

Description

The SX65N03DF uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

$V_{DS}=30V$ $I_D=65A$

$R_{DS(ON)} < 5.5m\Omega$ @ $V_{GS}=10V$

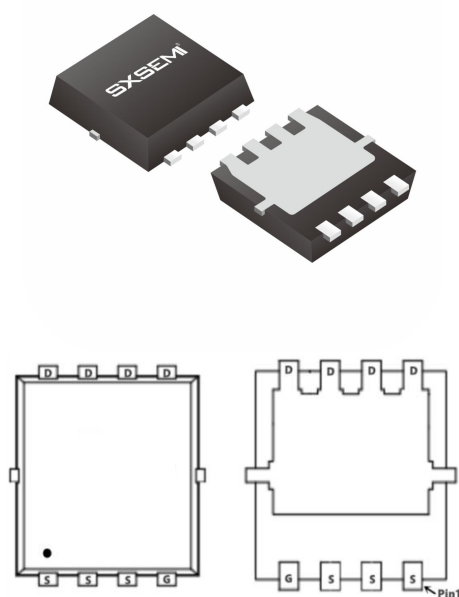
Application

Battery protection

Load switch

Uninterruptible power supply

PDFN3*3-8L



Absolute Maximum Ratings ($T_C=25^{\circ}C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^{\circ}C$	Continuous Drain Current, V_{GS} @ 10V ¹	65	A
$I_D@T_C=75^{\circ}C$	Continuous Drain Current, V_{GS} @ 10V ¹	45	A
I_{DM}	Pulsed Drain Current ²	240	A
EAS	Single Pulse Avalanche Energy ³	256	mJ
I_{AS}	Avalanche Current	15	A
$P_D@T_C=25^{\circ}C$	Total Power Dissipation ⁴	46	W
$P_D@T_A=25^{\circ}C$	Total Power Dissipation ⁴	2.72	W
T_{STG}	Storage Temperature Range	-55 to 175	$^{\circ}C$
T_J	Operating Junction Temperature Range	-55 to 175	$^{\circ}C$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	62	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	2.72	$^{\circ}C/W$

Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30	33	-	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} = 0V,	-	-	1.0	μA
IGSS	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±20V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D =250μA	1.0	1.6	2.5	V
RDS(on)	Static Drain-Source on-Resistance	V _{GS} =10V, I _D =30A	-	4.0	5.5	mΩ
		V _{GS} =4.5V, I _D =20A	-	6.1	8.5	
Ciss	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f = 1.0MHz	-	1614	-	pF
Coss	Output Capacitance		-	245	-	pF
Crss	Reverse Transfer Capacitance		-	215	-	pF
Q _g	Total Gate Charge	V _{DS} =15V, I _D =30A, V _{GS} =10V	-	33.7	-	nC
Q _{gs}	Gate-Source Charge		-	8.5	-	nC
Q _{gd}	Gate-Drain("Miller") Charge		-	7.5	-	nC
td(on)	Turn-on Delay Time	V _{DS} =15V, I _D =30A, R _{GEN} =3Ω, V _{GS} =10V	-	7.5	-	ns
t _r	Turn-on Rise Time		-	14.5	-	ns
td(off)	Turn-off Delay Time		-	35.2	-	ns
t _f	Turn-off Fall Time		-	9.6	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	70	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	280	A
VSD	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _S =30A	-	-	1.2	V

Note :

- 1、 The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2、 The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3、 The EAS data shows Max. rating . The test condition is VDD=24V, VGS=10V, L=0.5mH, IAS=18A
- 4、 The power dissipation is limited by 175°C junction temperature
- 5、 The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

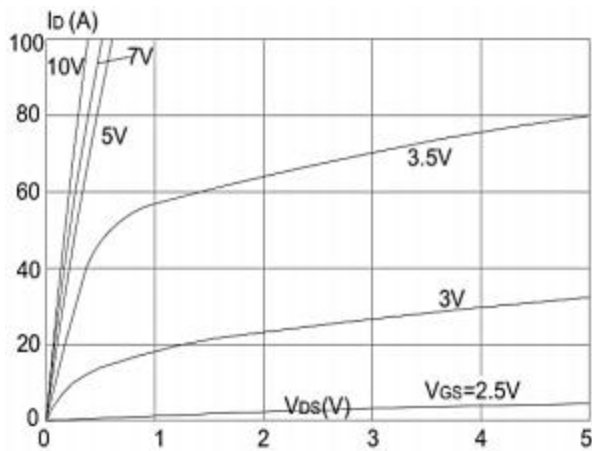


Figure 1: Output Characteristics

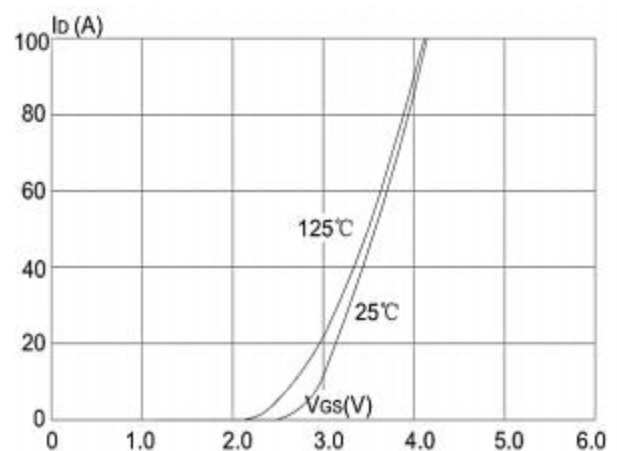


Figure 2: Typical Transfer Characteristics

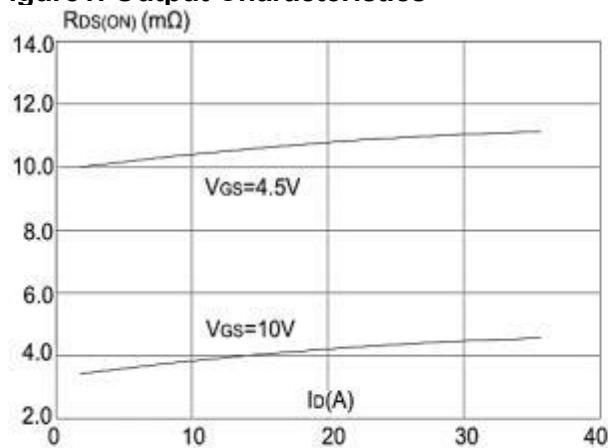


Figure 3: On-resistance vs. Drain Current

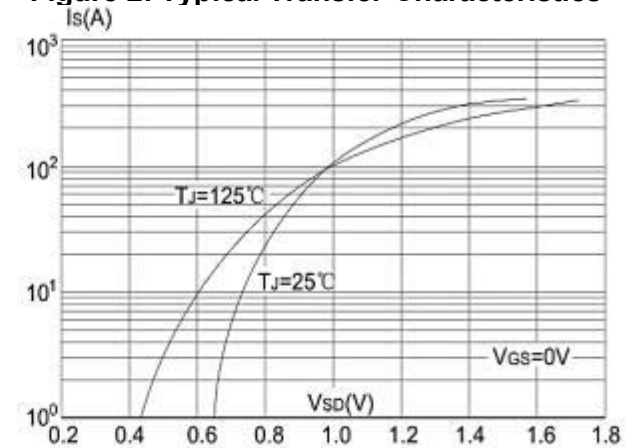


Figure 4: Body Diode Characteristics

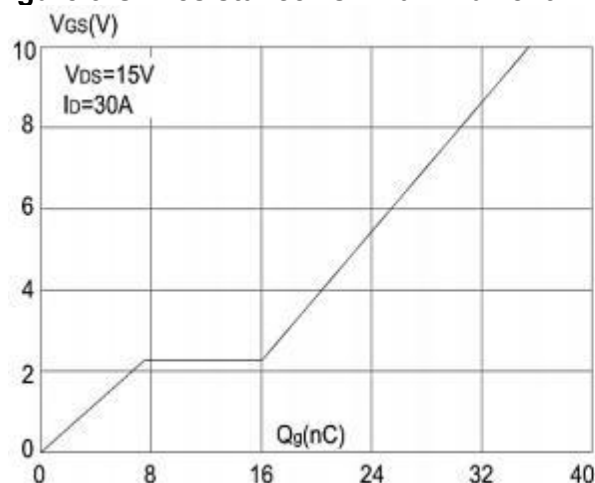


Figure 5: Gate Charge Characteristics

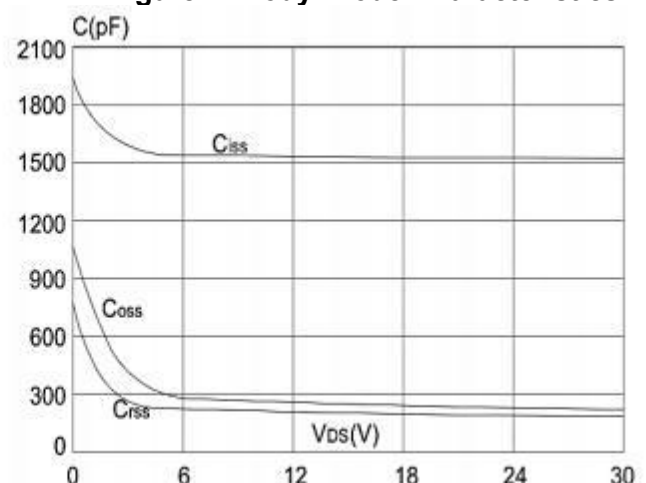


Figure 6: Capacitance Characteristics

Typical Characteristics

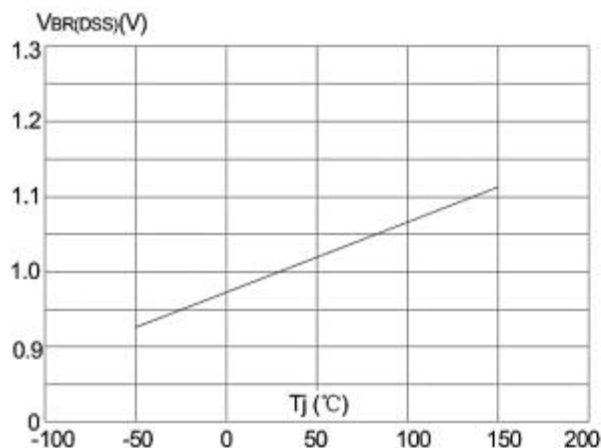


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

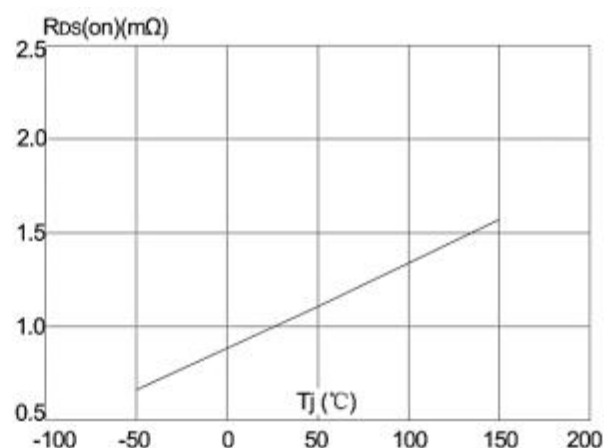


Figure 8: Normalized on Resistance vs. Junction Temperature

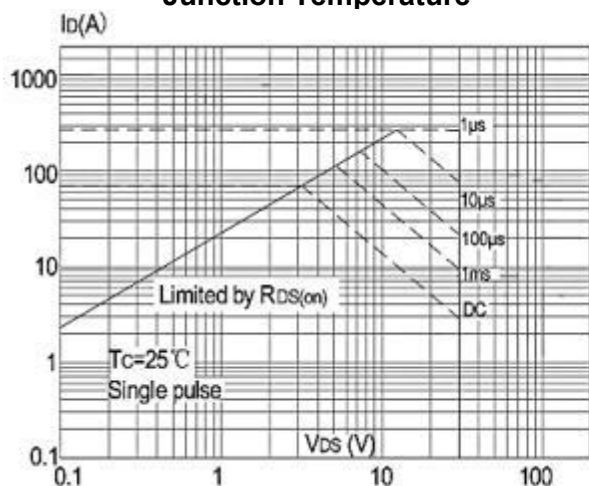


Figure 9: Maximum Safe Operating Area vs. Case Temperature

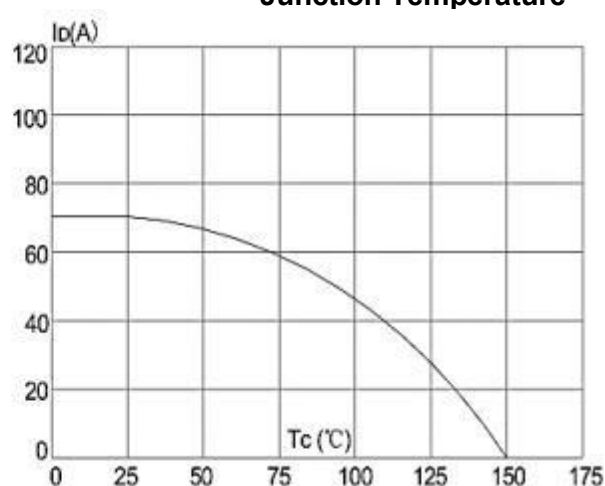


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

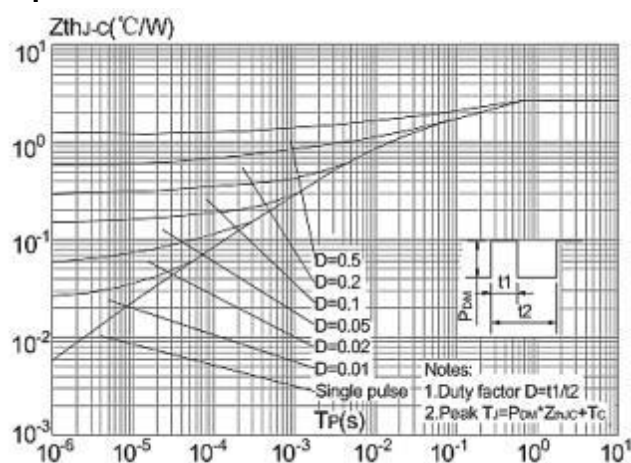
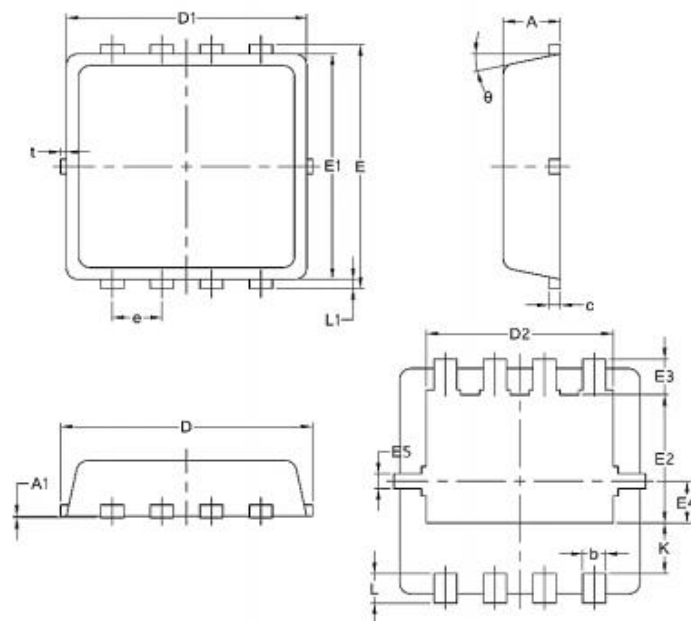


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ca

Package Mechanical Data-PDFN3*3-8L-JQ Single


Symbol	Common		
	mm		
	Mim	Nom	Max
A	0.70	0.75	0.85
A1	/	/	0.05
b	0.20	0.30	0.40
c	0.10	0.152	0.25
D	3.15	3.30	3.45
D1	3.00	3.15	3.25
D2	2.29	2.45	2.65
E	3.15	3.30	3.45
E1	2.90	3.05	3.20
E2	1.54	1.74	1.94
E3	0.28	0.48	0.65
E4	0.37	0.57	0.77
E5	0.10	0.20	0.30
e	0.60	0.65	0.70
K	0.59	0.69	0.89
L	0.30	0.40	0.50
L1	0.06	0.125	0.20
t	0	0.075	0.13
Φ	10	12	14

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	PDFN3*3-8L		5000