



UF3315H

Preliminary

Power MOSFET

23A, 150V N-CHANNEL POWER MOSFET

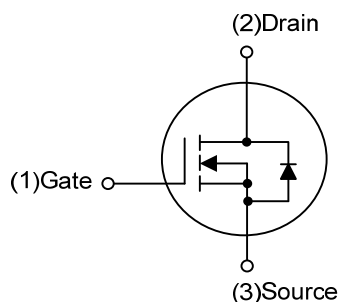
DESCRIPTION

The UTC **UF3315H** is an N-channel enhancement mode Power FET, it uses UTC's advanced technology to provide customers a minimum on-state resistance and high switching speed.

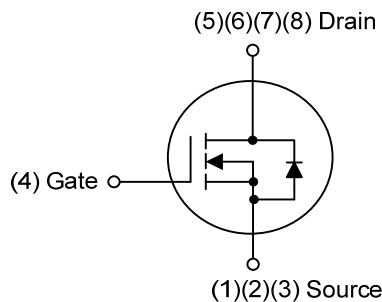
FEATURES

- * $R_{DS(ON)} \leq 57 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=12\text{A}$
- * High switching speed
- * Improved dv/dt capability

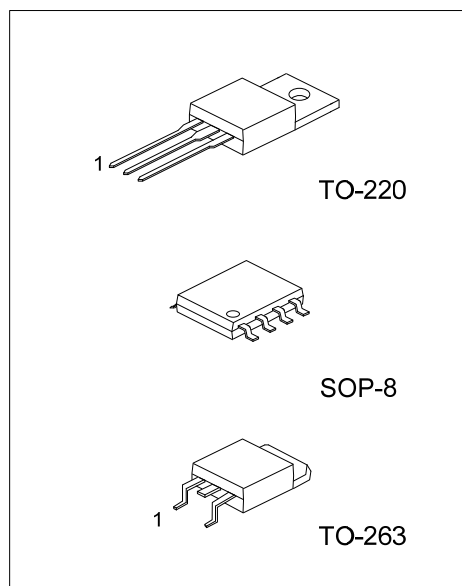
SYMBOL



TO-220 / TO-263



SOP-8



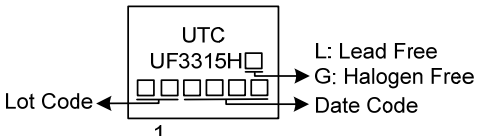
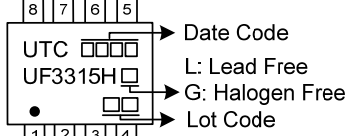
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UF3315HL-TA3-T	UF3315HG-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UF3315HL-TQ2-T	UF3315HG-TQ2-T	TO-263	G	D	S	-	-	-	-	-	Tube
UF3315HL-TQ2-R	UF3315HG-TQ2-R	TO-263	G	D	S	-	-	-	-	-	Tape Reel
UF3315HL-S08-R	UF3315HG-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

UF3315HG-TA3-T		(1)Packing Type	(1) T: Tube, R: Tape Reel
		(2)Package Type	(2) TA3: TO-220, TQ2: TO-263, S08: SOP-8
		(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

TO-220 / TO-263	SOP-8
 UTC UF3315H Lot Code 1 L: Lead Free G: Halogen Free Date Code	 UTC UF3315H Date Code L: Lead Free G: Halogen Free Lot Code

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

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V _{DSS}	150	V
Gate-Source Voltage			V _{GSS}	±20	V
Drain Current	Continuous	TO-220/TO-263	I _D	23	A
		SOP-8		5.1	A
	Pulsed		I _{DM}	46	A
Avalanche Energy	Single Pulsed		E _{AS}	207	mJ
Peak Diode Recovery dv/dt (Note 4)			dv/dt	3.73	V/ns
Power Dissipation	TO-220/TO-263		P _D	90	W
	SOP-8			3	W
Junction Temperature			T _J	+150	°C
Storage Temperature Range			T _{STG}	-55 ~ +150	°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. $L = 4.9\text{mH}$, $I_{AS} = 9.19\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^{\circ}\text{C}$

4. $I_{SD} \leq 23\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DS}$, Starting $T_J = 25^{\circ}\text{C}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-263	θ_{JA}	62.5	$^{\circ}\text{C}/\text{W}$
	SOP-8		90(Note)	
Junction to Case	TO-220/TO-263	θ_{JC}	1.39	$^{\circ}\text{C}/\text{W}$
	SOP-8		41.6(Note)	

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

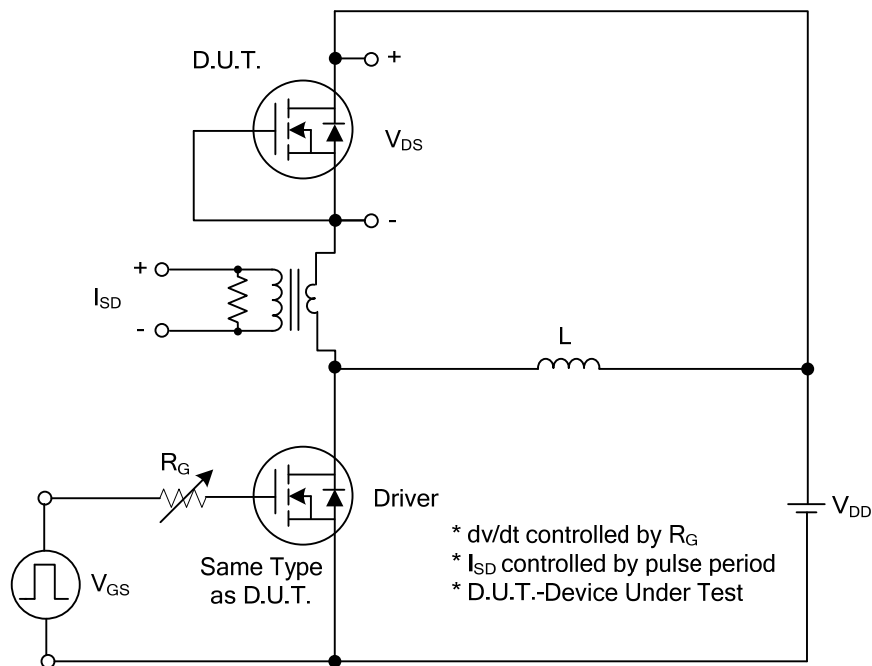
■ ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	150			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =150V, V _{GS} =0V			10	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} =+20V, V _{DS} =0V			+100	nA
	Reverse		V _{GS} =-20V, V _{DS} =0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	I _D =250μA, V _{DS} =V _{GS}	2.0		4.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =12A			57	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz		2307		pF
Output Capacitance		C _{OSS}			154		pF
Reverse Transfer Capacitance		C _{RSS}			125		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DD} =120V, V _{GS} =10V, I _D =23A, (Note 1, 2)		65.2		nC
Gate to Source Charge		Q _{GS}			11		nC
Gate to Drain Charge		Q _{GD}			23		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =75V, V _{GS} =10V I _D =23A, R _G =3Ω (Note 1, 2)		10		ns
Rise Time		t _R			18.8		ns
Turn-OFF Delay Time		t _{D(OFF)}			42.1		ns
Fall-Time		t _F			25.8		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				23	A
Maximum Body-Diode Pulsed Current		I _{SM}				46	A
Drain-Source Diode Forward Voltage		V _{SD}	I _S =23A			1.4	V
Reverse Recovery Time		t _{rr}	I _S =23A, V _{GS} =0V		74		nS
Reverse Recovery Charge (Note 1)		Q _{rr}	dl _F /dt=100A/μs		200		nC

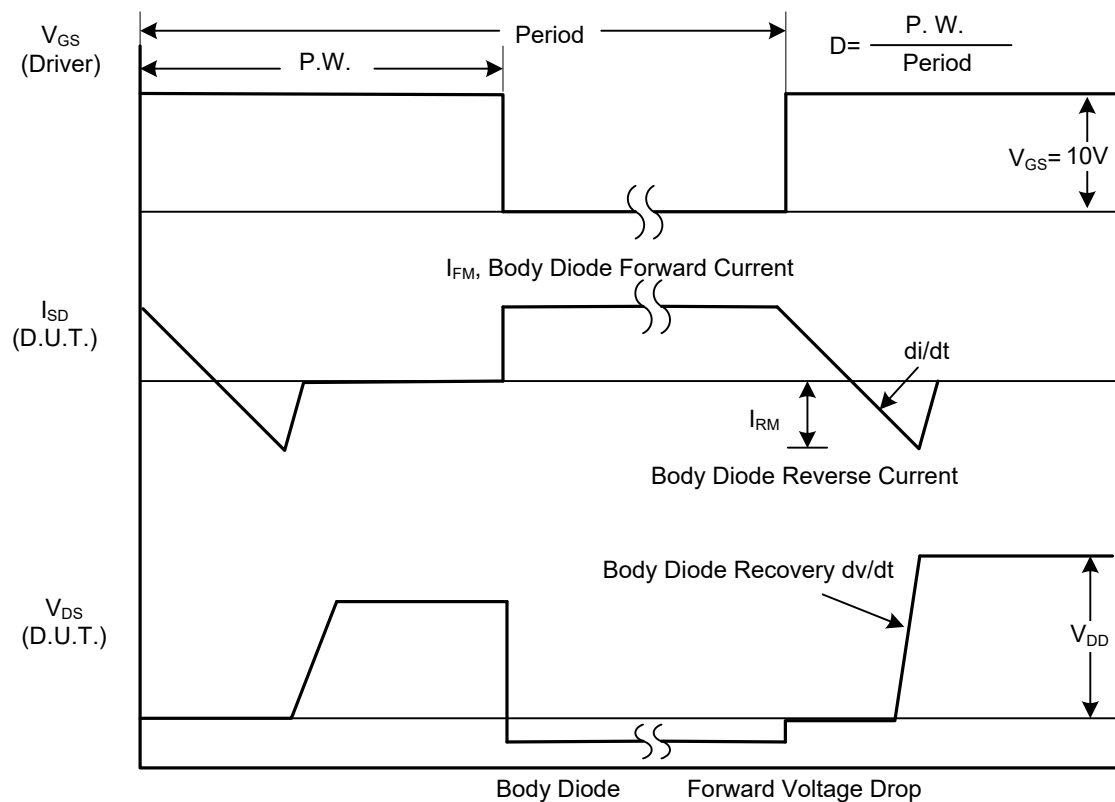
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS

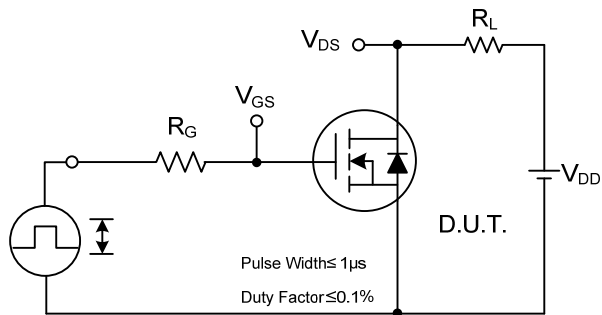


Peak Diode Recovery dv/dt Test Circuit

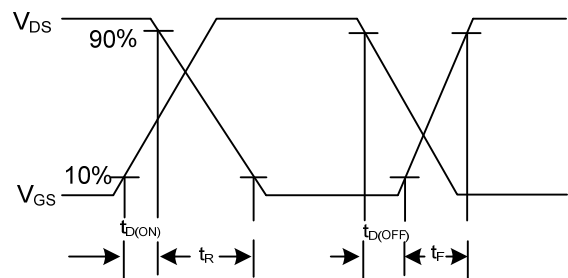


Peak Diode Recovery dv/dt Waveforms

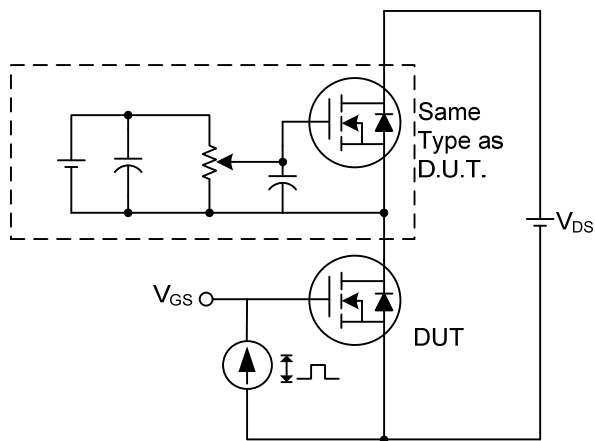
■ TEST CIRCUITS AND WAVEFORMS



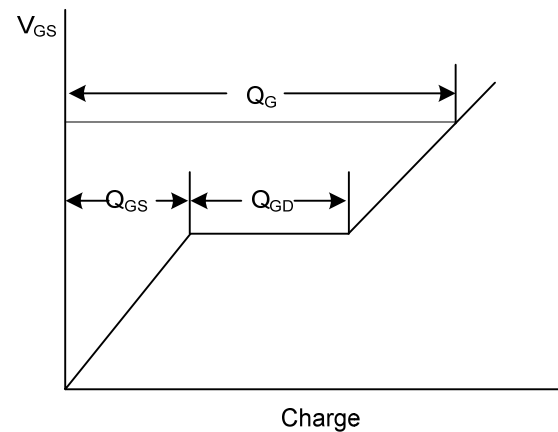
Switching Test Circuit



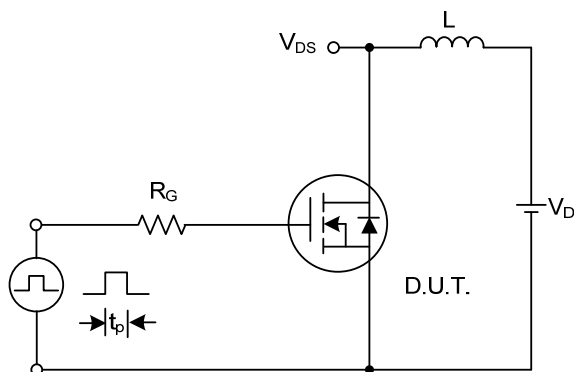
Switching Waveforms



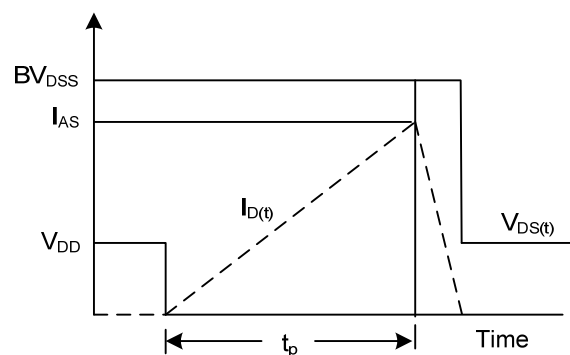
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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