

**UNISONIC TECHNOLOGIES CO., LTD**

UF730

MOSFET

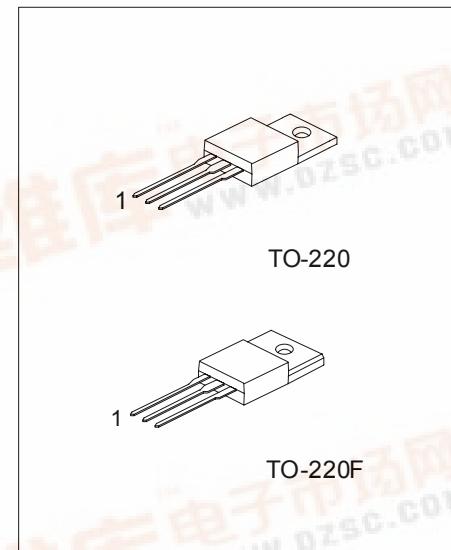
5.5A, 400V, 1.0 OHM,
N-CHANNEL POWER MOSFET

■ DESCRIPTION

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

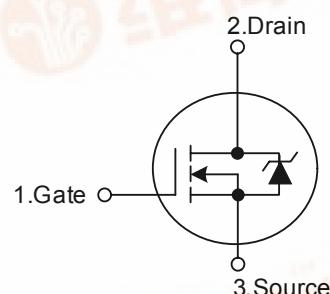
■ FEATURES

- * 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

UF730L-TA3-T	(1)Packing Type (2)Package Type (3)Lead Plating	(1) T: Tube (2) TA3: TO-220, TF3: TO-220F (3) L: Lead Free Plating, Blank: Pb/Sn
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■ ABSOLUTE MAXIMUM RATINGS ($T_c = 25^\circ C$, Unless Otherwise Specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain to Source Voltage ($T_J = 25^\circ C \sim 125^\circ C$)	V_{DS}	400	V
Drain to Gate Voltage ($R_{GS} = 20k\Omega$) ($T_J = 25^\circ C \sim 125^\circ C$)	V_{DGR}	400	V
Gate to Source Voltage	V_{GS}	± 20	V
Drain Current	Continuous	I_D	6.5
	$T_c = 100^\circ C$	I_D	3.5
	Pulsed	I_{DM}	22
Maximum Power Dissipation Derating above 25	P_D	93 0.6	W W/
Single Pulse Avalanche Energy Rating ($V_{DD} = 50V$, starting $T_J = 25^\circ C$, $L = 17mH$, $R_G = 25\Omega$, 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 ($T_c = 25^\circ C$, Unless Otherwise Specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Drain to Source Breakdown Voltage	BV_{DSS}	$I_D = 250\mu A$, $V_{GS} = 0V$	400			V	
Gate to Threshold Voltage	$V_{GS(THR)}$	$V_{DS} = V_{GS}$, $I_D = 250\mu A$	2.0		4.0	V	
On-State Drain Current (Note 1)	$I_{D(ON)}$	$V_{DS} > I_{D(ON)} \times R_{DS(ON)MAX}$, $V_{GS} = 10V$	5.5			A	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = \text{Rated } BV_{DSS}$, $V_{GS} = 0V$ $V_{DS} = 0.8 \times \text{Rated } BV_{DSS}$, $V_{GS} = 0V$, $T_J = 125^\circ C$			25 250	μA μA	
Gate to Source Leakage Current	I_{GSS}	$V_{GS} = \pm 20V$			± 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}	$V_{DS} \geq 10V$, $I_D = 3.3A$	2.9	4.4		S	
Turn-On Delay Time	$t_{DLY(ON)}$	$V_{DD} = 200V$, $I_D \approx 5.5A$,			10	17	ns
Rise Time	t_R	$R_{GS} = 12\Omega$, $R_L = 35\Omega$			20	29	ns
Turn-Off Delay Time	$t_{DLY(OFF)}$	MOSFET Switching Times are Essentially			35	56	ns
Fall Time	t_F	Independent of Operating Temperature			15	24	ns
Total Gate Charge (Gate to Source + Gate to Drain)	$Q_{G(TOT)}$	$V_{GS} = 10V$, $I_D = 5.5A$, $V_{DS} = 0.8 \times \text{Rated } BV_{DSS}$			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}	$T_J = 25^\circ C$, $I_{SD} = 5.5A$, $V_{GS} = 0V$			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}	$T_J = 25^\circ C$, $I_{SD} = 5.5A$, $dI_{SD}/dt = 100A/\mu s$	140	300	660	ns
Reverse Recovery Charge	Q_{RR}	$T_J = 25^\circ C$, $I_{SD} = 5.5A$, $dI_{SD}/dt = 100A/\mu s$	0.93	2.1	4.3	μC

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

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

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

■ TEST CIRCUITS AND WAVEFORMS

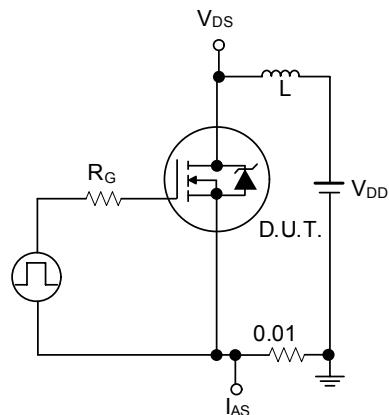


Figure 1A. Unclamped Energy Test Circuit

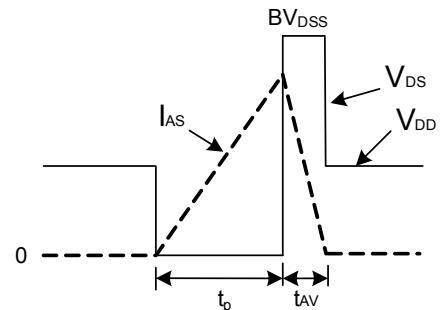


Figure 1B. Unclamped Energy Waveforms

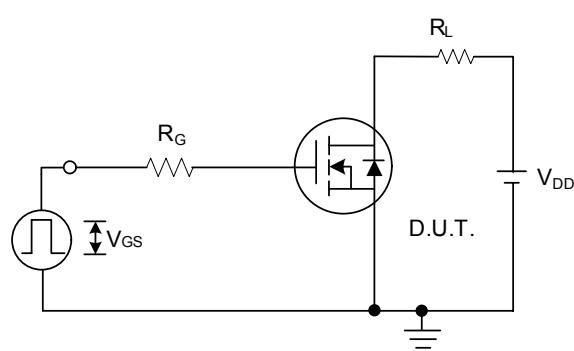


Figure 2A. Switching Time Test Circuit

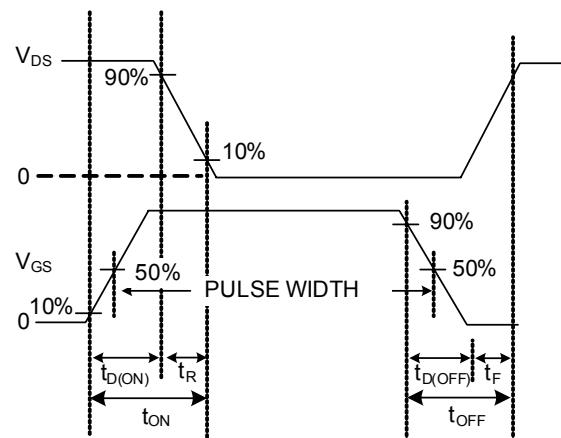


Figure 2B. Resistive Switching Waveforms

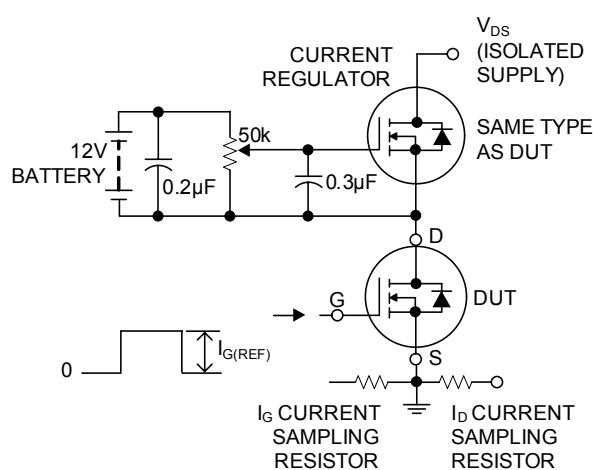


Figure 3A. Gate Charge Test Circuit

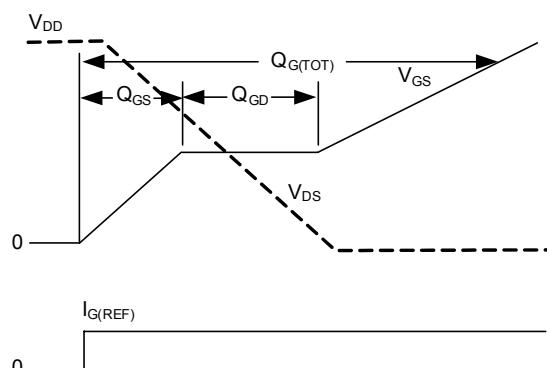
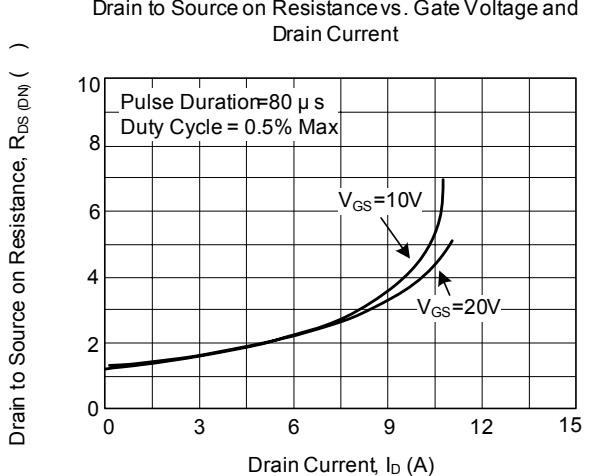
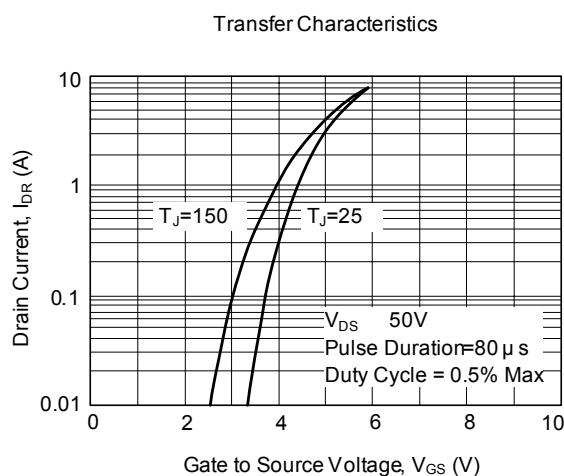
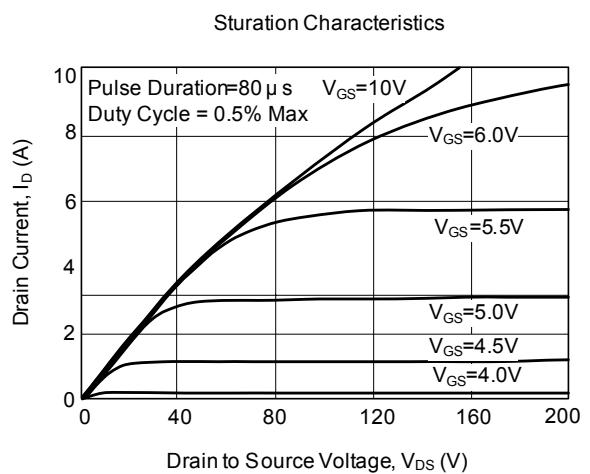
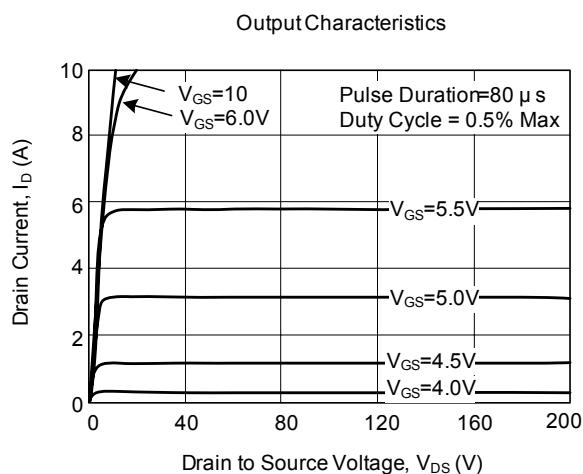
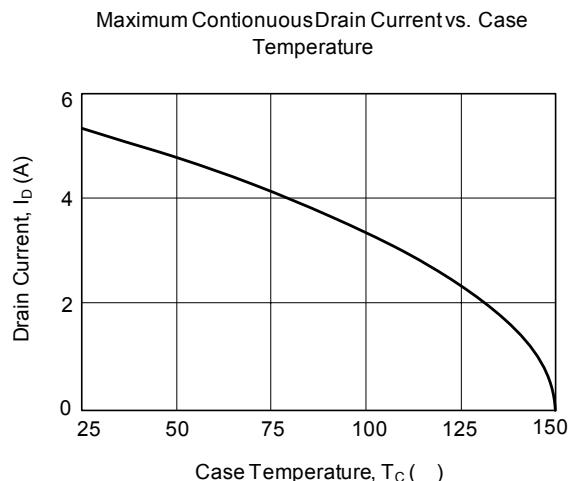
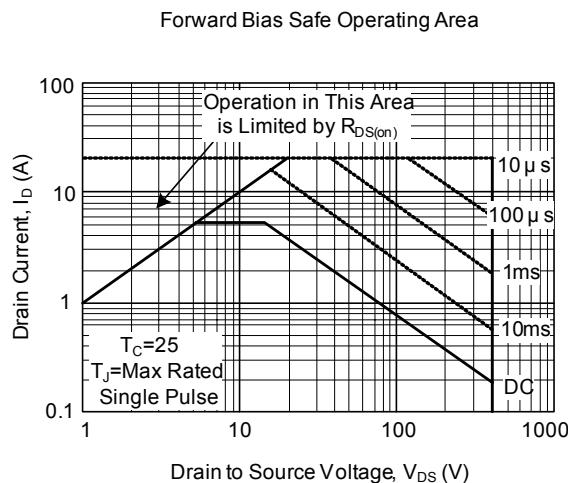
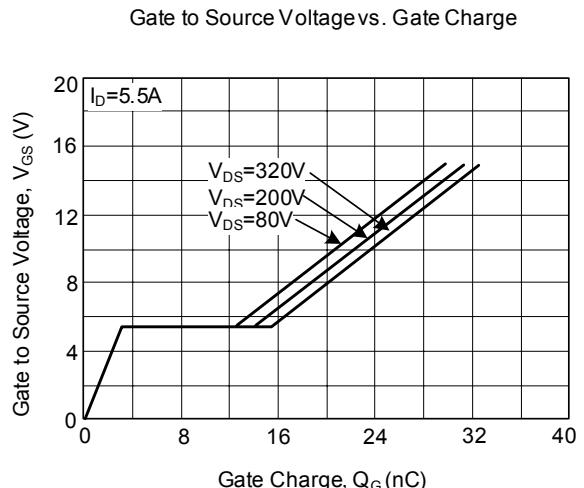
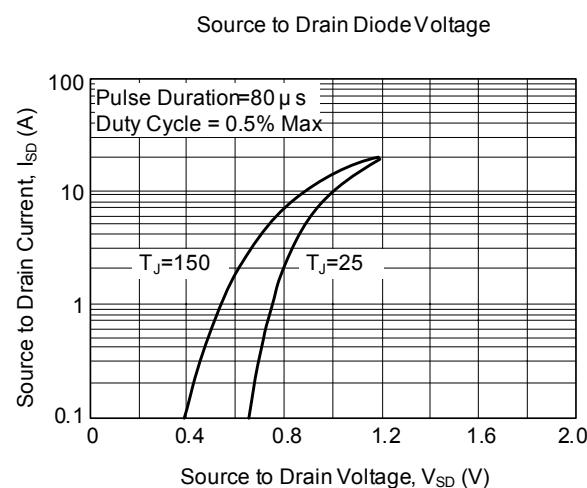
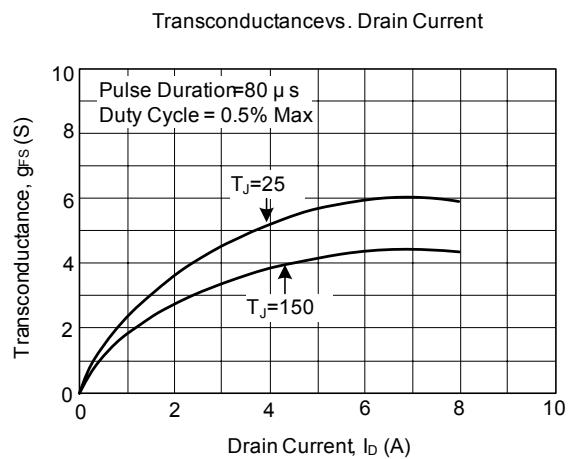
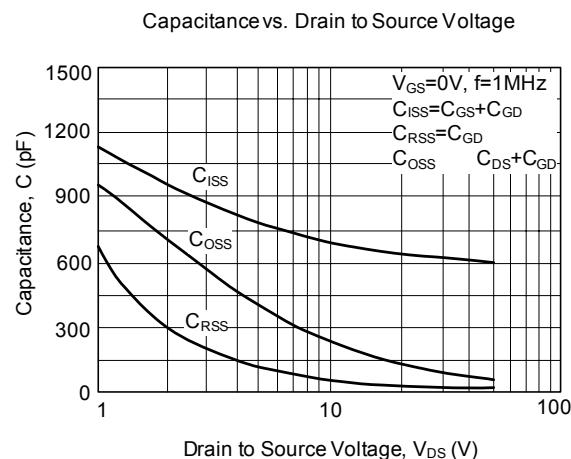


Figure 3B. Gate Charge Waveforms

■ TYPICAL PERFORMANCE CUVES (Unless Otherwise Specified)



■ TYPICAL PERFORMANCE CURVES



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