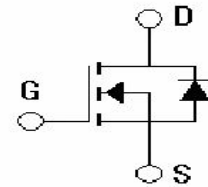
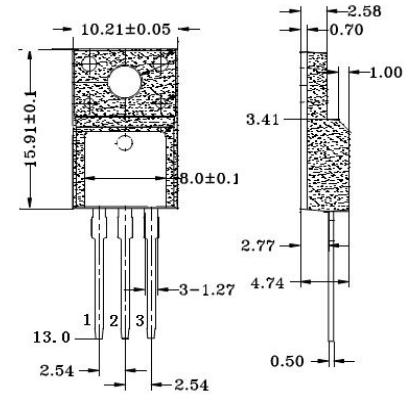


# N沟道增强型功率场效应晶体管

## 1、概述与特点

DHF12N60 是 N 沟道增强型 600V 高压功率 MOS 场效应晶体管。主要用途：AC-DC 开关电源、DC-DC 电源转换器、LED 电源、高压 H 桥 PWM 马达驱动等。其特点如下：

- 导通电阻低
- 低栅极电荷
- 开关速度快
- 低反向传输电容
- 100%单脉冲雪崩能量筛选测试
- 封装形式：TO-220F，管脚排列：G、D、S
- 符合 RoHS 指令要求



## 2、电特性

### 2.1 极限值 (除非另有规定, Tc=25°C)

参数名称	符号	额定值	单位
最高漏极-源极直流电压	$V_{DSS}$	600	V
最高栅极-源极电压	$V_{GSS}$	±30	V
连续漏极电流	$I_D$ (T=25°C) (T=100°C)	12	A
		7.2	A
单脉冲雪崩能量(注 1)	$E_{AS}$	860	mJ
二极管反向恢复最大电压变化速率(注 2)	dv/dt	4.5	V/ns
耗散功率	$T_a=25^\circ\text{C}$	$P_{tot}$	2.0 W
	$T_c=25^\circ\text{C}$	$P_{tot}$	80 W
最高结温	$T_j$	150	°C
贮存温度	$T_{stg}$	-55~150	°C
焊锡最高温度	$T_L$	300	°C

### 2.2 电参数 (除非另有规定, Tc=25°C)

参数名称	符号	测试条件	规范值			单位
			最小	典型	最大	
漏源击穿电压	$BV_{DSS}$	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$	600			V
零栅电压漏极电流	$I_{DSS}$	$V_{DS}=600\text{V}, V_{GS}=0\text{V}, T_c=25^\circ\text{C}$			25	$\mu\text{A}$
		$V_{DS}=480\text{V}, V_{GS}=0\text{V}, T_c=100^\circ\text{C}$			250	$\mu\text{A}$
栅源正向漏电流	$I_{GSSF}$	$V_{GS}=30\text{V}, V_{DS}=0\text{V}$			100	nA
栅源反向漏电流	$I_{GSSR}$	$V_{GS}=-30\text{V}, V_{DS}=0\text{V}$			-100	nA
栅门槛电压	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	2.0	3.0	4.0	V
漏源导通电阻	$R_{DS(on)}$	$V_{GS}=10\text{V}, I_D=6.0\text{A}$			0.65	$\Omega$
漏源二极管正向电压	$V_{FSD}$	$V_{GS}=0\text{V}, I_S=12\text{A}$			1.5	V
正向跨导	$g_{FS}^a$	$V_{DS}=15\text{V}, I_D=6.0\text{A}$	5.0			S
栅极总电荷	$Q_g$	$I_D=12\text{A}, V_{DD}=480\text{V}, V_{GS}=10\text{V}$		58	65	nC
输入电容	$C_{iss}$	$V_{GS}=0\text{V}, V_{DS}=25\text{V}, f=1.0\text{MHz}$	---	2107	---	pF
输出电容	$C_{oss}$		---	195	---	
反向传输电容	$C_{rss}$		---	16	---	

a: 脉冲测试  $t_p \leq 300\mu\text{s}, \delta \leq 2\%$

注释： 1、L=20mH,  $I_D=8.9\text{A}, V_{DD}=50\text{V}, V_{GATE}=600\text{V}$ , 起始结温  $T_j=25^\circ\text{C}$ .

2、 $I_{SD}=12\text{A}, di/dt \leq 200\text{A}/\mu\text{s}, V_{DD} \leq BV_{DSS}$ , 起始结温  $T_j=25^\circ\text{C}$ .

3、特性曲线

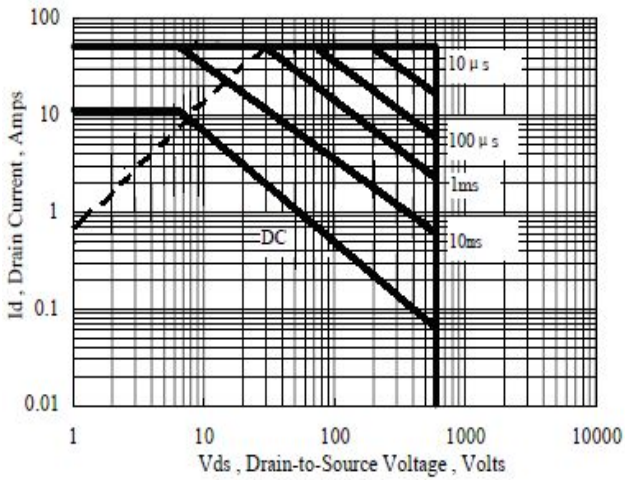


Figure 1 Maximum Forward Bias Safe Operating Area

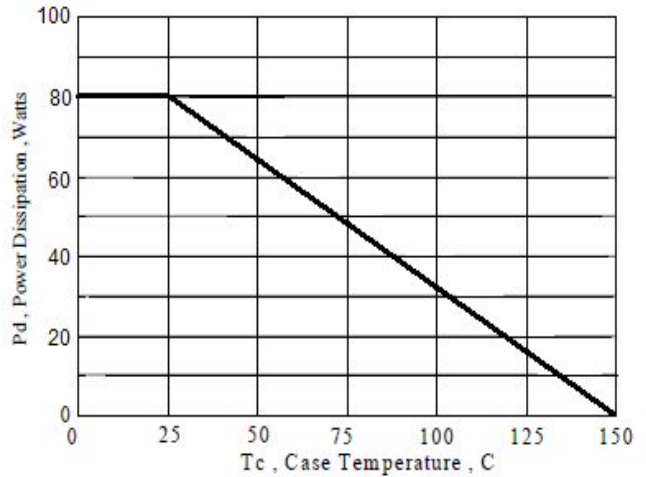


Figure 2 Maximum Power Dissipation vs Case Temperature

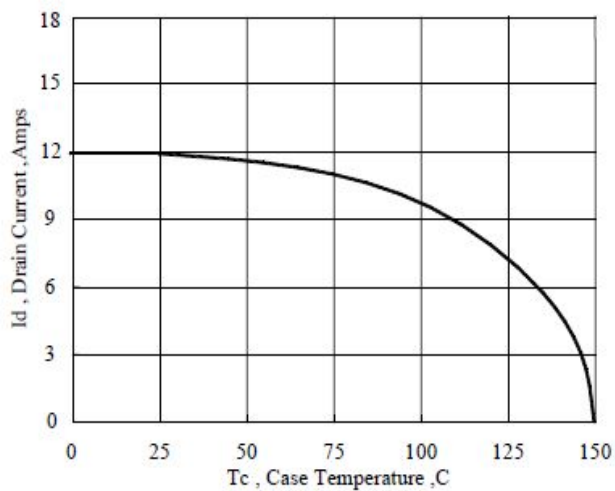


Figure 3 Maximum Continuous Drain Current vs Case Temperature

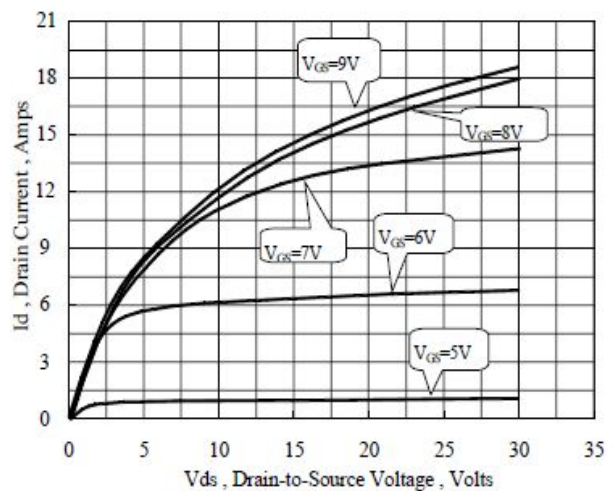


Figure 4 Typical Output Characteristics

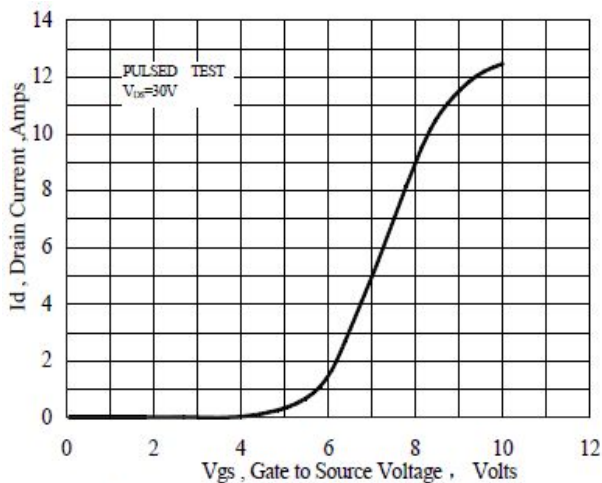


Figure 5 Typical Transfer Characteristics

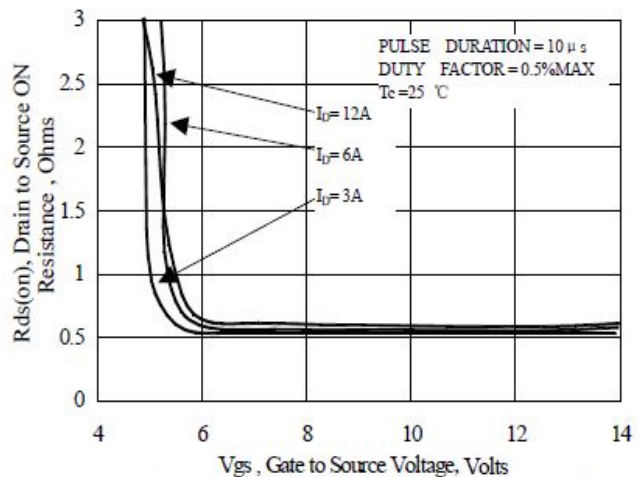


Figure 6 Typical Drain to Source ON Resistance vs Gate Voltage and Drain Current

3、特性曲线

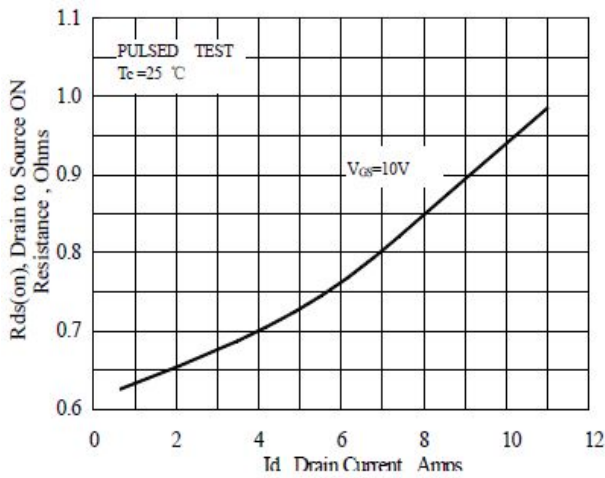


Figure 7 Typical Drain to Source ON Resistance vs Drain Current

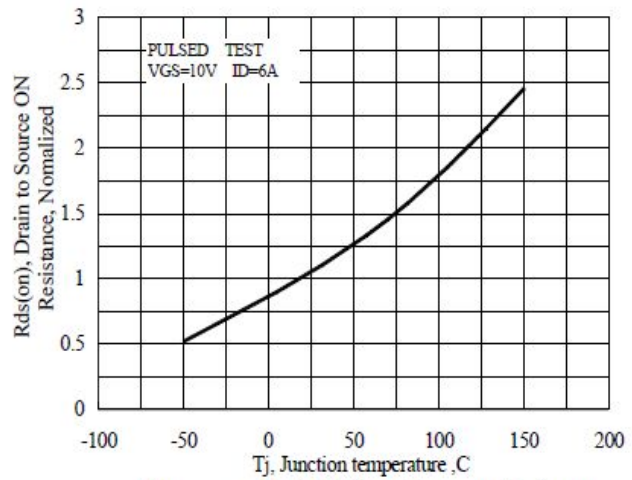


Figure 8 Typical Drain to Source on Resistance vs Junction Temperature

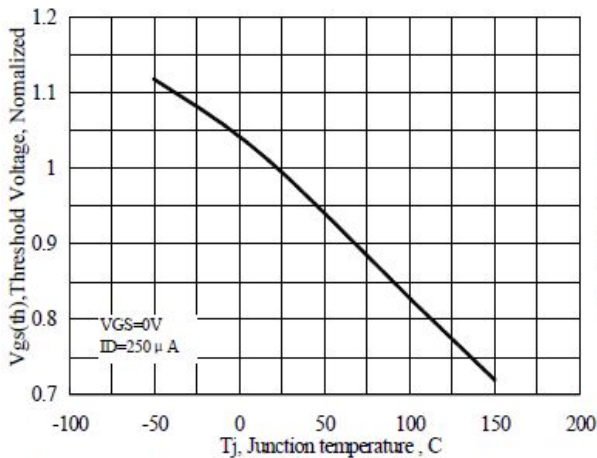


Figure 9 Typical Threshold Voltage vs Junction Temperature

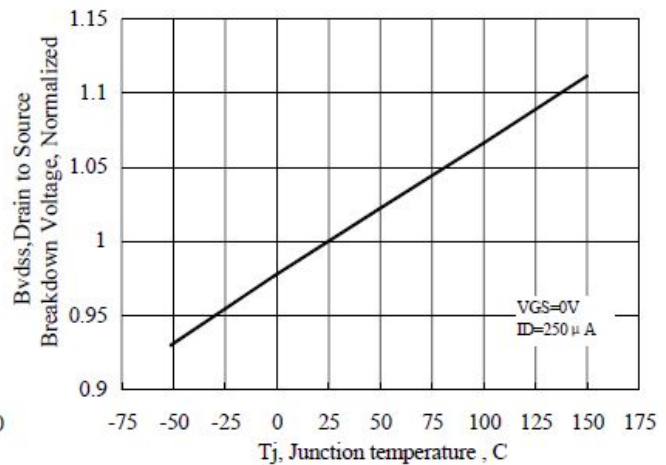


Figure 10 Typical Breakdown Voltage vs Junction Temperature

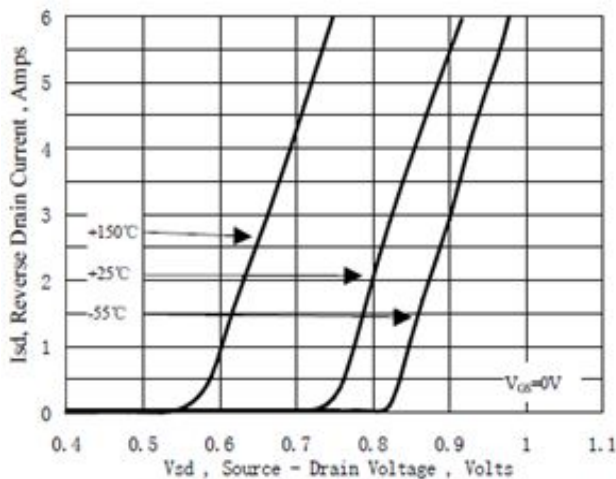


Figure 11 Typical Body Diode Transfer Characteristics

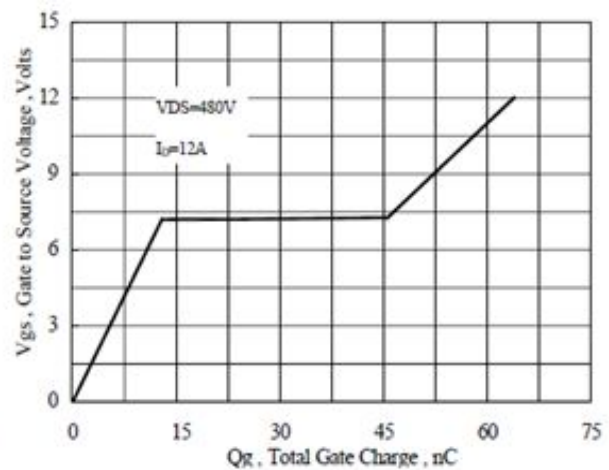
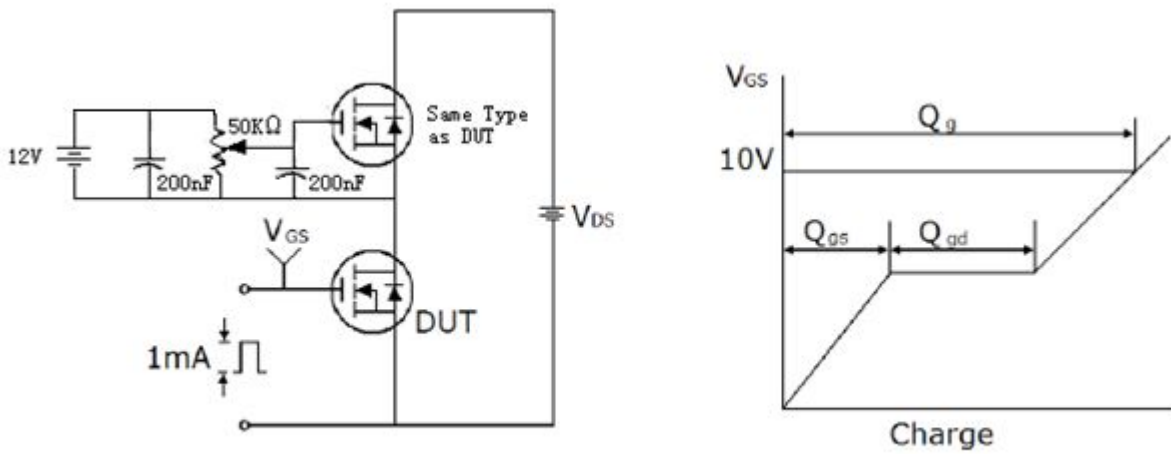
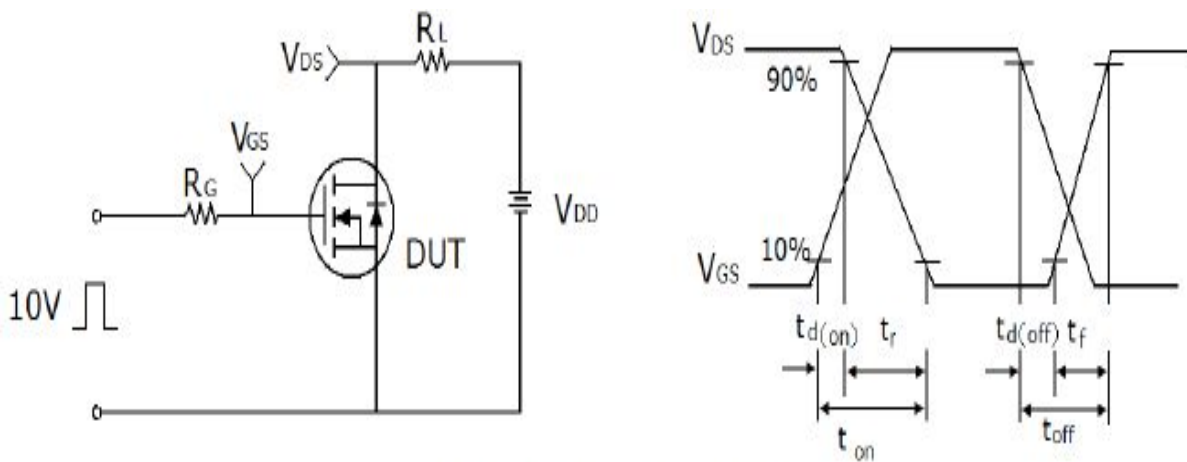


Figure 12 Typical Gate Charge vs Gate to Source Voltage

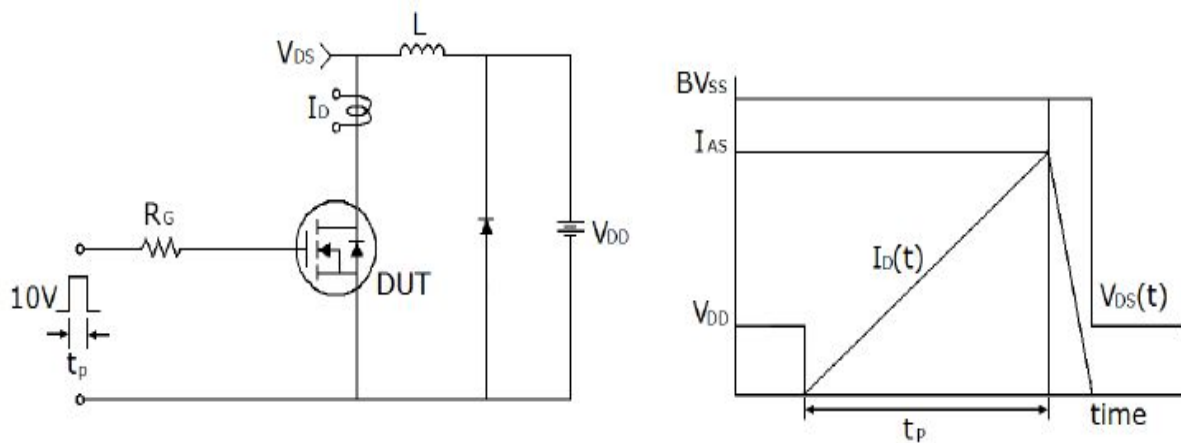
4、测试电路与波形图 (Test Circuit and Waveform)



1) Gate charge test circuit & Waveform



2) Switch Time Test Circuit:



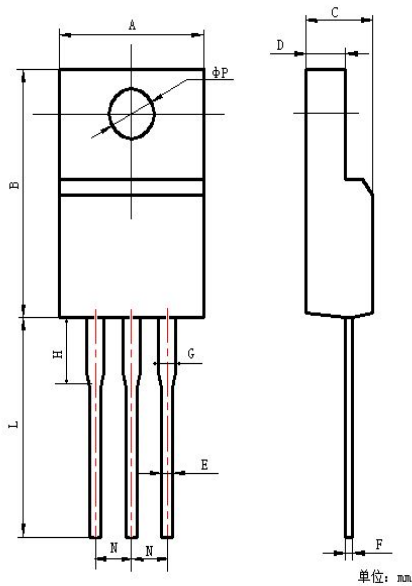
3) Unclamped Inductive Switching Test Circuit & Waveforms

5、产品印记



第一排：WXDH 无锡东海商标  
 第二排：产品名称F12N60  
 第三排左：HR芯片代码，第三排右：组装周期代码420代表2014年第20自然周

6、外形尺寸



项 目	规范(mm)	
	MIN	MAX
A	9.70	10.30
B	15.50	16.10
C	4.40	4.80
D	2.50	2.90
E	0.70	0.90
F	0.40	0.60
G	1.12	1.42
H	3.40	3.80
L	12.6	13.6
N	2.34	2.74
$\phi P$	3.00	3.30