



## USG130N10

Advance

POWER MOSFET

### 130A, 100V N-CHANNEL ENHANCEMENT MODE TRENCH POWER MOSFET

#### DESCRIPTION

The UTC **USG130N10** 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 **USG130N10** is suitable for high efficiency synchronous rectification in SMPS, UPS, hard switched and high frequency circuits.

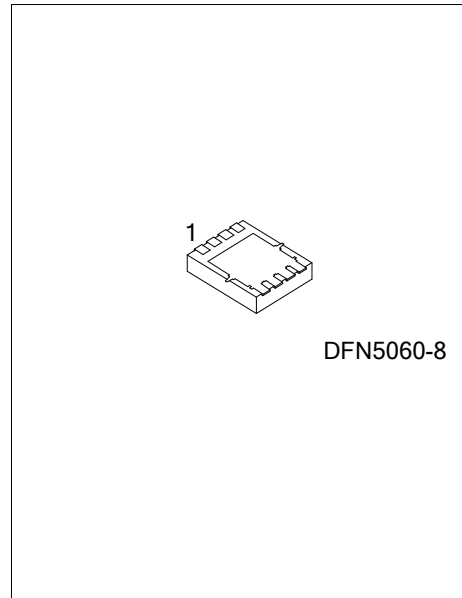
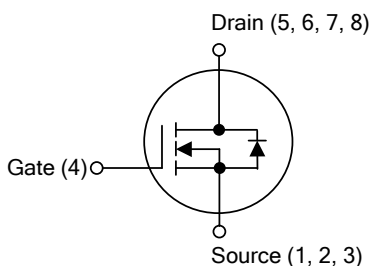
#### APPLICATION

- \* Synchronous Rectification in SMPS
- \* Hard Switching and High Speed Circuit
- \* DC/DC in Telecoms and Industrial

#### FEATURES

- \*  $R_{DS(ON)} \leq 4.2 \text{ m}\Omega @ V_{GS}=10V, I_D=20A$
- \*  $R_{DS(ON)} \leq 6.0 \text{ m}\Omega @ V_{GS}=4.5V, I_D=20A$
- \* Optimized for high speed switching, Logic level
- \* Enhanced Body diode dv/dt capability
- \* Enhanced Avalanche Ruggedness

#### SYMBOL



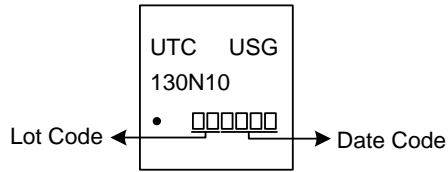
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
USG130N10L-K08-5060-R	USG130N10G-K08-5060-R	DFN5060-8	S	S	S	G	D	D	D	D	Tape Reel

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

USG130N10G-K08-5060-R	(1) Packing Type	(1) R: Tape Reel
	(2) Package Type	(2) K08-5060: DFN5060-8
	(3) Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

## MARKING



FLYING 汎翔國際有限公司  
www.flying1688.com

### ■ ABSOLUTE MAXIMUM RATINGS (T<sub>C</sub>=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V <sub>DSS</sub>	100	V
Gate-Source Voltage		V <sub>GSS</sub>	±20	V
Continuous Drain Current	Continuous	I <sub>D</sub>	130	A
Pulsed Drain Current	Pulsed (Note 2)	I <sub>DM</sub>	400	A
Avalanche energy	Single Pulsed (Note 3)	E <sub>AS</sub>	180	mJ
Power Dissipation		P <sub>D</sub>	41	W
Junction Temperature		T <sub>J</sub>	+150	°C
Storage Temperature Range		T <sub>STG</sub>	-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=0.1mH, I<sub>AS</sub>=60A, V<sub>DD</sub>=50V, R<sub>G</sub>=25Ω, Starting T<sub>J</sub> = 25°C.

### ■ THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient (Note)	θ <sub>JA</sub>	35	°C/W
Junction to Case	θ <sub>JC</sub>	3	°C/W

Note: Device mounted on FR-4 substrate P<sub>C</sub> board, 2oz copper, with 1inch square copper plate.

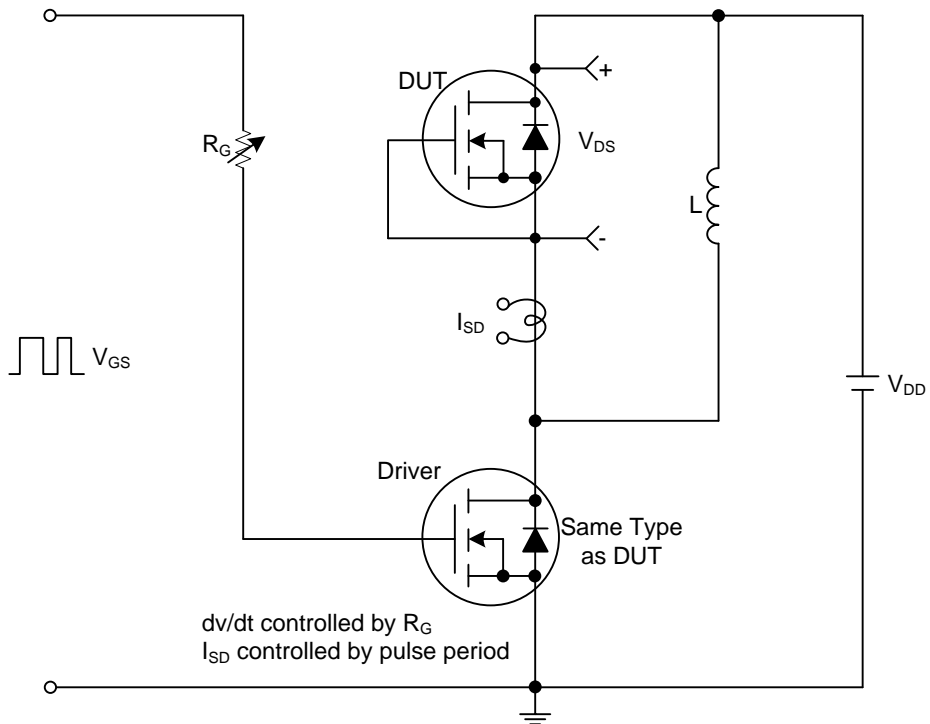
### ■ ELECTRICAL CHARACTERISTICS (T<sub>J</sub> =25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> =250μA, V <sub>GS</sub> =0V	100			V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V			1	μA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =+20V, V <sub>DS</sub> =0V			+100	nA
		V <sub>GS</sub> =-20V, V <sub>DS</sub> =0V			-100	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.4	1.8	2.4	V
Static Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A		3.4	4.2	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A		4.6	6.0	mΩ
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Body-Diode Continuous Current	I <sub>S</sub>				130	A
Maximum Body-Diode Pulsed Current	I <sub>SM</sub>				400	A
Drain-Source Diode Forward Voltage (Note 1)	V <sub>SD</sub>	I <sub>F</sub> =20A, V <sub>GS</sub> =0V		0.9	1.2	V

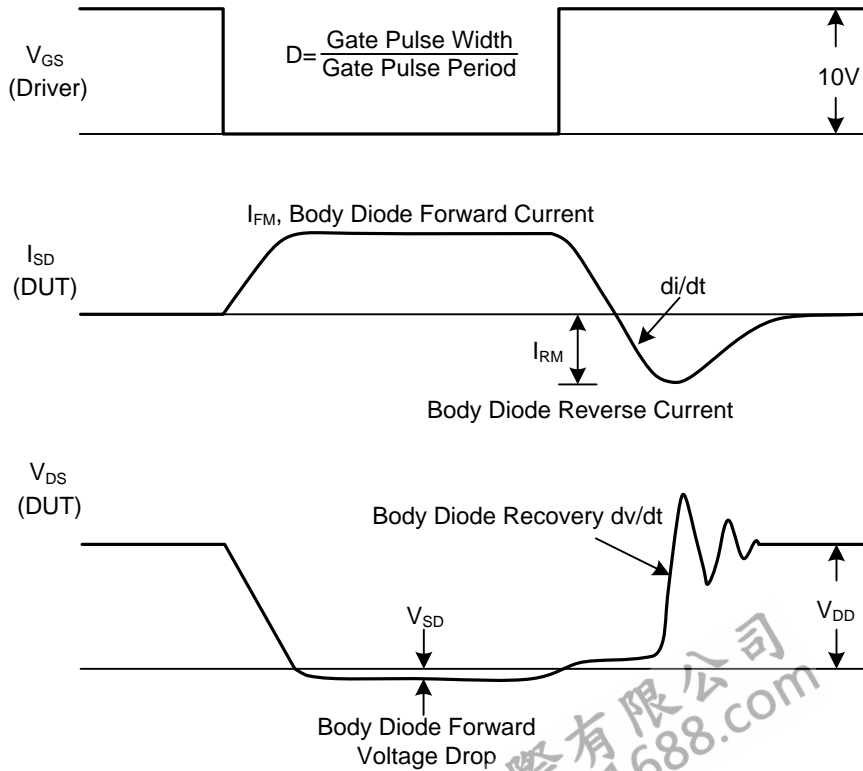
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



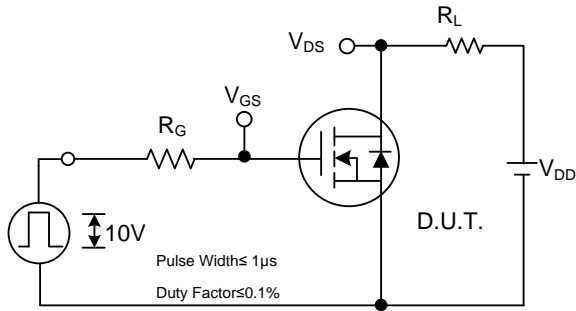
Peak Diode Recovery dv/dt Test Circuit



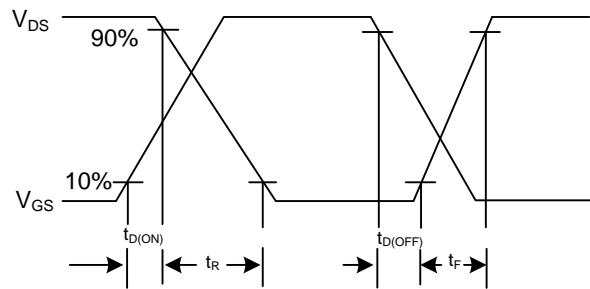
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

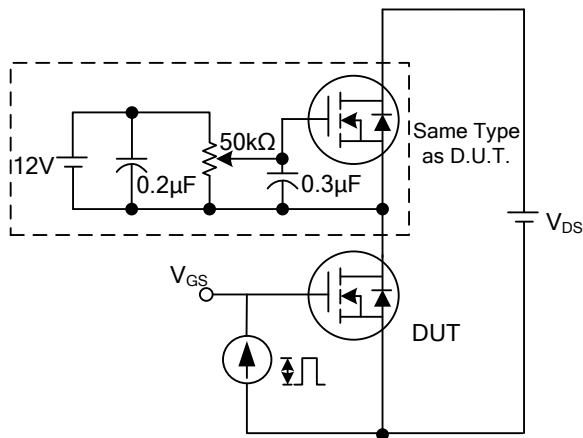
TEST CIRCUITS AND WAVEFORMS



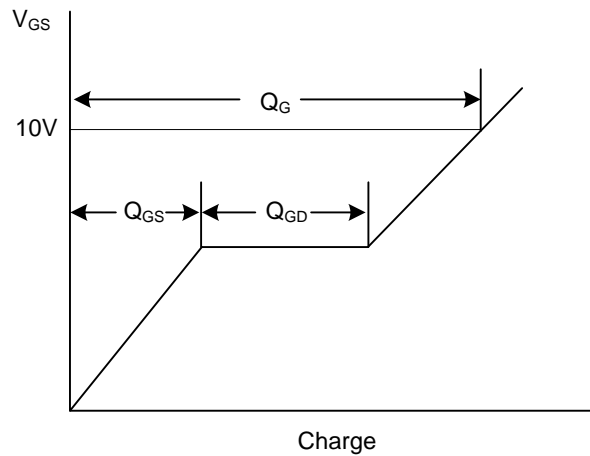
Switching Test Circuit



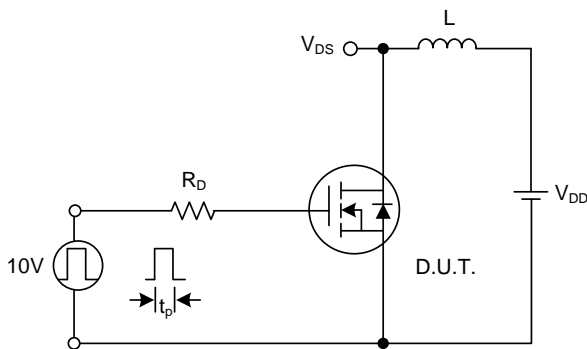
Switching Waveforms



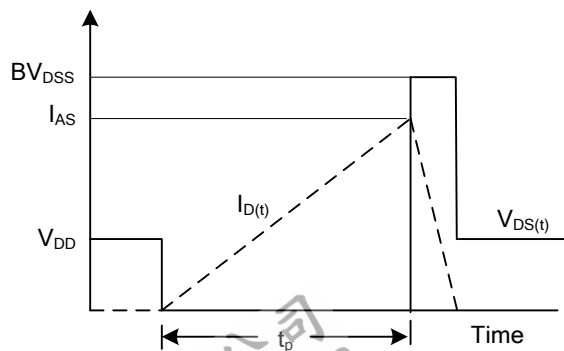
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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