



**UT4801Z**

Preliminary

**POWER MOSFET**

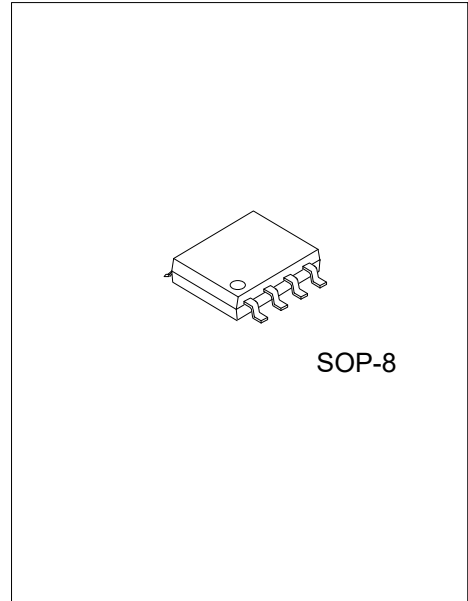
**-5.0A, -30V P-CHANNEL  
POWER MOSFET**

■ DESCRIPTION

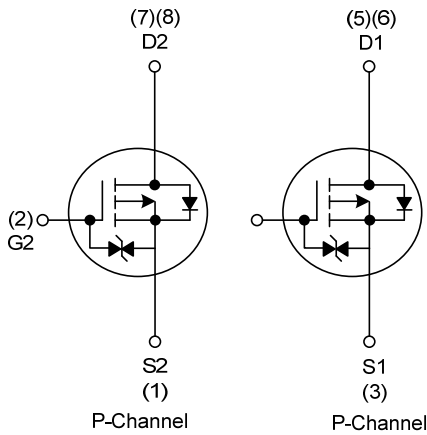
The UTC **UT4801Z** combines advanced trench MOSFET technology with a low resistance package to provide extremely low RDS(ON). This device is suitable for use as a load switch or in PWM applications.

■ FEATURES

- \*  $R_{DS(ON)} \leq 54 \text{ m}\Omega @ V_{GS} = -10V, I_D = -5.0A$
- $R_{DS(ON)} \leq 65 \text{ m}\Omega @ V_{GS} = -4.5V, I_D = -3.5A$
- $R_{DS(ON)} \leq 95 \text{ m}\Omega @ V_{GS} = -2.5V, I_D = -2.5A$
- \* High Switching Speed
- \* High Cell Density Trench Technology
- \* With ESD protection



■ SYMBOL



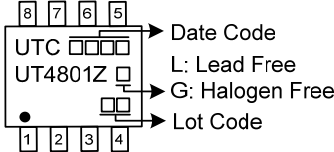
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment						Packing		
Lead Free	Halogen Free		1	2	3	4	5	6		7	8
UT4801ZL-S08-R	UT4801ZG-S08-R	SOP-8	S2	G2	S1	G1	D1	D1	D2	D2	Tape Reel

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

<p>UT4801ZG-S08-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) S08: SOP-8 (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		$V_{DSS}$	-30	V
Gate-Source Voltage		$V_{GSS}$	$\pm 12$	V
Drain Current	Continuous	$I_D$	-5	A
	Pulsed	$I_{DM}$	-10	A
Avalanche Energy	Single Pulsed (Note 3)	$E_{AS}$	34	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	0.4	V/ns
Power Dissipation (Note 1, 2)		$P_D$	1.38	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.  $L = 0.1\text{mH}$ ,  $I_{AS} = -26.1\text{A}$ ,  $V_{DD} = -50\text{V}$ ,  $R_G = 25\Omega$ , Starting  $T_J = 25^\circ\text{C}$ .

4.  $I_{SD} \leq -5.0\text{A}$ ,  $di/dt \leq 200\text{A}/\mu\text{s}$ ,  $V_{DD} \leq V_{(BR)DSS}$ ,  $T_J = 25^\circ\text{C}$ .

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	90 (Note)	$^\circ\text{C}/\text{W}$

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

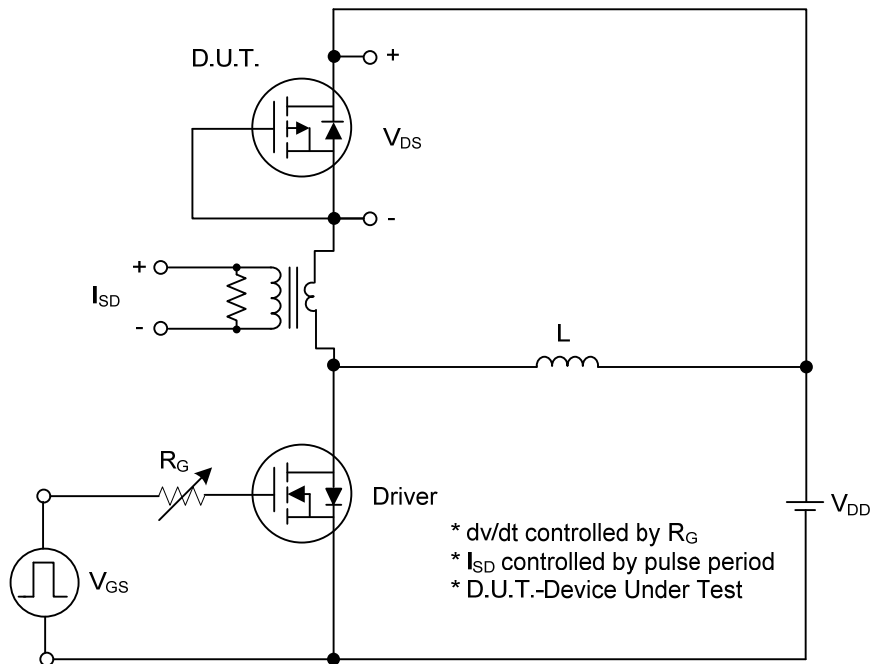
■ ELECTRICAL CHARACTERISTICS (T<sub>J</sub>=25°C unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> = -250μA	-30			V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> = -30V, V <sub>GS</sub> =0V			-1	μA
Gate-Source Leakage Current	Forward	V <sub>GS</sub> =+12V, V <sub>DS</sub> =0V			+10	μA
	Reverse	V <sub>GS</sub> =-12V, V <sub>DS</sub> =0V			-10	μA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	-0.5		-1.3	V
Static Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> = -10V, I <sub>D</sub> = -5.0A			54	mΩ
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -3.5A			65	mΩ
		V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -2.5A			95	mΩ
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> = -25V, f=1.0MHz		806		pF
Output Capacitance	C <sub>OSS</sub>			98		pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			52		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge	Q <sub>G</sub>	V <sub>DS</sub> = -24V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -5.0A (Note 1, 2)		32		nC
Gate to Source Charge	Q <sub>GS</sub>			2		nC
Gate to Drain Charge	Q <sub>GD</sub>			6		nC
Turn-ON Delay Time	t <sub>D(ON)</sub>	V <sub>DD</sub> = -15V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -5.0A, R <sub>G</sub> =3Ω (Note 1, 2)		10		ns
Rise Time	t <sub>R</sub>			25		ns
Turn-OFF Delay Time	t <sub>D(OFF)</sub>			584		ns
Fall-Time	t <sub>F</sub>			331		ns
<b>SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Continuous Drain-Source Diode Forward Current	I <sub>S</sub>				-5	A
Maximum Pulsed Drain-Source Diode Forward Current	I <sub>SM</sub>				-10	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>F</sub> = -1.0A, V <sub>GS</sub> =0V			-1.4	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>S</sub> = -5.0A, V <sub>GS</sub> =0V		326		ns
Reverse Recovery Charge	Q <sub>rr</sub>	dI <sub>F</sub> /dt= -100A/μs (Note 1)		0.22		μC

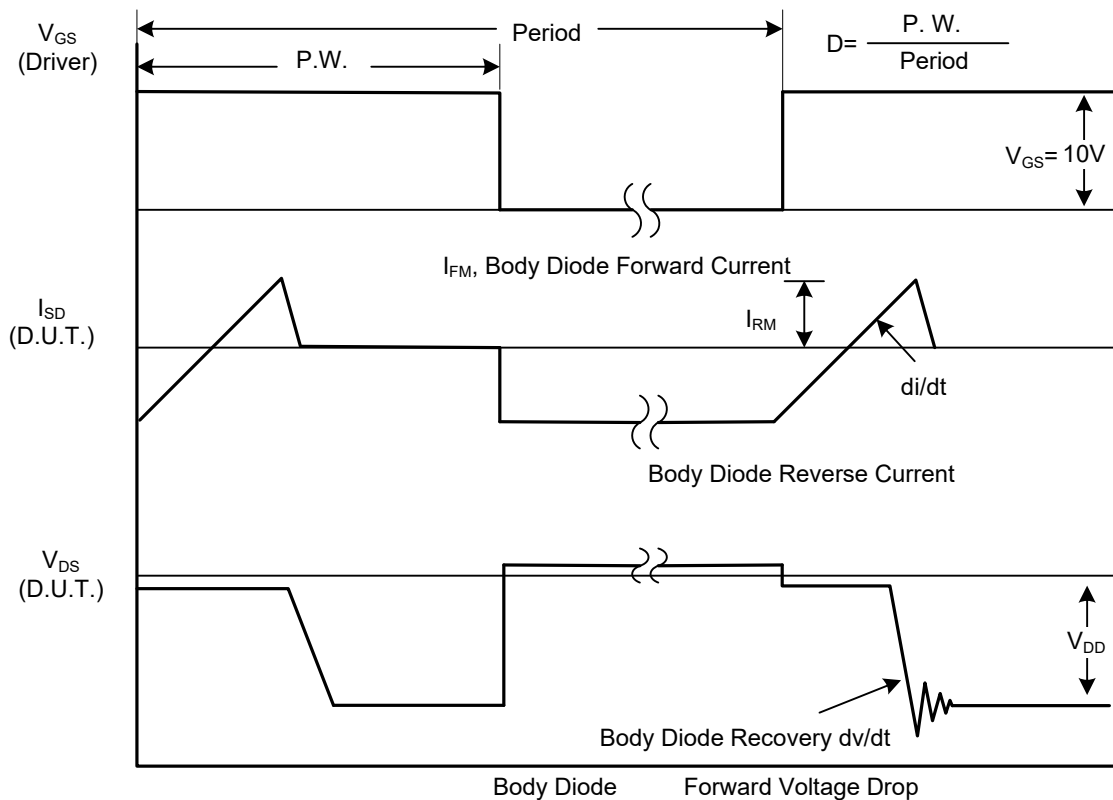
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

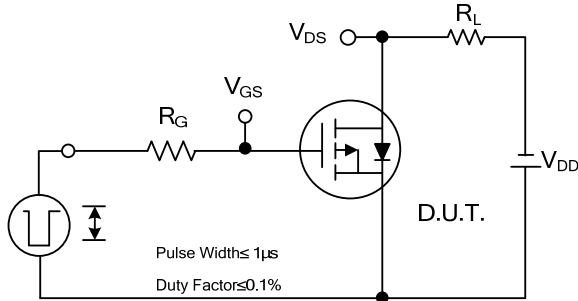


Peak Diode Recovery  $dv/dt$  Test Circuit

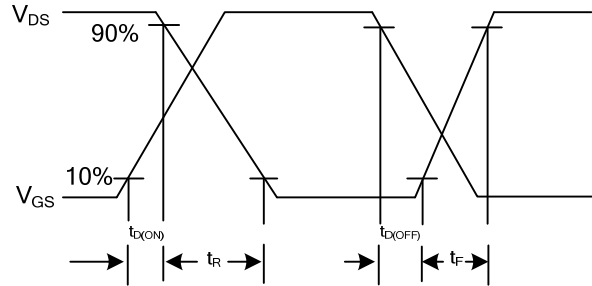


Peak Diode Recovery  $dv/dt$  Waveforms

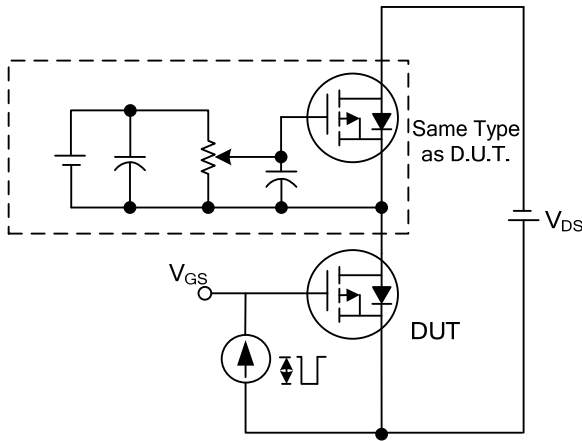
■ TEST CIRCUITS AND WAVEFORMS



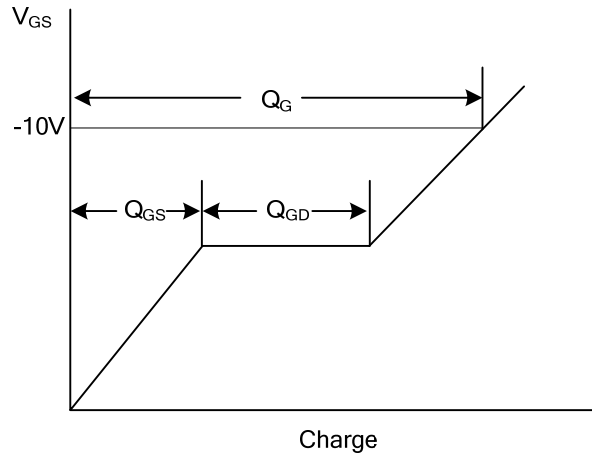
Switching Test Circuit



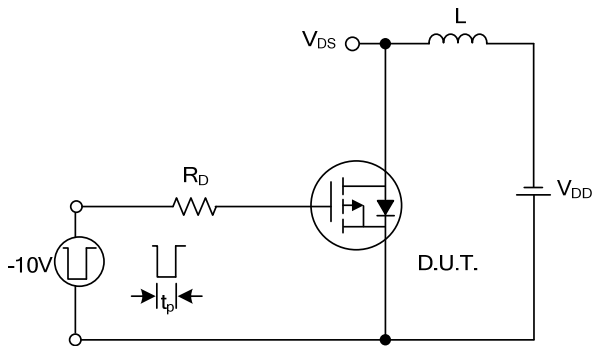
Switching Waveforms



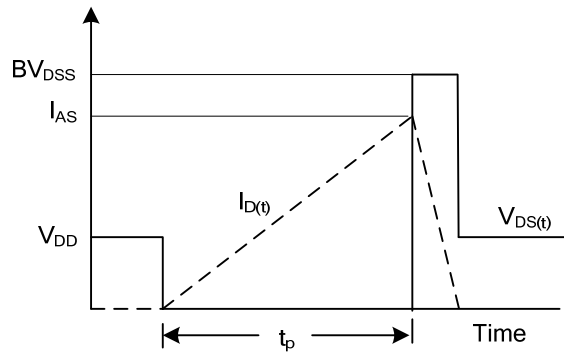
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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