



UF730

MOSFET

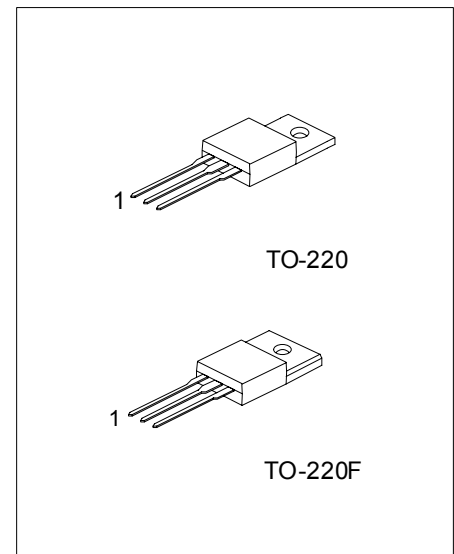
5.5A, 400V, 1.0 OHM, N-CHANNEL POWER MOSFET

DESCRIPTION

The UF730 power MOSFET is designed for high voltage, high speed power switching applications such as switching power supplies, switching adaptors.

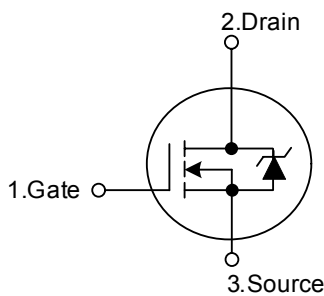
FEATURES

- * 5.5A, 400V, Low $R_{DS(ON)}$ (1.0Ω)
- * Single Pulse Avalanche Energy Rated
- * Rugged - SOA is Power Dissipation Limited
- * Fast Switching



*Pb-free plating product number: UF730L

SYMBOL



ORDERING INFORMATION

Order Number		Package	Pin Assignment			Packing
Normal	Lead Free Plating		1	2	3	
UF730-TA3-T	UF730L-TA3-T	TO-220	G	D	S	Tube
UF730-TF3-T	UF730L-TF3-T	TO-220F	G	D	S	Tube

Note: Pin Assignment: G: GATE D: DRAIN S: SOURCE

<p>UF730L-TA3-T</p> <p>(1)Packing Type (2)Package Type (3)Lead Plating</p>	<p>(1) T: Tube (2) TA3: TO-220, TF3: TO-220F (3) L: Lead Free Plating, Blank: Pb/Sn</p>
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■ ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C, Unless Otherwise Specified)

PARAMETER	SYMBOL	RATINGS	UNIT	
Drain to Source Voltage (T _J =25 ~125 °C)	V _{DS}	400	V	
Drain to Gate Voltage (R _{GS} = 20kΩ) (T _J =25 ~125 °C)	V _{DGR}	400	V	
Gate to Source Voltage	V _{GS}	±20	V	
Drain Current	Continuous	I _D	6.5	A
	T _C = 100	I _D	3.5	A
	Pulsed	I _{DM}	22	A
Maximum Power Dissipation Derating above 25	P _D	93	W	
		0.6	W/	
Single Pulse Avalanche Energy Rating (V _{DD} =50V, starting T _J =25 °C, L=17mH, R _G =25Ω, peak I _{AS} = 5.5A)	E _{AS}	300	mJ	
Operating Temperature Range	T _{OPR}	-55 ~ +150		
Storage Temperature Range	T _{STG}	-55 ~ +150		

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Thermal Resistance Junction-Ambient	θ _{JA}	80	/W
Thermal Resistance Junction-Case	θ _{JC}	1.67	

■ ELECTRICAL CHARACTERISTICS (T_C=25 °C, Unless Otherwise Specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Drain to Source Breakdown Voltage	BV _{DSS}	I _D = 250μA, V _{GS} = 0V	400			V	
Gate to Threshold Voltage	V _{GS(THR)}	V _{DS} = V _{GS} , I _D = 250μA	2.0		4.0	V	
On-State Drain Current (Note 1)	I _{D(ON)}	V _{DS} > I _{D(ON)} × R _{DS(ON)MAX} , V _{GS} = 10V	5.5			A	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = Rated BV _{DSS} , V _{GS} = 0V			25	μA	
		V _{DS} = 0.8 × Rated BV _{DSS} , V _{GS} = 0V, T _J = 125			250	μA	
Gate to Source Leakage Current	I _{GSS}	V _{GS} = ±20V			±100	nA	
Drain to Source On Resistance (Note 1)	R _{DS(ON)}	I _D = 3.0A, V _{GS} = 10V		0.8	1.0	Ω	
Forward Transconductance (Note 1)	g _{FS}	V _{DS} ≥ 10V, I _D = 3.3A	2.9	4.4		S	
Turn-On Delay Time	t _{DLY(ON)}	V _{DD} = 200V, I _D ≈ 5.5A, R _{GS} = 12Ω, R _L = 35Ω MOSFET Switching Times are Essentially Independent of Operating Temperature		10	17	ns	
Rise Time	t _r			20	29	ns	
Turn-Off Delay Time	t _{DLY(OFF)}				35	56	ns
Fall Time	t _f				15	24	ns
Total Gate Charge (Gate to Source + Gate to Drain)	Q _{G(TOT)}	V _{GS} = 10V, I _D = 5.5A, V _{DS} = 0.8 × Rated BV _{DSS}		20	35	nC	
Gate to Source Charge	Q _{GS}	I _{G(REF)} = 1.5mA		3.0		nC	
Gate to Drain "Miller" Charge	Q _{GD}	Gate Charge is Essentially Independent of Operating Temperature		10		nC	
Input Capacitance	C _{ISS}	V _{DS} = 25V, V _{GS} = 0V, f = 1MHz		600		pF	
Output Capacitance	C _{OSS}				150		pF
Reverse - Transfer Capacitance	C _{RSS}				40		pF

■ ELECTRICAL CHARACTERISTICS(Cont.)

SOURCE TO DRAIN DIODE SPECIFICATIONS						
Source to Drain Diode Voltage (Note 1)	V_{SD}	$T_J = 25^\circ\text{C}$, $I_{SD} = 5.5\text{A}$, $V_{GS} = 0\text{V}$			1.6	V
Continuous Source to Drain Current	I_S				5.5	A
Pulse Source to Drain Current (Note 2)	I_{SM}				22	A
Reverse Recovery Time	t_{RR}	$T_J = 25^\circ\text{C}$, $I_{SD} = 5.5\text{A}$, $dI_{SD}/dt = 100\text{A}/\mu\text{s}$	140	300	660	ns
Reverse Recovery Charge	Q_{RR}	$T_J = 25^\circ\text{C}$, $I_{SD} = 5.5\text{A}$, $dI_{SD}/dt = 100\text{A}/\mu\text{s}$	0.93	2.1	4.3	μC

Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

2. Repetitive rating: Pulse width limited by maximum junction temperature.

3. $V_{DD} = 50\text{V}$, starting $T_J = 25^\circ\text{C}$, $L = 17\text{mH}$, $R_G = 25\Omega$, peak $I_{AS} = 5.5\text{A}$.

■ TEST CIRCUITS AND WAVEFORMS

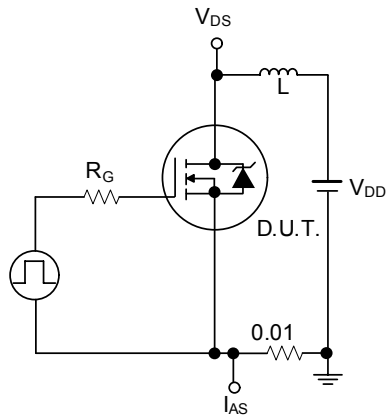


Figure 1A. Unclamped Energy Test Circuit

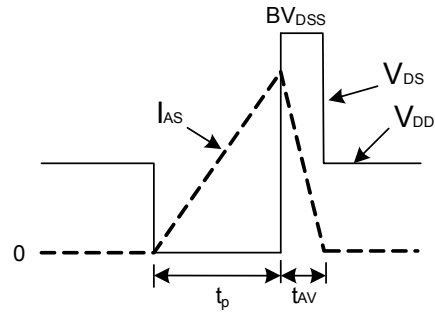


Figure 1B. Unclamped Energy Waveforms

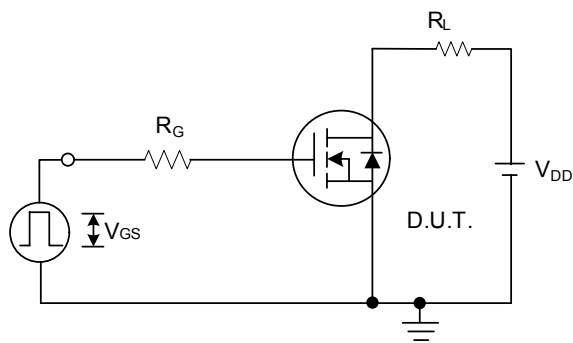


Figure 2A. Switching Time Test Circuit

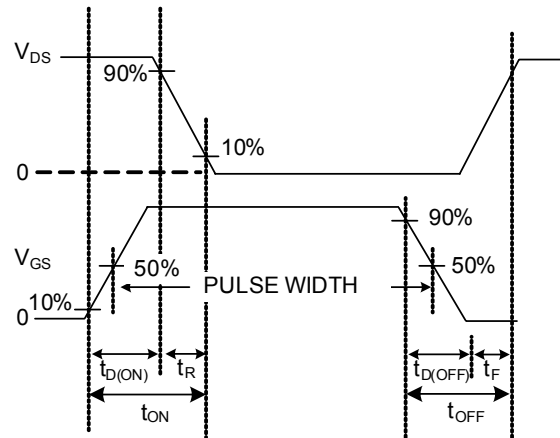


Figure 2B. Resistive Switching Waveforms

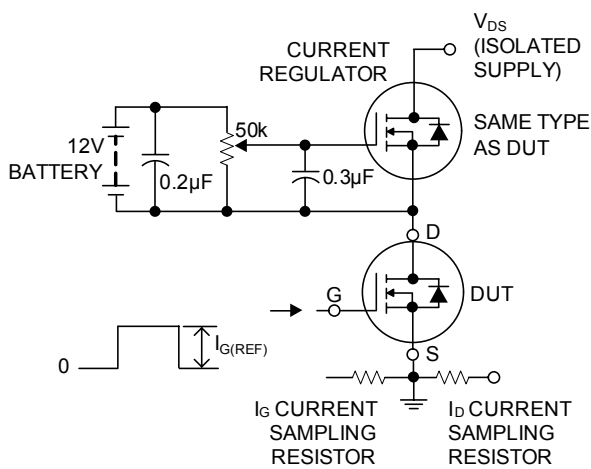


Figure 3A. Gate Charge Test Circuit

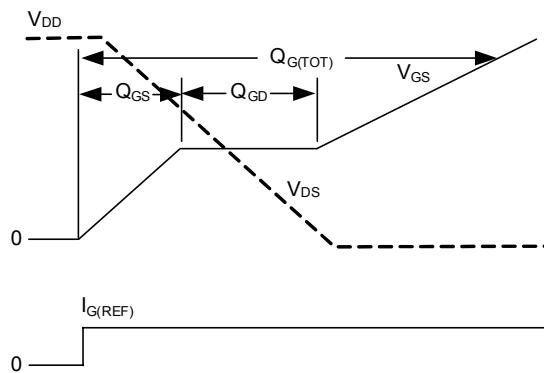
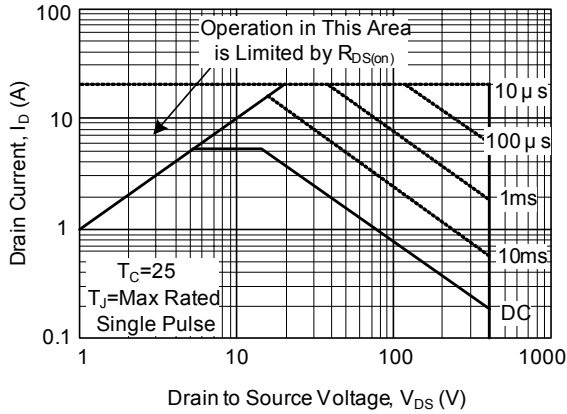


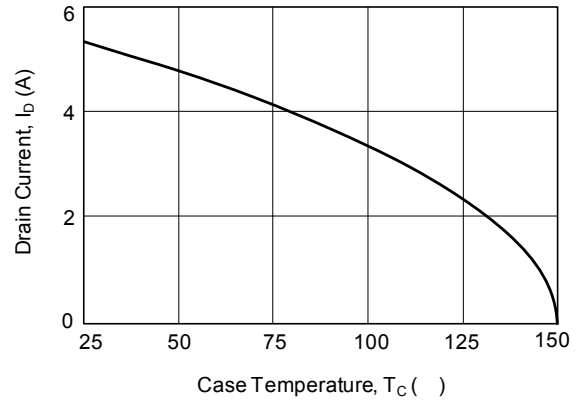
Figure 3B. Gate Charge Waveforms

■ TYPICAL PERFORMANCE CUVES (Unless Otherwise Specified)

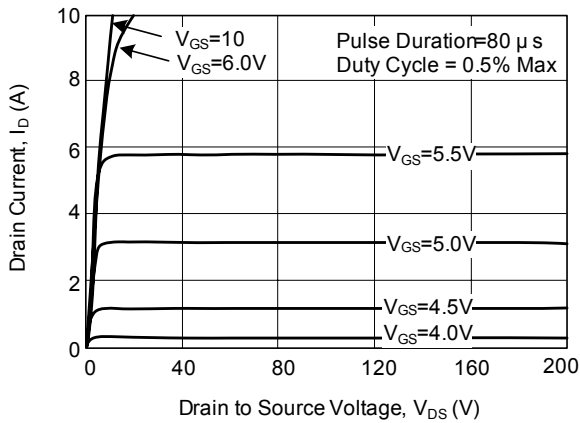
Forward Bias Safe Operating Area



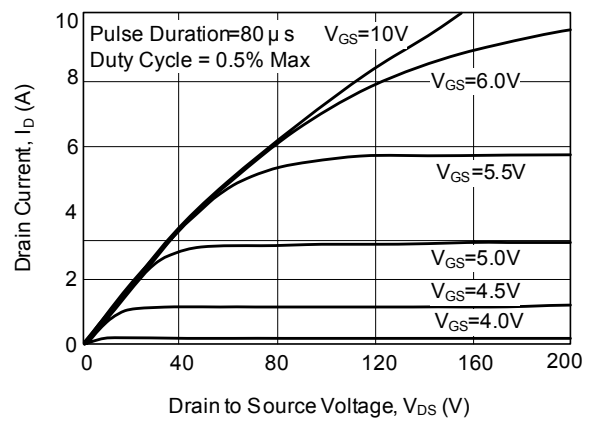
Maximum Contionuous Drain Current vs. Case Temperature



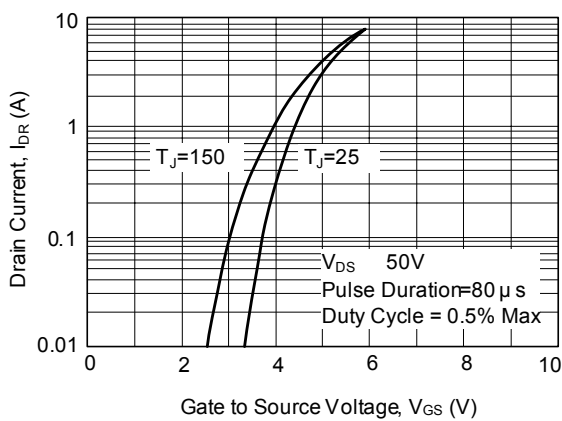
Output Characteristics



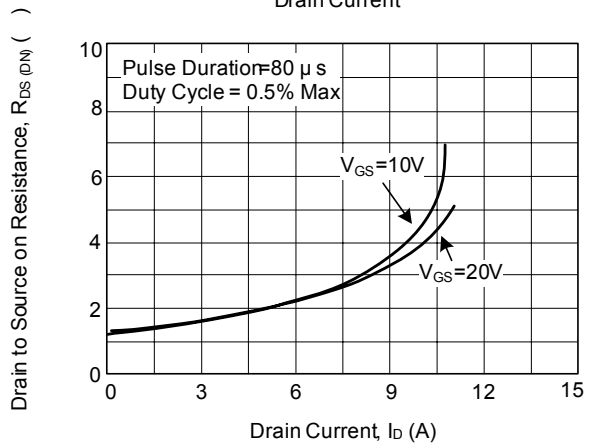
Sturation Characteristics



Transfer Characteristics

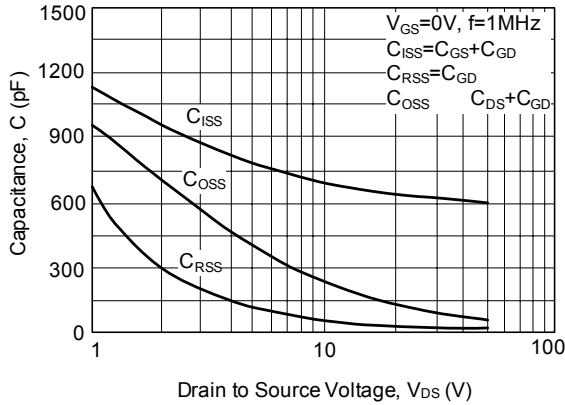


Drain to Source on Resistance vs. Gate Voltage and Drain Current

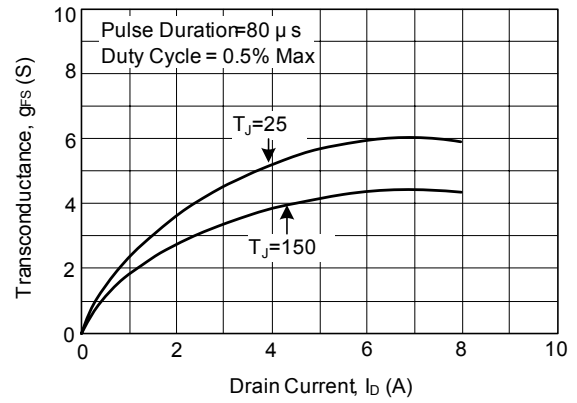


TYPICAL PERFORMANCE CURVES

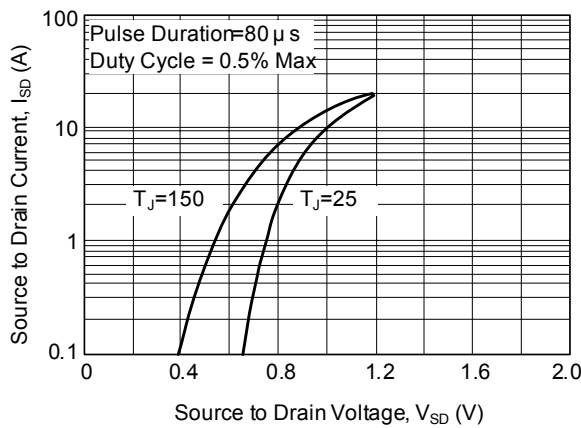
Capacitance vs. Drain to Source Voltage



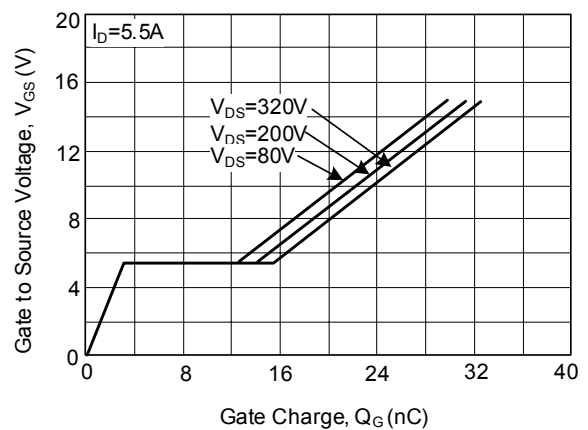
Transconductance vs. Drain Current



Source to Drain Diode Voltage



Gate to Source Voltage vs. Gate Charge



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