Description

The SX420N06T uses advanced technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 10V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

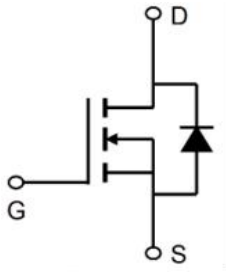
V_{DS} = 60V I_D =300A

$R_{DS(ON)}$ < 2.0mΩ @ V_{GS}=10V

Application

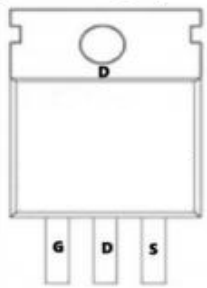
Battery protection

UPS



TO-263-3L





Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	60	V
VGS	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current[1,6]	420	A
I_D@T_C=100℃	Continuous Drain Current[1,6]	238	A
IDM	Pulsed Drain Current[2]	1340	A
EAS	Single Pulse Avalanche Energy[3]	580	mJ
IAS	Avalanche Current	47	A
P_D@T_C=25℃	Total Power Dissipation[4]	231	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	62.5	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	0.65	℃/W

Electrical Characteristics (T_J=25℃, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Type	Max	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	60	66	-	V
IGSS	Gate-body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
IDSS T_J=25°C	Zero Gate Voltage Drain Current	V_{DS} = 60V, V_{GS} = 0V	-	-	1	μA
IDSS T_J=100°C	Zero Gate Voltage Drain Current		-	-	100	
VGS(th)	Gate-Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2.0	2.9	4.0	V
RDS(on)	Drain-Source On-Resistance[4]	V_{GS} = 10V, I_D = 20A	-	1.8	2.0	mΩ
gfs	Forward Transconductance[4]	V_{DS} = 5V, I_D = 20A	-	97	-	S
Ciss	Input Capacitance	V_{DS} = 30V, V_{GS} =0V, f =1MHz	-	7312	-	pF
Coss	Output Capacitance		-	2239	-	
Crss	Reverse Transfer Capacitance		-	53	-	
RG	Gate Resistance	f =1MHz	-	3.0	-	Ω
Q_g	Total Gate Charge	V_{GS} = 10V, V_{DS} = 30V, I_D= 20A	-	102	-	nC
Qgs	Gate-Source Charge		-	25	-	
Qgd	Gate-Drain Charge		-	15.8	-	
td(on)	Turn-on Delay Time	V_{GS} =10V, V_{DD} = 30V, R_G = 3Ω, I_D= 20A	-	24	-	ns
t_r	Rise Time		-	71	-	
td(off)	Turn-off Delay Time		-	129	-	
t_f	Fall Time		-	92	-	
trr	Body Diode Reverse Recovery Time	I_F=20A , dI/dt=100A/μs	-	86	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	61	-	nC
VSD	Diode Forward Voltage[4]	I_S = 20A, V_{GS} = 0V	-	-	1.2	V
IS	Continuous Source Current T_C=25°C		-	-	300	A

Note：

1、The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.

2、The data tested by pulsed , pulse width .The EAS data shows Max. rating .

3、The power dissipation is limited by 175℃ junction temperature

4、EAS condition: TJ=25℃, VDD=48V, VG=10V, RG=25Ω, L=0.1mH, IAS= 55A

5、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

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Typical Characteristics

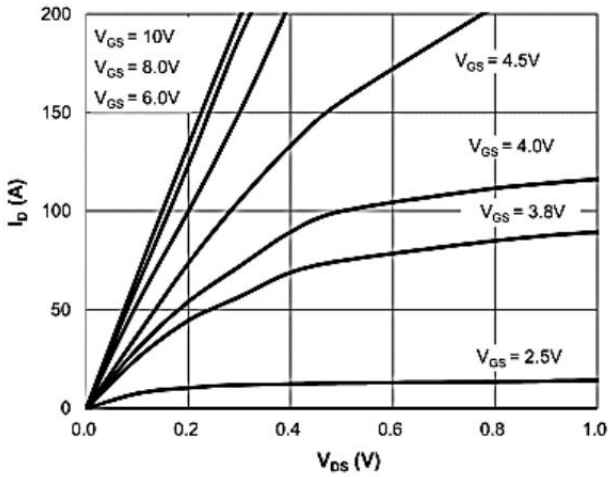


Figure 1: Saturation Characteristics

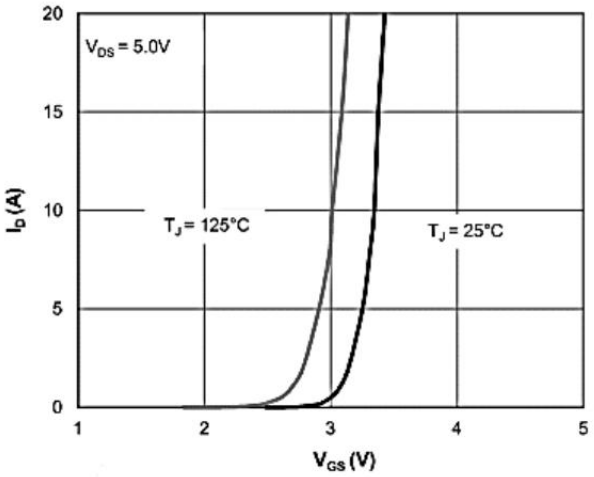


Figure 2: Transfer Characteristics

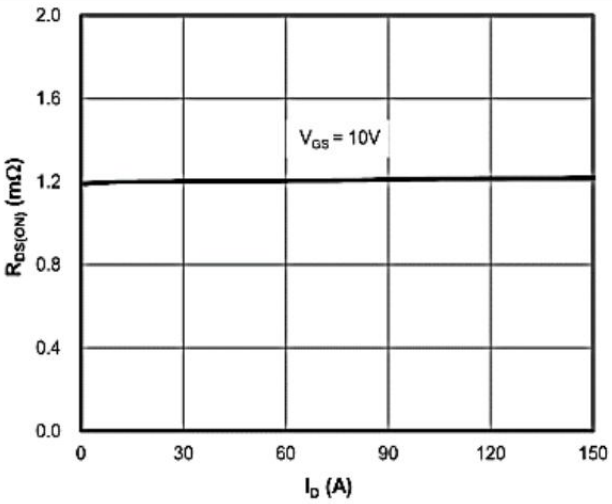


Figure 3: $R_{DS(ON)}$ vs. Drain Current

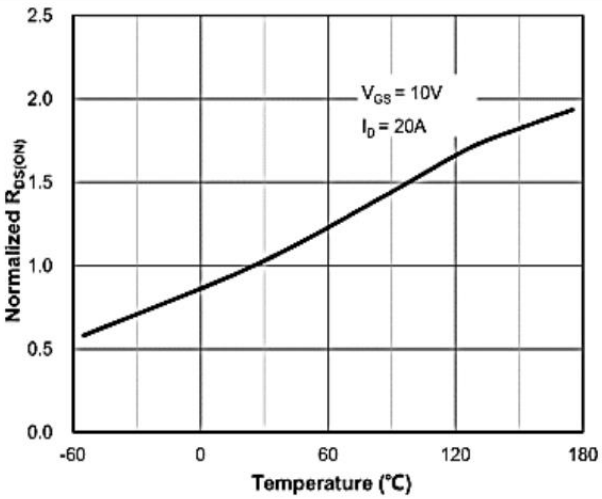


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

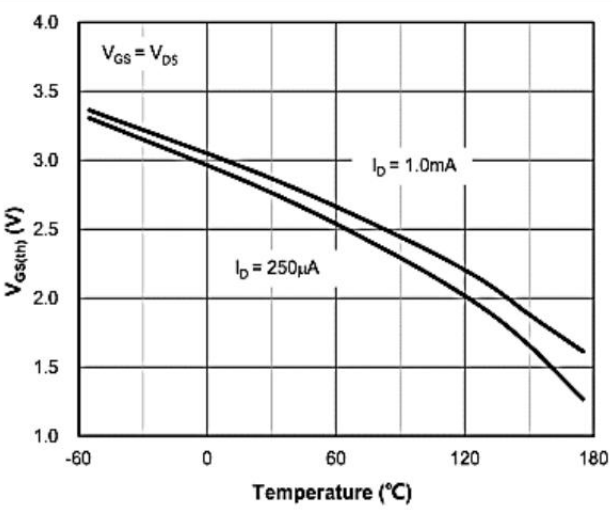


Figure 5: $V_{GS(th)}$ vs. Junction Temperature

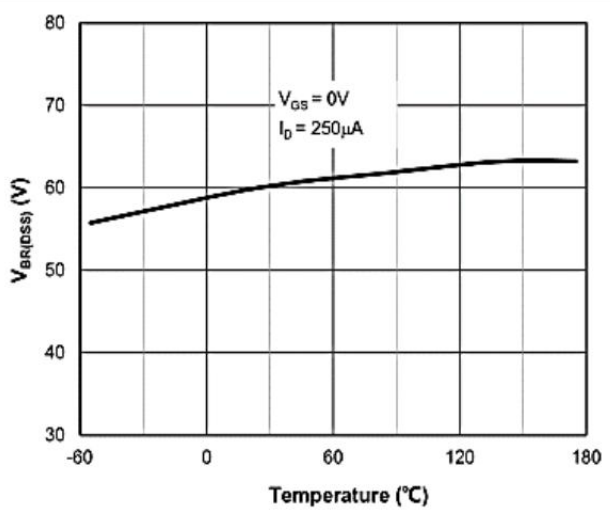


Figure 6: $V_{BR(DSS)}$ vs. Junction Temperature

Typical Characteristics

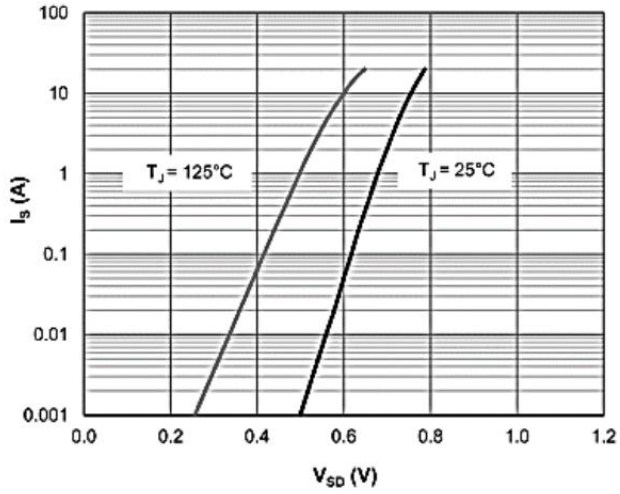


Figure 7: Body-Diode Characteristics

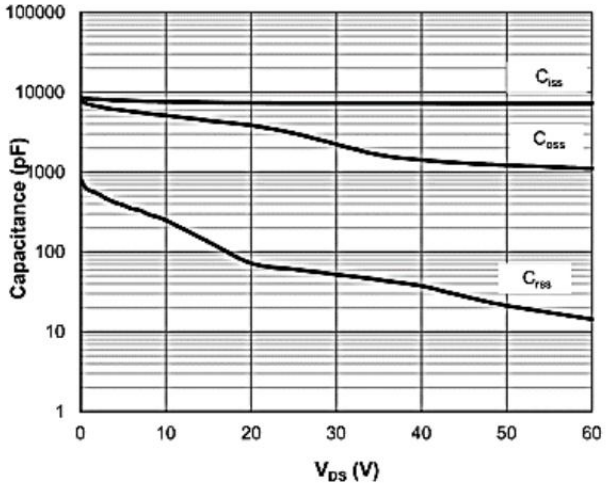


Figure 8: Capacitance Characteristics

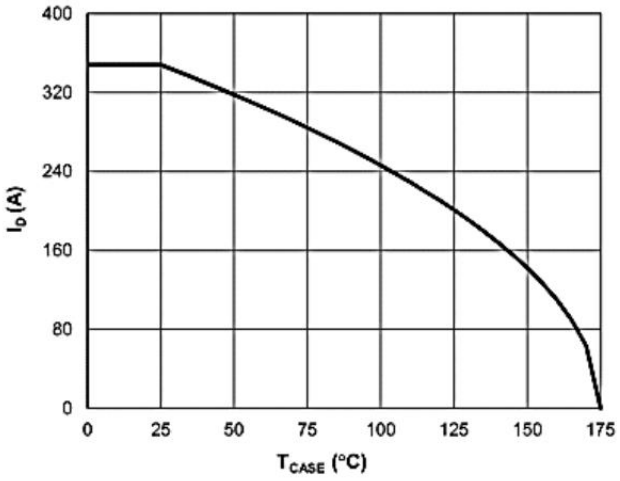


Figure 9: Current De-rating

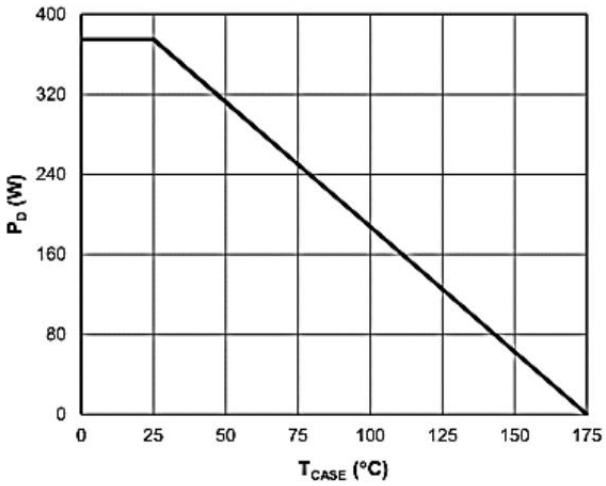


Figure 10: Power De-rating

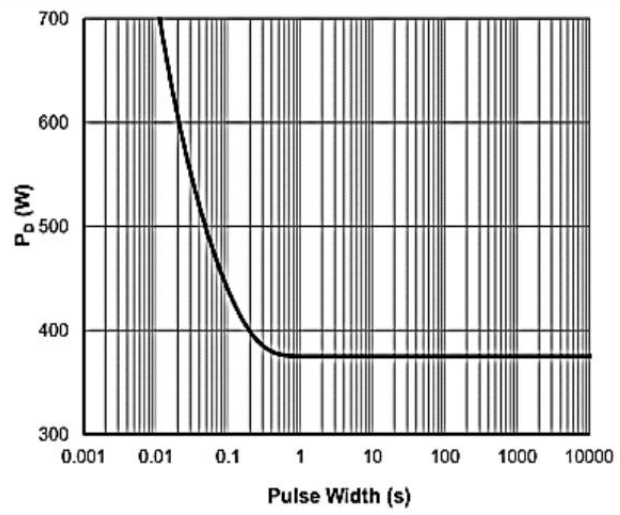


Figure 11: Single Pulse Power Rating, Junction-to-Case

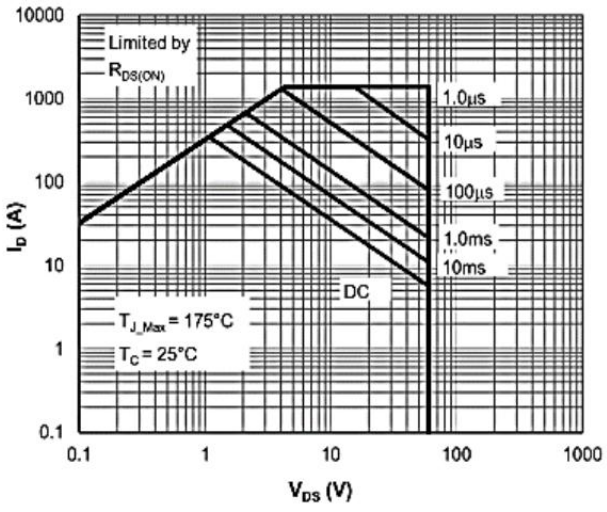


Figure 12: Maximum Safe Operating Area

Typical Characteristics

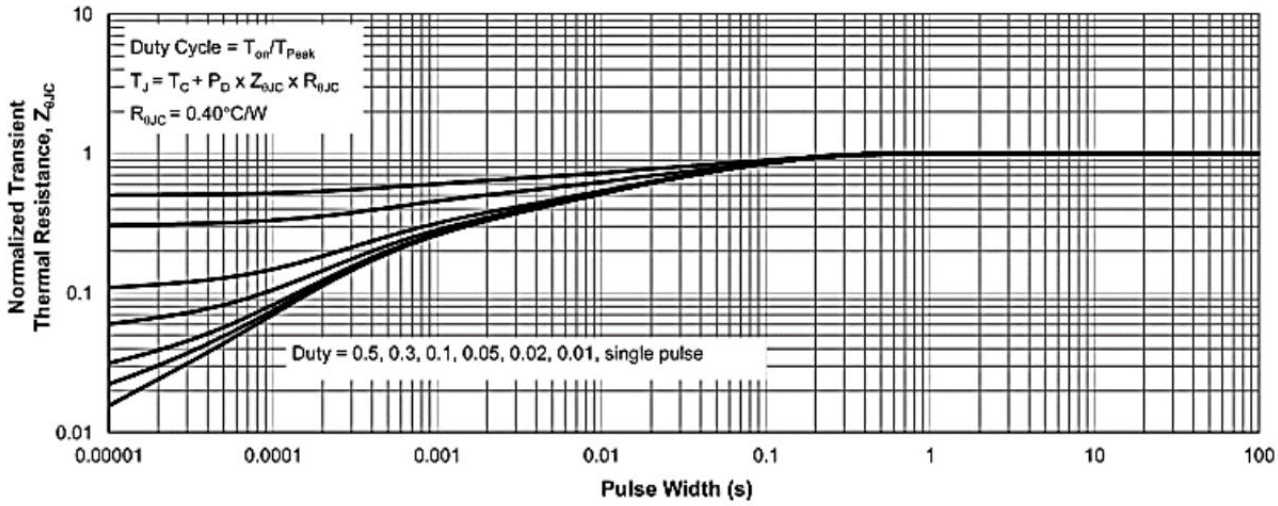
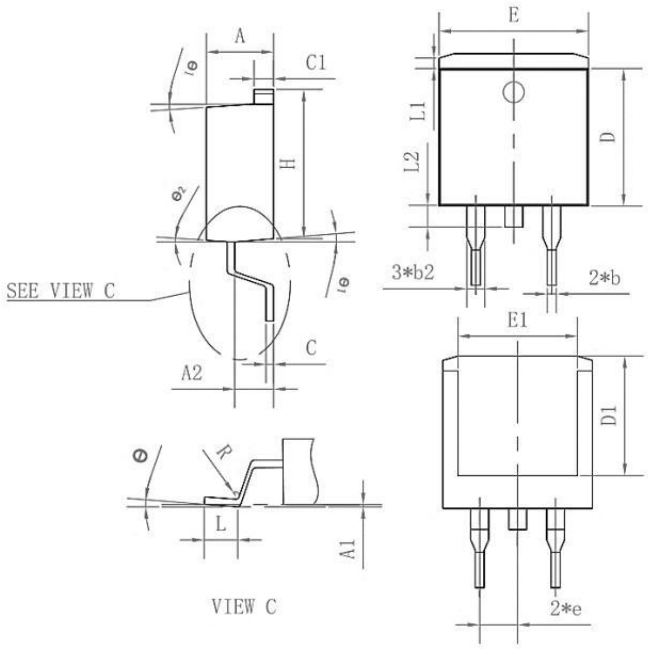


Figure 13: Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-TO-263-3L



Symbol	Common		
	mm		
	Mim	Nom	Max
A	4.35	4.47	4.60
A1	0.09	0.10	0.11
A2	2.30	2.40	2.70
b	0.70	0.80	1.00
b2	1.25	1.36	1.50
C	0.45	0.50	0.65
C1	1.29	1.30	9.40
D	9.10	9.20	9.30
D1	7.90	8.00	8.10
E	9.85	10.00	10.20
E1	7.90	8.00	8.10
H	15.30	15.50	15.70
e	-	2.54	-
L	2.34	2.54	2.74
L1	1.00	1.10	1.20
L2	1.30	1.40	1.50
R	0.24	0.25	0.26
θ	0°	4°	8°
Θ1	4°	7°	10°
Θ2	0°	3°	6°

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	TO-263-3L		800