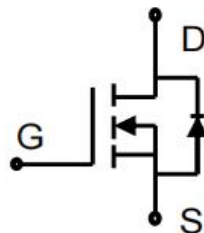


N-Channel SGT MOSFET 40V/215A

Parameter	Value	Unit
V _{DS}	40	V
R _{DS(on)}	1.17	mΩ
I _D	215	A



PDFN5X6

FEATURES

- Low Intrinsic Capacitances.
- Excellent Switching Characteristics.
- Extended Safe Operating Area.
- Unrivalled Gate Charge :Q_g= 43 nC (Typ.).
- V_{DSS}= 40 V,I_D=215 A
- R_{DS(on)} : 1.17mΩ (Typ) @V_G=-10 V
- 100% Avalanche Tested

APPLICATIONS

- PWM application
- Hard switched and high frequency circuit
- Power management

MAXIMUM RATED VALUES(at TC=25°C unless otherwise specified)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage (V _{GS} =0V)	V _{DS}	40	V
Gate-Source Voltage (V _{DS} =0V)	V _{GS}	±20	V
Drain Current-Continuous(TC=25°C)	I _D	215	A
Drain Current-Continuous(TC=100°C)		154	A
Drain Current-Continuous@ Current-Pulsed	I _{DM} (pluse)	860	A
Maximum Power Dissipation(TC=25°C)	P _D	115	W
Maximum Power Dissipation(TC=100°C)		60	W
Avalanche energy (I _D =40A,R _g =25Ω) ^[1]	E _{AS}	399	mJ
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55 To 150	°C

Notes:1.EAS is tested at starting T_J = 25°C, L = 0.5mH, I_{AS} =40A, V_{GS} = 10V.

THERMAL CHARACTERISTICS

Parameter	Symbol	Typ	Max	Unit
Thermal resistance, junction – case.	R _{θJC}		1.30	°C/W
Thermal resistance, junction – ambient(min. footprint)	R _{θJA}		47	°C/W

ELECTRICAL CHARACTERISTICS (at $T_J = 25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Condition	Value			Unit
			min.	typ.	max.	
Static Characteristic						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	40	-	-	V
		V _{GS} =0V, I _D =1mA	40	-	-	V
Gate threshold voltage	V _{GS} (th)	V _D =V _{GS} ,I _D =250uA	2	3	4	V
Zero gate voltage drain current	I _{DSS}	V _D =40V,V _{GS} =0V T _j =25°C T _j =125°C	- -	- -	1 100	μA
Gate-source leakage current	I _{GSS}	V _{GS} =±20V,V _D =0V	0	-	±100	nA
Drain-source on-state resistance	R _D S(on)	V _{GS} =10V, I _D =20A	-	1.17	1.45	mΩ
		V _{GS} =7V, I _D =20A		1.60	2.50	
Transconductance	g _{fs}	V _D =5V, I _D =20A	-	73.7	-	S
Dynamic Characteristic						
Input Capacitance	C _{iss}	V _{GS} =0V, V _D =20V, f=1MHz	1807	2710	4065	pF
Output Capacitance	C _{oss}		542	813	1219.5	
Reverse Transfer Capacitance	C _{rss}		23	69	207	
Gate Total Charge	Q _G	V _{GS} =10V, V _D =20V, I _D =20A	22	43	87	nC
Gate-Source charge	Q _{gs}		8	15	30	
Gate-Drain charge	Q _{gd}		5	9	18	
Turn-on delay time	t _d (on)	V _{GS} =10V, V _{DD} =20V, R _{G_ext} =3Ω I _D =20A	6	12	23	ns
Rise time	t _r		17	34	68	
Turn-off delay time	t _d (off)		22	44	88	
Fall time	t _f		10	21	41	
Gate resistance	R _G	V _{GS} =0V, V _D =0V, f=1MHz	-	5	10	Ω

Body Diode Characteristic

Parameter	Symbol	Test Condition	Value			Unit
			min.	typ.	max.	
Body Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _{SD} =20A	-	0.8	1.3	V
Body Diode Reverse Recovery Time	t _{rr}	I _F =20A, dI/dt=100A/ μ s	16	32	64	ns
Body Diode Reverse Recovery Charge	Q _{rr}		11	22	45	nC

CHARACTERISTICS DIAGRAMS

Fig 1: Output Characteristics

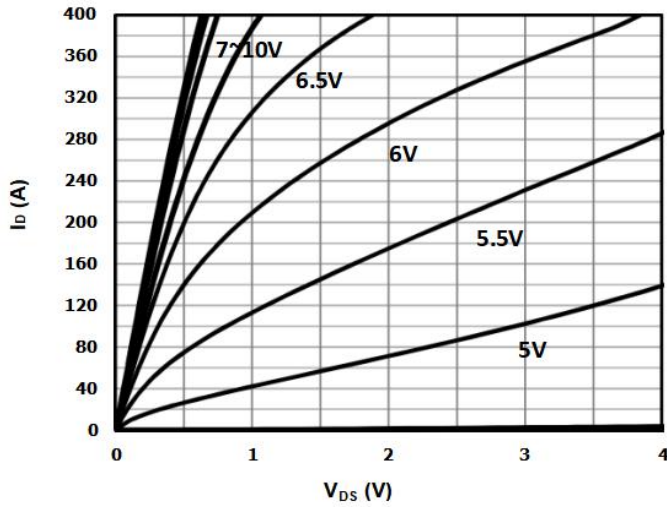


Fig 2: Transfer Characteristics

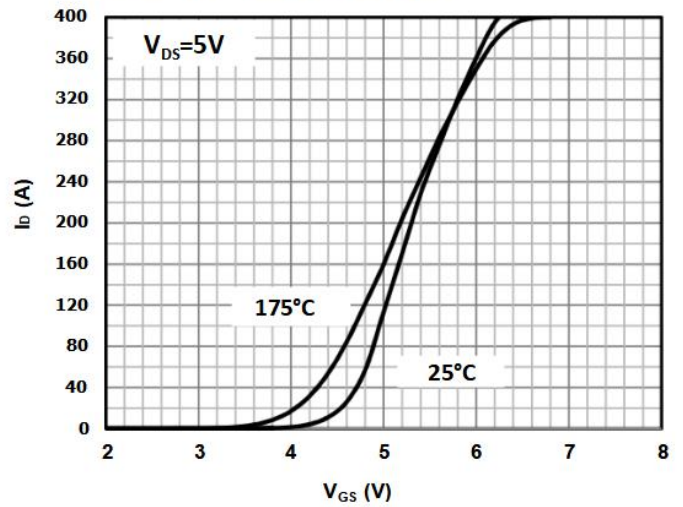


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

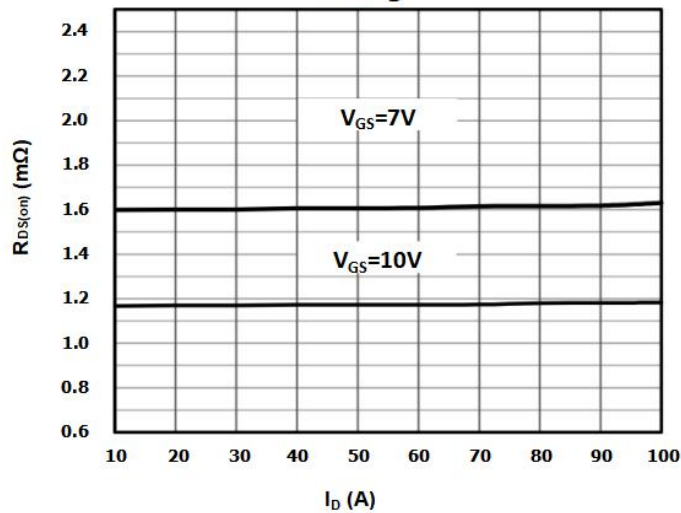


Fig 4: $R_{DS(on)}$ vs Gate Voltage

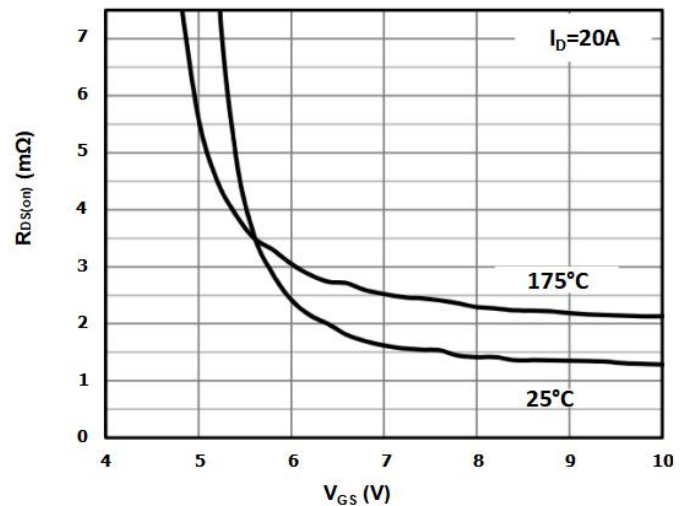


Fig 5: $R_{DS(on)}$ vs. Temperature

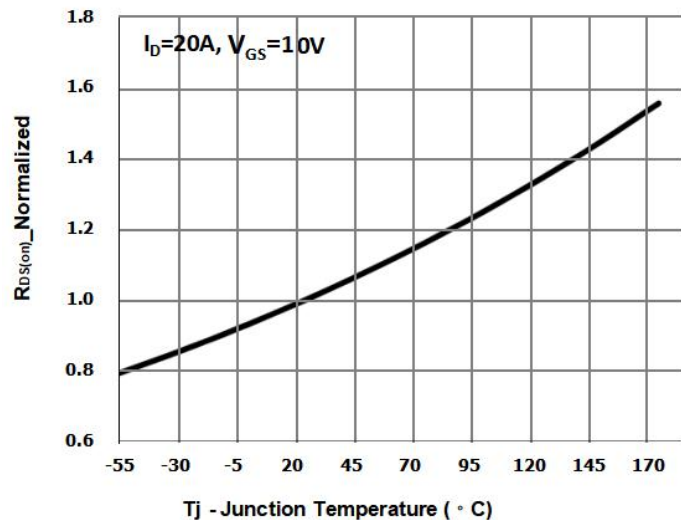


Fig 6: $V_{GS(th)}$ vs. Temperature

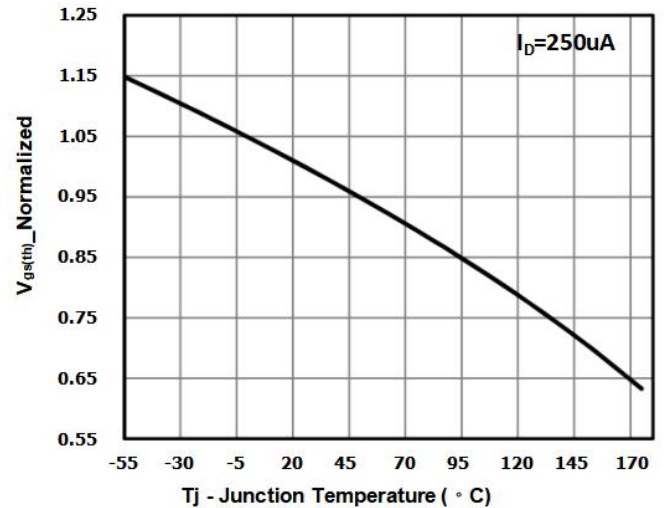


Fig 7: BVdss vs. Temperature

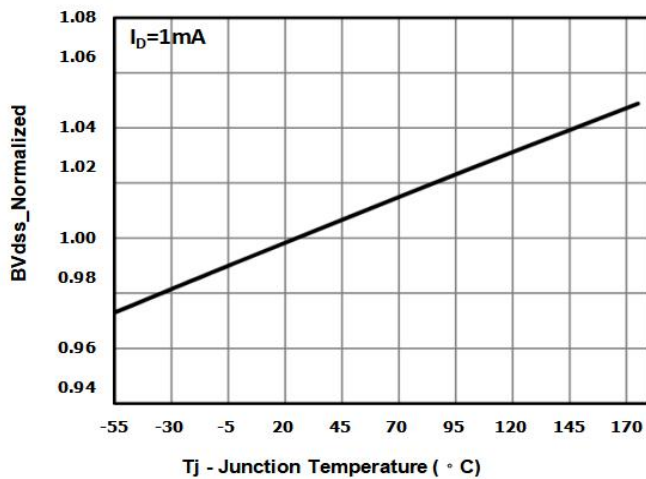


Fig 8: Capacitance Characteristics

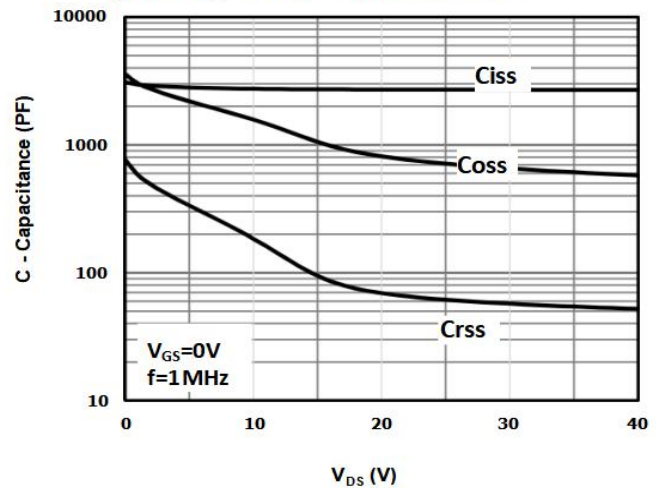


Fig 9: Gate Charge Characteristics

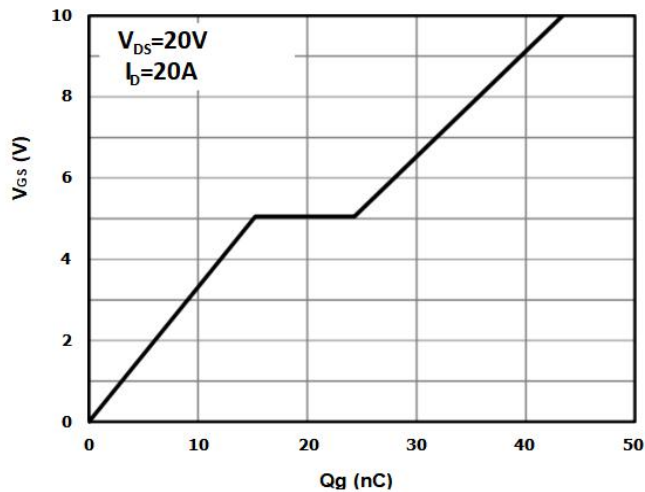


Fig 10: Body-diode Forward Characteristics

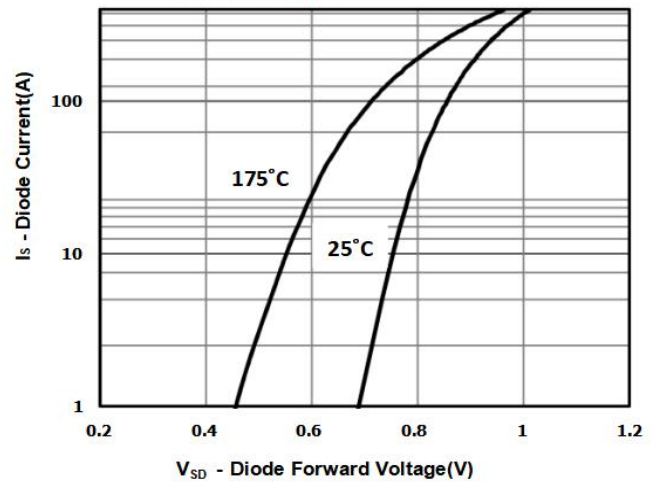


Fig 11: Power Dissipation

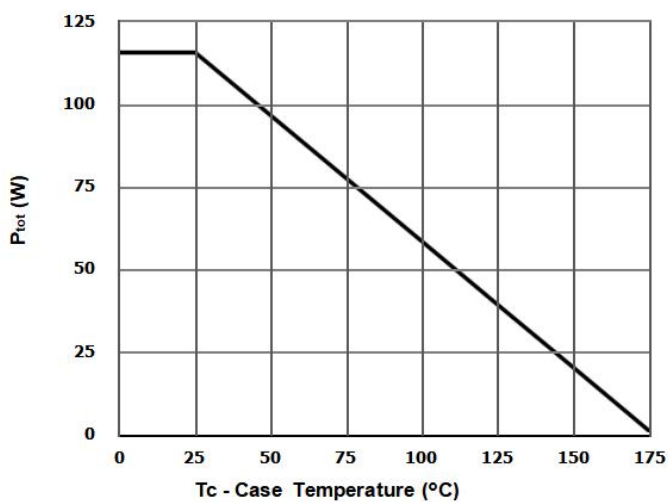


Fig 12: Drain Current Derating

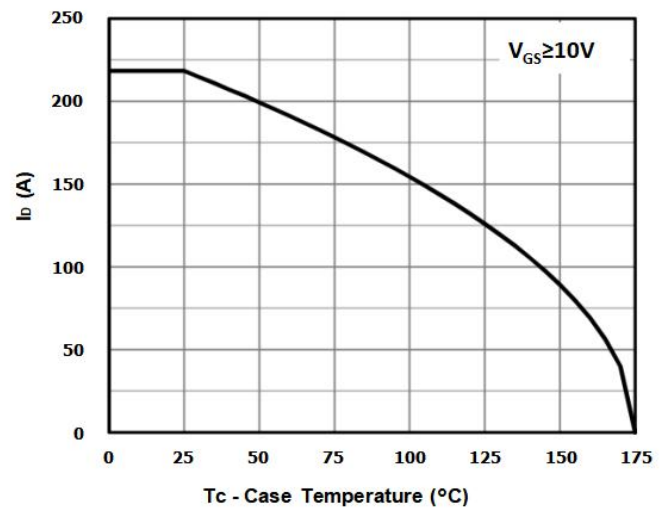


Fig 13: Safe Operating Area

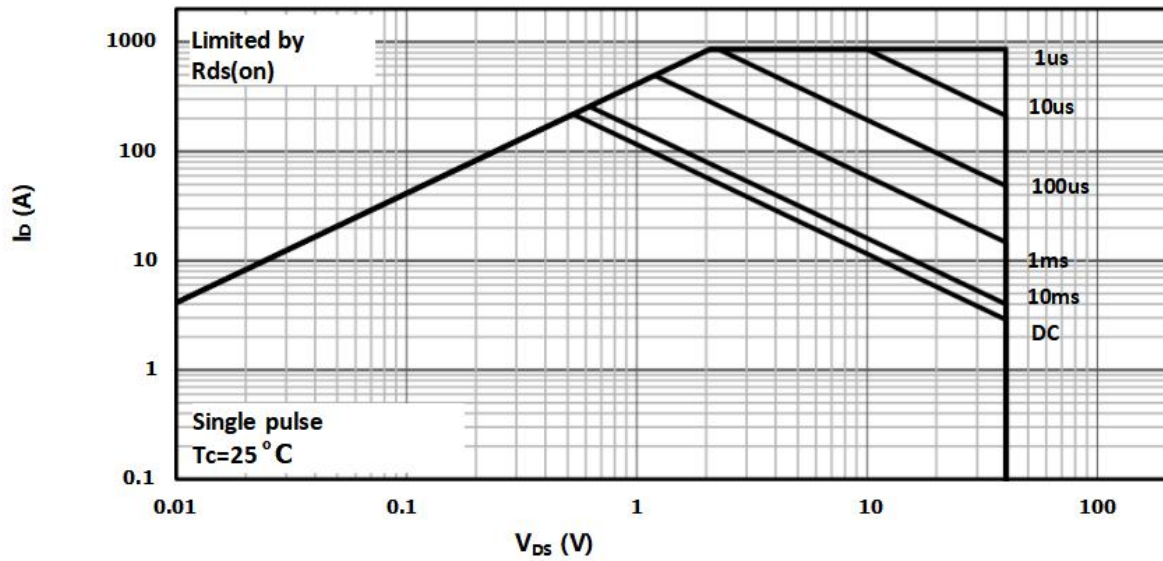
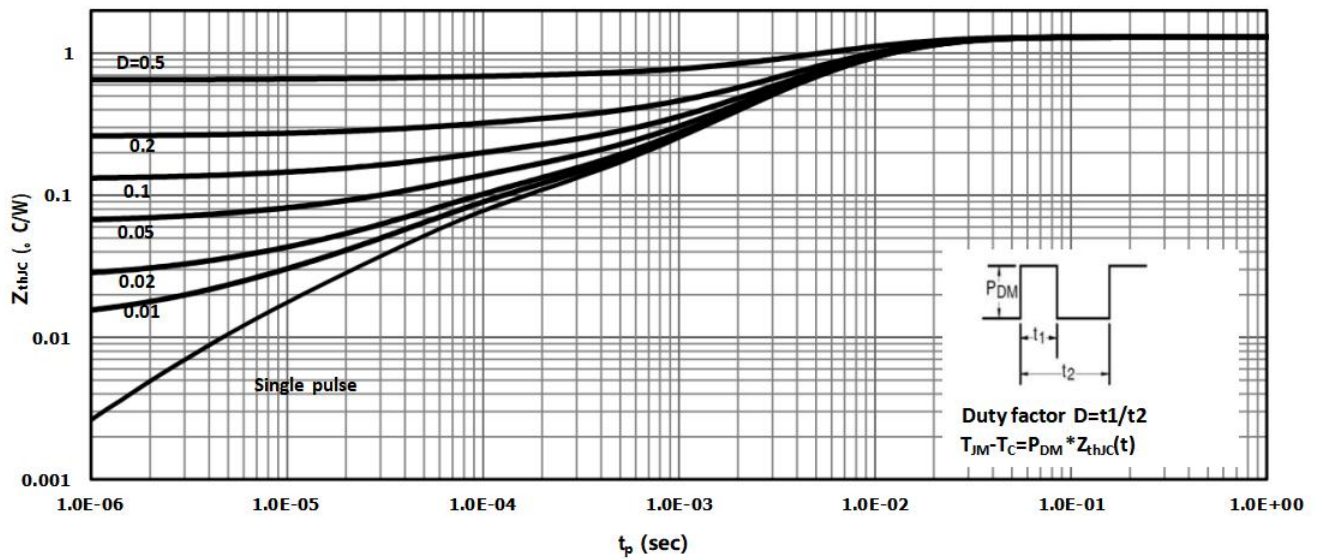
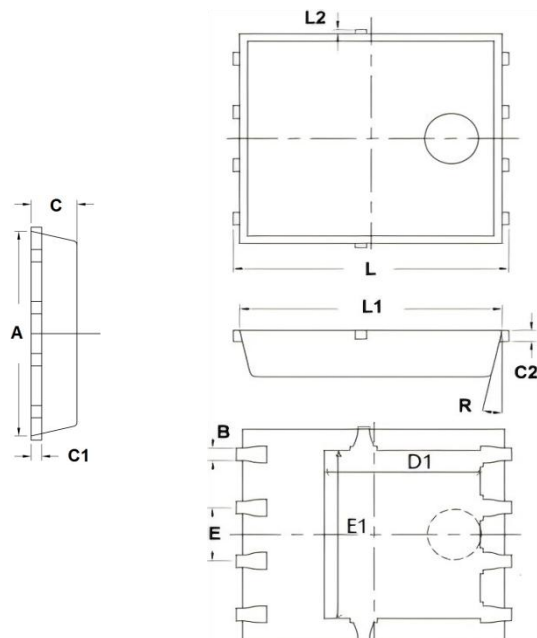


Fig 14: Max. Transient Thermal Impedance



PACKAGE OUTLINE



Dim.	Min.	Max.
A	4.8	5.2
B	0.25	0.35
C	1	1.2
C1	Typ0.254	
C2	Typ0.254	
D1	3.35	3.81
E	Typ1.27	
E1	3.9	4.18
L	6	6.3
L1	5.7	6
L2	MAX 0.2	
R	Typ 13°	
All Dimensions in millimeter		

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