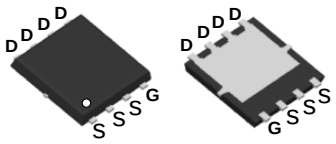
MTR10R2N06SD

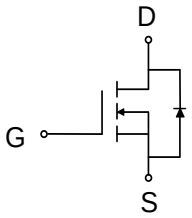
10-Jun-2023

SGT N-Channel Power MOSFET

MTR10R2N06SD

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 Inductrial
- Hard Switching and High Speed Circuit

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_D	Continuous drain current	T_C =25°C	52	A
		T_C =100°C	33	A
I_{DM}	Pulse drain current tested ①	T_C =25°C	128	A
EAS	Avalanche energy, single pulsed ②		30	mJ
P_D	Maximum power dissipation	T_C =25°C	48	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	2.6	°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	60	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V,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	--	2.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance③	V_{GS}=10V, I_D=20A	--	9.0	10.2	mΩ
		V_{GS}=4.5V, I_D=20A	--	12.8	16.0	mΩ

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

C_{iss}	Input Capacitance	V_{DD}=30V,V_{GS}=0 V , f=1MHz	--	885	--	pF
C_{oss}	Output Capacitance		--	291	--	pF
C_{rss}	Reverse Transfer Capacitance		--	18.5	--	pF
Q_g	Total Gate Charge	V_{DD}=30V, I_D=20A , V_{GS}=10V	--	15.7	--	nC
Q_{gs}	Gate-Source Charge		--	2.3	--	nC
Q_{gd}	Gate-Drain Charge		--	4.4	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V_{DD}=30V, V_{GS}=10V I_D=20A, R_G=10Ω	--	7	--	ns
Tr	Turn-on Rise Time		--	5	--	ns
Td(off)	Turn-Off Delay Time		--	23	--	ns
Tf	Turn-Off Fall Time		--	4	--	ns

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

V_{SD}	Forward on voltage	I_S=20A,V_{GS}=0V	--	--	1.3	V
I_S	Body Diode Forward Current	--	--	--	52	A
I_{SM}	Max Pulsed Drain-source diode forward current		--	--	128	A

NOTE: ① Repetitive Rating: Pulse width limited by maximum junction temperature.

② EAS Condition: L=0.5mH, Rg=25Ω, Start T_J=25℃

③ Pulse test: Width≤300us, Duty Cycle≤2%

Typical Characteristics

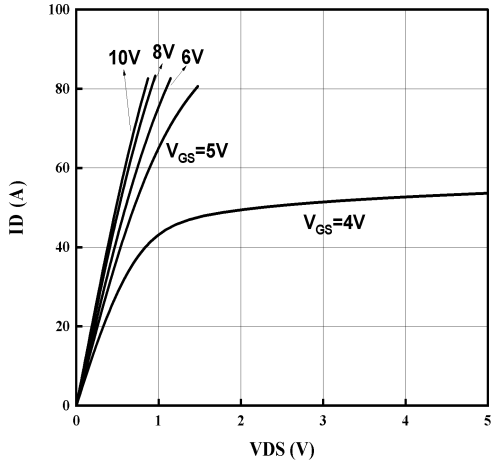


Fig1. Typical Output Characteristics

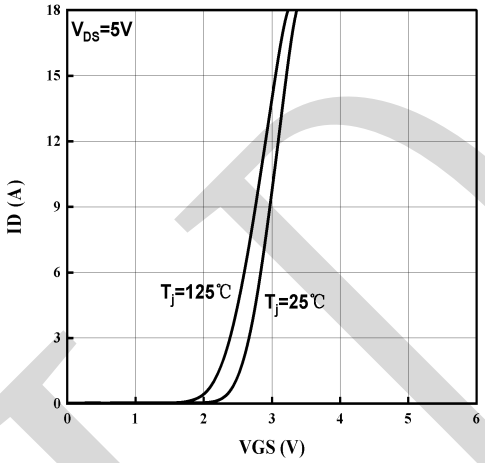


Fig2. Typical Transfer Characteristics

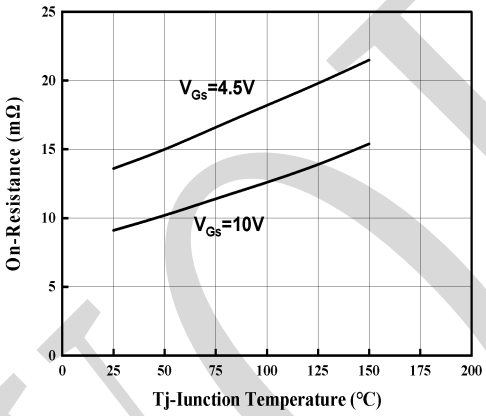


Fig3. On-Resistance Vs. Temperature

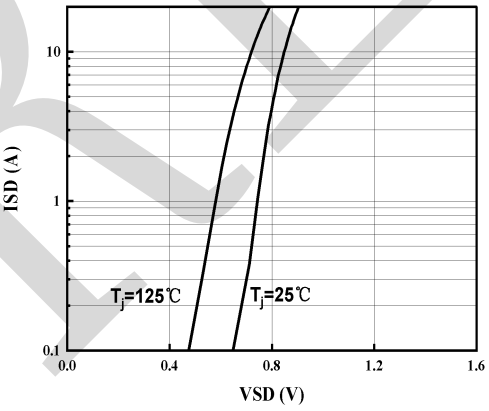


Fig4. Typical Source-Drain Diode Forward Voltage

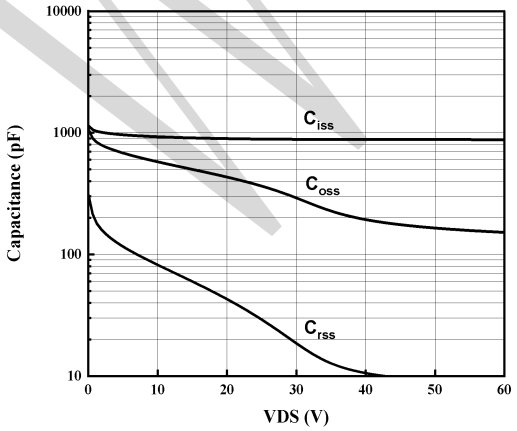


Fig5. Typical.Capacitance

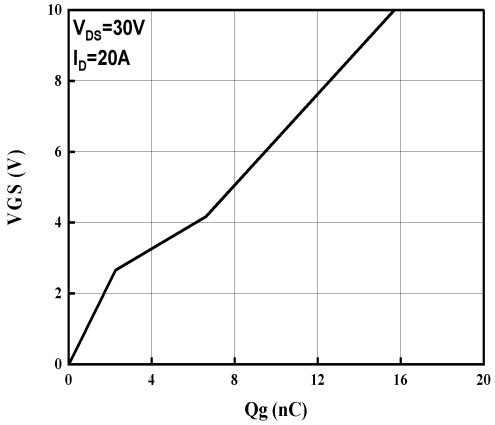


Fig6. Typical.Gate Charge

Typical Characteristics

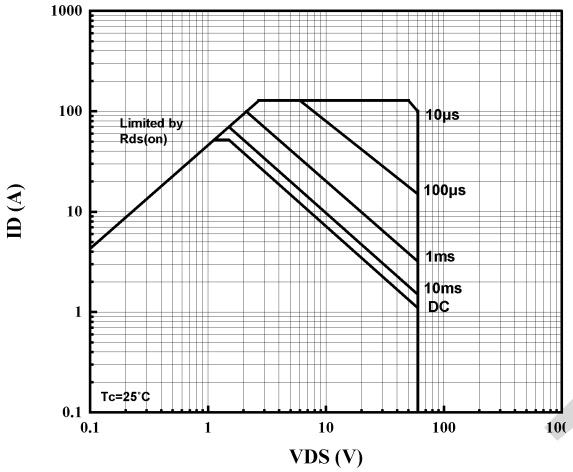


Fig7. Safe Operating Area

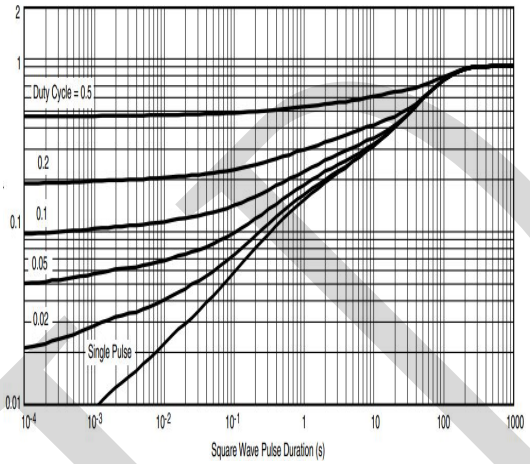
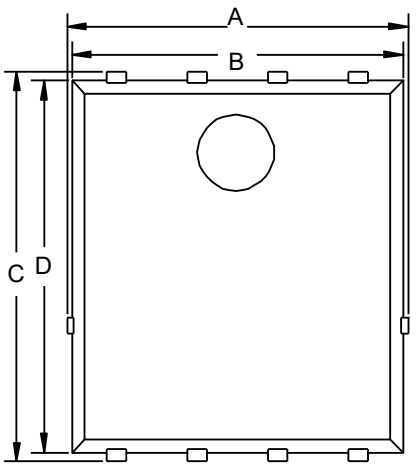
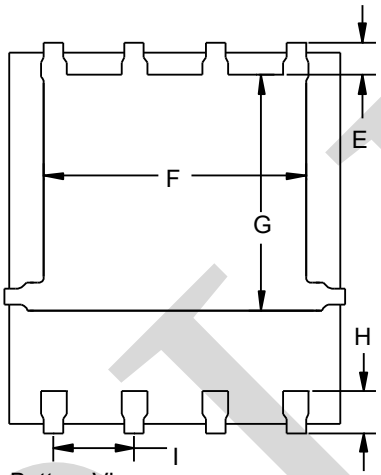


Fig8. Normalized transient thermal impedance

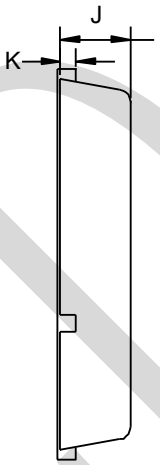
PACKAGE OUTLINE DIMENSIONS



Top View



Bottom View

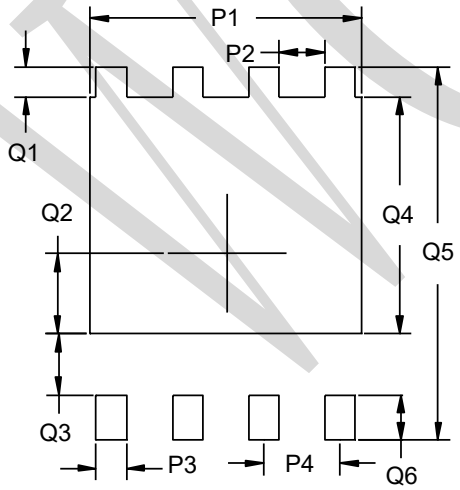


Side View

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

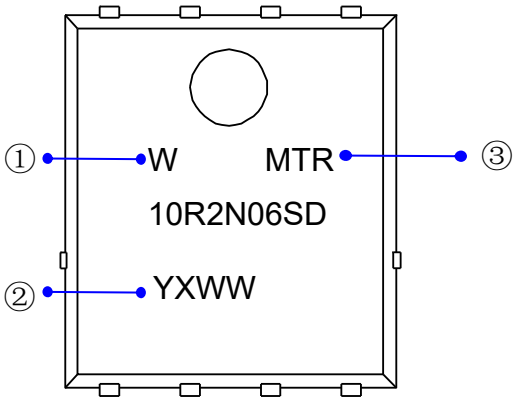


UNIT		P1	P2	P3	P4	Q1
mm	min	4.52	0.76	0.51	1.27	0.50
mil	min	177.9	29.9	20.07	50.0	20.0

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 : MTR10R2N06SD
③PDC information：

Y X WW

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