



UD12N04Z

Advance

POWER MOSFET

**6A, 40V DUAL N-CHANNEL
ENHANCEMENT MODE
TRENCH POWER MOSFET**

■ **DESCRIPTION**

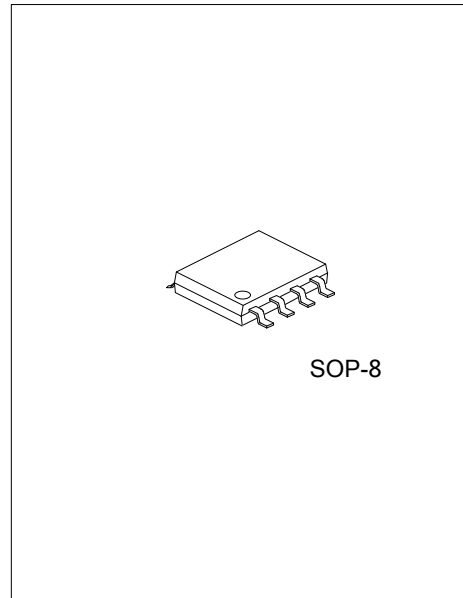
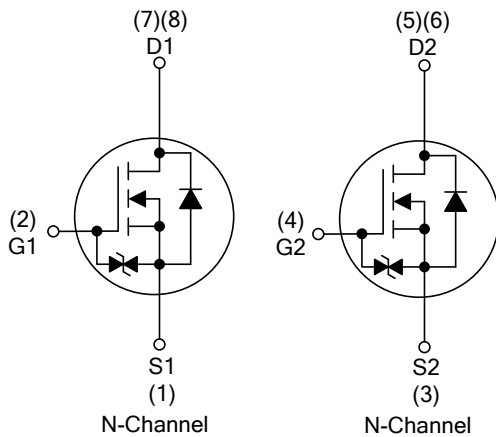
The UTC **UD12N04Z** is a Dual N-channel enhancement mode power MOSFET using UTC's advanced technology to provide customers with an extremely low on-state resistance and superior switching performance.

The UTC **UD12N04Z** is suitable for high frequency DC-DC converters with synchronous rectification applications.

■ **FEATURES**

- * $R_{DS(ON)} \leq 38 \text{ m}\Omega @ V_{GS}=10\text{V}, I_D=6.0\text{A}$
- $R_{DS(ON)} \leq 50 \text{ m}\Omega @ V_{GS}=4.5\text{V}, I_D=6.0\text{A}$
- * High Power and Current Handling Capability
- * High Cell Density Trench Technology

■ **SYMBOL**



SOP-8

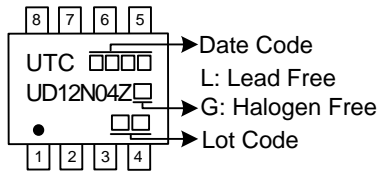
■ **ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UD12N04ZL-S08-R	UD12N04ZG-S08-R	SOP-8	S1	G1	S2	G2	D2	D2	D1	D1	Tape Reel

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

<p>UD12N04ZG-S08-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) S08: SOP-8</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V _{DSS}	40	V
Gate-Source Voltage		V _{GSS}	±12	V
Continuous Drain Current	Continuous	I _D	6	A
Pulsed Drain Current	Pulsed (Note 2)	I _{DM}	12	A
Avalanche Current (Note 3)		I _{AS}	12	A
Avalanche energy	Single Pulsed (Note 3)	E _{AS}	1.08	mJ
Power Dissipation (Note 4)		P _D	1.47	W
Junction Temperature		T _J	+150	°C
Storage Temperature Range		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=10μH, I_{AS}=12A, V_{DD}=20V, R_G=25Ω, Starting T_J = 25°C.

4. Mounted on a ceramic board.

■ THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ _{JA}	85	°C/W

Note: Mounted on a ceramic board.

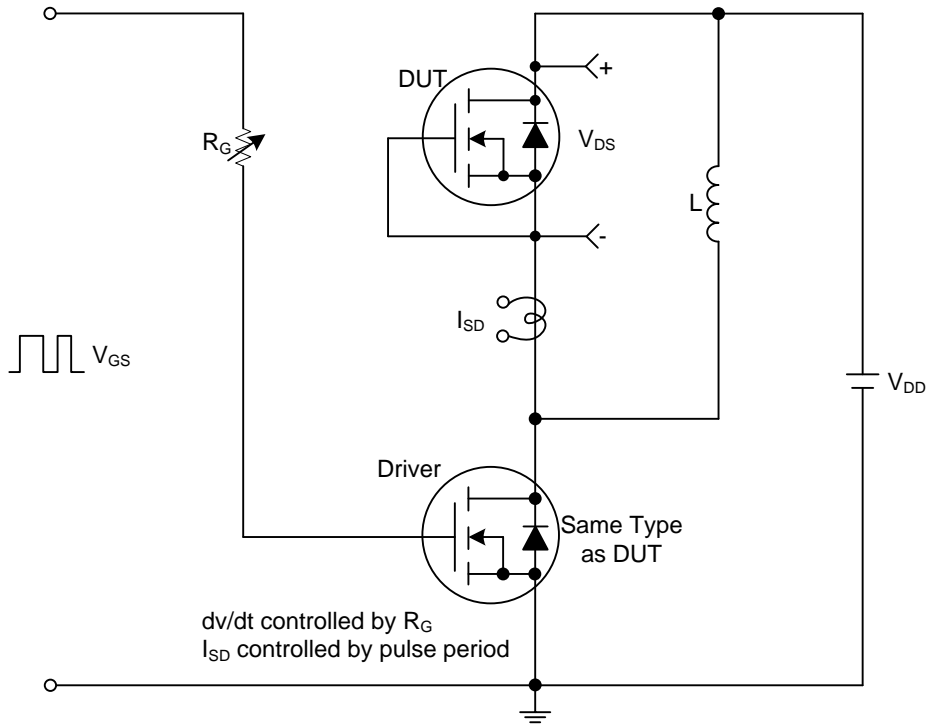
■ ELECTRICAL CHARACTERISTICS (T_A =25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	40			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =40V, V _{GS} =0V			1	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =+12V, V _{DS} =0V			+10	μA
		V _{GS} =-12V, V _{DS} =0V			-10	μA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	1.0		2.5	V
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =6.0A			38	mΩ
		V _{GS} =4.5V, I _D =6.0A			50	mΩ
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I _S				1.6	A
Maximum Body-Diode Pulsed Current	I _{SM}				12	A
Drain-Source Diode Forward Voltage (Note 1)	V _{SD}	I _S =6.0A, V _{GS} =0V			1.2	V

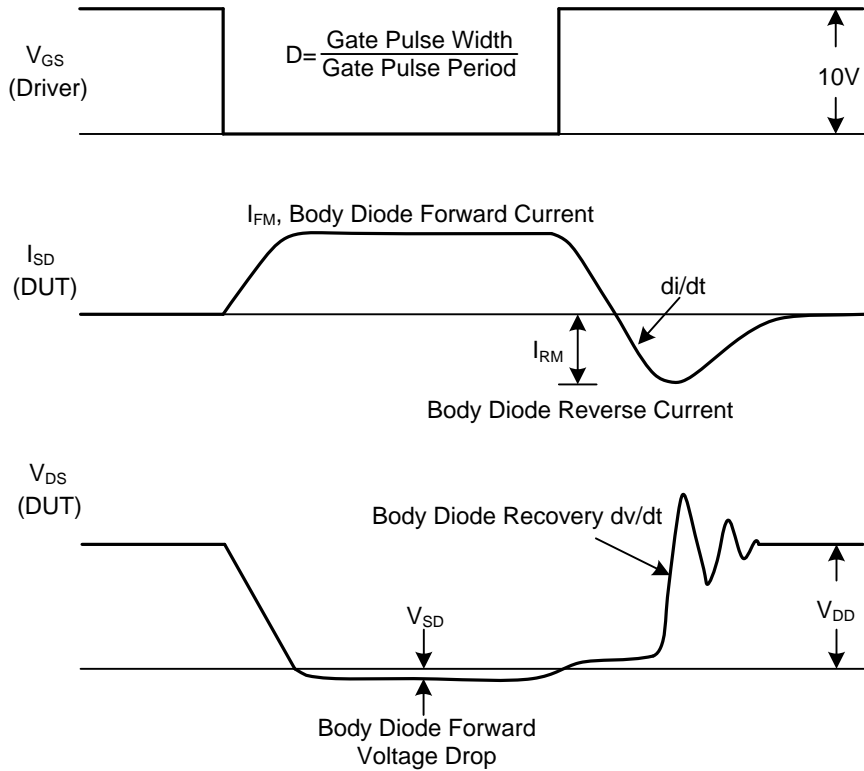
Notes: 1. Pulse Test: Pulse width ≤ 10μs, Duty cycle ≤ 1%.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



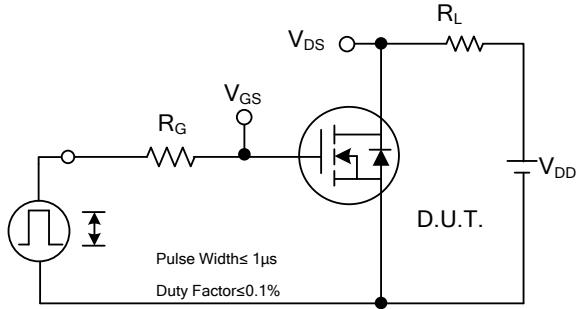
Peak Diode Recovery dv/dt Test Circuit



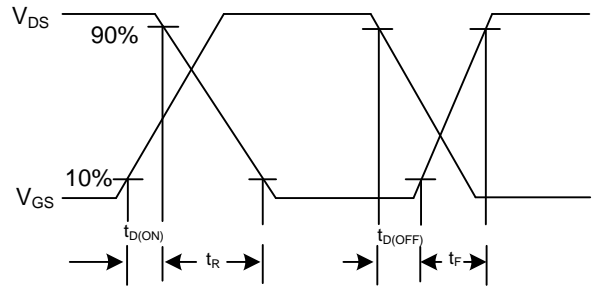
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

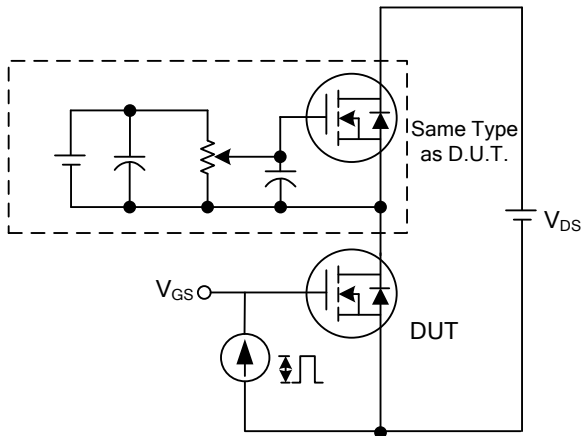
■ TEST CIRCUITS AND WAVEFORMS



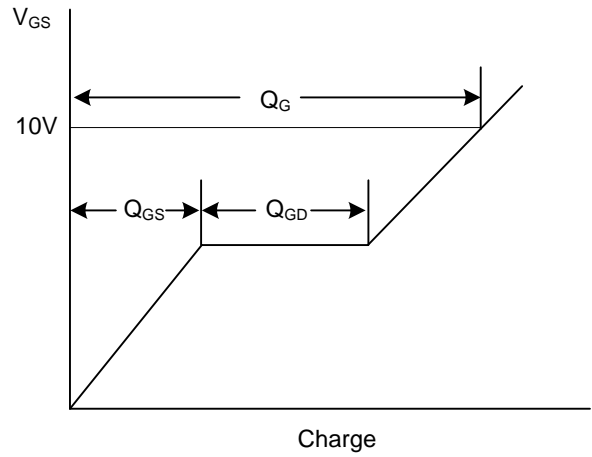
Switching Test Circuit



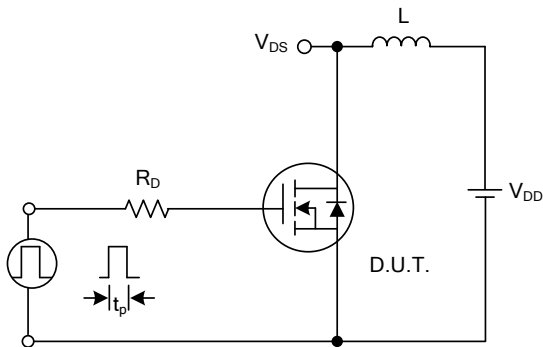
Switching Waveforms



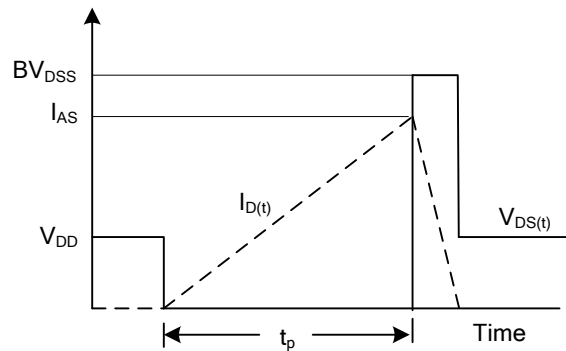
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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