



UF3710

Power MOSFET

57A, 100V N-CHANNEL POWER MOSFET

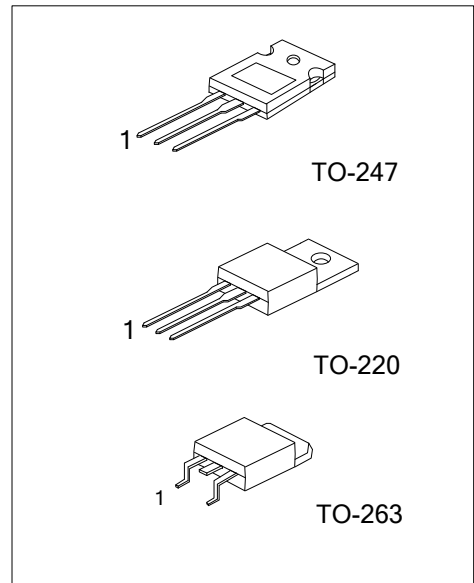
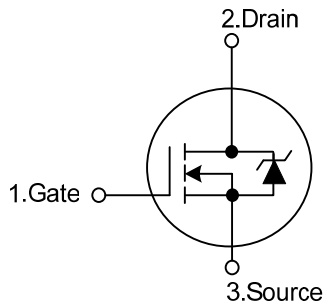
DESCRIPTION

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

- * $R_{DS(ON)} \leq 23 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=28\text{A}$
- * 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
UF3710L-T47-T	UF3710G-T47-T	TO-247	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, R: Tape Reel</p> <p>(2) TA3: TO-220, TQ2: TO-263, T47: TO-247</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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■ 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	A
	Pulsed (Note 2)	I_{DM}	230	
Avalanche Current (Note 2)		I_{AR}	57	A
Avalanche Energy	Repetitive(Note 2)	E_{AR}	20	mJ
	Single Pulsed(Note 3)	E_{AS}	1060 (Note 4)	
Power Dissipation	TO-220/TO-263	P_D	165	W
	TO-247		210	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. $T_J=25^\circ\text{C}$, $L=0.65\text{mH}$, $R_G=25\Omega$, $I_{AS}=57\text{A}$, $V_{GS}=10\text{V}$

4. This is a typical value at device destruction and represents operation outside rated limits.

■ THERMAL DATA

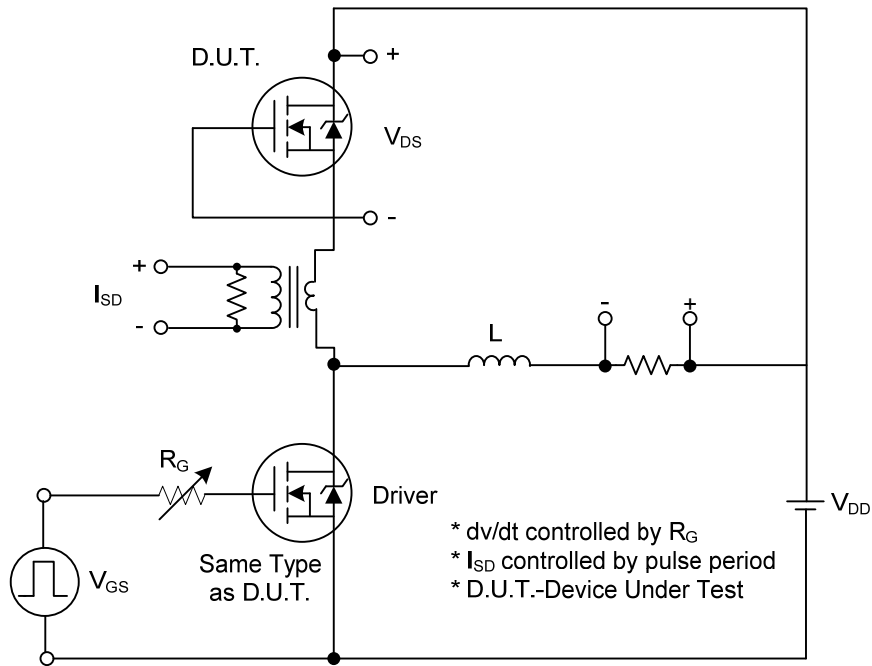
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-263	θ_{JA}	62	$^\circ\text{C/W}$
	TO-247		50	$^\circ\text{C/W}$
Junction to Case	TO-220/TO-263	θ_{JC}	0.75	$^\circ\text{C/W}$
	TO-247		0.59	$^\circ\text{C/W}$

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

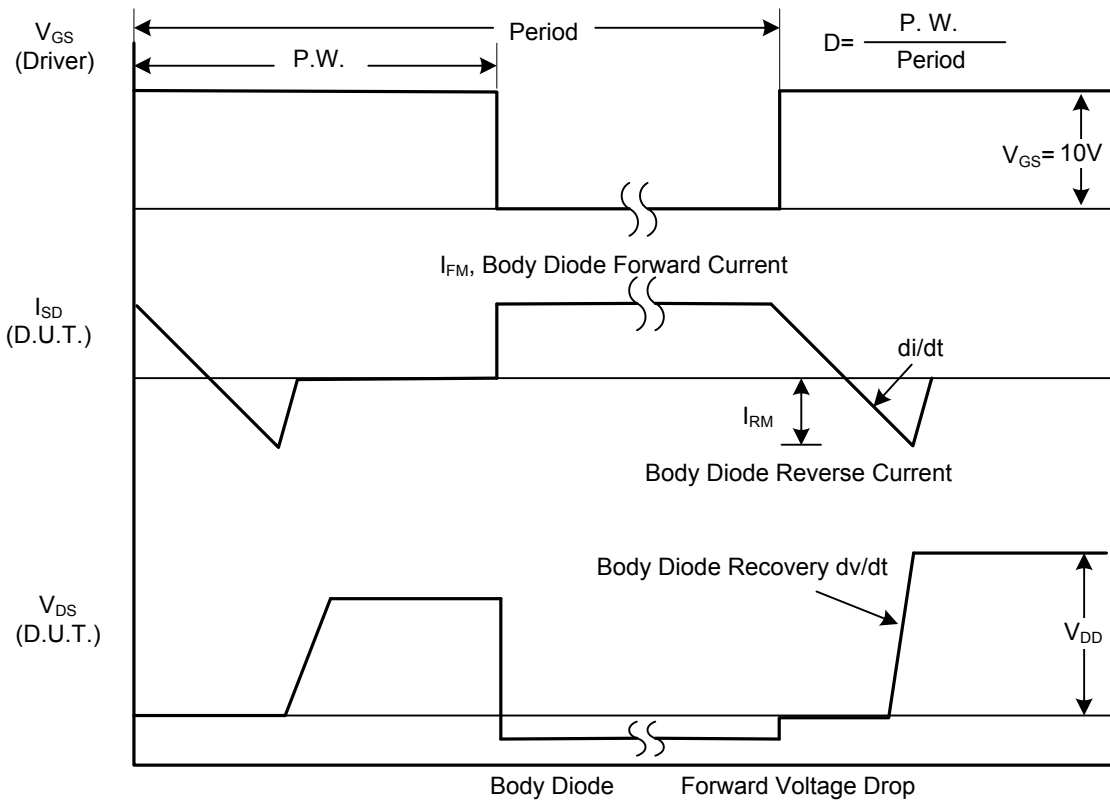
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	100			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V			25	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±100	nA
Breakdown 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
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 =2.5Ω 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/μs (Note)		140	220	ns
Body Diode Reverse Recovery Charge	Q _{rr}			670	1010	nC

Note: Pulse width ≤ 400μs; duty cycle ≤ 2%.

■ TEST CIRCUITS AND WAVEFORMS

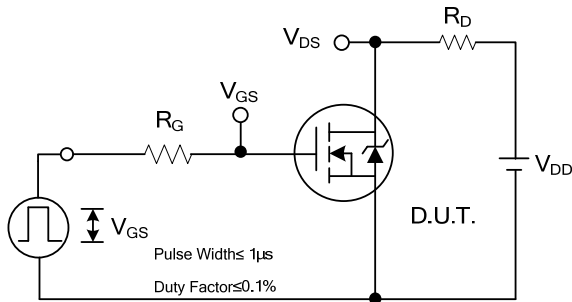


Peak Diode Recovery dv/dt Test Circuit

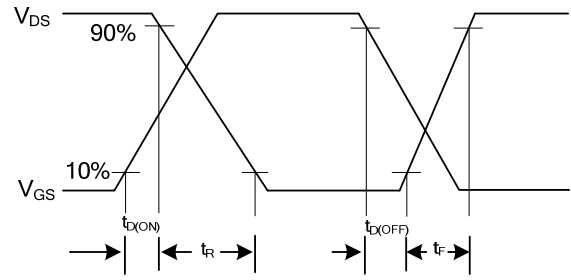


Peak Diode Recovery dv/dt Waveforms

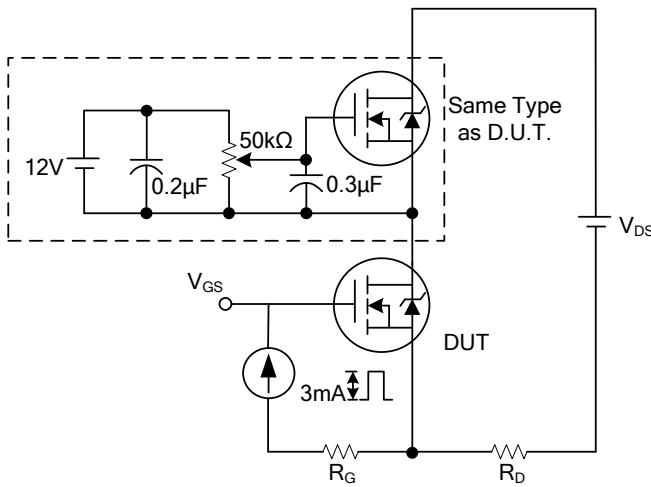
TEST CIRCUITS AND WAVEFORMS



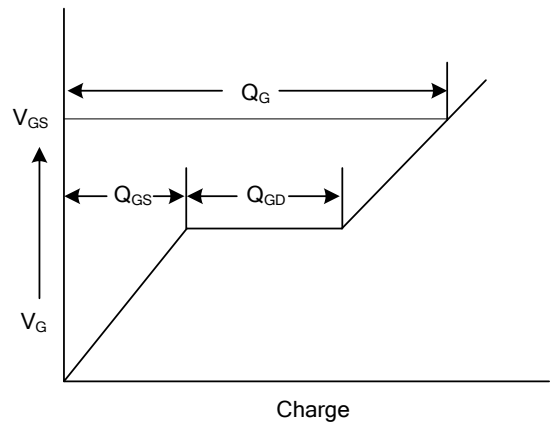
Switching Test Circuit



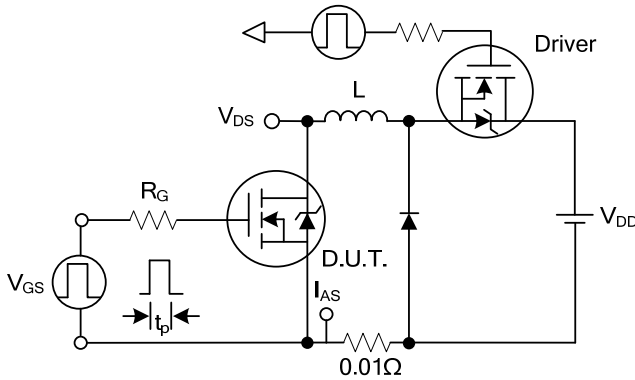
Switching Waveforms



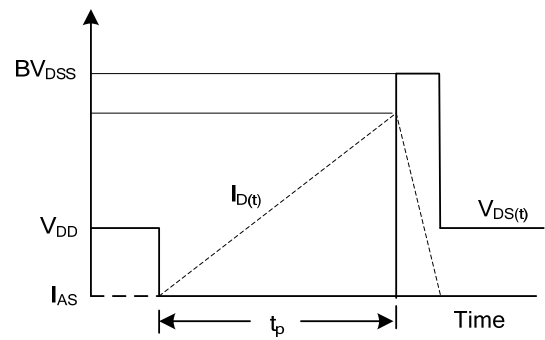
Gate Charge Test Circuit



Gate Charge Waveform

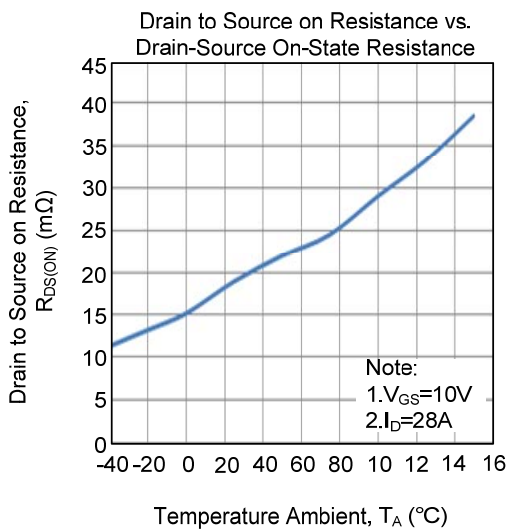
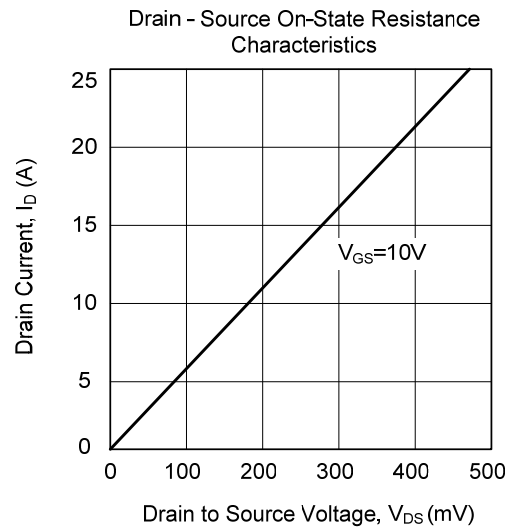
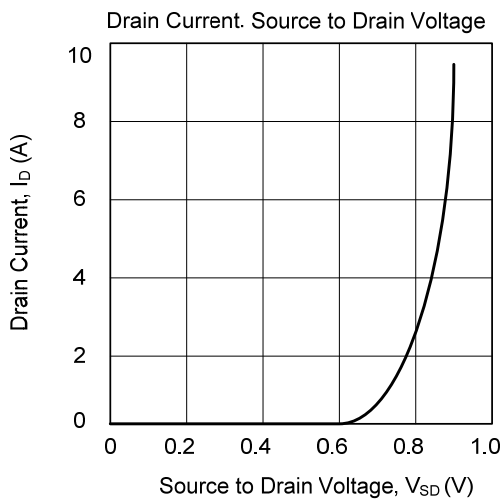
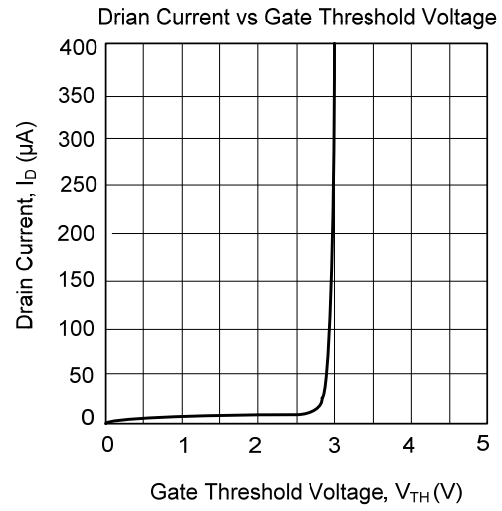
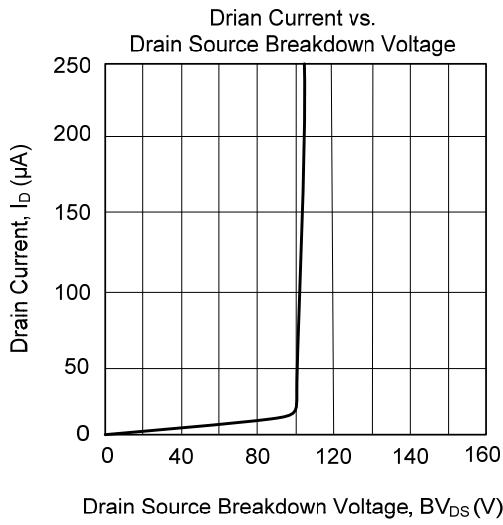


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS



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