

**UT3430**

Preliminary

Power MOSFET

2A, 20V N-CHANNEL ENHANCEMENT MODE TRENCH POWER MOSFET

DESCRIPTION

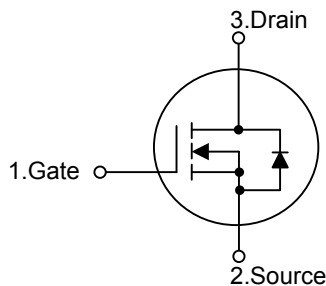
The UTC **UT3430** is a N-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with low $R_{DS(ON)}$ characteristic by high cell density trench technology.

The UTC **UT3430** is suitable for high efficiency synchronous rectification in SMPS, UPS, hard switched and high frequency circuits.

FEATURES

- * $R_{DS(ON)} \leq 150 \text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=2.0\text{A}$
- $R_{DS(ON)} \leq 215 \text{ m}\Omega$ @ $V_{GS}=2.5\text{V}$, $I_D=1.5\text{A}$
- $R_{DS(ON)} \leq 400 \text{ m}\Omega$ @ $V_{GS}=1.85\text{V}$, $I_D=0.5\text{A}$
- * Advanced Trench Process Technology
- * Specially Designed for Switch Load, PWM Application, etc.
- * ESD Protected

SYMBOL

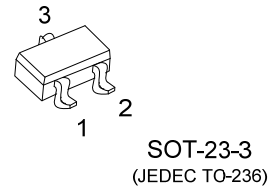


ORDERING INFORMATION

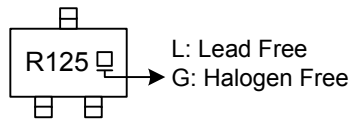
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT3430L-AE2-R	UT3430G-AE2-R	SOT-23-3	G	S	D	Tape Reel

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

UT3400MG-AE2-R (1)Packing Type (2)Package Type (3)Green Package		(1) R: Tape Reel (2) AE2: SOT-23-3 (3) G: Halogen Free and Lead Free, L: Lead Free
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■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	± 8	V
Drain Current	Continuous	I_D	2	A
	Pulsed (Note 2)	I_{DM}	4	A
Power Dissipation		P_D	0.4	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature Range		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.

■ **THERMAL DATA**

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	312	$^\circ\text{C/W}$

Note: The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.

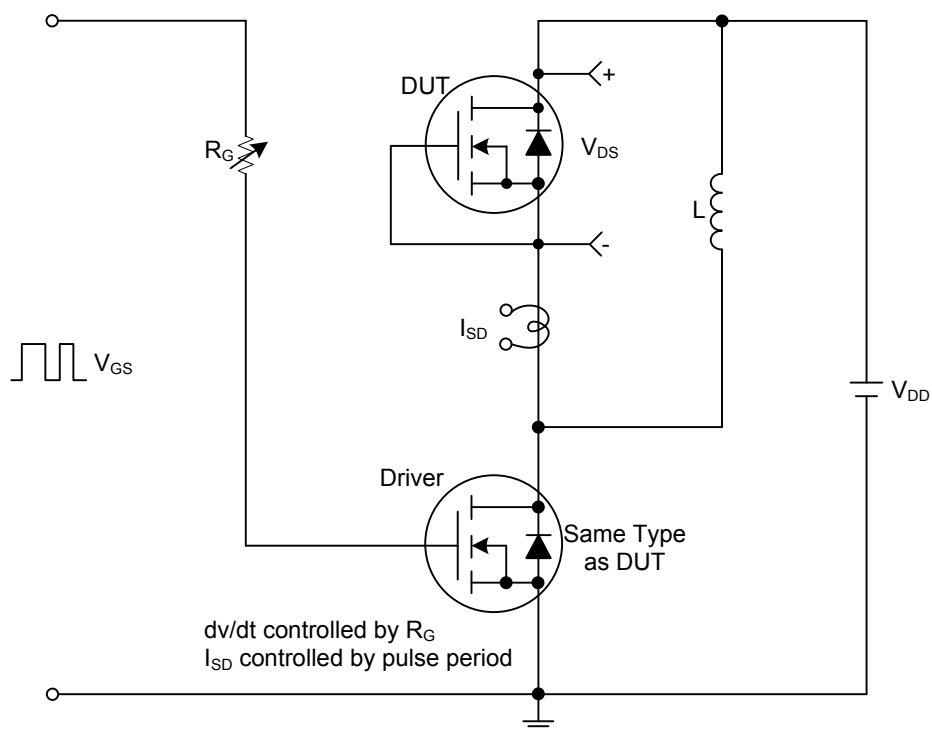
■ **ELECTRICAL CHARACTERISTICS** ($T_J = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DS}	$I_D = 250\mu\text{A}$, $V_{GS} = 0\text{V}$	20			V
Drain-Source Leakage Current		I_{DSS}	$V_{DS} = 20\text{V}$, $V_{GS} = 0\text{V}$			1.0	μA
Gate-Source Leakage Current	Forward	I_{GSS}	$V_{GS} = +8\text{V}$, $V_{DS} = 0\text{V}$			+100	nA
	Reverse		$V_{GS} = -8\text{V}$, $V_{DS} = 0\text{V}$			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS} = V_{GS}$, $I_D = 250\mu\text{A}$	0.7		1.1	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	$V_{GS} = 4.5\text{V}$, $I_D = 2.0\text{A}$		110	150	m Ω
			$V_{GS} = 2.5\text{V}$, $I_D = 1.5\text{A}$		150	215	m Ω
			$V_{GS} = 1.8\text{V}$, $I_D = 0.5\text{A}$		180	400	m Ω
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q_G	$V_{DS} = 10\text{V}$, $V_{GS} = 4.5\text{V}$, $I_D = 2.0\text{A}$, $I_G = 1\text{mA}$ (Note 1, 2)		44		nC
Gate to Source Charge		Q_{GS}			0.7		nC
Gate to Drain Charge		Q_{GD}			1		nC
Turn-on Delay Time (Note 1)		$t_{D(ON)}$	$V_{DS} = 10\text{V}$, $V_{GS} = 4.5\text{V}$, $I_D = 2.0\text{A}$, $R_G = 25\Omega$ (Note 1, 2)		1.2		ns
Rise Time		t_R			16		ns
Turn-off Delay Time		$t_{D(OFF)}$			7		ns
Fall-Time		t_F			16		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				1.6	A
Drain-Source Diode Forward Voltage (Note 1)		V_{SD}	$I_S = 1.6\text{A}$, $V_{GS} = 0\text{V}$		0.9	1.2	V

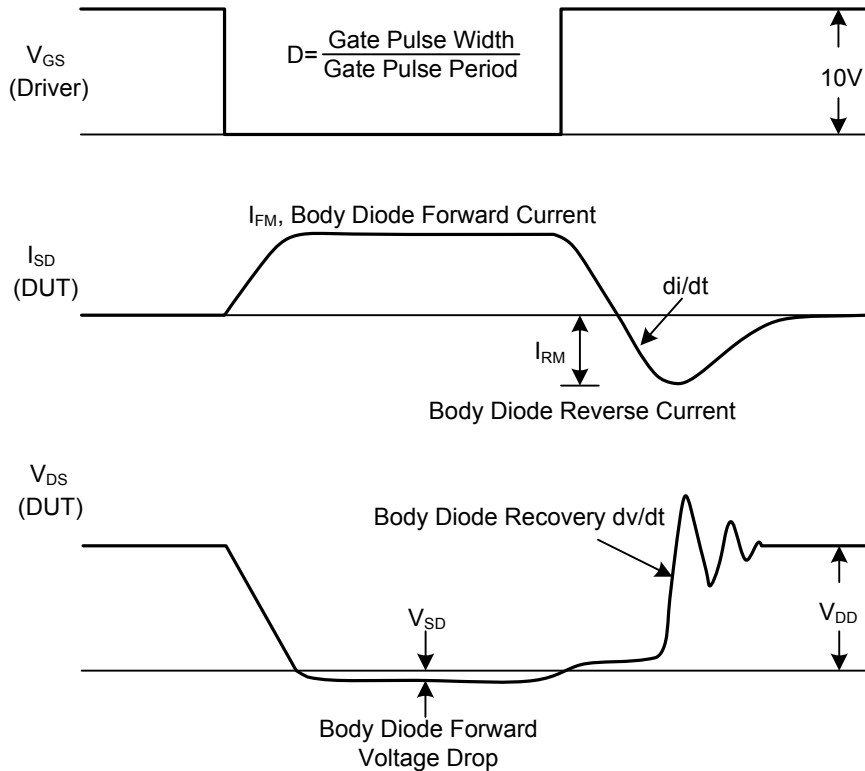
Notes: 1. Pulse Test : Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS



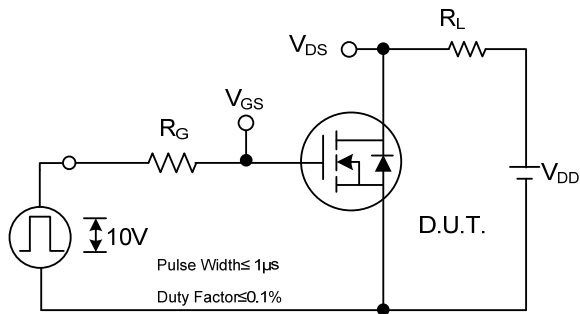
Peak Diode Recovery dv/dt Test Circuit



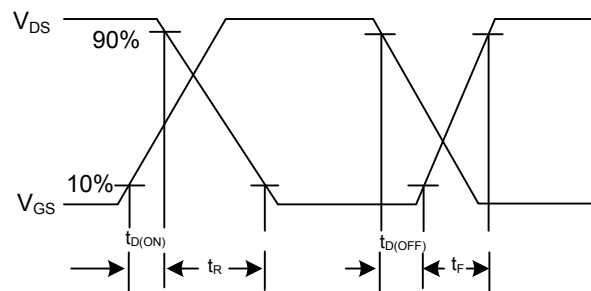
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

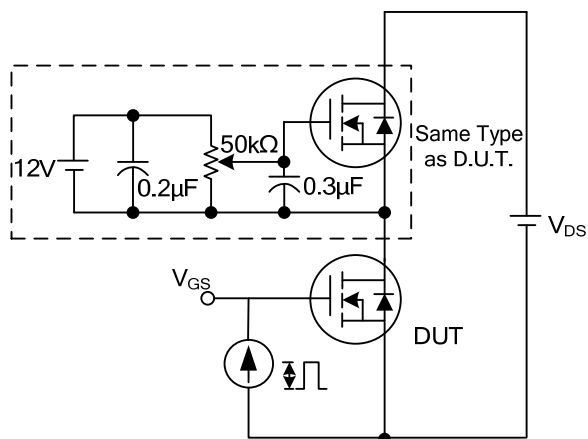
■ TEST CIRCUITS AND WAVEFORMS



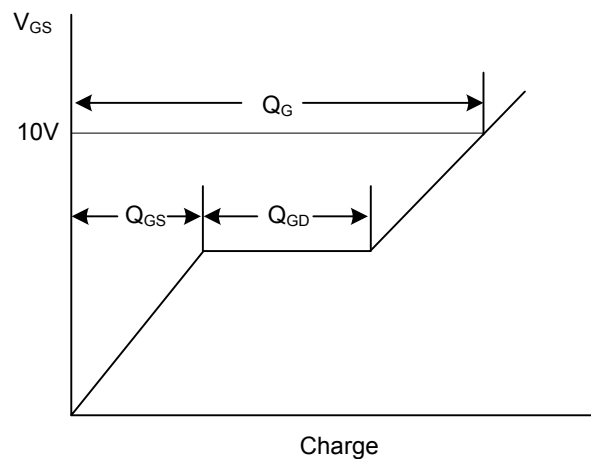
Switching Test Circuit



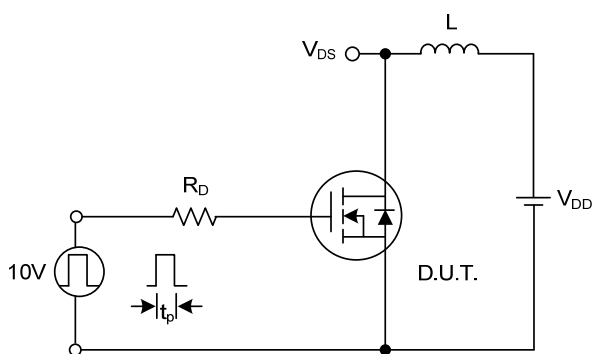
Switching Waveforms



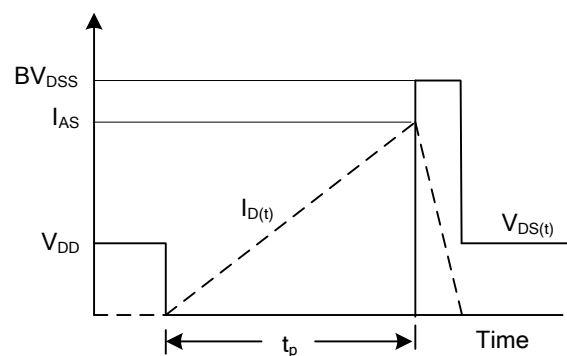
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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