



UF730K-TC

Power MOSFET

5.5A, 400V N-CHANNEL POWER MOSFET

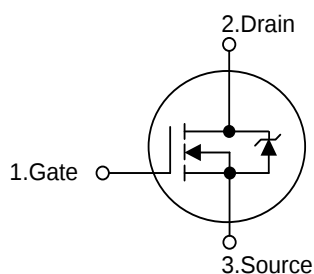
DESCRIPTION

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

- * $R_{DS(ON)} \leq 1.1 \Omega$ @ $V_{GS}=10V$, $I_D=3.0A$
- * Avalanche Energy Specified
- * Fast Switching Capability
- * Linear Transfer Characteristics
- * High Input Impedance

SYMBOL



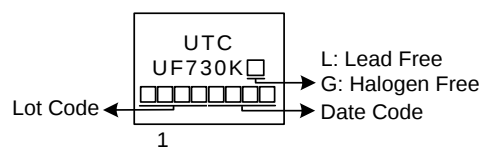
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UF730KL-TA3-T	UF730KG-TA3-T	TO-220	G	D	S	Tube
UF730KL-TF1-T	UF730KG-TF1-T	TO-220F1	G	D	S	Tube
UF730KL-TF2-T	UF730KG-TF2-T	TO-220F2	G	D	S	Tube
UF730KL-TF3-T	UF730KG-TF3-T	TO-220F	G	D	S	Tube
UF730KL-TM3-T	UF730KG-TM3-T	TO-251	G	D	S	Tube
UF730KL-TN3-R	UF730KG-TN3-R	TO-252	G	D	S	Tape Reel

Note: Pin Assignment: G: Gate D: Drain S: Source

UF730KG-TA3-T		(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TF3: TO-220F, TF1: TO-220F1, TF2: TO-220F2, TM3: TO-251, TN3: TO-252 (3) G: Halogen Free and Lead Free, L: Lead Free
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■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V _{DSS}	400	V
Gate-Source Voltage		V _{GSS}	±20	V
Drain Current	Continuous	I _D	5.5	A
	Pulsed (Note 2)	I _{DM}	22	A
Avalanche Current (Note 2)		I _{AR}	4.6	A
Avalanche Energy	Single Pulsed (Note 3)	E _{AS}	106	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	2.0	V/ns
Power Dissipation	TO-220	P _D	73	W
	TO-220F/TO-220F1		38	W
	TO-220F2		40	W
	TO-251/TO-252		48	W
Junction Temperature		T _J	+150	°C
Storage Temperature		T _{STG}	-55 ~ +150	°C

Notes: 1. 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.

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

3. L = 10mH, I_{AS} = 4.6A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C

4. I_{SD} ≤ 5.5A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	TO-220/TO-220F	θ _{JA}	62.5	°C/W
	TO-220F1/TO-220F2			
	TO-251/TO-252		110	
Junction to Case	TO-220	θ _{JC}	1.71	°C/W
	TO-220F/TO-220F1		3.31	
	TO-220F2		3.125	
	TO-251/TO-252		2.6	

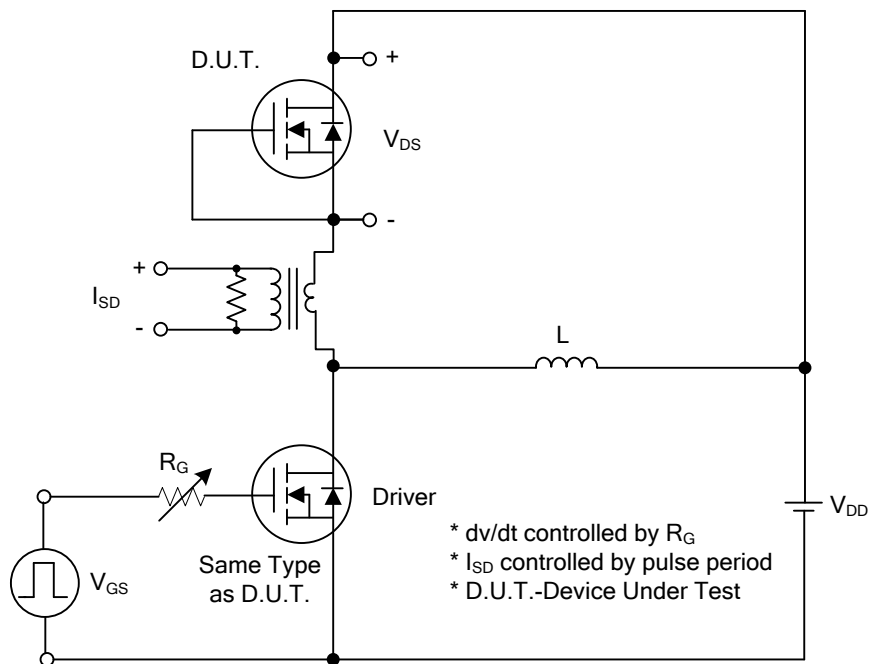
ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	400			V
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			1.1	Ω
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		250		pF
Output Capacitance	C _{OSS}			83		pF
Reverse Transfer Capacitance	C _{RSS}			7.0		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge (Note 1)	Q _G	V _{DS} =50V, V _{GS} =10V, I _D =1.3A I _G =100μA (Note1, 2)		44		nC
Gate to Source Charge	Q _{GS}			3.4		nC
Gate to Drain Charge	Q _{GD}			3.4		nC
Turn-ON Delay Time (Note 1)	t _{D(ON)}	V _{DS} =30V, V _{GS} =10V, I _D =0.5A, R _G =25Ω (Note1, 2)		44		ns
Rise Time	t _R			48		ns
Turn-OFF Delay Time	t _{D(OFF)}			268		ns
Fall-Time	t _F			83		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I _S				5.5	A
Maximum Body-Diode Pulsed Current	I _{SM}				22	A
Drain-Source Diode Forward Voltage (Note 1)	V _{SD}	I _S =5.5A, V _{GS} =0V			1.4	V
Body Diode Reverse Recovery Time (Note 1)	t _{rr}	I _S =5.5A, V _{GS} =0V		220		ns
Body Diode Reverse Recovery Charge	Q _{rr}	dl _F /dt=100A/μs		1.0		μC

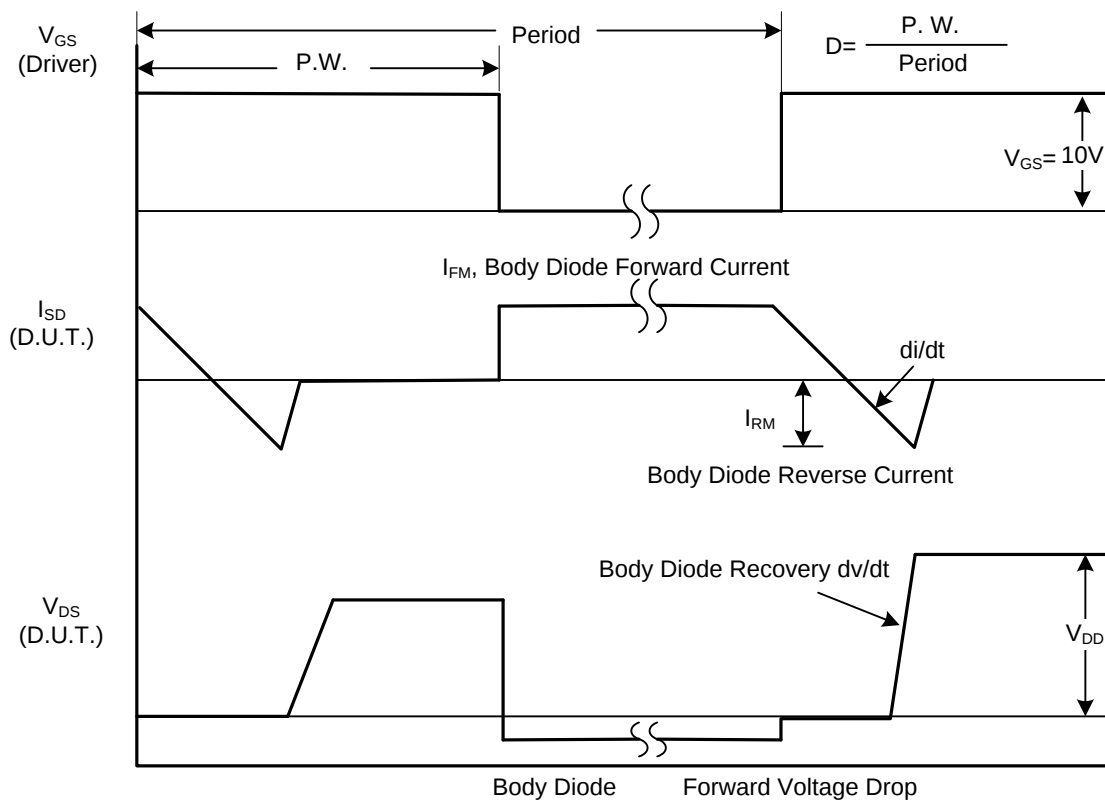
Notes: 1. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



Peak Diode Recovery dv/dt Test Circuit



Peak Diode Recovery dv/dt Waveforms

■ TEST CIRCUITS AND WAVEFORMS

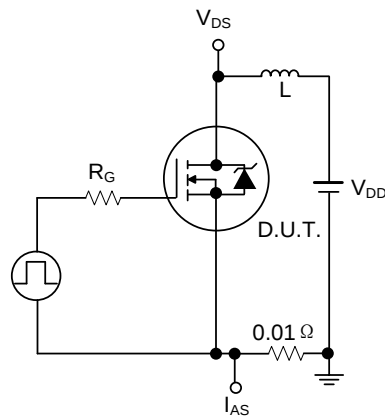


Figure 1A. Unclamped Energy Test Circuit

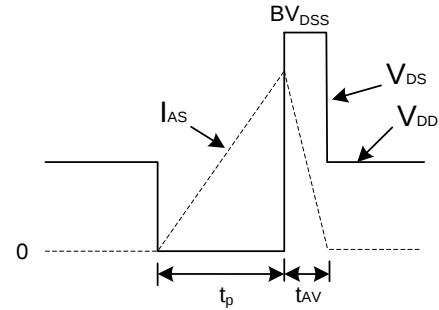


Figure 1B. Unclamped Energy Waveforms

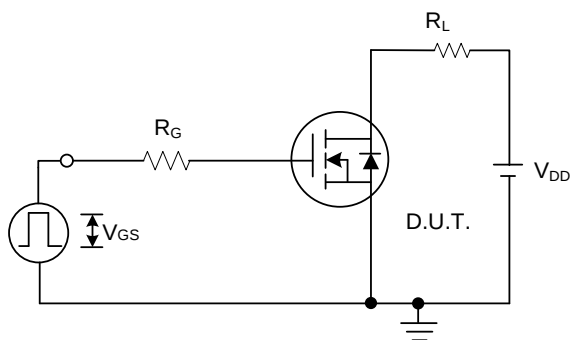


Figure 2A. Switching Time Test Circuit

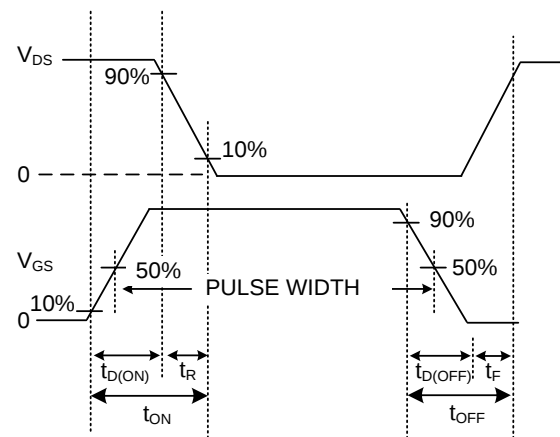


Figure 2B. Resistive Switching Waveforms

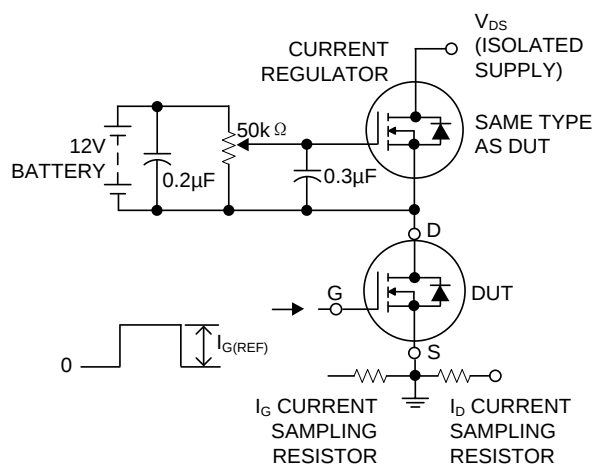


Figure 3A. Gate Charge Test Circuit

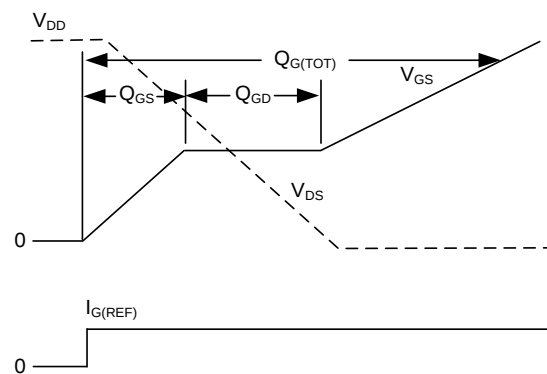


Figure 3B. Gate Charge Waveforms

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