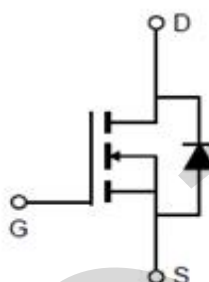


SGT N-channel Power MOSFET

TO-247
MTR4R5N10PT



V_{DS}	100	V
$R_{DS(on),TYP@ V_{GS}=10V}$	3.2	m Ω
I_D	200	A

Features

- 1、Low on – resistance
- 2、Package TO-247
- 3、SGT N-channel Power MOSFET

Applications

- 1、Load Switch for Portable Devices
- 2、DC/DC Converter

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 @ $V_{GS}=10V$	$T_C = 25^\circ\text{C}$ (Silicon limit)	220	A
		$T_C = 25^\circ\text{C}$ (Package limit)	200	A
		$T_C = 100^\circ\text{C}$ (Silicon limit)	110	A
I_{DM}	Pulse drain current tested ①	$T_C = 25^\circ\text{C}$	480	A
E_{AS}	Avalanche energy, single pulsed ②		900	mJ
P_D	Maximum power dissipation	$T_C = 25^\circ\text{C}$	227	W
T_{STG}, T_J	Storage and Junction Temperature Range		-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typical	Unit
R _{θJC}	Thermal Resistance, Junction-to-Case	0.44	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient	60	°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	2.0	3.0	4.0	V
R _{DS(on)}	Drain-Source On-State Resistance ④	V _{GS} =10V, I _D =50A	--	3.2	4.5	mΩ

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

C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V , f=1MHz	--	7300	--	pF
C _{oss}	Output Capacitance		--	2700	--	pF
C _{rss}	Reverse Transfer Capacitance		--	309	--	pF
R _g	Gate Resistance	V _{GS} =0V, f=1MHz, V _{DS} =0V	--	1.6	--	Ω
Q _g (10V)	Total Gate Charge	V _{DS} =50V, I _D =50A , V _{GS} =10V	--	90	--	nC
Q _{gs}	Gate-Source Charge		--	30	--	nC
Q _{gd}	Gate-Drain Charge		--	19	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V _{DS} =50V, V _{GS} =10V, R _L =3.0Ω, T _J =25°C	--	25	--	ns
Tr	Turn-on Rise Time		--	32	--	ns
Td(off)	Turn-Off Delay Time		--	48	--	ns
Tf	Turn-Off Fall Time		--	27	--	ns

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

VSD	Forward on voltage	I _{SD} =50A, V _{GS} =0V	--	0.9	1.2	V
Trr	Reverse Recovery Time	I _F =30A, di/dt=500A/μs	--	80	--	ns
Qrr	Reverse Recovery Charge	I _F =30A, di/dt=500A/μs	--	185	--	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, I_{AS} = 9A, V_{GS} = 10V. Part not recommended for use above this value

③ The power dissipation P_{DSM} is based on R_{θJA} and the maximum allowed junction temperature of 150°C.

④ Pulse width ≤ 380μs; duty cycle ≤ 2%.

Typical Characteristics

Fig 1: Output Characteristics

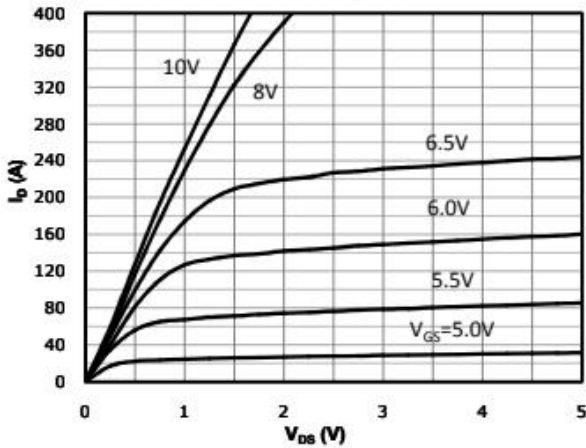


Fig 2: Transfer Characteristics

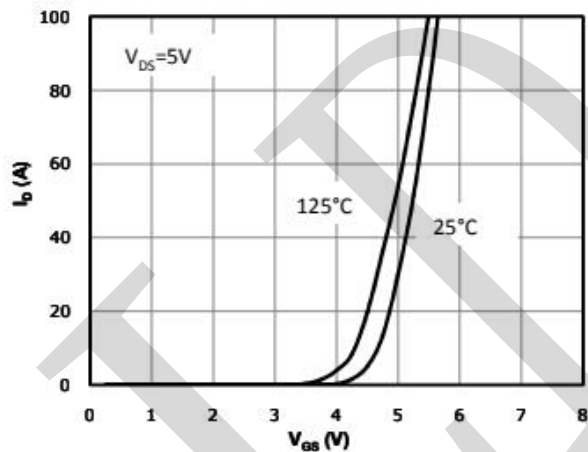


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

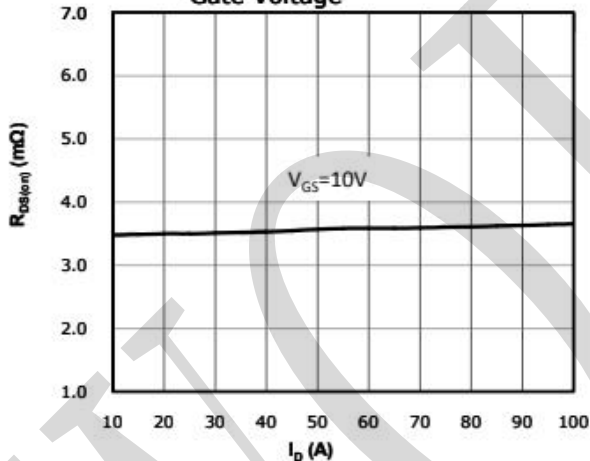


Fig 4: $R_{DS(on)}$ vs Gate Voltage

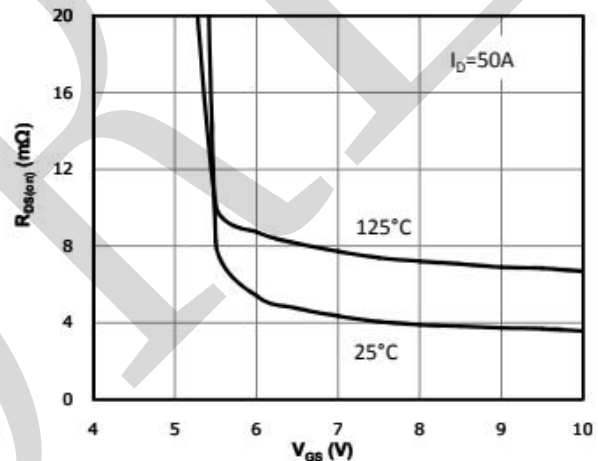


Fig 5: $R_{DS(on)}$ vs. Temperature

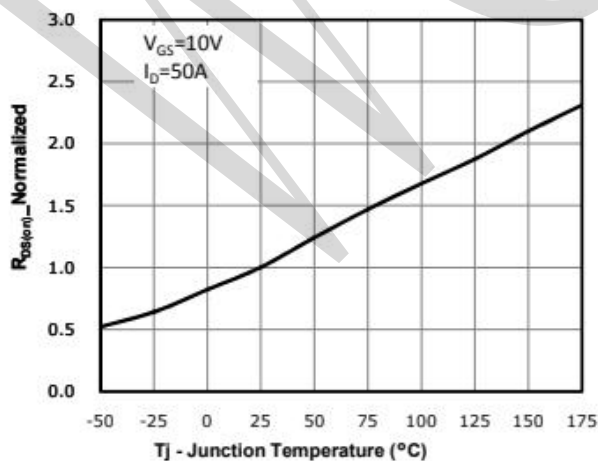
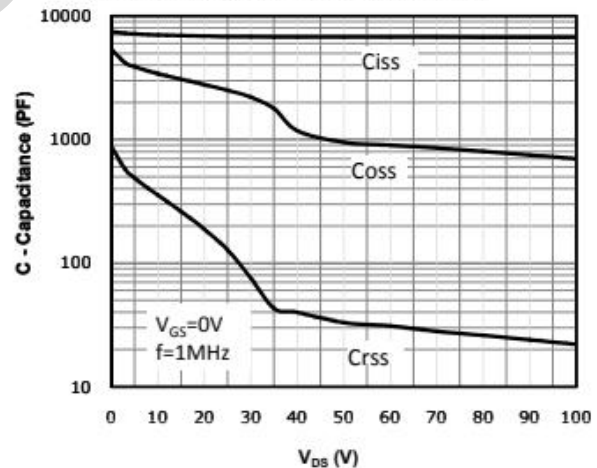


Fig 6: Capacitance Characteristics



Typical Characteristics

Fig 7: Gate Charge Characteristics

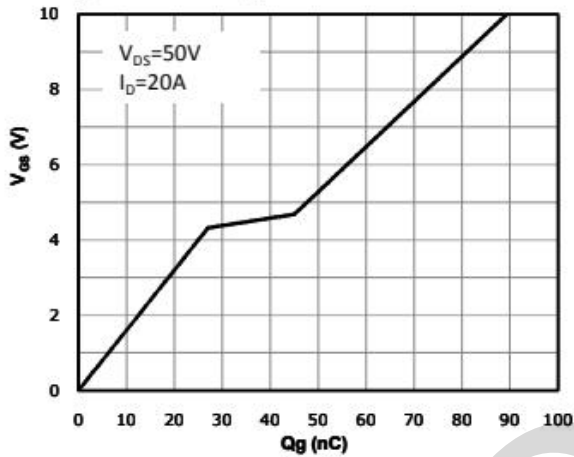


Fig 8: Body-diode Forward Characteristics

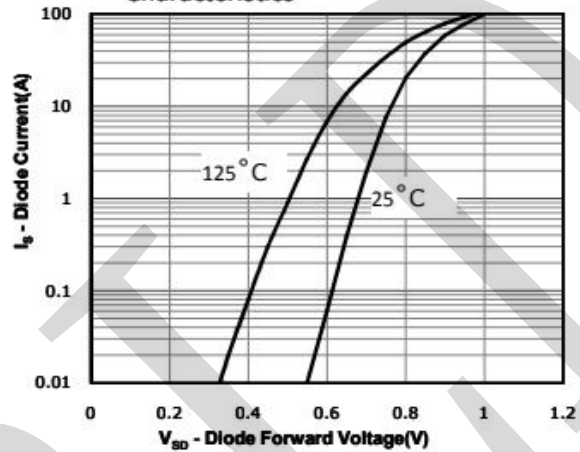


Fig 9: Power Dissipation

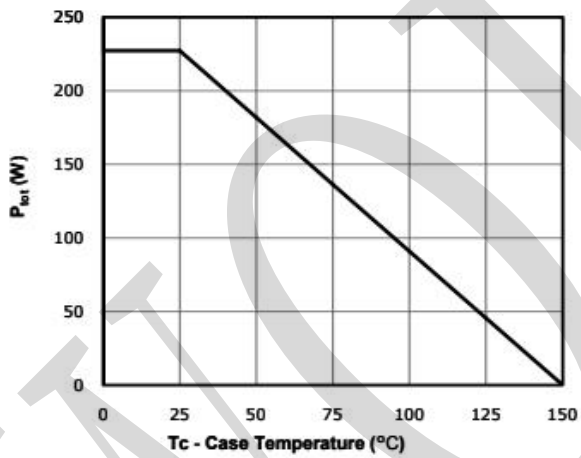


Fig 10: Drain Current Derating

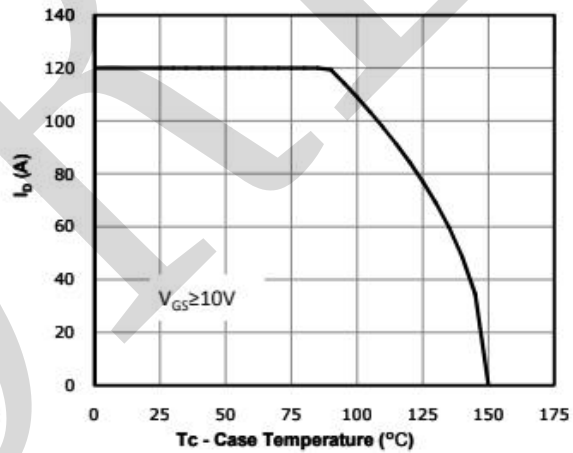
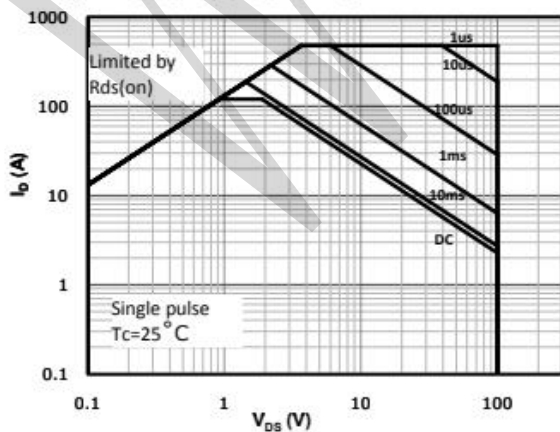
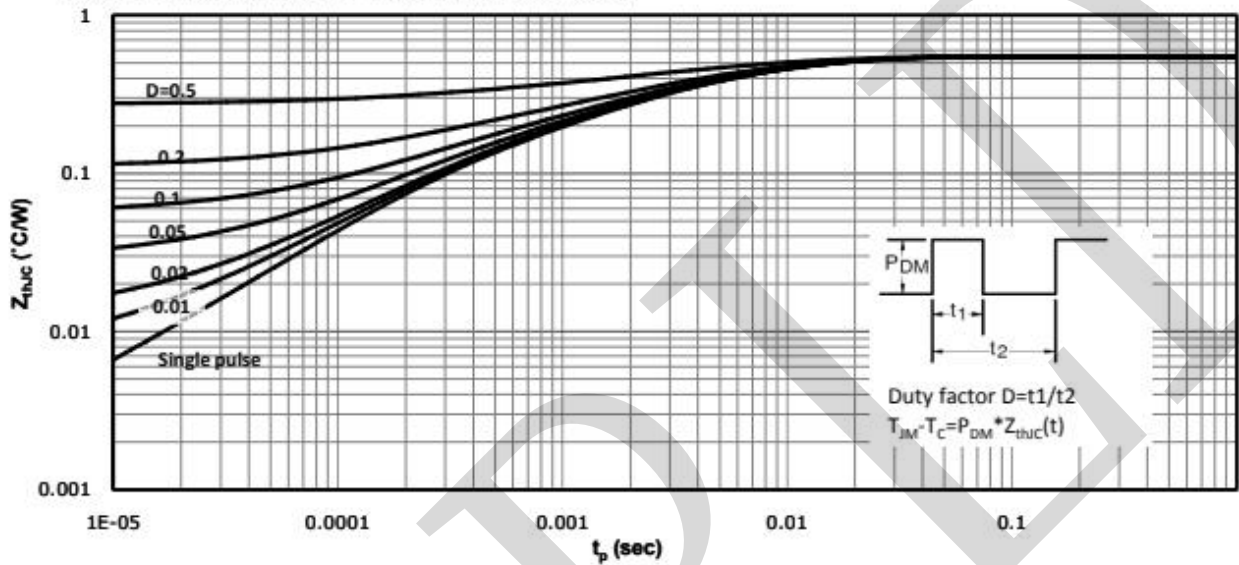


Fig 11: Safe Operating Area



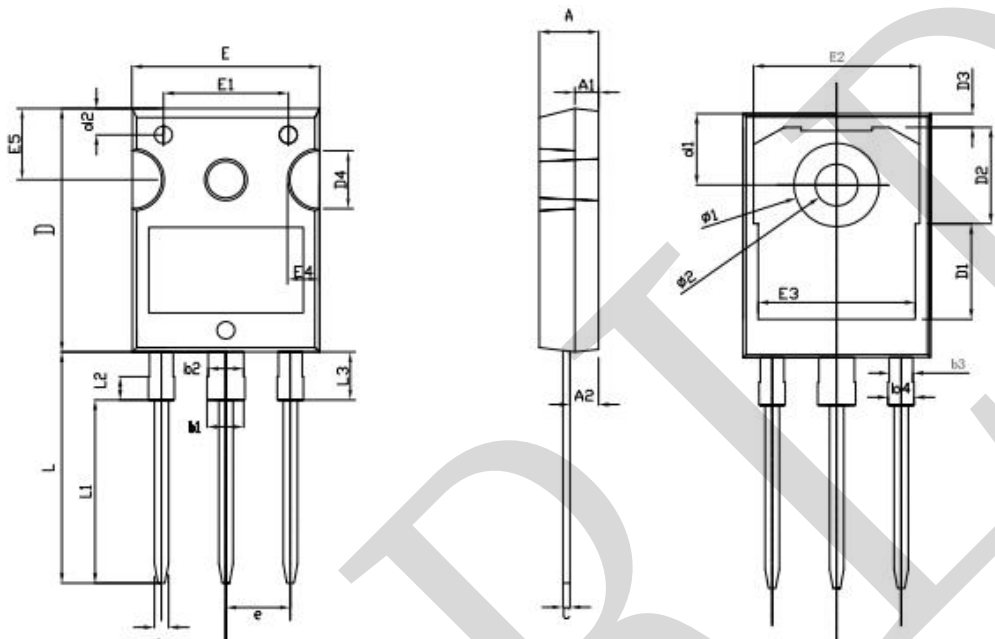
Typical Characteristics

Fig 12: Max. Transient Thermal Impedance

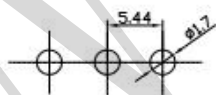


PACKAGE OUTLINE DIMENSIONS

TO-247



RECOMMENDED LAND PATTERN



UNIT: mm

	MIN	NOM	MAX
A	4.85	5.00	5.15
A1	1.90	2.00	2.10
A2	2.27	2.41	2.54
b	1.10	1.20	1.30
b1	2.90	-	3.20
b2	2.90	3.00	3.10
b3	1.90	2.00	2.10
b4	2.00	-	2.20
c	0.55	0.60	0.68
D	20.80	21.00	21.10
D1	-	8.23	-
D2	-	8.32	-
D3	-	1.17	-
D4	3.68	4.90	5.10
d1	6.04	6.15	6.30
d2	2.20	2.30	2.40
E	15.70	15.80	16.00
E1	-	10.50	-
E2	-	14.02	-
E3	-	13.50	-
E4	2.20	2.40	2.60
E5	5.49	5.80	6.00
e	5.34	5.44	5.54
L	19.72	19.92	20.12
L1	-	15.79	-
L2	-	1.98	-
L3	4.00	4.10	4.47
ø1	7.10	7.19	7.30
ø2	3.50	3.60	3.70