汕头华汕电子器件有限公司

N-Channel Enhancement Mode Field Effect Transistor

HFF640

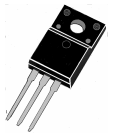
对应国外型号
IRFS640B

■ 主要用途

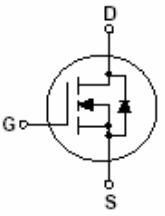
高压高速电源开关。

■ 外形图及引脚排列

TO-220F



1—栅 极 G
2—漏 极 D
3—源 极 S



■ 极限值（T_a=25℃）

T_{stg}——贮存温度…… -55~150℃

T_j——结温……150℃

V_{DSS}——漏极—源极电压…… 200V

V_{DGR} —— 漏极—栅极电压(R_{GS}=20KΩ) …… 200V

V_{GS}——栅极—源极电压…… ±20V

I_D——*漏极电流(T_c=25℃)……18A

P_D——耗散功率（T_c=25℃）……43W

*漏极电流受最大结温限制

■ 电参数（T_a=25℃）

参数符号	符 号 说 明	最小值	典型值	最大值	单 位	测 试 条 件
BV_{DSS}	漏—源极击穿电压	200			V	I_D=250μA ,V_{GS}=0V
I_{DSS}	零栅压漏极电流			10	μA	V_{DS} =200V， V_{GS}=0
I_{GSS}	栅极泄漏电流			±100	nA	V_{GS}=±20V , V_{DS} =0V
$V_{GS(th)}$	栅—源极开启电压	2.0		4.0	V	V_{DS} = V_{GS} , I_D =250μA
$R_{DS(on)}$	漏—源极导通电阻		0.145	0.18	?	V_{GS}=10V, I_D =9A
gfs	正向跨导		13		S	V_{DS} = 40V , I_D =9A（注 1）
Ciss	输入电容		1300	1700	pF	
Coss	输出电容		175	230	pF	V_{DS} =25V, V_{GS}=0,f=1MHz
Crss	反向传输电容		45	60	pF	
$t_{d(on)}$	导通延迟时间		20	50	nS	
tr	上升时间		145	300	nS	V_{DD} =100V,
$t_{d(off)}$	断开延迟时间		145	300	nS	I_D =18A (峰值)
t_f	下降时间		110	230	nS	R_G= 25 Ω（注 1）
Qg	栅极总电荷		45	58	nC	V_{DS} =0.8V_{DSS}
Qgs	栅极—源极电荷		6.5		nC	V_{GS}=10V
Qgd	栅极—漏极电荷		22		nC	I_D=18A（注 1）
Is	源极—漏极二极管正向电流			18	A	
V_{SD}	源极—漏极二极管导通电压			1.5	V	I_S =18A , V_{GS}=0
Rth(j-c)	热阻			2.89	℃/W	结到外壳

注：1、脉冲测试，宽度≤300μS,占空比≤2%

■ 典型特性曲线

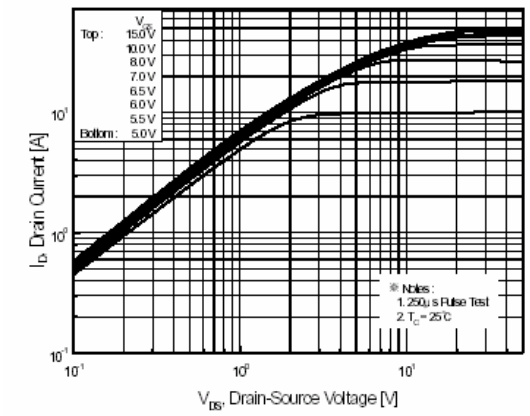


Figure 1. On-Region Characteristics

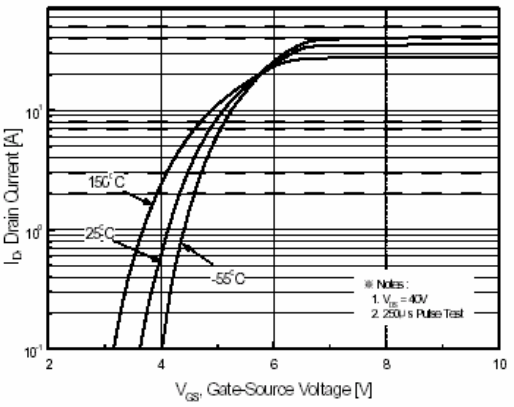


Figure 2. Transfer Characteristics

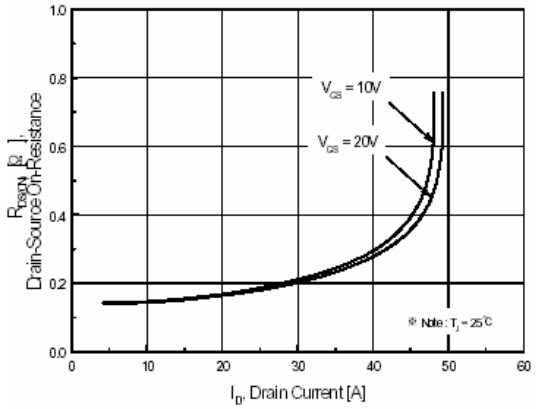


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

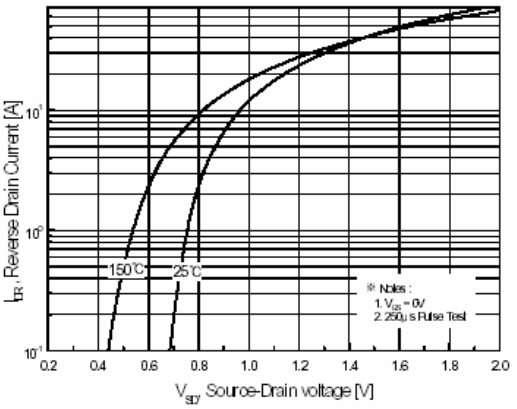


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

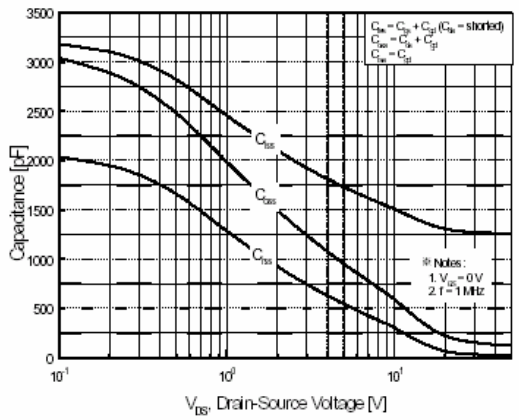


Figure 5. Capacitance Characteristics

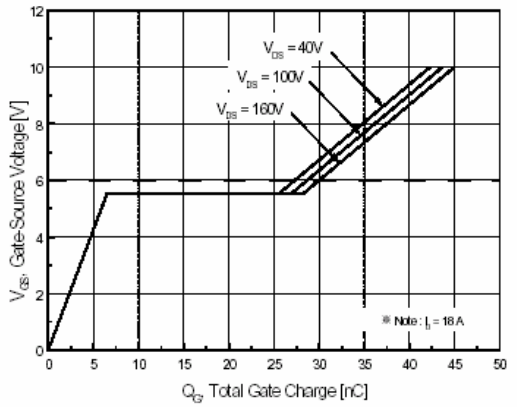


Figure 6. Gate Charge Characteristics

■ 典型特性曲线

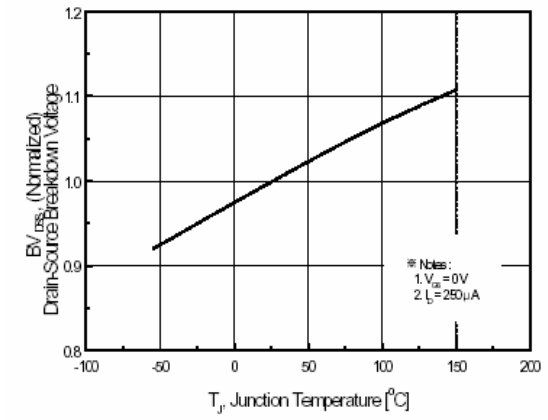


Figure 7. Breakdown Voltage Variation vs Temperature

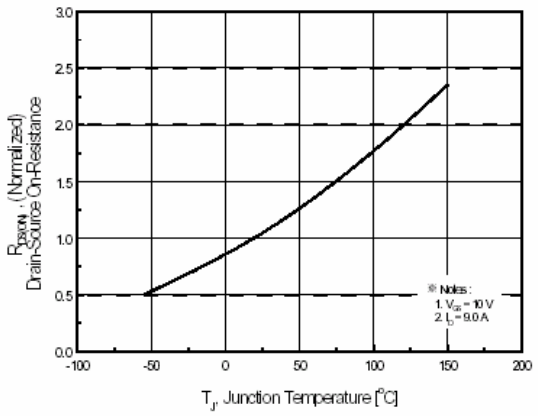


Figure 8. On-Resistance Variation vs Temperature

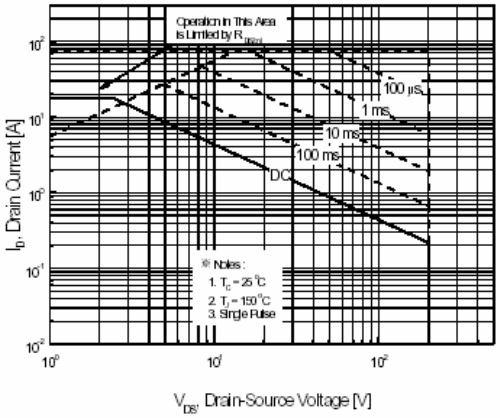


Figure 9 Maximum Safe Operating Area

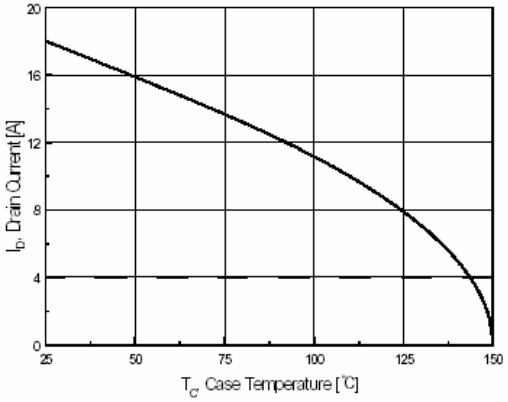


Figure 10. Maximum Drain Current vs Case Temperature

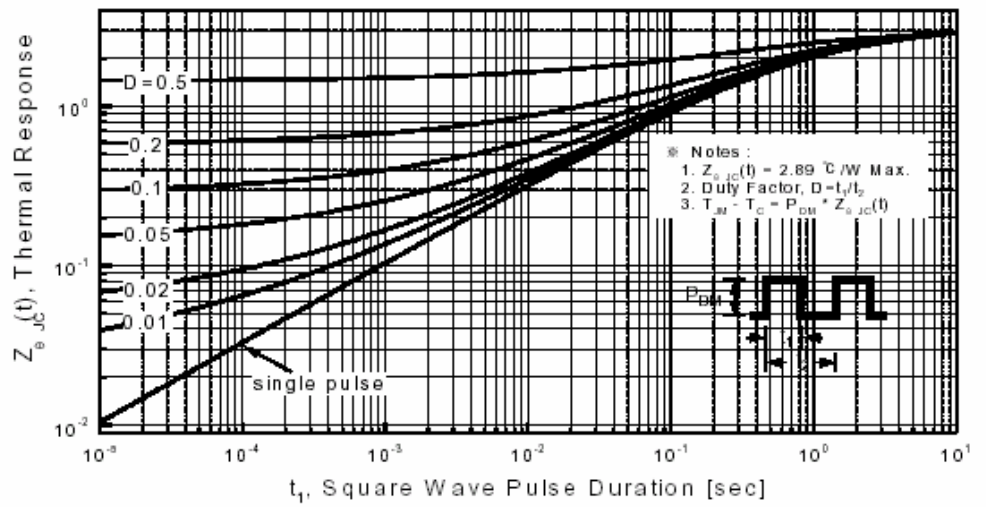
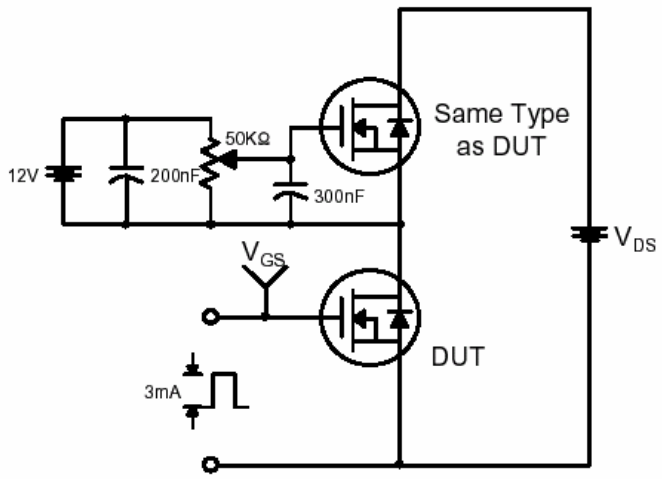
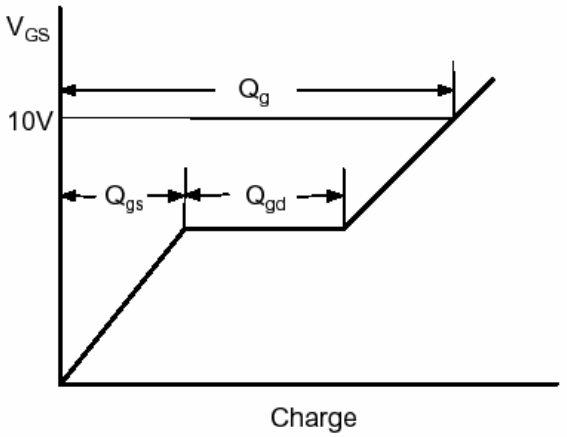


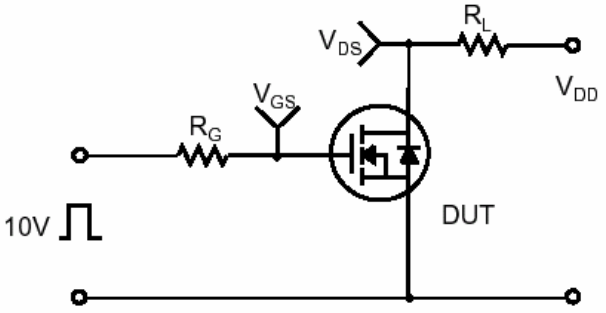
Figure 11 Transient Thermal Response Curve

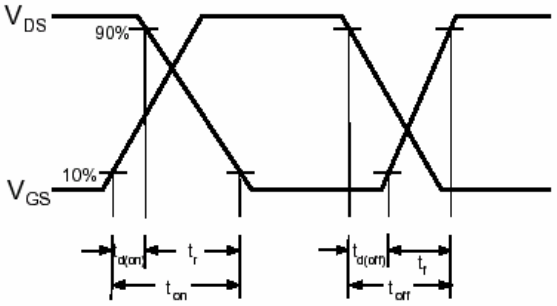
Gate Charge Test Circuit & Waveform



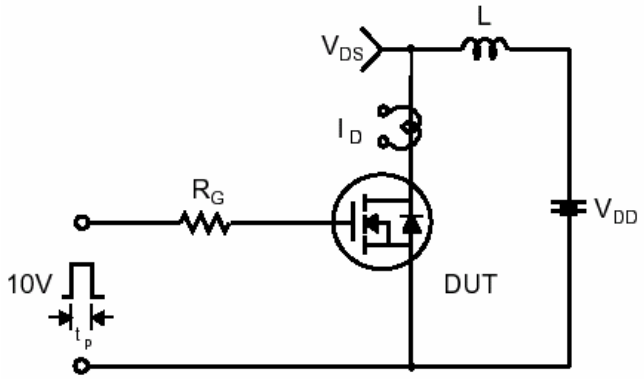


Resistive Switching Test Circuit & Waveforms

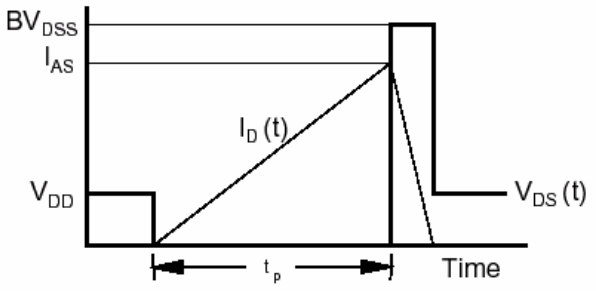




Unclamped Inductive Switching Test Circuit & Waveforms



$$E_{AS} = \frac{1}{2} L I_{AS}^2 \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$



Peak Diode Recovery dv/dt Test Circuit & Waveforms