



UF3710

Power MOSFET

57A, 100V N-CHANNEL POWER MOSFET

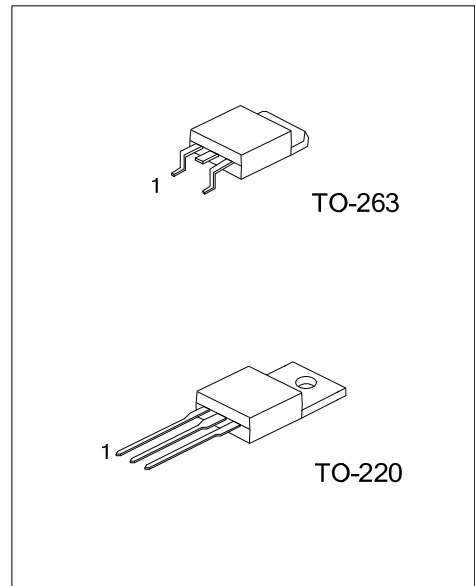
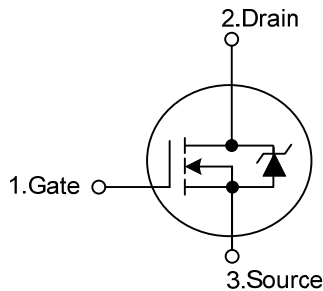
DESCRIPTION

The UTC **UF3710** 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 130 nC)
- * Low reverse transfer Capacitance ($C_{RSS} =$ typical 72 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
UF3710L-TQ2-T	UF3710G-TQ2-T	TO-263	G	D	S	Tube
UF3710L-TQ2-R	UF3710G-TQ2-R	TO-263	G	D	S	Tape Reel

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

<p>UF3710L-TA3-T</p>	<p>(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TQ2: TO-263 (3) G: Halogen Free, L: Lead Free</p>
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■ ABSOLUTE MAXIMUM RATINGS (T_C=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Gate-Source Voltage	V _{GSS}	±20	V
Drain-Source Voltage	V _{DSS}	100	V
Drain Current	Continuous (V _{GS} =10V)	I _D	57
	Pulsed (Note 2)	I _{DM}	230
Avalanche Current (Note 2)	I _{AR}	57	A
Avalanche Energy	Repetitive(Note 2)	E _{AR}	20
	Single Pulsed(Note 3)	E _{AS}	1060 (Note 4)
Power Dissipation	P _D	165	W
Junction Temperature	T _J	+150	°C
Storage Temperature	T _{STG}	-55 ~ +150	°C

Note: 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. Pulse width limited by T_{J(MAX)}

3. T_J=25°C, L=0.65mH, R_G=25Ω, I_{AS}=57A, V_{GS}=10V

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	°C/W
Junction to Case	θ _{JC}	0.75	°C/W

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

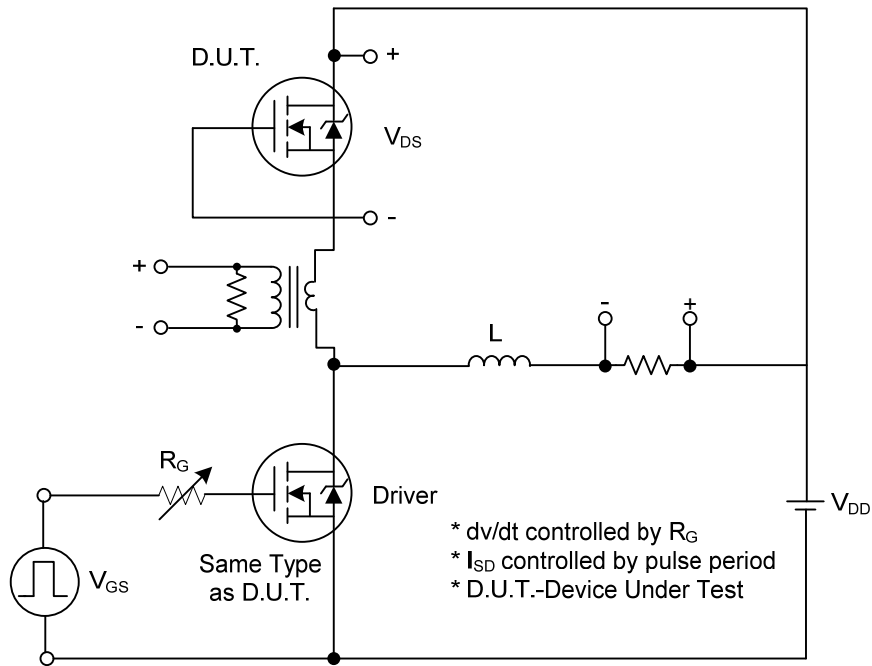
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	100			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V			25	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±100	nA
Breakdown Voltage Temperature Coefficient	ΔBV _{DSS} /ΔT _J	I _D =1mμA, Referenced to 25°C		0.13		V/°C
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	2.0		4.0	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =28A (Note)			23	mΩ
Forward Transconductance	g _{FS}	V _{DS} =25V, I _D =28 A	32			S
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{DS} =25V, V _{GS} =0V, f = 1MHz		3130		pF
Output Capacitance	C _{OSS}			410		pF
Reverse Transfer Capacitance	C _{RSS}			72		pF

■ ELECTRICAL CHARACTERISTICS(Cont.)

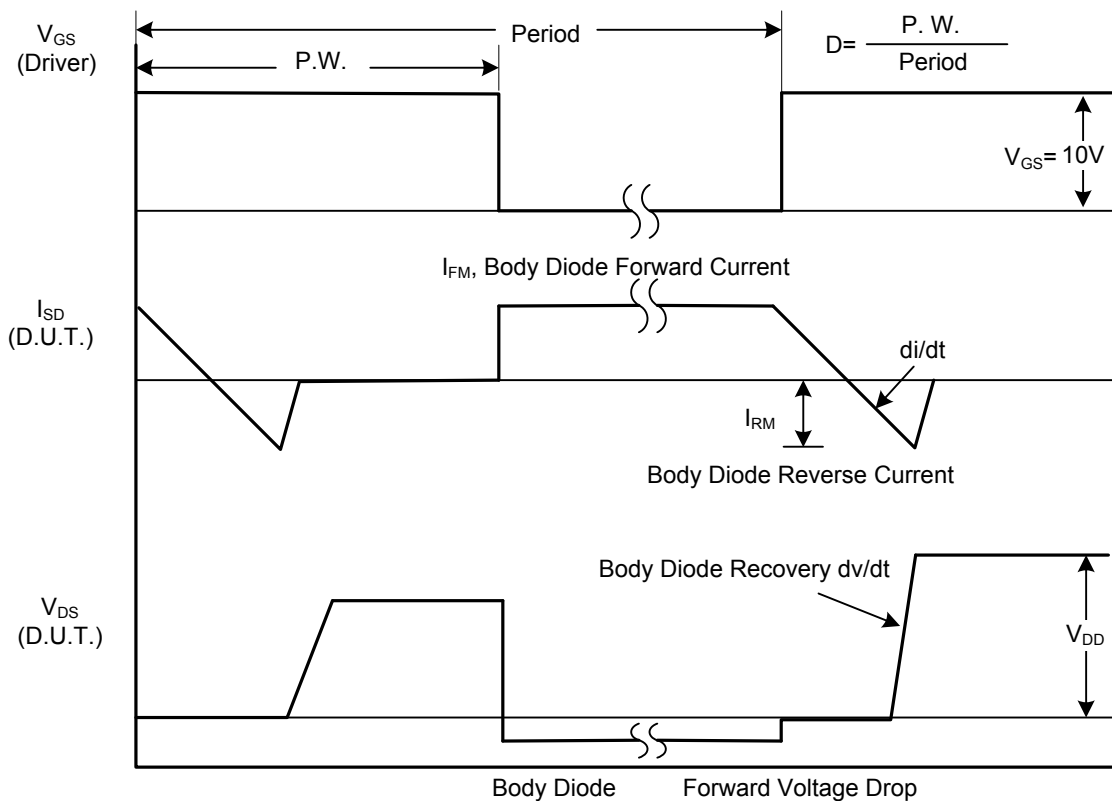
SWITCHING PARAMETERS					
Total Gate Charge	Q_G	$V_{DS}=80V, I_D=28A, V_{GS}=10V$		130	nC
Gate Source Charge	Q_{GS}			26	nC
Gate Drain Charge	Q_{GD}			43	nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=50V, I_D=28A, R_G=2.5\Omega$ $V_{GS}=10V$ (Note)		12	ns
Turn-ON Rise Time	t_R			58	ns
Turn-OFF Delay Time	$t_{D(OFF)}$			45	ns
Turn-OFF Fall-Time	t_F			47	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS					
Diode Forward Voltage	V_{SD}	$I_S=28A, V_{GS}=0V$ (Note)		1.2	V
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
Body Diode Reverse Recovery Time	t_{rr}	$I_F=28A, di/dt=100A/\mu s$ (Note)		140	220
Body Diode Reverse Recovery Charge	Q_{RR}			670	1010

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

■ TEST CIRCUITS AND WAVEFORMS

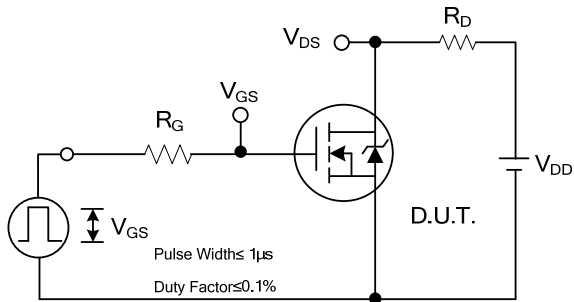


Peak Diode Recovery dv/dt Test Circuit

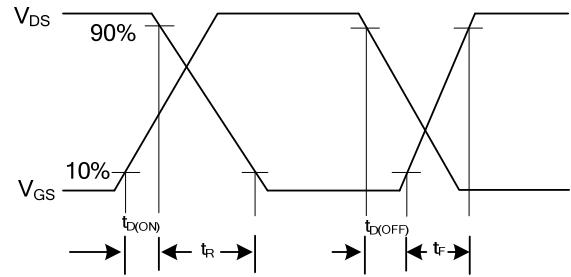


Peak Diode Recovery dv/dt Waveforms

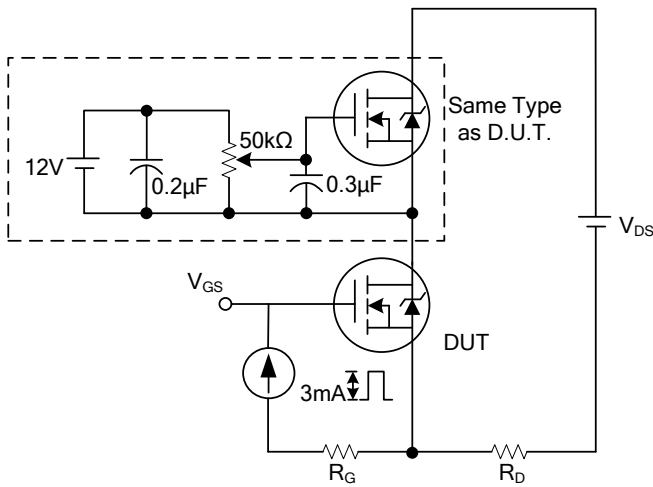
TEST CIRCUITS AND WAVEFORMS (Cont.)



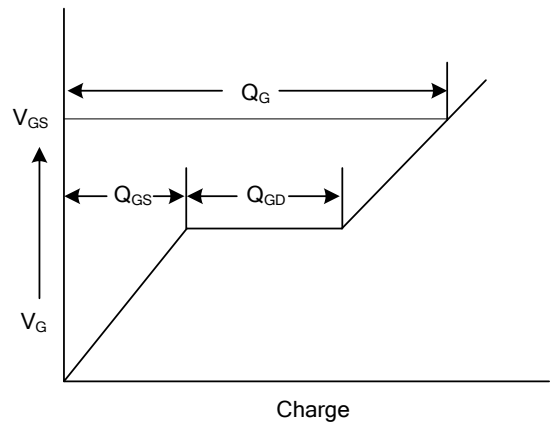
Switching Test Circuit



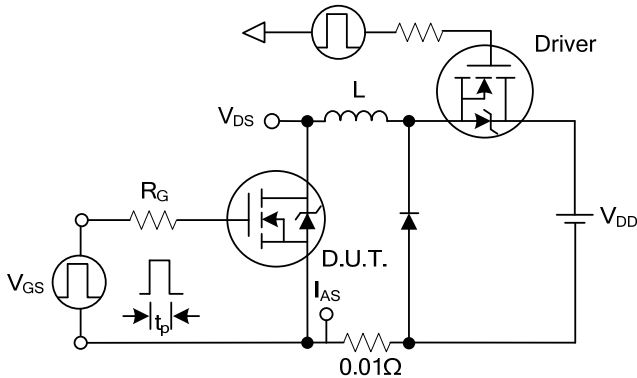
Switching Waveforms



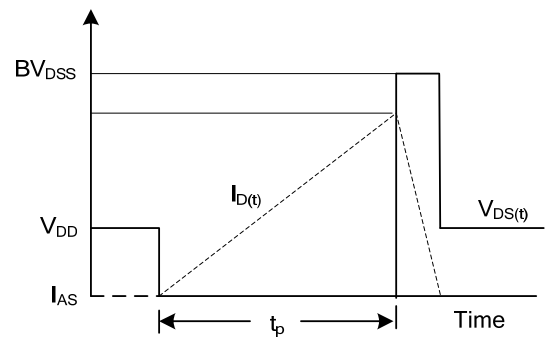
Gate Charge Test Circuit



Gate Charge Waveform

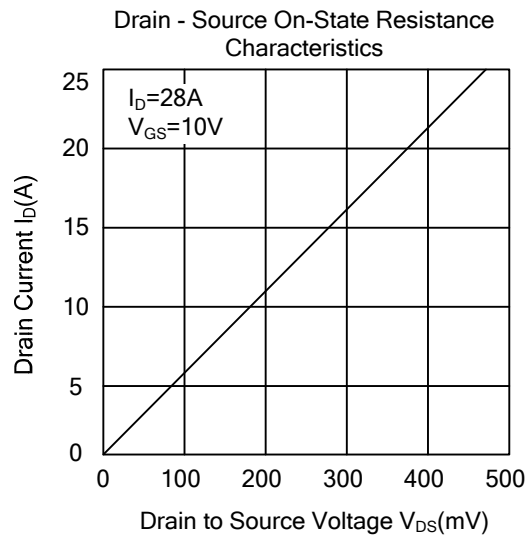
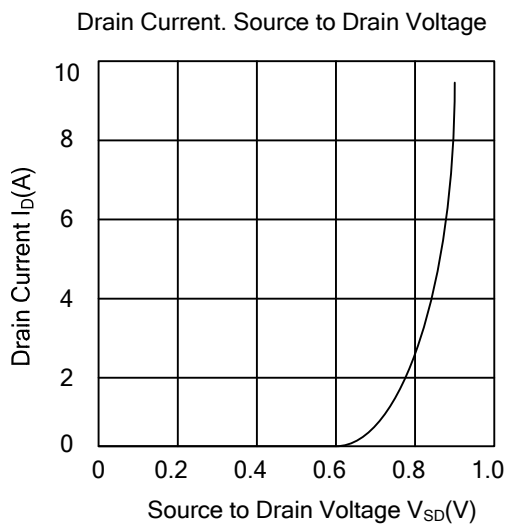
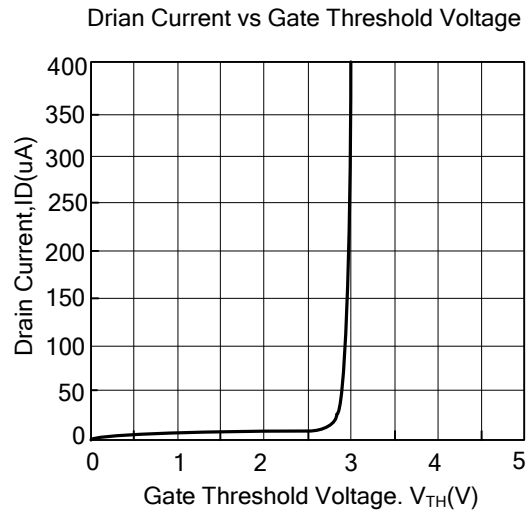
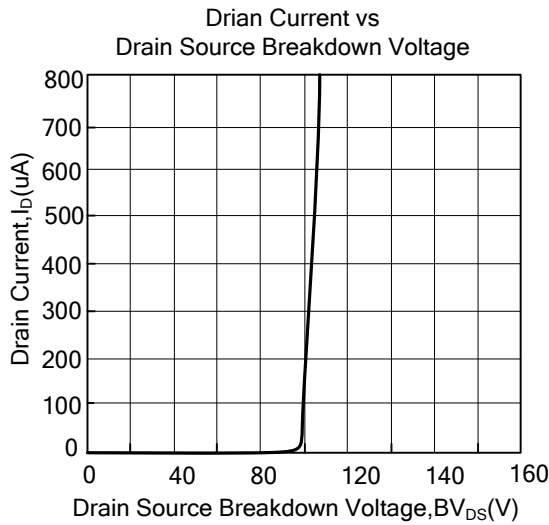


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS



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