



UT02N03VZ

Preliminary

Power MOSFET

0.2A, 30V N-CHANNEL POWER MOSFET

DESCRIPTION

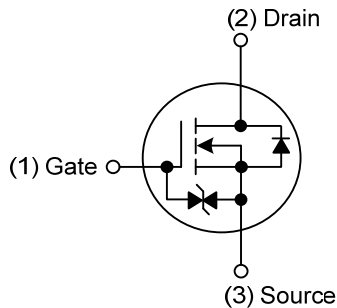
The UTC **UT02N03VZ** employs advanced MOSFET technology and features low gate charge while maintaining low on-resistance.

Optimized for switching applications, this device improves the overall efficiency of DC/DC converters and allows operation to higher switching frequencies.

FEATURES

- * $R_{DS(on)} \leq 1.5 \Omega$ @ $V_{GS}=10V$, $I_D=100mA$
- * $R_{DS(on)} \leq 2.0 \Omega$ @ $V_{GS}=4.5V$, $I_D=100mA$
- * $R_{DS(on)} \leq 4.0 \Omega$ @ $V_{GS}=2.5V$, $I_D=10mA$
- * Low Capacitance
- * Low Gate Charge
- * Fast Switching Capability
- * With ESD protection

SYMBOL

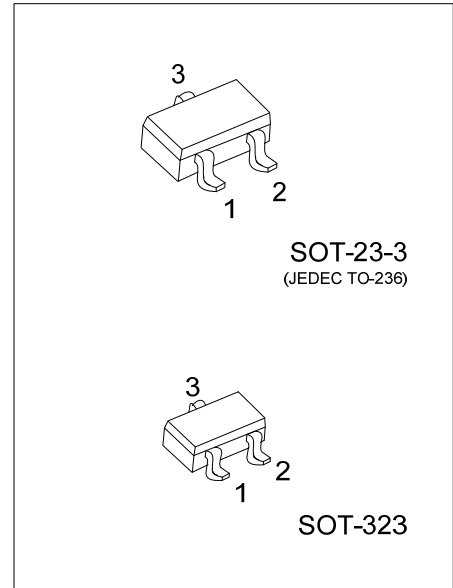


ORDERING INFORMATION

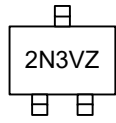
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT02N03VZL-AE2-R	UT02N03VZG-AE2-R	SOT-23-3	G	S	D	Tape Reel
UT02N03VZL-AL3-R	UT02N03VZG-AL3-R	SOT-323	G	S	D	Tape Reel

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

<p>UT02N03VZG-AE2-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) AE2: SOT-23-3, AL3: SOT-323</p> <p>(3) G: Halogen Free and Lead Free, L: 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_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	Continuous	I_D	0.2	A
	Pulsed (Note 2)	I_{DM}	0.4	A
Power Dissipation ($T_A=25^\circ\text{C}$)	SOT-23-3	P_D	0.3	W
	SOT-323		0.2	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.

■ THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	SOT-23-3	θ_{JA}	416	$^\circ\text{C/W}$
	SOT-323		625	$^\circ\text{C/W}$

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

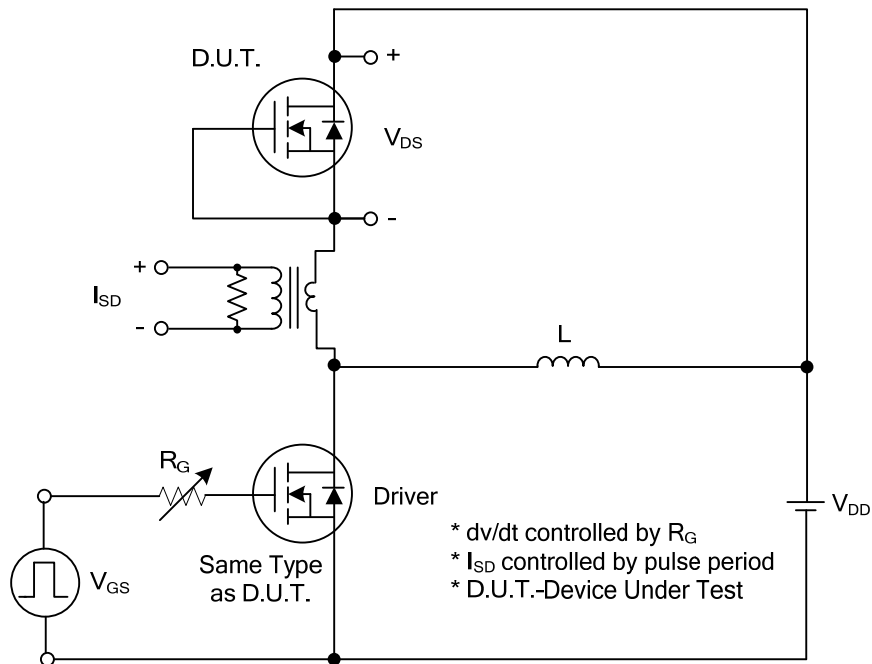
■ ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{DS} =0V	30			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =30V, V _{GS} =0V			1	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{DS} =0V, V _{GS} =+20V			10	μA
	Reverse		V _{DS} =0V, V _{GS} =-20V			-10	μA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} = V _{GS} , I _D =250μA	0.5		1.5	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =100mA			1.5	Ω
			V _{GS} =4.5V, I _D =100mA			2.0	Ω
			V _{GS} =2.5V, I _D =10mA			4.0	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =15V, f=1MHz		14		pF
Output Capacitance		C _{OSS}			9		pF
Reverse Transfer Capacitance		C _{RSS}			4		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q _G	V _{DD} =24V, V _{GS} =10V, I _D =0.2A (Note 1, 2)		7		nC
Gate to Source Charge		Q _{GS}			1		nC
Gate to Drain Charge		Q _{GD}			0.6		nC
Turn-ON Delay Time (Note 1)		t _{D(ON)}	V _{DD} =15V, V _{GS} =10V, I _D =0.2A, R _G =3Ω (Note 1, 2)		0.2		ns
Rise Time		t _R			18		ns
Turn-OFF Delay Time		t _{D(OFF)}			6.4		ns
Fall-Time		t _F			20		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Continuous Drain-Source Diode Forward Current		I _S				0.2	A
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	I _S =0.2A, V _{GS} =0V			1.4	V

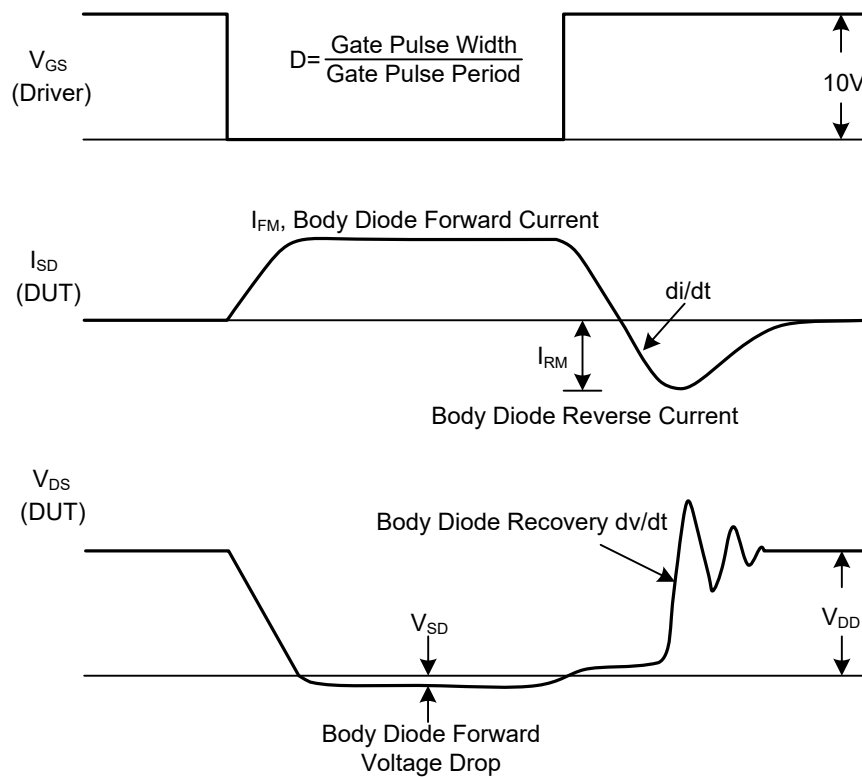
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

TEST CIRCUITS AND WAVEFORMS

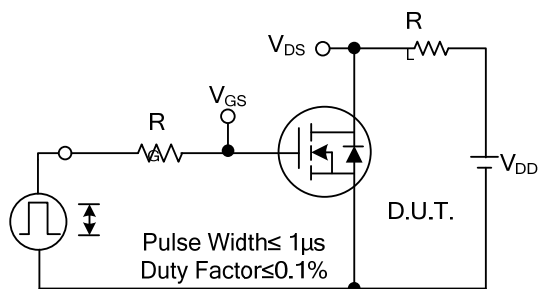


Peak Diode Recovery dv/dt Test Circuit

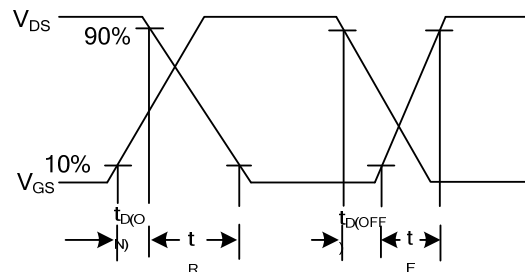


Peak Diode Recovery dv/dt Waveforms

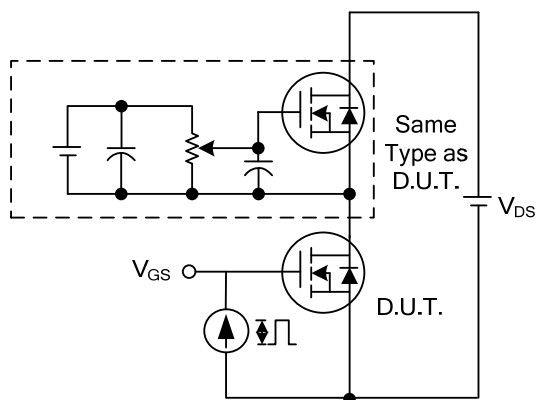
■ TEST CIRCUITS AND WAVEFORMS



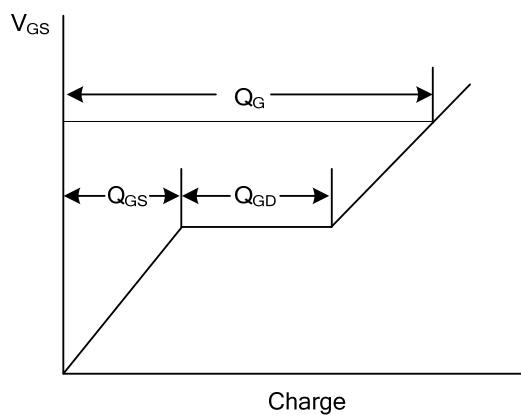
Switching Test Circuit



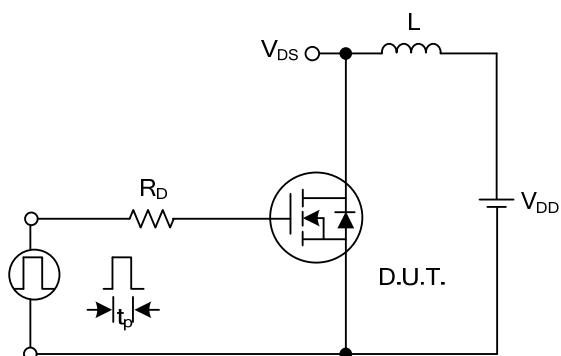
Switching Waveforms



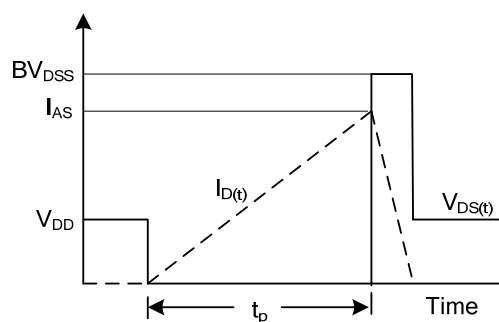
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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