



# UT40N03

**Power MOSFET**

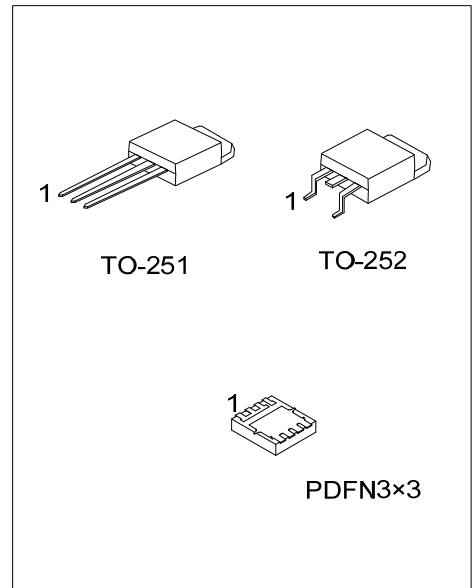
## 40 Amps, 30 Volts N-CHANNEL POWER MOSFET

■ DESCRIPTION

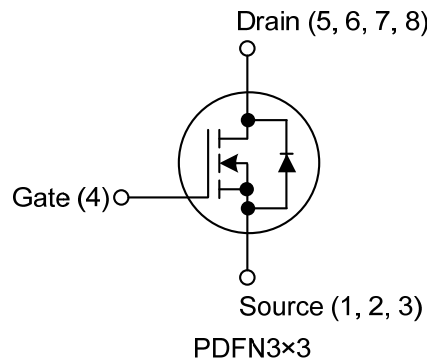
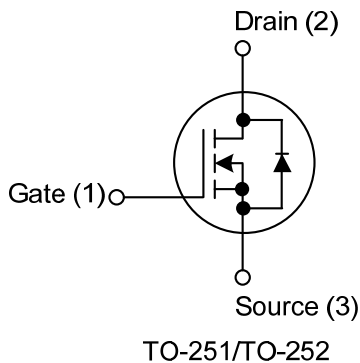
The **UT40N03** power MOSFET provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness

■ FEATURES

- \*  $R_{DS(ON)} \leq 17 \text{ m}\Omega @ V_{GS}=10V, I_D=20A$
- \* Low capacitance
- \* Optimized gate charge
- \* Fast switching capability
- \* Avalanche energy specified



■ SYMBOL



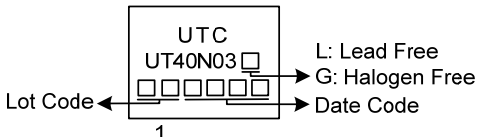
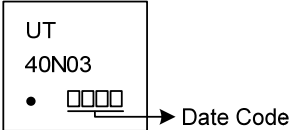
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT40N03L-TM3-T	UT40N03G-TM3-T	TO-251	G	D	S	-	-	-	-	-	Tube
UT40N03L-TN3-R	UT40N03G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UT40N03L-P3030-R	UT40N03G-P3030-R	PDFN3x3	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UT40N03G-TM3-T</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p>	<p>(1) T: Tube, R: Tape Reel (2) TM3: TO-251, TN3: TO-252, P3030: PDFN3x3 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
---	---

■ MARKING

TO-251 / TO-252	PDFN3×3
 <p>UTC UT40N03</p> <p>Lot Code ←</p> <p>→ L: Lead Free → G: Halogen Free → Date Code</p> <p>1</p>	 <p>UT 40N03</p> <p>• □□□□ → Date Code</p>

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V <sub>DSS</sub>	30	V
Gate-Source Voltage		V <sub>GSS</sub>	±20	V
Continuous Drain Current		I <sub>D</sub>	40	A
Pulsed Drain Current (Note 1)		I <sub>DM</sub>	80	A
Total Power Dissipation	TO-251/TO-252	P <sub>D</sub>	48	W
	PDFN3×3		20	W
Junction Temperature		T <sub>J</sub>	+150	°C
Storage Temperature		T <sub>STG</sub>	-55 ~ +150	°C

Note: 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.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-251/TO-252	θ <sub>JA</sub>	50	°C/W
	PDFN3×3		65	°C/W
Junction to Case	TO-251/TO-252	θ <sub>JC</sub>	2.6	°C/W
	PDFN3×3		6.25	°C/W

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

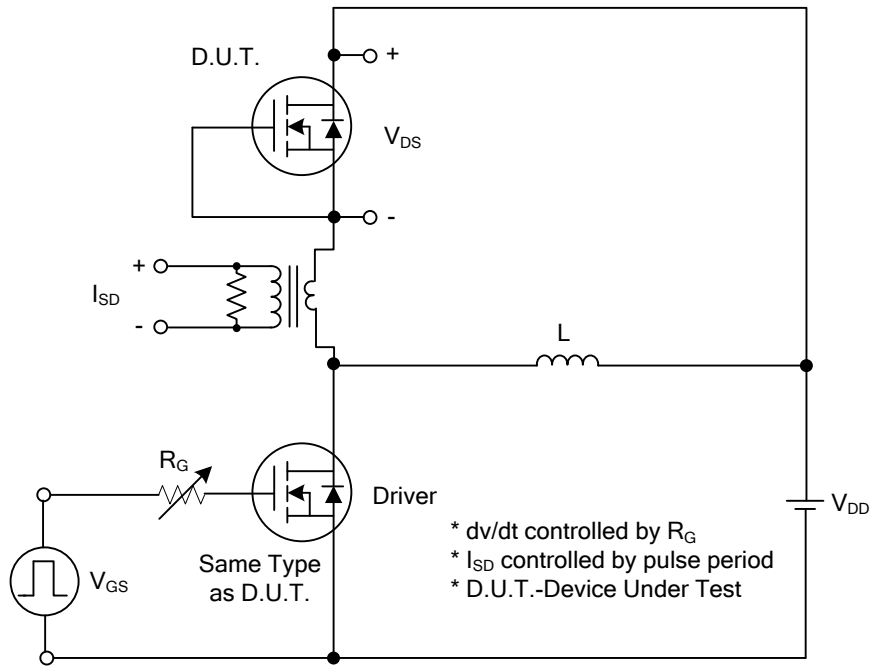
■ ELECTRICAL CHARACTERISTICS (T<sub>A</sub> =25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0 V, I <sub>D</sub> =250 μA	30			V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =30 V, V <sub>GS</sub> =0 V, T <sub>J</sub> =25°C			1	μA
Gate- Source Leakage Current	I <sub>GSS</sub>	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> =250 μA	1		3	V
Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10 V, I <sub>D</sub> =20 A		14	17	mΩ
		V <sub>GS</sub> =4.5 V, I <sub>D</sub> =16 A		20	23	
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =25 V, V <sub>GS</sub> =0V, f=1.0MHz		600		pF
Output Capacitance	C <sub>OSS</sub>			145		
Reverse Transfer Capacitance	C <sub>RSS</sub>			125		
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge	Q <sub>G</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =10V, I <sub>D</sub> =20A		24		nC
Gate-Source Charge	Q <sub>GS</sub>			3		
Gate-Drain Charge	Q <sub>GD</sub>			6		
Turn-ON Delay Time	t <sub>D(ON)</sub>	V <sub>DS</sub> =15 V, V <sub>GS</sub> =10V, I <sub>D</sub> =1.0A, R <sub>G</sub> =3.3 Ω, R <sub>L</sub> =0.75 Ω		14		ns
Turn-ON Rise Time	t <sub>R</sub>			18		
Turn-OFF Delay Time	t <sub>D(OFF)</sub>			32		
Turn-OFF Fall-Time	t <sub>F</sub>			28		
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Continuous Drain-Source Diode Forward Current	I <sub>S</sub>				40	A
Maximum Pulsed Drain-Source Diode Forward Current	I <sub>SM</sub>				80	
Drain-Source Diode Forward Voltage	V <sub>SD</sub>	T <sub>J</sub> =25°C, I <sub>S</sub> =40A, V <sub>GS</sub> =0V			1.3	V

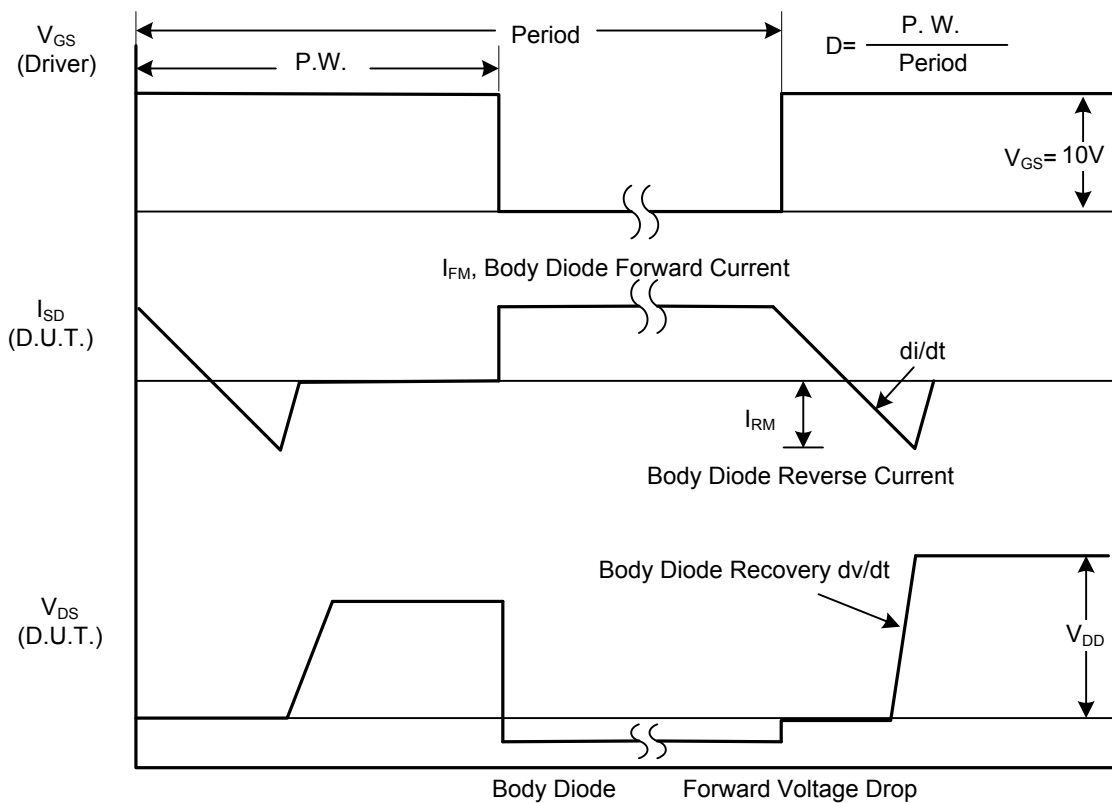
Notes: 1. Repetitive rating; pulse width limited by max. junction temperature.

2. Pulse width ≤ 300us, duty cycle ≤ 2%.

■ TEST CIRCUITS AND WAVEFORMS

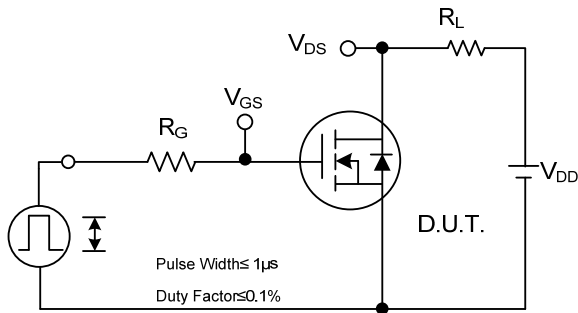


Peak Diode Recovery  $dv/dt$  Test Circuit

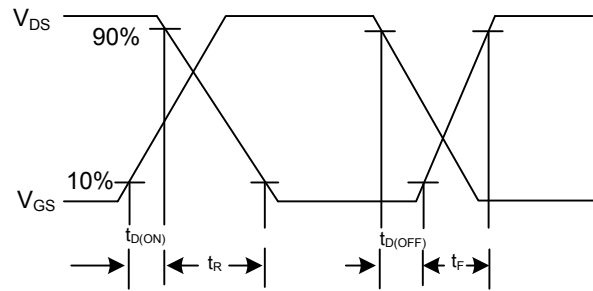


Peak Diode Recovery  $dv/dt$  Waveforms

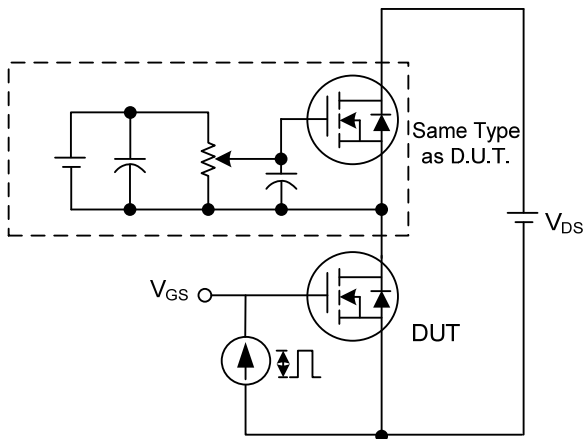
## TEST CIRCUITS AND WAVEFORMS



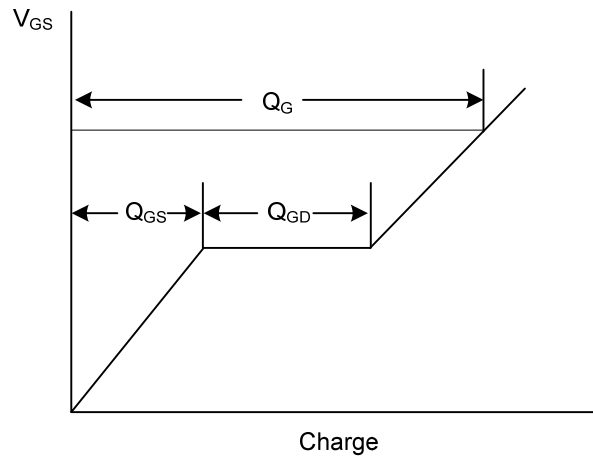
Switching Test Circuit



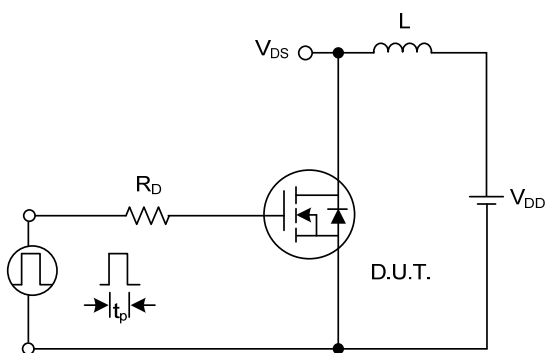
Switching Waveforms



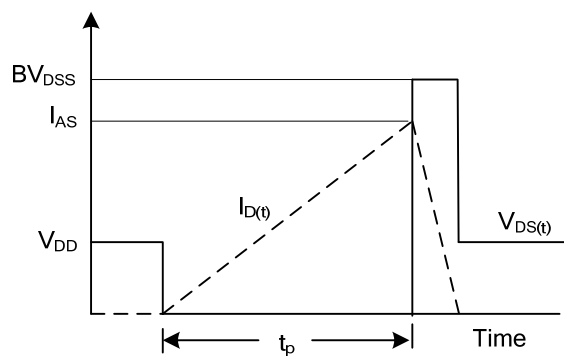
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.