: Transfer Characteristics(Note E)

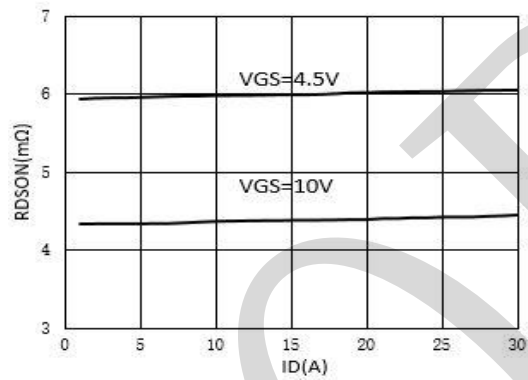


Figure3: On-Resistance vs. Drain Current and Gate Voltage(Note E)

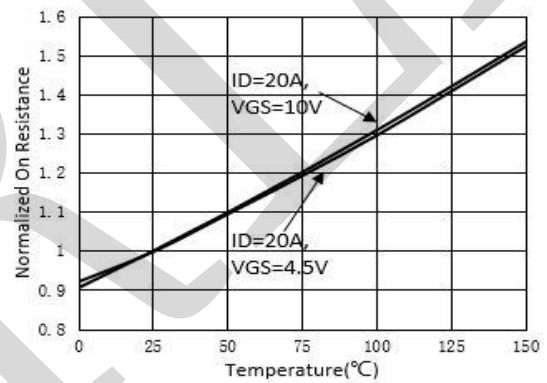


Figure 4: On-Resistance vs. Junction Temperature(Note E)

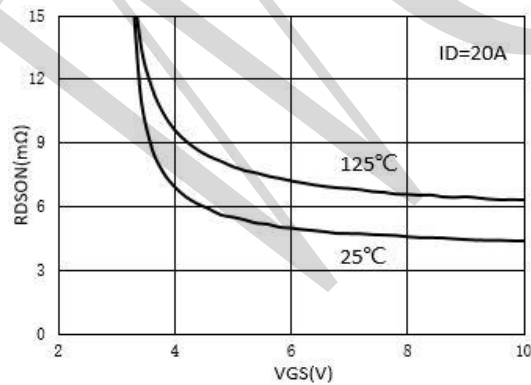


Figure 5: On-Resistance vs. Gate-Source Voltage(Note E)

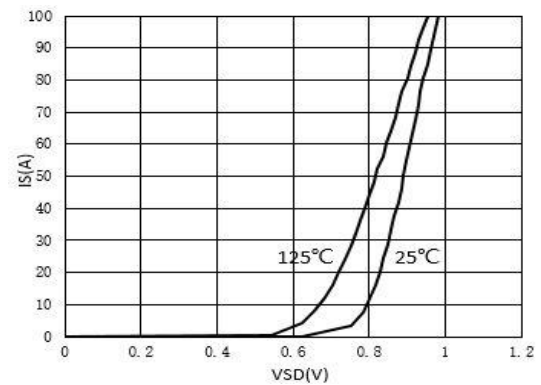


Figure 6: Body-Diode Characteristics (Note E)

Typical Characteristics

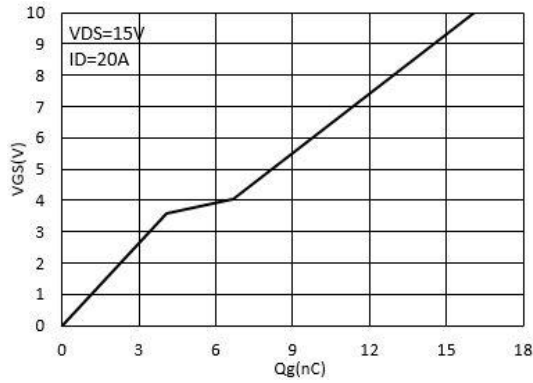


Figure 7: Gate-Charge Characteristics

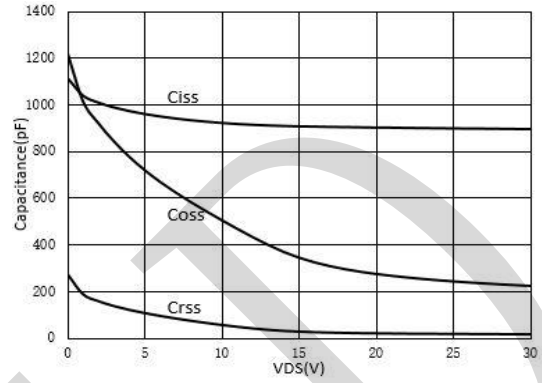


Figure 8: Capacitance Characteristics

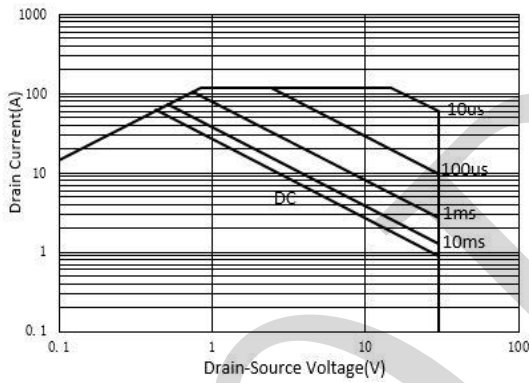


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

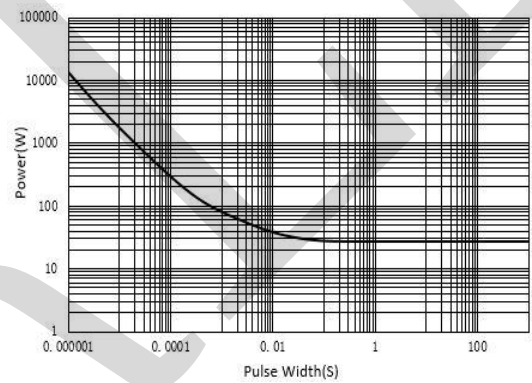


Figure 10: Single pulse Power Rating Junction-to-Case(Note F)

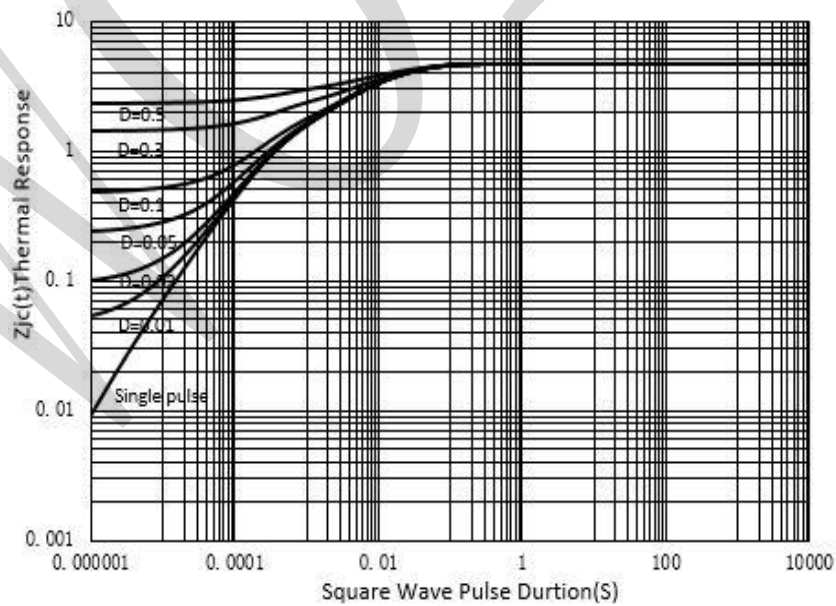
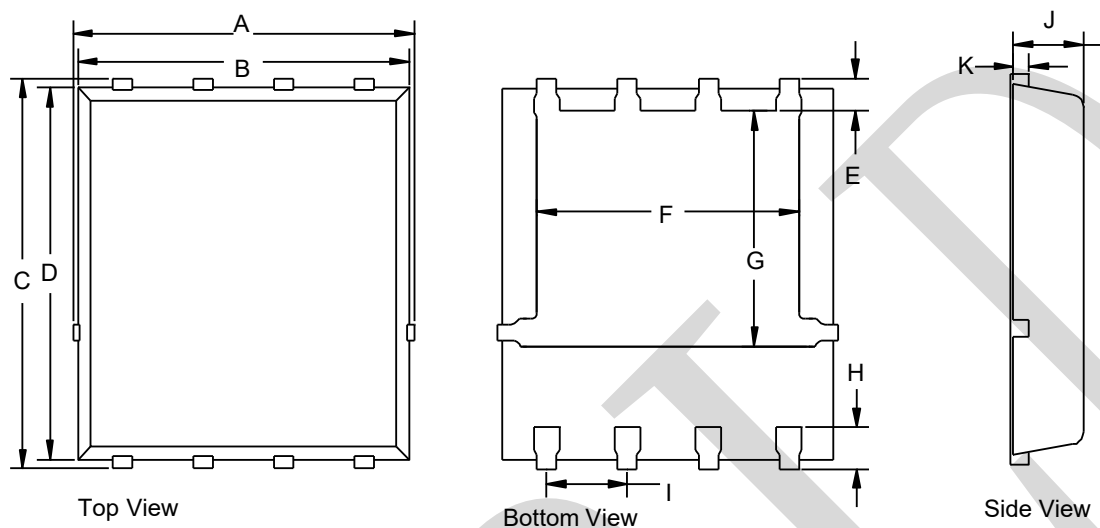


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

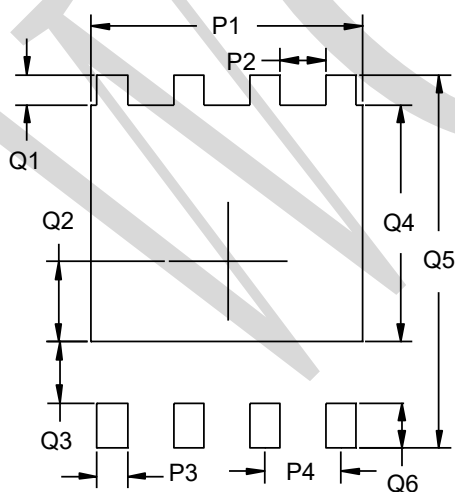
PACKAGE OUTLINE DIMENSIONS



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

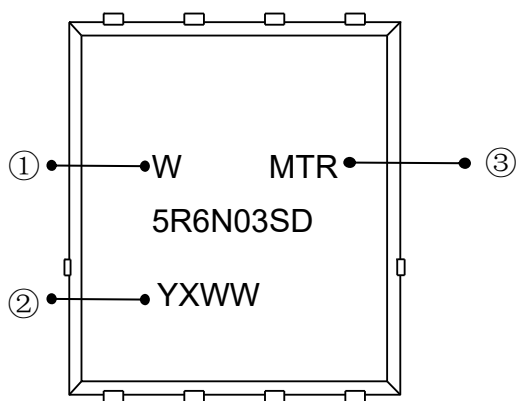


UNIT		P1	P2	P3	P4	Q1
mm	min	4.52	0.76	0.51	1.27	0.50
mil	min	177.9	29.9	20.07	50.0	20.0

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

PACKAGE OUTLINE DIMENSIONS

Marking Information



- ① W : Company's trademark
- ② Product model : MTR5R6N03SD

③ PDC information :

Y X WW

WW: Week code(01 to 53)

X: Internal identification code

Y: Year code(ex:0=2020)