



Description

The HXY40P06DF 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

$V_{DS} = -60V$ $I_D = -30A$

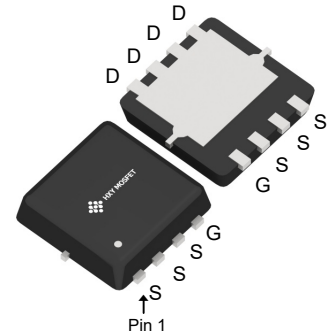
$R_{DS(ON)} < 29\text{ m}\Omega @ V_{GS} = -10V$

Application

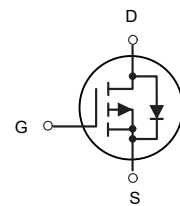
Battery protection

Load switch

Uninterruptible power supply



DFN3X3-8L



P-Channel MOSFET

Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
HXY40P06DF	DFN3X3-8L	HXY MOSFET	5000

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C=25^{\circ}\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	-40	A
$I_D @ T_C=100^{\circ}\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	-24	A
I_{DM}	Pulsed Drain Current ²	-110	A
$P_D @ T_C=25^{\circ}\text{C}$	Total Power Dissipation ⁴	65	W
TSTG	Storage Temperature Range	-55 to 150	$^{\circ}\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^{\circ}\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	65	$^{\circ}\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	1.92	$^{\circ}\text{C/W}$



Electrical Characteristics ($T_J=25\text{ }^{\circ}\text{C}$, 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}	Zero Gate Voltage Drain 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	-1.8	-2.5	V
$R_{DS(on)}$	Drain-Source On Resistance②	$V_{GS}=-10V, I_D=-15A$	---	24	29	m Ω
		$V_{GS}=-4.5V, I_D=-10A$	---	30.4	39	
G_{FS}	Forward Transconductance	$V_{DS}=-5V, I_D=-15A$	---	35	---	S
C_{iss}	Input Capacitance	$V_{DS}=-25V, V_{GS}=0V, f=1MHz$	---	4025	---	pF
C_{oss}	Output Capacitance		---	133	---	
C_{rss}	Reverse Transfer Capacitance		---	97	---	
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=-30V$ $R_{GEN}=3\Omega, V_{GS}=-10V$	---	12	---	ns
t_r	Rise Time		---	9	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	63	---	ns
t_f	Fall Time		---	13	---	ns
Q_g	Total Gate Charge	$V_{GS}=-10V,$ $V_{DS}=-30V, I_D=-20A$	---	53	---	nC
Q_{gs}	Gate-Source Charge		---	10	---	nC
Q_{gd}	Gate-Drain "Miller" Charge		---	12	---	nC
V_{SD}	Source-Drain Diode Forward Voltage ³	$V_{GS}=0V, I_S=-15A, T_J=25^{\circ}\text{C}$	---	-0.88	-1.2	V
I_S	Continuous Drain Current	$V_D=V_G=0V$	---	-18	---	V
I_{SM}	Pulsed Drain Current	$V_D=V_G=0V$	---	-110	---	V
t_{rr}	Reverse Recovery Time	$I_{SD}=-20A, V_{GS}=0V$ $dI/dt=-500A/\mu s$	---	26	---	ns
Q_{rr}	Reverse Recovery Charge		---	29	---	nc

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. E_{AS} condition: $T_J=25^{\circ}\text{C}, V_{DD}=40V, V_G=-10V, R_g=25\Omega, L=0.5mH$.
3. Repetitive Rating: Pulse width limited by maximum junction temperature.



Typical Characteristics

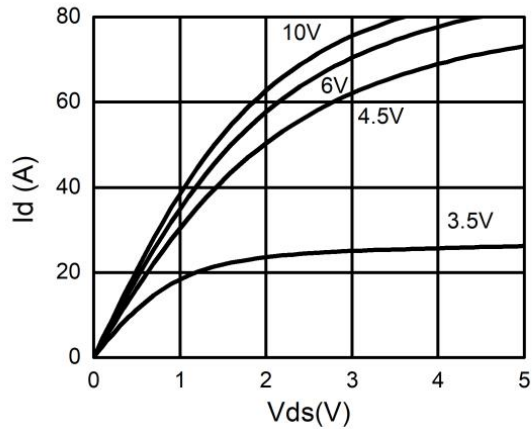


Figure 1. Output Characteristics

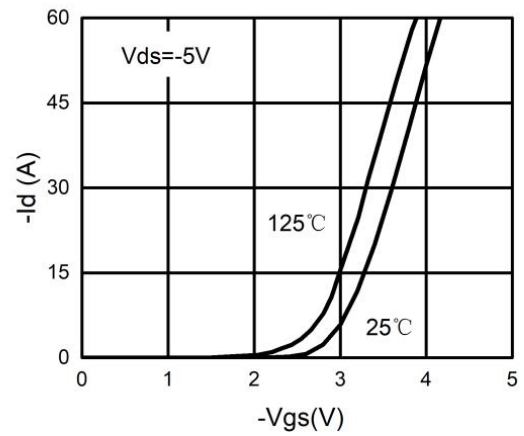


Figure 2. Transfer Characteristics

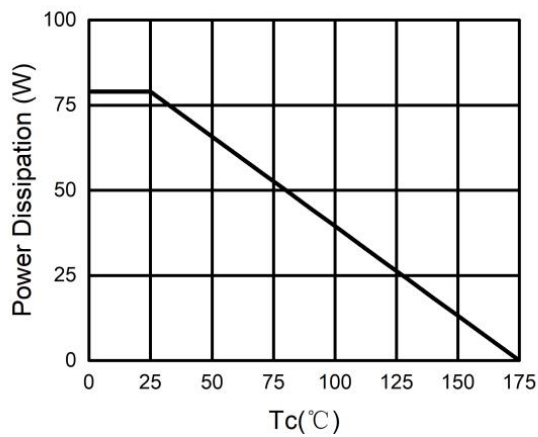


Figure 3. Power Dissipation

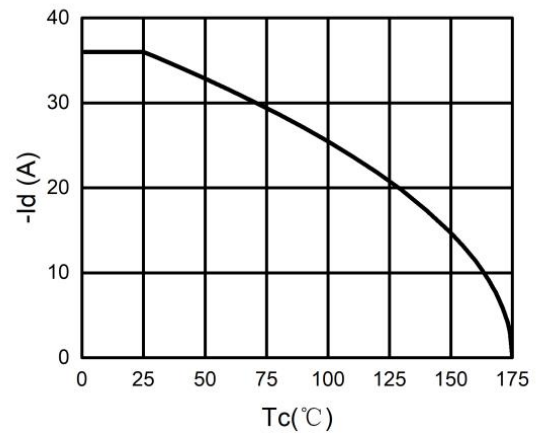


Figure 4. Drain Current

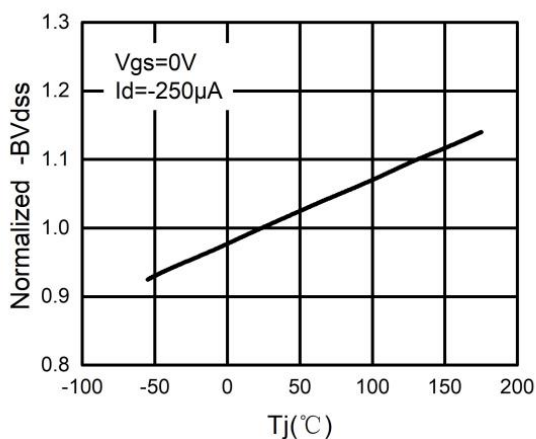


Figure 5. BV_{DSS} vs Junction Temperature

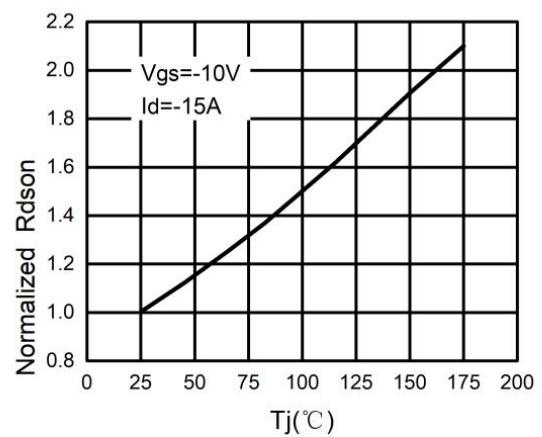


Figure 6. $R_{DS(ON)}$ vs Junction Temperature

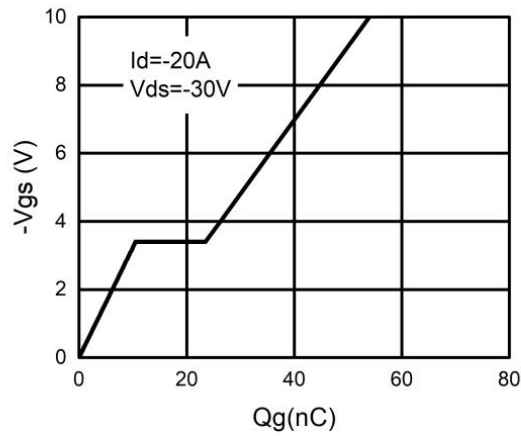


Figure 7. Gate Charge Waveforms

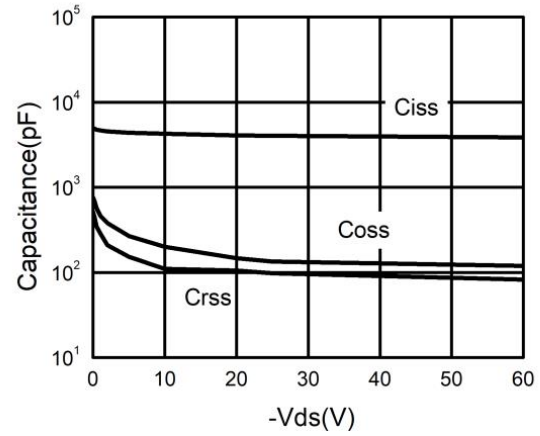


Figure 8. Capacitance

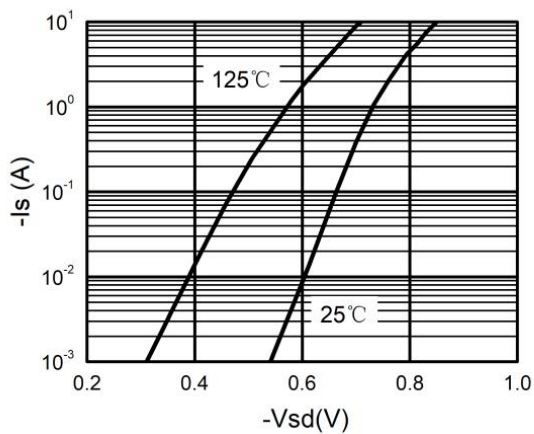


Figure 9. Body-Diode Characteristics

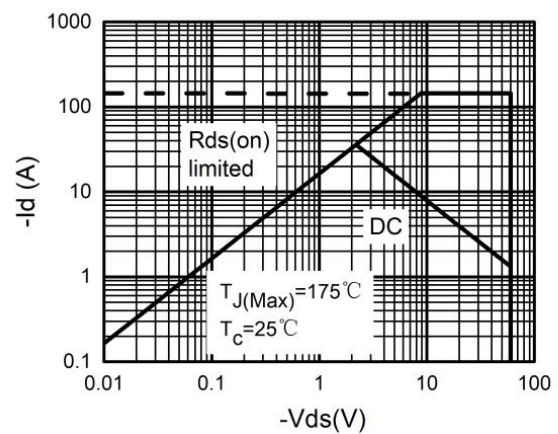
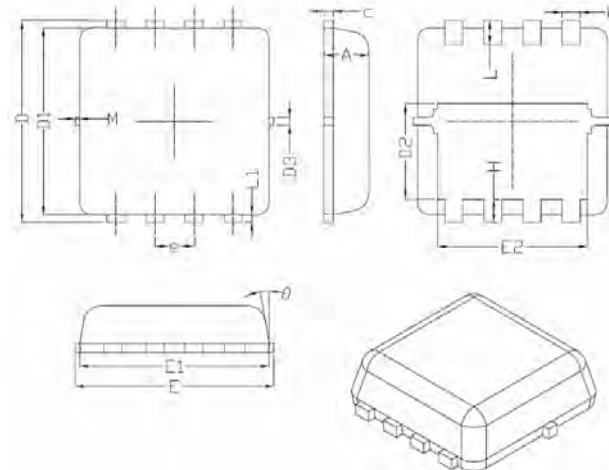


Figure 10. Maximum Safe Operating Area



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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