



UT2D5N03VZ

Preliminary

Power MOSFET

2.5A, 30V N-CHANNEL ENHANCEMENT MODE

DESCRIPTION

The UTC **UT2D5N03VZ** 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.

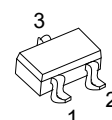
FEATURES

* $R_{DS(ON)} \leq 69 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=1.25\text{A}$

$R_{DS(ON)} \leq 83 \text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=1.25\text{A}$

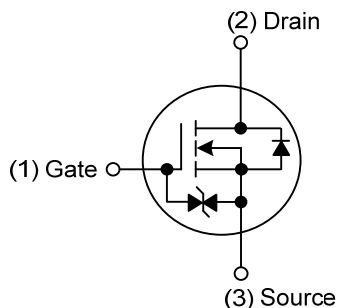
$R_{DS(ON)} \leq 122 \text{ m}\Omega$ @ $V_{GS}=2.5\text{V}$, $I_D=0.8\text{A}$

* With ESD Protected



SOT-23-3
(JEDEC TO-236)

SYMBOL



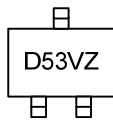
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT2D5N03VZL-AE2-R	UT2D5N03VZG-AE2-R	SOT-23-3	G	S	D	Tape Reel

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

UT2D5N03VZG-AE2-R		(1) Packing Type	(1) R: Tape Reel
		(2) Package Type	(2) AE2: SOT-23-3
		(3) Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 12	V
Drain Current	Continuous	I_D	2.5	A
	Pulsed (Note 2)	I_{DM}	5	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	0.5	mJ
Power Dissipation		P_D	0.33	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. $L = 0.1\text{mH}$, $I_{AS} = 3.2\text{A}$, $V_{DD} = 30\text{V}$, $R_G = 25\ \Omega$, Starting $T_J = 25^{\circ}\text{C}$

4. $I_{SD} \leq 2.5\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J=25^{\circ}\text{C}$

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	378	$^{\circ}\text{C}/\text{W}$

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

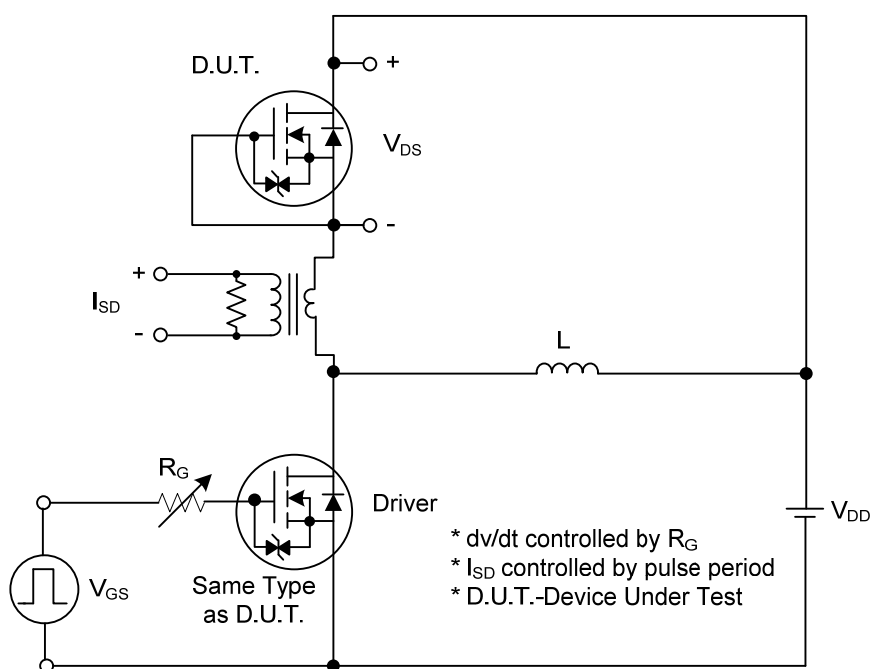
■ ELECTRICAL CHARACTERISTICS ($T_J=25^{\circ}\text{C}$, unless otherwise specified)

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} =±30V, 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 =1.25A			69	mΩ
		V _{GS} =4.5V, I _D =1.25A			83	mΩ
		V _{GS} =2.5V, I _D =0.8A			122	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{ISS}	V _{DS} =15V, V _{GS} =0V, f=1.0MHz		145		pF
Output Capacitance	C _{OSS}			29		pF
Reverse Transfer Capacitance	C _{RSS}			19		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge (Note 1)	Q _G	V _{DS} =24V, V _{GS} =10V, I _D =2.5A (Note 1, 2)		11		nC
Gate-Source Charge	Q _{GS}			2		nC
Gate-Drain Charge	Q _{GD}			2		nC
Turn-On Delay Time (Note 1)	t _{D(ON)}	V _{DS} =15V, V _{GS} =10V, I _D =2.5A, R _G =3Ω (Note 1, 2)		10		ns
Turn-On Rise Time	t _R			22		ns
Turn-Off Delay Time	t _{D(OFF)}			348		ns
Turn-Off Fall Time	t _F			169		ns
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I _S				2.5	A
Maximum Body-Diode Pulsed Current	I _{SM}				5	A
Drain-Source Diode Forward Voltage(Note2)	V _{SD}	I _S =2.5A, V _{GS} =0V			1.4	V
Reverse Recovery Time (Note 1)	t _{rr}	I _S =2.5A, V _{GS} =0V		174		ns
Reverse Recovery Charge	Q _{rr}	dI _F /dt = 100A/μs		638		nC

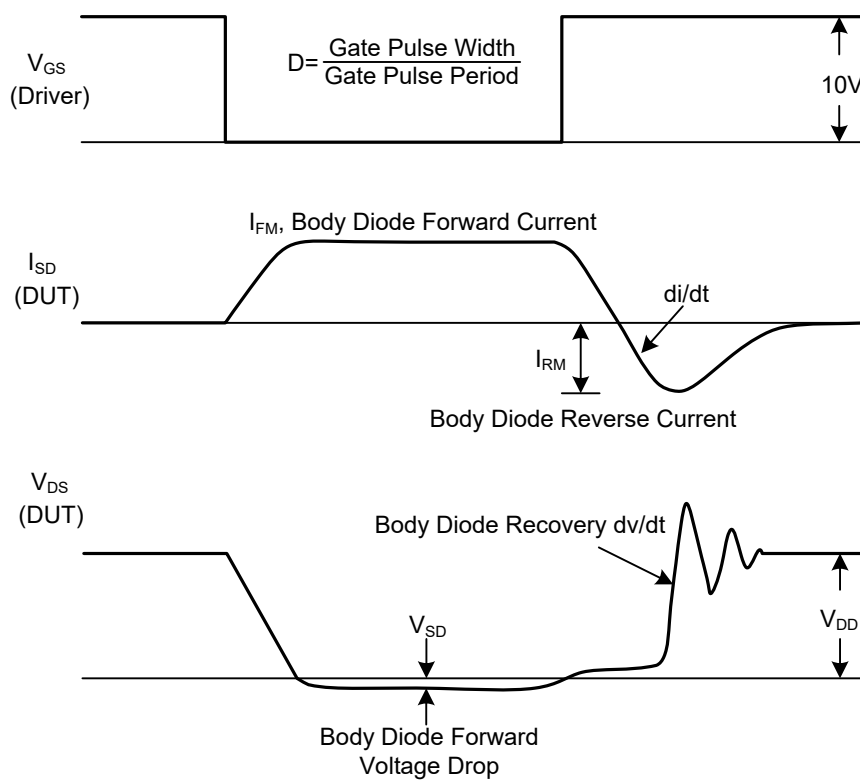
Notes: 1. Repetitive rating, pulse width limited by junction temperature.

2. Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

■ TEST CIRCUITS AND WAVEFORMS

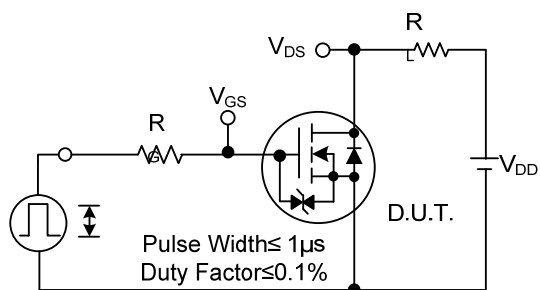


Peak Diode Recovery dv/dt Test Circuit

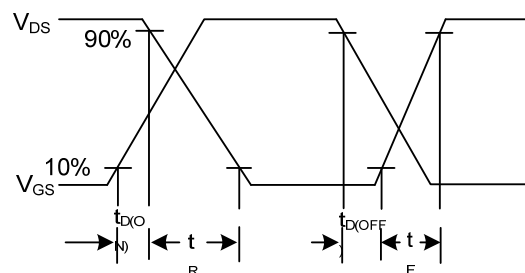


Peak Diode Recovery dv/dt Waveforms

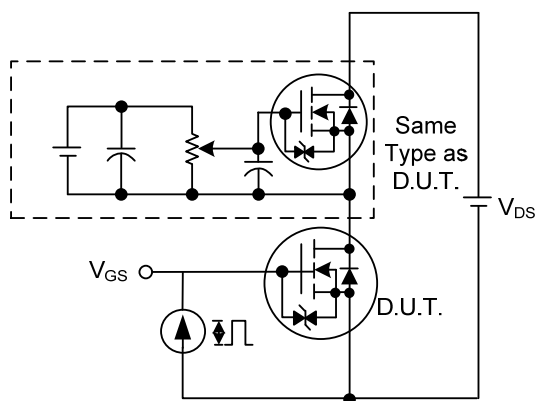
■ TEST CIRCUITS AND WAVEFORMS



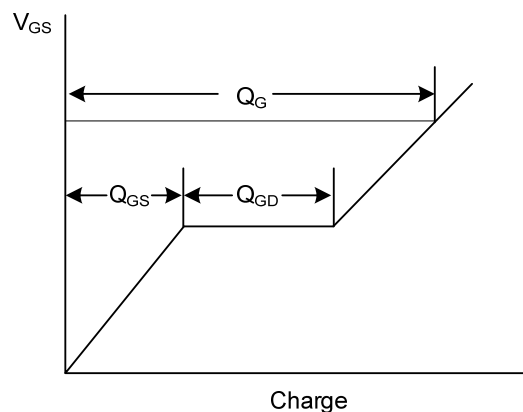
Switching Test Circuit



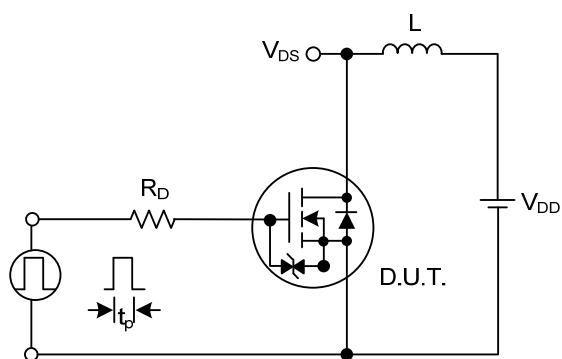
Switching Waveforms



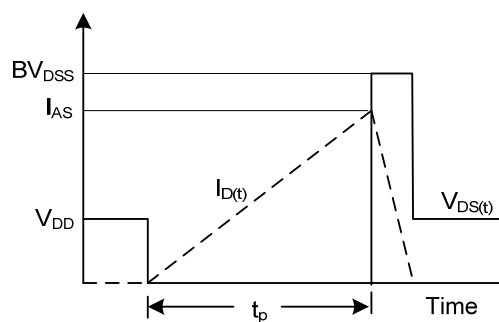
Gate Charge Test Circuit



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.