

**HFF640****APPLICATIONS**

High Voltage High-Speed Switching.

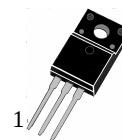
ABSOLUTE MAXIMUM RATINGS ($T_a=25^\circ\text{C}$)

T_{stg}	Storage Temperature.....	-55~150
T_j	Operating Junction Temperature	150
P_D	Allowable Power Dissipation ($T_c=25^\circ\text{C}$)	43W
V_{DSS}	Drain-Source Voltage	200V
V_{DGR}	Drain-Gate Voltage ($R_{\text{GS}}=1\text{M}\Omega$)	200V
V_{GSS}	Gate-Source Voltage	$\pm 20\text{V}$
I_D	*Drain Current($T_c=25^\circ\text{C}$).....	18A

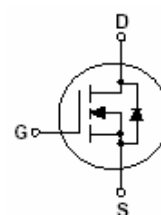
* Drain current limited by maximum junction temperature

ELECTRICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$)

TO-220F



1—G
2—D
3—S



Symbol	Characteristics	Min	Typ	Max	Unit	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	200			V	$I_D=250\mu\text{A}$, $V_{\text{GS}}=0\text{V}$
I_{DSS}	Zero Gate Voltage Drain Current			10	μA	$V_{\text{DS}}=200\text{V}$, $V_{\text{GS}}=0$
I_{GSS}	Gate-Source Leakage Current			± 100	nA	$V_{\text{GS}}=\pm 20\text{V}$, $V_{\text{DS}}=0\text{V}$
$V_{\text{GS(th)}}$	Gate Threshold Voltage	2.0		4.0	V	$V_{\text{DS}}=V_{\text{GS}}$, $I_D=250\mu\text{A}$
$R_{\text{DS(on)}}$	Static Drain-Source On-Resistance		0.145	0.18	Ω	$V_{\text{GS}}=10\text{V}$, $I_D=9\text{A}$
g_{fs}	Forward Transconductance		13		S	$V_{\text{DS}}=40\text{V}$, $I_D=9\text{A}^*$
C_{iss}	Input Capacitance		1300	1700	pF	$V_{\text{DS}}=25\text{V}$, $V_{\text{GS}}=0$, $f=1\text{MHz}$
C_{oss}	Output Capacitance		175	230	pF	
C_{rss}	Reverse Transfer Capacitance		45	60	pF	
$t_{\text{d(on)}}$	Turn - On Delay Time		20	50	nS	$V_{\text{DD}}=100\text{V}$, $I_D=18\text{A}$ $R_G=25\Omega^*$
t_r	Rise Time		145	300	nS	
$t_{\text{d(off)}}$	Turn - Off Delay Time		145	300	nS	
t_f	Fall Time		110	230	nS	$V_{\text{DS}}=0.8V_{\text{DSS}}$ $V_{\text{GS}}=10\text{V}$ $I_D=18\text{A}^*$
Q_g	Total Gate Charge		45	58	nC	
Q_{gs}	Gate-Source Charge		6.5		nC	
Q_{gd}	Gate-Drain Charge		22		nC	
I_s	Continuous Source Current			18	A	
V_{SD}	Diode Forward Voltage			1.5	V	$I_S=18\text{A}$, $V_{\text{GS}}=0$
$R_{\text{th(j-c)}}$	Thermal Resistance , Junction-to-Case			2.89	/W	

*Pulse Test : Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$

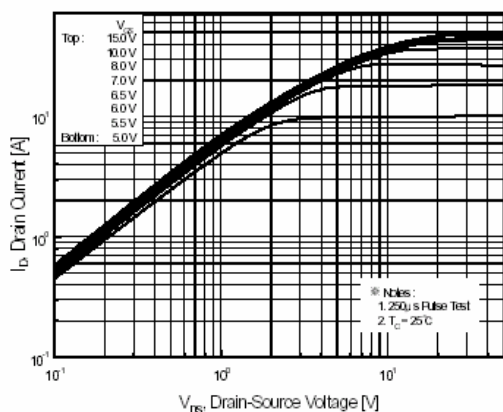


Figure 1. On-Region Characteristics

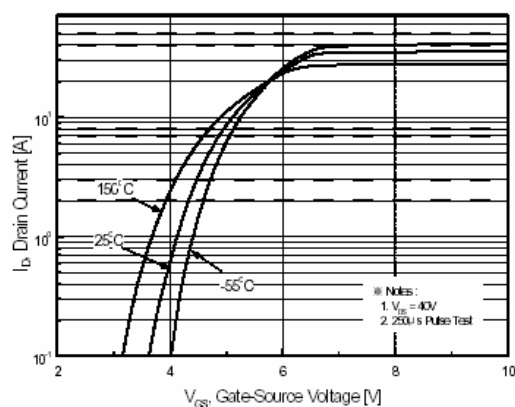


Figure 2. Transfer Characteristics

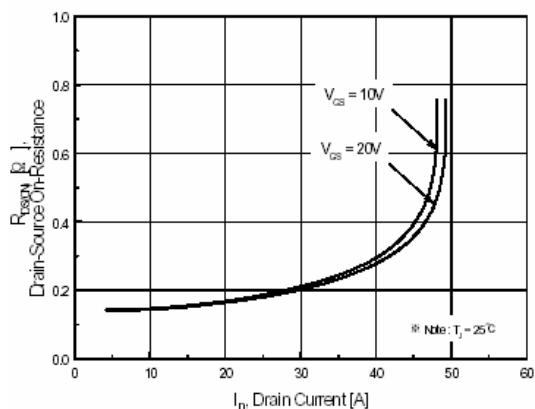


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

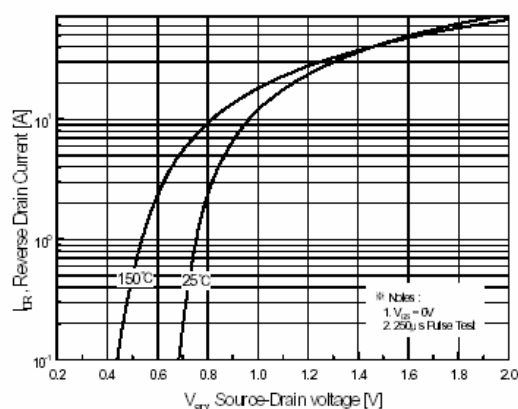


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

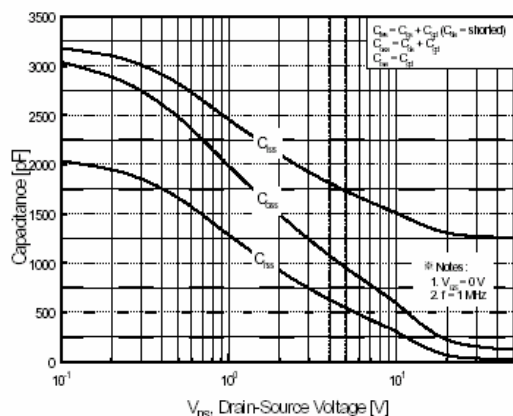


Figure 5. Capacitance Characteristics

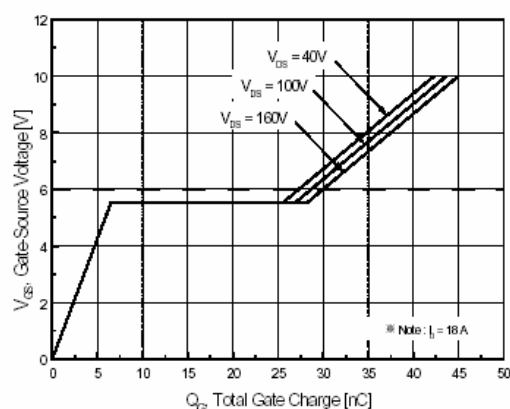


Figure 6. Gate Charge Characteristics

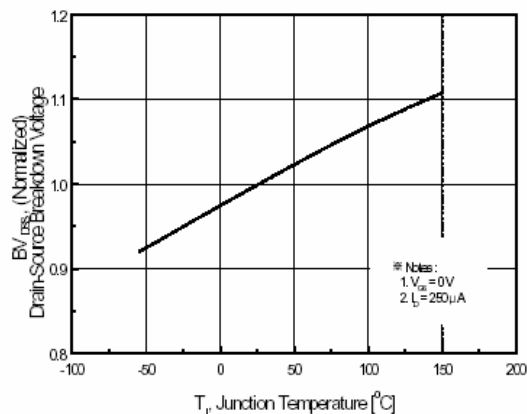


Figure 7. Breakdown Voltage Variation vs Temperature

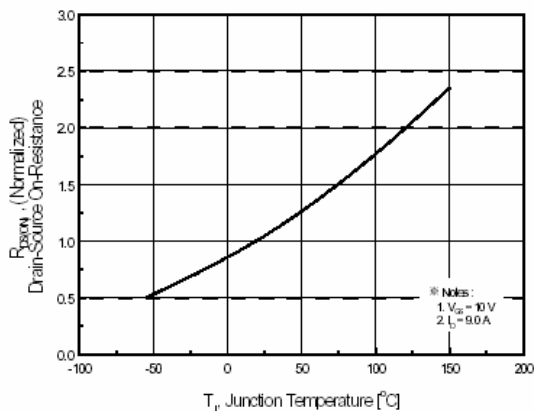


Figure 8. On-Resistance Variation vs Temperature

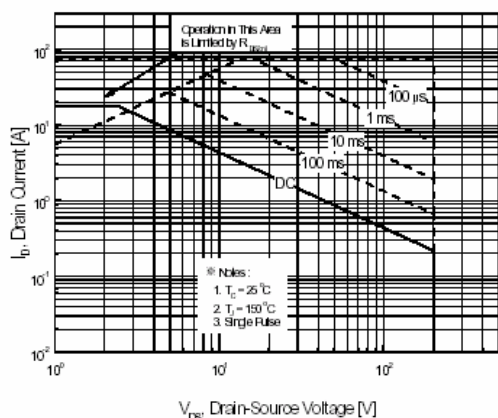


Figure 9 Maximum Safe Operating Area

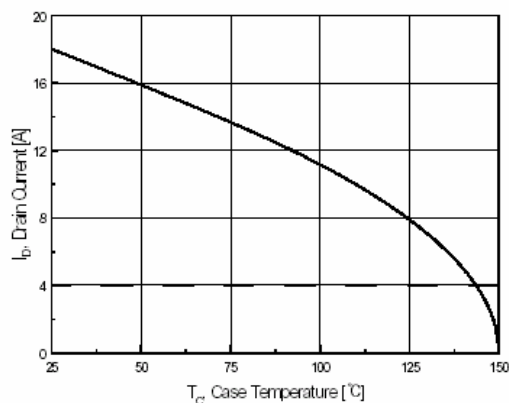


Figure 10. Maximum Drain Current vs Case Temperature

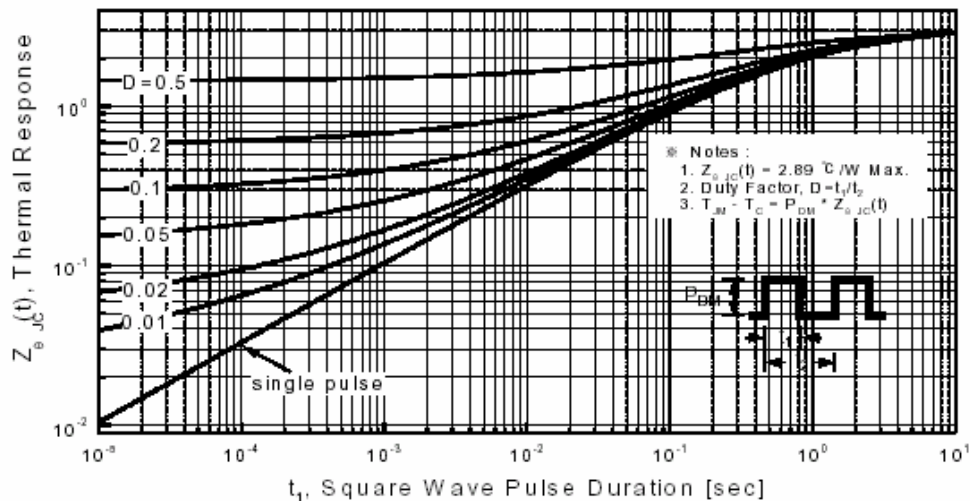
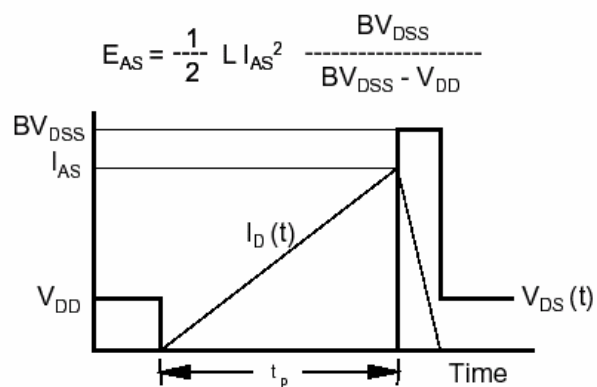


Figure 11 Transient Thermal Response Curve



HFF640





Peak Diode Recovery dv/dt Test Circuit & Waveforms

