Shantou Huashan Electronic Devices Co.,Ltd.

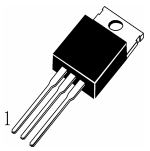
N-Channel MOSFET

HFP45N06

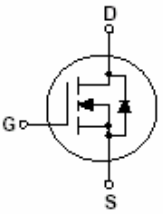
APPLICATIONSL

Low Voltage high-Speed Switching.

TO-220



1—G
2—D
3—S



ABSOLUTE MAXIMUM RATINGS (T_a=25℃)

T_{stg}——Storage Temperature·····-55~175℃
T_j ——Operating Junction Temperature ·····150℃
P_D —— Allowable Power Dissipation (T_c=25℃) ·····131W
V_{DSS} —— Drain-Source Voltage ····· 60V
V_{GSS} —— Gate-Source Voltage ·····±20V
I_D —— Drain Current (T_c=25℃) ·····45A

ELECTRICAL CHARACTERISTICS (T_a=25℃)

Symbol	Characteristics	Min	Typ	Max	Unit	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	60			V	I_D=250μA ,V_{GS}=0V
I_{DSS}	Zero Gate Voltage Drain Current			1	μA	V_{DS} = 60V， 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			0.028	?	V_{GS}=10V, I_D =45A
Ciss	Input Capacitance		2050		pF	V_{DS} =25V, V_{GS}=0,f=1MHz
Coss	Output Capacitance		600		pF	
Crss	Reverse Transfer Capacitance		200		pF	
tON	Turn-On Time			120	nS	V_{DD} =30V, I_D =45A R_L=0.667Ω, V_{GS}=10V R_G= 3.6 Ω
$t_{d(on)}$	Turn - On Delay Time		12		nS	
tr	Rise Time		74		nS	
$t_{d(off)}$	Turn - Off Delay Time		37		nS	
t_f	Fall Time		16		nS	
tOFF	Turn Off Time			80	nS	
Qg	Total Gate Charge		125	150	nC	V_{GS}=20V V_{DS} =48V， I_D=45A
Qg(10)	Gate Charge at 10V		67	80	nC	V_{GS}=10V R_L=1.07Ω
Qgd	Threshold Gate Charge		3.7	4.5	nC	V_{GS}=2V Ig (REF) =1.5mA
V_{SD}	Diode Forward Voltage			1.5	V	I_{SD} =45A
Rth (j-c)	Thermal Resistance， Junction-to-Case			1.14	℃/W	

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

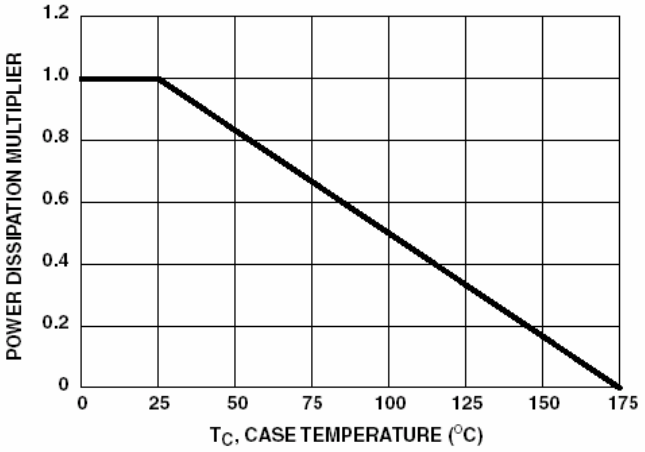


FIGURE 1. NORMALIZED POWER DISSIPATION vs CASE TEMPERATURE

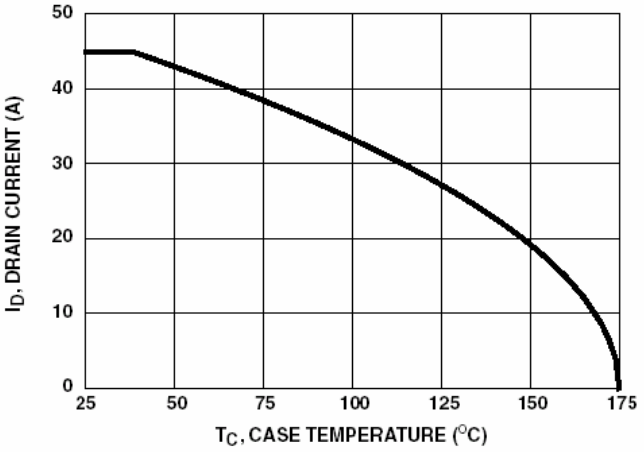


FIGURE 2. MAXIMUM CONTINUOUS DRAIN CURRENT vs CASE TEMPERATURE

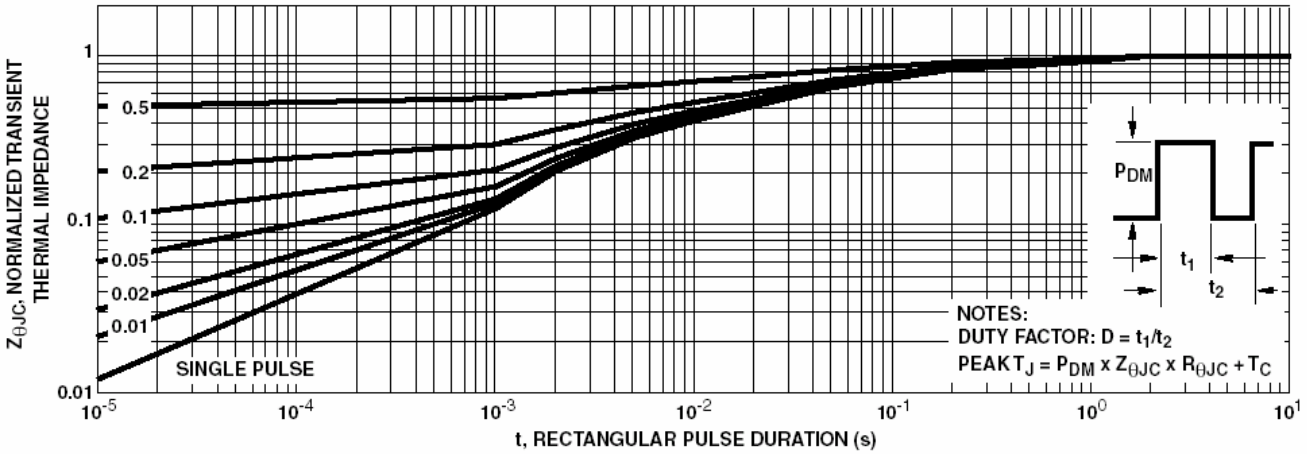


FIGURE 3. NORMALIZED MAXIMUM TRANSIENT THERMAL IMPEDANCE

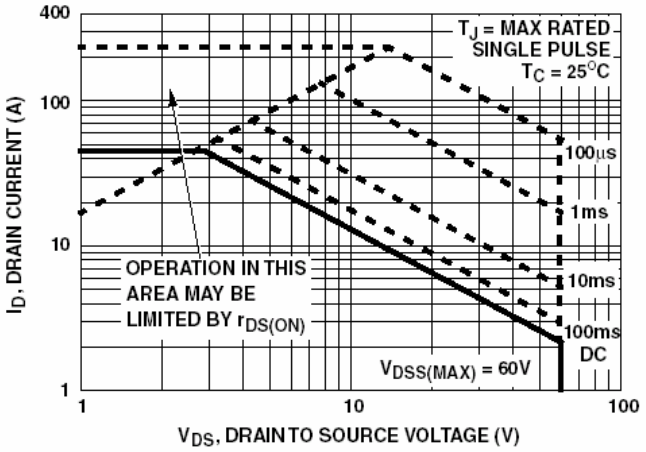


FIGURE 4. FORWARD BIAS SAFE OPERATING AREA

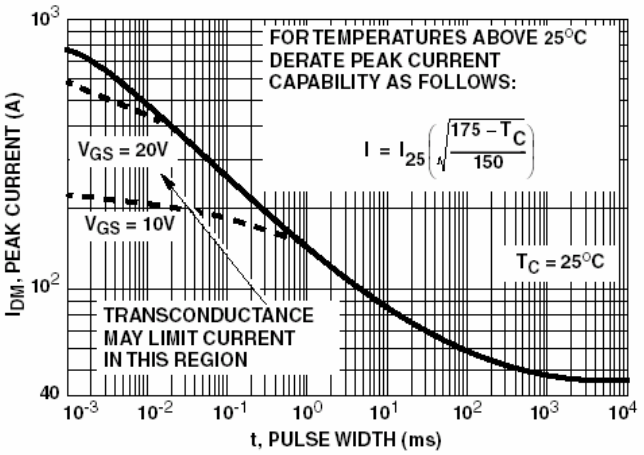


FIGURE 5. PEAK CURRENT CAPABILITY

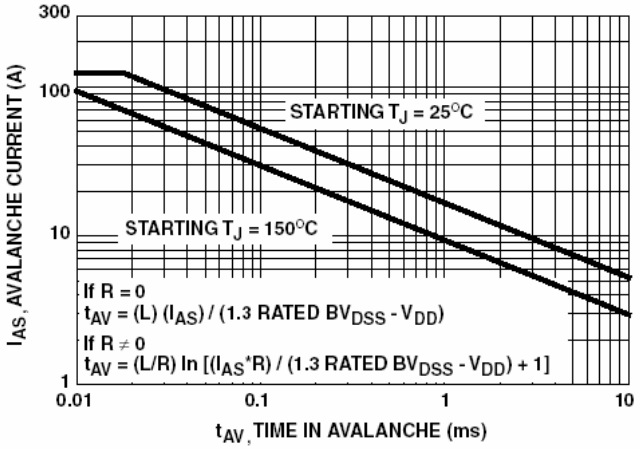


FIGURE 6. UNCLAMPED INDUCTIVE SWITCHING

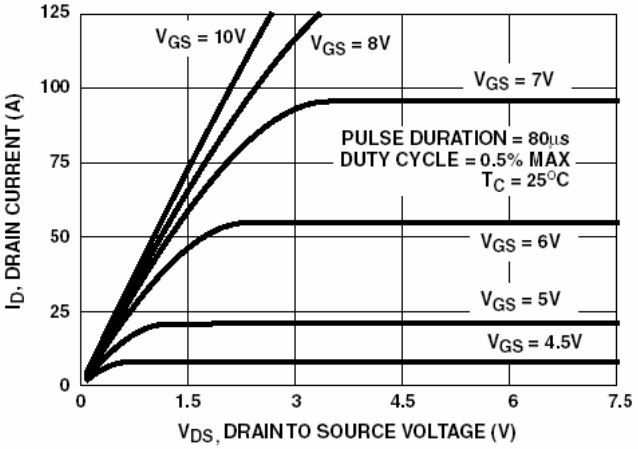


FIGURE 7. SATURATION CHARACTERISTICS

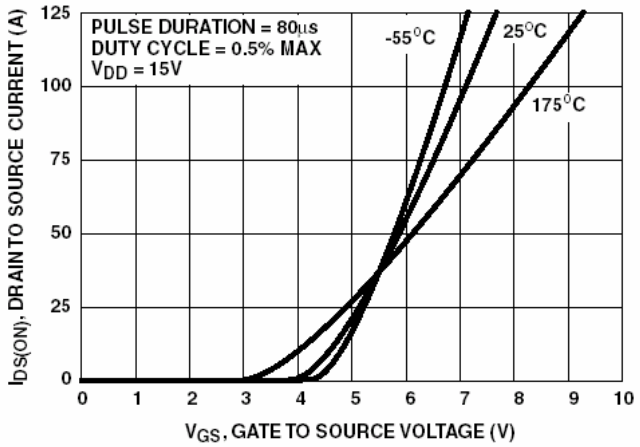


FIGURE 8. TRANSFER CHARACTERISTICS

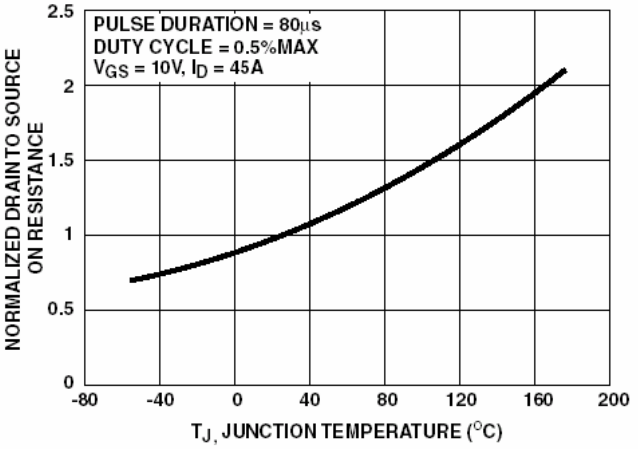


FIGURE 9. NORMALIZED DRAIN TO SOURCE ON RESISTANCE vs JUNCTION TEMPERATURE

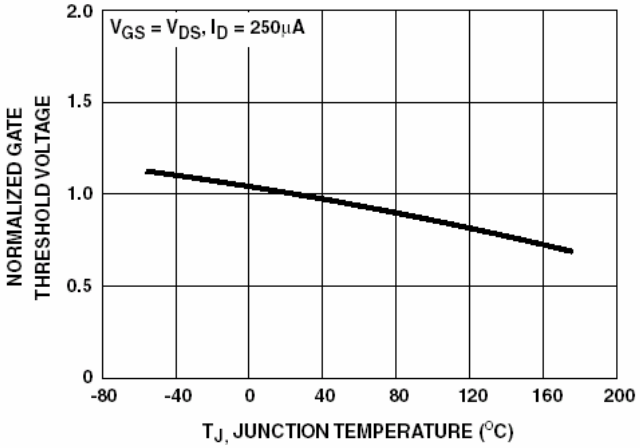


FIGURE 10. NORMALIZED GATE THRESHOLD VOLTAGE vs JUNCTION TEMPERATURE

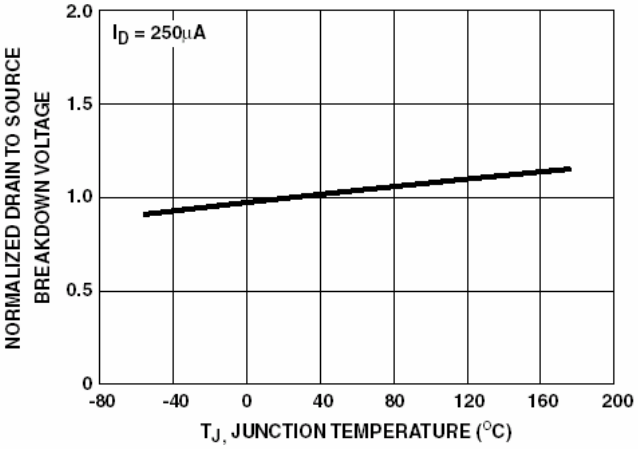


FIGURE 11. NORMALIZED DRAIN TO SOURCE BREAKDOWN VOLTAGE vs JUNCTION TEMPERATURE

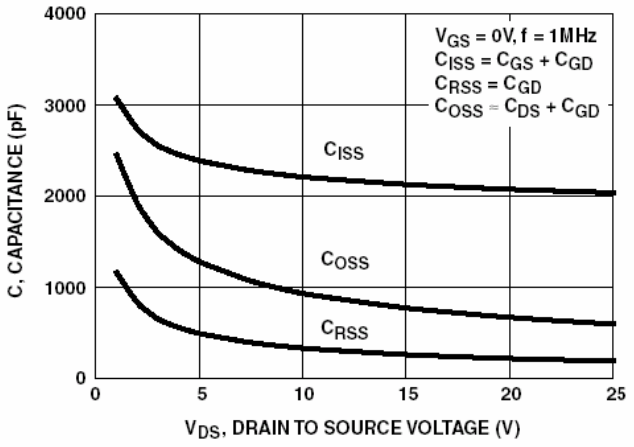


FIGURE 12. CAPACITANCE vs DRAIN TO SOURCE VOLTAGE

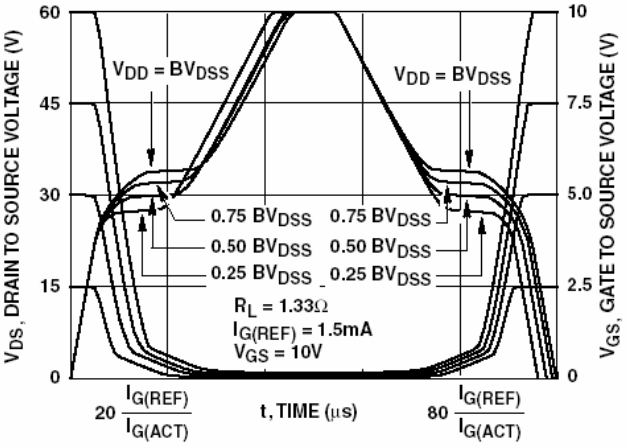


FIGURE 13. NORMALIZED SWITCHING WAVEFORMS FOR CONSTANT GATE CURRENT

Test Circuits and Waveforms

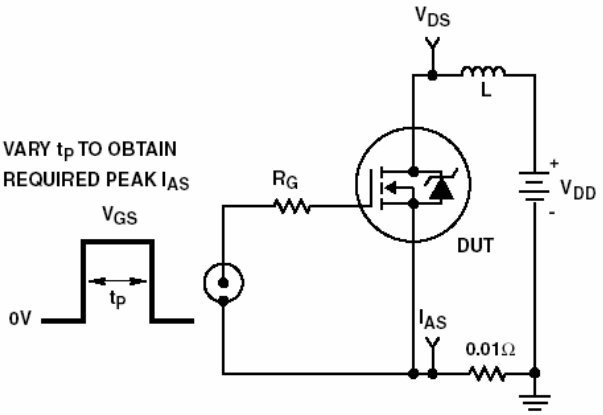


FIGURE 14. UNCLAMPED ENERGY TEST CIRCUIT

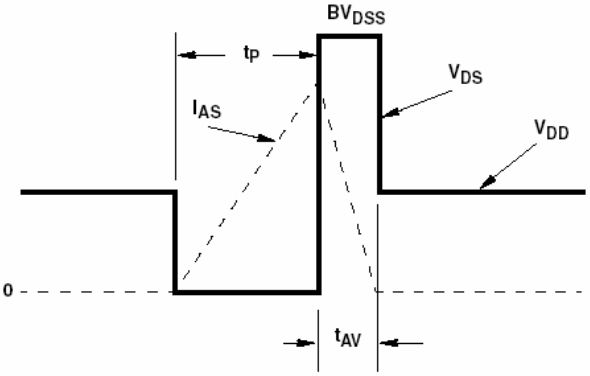


FIGURE 15. UNCLAMPED ENERGY WAVEFORMS

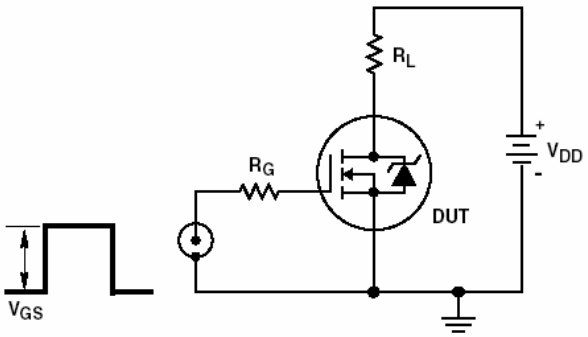


FIGURE 16. SWITCHING TIME TEST CIRCUIT

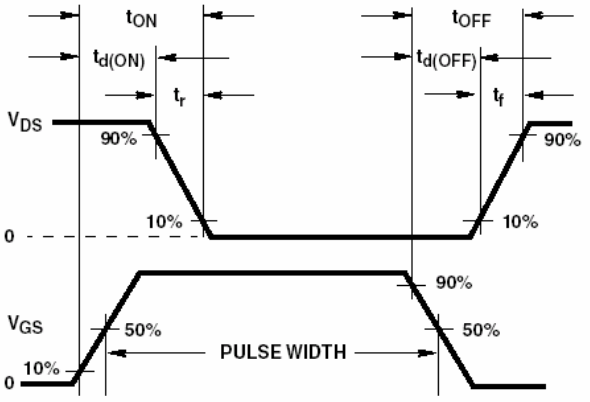


FIGURE 17. RESISTIVE SWITCHING WAVEFORMS

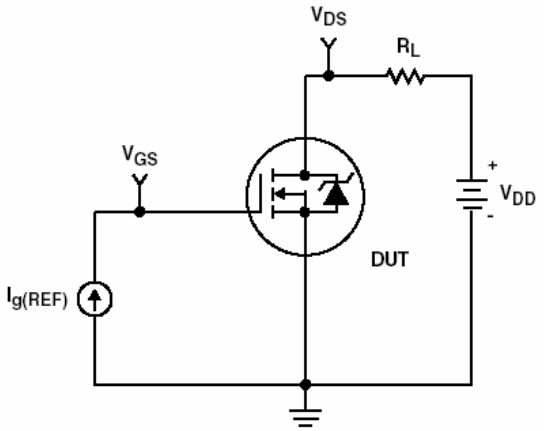


FIGURE 18. GATE CHARGE TEST CIRCUIT

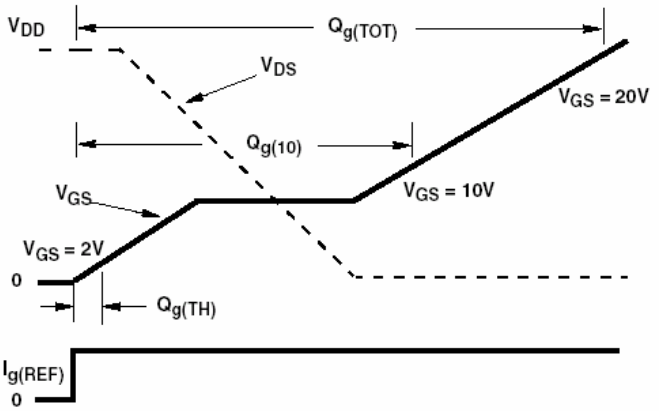


FIGURE 19. GATE CHARGE WAVEFORMS