

**UT1P02LZ**

Preliminary

Power MOSFET

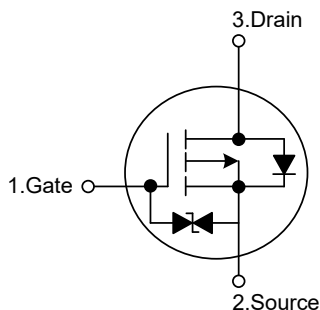
**P-CHANNEL LOGIC LEVEL
ENHANCEMENT MODE****DESCRIPTION**

The **UT1P02LZ** 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

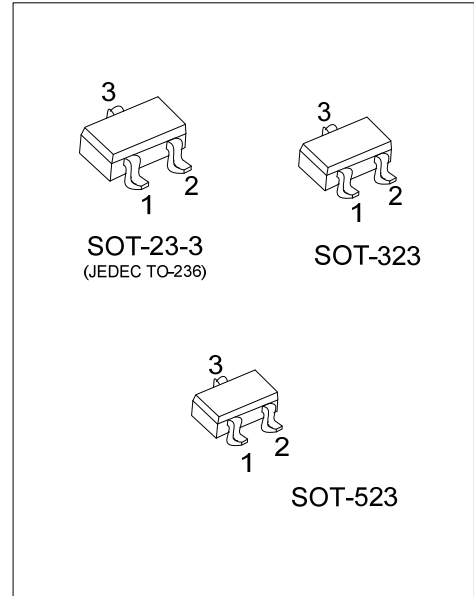
- * $R_{DS(ON)} \leq 0.5 \Omega$ @ $V_{GS} = -4.5V$, $I_D = -0.9A$
- $R_{DS(ON)} \leq 0.75 \Omega$ @ $V_{GS} = -2.5V$, $I_D = -0.2A$
- $R_{DS(ON)} \leq 1.5 \Omega$ @ $V_{GS} = -1.8V$, $I_D = -0.2A$
- * Low Capacitance
- * Low Gate Charge
- * Fast Switching Capability
- * Avalanche Energy Specified
- * With ESD Protected

SYMBOL**ORDERING INFORMATION**

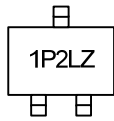
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT1P02LZL-AE2-R	UT1P02LZG-AE2-R	SOT-23-3	G	S	D	Tape Reel
UT1P02LZL-AL3-R	UT1P02LZG-AL3-R	SOT-323	G	S	D	Tape Reel
UT1P02LZL-AN3-R	UT1P02LZG-AN3-R	SOT-523	G	S	D	Tape Reel

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

UT1P02LZG-AE2-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) AE2: SOT-23-3, AL3:SOT-323, AN3: SOT-523 (3) G: Halogen Free and Lead Free, L: Lead Free
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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}	-20	V
Gate-Source Voltage		V_{GS}	± 8	V
Continuous Drain Current	DC	I_D	-1	A
	Pulse		-2	A
Power Dissipation	SOT-23-3	P_D	0.4	W
	SOT-323		0.2	W
	SOT-523		0.17	W
Junction Temperature		T_J	+150	$^{\circ}\text{C}$
Storage Temperature		T_{STG}	-55 ~ +150	$^{\circ}\text{C}$

Note: 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.

■ **THERMAL DATA**

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-23-3	θ_{JA}	312	$^{\circ}\text{C/W}$
	SOT-323		625	$^{\circ}\text{C/W}$
	SOT-523		833	$^{\circ}\text{C/W}$

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

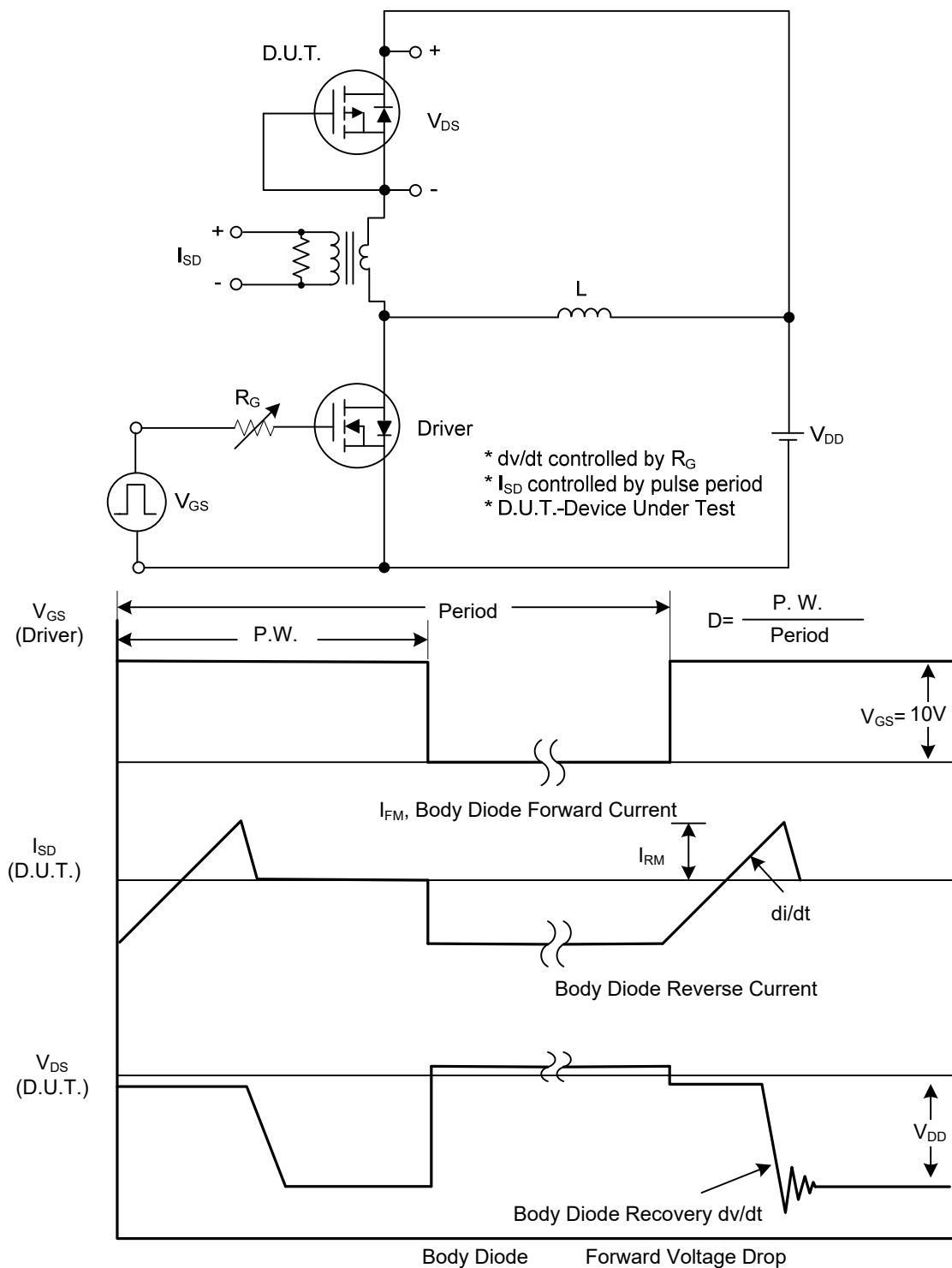
■ **ELECTRICAL CHARACTERISTICS** ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D =-250μA	-20			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =-20V, V _{GS} =0V			-1	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} =+8V, V _{DS} =0V			+10	μA
	Reverse		V _{GS} =-8V, V _{DS} =0V			-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 =-0.9A			0.5	Ω
			V _{GS} =-2.5V, I _D =-0.2A			0.75	Ω
			V _{GS} =-1.8V, I _D =-0.2A			1.5	Ω
			DYNAMIC PARAMETERS				
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =-10V, f=1.0MHz		69		pF
Output Capacitance		C _{OSS}			26		pF
Reverse Transfer Capacitance		C _{RSS}			16		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DS} =-16V, V _{GS} =-10V, I _D =-1.0A , (Note 1, 2)		7		nC
Gate to Source Charge		Q _{GS}			0.5		nC
Gate to Drain Charge		Q _{GD}			0.2		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =-10V, V _{GS} =-10V, I _D =-1.0A, R _G =-3Ω (Note 1, 2)		6		ns
Rise Time		t _R			20		ns
Turn-OFF Delay Time		t _{D(OFF)}			187		ns
Fall-Time		t _F			94		ns
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				-1	A
Maximum Body-Diode Pulsed Current		I _{SM}				-2	A
Diode Forward Voltage		V _{SD}	I _F =-1.0A, V _{GS} =0V			-1.4	V

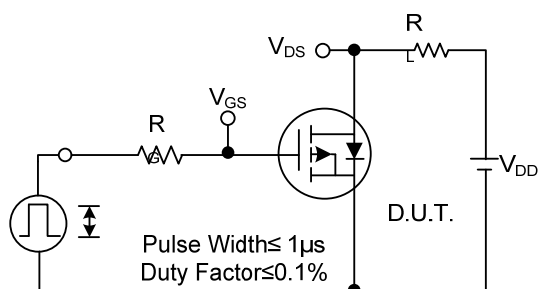
Notes: 1. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

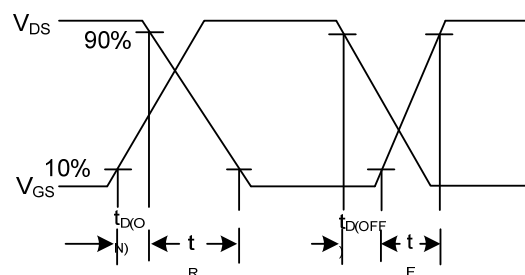
■ TEST CIRCUITS AND WAVEFORMS



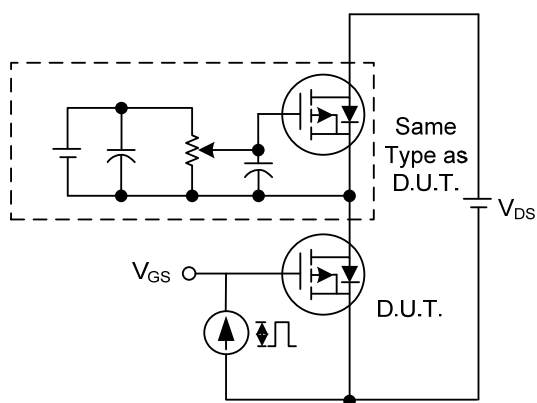
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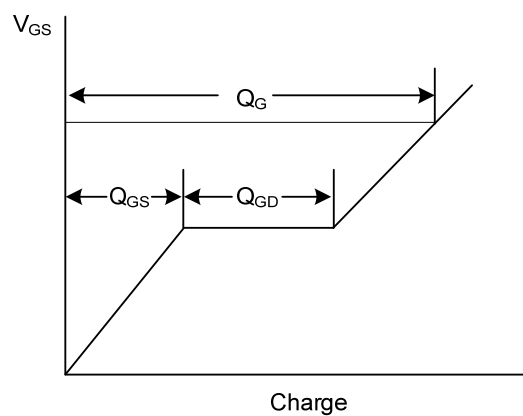
Switching Test Circuit



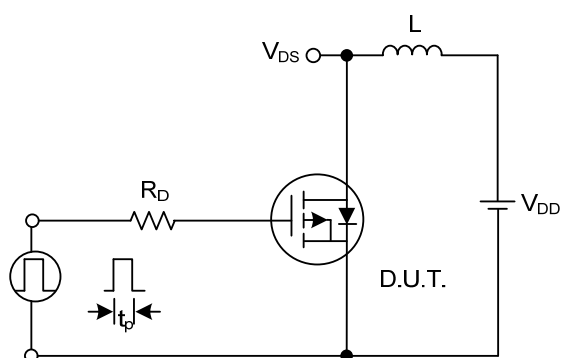
Switching Waveforms



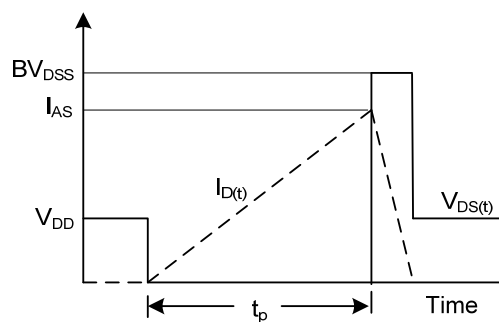
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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