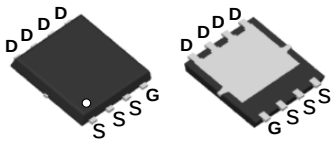
MTR3R6N03SDL

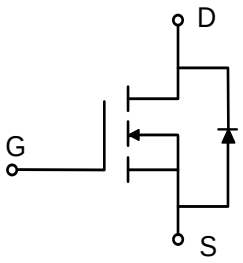
10-JUN-2023

SGT N-Channel Power MOSFET

MTR3R6N03SDL

PDFN5x6





V_{DS}	30	V
$R_{DS(on),max}$ @ V_{GS}=10 V	3.6	mΩ
I_D	86	A

Features

1、Low on – resistance
2、High power package (PDFN5X6)
3、SGT N-channel Power MOSFET
4、Halogen free

Applications

1、Power Management Switches
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		30	V
V_{GS}	Gate-Source voltage		±20	V
I_{AS}	Avalanche Current	T_C =25°C	32	A
I_D	Continuous drain current @VGS=10V	T_C =25°C	86	A
		T_C =100°C	54	A
I_{DM}	Pulse drain current tested ①	T_C =25°C	344	A
EAS	Avalanche energy, single pulsed ②		72.2	mJ
P_D	Maximum power dissipation	T_C =25°C	43.1	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	2.9	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	58	°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	30	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=48V,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	1.6	2.2	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=20A	--	2.6	3.6	mΩ
		V_{GS}=4.5V, I_D=15A	--	4	5.5	mΩ
gfs	Forward Transconductance	V_{DS} = 10V, I_D =20A	--	90	--	S

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

C_{iss}	Input Capacitance	V_{DS}=15V,V_{GS}=0 V , f=1MHz	--	1160	--	pF
C_{oss}	Output Capacitance		--	435	--	pF
C_{rss}	Reverse Transfer Capacitance		--	35	--	pF
R_g	Gate Resistance	V_{GS} = 0V, V_{DS}= 0V, f = 1MHz	--	1.2	--	Ω
Q_g	Total Gate Charge	V_{DS}=15V, I_D=20A , V_{GS}=10V	--	18	--	nC
Q_{gs}	Gate-Source Charge		--	3.2	--	nC
Q_{gd}	Gate-Drain Charge		--	2.5	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V_{DD}=15V, V_{GS}=10V I_D=20A, R_G=3Ω,	--	6.1	--	ns
Tr	Turn-on Rise Time		--	1.8	--	ns
Td(off)	Turn-Off Delay Time		--	16.9	--	ns
Tf	Turn-Off Fall Time		--	2.8	--	ns

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

V_{SD}	Forward on voltage	I_S=20A,V_{GS}=0V	--	--	1.2	V
Trr	Reverse Recovery Time	I_F=20A di/dt=100A/μs	--	34	--	ns
Qrr	Reverse Recovery Charge		--	6.8	--	nC

NOTE: ① Repetitive rating; pulse width limited by junction temperature $T_{J(MAX)}$=150°C.

② The test condition is V_{DD}=25V,V_{GS}=10V,L=0.4mH, I_{AS}=19A.

Typical Characteristics

Figure 1. Output Characteristics

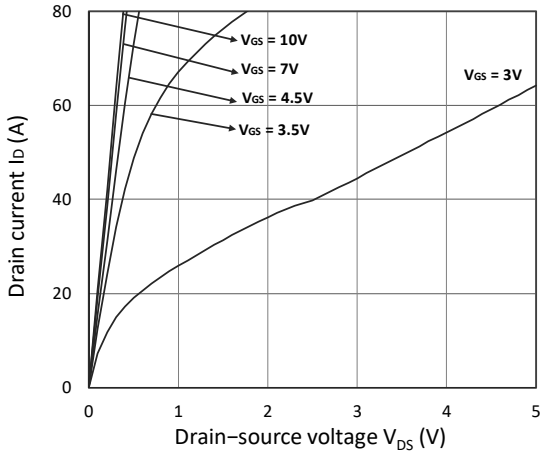


Figure 2. Transfer Characteristics

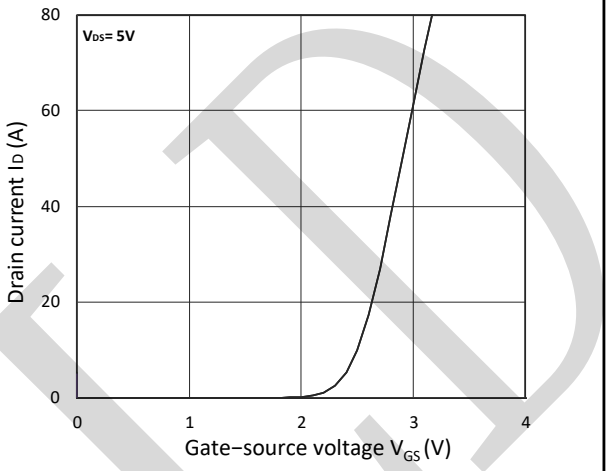


Figure 3. Forward Characteristics of Reverse

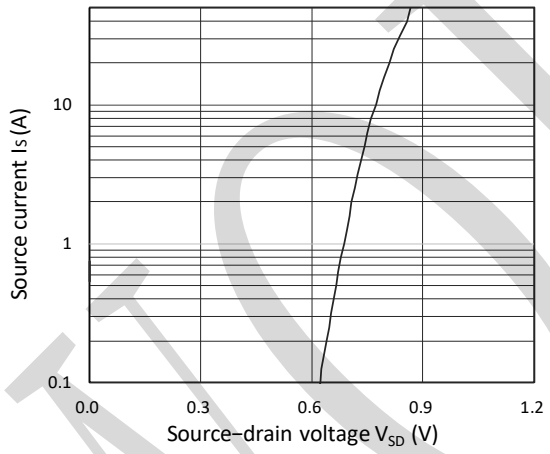


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

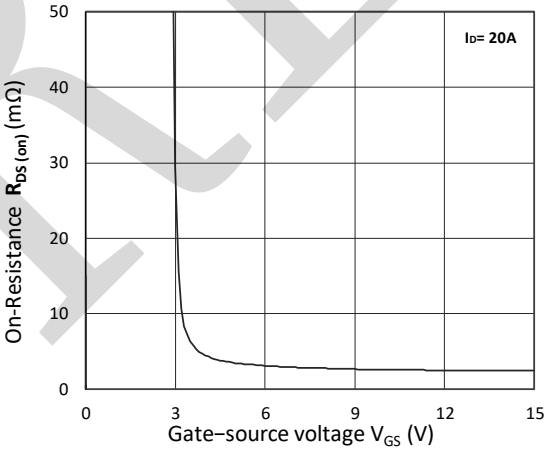


Figure 5. $R_{DS(ON)}$ vs. I_D

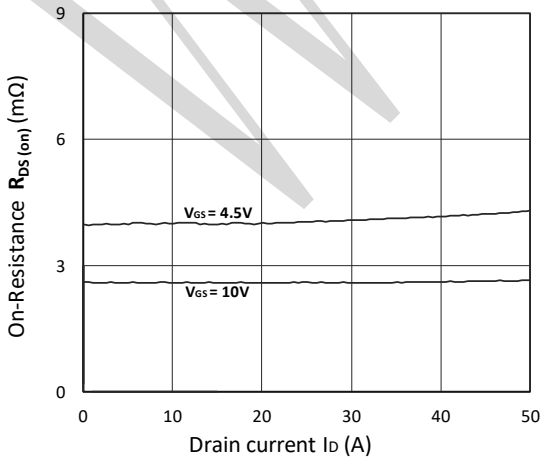
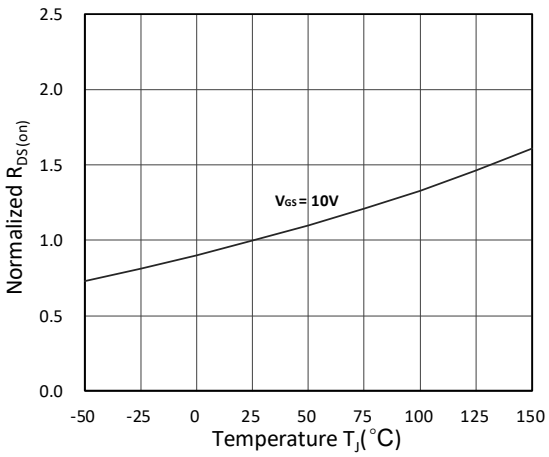


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature



Typical Characteristics

Figure 7. Capacitance Characteristics

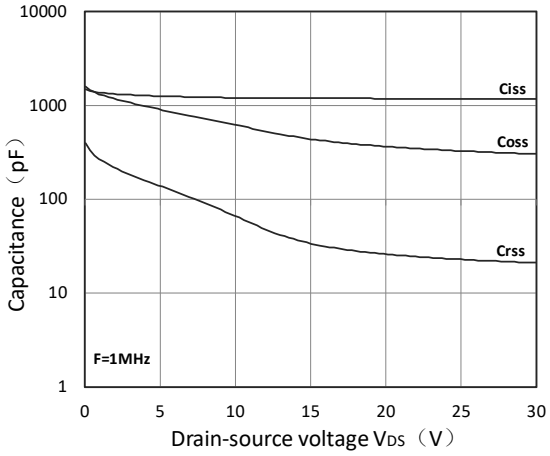


Figure 8. Gate Charge Characteristics

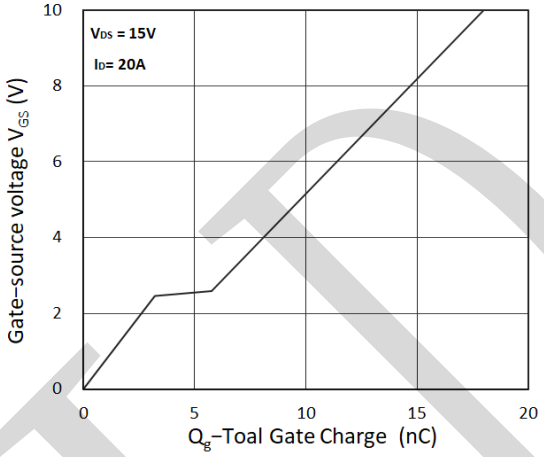


Figure 9. Power Dissipation

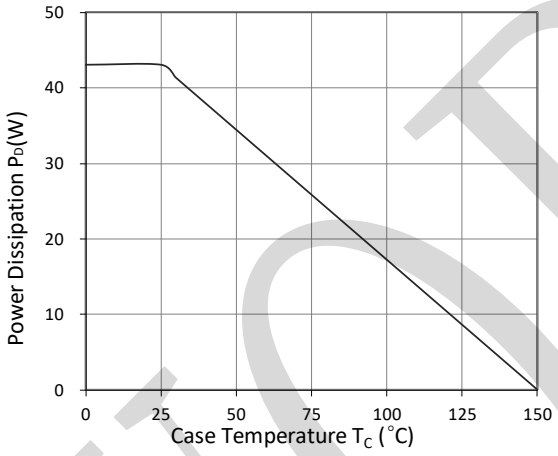


Figure10. Safe Operating Area

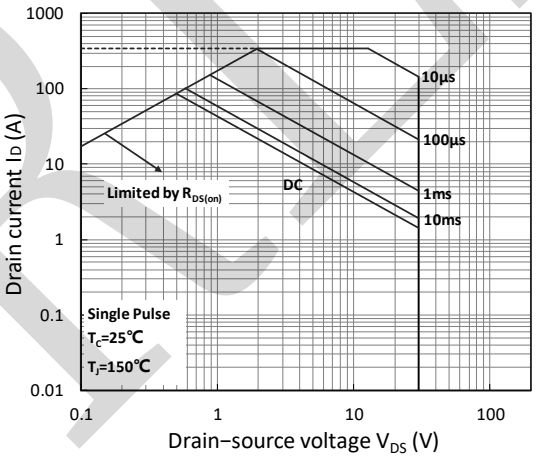
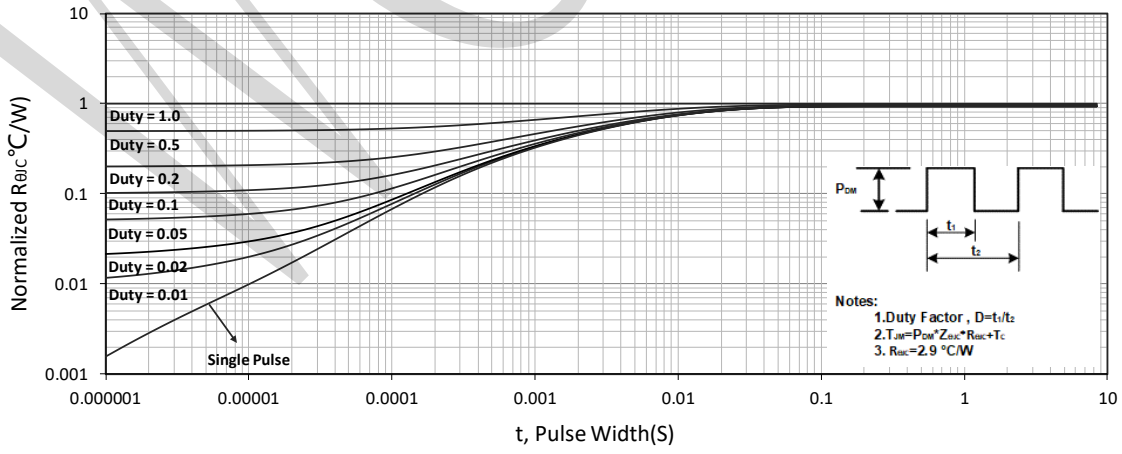
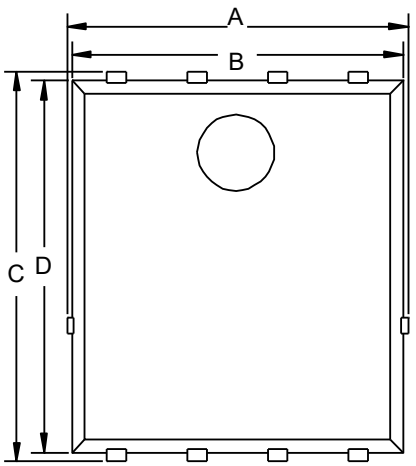


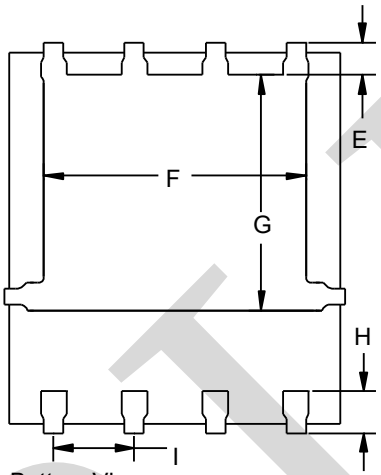
Figure 11. Normalized Maximum Transient Thermal Impedance



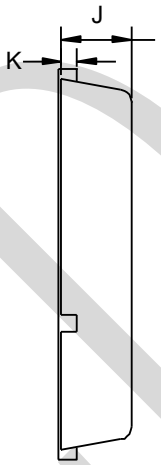
PACKAGE OUTLINE DIMENSIONS



Top View



Bottom View

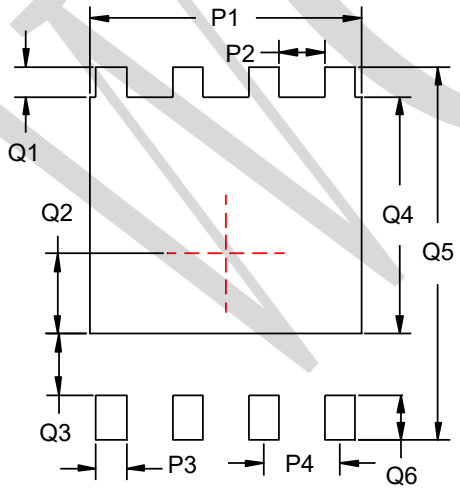


Side View

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

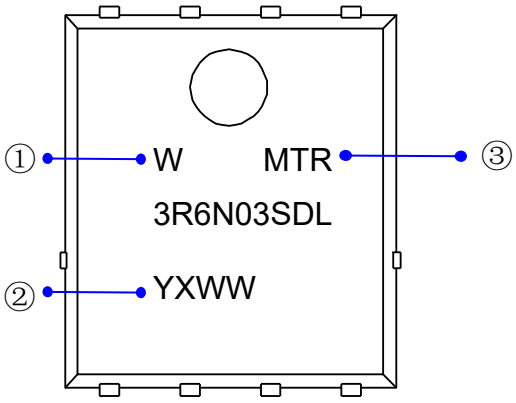


UNIT		P1	P2	P3	P4	Q1
mm	min	4.52	0.76	0.51	1.27	0.50
mil	min	177.9	29.9	20.07	50.0	20.0

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

PACKAGE OUTLINE DIMENSIONS

Marking Information



①W : Company's trademark
②Product model : MTR3R6N03SDL
③PDC information：

Y X WW

WW:Week code(01 to 53)
X:Internal identification code
Y:Year code(ex:0=2020)