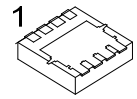
UT10N03VZ

Preliminary ***Power MOSFET***

10A,30V N-CHANNEL ENHANCEMENT MODE



PDFN3×3

■ DESCRIPTION

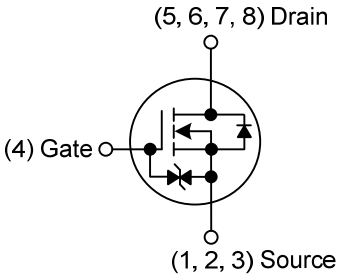
The UTC **UT10N03VZ** is a N-channel mode power MOSFET using UTC's advanced technology to provide customers with a minimum on-state resistance, low gate charge and high switching speed.

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

* $R_{DS(ON)}$ ≤ 11 mΩ @ V_{GS}=10V, I_D=10A
  $R_{DS(ON)}$ ≤ 13 mΩ @ V_{GS}=4.5V, I_D=10A
  $R_{DS(ON)}$ ≤ 20 mΩ @ V_{GS}=2.5V, I_D=5.0A

■ 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	PDFN3×3	S	S	S	G	D	D	D	D	Tape Reel

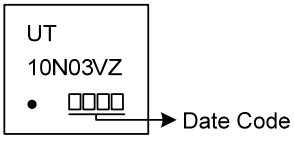
Note: Pin Assignment: G: Gate D: Drain S: Source

UT10N03VZG-P3030-R

(1)Packing Type
(2)Package Type
(3)Green Package

(1) R: Tape Reel
(2) P3030: PDFN3×3
(3) G: Halogen Free and Lead Free, K: Lead Free

■ MARKING



■ ABSOLUTE MAXIMUM RATINGS (T_C=25°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	A
	Pulsed (Note 2)	I_{DM}	20	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	29	mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	1.3	V/ns
Power Dissipation		P_D	17	W
Junction Temperature		T_J	+150	°C
Storage Temperature		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} = 24.1A, V_{DD} = 30V, R_G = 25 Ω, Starting T_J = 25°C
4. I_{SD} ≤ 10A, 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}	7.35	°C/W

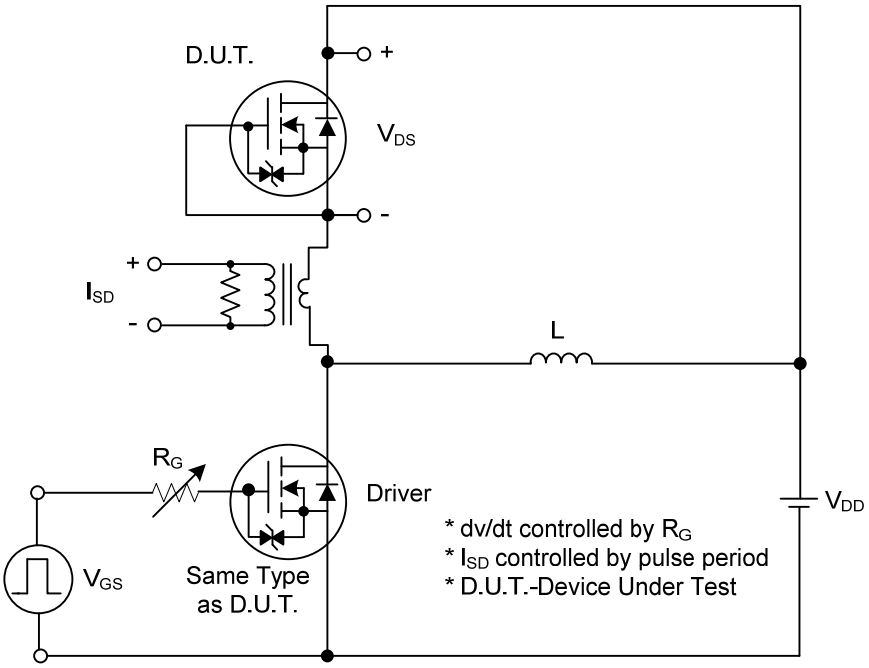
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

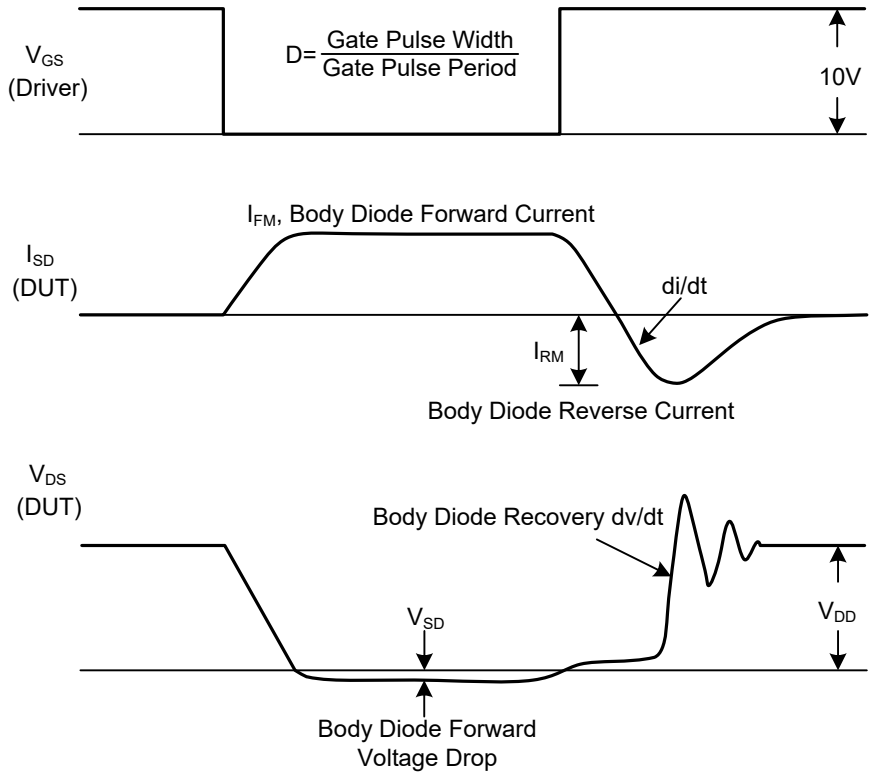
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	30			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=±12V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±12V			±10	μA
ON CHARACTERISTICS						
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

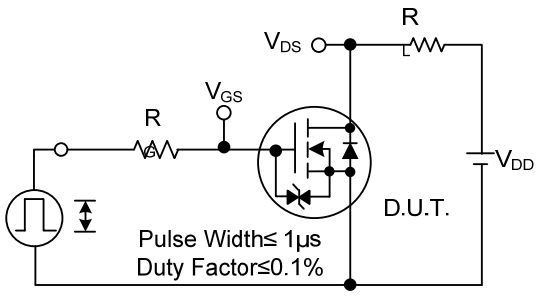


Peak Diode Recovery dv/dt Test Circuit

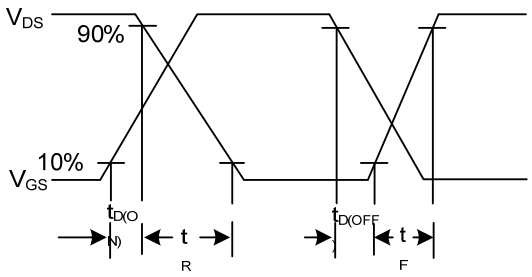


Peak Diode Recovery dv/dt Waveforms

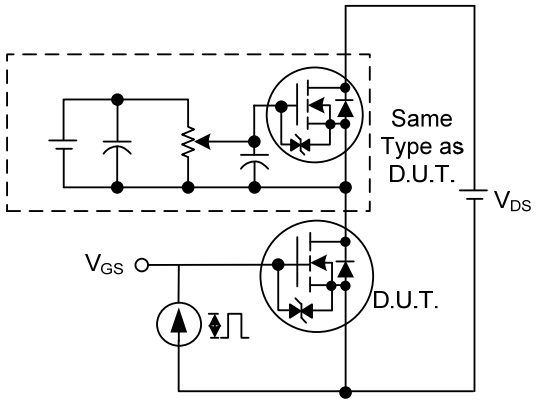
■ TEST CIRCUITS AND WAVEFORMS



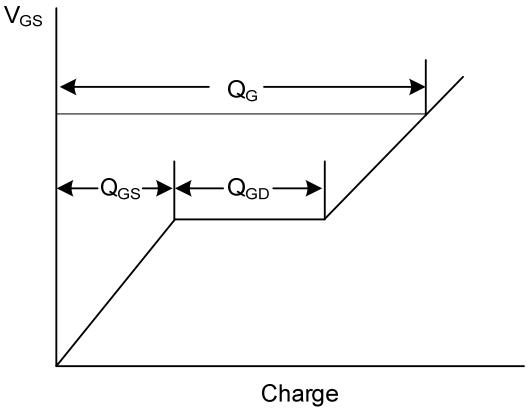
Switching Test Circuit



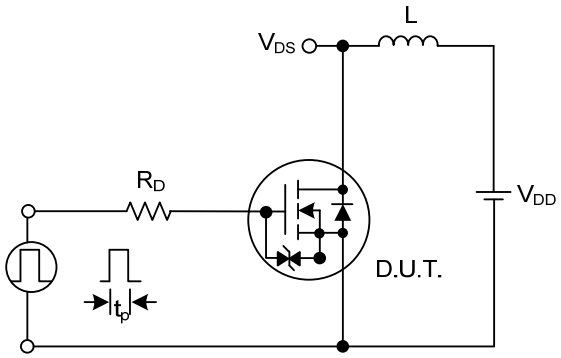
Switching Waveforms



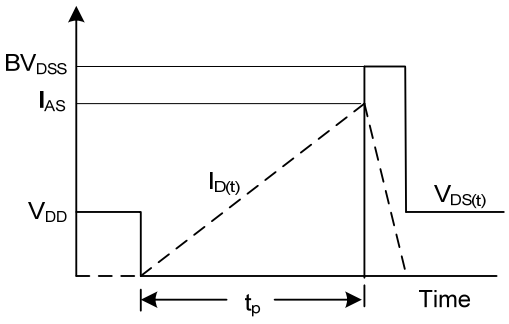
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms