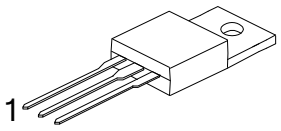
UF730-E

Power MOSFET

5.5 Amps, 400 Volts
N-CHANNEL POWER MOSFET



TO-220

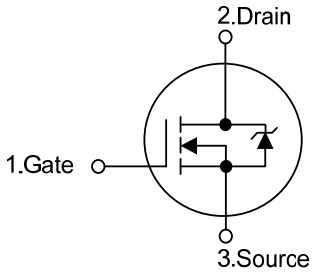
■ DESCRIPTION

The N-Channel enhancement mode silicon gate power MOSFET is designed for high voltage, high speed power switching applications such as switching regulators, switching converters, solenoid, motor drivers, relay drivers.

■ FEATURES

* $R_{DS(ON)}$=0.85Ω@ V_{GS}=10V, I_D=3.0A
* Avalanche Energy Specified
* Rugged - SOA is Power Dissipation Limited
* Fast Switching Capability
* Linear Transfer Characteristics
* High Input Impedance

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UF730L-TA3-T	UF730G-TA3-T	TO-220	G	D	S	Tube

UF730L-TA3-T
(1)Packing Type
(2)Package Type
(3)Lead Free

(1) T: Tube
(2) TA3: TO-220
(3) L: Lead Free, G: Halogen Free

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■ ABSOLUTE MAXIMUM RATINGS (T_C = 25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	400	V
Drain-Gate Voltage (R_{GS} = 20kΩ) (T_J =25°C ~125°C)	V_{DGR}	400	V
Gate-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current	I_D	5.5	A
Pulsed Drain Current (Note 1)	I_{DM}	22	A
Single Pulse Avalanche Energy (Note 2)	E_{AS}	300	mJ
Power Dissipation	P_D	73	W
Junction Temperature	T_J	+150	°C
Storage Temperature	T_{STG}	-55 ~ +150	°C

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
Junction-to-Ambient	θ_{JA}	62.5	°C/W
Junction-to-Case	θ_{JC}	1.71	°C/W

■ ELECTRICAL CHARACTERISTICS (T_C =25°C, unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	400			V
On-State Drain Current (Note 3)	$I_{D(ON)}$	V_{DS}>$I_{D(ON)}$×$R_{DS(ON)MAX}$, V_{GS}=10V	5.5			A
Drain-Source Leakage Current	I_{DSS}	V_{DS}=Rated BV_{DSS}, V_{GS}=0V			25	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	2.0		4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=3.0A		0.69	0.85	Ω
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	V_{DS}=25V, V_{GS}=0V, f=1MHz		615	630	pF
Output Capacitance	C_{OSS}			115	125	pF
Reverse Transfer Capacitance	C_{RSS}			45	55	pF
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD}=30V, I_D≈0.5A, V_{GS}=0~10V, R_G=25Ω (Note 3, 4)		98	120	ns
Turn-On Rise Time	t_R			104	125	ns
Turn-Off Delay Time	$t_{D(OFF)}$			238	250	ns
Turn-Off Fall Time	t_F			148	160	ns
Total Gate Charge	Q_G	V_{GS}=50V, I_D=1.3A, V_{DS}=10V, I_G=100μA		31	35	nC
Gate-Source Charge	Q_{GS}			5.5		nC
Gate-Drain Charge	Q_{GD}			10		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_{SD}=5.5A			1.6	V
Maximum Continuous Drain-Source Diode Forward Current	I_S				5.5	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				22	A
Reverse Recovery Time	t_{RR}	I_{SD} = 5.5A, dI_{SD}/dt = 100A/μs (Note 3)	140	300	660	ns
Reverse Recovery Charge	Q_{RR}		0.93	2.1	4.3	μC

Notes: 1. Repetitive Rating : Pulse width limited by T_J
2. L = 20mH, I_{AS} = 5.5A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25°C
3. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%
4. Essentially independent of operating temperature

■ TEST CIRCUITS AND WAVEFORMS

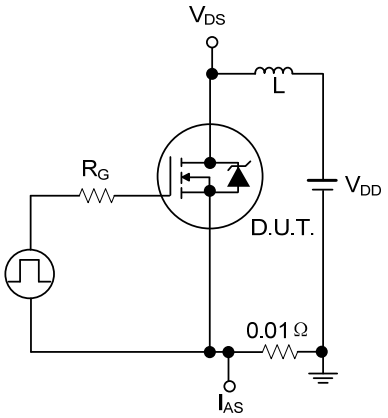


Figure 1A. Unclamped Energy Test Circuit

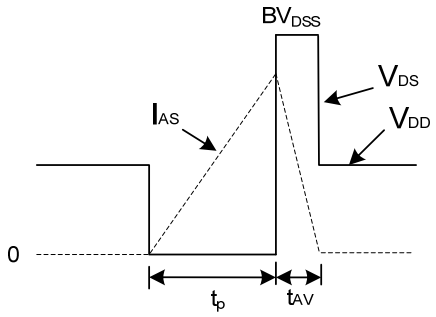


Figure 1B. Unclamped Energy Waveforms

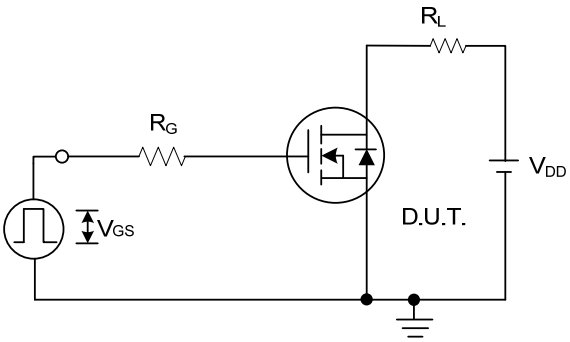


Figure 2A. Switching Time Test Circuit

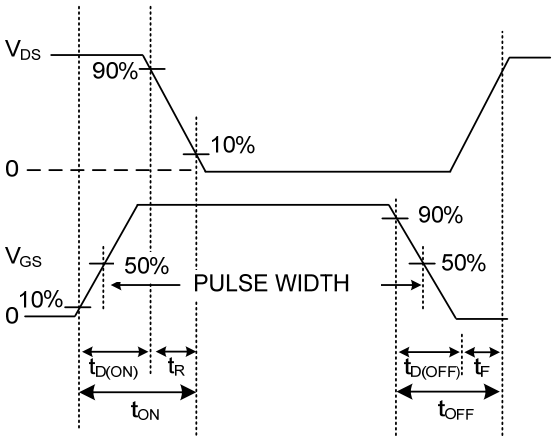


Figure 2B. Resistive Switching Waveforms

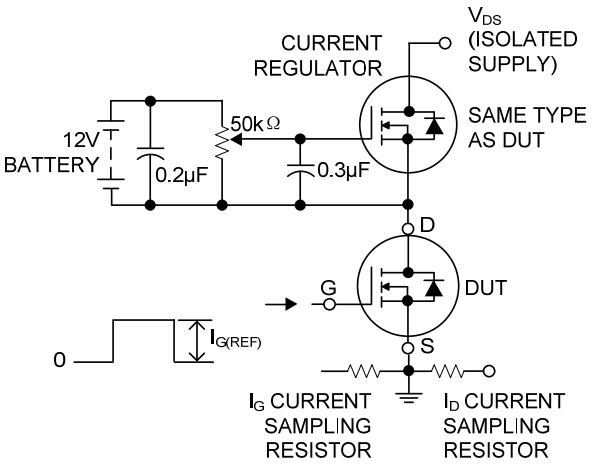


Figure 3A. Gate Charge Test Circuit

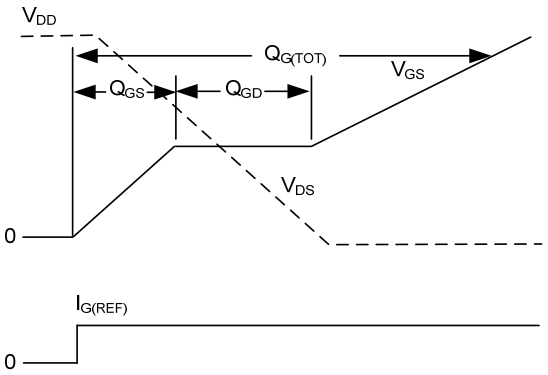
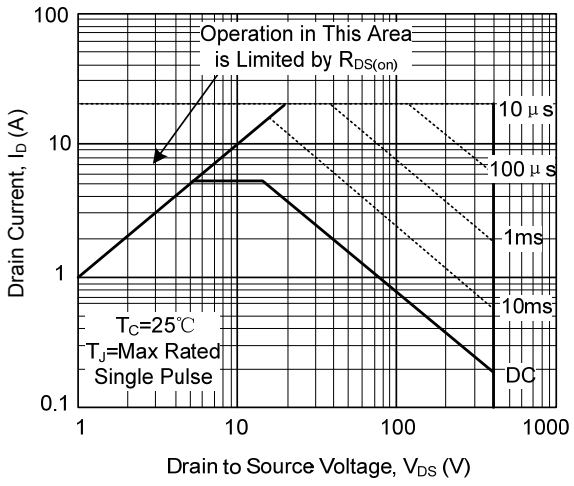


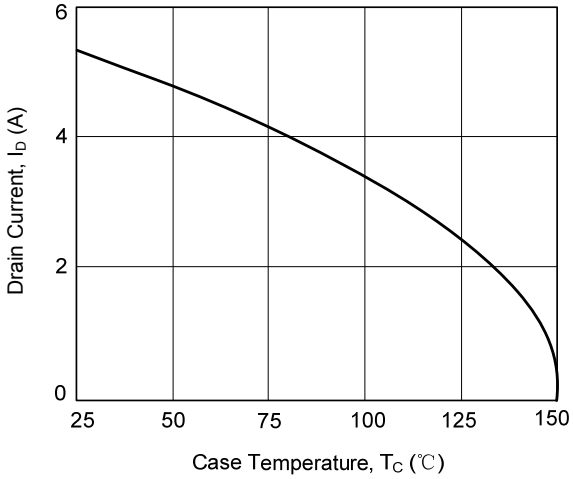
Figure 3B. Gate Charge Waveforms

■ TYPICAL CHARACTERISTICS

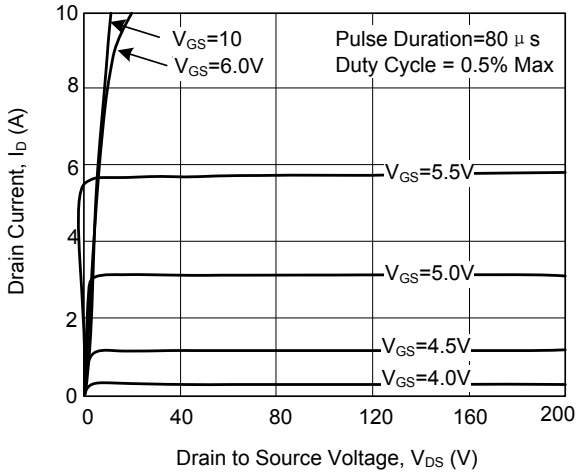
Forward Bias Safe Operating Area



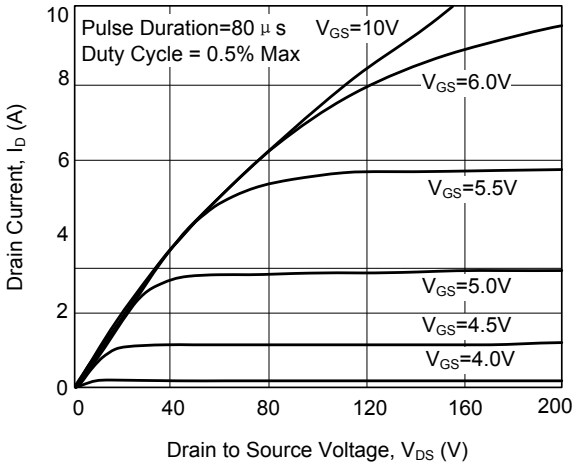
Maximum Contionuous Drain Current vs. Case Temperature



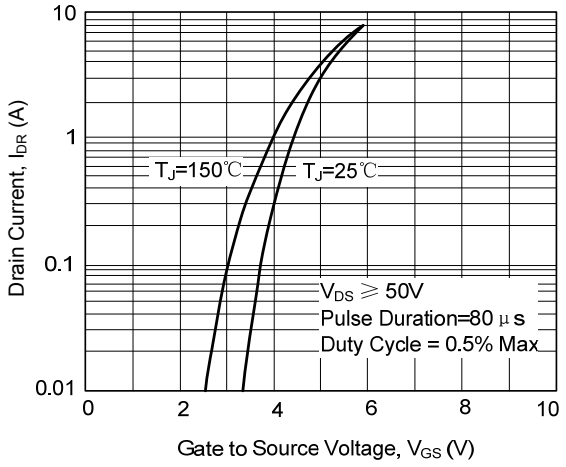
Output Characteristics



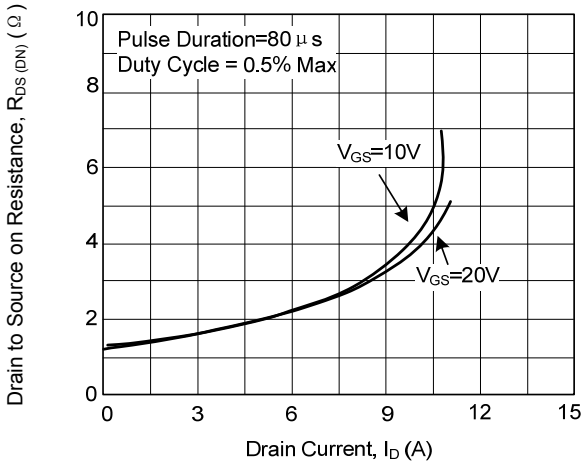
Sturation Characteristics



Transfer Characteristics

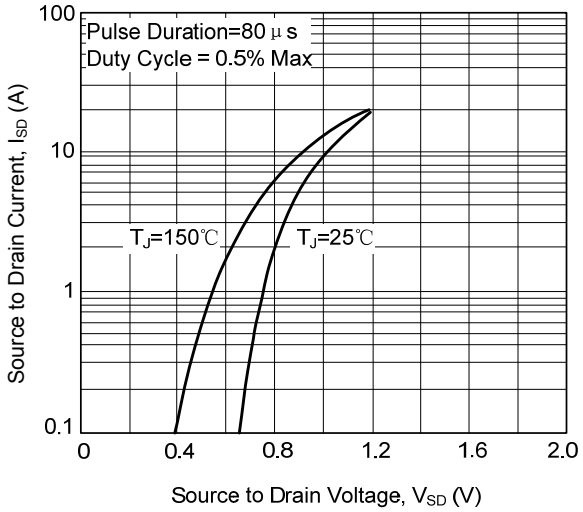


Drain to Source on Resistance vs. Gate Voltage and Drain Current

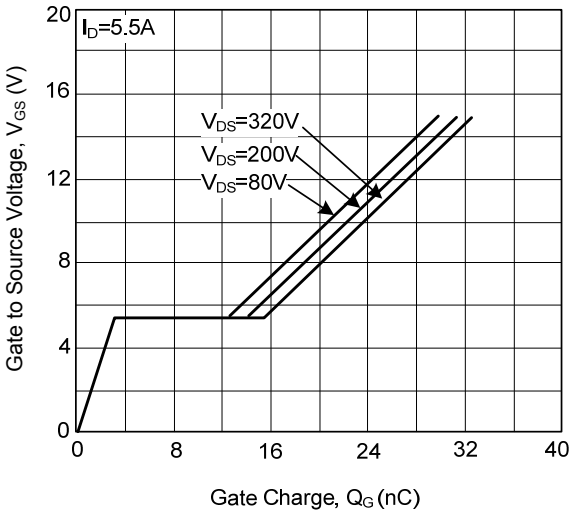


■ TYPICAL CHARACTERISTICS

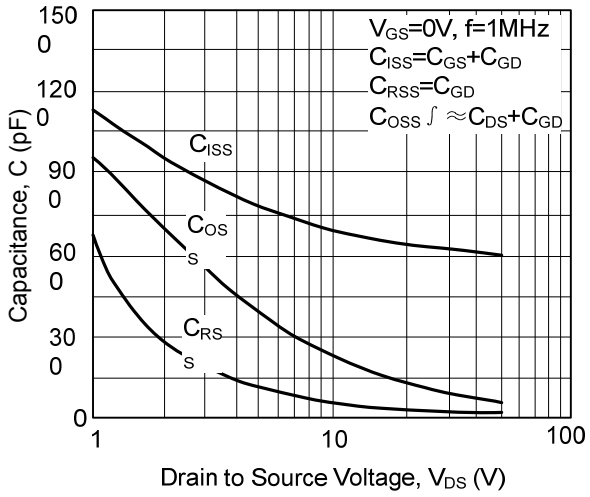
Source to Drain Diode Voltage



Gate to Source Voltage vs. Gate Charge



Capacitance vs. Drain to Source Voltage



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