

**UT4N02LZ**

Preliminary

Power MOSFET

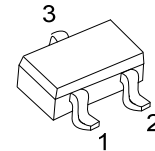
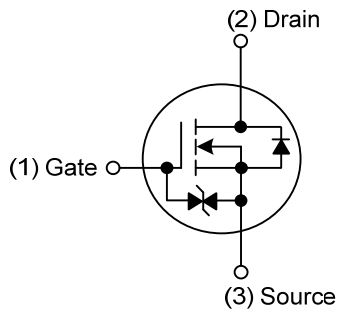
**4.0A, 20V N-CHANNEL
POWER MOSFET****DESCRIPTION**

The UTC **UT4N02LZ** 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

- * $R_{DS(on)} \leq 34 \text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=4.0\text{A}$
- * $R_{DS(on)} \leq 48 \text{ m}\Omega$ @ $V_{GS}=2.5\text{V}$, $I_D=3.9\text{A}$
- * Low Capacitance
- * Low Gate Charge
- * Fast Switching Capability
- * Avalanche Energy Specified

SYMBOL

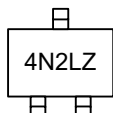
SOT-23-3
(JEDEC TO-236)

ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT4N02LZL-AE3-R	UT4N02LZG-AE3-R	SOT-23-3	G	S	D	Tape Reel

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

UT4N02LZG-AE3-R (1) Packing Type (2) Package Type (3) Green Package		(1) R: Tape Reel
		(2) AE3: SOT-23-3
		(3) G: Halogen Free and Lead Free, L: Lead Free

MARKING

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V _{DSS}	20	V
Gate-Source Voltage		V _{GSS}	±8	V
Continuous Drain Current	Continuous	I _D	4	A
	Pulsed (Note 2)	I _{DM}	8	A
Avalanche Energy	Repetitive (Note 3)	E _{AS}	5	mJ
Power Dissipation(T _A =25°C)		P _D	0.33	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} = 10A, V_{DD} = 25V, R_G = 25Ω, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ _{JA}	378	°C/W

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

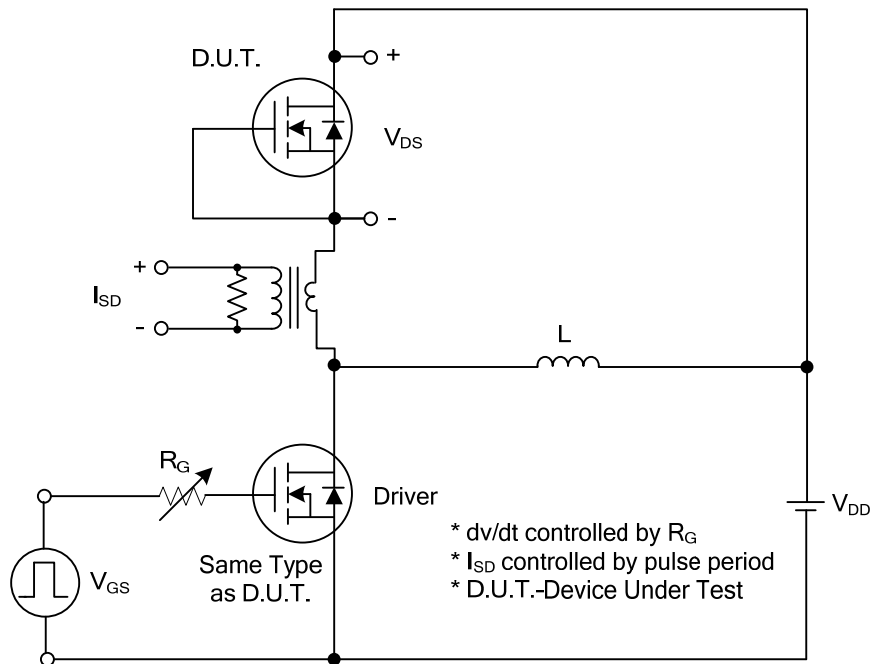
■ ELECTRICAL CHARACTERISTICS (T_J=25°C ,unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{DS} =0V	20			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =20V, V _{GS} =0V			1	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{DS} =0V, V _{GS} =+8V			10	μA
	Reverse		V _{DS} =0V, V _{GS} =-8V			-10	μA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} = V _{GS} , I _D =250μA	0.3		1.2	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =4.5V, I _D =4.0A			34	mΩ
			V _{GS} =2.5V, I _D =3.9A			48	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =10V, f=1MHz		127		pF
Output Capacitance		C _{OSS}			92		pF
Reverse Transfer Capacitance		C _{RSS}			61		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q _G	V _{DD} =16V, V _{GS} =10V, I _D =4.0A (Note 1, 2)		19		nC
Gate to Source Charge		Q _{GS}			2		nC
Gate to Drain Charge		Q _{GD}			3		nC
Turn-ON Delay Time (Note 1)		t _{D(ON)}	V _{DD} =10V, V _{GS} =10V, I _D =4A, R _G =3Ω (Note 1, 2)		10		ns
Rise Time		t _R			40		ns
Turn-OFF Delay Time		t _{D(OFF)}			675		ns
Fall-Time		t _F			611		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Continuous Drain-Source Diode Forward Current		I _S				4	A
Maximum Pulsed Drain-Source Diode Forward Current		I _{SM}				8	A
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	I _S =4.0A, V _{GS} =0V			1.4	V

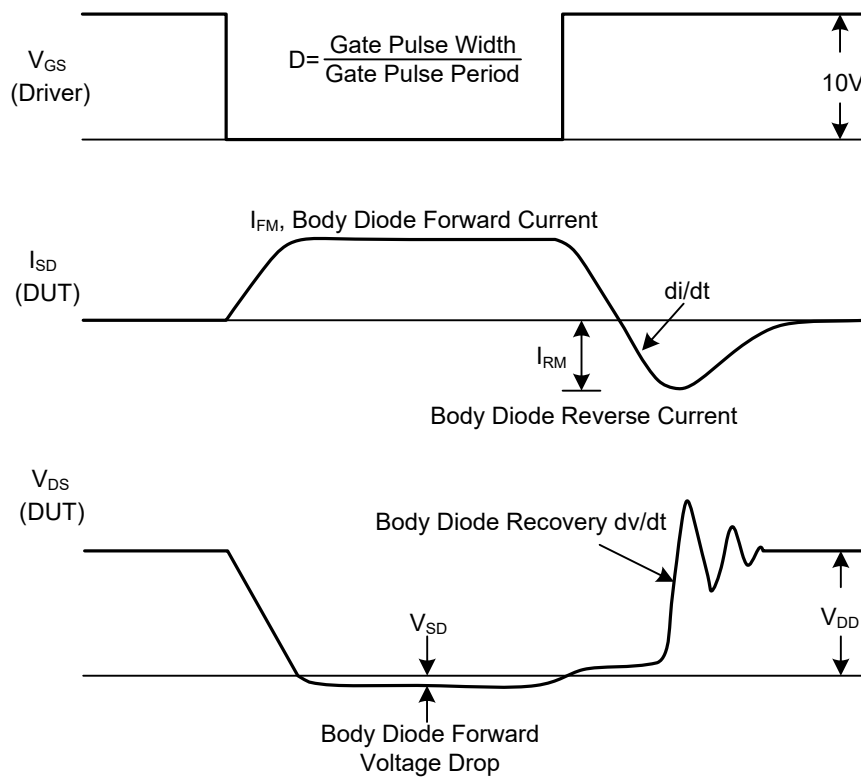
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

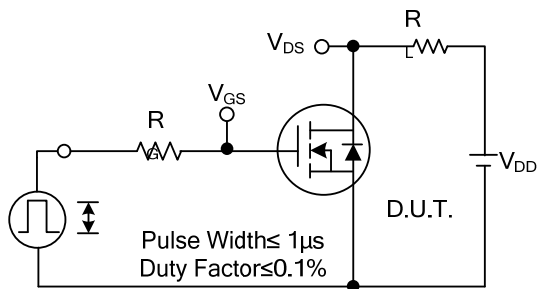


Peak Diode Recovery dv/dt Test Circuit

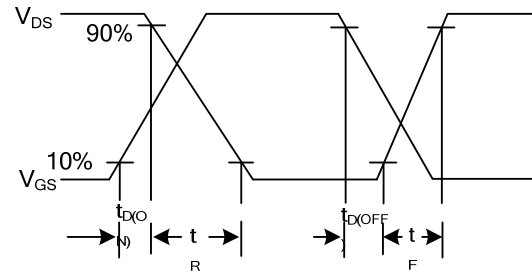


Peak Diode Recovery dv/dt Waveforms

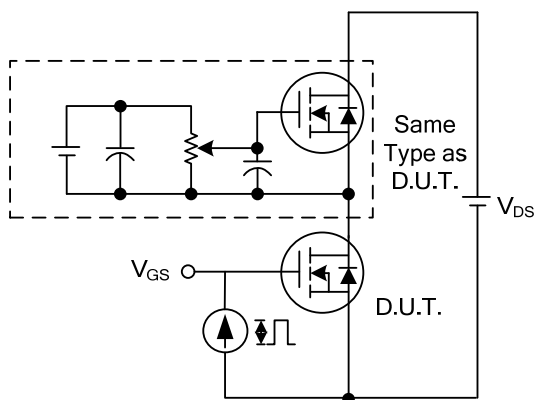
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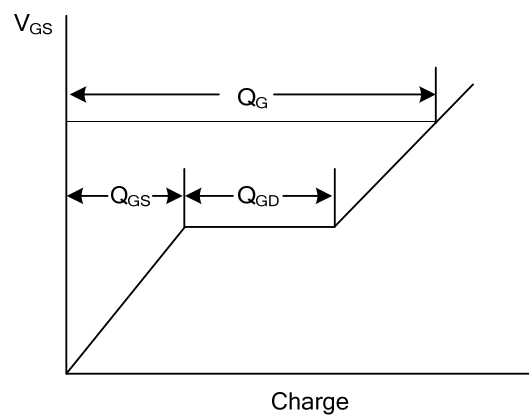
Switching Test Circuit



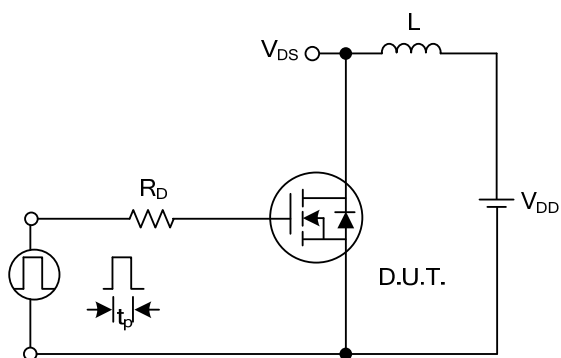
Switching Waveforms



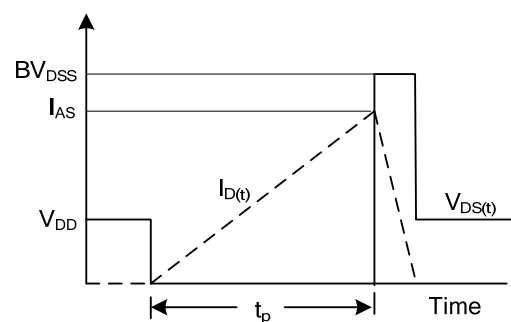
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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