



UF3710-S

Power MOSFET

57A, 100V N-CHANNEL POWER MOSFET

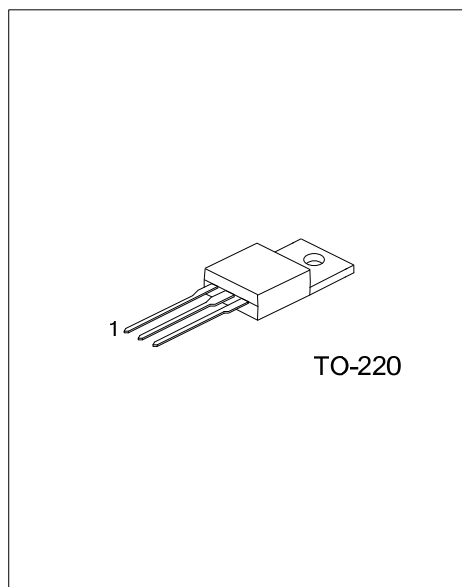
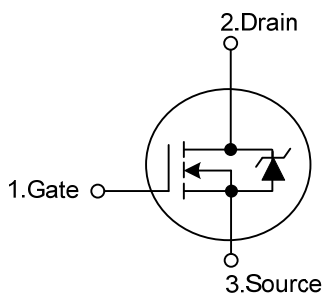
DESCRIPTION

The UTC **UF3710-S** uses advanced process technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

FEATURES

- * $R_{DS(ON)} < 23m\Omega @ V_{GS} = 10V$
- * Ultra low gate charge (typical 218 nC)
- * Low reverse transfer Capacitance ($C_{RSS} =$ typical 37 pF)
- * Fast switching capability
- * Avalanche energy Specified
- * Improved dv/dt capability, high ruggedness

SYMBOL



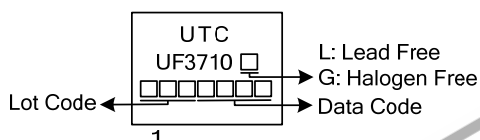
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UF3710L-TA3-T	UF3710G-TA3-T	TO-220	G	D	S	Tube

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

<p>UF3710G-TA3-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) T: Tube</p> <p>(2) TA3: TO-220</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



■ ABSOLUTE MAXIMUM RATINGS ($T_C=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Gate-Source Voltage	V_{GS}	± 20	V
Drain-Source Voltage	V_{DSS}	100	V
Drain Current	Continuous ($V_{GS}=10\text{V}$)	I_D	57
	Pulsed (Note 2)	I_{DM}	230
Avalanche Current (Note 2)	I_{AR}	57	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	570 (Note 4)
Power Dissipation	P_D	165	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. $L=0.35\text{mH}$, $I_{AS}=57\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\ \Omega$, Starting $T_J = 25^{\circ}\text{C}$
 4. This is a typical value at device destruction and represents operation outside rated limits.

■ THERMAL DATA

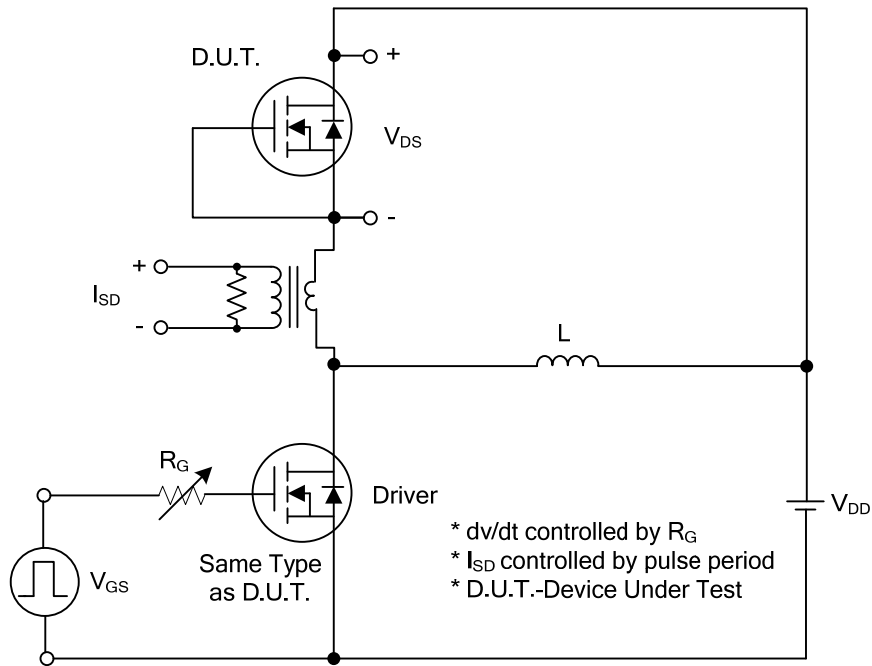
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62	$^{\circ}\text{C/W}$
Junction to Case	θ_{JC}	0.75	$^{\circ}\text{C/W}$

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

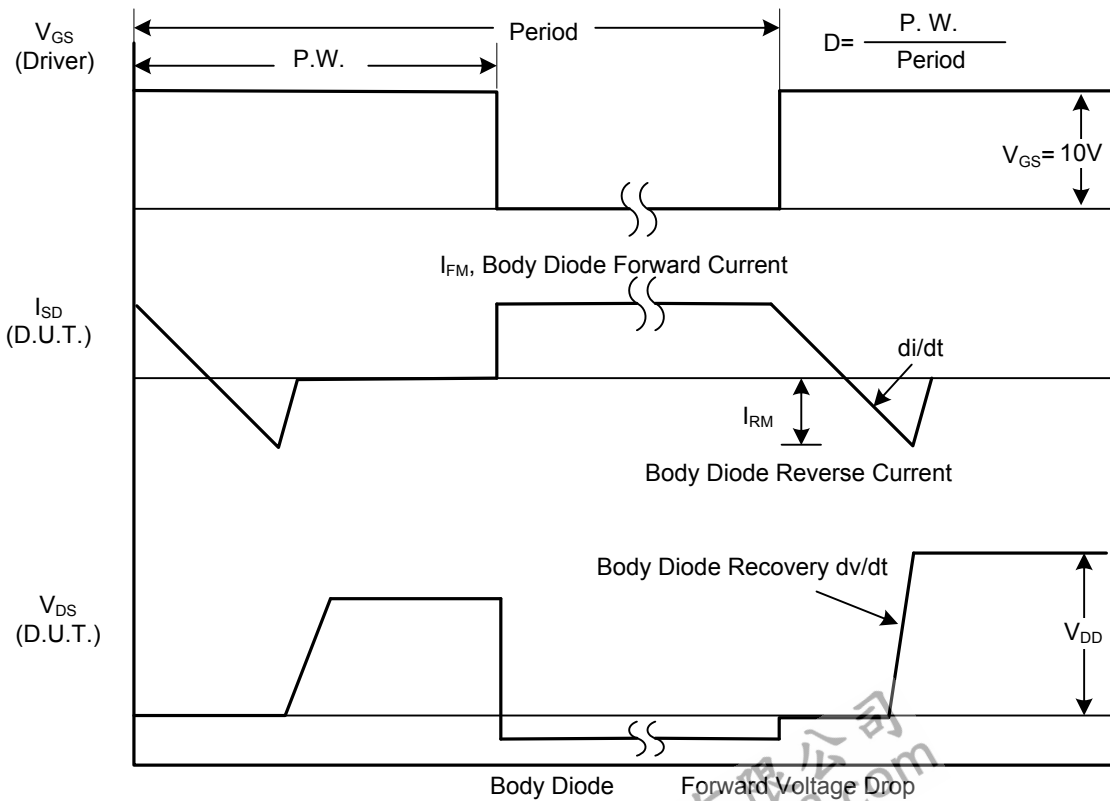
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0\text{V}$, $I_D=250\mu\text{A}$	100			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=100\text{V}$, $V_{GS}=0\text{V}$			25	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20\text{V}$, $V_{DS}=0\text{V}$			± 100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	2.0		4.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=28\text{A}$ (Note)			23	m Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{DS}=25\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$		3384		pF
Output Capacitance	C_{OSS}			380		pF
Reverse Transfer Capacitance	C_{RSS}			37		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	$V_{DS}=50\text{V}$, $I_D=1.3\text{A}$, $V_{GS}=10\text{V}$		218		nC
Gate Source Charge	Q_{GS}			15		nC
Gate Drain Charge	Q_{GD}			19		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=30\text{V}$, $I_D=0.5\text{A}$, $R_G=25\ \Omega$ $V_{GS}=10\text{V}$ (Note)		72		ns
Turn-ON Rise Time	t_R			69		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			1000		ns
Turn-OFF Fall-Time	t_F			165		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S	MOSFET symbol showing the integral reverse P-N junction diode.			57	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				230	A
Diode Forward Voltage	V_{SD}	$I_S=57\text{A}$, $V_{GS}=0\text{V}$ (Note)			1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F=28\text{A}$, $dI/dt=100\text{A}/\mu\text{s}$ (Note)		80		ns
Body Diode Reverse Recovery Charge	Q_{rr}			277		nC

Note: Pulse width $\leq 400\mu\text{s}$; duty cycle $\leq 2\%$.

■ TEST CIRCUITS AND WAVEFORMS

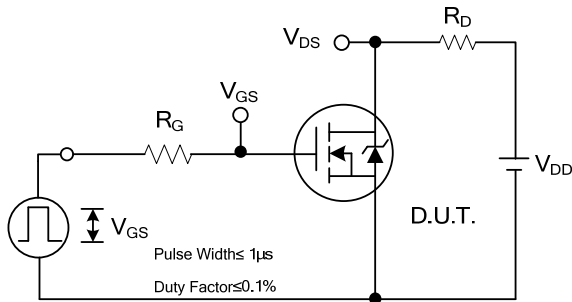


Peak Diode Recovery dv/dt Test Circuit

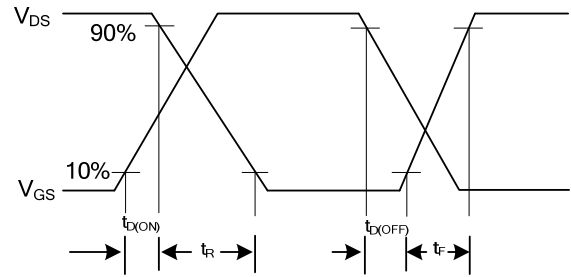


Peak Diode Recovery dv/dt Waveforms

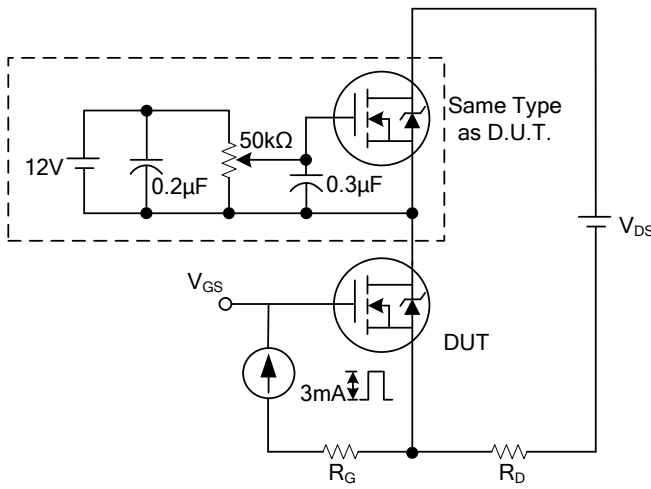
TEST CIRCUITS AND WAVEFORMS (Cont.)



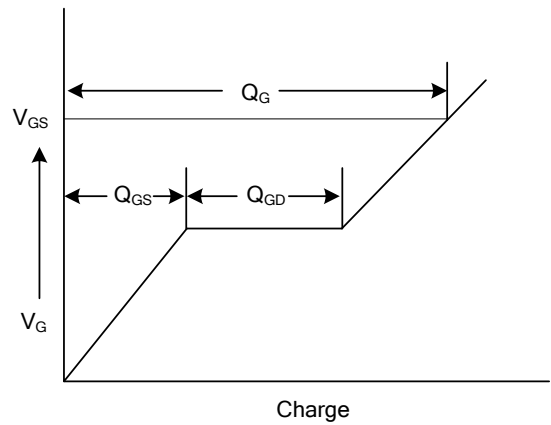
Switching Test Circuit



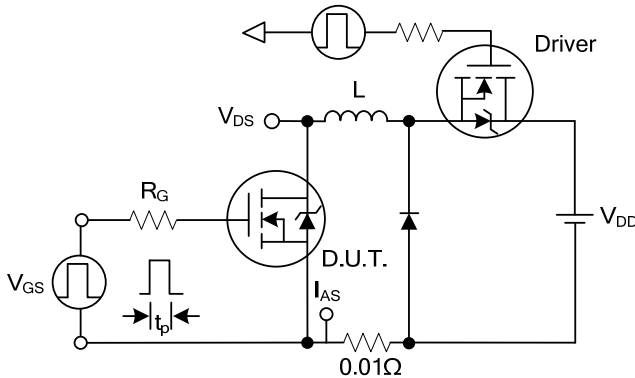
Switching Waveforms



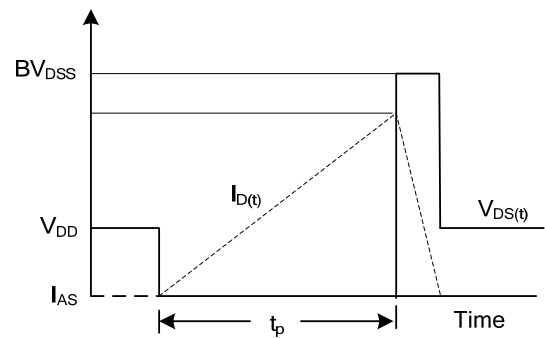
Gate Charge Test Circuit



Gate Charge Waveform

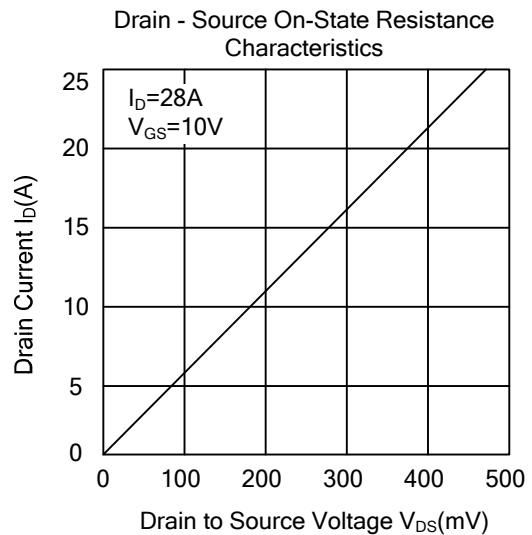
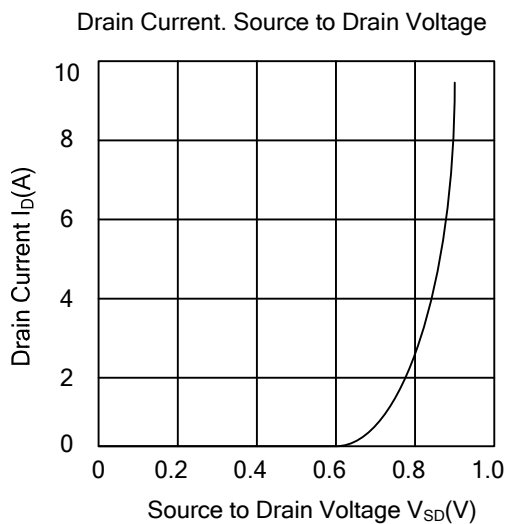
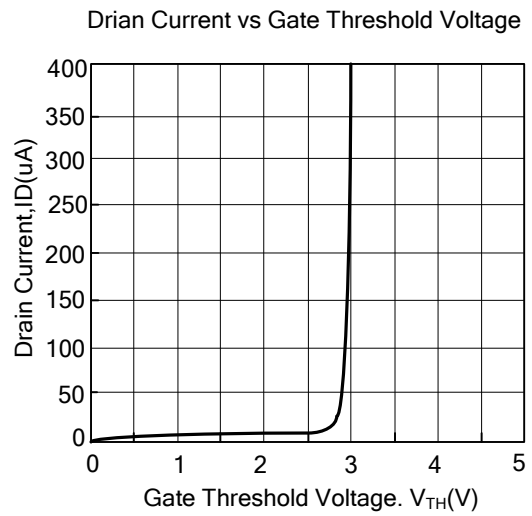
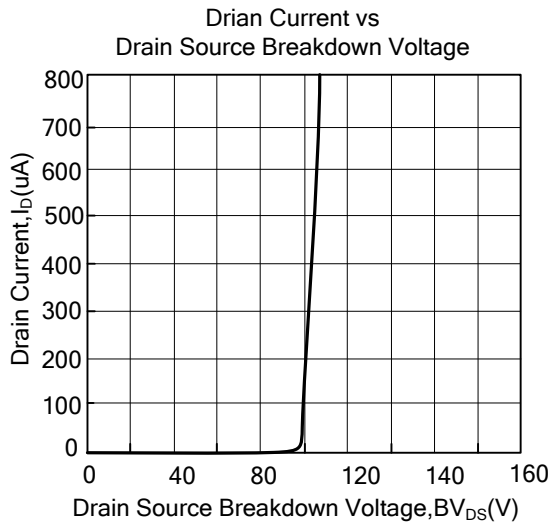


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

TYPICAL CHARACTERISTICS



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