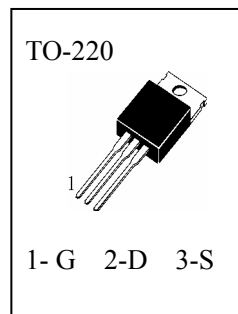


N-Channel Enhancement Mode Field Effect Transistor

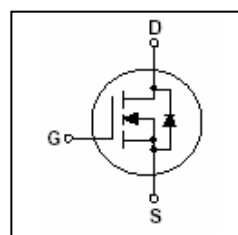
General Description

This Power MOSFET is produced using planar stripe, DMOS technology. This latest technology has been especially designed to minimize on-state resistance, have a high rugged avalanche characteristics. This devices is specially well suited for half bridge and full bridge resonant topolgy like a electronic lamp ballast.



Features

- 4.5A, 500V, $R_{DS(on)} = 1.5\Omega @ V_{GS} = 10V$
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- Equivalent Type:IRF830

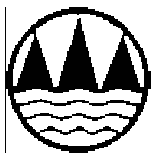


Maximum Ratings (Ta=25°C unless otherwise specified)

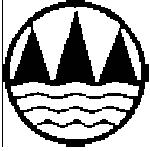
T_{stg}	Storage Temperature	-----	-55~150°C
T_j	Operating Junction Temperature	-----	-55~150°C
V_{DSS}	Drain-Source Voltage	-----	500V
V_{DGR}	Drain-Gate Voltage ($R_{GS}=1M\Omega$)	-----	500V
V_{GSS}	Gate-Source Voltage	-----	±20V
I_D	Drain Current (Continuous)	-----	4.5A
P_D	Maximum Power Dissipation	-----	75W
I_{AR}	Avalanche Current, Repetitive or Not-Repetitive (pulse width limited by T_j max, $d < 1\%$)	-----	4.5 A
E_{AS}	Single Pulse Avalanche Energy (starting $T_j = 25^\circ C$, $I_D = I_{AR}$, $V_{DD} = 50V$)	-----	270 mJ
E_{AR}	Repetitive Avalanche Energy(pulse width limited by T_j max, $d < 1\%$)	-----	7.3mJ

Thermal Characteristics

Symbol	Items	TO-220	Unit
Rthj-case	Thermal Resistance Junction-case	Max 1.71	°C/W
Rthj-amb	Thermal Resistance Junction-ambient	Max 62.5	°C/W
Rth c-s	Thermal Resistance Case-sink	Typ 0.5	°C/W

**Electrical Characteristics** (Ta=25°C unless otherwise specified)

Symbol	Items	Min.	Typ.	Max.	Unit	Conditions
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	500			V	I _D =250μA , V _{GS} =0V
I _{DSS}	Zero Gate Voltage Drain Current			25	μA	V _{DS} =500V, V _{GS} =0V
				250	μA	V _{DS} =400V, V _{GS} =0V,Tj=125 °C
I _{GSS}	Gate – Body Leakage			±100	nA	V _{GS} = ±20V , V _{DS} =0V
On Characteristics						
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			1.5	Ω	V _{GS} =10V, I _D =2.5A
g _{FS}	Forward Transconductance	2.5			S	V _{DS} =40V, I _D =2.5A
Dynamic Characteristics and Switching Characteristics						
C _{iss}	Input Capacitance			800	pF	V _{DS} = 25 V, V _{GS} = 0 V, f = 1.0 MHz
C _{oss}	Output Capacitance			200	pF	
C _{rss}	Reverse Transfer Capacitance			60	pF	
t _{d(on)}	Turn - On Delay Time			30	nS	V _{DD} = 200 V, I _D = 2.5Apk R _G = 15 Ω
t _r	Rise Time			30	nS	
t _{d(off)}	Turn - Off Delay Time			55	nS	
t _f	Fall Time			30	nS	
Q _g	Total Gate Charge		22		nC	V _{DS} =0.8V _{DSS} , I _D =4.5A, V _{GS} = 10 V
Q _{gs}	Gate–Source Charge		12		nC	
Q _{gd}	Gate–Drain Charge		10		nC	
Drain-Source Diode Characteristics and Maximun Ratings						
I _S	Continuous Source–Drain Diode Forward Current			4.5	A	
I _{SM}	Pulsed Drain-Source Diode Forward Current			18	A	
V _{SD}	Source–Drain Diode Forward On–Voltage			1.5	V	I _S =4.5A,V _{GS} =0



Typical Characteristics ($T_a=25^\circ\text{C}$ unless otherwise specified)

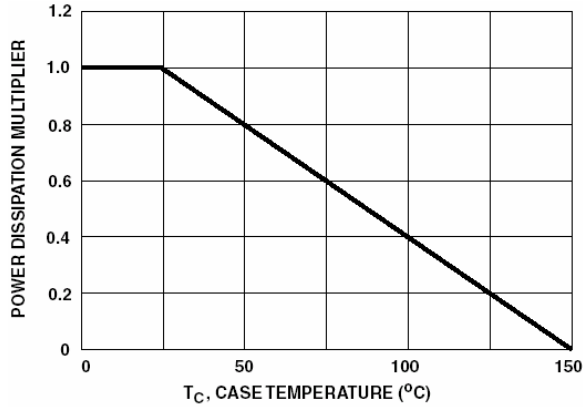


FIGURE 1. NORMALIZED POWER DISSIPATION vs CASE TEMPERATURE

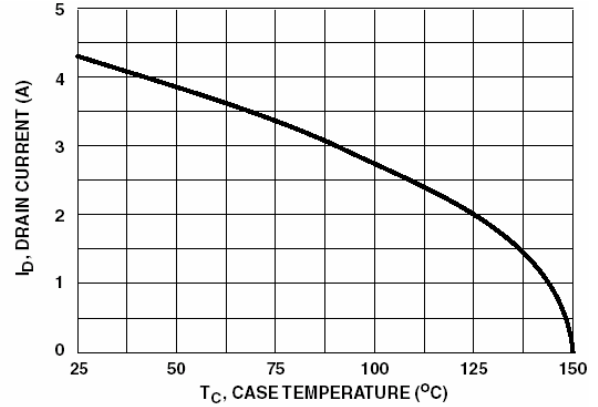


FIGURE 2. MAXIMUM CONTINUOUS DRAIN CURRENT vs CASE TEMPERATURE

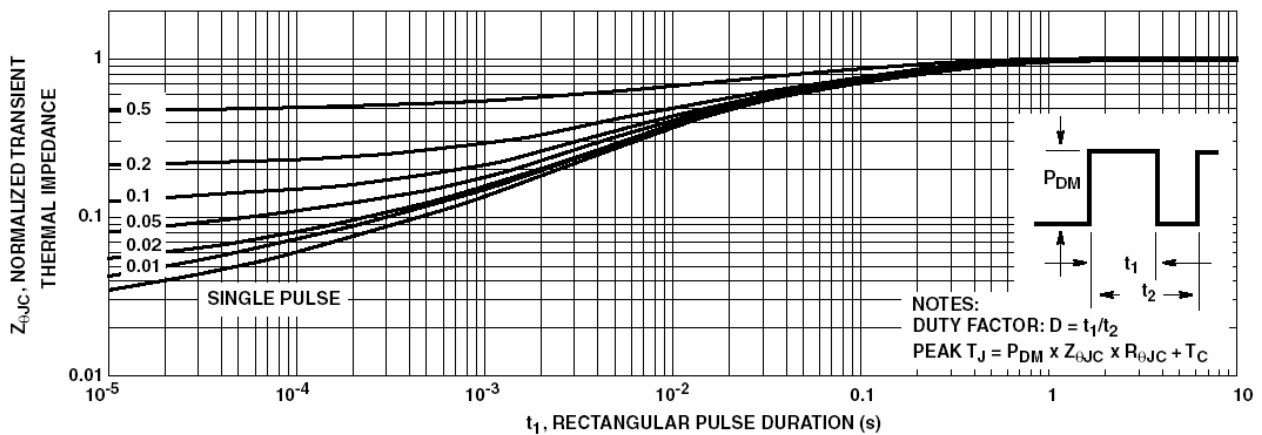


FIGURE 3. NORMALIZED MAXIMUM TRANSIENT THERMAL IMPEDANCE

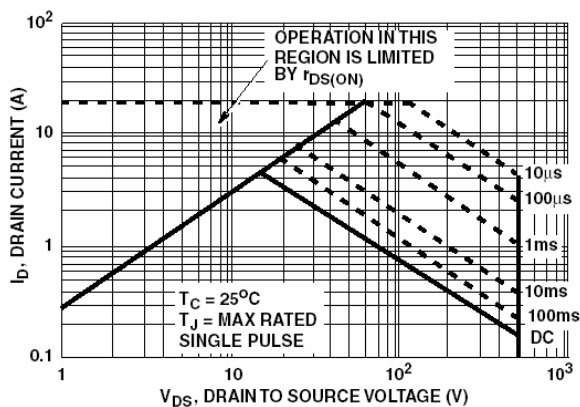


FIGURE 4. FORWARD BIAS SAFE OPERATING AREA

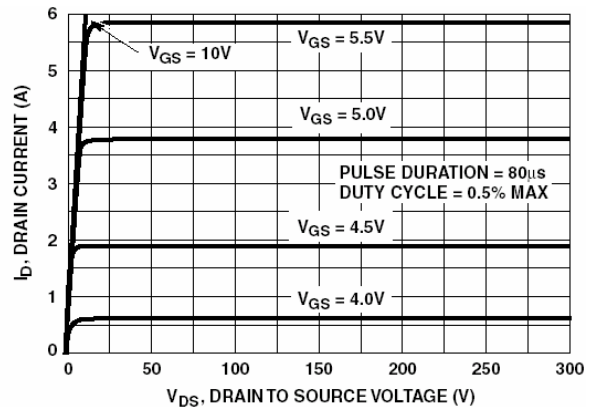
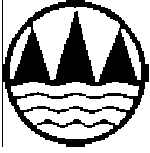


FIGURE 5. OUTPUT CHARACTERISTICS



Typical Characteristics ($T_a=25^\circ\text{C}$ unless otherwise specified)

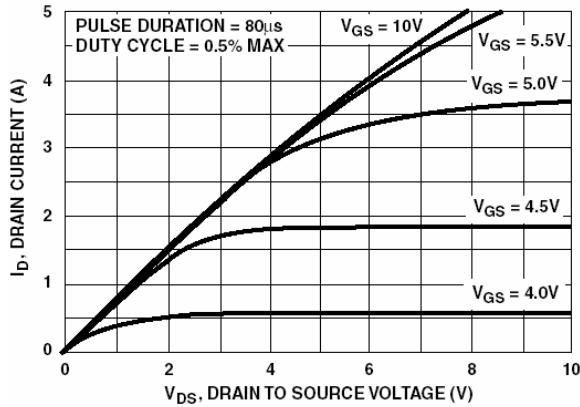


FIGURE 6. SATURATION CHARACTERISTICS

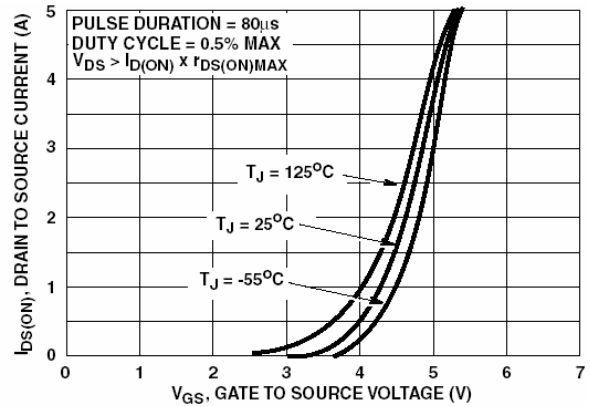


FIGURE 7. TRANSFER CHARACTERISTICS

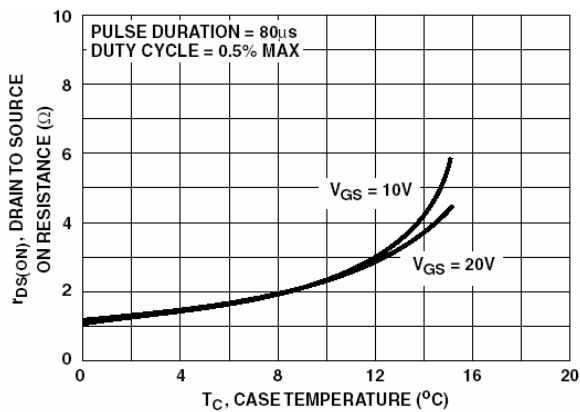


FIGURE 8. DRAIN TO SOURCE ON RESISTANCE vs GATE VOLTAGE AND DRAIN CURRENT

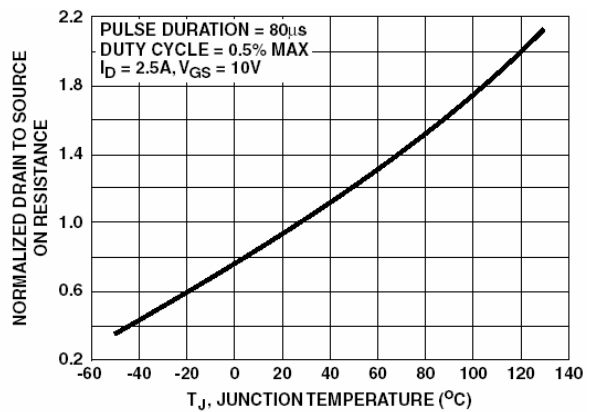


FIGURE 9. NORMALIZED DRAIN TO SOURCE ON RESISTANCE vs JUNCTION TEMPERATURE

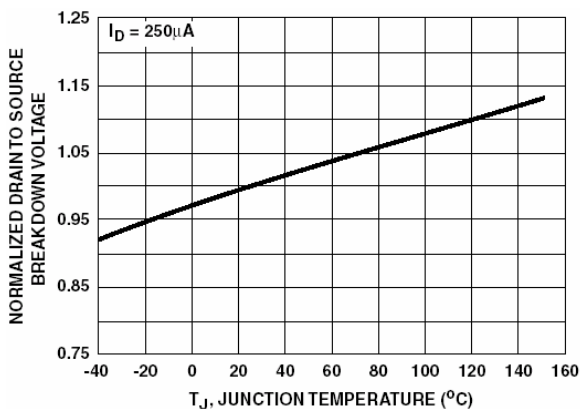


FIGURE 10. NORMALIZED DRAIN TO SOURCE BREAKDOWN VOLTAGE vs JUNCTION TEMPERATURE

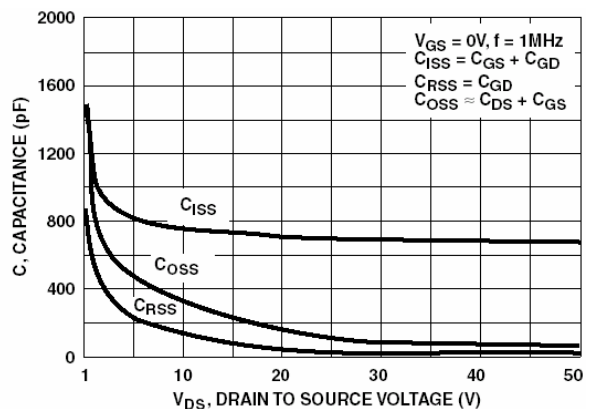
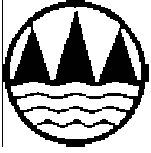


FIGURE 11. CAPACITANCE vs DRAIN TO SOURCE VOLTAGE



■ Typical Characteristics ($T_a=25^\circ\text{C}$ unless otherwise specified)

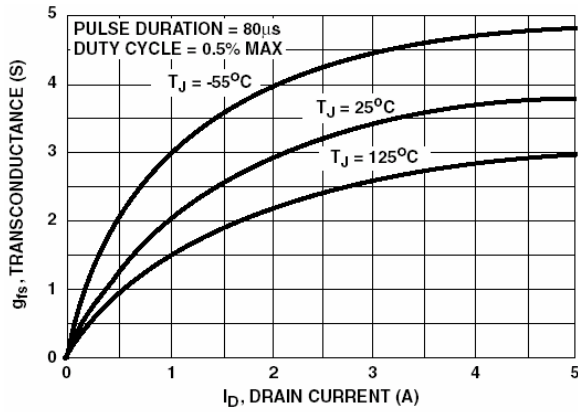


FIGURE 12. TRANSCONDUCTANCE vs DRAIN CURRENT

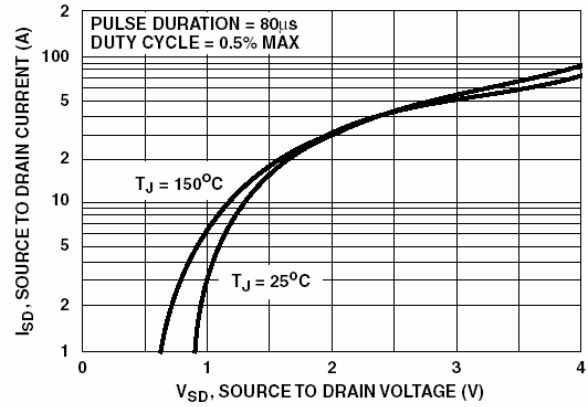


FIGURE 13. SOURCE TO DRAIN DIODE VOLTAGE

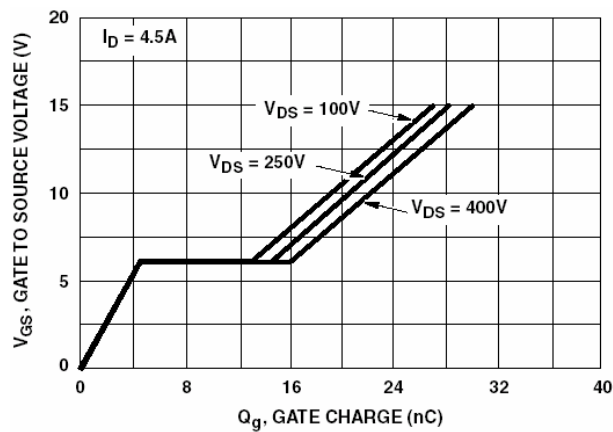
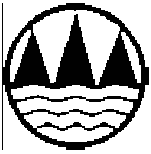


FIGURE 14. GATE TO SOURCE VOLTAGE vs GATE CHARGE



Typical Characteristics (Ta=25°C unless otherwise specified)

Test Circuits and Waveforms

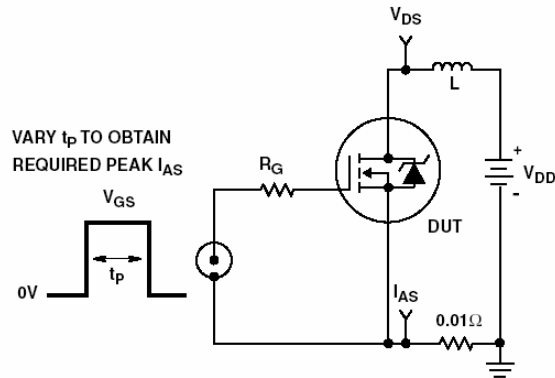


FIGURE 15. UNCLAMPED ENERGY TEST CIRCUIT

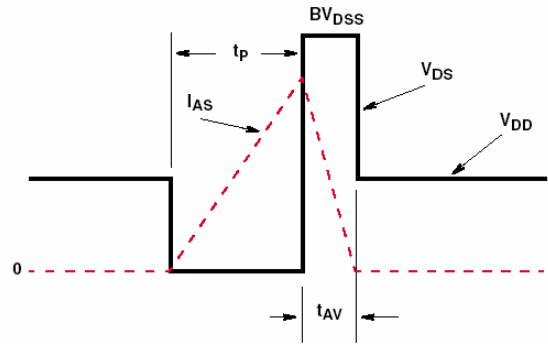


FIGURE 16. UNCLAMPED ENERGY WAVEFORMS

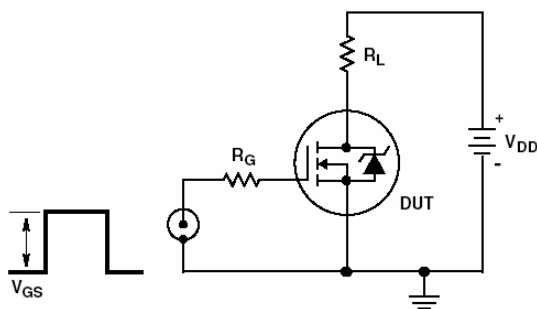


FIGURE 17. SWITCHING TIME TEST CIRCUIT

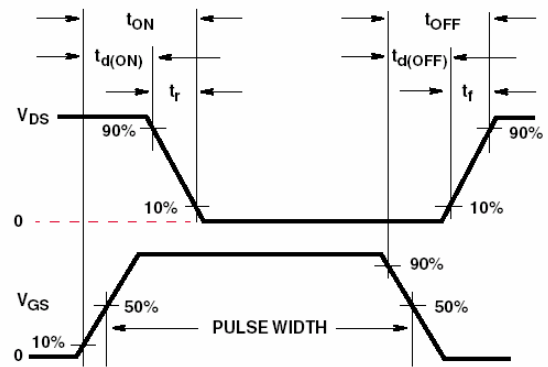


FIGURE 18. RESISTIVE SWITCHING WAVEFORMS

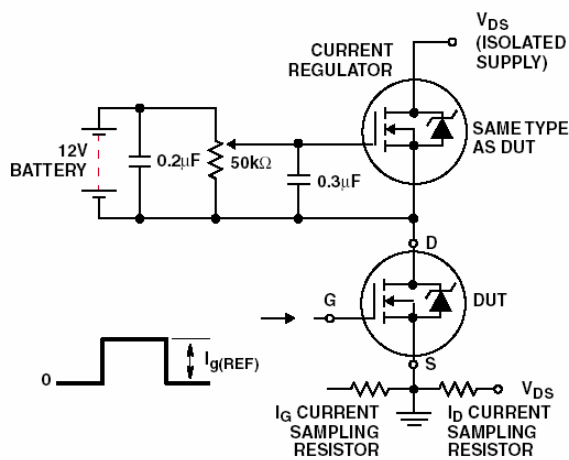


FIGURE 19. GATE CHARGE TEST CIRCUIT

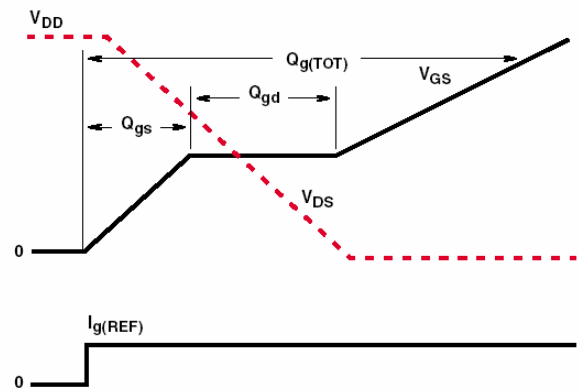


FIGURE 20. GATE CHARGE WAVEFORMS