



12N30

Preliminary

Power MOSFET

12A, 300V N-CHANNEL POWER MOSFET

DESCRIPTION

The UTC **12N30** is an N-channel mode power MOSFET using UTC's advanced technology to provide customers with planar stripe and DMOS technology. This technology specializes in allowing a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

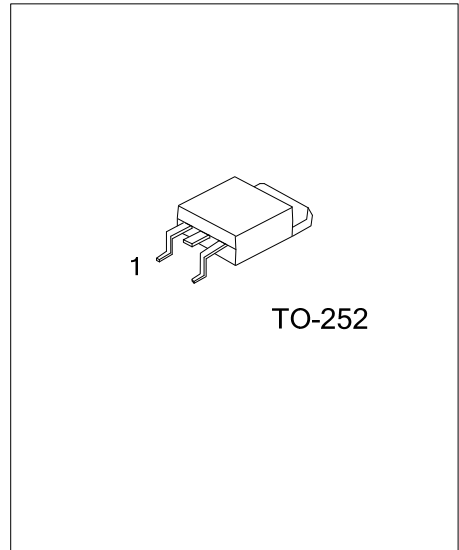
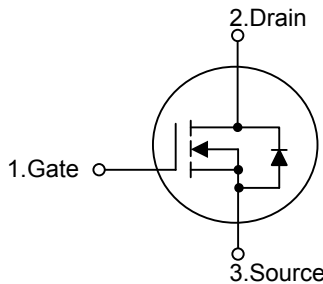
The UTC **12N30** is universally applied in electronic lamp ballast based on half bridge topology and high efficient switched mode power supply.

FEATURES

* $R_{DS(ON)} < 0.47\Omega$ @ $V_{GS}=10V, I_D=12A$

* High switching speed

SYMBOL



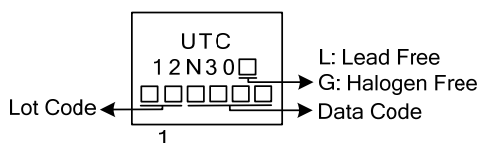
ORDERING INFORMATION

Ordering Number	Package	Pin Assignment			Packing
		1	2	3	
12N30G-TN3-R	TO-252	G	D	S	Tape Reel

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

<p>12N30L-TN3-T</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) T: Tube</p> <p>(2) TN3: TO-252</p> <p>(3) L: Lead Free, G: Halogen Free and 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}	300	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	Continuous ($T_C=25^\circ\text{C}$)	I_D	12	A
	Pulsed (Note 2)	I_{DM}	48	A
Single Pulsed Avalanche Energy		E_{AS}	300	mJ
Power Dissipation		P_D	83	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55~+150	$^\circ\text{C}$

Note: 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. Starting $T_J=25^\circ\text{C}$, $I_{AS}=12\text{A}$, $V_{DD}=50\text{V}$, $L=4.1\text{mH}$.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62.5	$^\circ\text{C/W}$
Junction to Case	θ_{JC}	1.5	$^\circ\text{C/W}$

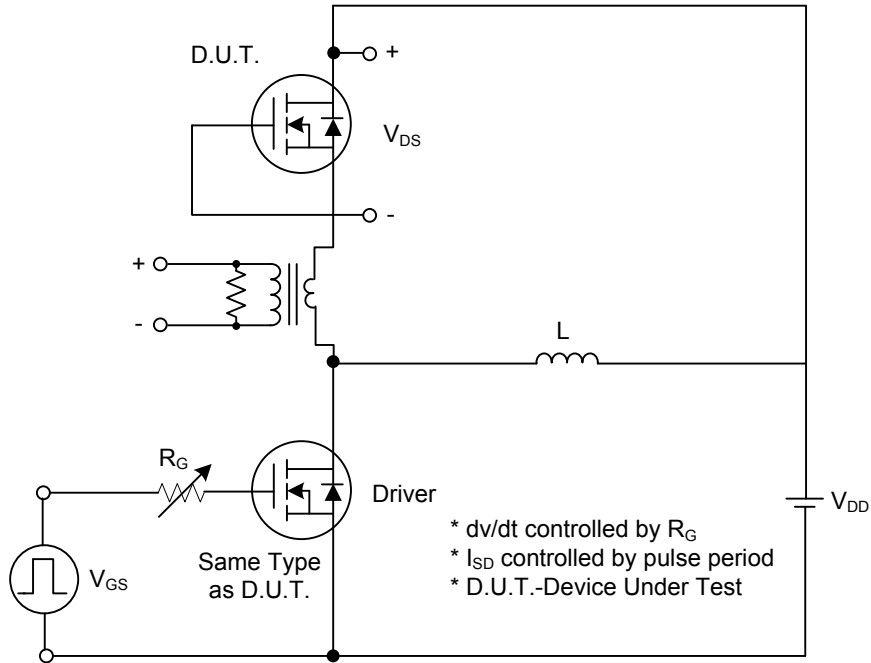
■ ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT			
OFF CHARACTERISTICS									
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	300			V			
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=300\text{V}$, $V_{GS}=0\text{V}$			1	μA			
Gate- Source Leakage Current		I_{GSS}							
							Forward	$V_{GS}=+20\text{V}$, $V_{DS}=0\text{V}$	+100
						Reverse	$V_{GS}=-20\text{V}$, $V_{DS}=0\text{V}$	-100	nA
ON CHARACTERISTICS									
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	2.0		4.0	V			
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=6\text{A}$		0.40	0.47	Ω			
DYNAMIC PARAMETERS									
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=25\text{V}$, $f=1.0\text{MHz}$		810		pF			
Output Capacitance	C_{OSS}				165		pF		
Reverse Transfer Capacitance	C_{RSS}				65		pF		
SWITCHING PARAMETERS									
Total Gate Charge	Q_G	$V_{DD}=50\text{V}$, $V_{GS}=10\text{V}$, $I_D=1.3\text{A}$ $I_G=100\mu\text{A}$ (Note 1, 2)		24		nC			
Gate-Source Charge	Q_{GS}			5		nC			
Gate-Drain Charge	Q_{GD}			5.6		nC			
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=30\text{V}$, $I_D=0.5\text{A}$, $R_G=25\Omega$ $V_{GS}=10\text{V}$ (Note 1, 2)		42		ns			
Rise Time	t_R			50		ns			
Turn-OFF Delay Time	$t_{D(OFF)}$			137		ns			
Fall-Time	t_F			52		ns			
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS									
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=12\text{A}$, $V_{GS}=0\text{V}$			1.4	V			
Maximum Body-Diode Continuous Current	I_S				12	A			
Maximum Body-Diode Pulsed Current	I_{SM}				48	A			

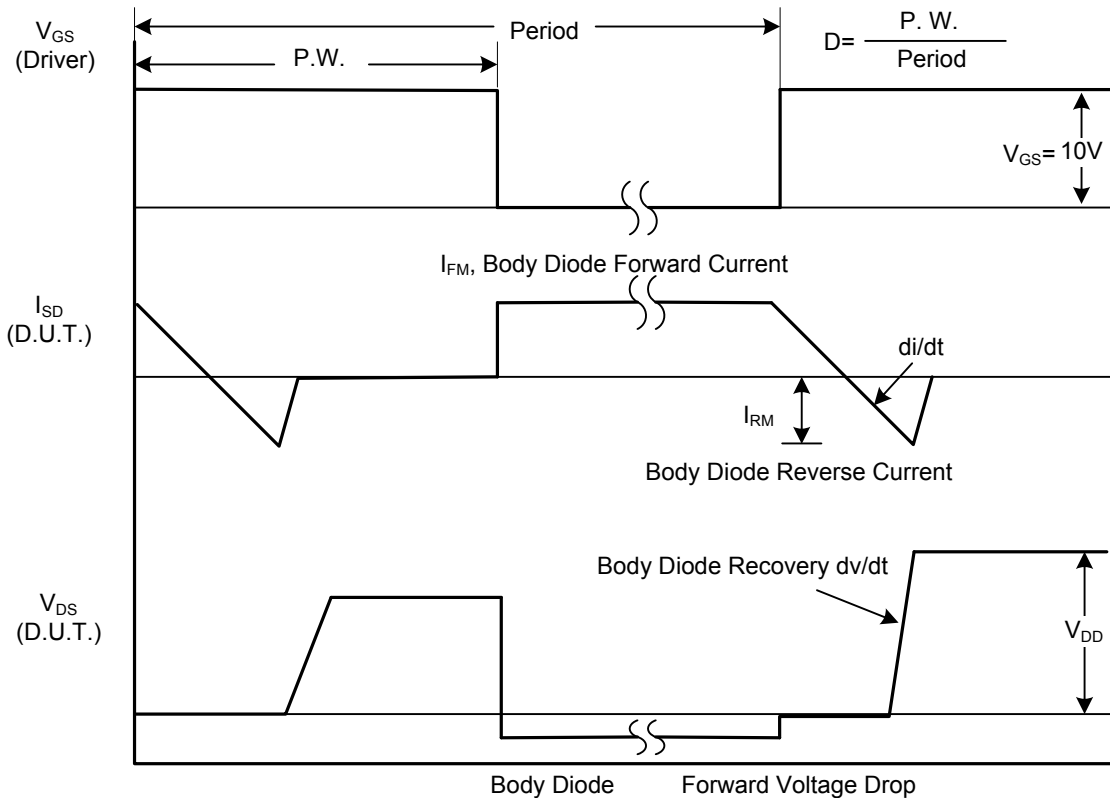
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$

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

<p>Switching Test Circuit</p>	<p>Switching Waveforms</p>
<p>Unclamped Inductive Switching Test Circuit</p>	<p>Unclamped Inductive Switching Waveforms</p>

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