



UF840-F

Power MOSFET

8.0A, 500V, 0.85Ω, N-CHANNEL POWER MOSFET

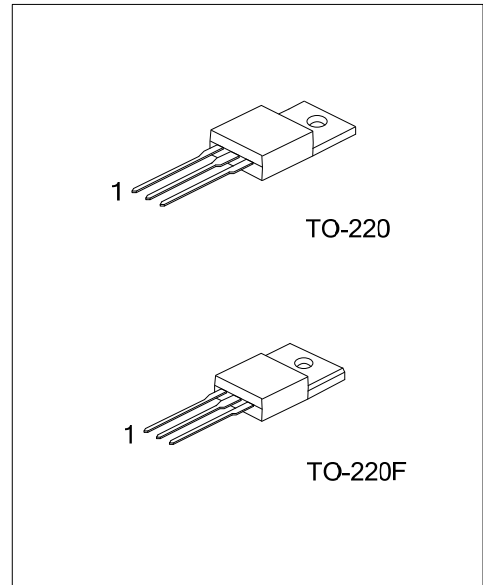
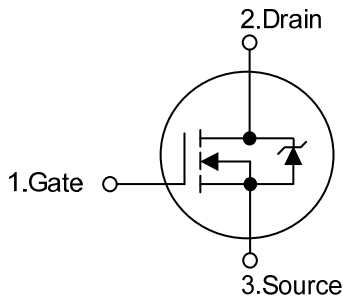
DESCRIPTION

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

- * Low $R_{DS(ON)} < 0.87\Omega @ V_{GS}=10V, I_D = 4.4A$
- * Single Pulse Avalanche Energy Rated
- * Fast Switching Speeds
- * Linear Transfer Characteristics
- * High Input Impedance

SYMBOL



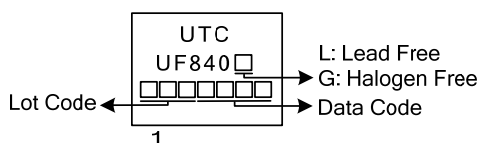
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UF840L-TA3-T	UF840G-TA3-T	TO-220	G	D	S	Tube
UF840L-TF3-T	UF840G-TF3-T	TO-220F	G	D	S	Tube

Note: Pin Assignment: A: Anode K: Cathode

	<p>(1) T: Tube</p> <p>(2) TA3: TO-220, TF3: TO-220F</p> <p>(3) L: Lead Free, G: Halogen Free and Lead Free</p>
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MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain to Source Voltage		V_{DSS}	500	V
Drain to Gate Voltage		V_{DGR}	500	V
Gate to Source Voltage		V_{GSS}	± 30	V
Drain Current (Note 2)	Continuous	I_D	8.0	A
	Pulsed	I_{DM}	32	A
Avalanche Current (Note 2)		I_{AR}	9.4	A
Single Pulse Avalanche Energy (Note 3)		E_{AS}	442	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	3.6	V/ns
Power Dissipation	TO-220	P_D	134	W
	TO-220F		44	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 maximum junction temperature.

3. $L = 10\text{mH}$, $I_{AS} = 9.4\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$.

4. $I_{SD} \leq 8\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$.

■ **THERMAL RESISTANCES CHARACTERISTICS**

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient		θ_{JA}	62.5	$^\circ\text{C}/\text{W}$
Junction to Case	TO-220	θ_{JC}	0.93	$^\circ\text{C}/\text{W}$
	TO-220F		2.84	$^\circ\text{C}/\text{W}$

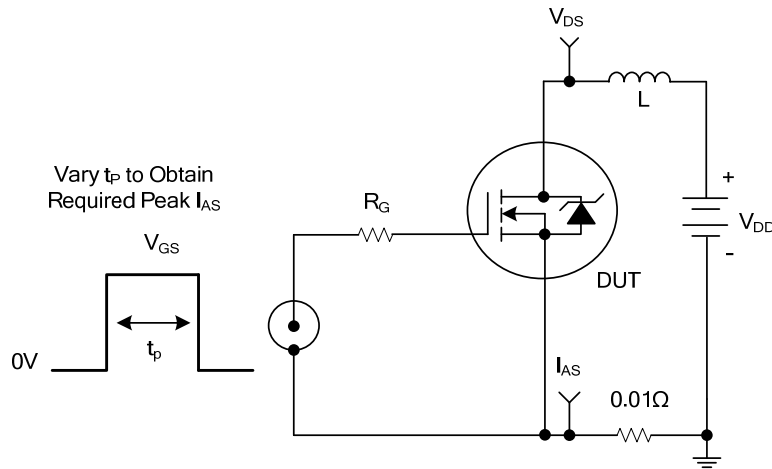
■ **ELECTRICAL CHARACTERISTICS** ($T_J = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	500			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=600V, V_{GS}=0V$			25	μA
Gate-Source Leakage Current	Forward	$V_{GS}=30V, V_{DS}=0V$			100	nA
	Reverse	$V_{GS}=-30V, V_{DS}=0V$			-100	
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0		4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=4.4A$			0.87	Ω
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	$V_{GS}=0V, V_{DS}=25V, f=1.0MHz$		1480		pF
Output Capacitance	C_{OSS}			193		pF
Reverse Transfer Capacitance	C_{RSS}			81		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge	Q_G	$V_{DS}=50V, I_D=1.3A, V_{GS}=10V$ $I_G=100\mu A$ (Note 1, 2)		120		nC
Gate-Source Charge	Q_{GS}			7.0		nC
Gate-Drain Charge	Q_{GD}			29		nC
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD}=30V, V_{GS}=10V, I_D=0.5A,$ $R_G=25\Omega$ (Note 1, 2)		54		ns
Turn-On Rise Time	t_R			382		ns
Turn-Off Delay Time	$t_{D(OFF)}$			165		ns
Turn-Off Fall Time	t_F			210		ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Maximum Continuous Drain-Source Diode Forward Current	I_S				5	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				20	A
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=5.0A, V_{GS}=0V$			1.4	V
Reverse Recovery Time (Note 1)	t_{rr}	$I_S=5.0A, V_{GS}=0V,$ $di_F/dt=100A/\mu s$		320		nS
Reverse Recovery Charge	Q_{rr}			3.55		μC

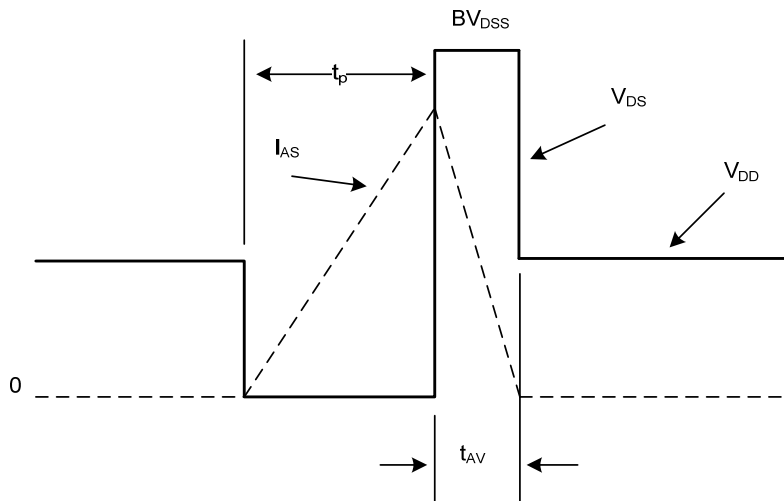
Note: 1. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

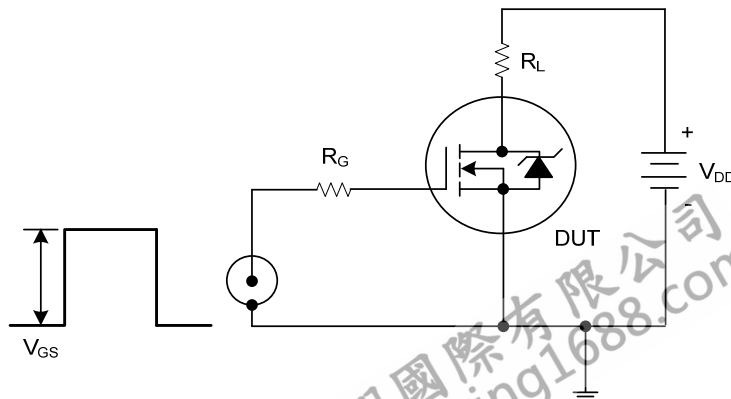
■ TEST CIRCUITS AND WAVEFORMS



Unclamped Energy Test Circuit

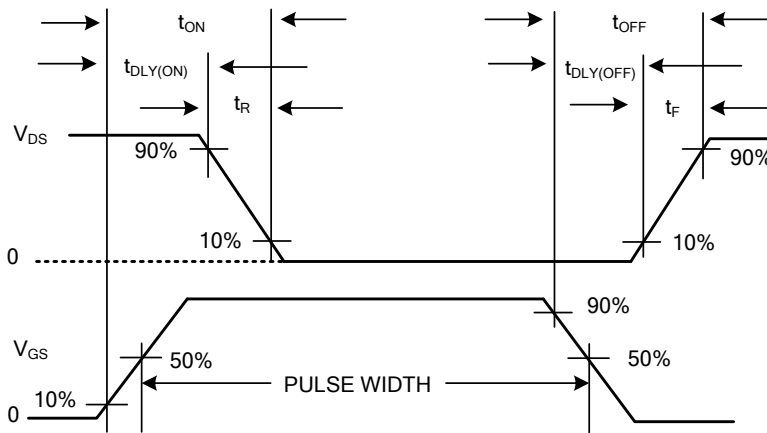


Unclamped Energy Waveforms

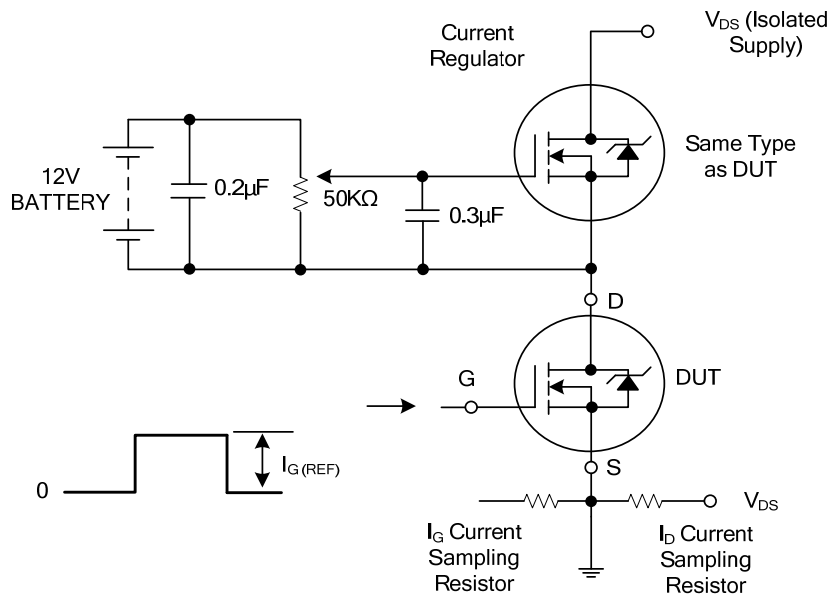


Switching Time Test Circuit

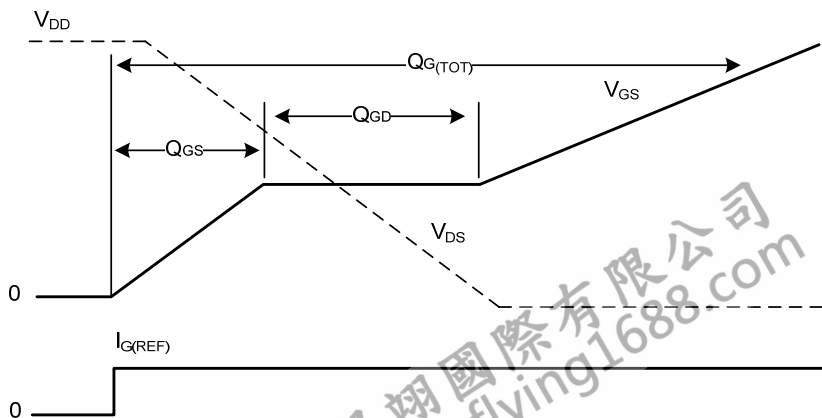
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



Resistive Switching Waveforms



Gate Charge Test Circuit



Gate Charge Waveforms

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