



# UTT80N07

**Power MOSFET**

## 70V, 80A N-CHANNEL POWER MOSFET

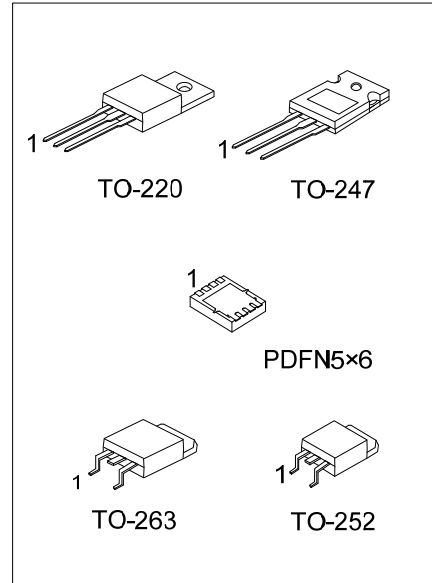
### DESCRIPTION

The UTC **UTT80N07** 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.

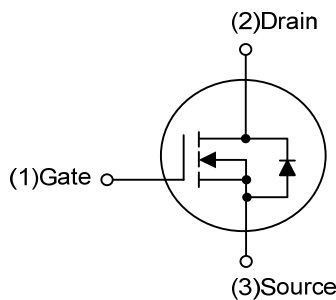
The UTC **UTT80N07** is suitable for high efficiency synchronous rectification in SMPS, UPS, hard switched and high frequency circuits.

### FEATURES

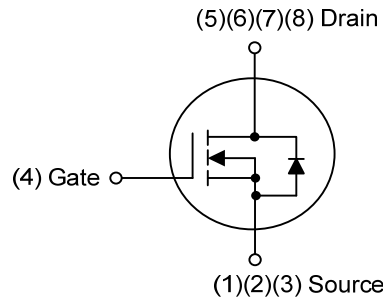
- \*  $R_{DS(ON)} \leq 11\text{ m}\Omega$  @  $V_{GS}=10\text{V}$ ,  $I_D=40\text{A}$
- \* Trench FET Power MOSFETS Technology



### SYMBOL



TO-220 / TO-247 / TO-252 / TO-263



PDFN5x6

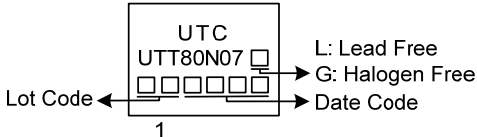
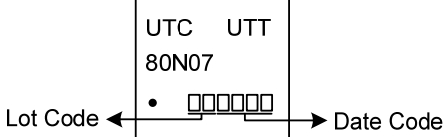
### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTT80N07L-TA3-T	UTT80N07G-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UTT80N07L-TN3-R	UTT80N07G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UTT80N07L-TQ2-T	UTT80N07G-TQ2-T	TO-263	G	D	S	-	-	-	-	-	Tube
UTT80N07L-TQ2-R	UTT80N07G-TQ2-R	TO-263	G	D	S	-	-	-	-	-	Tape Reel
UTT80N07L-T47-T	UTT80N07G-T47-T	TO-247	G	D	S	-	-	-	-	-	Tube
UTT80N07L-P5060-R	UTT80N07G-P5060-R	PDFN5x6	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UTT80N07G-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, TN3: TO-252, TQ2: TO-263 T47: TO-247, P5060: PDFN5x6</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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## MARKING

TO-220 / TO-247 / TO-252 / TO-263	PDFN5×6
 <p>UTC UTT80N07 □ □ □ □ □ □ → Date Code Lot Code ← 1 L: Lead Free G: Halogen Free</p>	 <p>UTC UTT 80N07 • □ □ □ □ □ → Date Code Lot Code ←</p>

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		$V_{DSS}$	70	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Continuous Drain Current		$I_D$	80	A
Pulsed Drain Current		$I_{DM}$	160	A
Avalanche Energy, Single Pulse		$E_{AS}$	180	mJ
Power Dissipation	TO-220/TO-263	$P_D$	180	W
	TO-247		230	W
	TO-252		64	W
	PDFN5x6		42	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.  $L=0.1\text{mH}$ ,  $I_{AS}=60\text{A}$ ,  $V_{DD}=25\text{V}$ ,  $R_G=20\Omega$ , Starting  $T_J = 25^\circ\text{C}$ .

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-263	$\theta_{JA}$	62.5	$^\circ\text{C/W}$
	TO-247		30	$^\circ\text{C/W}$
	TO-252		110(Note)	$^\circ\text{C/W}$
	PDFN5x6		65 (Note)	$^\circ\text{C/W}$
Junction to Case	TO-220/TO-263	$\theta_{JC}$	0.69	$^\circ\text{C/W}$
	TO-247		0.54	$^\circ\text{C/W}$
	TO-252		1.95 (Note)	$^\circ\text{C/W}$
	PDFN5x6		2.97 (Note)	$^\circ\text{C/W}$

Note: The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.

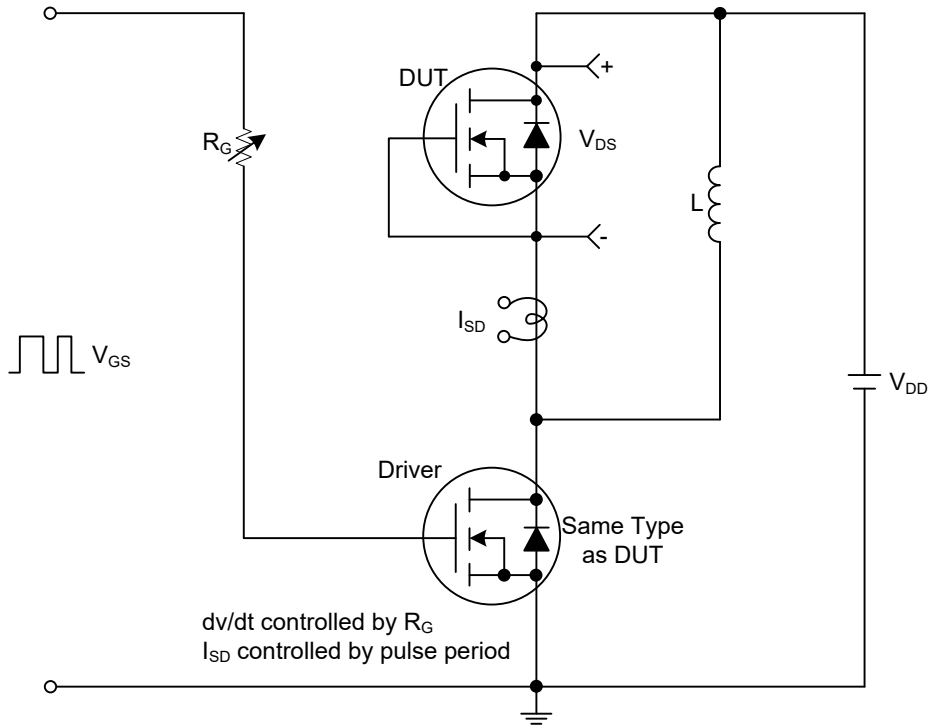
■ ELECTRICAL CHARACTERISTICS (T<sub>J</sub> =25°C, unless otherwise specified)

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	70			V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =70V, V <sub>GS</sub> =0V			1	μA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±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	2.0		4.0	V
Static Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =40A			11	mΩ
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1.0MHz		4380		pF
Output Capacitance	C <sub>OSS</sub>			393		pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			340		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge (Note 1)	Q <sub>G</sub>	V <sub>DS</sub> =56V, V <sub>GS</sub> =10V, I <sub>D</sub> =80A, (Note 1, 2)		130		nC
Gate to Drain Charge	Q <sub>GD</sub>			22		nC
Gate to Source Charge	Q <sub>GS</sub>			45		nC
Turn-ON Delay Time (Note 1)	t <sub>D(ON)</sub>	V <sub>DS</sub> =35V, V <sub>GS</sub> =10V, I <sub>D</sub> =80A, R <sub>G</sub> =3.3Ω (Note 1, 2)		19		ns
Rise Time	t <sub>R</sub>			22		ns
Turn-OFF Delay Time	t <sub>D(OFF)</sub>			65		ns
Fall-Time	t <sub>F</sub>			25		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Body-Diode Continuous Current	I <sub>S</sub>				80	A
Maximum Body-Diode Pulsed Current	I <sub>SM</sub>				160	A
Drain-Source Diode Forward Voltage (Note 1)	V <sub>SD</sub>	I <sub>SD</sub> =80A			1.2	V
Reverse Recovery Time (Note 1)	t <sub>rr</sub>	I <sub>S</sub> =30A, V <sub>GS</sub> =0V,		50		nS
Reverse Recovery Charge	Q <sub>rr</sub>	dI <sub>F</sub> /dt =100A/μs		75		nC

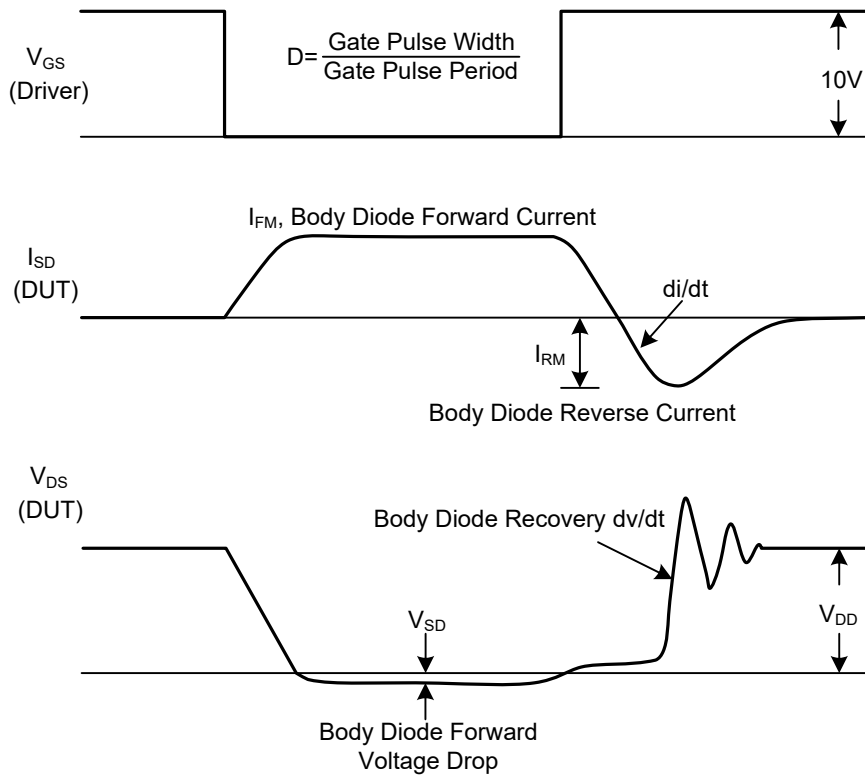
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



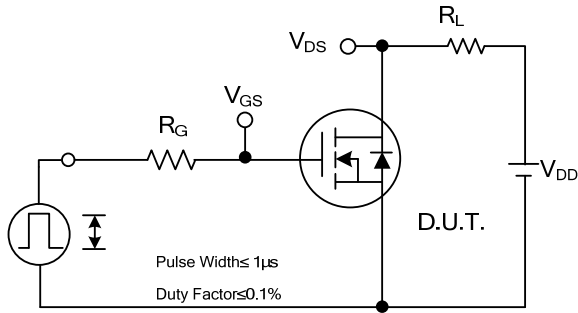
Peak Diode Recovery dv/dt Test Circuit



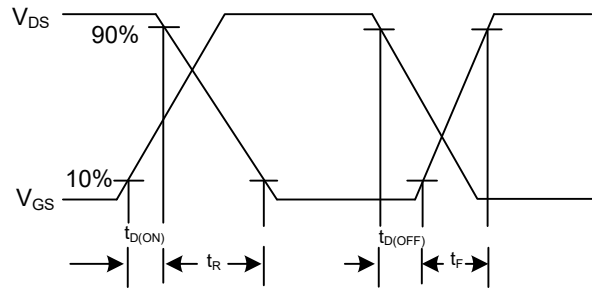
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

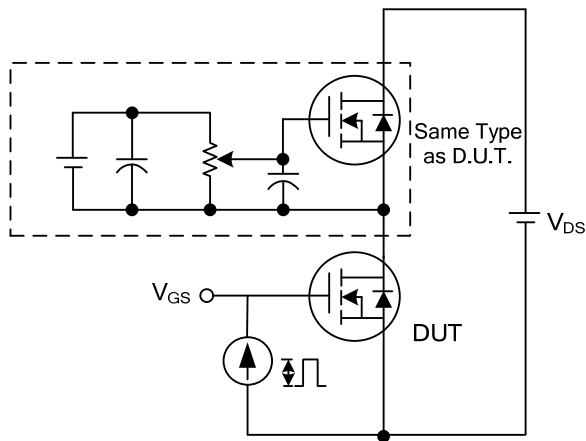
## TEST CIRCUITS AND WAVEFORMS



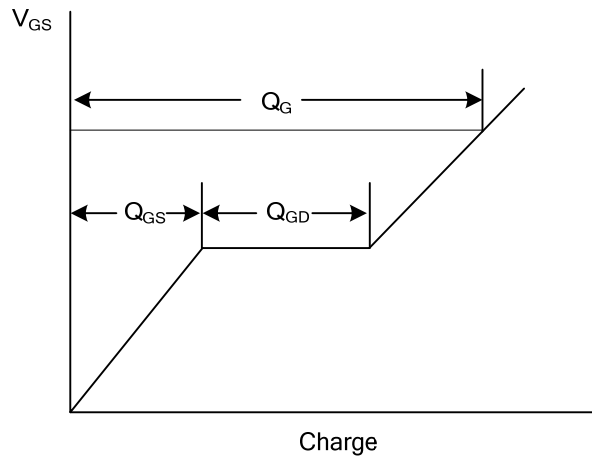
**Switching Test Circuit**



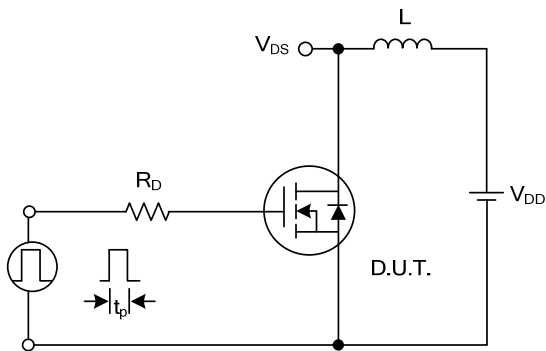
**Switching Waveforms**



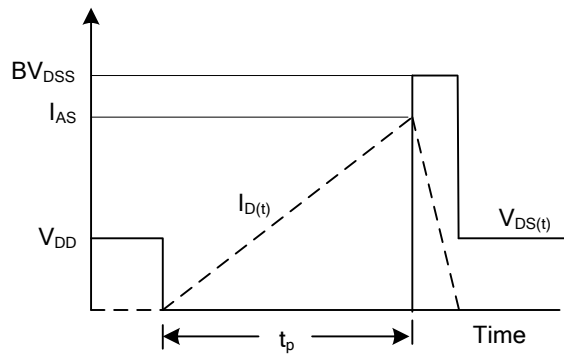
**Gate Charge Test Circuit**



**Gate Charge Waveform**



**Unclamped Inductive Switching Test Circuit**



**Unclamped Inductive Switching Waveforms**

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