Shantou Huashan Electronic Devices Co.,Ltd.

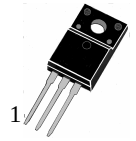
N-Channel MOSFET

HFF640

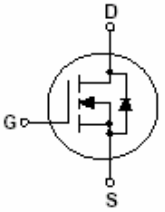
APPLICATIONSL

High Voltage High-Speed Switching.

TO-220F



1—G
2—D
3—S



ABSOLUTE MAXIMUM RATINGS (T_a=25℃)

T_{stg}——Storage Temperature·····-55~150℃

T_j ——Operating Junction Temperature ·····150℃

P_D —— Allowable Power Dissipation (T_c=25℃) ·····43W

V_{DSS} —— Drain-Source Voltage ····· 200V

V_{DGR} —— Drain-Gate Voltage (R_{GS}=1MΩ) ·····200V

V_{GSS} —— Gate-Source Voltage ·····±20V

I_D —— *Drain Current (T_c=25℃) ·····18A

* Drain current limited by maximumjunction temperature

ELECTRICAL CHARACTERISTICS (T_a=25℃)

Symbol	Characteristics	Min	Typ	Max	Unit	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	200			V	I_D=250μA ,V_{GS}=0V
I_{DSS}	Zero Gate Voltage Drain Current			10	μA	V_{DS} =200V， V_{GS}=0
I_{GSS}	Gate –Source Leakage Current			±100	nA	V_{GS}=±20V , V_{DS} =0V
$V_{GS(th)}$	Gate Threshold Voltage	2.0		4.0	V	V_{DS} = V_{GS} , I_D =250μA
$R_{DS(on)}$	Static Drain-Source On-Resistance		0.145	0.18	?	V_{GS}=10V, I_D =9A
gfs	Forward Transconductance		13		S	V_{DS} = 40V , I_D =9A*
Ciss	Input Capacitance		1300	1700	pF	V_{DS} =25V, V_{GS}=0,f=1MHz
Coss	Output Capacitance		175	230	pF	
Crss	Reverse Transfer Capacitance		45	60	pF	
$t_{d(on)}$	Turn - On Delay Time		20	50	nS	V_{DD} =100V, I_D =18A R_G= 25 Ω *
tr	Rise Time		145	300	nS	
$t_{d(off)}$	Turn - Off Delay Time		145	300	nS	
t_f	Fall Time		110	230	nS	
Qg	Total Gate Charge		45	58	nC	V_{DS} =0.8V_{DSS} V_{GS}=10V I_D=18A *
Qgs	Gate–Source Charge		6.5		nC	
Qgd	Gate–Drain Charge		22		nC	
Is	Continuous Source Current			18	A	
V_{SD}	Diode Forward Voltage			1.5	V	I_S =18A , V_{GS}=0
Rth(j-c)	Thermal Resistance, Junction-to-Case			2.89	℃/W	

*Pulse Test：Pulse Width≤300μs， Duty Cycle≤2%

HFF640

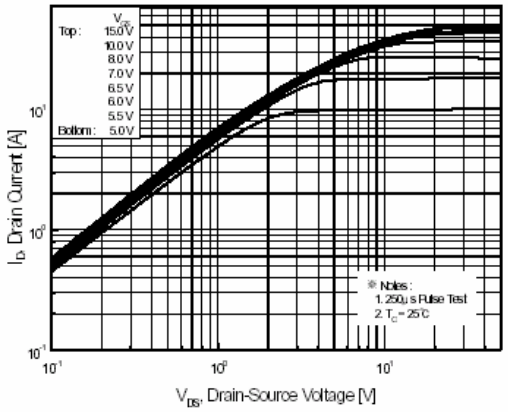


Figure 1. On-Region Characteristics

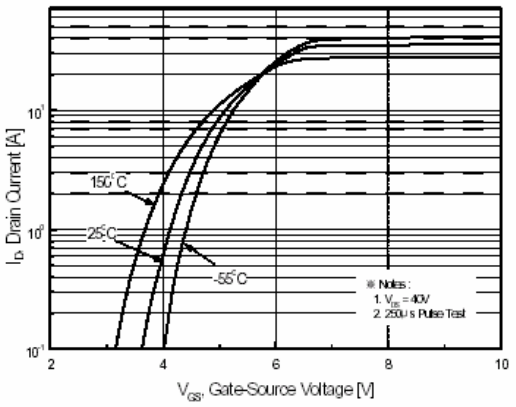


Figure 2. Transfer Characteristics

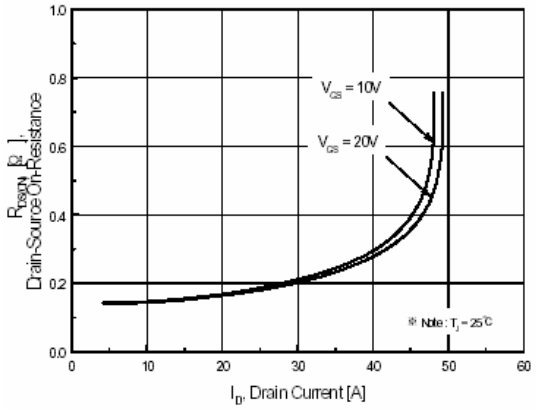


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

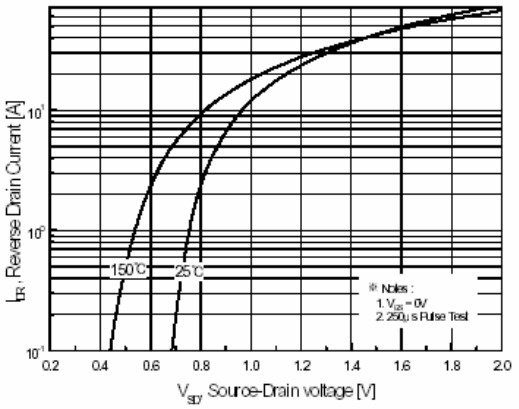


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

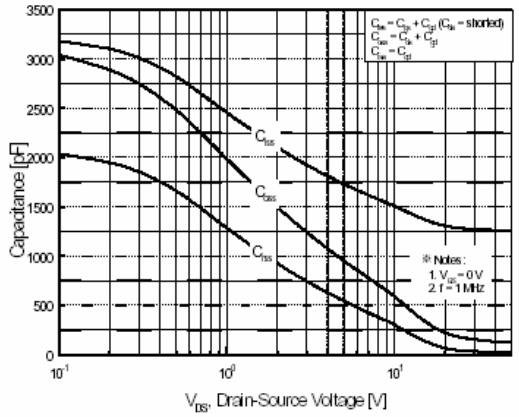


Figure 5. Capacitance Characteristics

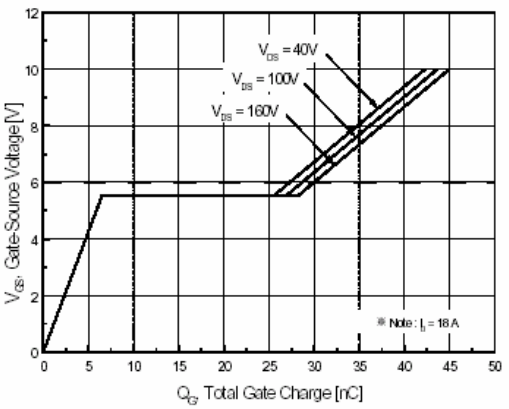


Figure 6. Gate Charge Characteristics

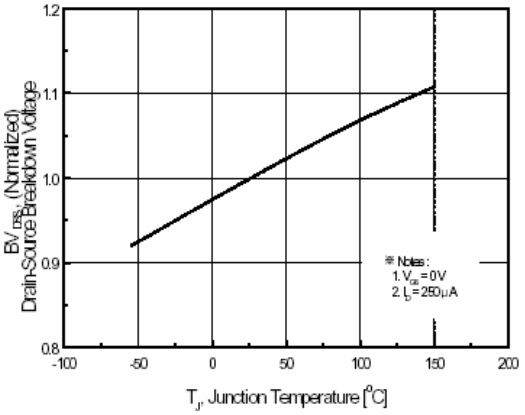


Figure 7. Breakdown Voltage Variation vs Temperature

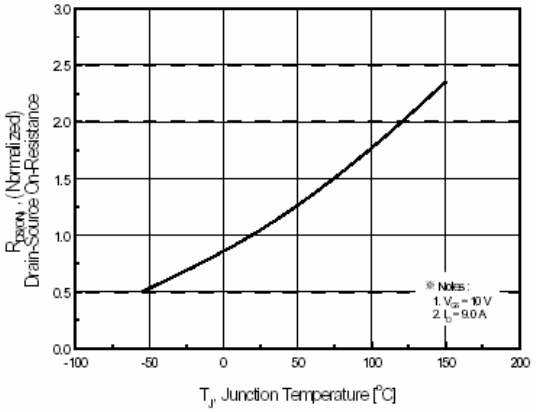


Figure 8. On-Resistance Variation vs Temperature

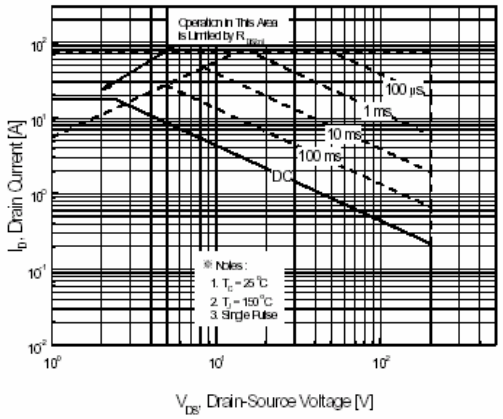


Figure 9 Maximum Safe Operating Area

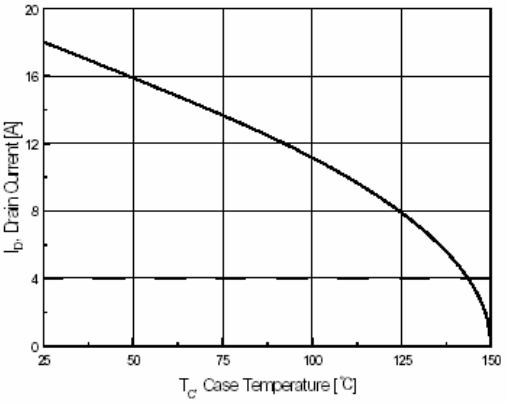


Figure 10. Maximum Drain Current vs Case Temperature

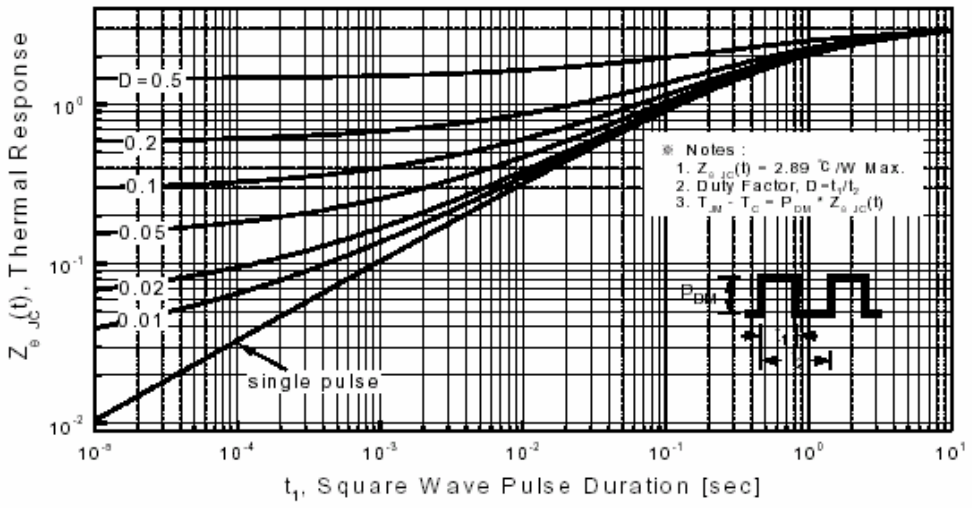
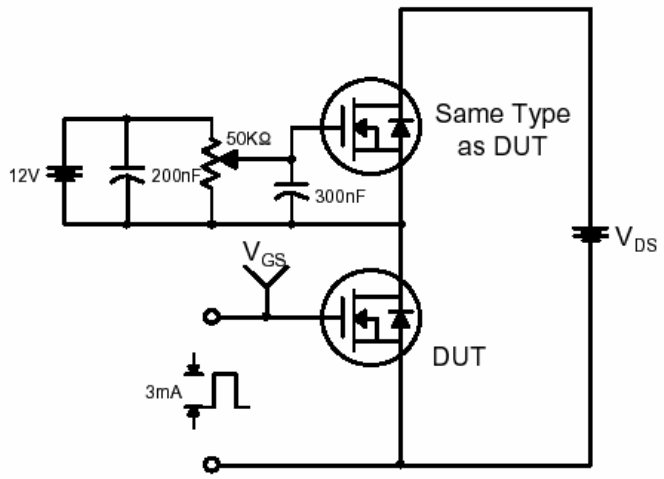
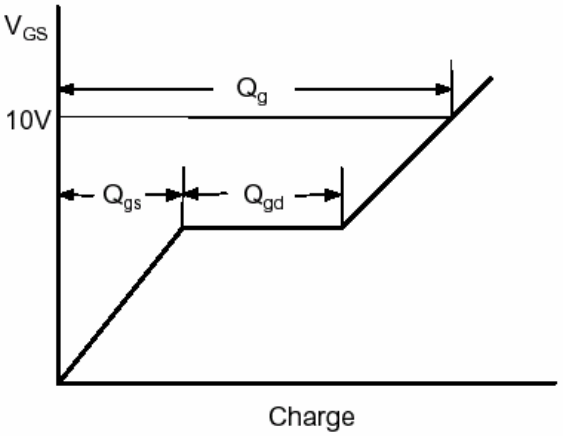


Figure 11 Transient Thermal Response Curve

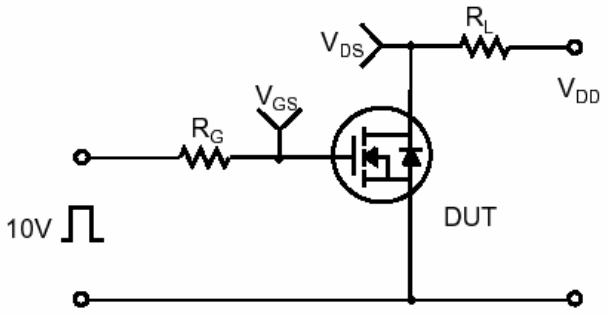
HFF640

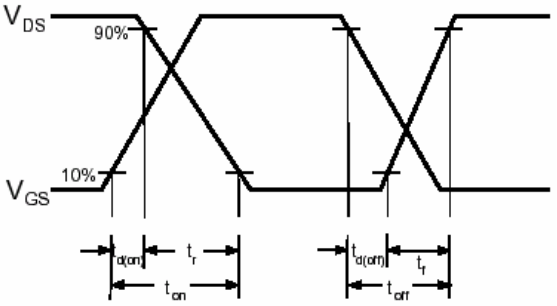
Gate Charge Test Circuit & Waveform



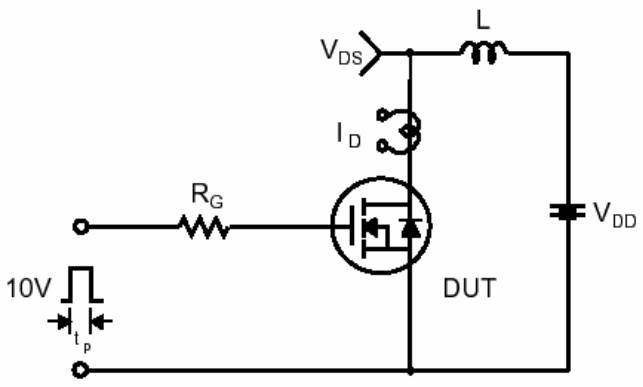


Resistive Switching Test Circuit & Waveforms

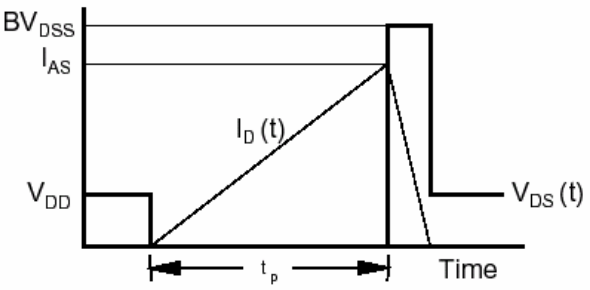




Unclamped Inductive Switching Test Circuit & Waveforms



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



Peak Diode Recovery dv/dt Test Circuit & Waveforms