



UT10N03VZ

Preliminary

Power MOSFET

10A, 30V N-CHANNEL ENHANCEMENT MODE

DESCRIPTION

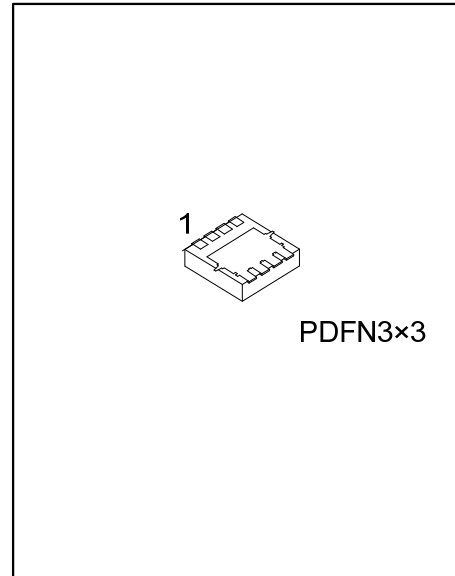
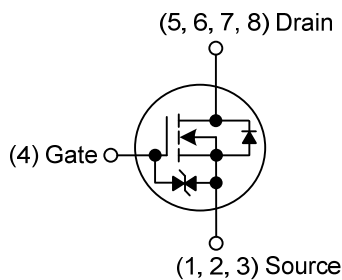
The UTC **UT10N03VZ** is a N-channel mode power MOSFET using UTC's advanced technology to provide customers with a minimum on-state resistance, low gate charge and high switching speed.

This power MOSFET is usually used at high speed switching applications in power supplies, PWM motor controls, high efficient AC to DC converters and bridge circuits.

FEATURES

- * $R_{DS(ON)} \leq 11\text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=10\text{A}$
- $R_{DS(ON)} \leq 13\text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=10\text{A}$
- $R_{DS(ON)} \leq 20\text{ m}\Omega$ @ $V_{GS}=2.5\text{V}$, $I_D=5.0\text{A}$

SYMBOL



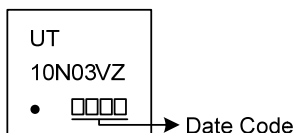
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment						Packing		
Lead Free	Halogen Free		1	2	3	4	5	6		7	8
UT10N03VZL-P3030-R	UT10N03VZG-P3030-R	PDFN3x3	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UT10N03VZG-P3030-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) P3030: PDFN3x3 (3) G: Halogen Free and Lead Free, K: Lead Free</p>
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MARKING



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

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	30	V
Gate-Source Voltage	V_{GSS}	± 12	V
Drain Current	Continuous	I_D	10
	Pulsed (Note 2)	I_{DM}	20
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	29
Peak Diode Recovery dv/dt (Note 3)	dv/dt	1.3	V/ns
Power Dissipation	P_D	17	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. $L = 0.1\text{mH}$, $I_{AS} = 24.1\text{A}$, $V_{DD} = 30\text{V}$, $R_G = 25\ \Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD} \leq 10\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	75	$^\circ\text{C}/\text{W}$
Junction to Case	θ_{JC}	7.35	$^\circ\text{C}/\text{W}$

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

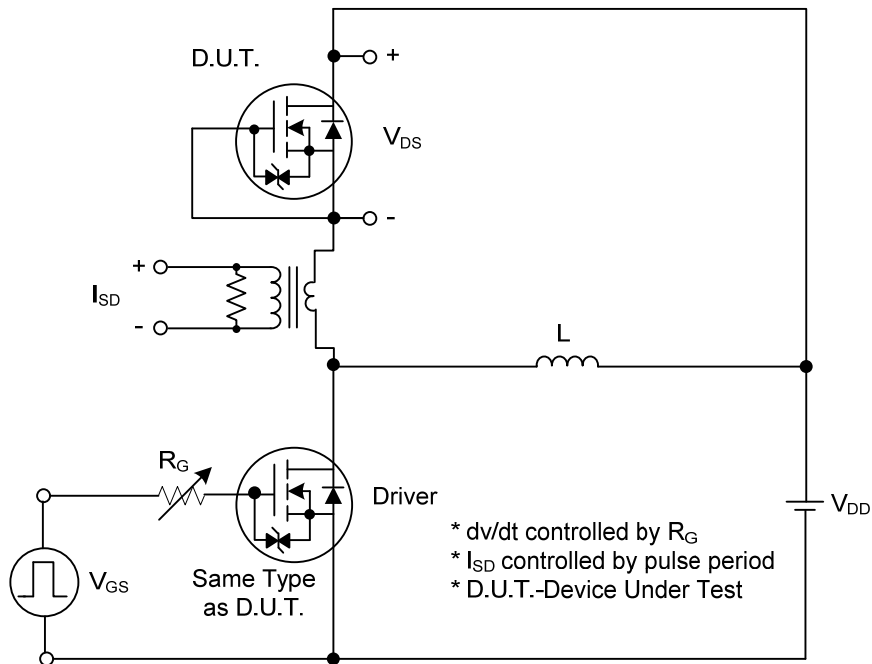
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	30			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =±12V, V _{GS} =0V			1	μA
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±12V			±10	μA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	0.5		1.5	V
Drain-Source On-State Resistance (Note 2)	R _{DS(ON)}	V _{GS} =10V, I _D =10A			11	mΩ
		V _{GS} =4.5V, I _D =10A			13	mΩ
		V _{GS} =2.5V, I _D =5.0A			20	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{ISS}	V _{DS} =15V, V _{GS} =0V, f=1.0MHz		1661		pF
Output Capacitance	C _{OSS}			201		pF
Reverse Transfer Capacitance	C _{RSS}			176		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge (Note 1)	Q _G	V _{DS} =24V, V _{GS} =10V, I _D =10A (Note 1, 2)		51		nC
Gate-Source Charge	Q _{GS}			4		nC
Gate-Drain Charge	Q _{GD}			11		nC
Turn-On Delay Time (Note 1)	t _{D(ON)}	V _{DS} =15V, V _{GS} =10V, I _D =10A, R _G =3Ω (Note 1, 2)		5		ns
Turn-On Rise Time	t _R			17		ns
Turn-Off Delay Time	t _{D(OFF)}			61		ns
Turn-Off Fall Time	t _F			33		ns
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I _S				10	A
Maximum Body-Diode Pulsed Current	I _{SM}				20	A
Drain-Source Diode Forward Voltage(Note2)	V _{SD}	V _{GS} =0V, I _S =10A			1.4	V
Reverse Recovery Time (Note 1)	t _{rr}	I _S =10A, V _{GS} =0V, dI _F /dt = 100A/μs		90		ns
Reverse Recovery Charge	Q _{rr}			88		nC

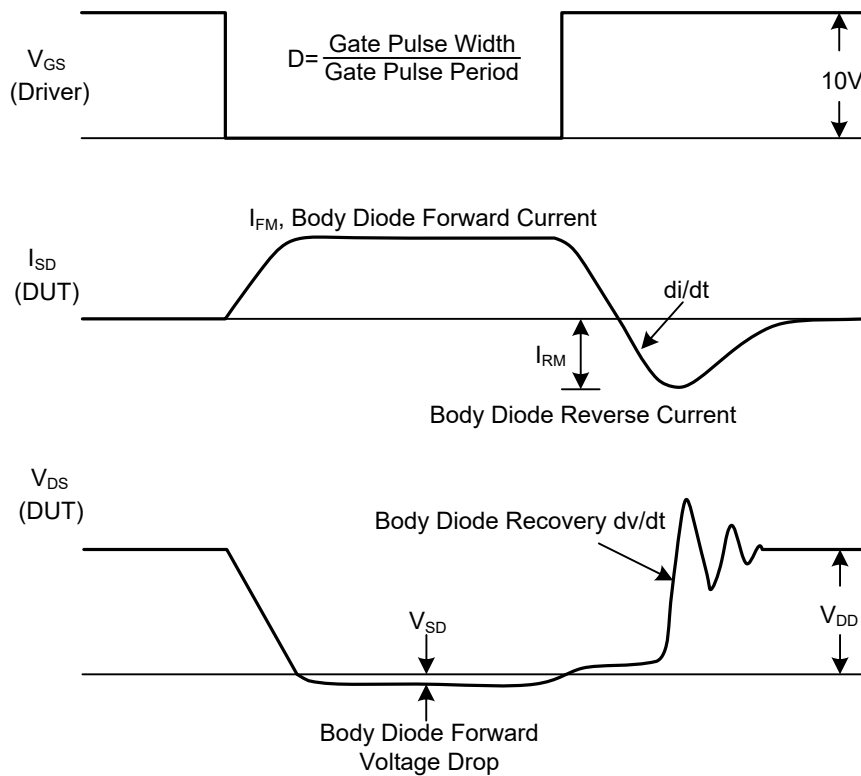
Notes: 1. Repetitive rating, pulse width limited by junction temperature.

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

■ TEST CIRCUITS AND WAVEFORMS

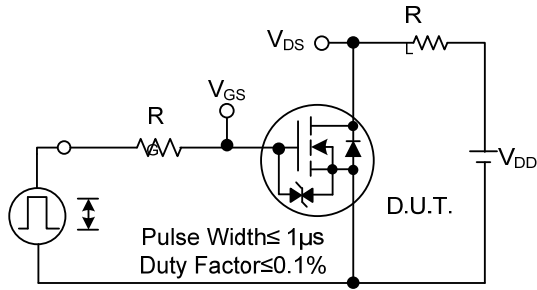


Peak Diode Recovery dv/dt Test Circuit

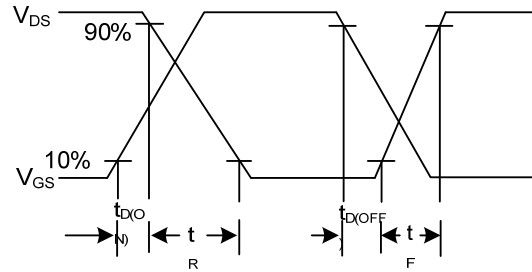


Peak Diode Recovery dv/dt Waveforms

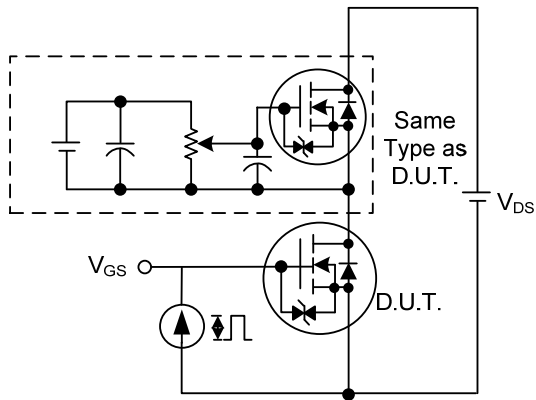
■ TEST CIRCUITS AND WAVEFORMS



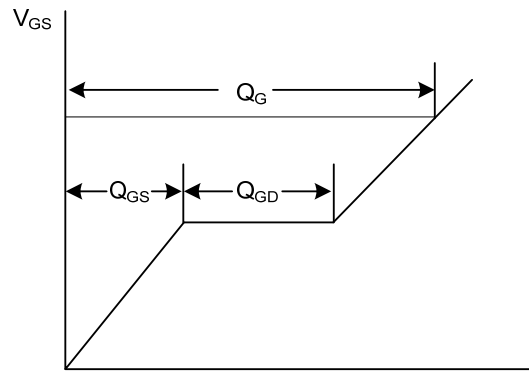
Switching Test Circuit



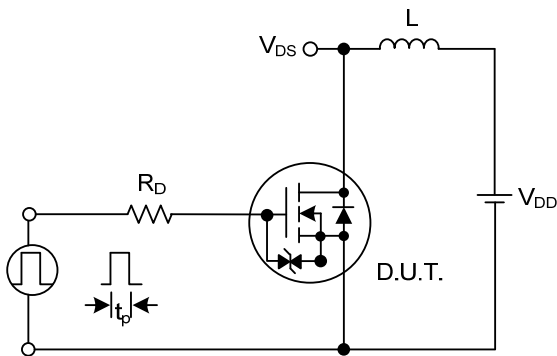
Switching Waveforms



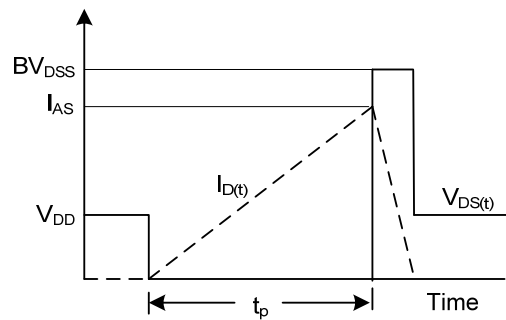
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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