



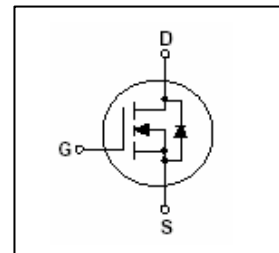
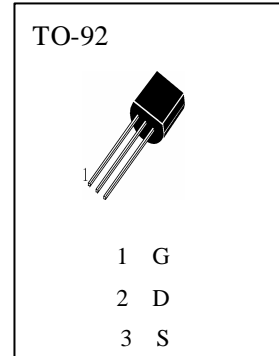
HFR1N60

APPLICATIONS

high-Speed Switching.

ABSOLUTE MAXIMUM RATINGS ($T_a=25$)

T_{stg}	Storage Temperature.....	-55~150
T_j	Operating Junction Temperature	150
P_D	Allowable Power Dissipation ($T_c=25$)	1W
V_{DSS}	Drain-Source Voltage	600V
V_{GSS}	Gate-Source Voltage	$\pm 30V$
I_D	Drain Current($T_c=25$).....	0.4A
I_{DM}	Drain Current(Pulsed).....	1.6A



ELECTRICAL CHARACTERISTICS ($T_a=25$)

Symbol	Characteristics	Min	Typ	Max	Unit	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	600			V	$I_D=250 \mu A, V_{GS}=0V$
I_{DSS}	Zero Gate Voltage Drain Current			50	μA	$V_{DS}=600V, V_{GS}=0$
I_{GSS}	Gate-Source Leakage Current			± 100	nA	$V_{GS}=\pm 30V, V_{DS}=0V$
$V_{GS(th)}$	Gate Threshold Voltage	2.0		4.0	V	$V_{DS}=V_{GS}, I_D=250 \mu A$
$R_{DS(on)}$	Static Drain-Source On-Resistance		9.3	11.5	Ω	$V_{GS}=10V, I_D=0.2A$
g_{fs}	Forward Transconductance		0.75		S	$V_{DS}=40V, I_D=0.3A^*$
C_{iss}	Input Capacitance		130	170	pF	$V_{DS}=25V, V_{GS}=0, f=1MHz$
C_{oss}	Output Capacitance		19	25	pF	
C_{rss}	Reverse Transfer Capacitance		3.5	6	pF	
$t_{d(on)}$	Turn - On Delay Time		7	24	nS	$V_{DD}=300V, I_D=1.1A$ $R_G=25 \Omega$ *
t_r	Rise Time		21	52	nS	
$t_{d(off)}$	Turn - Off Delay Time		13	36	nS	
t_f	Fall Time		27	64	nS	$V_{DS}=480V, I_D=1.1A$ $V_{GS}=10V$ *
Q_g	Total Gate Charge		4.8	6.2	nC	
Q_{gs}	Gate-Source Charge		0.7		nC	
Q_{gd}	Gate-Drain Charge		2.7		nC	
I_s	Continuous Source Current			0.3	A	
V_{SD}	Diode Forward Voltage			1.4	V	$I_s=0.4A, V_{GS}=0$
$R_{th(j-A)}$	Thermal Resistance , Junction-to-Ambient			140	/W	

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



Figure 1. On-Region Characteristics

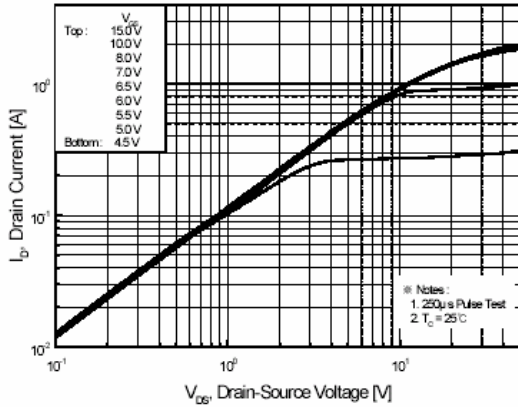


Figure 2. Transfer Characteristics

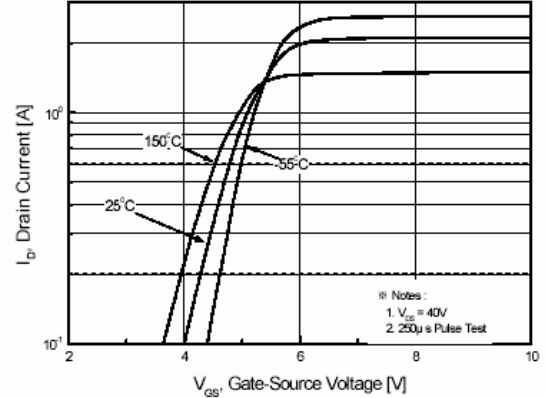


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

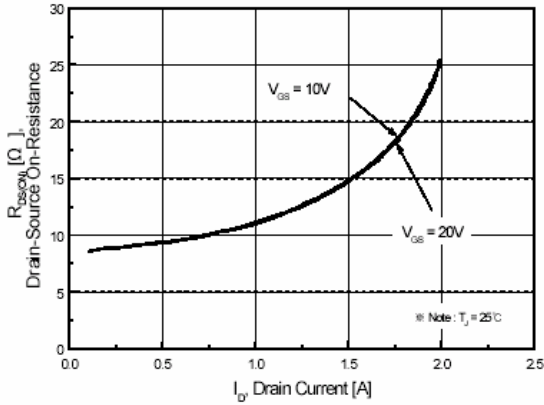


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

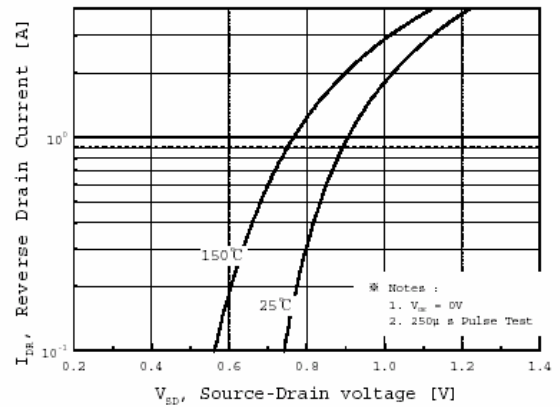


Figure 5. Capacitance Characteristics

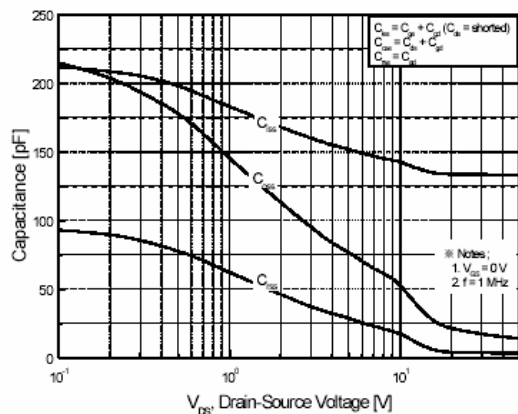


Figure 6. Gate Charge Characteristics

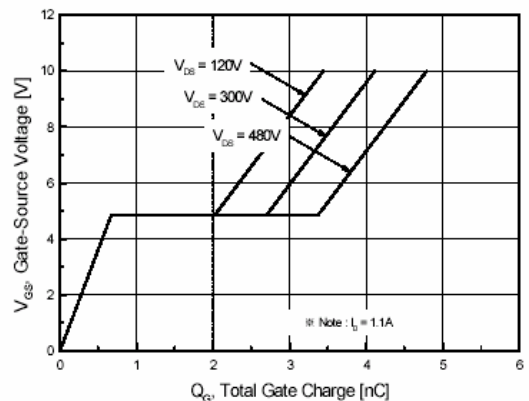




Figure 7. Breakdown Voltage Variation vs. Temperature

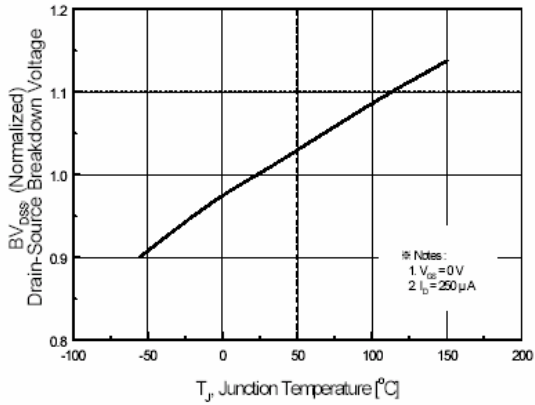


Figure 8. On-Resistance Variation vs. Temperature

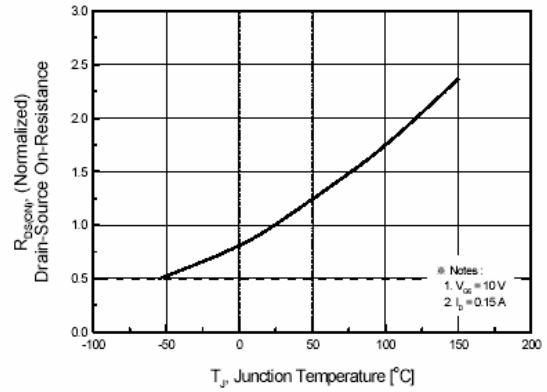


Figure 9. Maximum Safe Operating Area

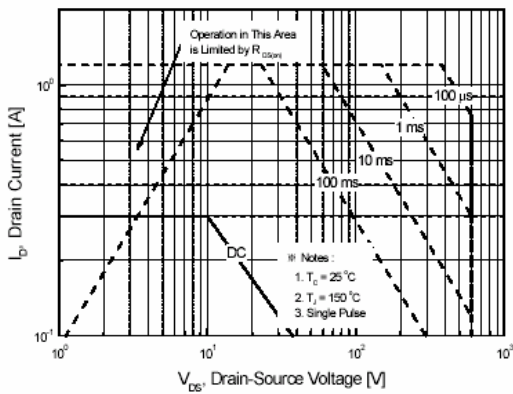


Figure 10. Maximum Drain Current vs. Case Temperature

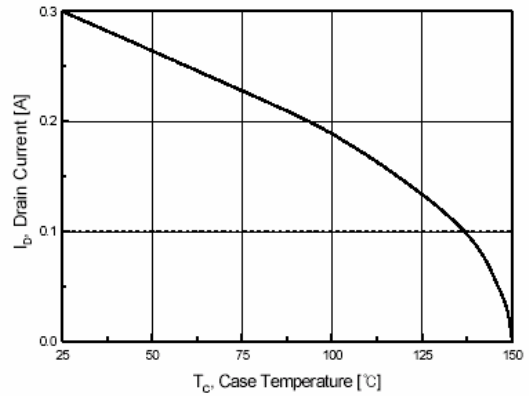
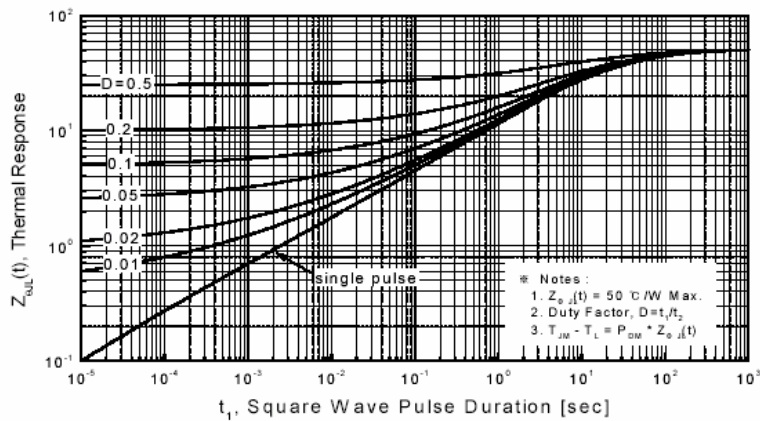
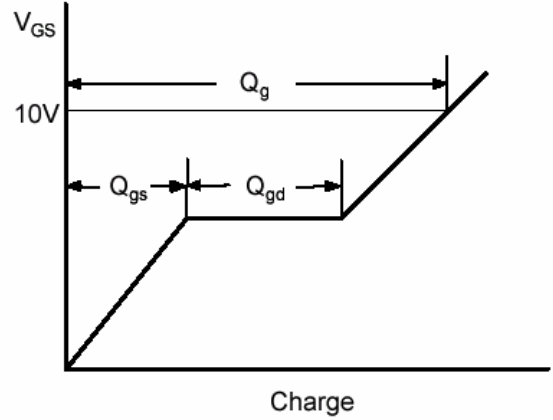
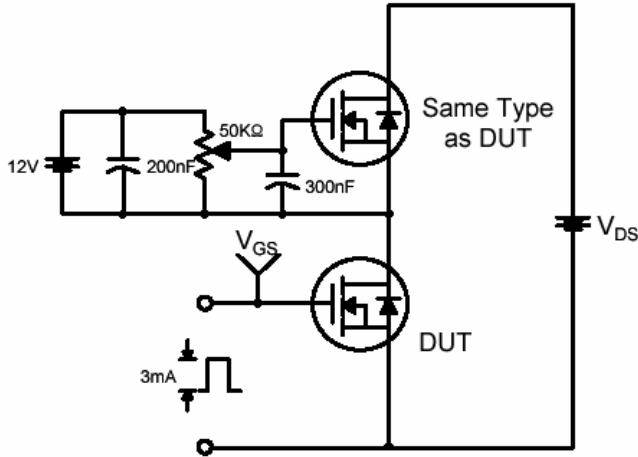


Figure 11. Transient Thermal Response Curve

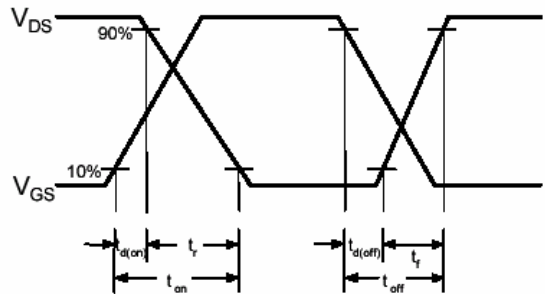
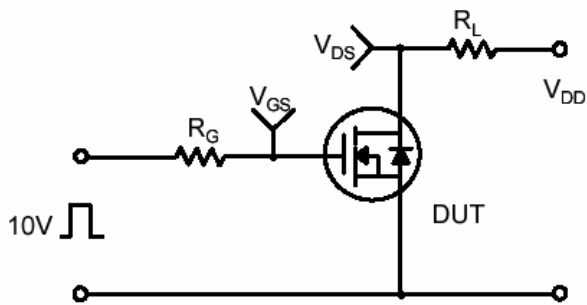




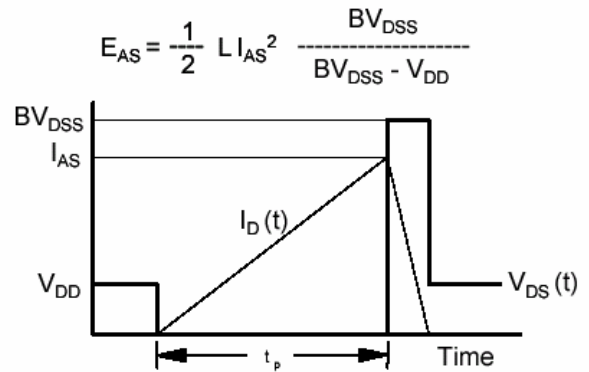
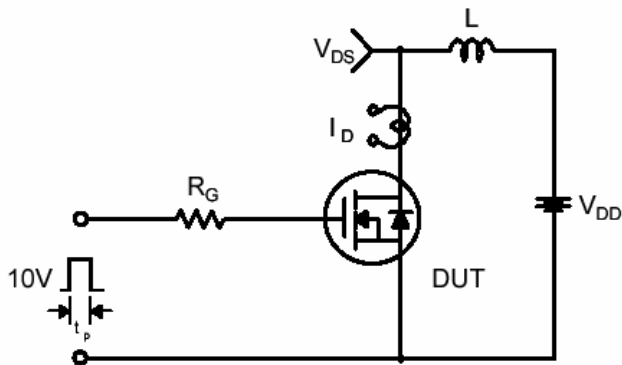
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms





Peak Diode Recovery dv/dt Test Circuit & Waveforms

