



Description

The SQ7414AEN-T1_BE3 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

$V_{DS} = 60V$ $I_D = 20A$

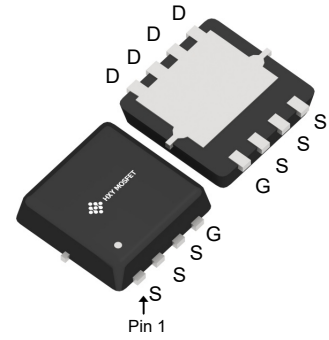
$R_{DS(ON)} < 30m\Omega$ @ $V_{GS}=10V$

Application

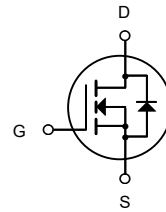
Battery protection

Load switch

Uninterruptible power supply



DFN3X3-8L



N-Channel MOSFET

Ordering Information

Product ID	Pack	Brand	Qty(PCS)
SQ7414AEN-T1_BE3	DFN3X3-8L	HXY MOSFET	5000

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

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	60	V
VGS	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, V_{GS} @ 10V	20	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, V_{GS} @ 10V	14	A
IDM	Pulsed Drain Current	90	A
EAS	Single Pulse Avalanche Energy	42	mJ
$P_D@T_C=25^\circ C$	Total Power Dissipation	33	W
TSTG	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance Junction-ambient	62	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case	3.79	$^\circ C/W$



Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	60	---	---	V
I_{DSS}	Drain-Source Leakage Current	$V_{GS}=0V, V_{DS}=60V$	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	± 100	nA
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1.2	1.8	2.5	V
$R_{DS(ON)}$	Drain-Source On Resistance ³	$V_{GS}=10V, I_D=20A$	---	24	30	m Ω
		$V_{GS}=4.5V, I_D=20A$	---	31	40	
C_{ISS}	Input Capacitance	$V_{DS}=30V, V_{GS}=0V,$ $f=1MHz$	---	1060	---	pF
C_{OSS}	Output Capacitance		---	64	---	
C_{RSS}	Reverse Transfer Capacitance		---	54	---	
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=30V,$ $V_{GS}=10V,$ $I_D=20A, R_G=3\Omega$	---	8.4	---	ns
t_r	Rise Time		---	8.5	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	36	---	ns
t_f	Fall Time		---	5	---	ns
Q_g	Total Gate Charge	$V_{DS}=30V, V_{GS}=10V,$ $I_D=20A$	---	26	---	nC
Q_{gs}	Gate-Source Charge		---	5.7	---	nC
Q_{gd}	Gate-Drain "Miller" Charge		---	5.2	---	nC
I_S	Continuous Source Current	$V_G=V_D=0V$	---	---	20	A
I_{SM}	Pulsed Source Current	$V_G=V_D=0V$	---	---	90	A
V_{SD}	Forward on voltage	$I_S=20A, V_{GS}=0V$	---	---	1.2	V
T_{rr}	Body Diode Reverse Recovery Time	$I_F=20A, di/dt=100A/\mu s$	---	18	---	nS
Q_{rr}	Body Diode Reverse Recovery Charge		---	13	---	nC

Notes:

- 1) $L=0.5mH, V_{DD}=30V, \text{Start } T_J=25^{\circ}\text{C}$.
- 2) Limited by maximum junction temperature.
- 3) Repetitive Rating: Pulse width limited by maximum junction temperature



Typical Characteristics

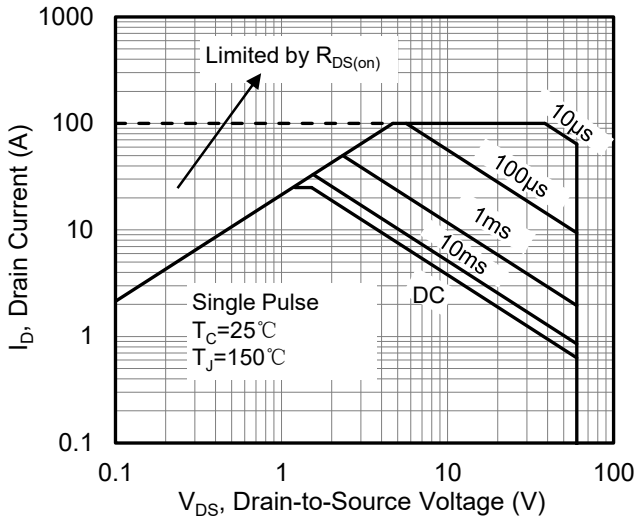


Figure 1. Maximum Safe Operating Area

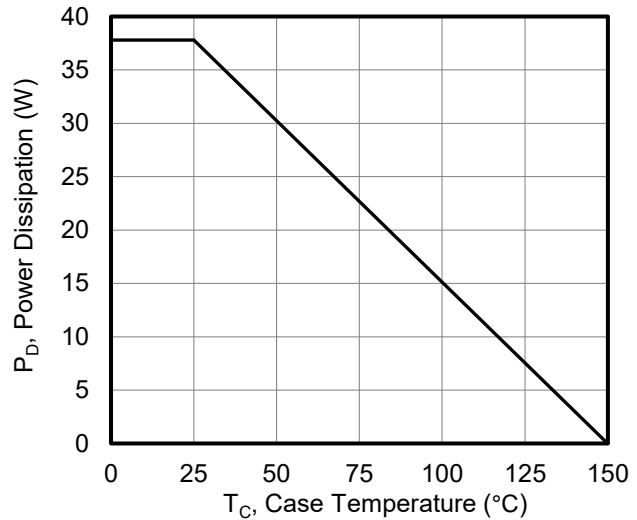


Figure 2. Maximum Power Dissipation vs. Case Temperature

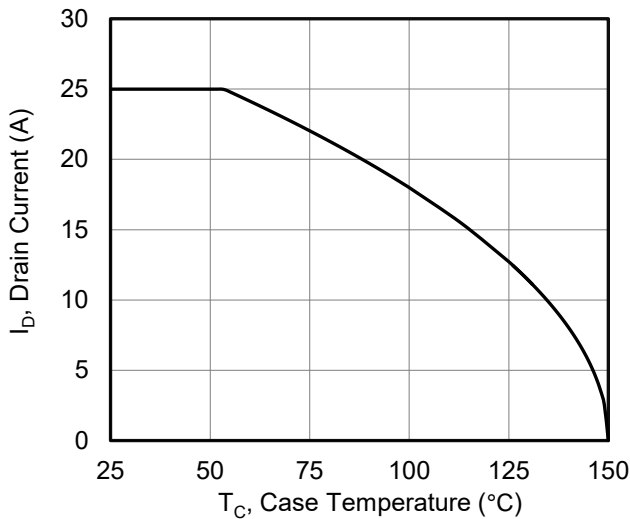


Figure 3. Maximum Continuous Drain Current vs. Case Temperature

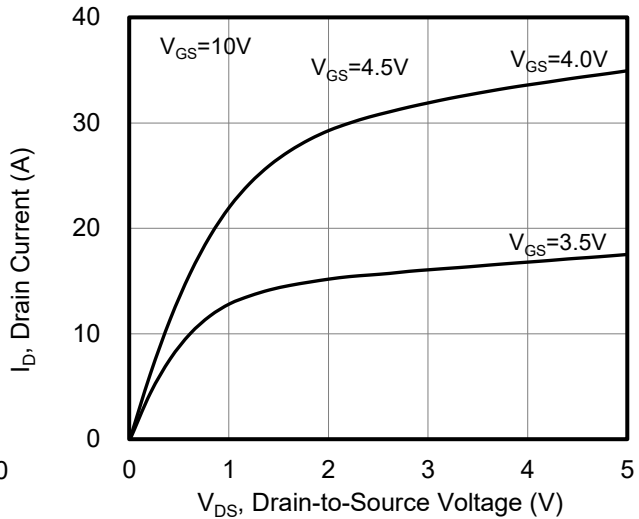


Figure 4. Typical output Characteristics

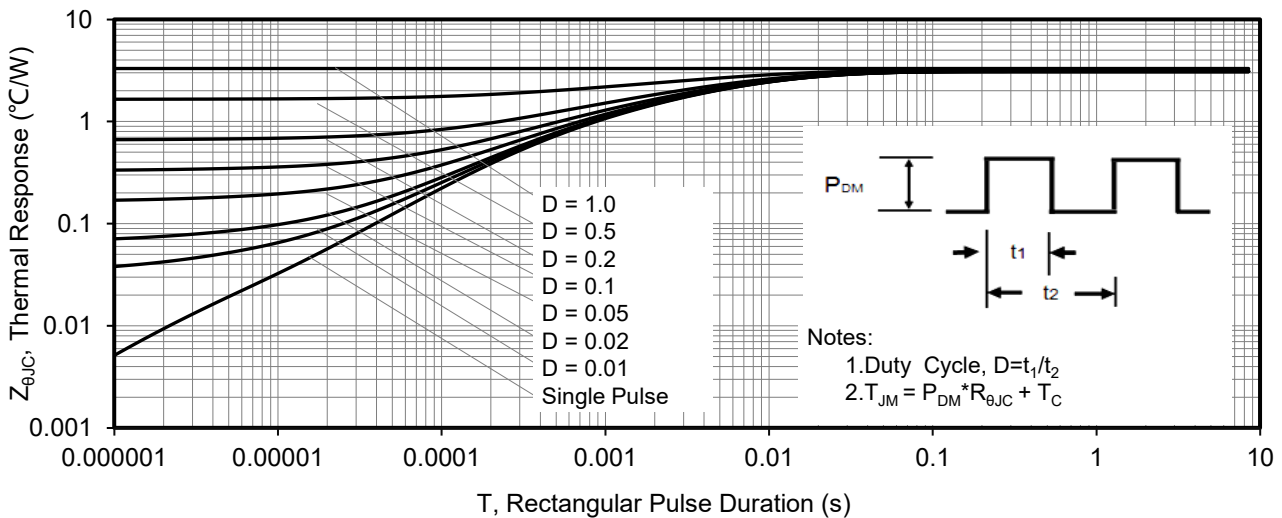


Figure 5. Maximum Effective Thermal Impedance, Junction to Case

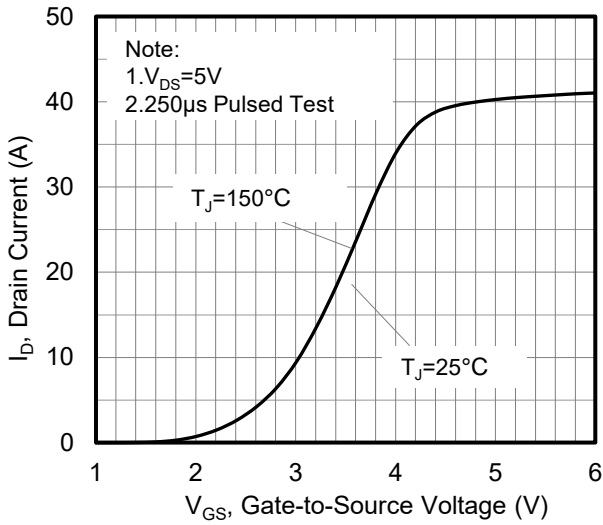


Figure 6. Typical Transfer Characteristics

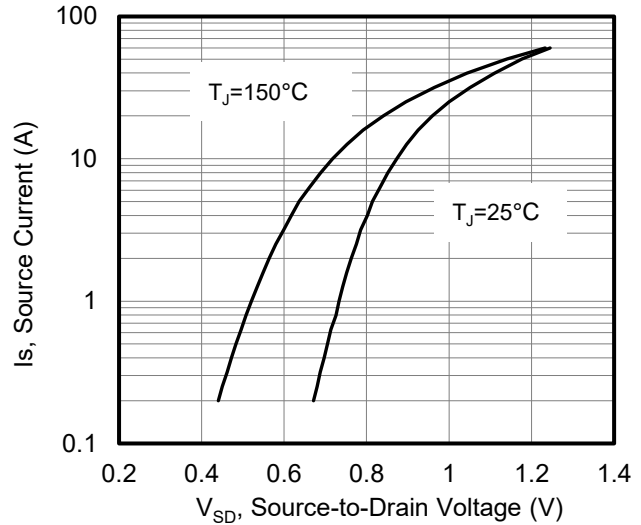


Figure 7. Typical Body Diode Transfer Characteristics

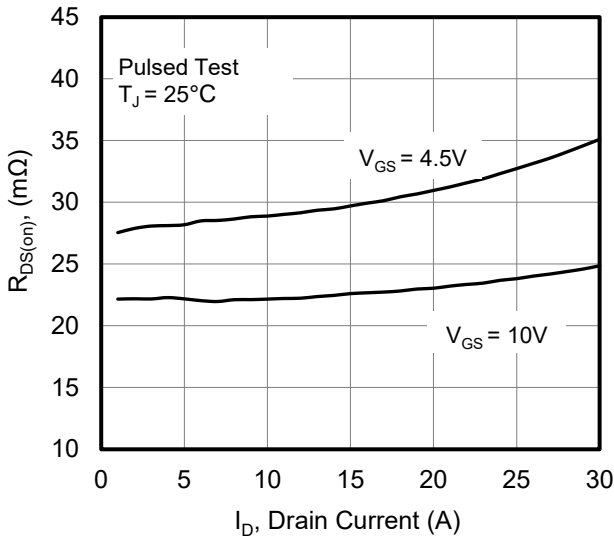


Figure 8. Drain-to-Source On Resistance vs Drain Current

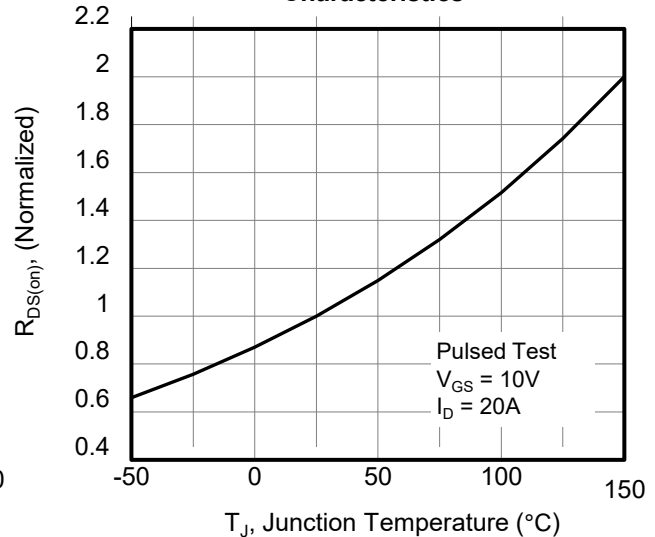


Figure 9. Normalized On Resistance vs Junction Temperature

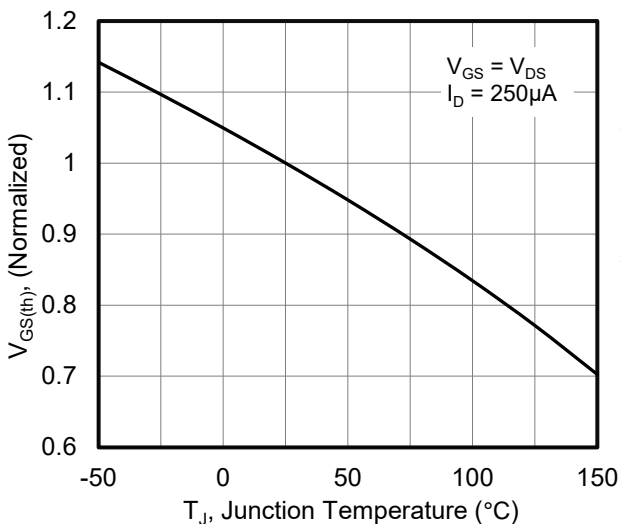


Figure 10. Normalized Threshold Voltage vs Junction Temperature

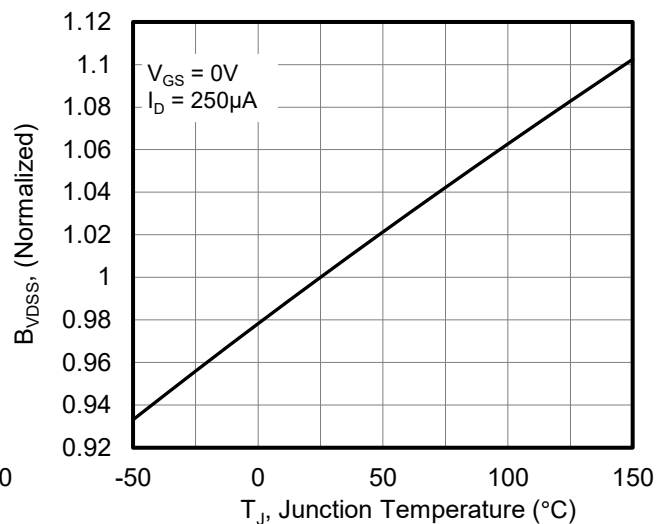


Figure 11. Normalized Breakdown Voltage vs Junction Temperature

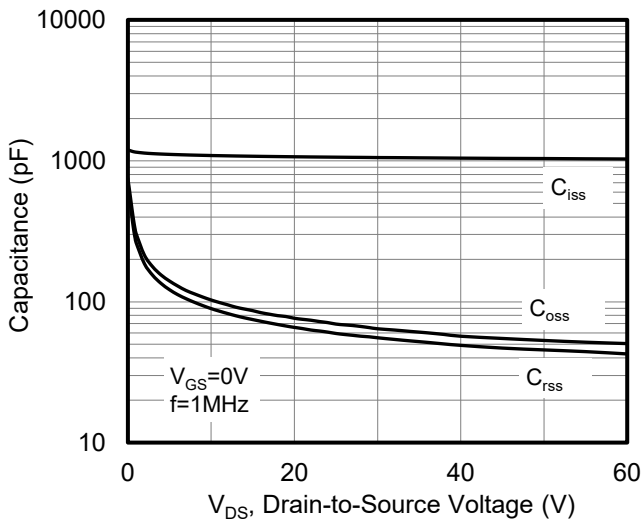


Figure 12. Capacitance Characteristics

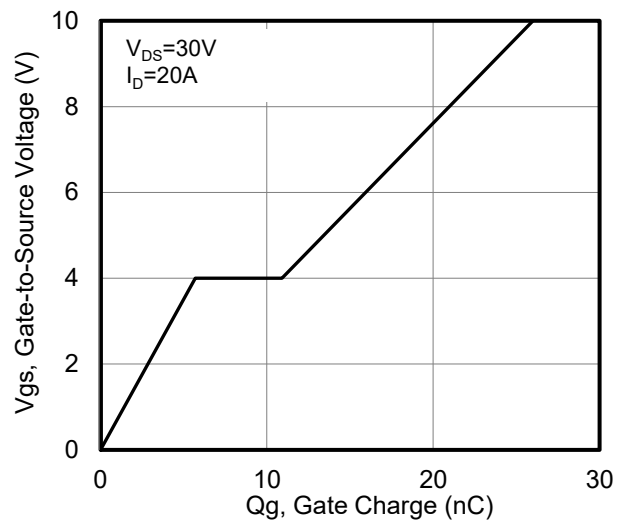
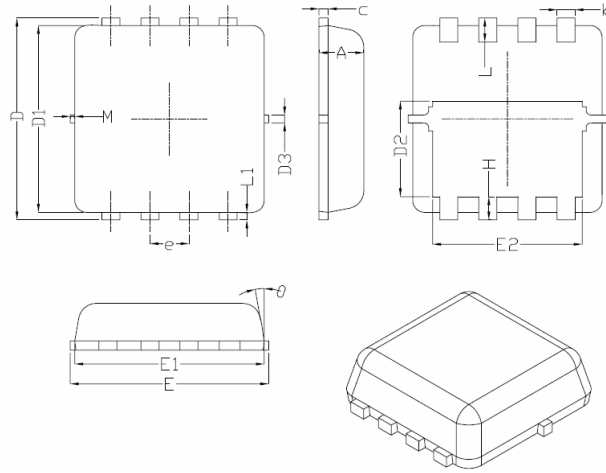


Figure 13. Typical Gate Charge vs. Gate to Source Voltage



DFN3X3-8L Package Information



Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.48	1.58	1.68
D3	-	0.13	-
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	-	0.13	-
M	*	*	0.15
θ		10°	12°



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