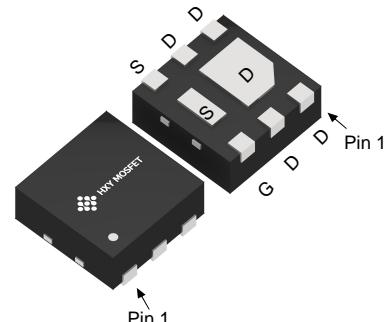




Description

The HXY30P20BF uses advanced trench technology to provide excellent $R_{DS(ON)}$. This device is suitable for use as a load switch or in PWM applications.



General Features

$V_{DS} = -30V, I_D = -20A$

$R_{DS(ON)} < 16m\Omega @ V_{GS} = -10V$

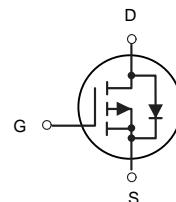
$R_{DS(ON)} < 27m\Omega @ V_{GS} = -5V$

Application

Battery protection

Load switch

Uninterruptible power supply



P-Channel MOSFET

Ordering Information

Product ID	Pack	Brand	Qty(PCS)
HXY30P20BF	DFN2X2B-6L	HXY MOSFET	5000

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_c = 25^\circ C$	Drain Current-Continuous	-20	A
$I_D @ T_c = 100^\circ C$	Drain Current-Continuous	-16	A
I_{DM}	Drain Current-Pulsed	-100	A
ESA	Single Pulse Avalanche Energy	45	MJ
IAS	Avalanche Current	-20	A
$P_D @ T_c = 25^\circ C$	Maximum Power Dissipation	9.5	W
$P_D @ T_A = 25^\circ C$	Maximum Power Dissipation	4.2	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	°C
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	68	°C/W



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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristics						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D = -250μA	-30	-	-	V
I _{DS}	Zero Gate Voltage Drain Current	V _{DS} = -30V, V _{GS} =0V,	-	-	-1	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±20V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D = -250μA	-1.0	-1.6	-2.5	V
R _{DS(on)} Note3	Static Drain-Source on-Resistance	V _{GS} = -10V, I _D = -10A	-	13	16	mΩ
		V _{GS} = -4.5V, I _D = -5A	-	18	27	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} = -15V, V _{GS} =0V, f=1.0MHz	-	1330	-	pF
C _{oss}	Output Capacitance		-	183	-	pF
C _{rss}	Reverse Transfer Capacitance		-	156	-	pF
Q _g	Total Gate Charge	V _{DS} = -15V, I _D = -5A, V _{GS} = -10V	-	22	-	nC
Q _{gs}	Gate-Source Charge		-	1.0	-	nC
Q _{gd}	Gate-Drain("Miller") Charge		-	1.8	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} = -15V, I _D = -10A, V _{GS} =-10V, R _{GEN} =2.5Ω	-	9	-	ns
t _r	Turn-on Rise Time		-	13	-	ns
t _{d(off)}	Turn-off Delay Time		-	48	-	ns
t _f	Turn-off Fall Time		-	20	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current	-	-	-20	-	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current	-	-	-80	-	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S = -15A	-	-0.8	-1.2	V
trr	Reverse Recovery Time	T _J =25°C, V _{DD} = -24V, I _F =-2.8A, dI/dt=-100A/μs	-	64	-	ns
Qrr	Reverse Recovery Charge		-	25	-	nC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: T_J=25°C, V_{GS}=10V, R_G=25Ω, L=0.5mH, I_{AS}=-12.7A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%



Typical Performance Characteristics

Figure 1: Output Characteristics

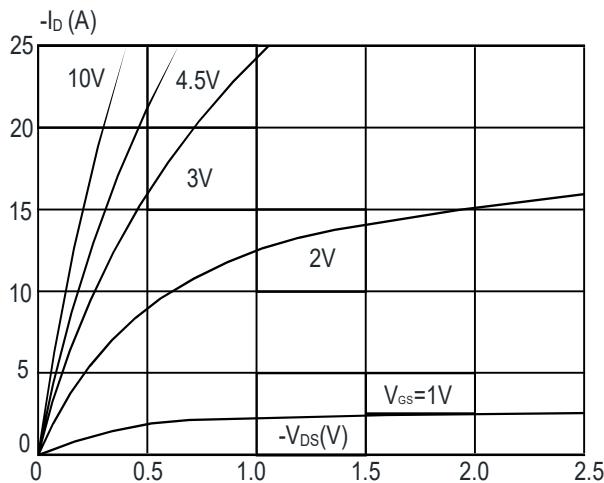


Figure 3: On resistance vs Drain Current

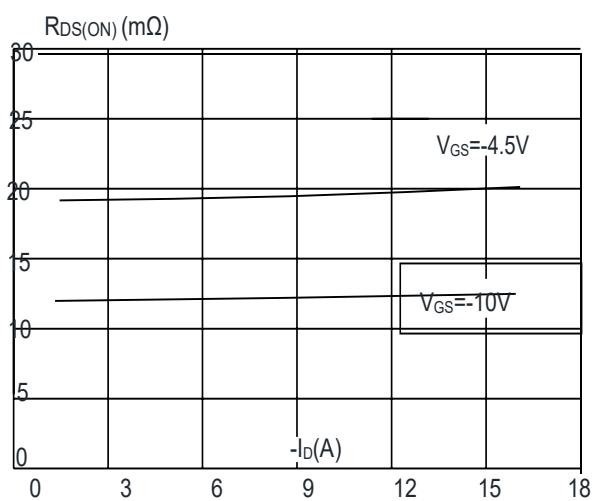


Figure 5: Gate Charge Characteristics

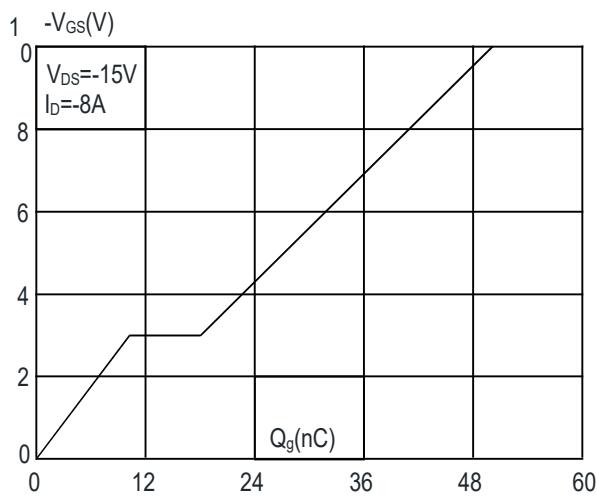


Figure 2: Typical Transfer Characteristics

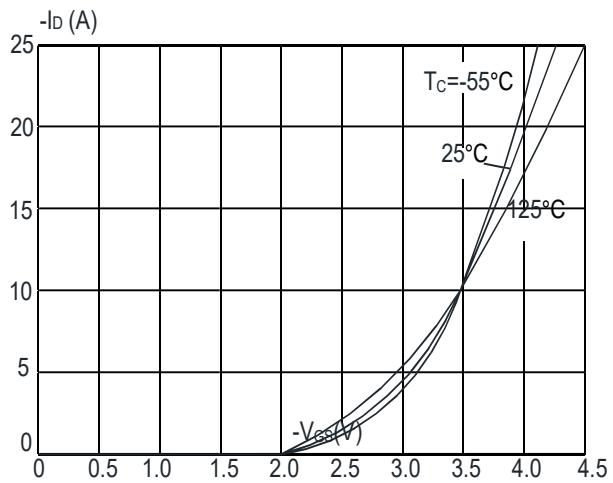


Figure 4: Body Diode Characteristics

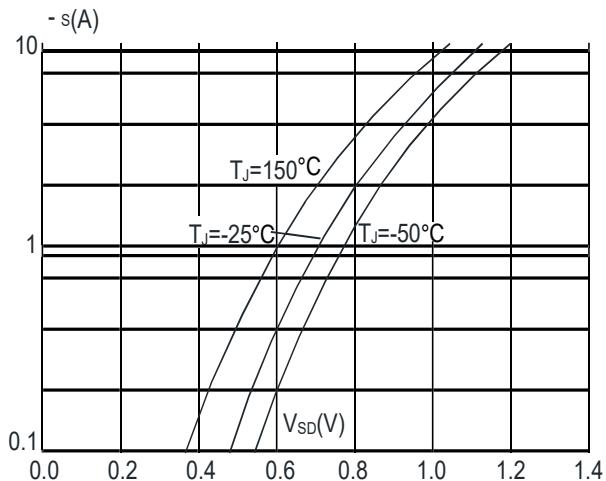


Figure 6: Capacitance Characteristics

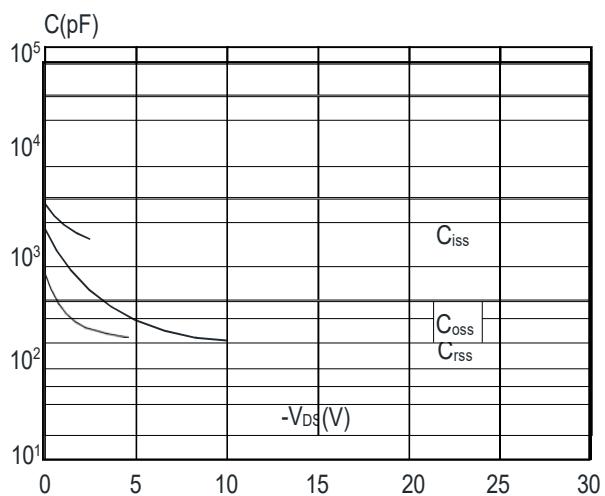




Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

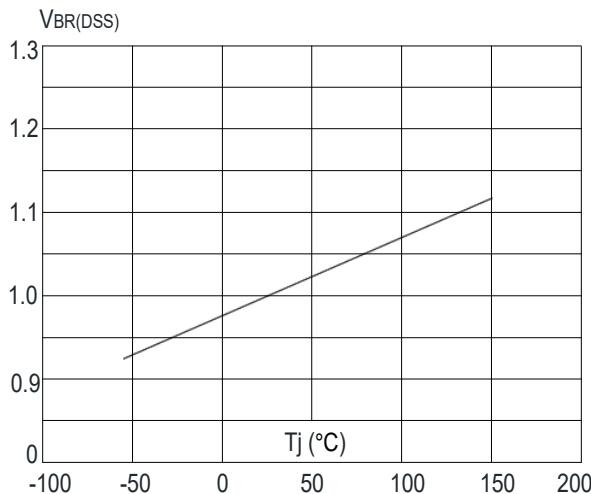


Figure 8: Normalized on Resistance vs. Junction Temperature

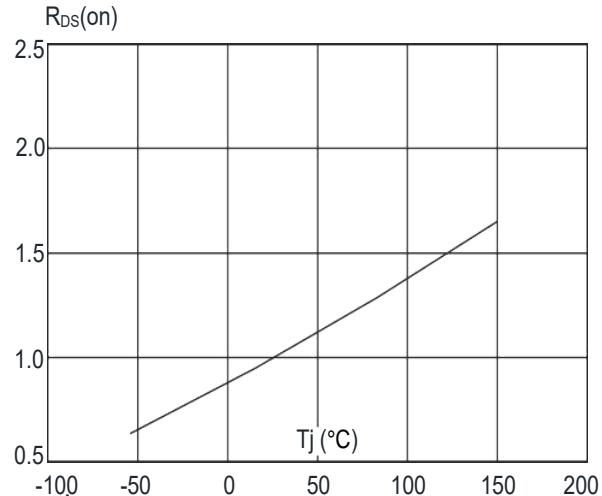


Figure 9: Maximum Safe Operating Area

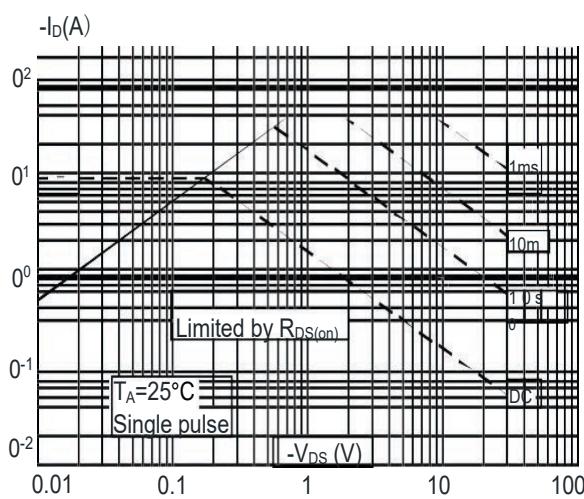


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

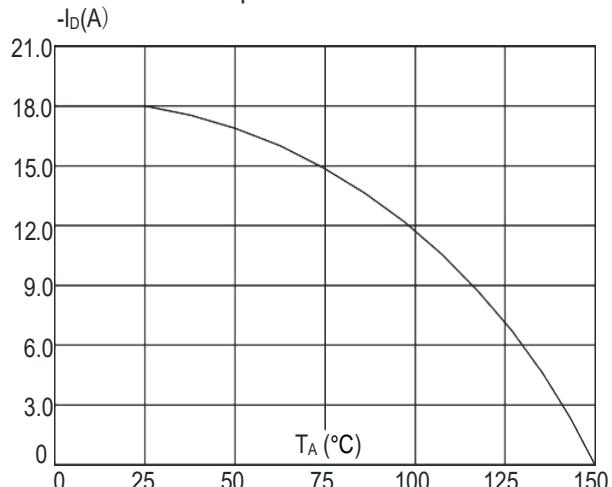
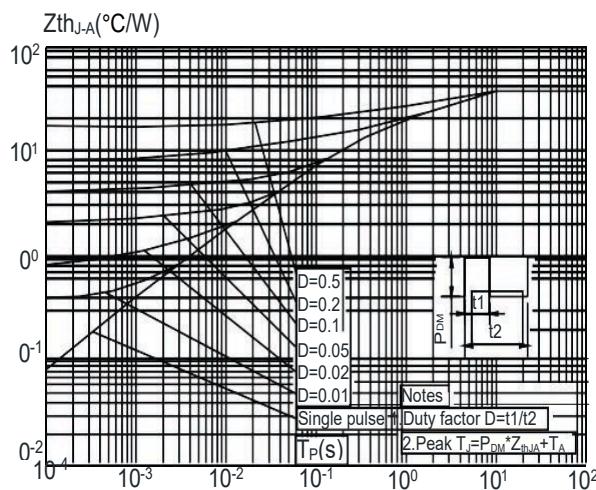


Figure 11: Maximum Effective Transient Thermal Impedance Junction-to-Ambient





Test Circuit

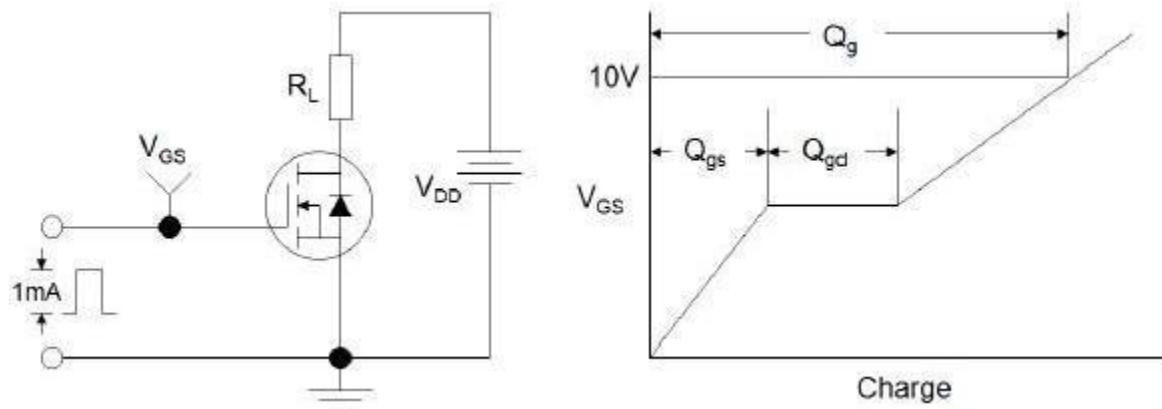


Figure 1: Gate Charge Test Circuit & Waveform

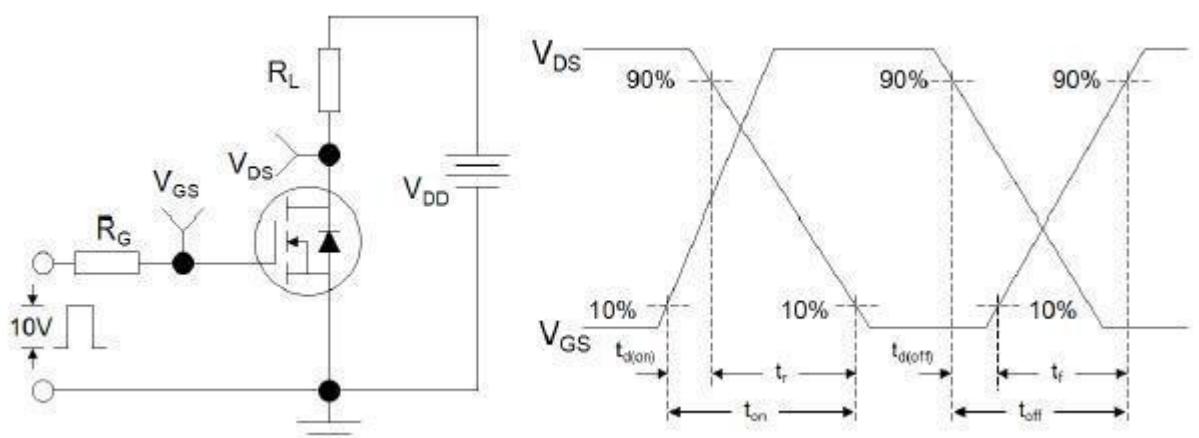


Figure 2: Resistive Switching Test Circuit & Waveforms

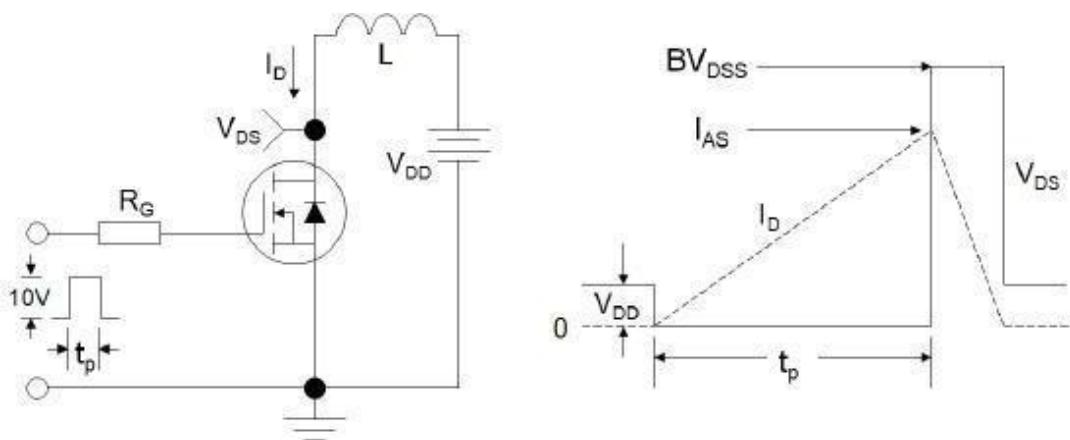
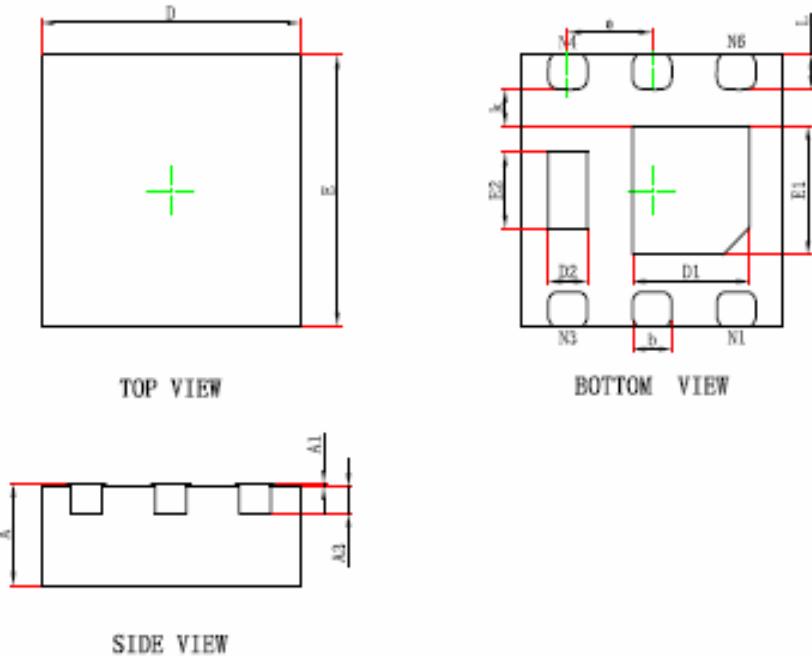


Figure 3: Unclamped Inductive Switching Test Circuit & Waveforms



DFN2X2B-6L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A3	0.203REF.		0.008REF.	
D	1.924	2.076	0.076	0.082
E	1.924	2.076	0.076	0.082
D1	0.800	1.000	0.031	0.039
E1	0.850	1.050	0.033	0.041
D2	0.200	0.400	0.008	0.016
E2	0.460	0.660	0.018	0.026
k	0.200MIN.		0.008MIN.	
b	0.250	0.350	0.010	0.014
e	0.650TYP.		0.026TYP.	
L	0.174	0.326	0.007	0.013



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