



12N25

Power MOSFET

12A, 250V N-CHANNEL POWER MOSFET

DESCRIPTION

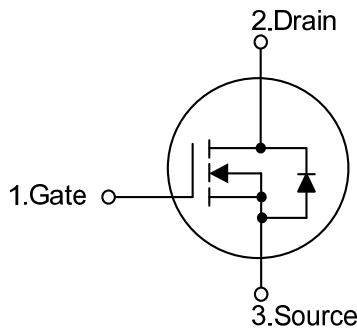
The UTC **12N25** is an N-channel mode power MOSFET using UTC's advanced technology to provide customers with planar stripe and DMOS technology. This technology specializes in allowing a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

The UTC **12N25** is universally applied in electronic lamp ballast based on half bridge topology and high efficient switched mode power supply.

FEATURES

- * $I_D=12A$
- * $V_{DS} = 250V$
- * $R_{DS(ON)}=0.34\Omega @ V_{GS}=10V$
- * High switching speed
- * 100% avalanche tested

SYMBOL

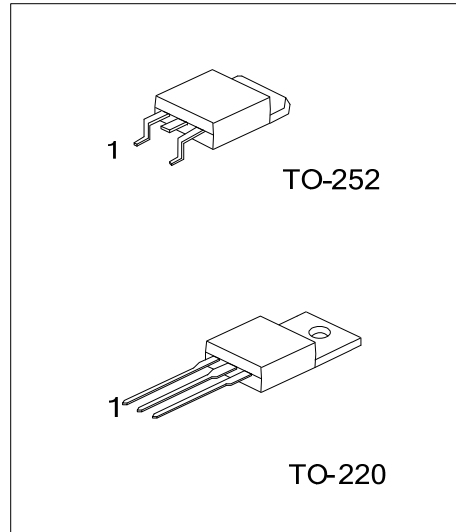


ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
12N25L-TA3-T	12N25G-TA3-T	TO-220	G	D	S	Tube
12N25L-TN3-T	12N25G-TN3-T	TO-252	G	D	S	Tube
12N25L-TN3-R	12N25G-TN3-R	TO-252	G	D	S	Tape Reel

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

<p>12N25L-TA3-T</p> <p>(1) Packing Type (2) Package Type (3) Lead Free</p>	<p>(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TN3: TO-252 (3) L: Lead Free, G: Halogen Free</p>
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■ ABSOLUTE MAXIMUM RATINGS (T_c=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V _{DSS}	250	V
Gate-Source Voltage		V _{GSS}	±20	V
Drain Current	Continuous (T _c =25°C)	I _D	12	A
	Pulsed (Note 2)	I _{DM}	48	A
Single Pulsed Avalanche Energy		E _{AS}	474	mJ
Power Dissipation	TO-220	P _D	73	W
	TO-252		30	W
Junction Temperature		T _J	+150	°C
Storage Temperature Range		T _{STG}	-55~+150	°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

■ THERMAL DATA

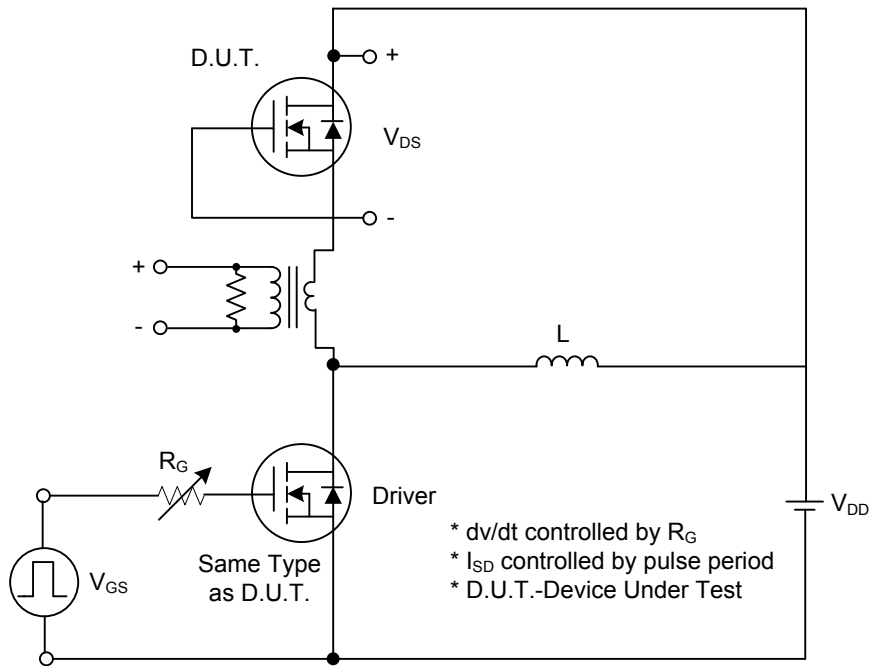
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220	θ _{JA}	62.5	°C/W
	TO-252		100	°C/W
Junction to Case	TO-220	θ _{JC}	1.7	°C/W
	TO-252		4.1	°C/W

■ ELECTRICAL CHARACTERISTICS (T_c=25°C, unless otherwise noted)

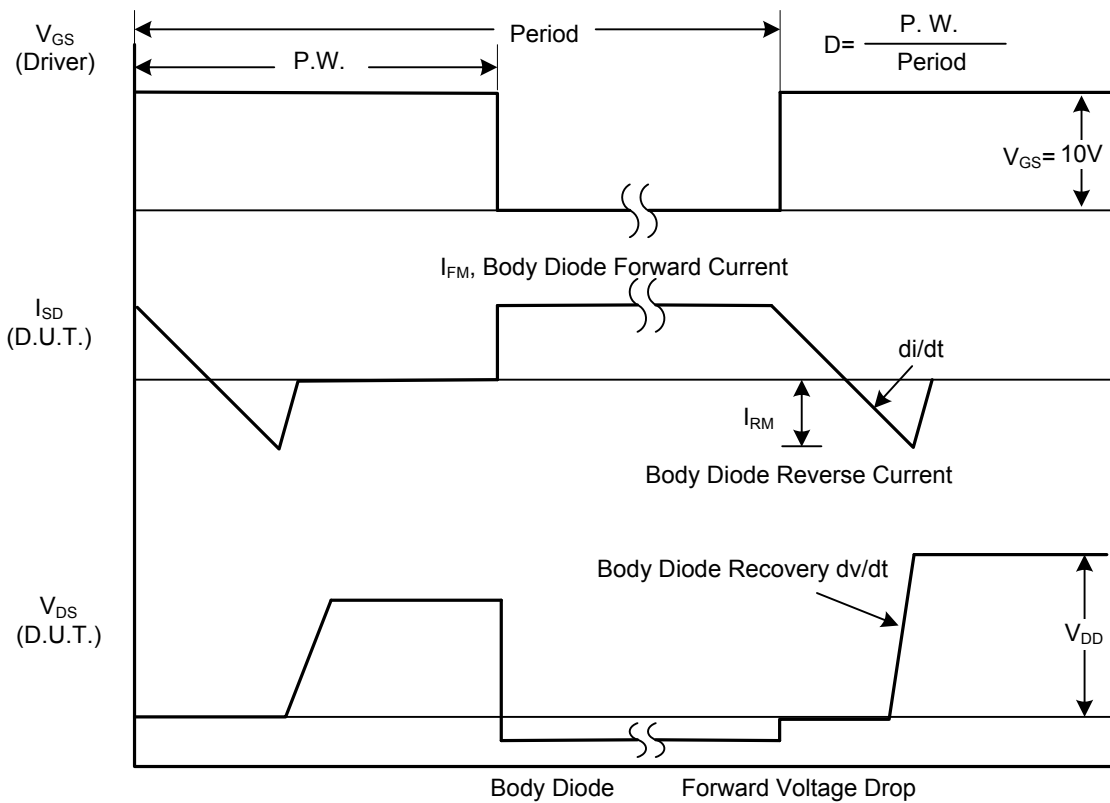
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	250			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =250V, V _{GS} =0V			1	μA
Gate- Source Leakage Current	I _{GSS}	Forward			+100	nA
		Reverse			-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	2.0		4.0	V
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =12A		0.34	0.5	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz			3000	pF
Output Capacitance	C _{OSS}				900	pF
Reverse Transfer Capacitance	C _{RSS}				400	pF
SWITCHING PARAMETERS						
Turn-ON Delay Time	t _{D(ON)}	V _{DD} =200V, I _D =12A, R _G =25Ω (Note 1, 2)		14	50	ns
Rise Time	t _R			80	150	ns
Turn-OFF Delay Time	t _{D(OFF)}			90	200	ns
Fall-Time	t _F			80	170	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V _{SD}	I _S =12A, V _{GS} =0V			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 ≤ 300μs, Duty cycle ≤ 2%
 2. Essentially independent of operating temperature

■ TEST CIRCUITS AND WAVEFORMS

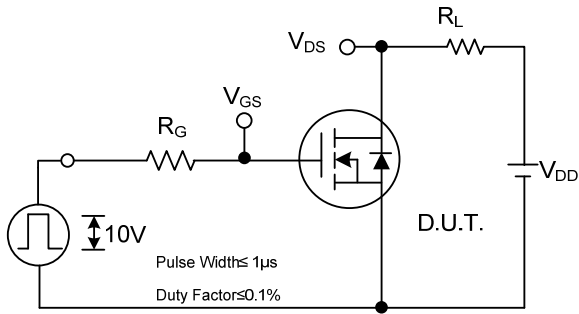


Peak Diode Recovery dv/dt Test Circuit

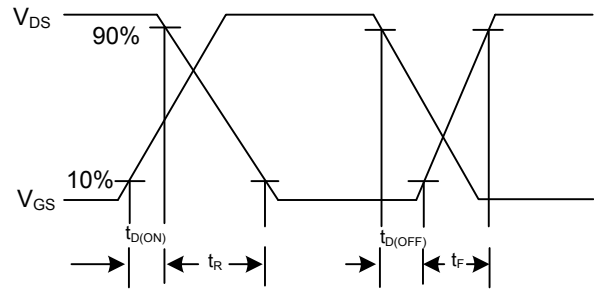


Peak Diode Recovery dv/dt Waveforms

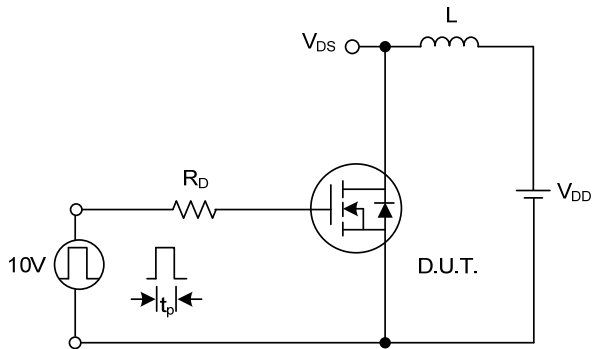
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



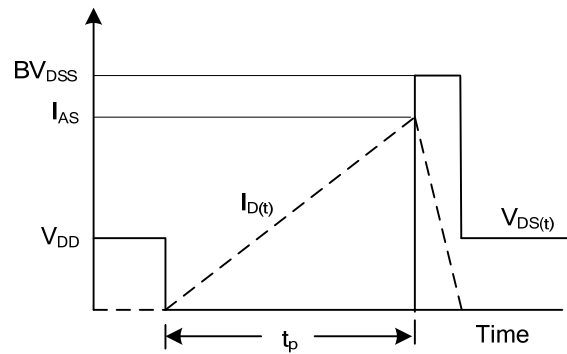
Switching Test Circuit



Switching Waveforms

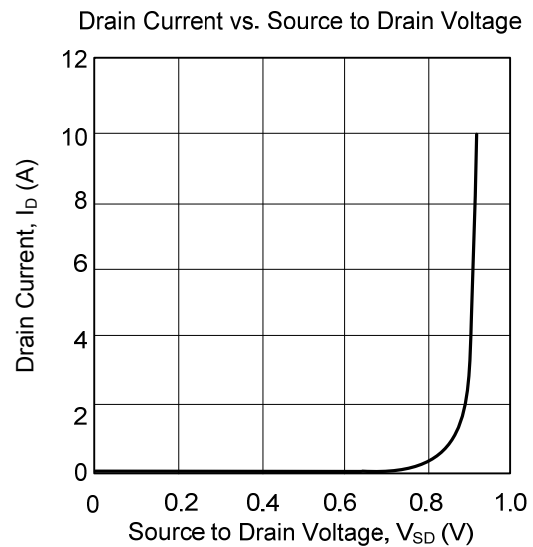
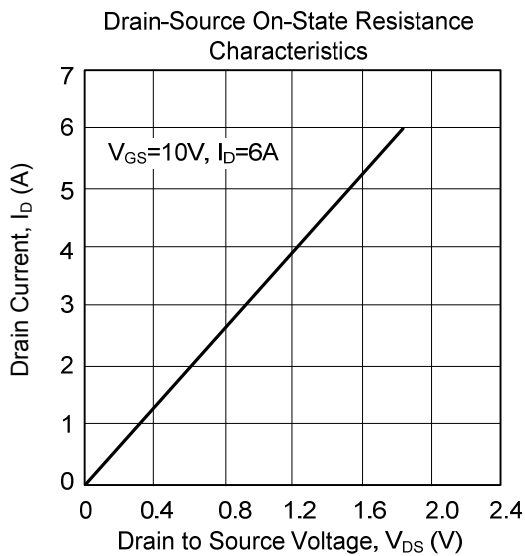
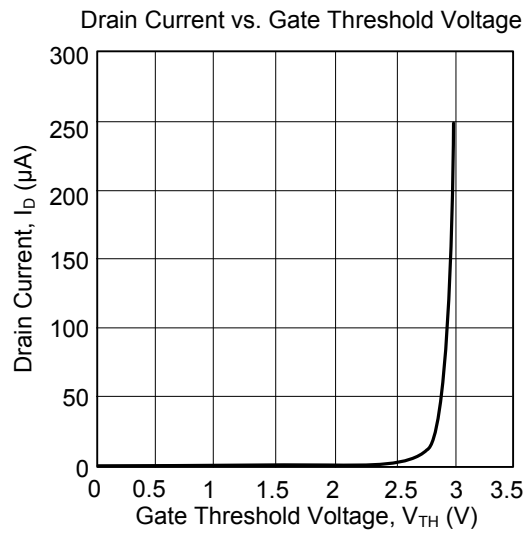
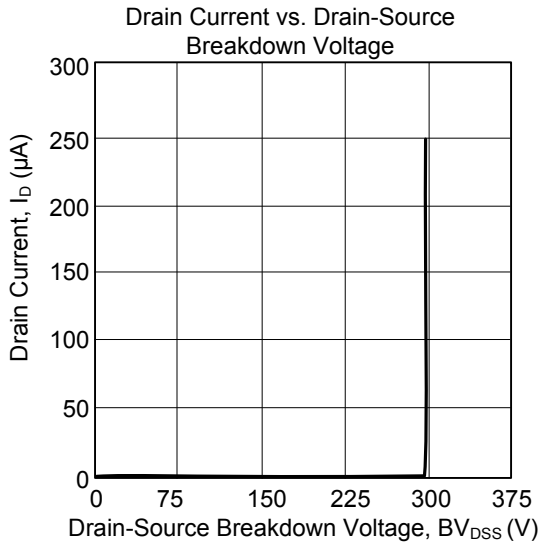


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

TYPICAL CHARACTERISTICS



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