



UF740K-MT

Power MOSFET

10A, 400V N-CHANNEL POWER MOSFET

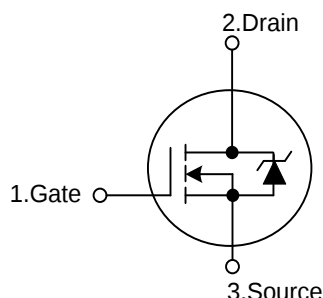
DESCRIPTION

The UTC **UF740K-MT** is a 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

- * $R_{DS(ON)} \leq 0.55 \Omega$ @ $V_{GS}=10V$, $I_D=5.0A$
- * Single Pulse Avalanche Energy Rated
- * Rugged - SOA is Power Dissipation Limited
- * Fast Switching Speeds
- * Linear Transfer Characteristics
- * High Input Impedance

SYMBOL

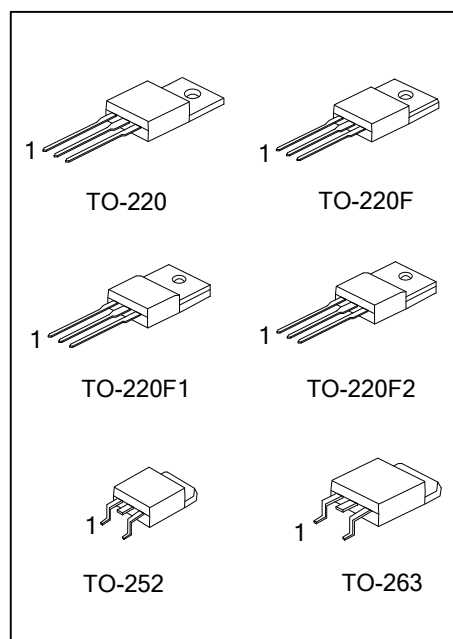


ORDERING INFORMATION

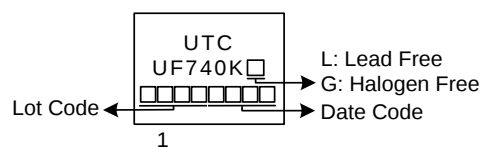
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UF740KL-TA3-T	UF740KG-TA3-T	TO-220	G	D	S	Tube
UF740KL-TF3-T	UF740KG-TF3-T	TO-220F	G	D	S	Tube
UF740KL-TF1-T	UF740KG-TF1-T	TO-220F1	G	D	S	Tube
UF740KL-TF2-T	UF740KG-TF2-T	TO-220F2	G	D	S	Tube
UF740KL-TN3-R	UF740KG-TN3-R	TO-252	G	D	S	Tape Reel
UF740KL-TQ2-T	UF740KG-TQ2-T	TO-263	G	D	S	Tube
UF740KL-TQ2-R	UF740KG-TQ2-R	TO-263	G	D	S	Tape Reel

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

UF740KG-TA3-T (1) Packing Type (2) Package Type (3) Green Package		(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TF3: TO-220F, TF1: TO-220F1, TF2: TO-220F2. TN3: TO-252, TQ2: TO-263 (3) G: Halogen Free and Lead Free, L: Lead Free
---	--	--



■ MARKING



■ ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$, Unless Otherwise Specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain to Source Voltage ($T_J = 25^\circ\text{C} \sim 125^\circ\text{C}$)		V_{DSS}	400	V
Gate to Source Voltage		V_{GSS}	± 20	V
Drain Current ($T_C = 25^\circ\text{C}$)	Continuous	I_D	10	A
	Pulsed	I_{DM}	40	A
Avalanche Current		I_{AR}	7.5	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	281	mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	5.3	V/ns
Power Dissipation	TO-220/TO-263	P_D	125	W
	TO-220F/TO-220F1		44	W
	TO-220F2		52	W
	TO-252		52	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55 ~ +150	$^\circ\text{C}$

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 max. junction temperature.

3. $L=10\text{mH}$, $I_{AS}=7.5\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD} \leq 10\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F	θ_{JA}	62.5	$^\circ\text{C/W}$
	TO-220F1/TO-220F2			
	TO-263			
	TO-252		110	$^\circ\text{C/W}$
Junction to Case	TO-220/TO-263	θ_{JC}	1.0	$^\circ\text{C/W}$
	TO-220F/TO-220F1		2.86	$^\circ\text{C/W}$
	TO-220F2			
	TO-252		2.4 (Note)	$^\circ\text{C/W}$

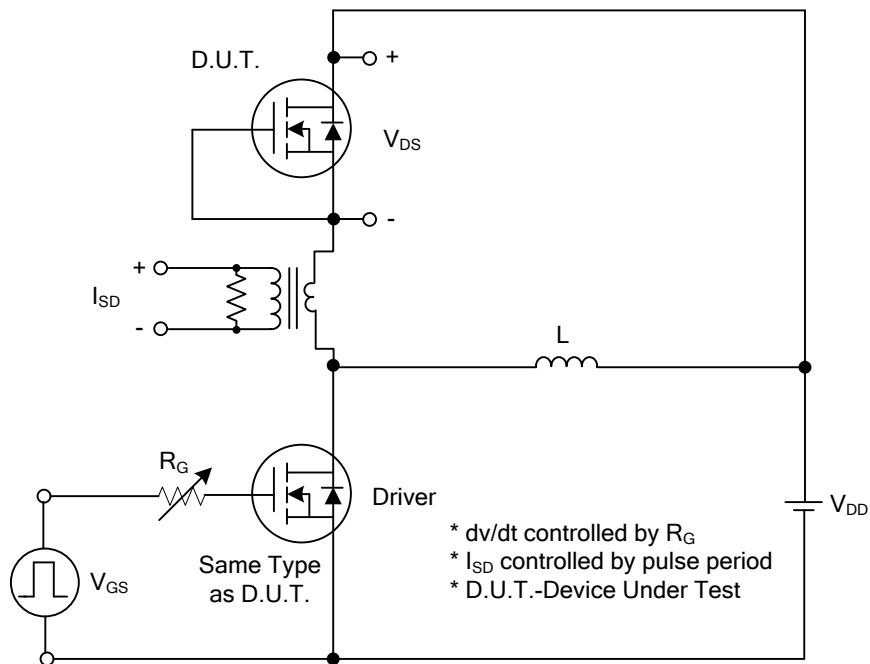
Note: Device mounted on FR-4 substrate P_C board, 2oz copper, with 1inch square copper plate.

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

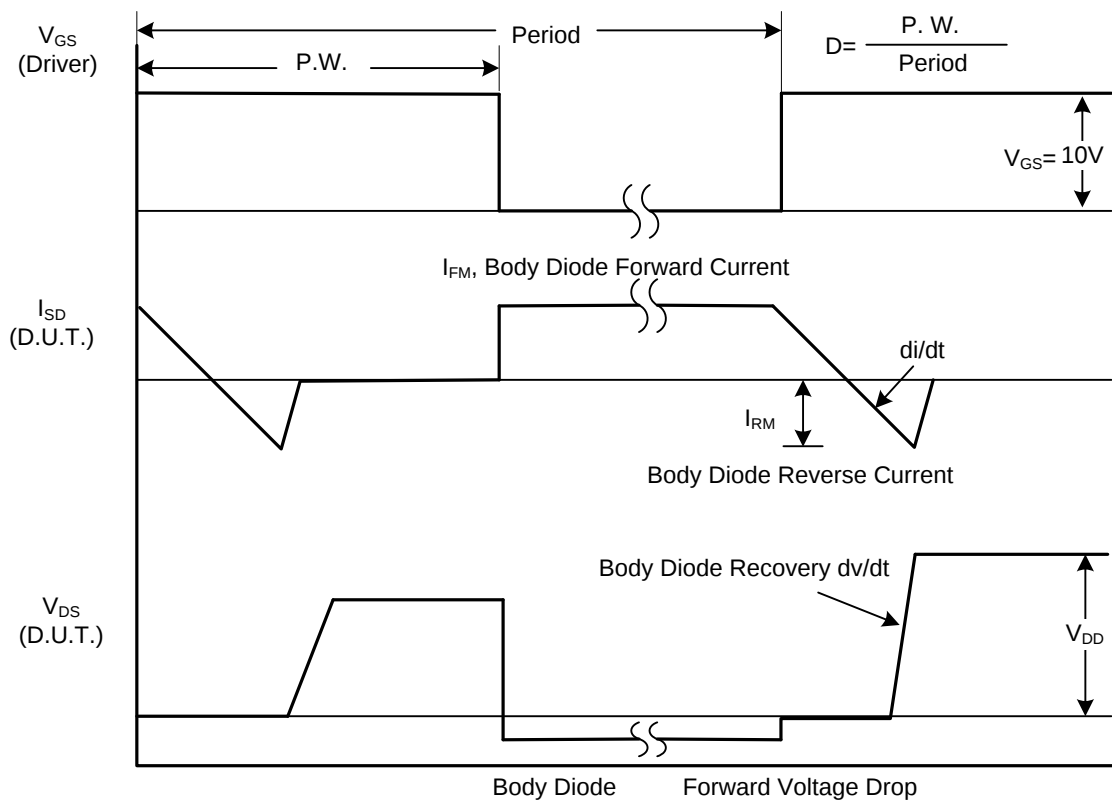
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250μA	400			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} = 400V, V _{GS} = 0V			25	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} = 20V, V _{DS} = 0V			100	nA
		V _{GS} = -20V, V _{DS} = 0V			-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 = 5.0A			0.55	Ω
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz		870		pF
Output Capacitance	C _{OSS}			115		pF
Reverse Transfer Capacitance	C _{RSS}			7		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge	Q _G	V _{DS} =50V, V _{GS} =10V, I _D =1.3A, I _D =100μA (Note 1, 2)		30		nC
Gate-Source Charge	Q _{GS}			4.5		nC
Gate-Drain Charge	Q _{GD}			5.5		nC
Turn-On Delay Time	t _{D(ON)}	V _{DS} =30V, V _{GS} =10V, I _D =0.5A, R _G =25Ω (Note 1, 2)		35		nS
Turn-On Rise Time	t _R			35		nS
Turn-Off Delay Time	t _{D(OFF)}			210		nS
Turn-Off Fall Time	t _F			40		nS
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Maximum Continuous Drain-Source Diode Forward Current	I _S				10	A
Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}				40	A
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} = 0V, I _S = 10A			2.0	V
Body Diode Reverse Recovery Time	t _{rr}	I _{SD} =10A, di/dt=100A/μs,		280		ns
Body Diode Reverse Recovery Charge	Q _{rr}	V _{DD} =50V, T _J =25°C		2.7		μC

Notes: 1. Pulse Test : Pulse width≤300μs, Duty cycle≤2%.
2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS

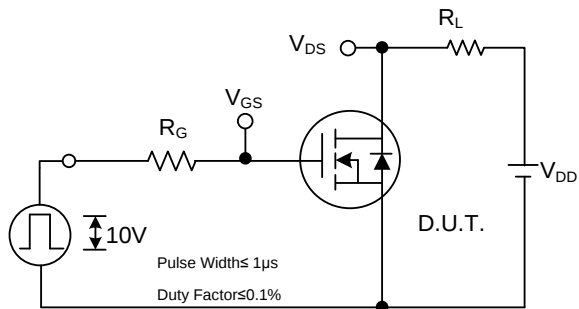


Peak Diode Recovery dv/dt Test Circuit

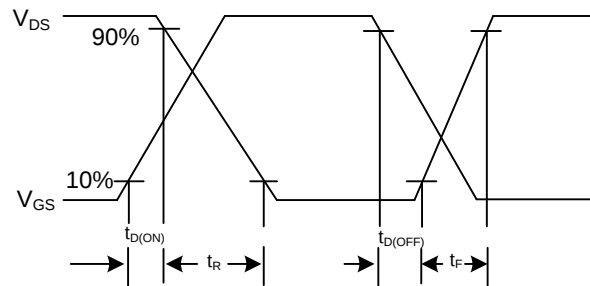


Peak Diode Recovery dv/dt Waveforms

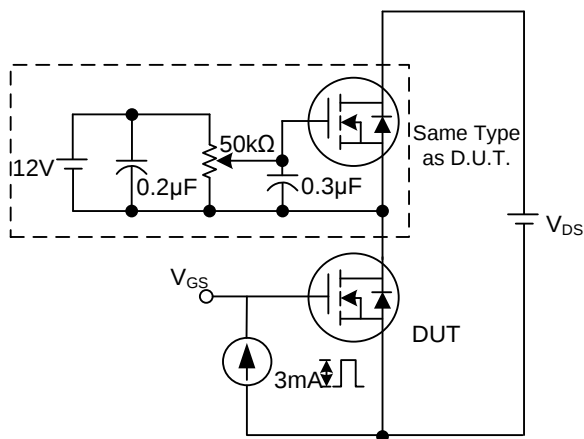
■ TEST CIRCUITS AND WAVEFORMS



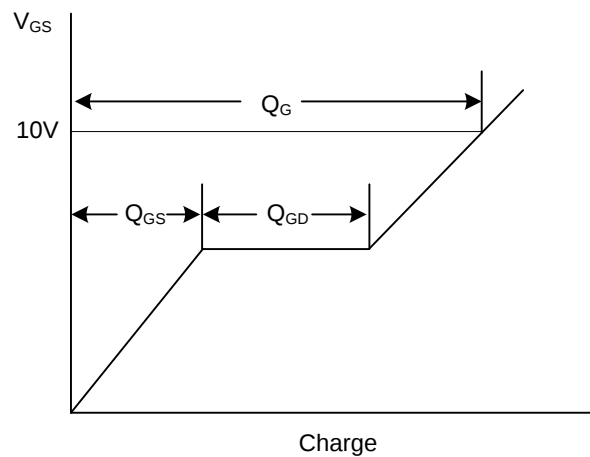
Switching Test Circuit



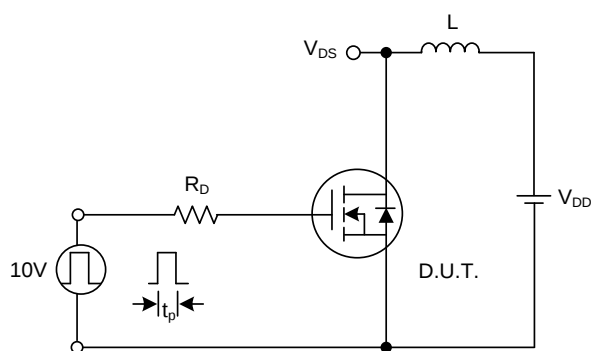
Switching Waveforms



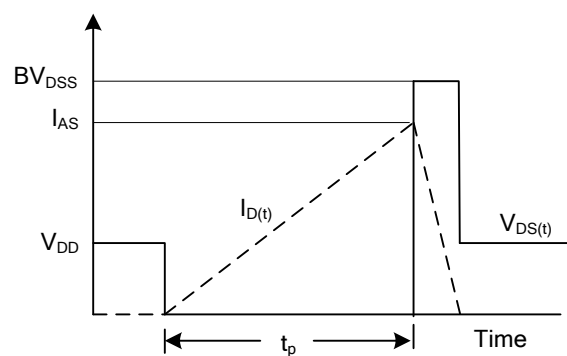
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.