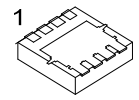
UTT40N04-H

Power MOSFET

40A, 40V N-CHANNEL ENHANCEMENT MODE POWER MOSFET



PDFN3×3

■ DESCRIPTION

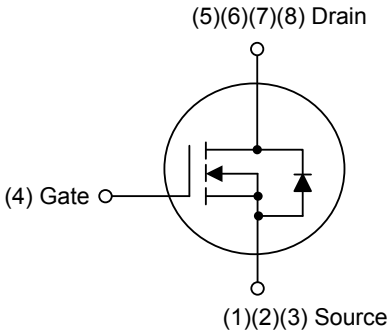
The UTC **UTT40N04-H** is a N-channel enhancement mode power MOSFET, it uses UTC's advanced technology to provide the customers with a minimum on state resistance and fast switching, etc.

The UTC **UTT40N04-H** is suitable for low voltage applications such as DC/DC converters.

■ FEATURES

* $R_{DS(ON)} \leq 7.0\ m\Omega$ @ V_{GS}=10V, I_D=20A
  $R_{DS(ON)} \leq 9.0\ m\Omega$ @ V_{GS}=4.5V, I_D=20A
* Fast switching characteristic
* Lower on-resistance

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTT40N04L-P3030-R	UTT40N04G-P3030-R	PDFN3×3	S	S	S	G	D	D	D	D	Tape Reel

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

UTT40N04G-P3030-R

(1)Packing Type	(1) R: Tape Reel
(2)Package Type	(2) P3030: PDFN3×3
(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

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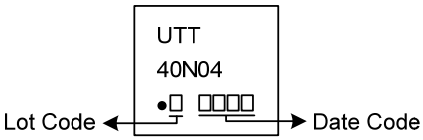
■ MARKING



■ ABSOLUTE MAXIMUM RATING (T_C=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	40	V
Gate-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current V_{GS} @ 10V | T_C=25°C	I_D	40	A
Pulsed Drain Current (Note 1)	I_{DM}	160	A
Single Pulse Avalanche Energy (Note 3)	E_{AS}	55	mJ
Peak Diode Recovery dv/dt (Note 4)	dv/dt	10	V/ns
Power Dissipation	P_D	20	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=0.1mH, I_{AS}=33.2A, V_{DD}=20V, R_G=25Ω, starting T_J=25°C
4. I_{SD} ≤ 30A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, starting T_J=25°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	75	°C/W
Junction to Case	θ_{JC}	6.25	°C/W

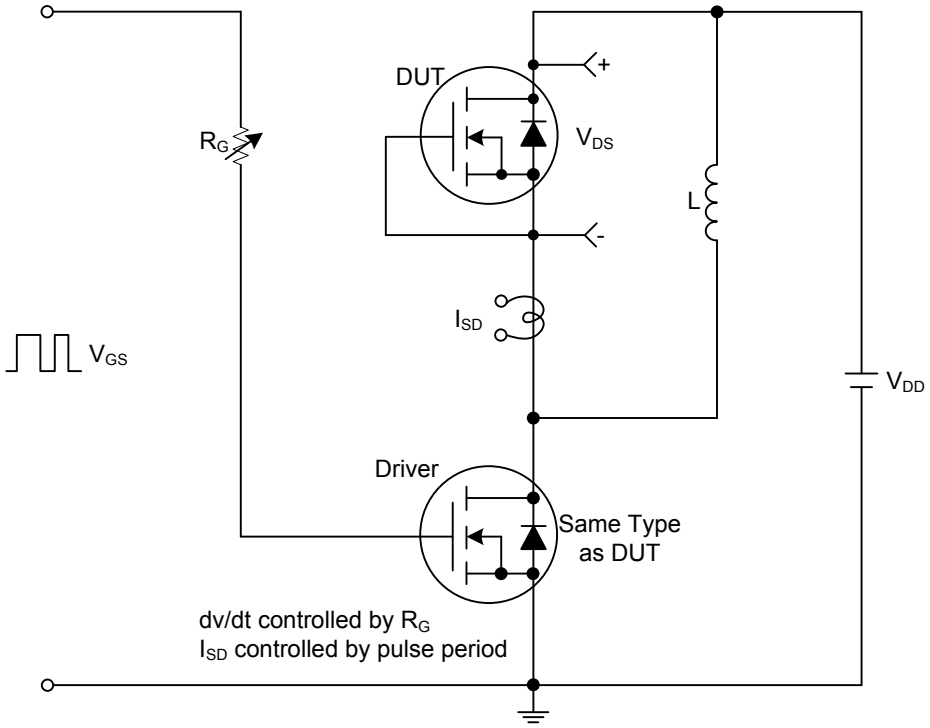
Note: The data tested by surface mounted on a 1 $inch^2$ FR-4 board with 2OZ copper.

■ ELECTRICAL CHARACTERISTICS (T_J=25°C unless otherwise specified)

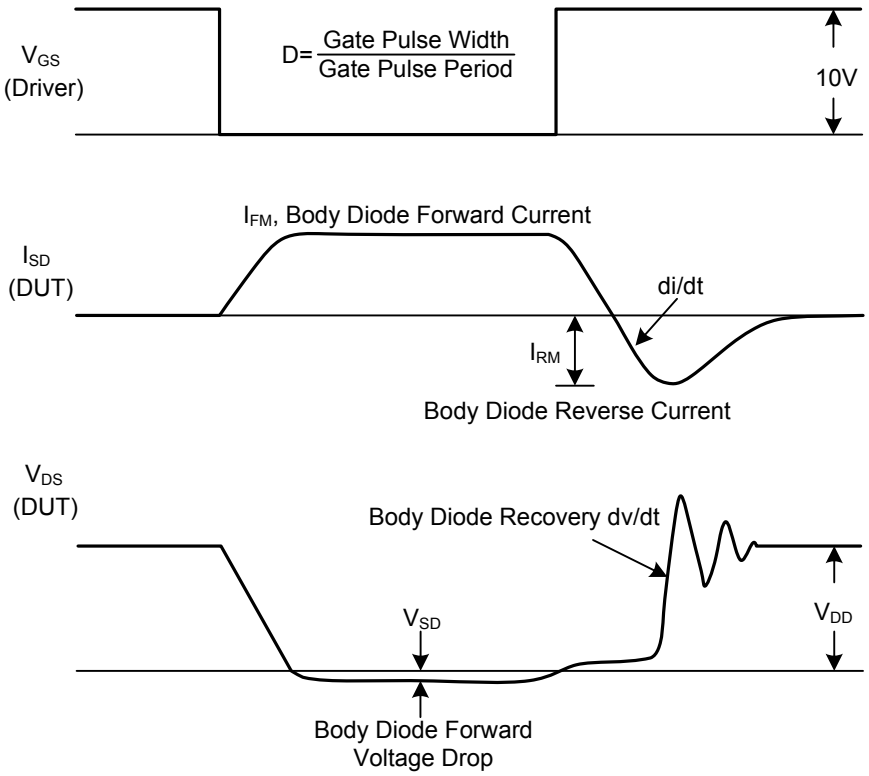
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
STATIC PARAMETERS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	40			V
Drain Cut-Off Current		I_{DSS}	V_{DS}=40V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V, V_{DS}=0V			100	nA
	Reverse		V_{GS}=-20V, V_{DS}=0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	1.0		3.0	V
Static Drain-Source On-State Resistance (Note 2)		$R_{DS(ON)}$	V_{GS}=10V, I_D=20A			7.0	mΩ
			V_{GS}=4.5V, I_D=20A			9.0	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=20V, f=1.0MHz		2600		pF
Output Capacitance		C_{OSS}			300		pF
Reverse Transfer Capacitance		C_{RSS}			220		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 2)		Q_G	V_{GS}=10V, V_{DS}=32V, I_D=40A I_G=1mA		44		nC
Gate to Source Charge		Q_{GS}			20		nC
Gate to Drain ("Miller") Charge		Q_{GD}			4		nC
Turn-ON Delay Time (Note 2)		$t_{D(ON)}$	V_{GS}=10V, V_{DS}=20V, I_D=40A, R_G=25Ω		25		ns
Rise Time		t_R			44		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			104		ns
Fall-Time		t_F			72		ns
SOURCE-DRAIN BODY DIODE CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				40	A
Maximum Body-Diode Pulsed Current		I_{SM}				160	A
Forward On Voltage (Note 2)		V_{SD}	I_S=40A,V_{GS}=0V			1.3	V
Reverse Recovery Time (Note 2)		t_{rr}	I_S=30A, V_{GS}=0V, dI/dt=40A/μs		880		ns
Reverse Recovery Charge		Q_{rr}			2.7		μC

Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



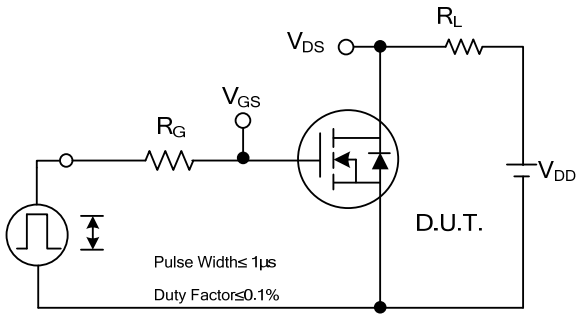
Peak Diode Recovery dv/dt Test Circuit



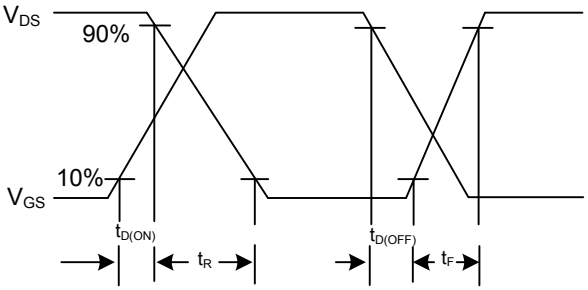
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

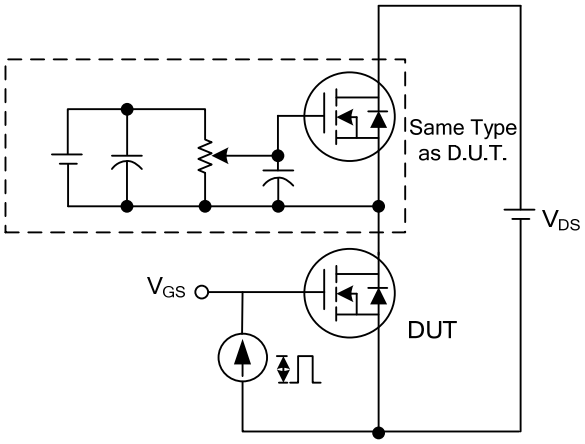
■ TEST CIRCUITS AND WAVEFORMS



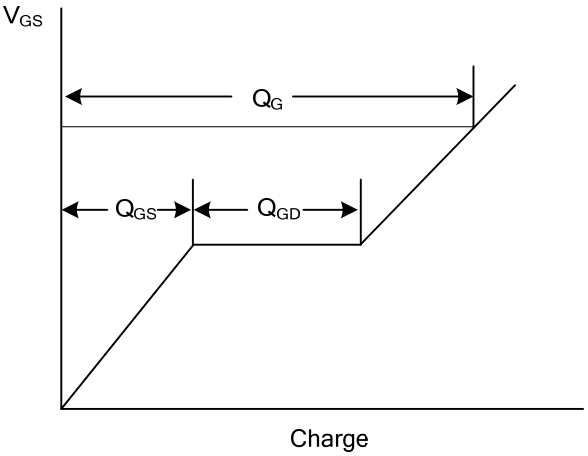
Switching Test Circuit



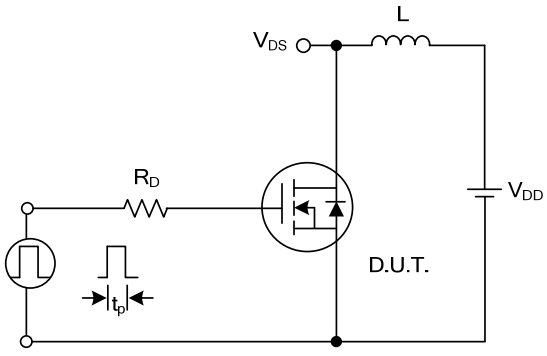
Switching Waveforms



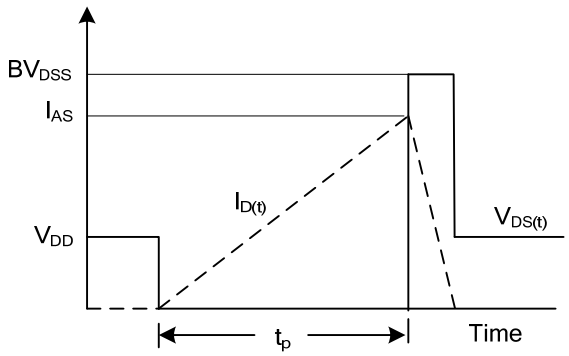
Gate Charge Test Circuit



Gate Charge Waveform



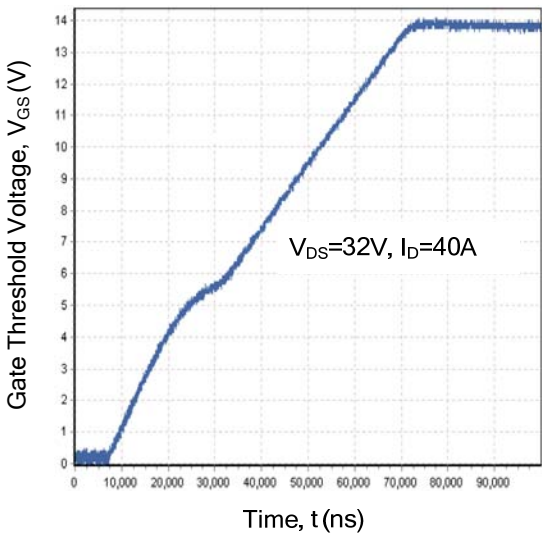
Unclamped Inductive Switching Test Circuit



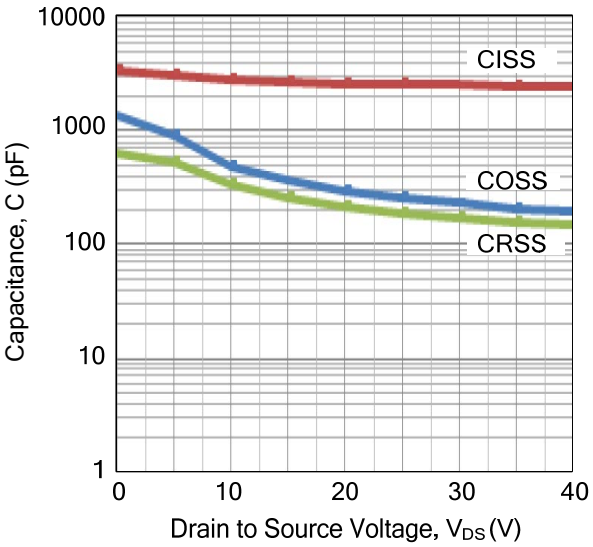
Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS

Gate-Charge Characteristics



Capacitance Characteristics



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