



18N25

Power MOSFET

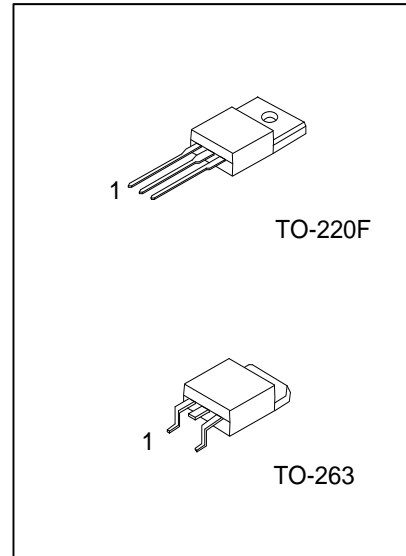
18A, 250V N-CHANNEL POWER MOSFET

DESCRIPTION

The UTC **18N25** is an N-channel enhancement mode power MOSFET using UTC's advanced planar stripe and DMOS technology to provide perfect performance.

This technology can withstand high energy pulse in the avalanche and commutation mode. It can provide minimum on-state resistance and high switching speed.

This device is generally applied in active power factor correction and high efficient switched mode power supplies.

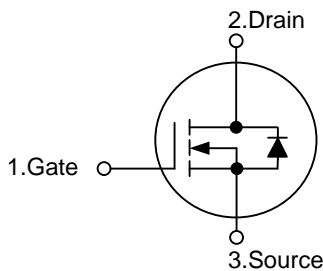


FEATURES

* $R_{DS(ON)}=0.16\Omega @ V_{GS}=10V$

* High switching speed

SYMBOL



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
18N25L-TF3-T	18N25G-TF3-T	TO-220F	G	D	S	Tube
18N25L-TQ2-T	18N25G-TQ2-T	TO-263	G	D	S	Tube
18N25L-TQ2-R	18N25G-TQ2-R	TO-263	G	D	S	Tape Reel

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

<p>18N25L-TA3-T</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Lead Free</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) TF3: TO-220F, TQ2: TO-263</p> <p>(3) L: Lead Free, G: Halogen Free</p>
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■ ABSOLUTE MAXIMUM RATINGS (TC=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain to Source Voltage		V_{DSS}	250	V
Gate to Source Voltage		V_{GSS}	±20	V
Drain Current	Continuous	I_D	18	A
	Pulsed (Note 2)	I_{DM}	72	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	945	mJ
Avalanche Current (Note 2)		I_{AR}	18	A
Power Dissipation	TO-220F	P_D	40	W
	TO-263		138	°C
Junction Temperature		T_J	+150	°C
Storage Temperature		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
3. Starting $T_J=25^\circ\text{C}$, $L=5.2\text{mH}$, $I_{AS}=18\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\Omega$.
4. Drain current limited by maximum junction temperature.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient		θ_{JA}	62.5	°C/W
Junction to Case	TO-220F	θ_{JC}	3.1	°C/W
	TO-263		0.9	°C/W

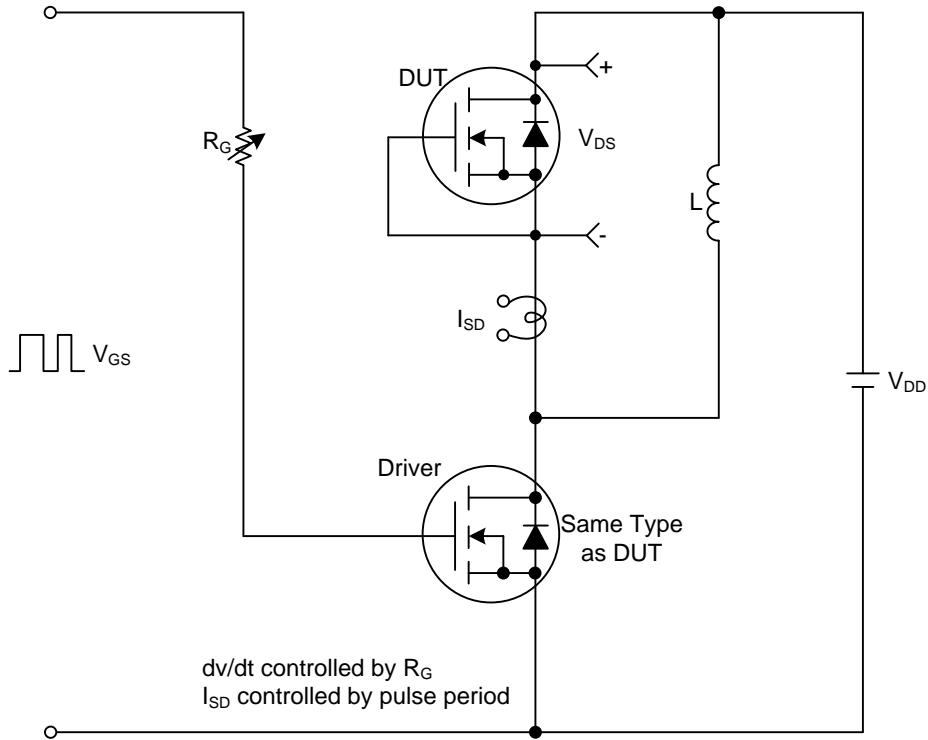
■ ELECTRICAL CHARACTERISTICS (TC=25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	$V_{GS}=0\text{V}$, $I_D=250\mu\text{A}$	250			V
Drain-Source Leakage Current		I_{DSS}	$V_{DS}=250\text{V}$, $V_{GS}=0\text{V}$			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	$V_{GS}=20\text{V}$, $V_{DS}=0\text{V}$			100	nA
	Reverse		$V_{GS}=-20\text{V}$, $V_{DS}=0\text{V}$			-100	
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	2.0		4.0	V
Drain-Source On-State Resistance		$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=18\text{A}$		0.16	0.24	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	$V_{DS}=25\text{V}$, $V_{GS}=0\text{V}$, $f=1.0\text{MHz}$		2200	2860	pF
Output Capacitance		C_{OSS}			330	430	pF
Reverse Transfer Capacitance		C_{RSS}			25	40	pF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	$V_{DS}=125\text{V}$, $V_{GS}=10\text{V}$, $I_D=18\text{A}$ (Note 1,2)		30	45	nC
Gate-Source Charge		Q_{GS}			10		nC
Gate-Drain Charge		Q_{GD}			10		nC
Turn-ON Delay Time		$t_{D(ON)}$	$V_{DD}=30\text{V}$, $I_D=18\text{A}$, $R_G=25\Omega$ (Note 1,2)		15	25	ns
Turn-ON Rise Time		t_R			130	195	ns
Turn-OFF Delay Time		$t_{D(OFF)}$			30	45	ns
Turn-OFF Fall Time		t_F			100	150	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				18	A
Maximum Body-Diode Pulsed Current		I_{SM}				72	A
Drain-Source Diode Forward Voltage		V_{SD}	$I_S=18\text{A}$, $V_{GS}=0\text{V}$			1.4	V

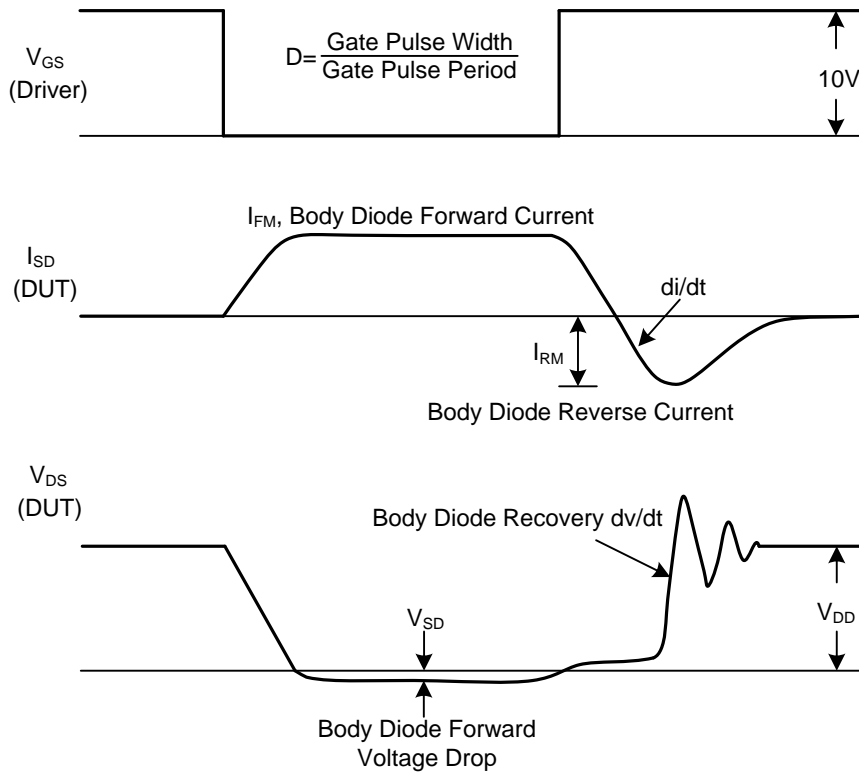
Note: 1. Pulse Test : Pulse width≤300μs, Duty cycle≤2%

2. Essentially independent of operating temperature

■ TEST CIRCUITS AND WAVEFORMS

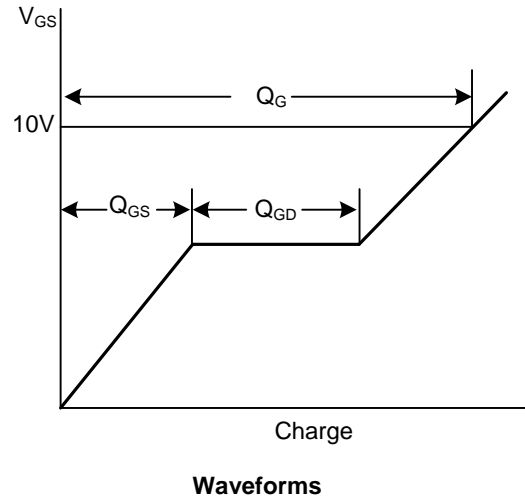
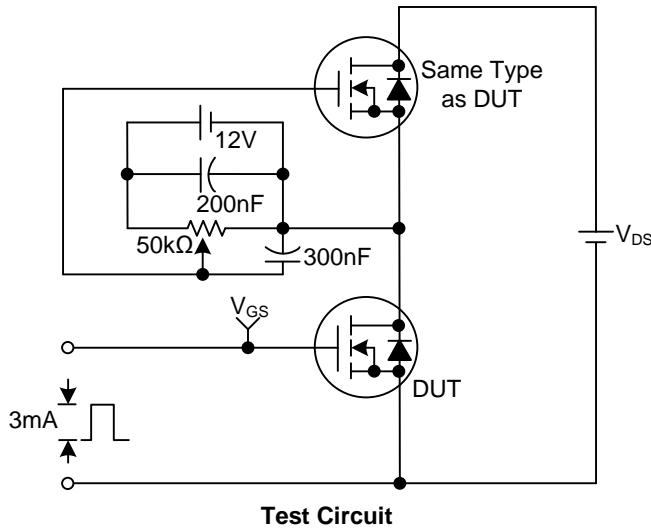


Peak Diode Recovery dv/dt Test Circuit & Waveforms

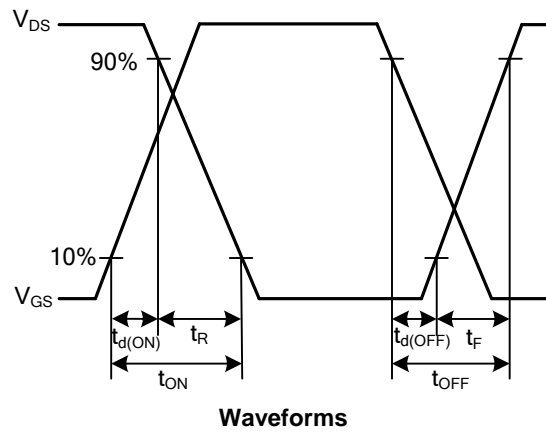
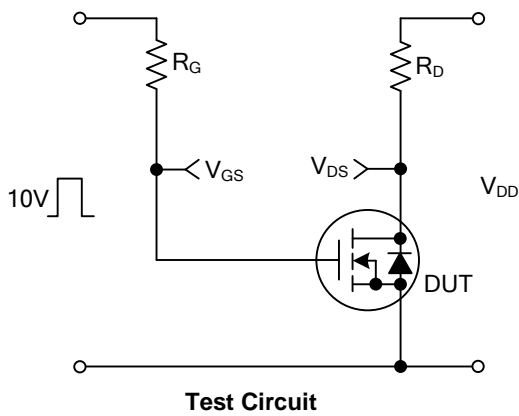


TEST CIRCUITS AND WAVEFORMS(Cont.)

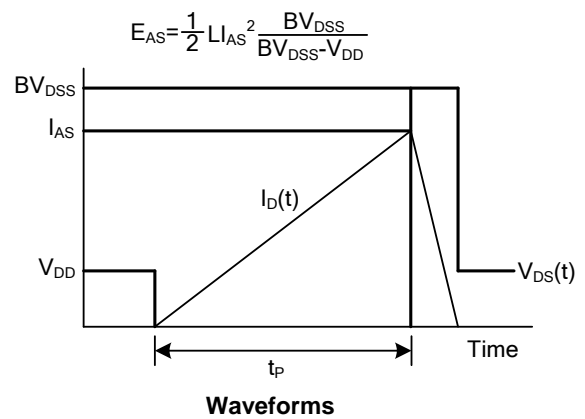
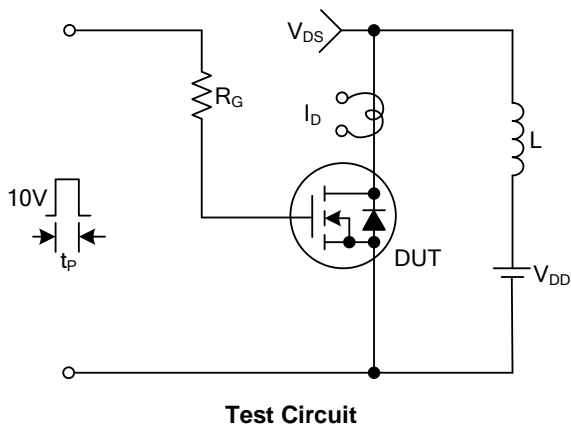
Gate Charge



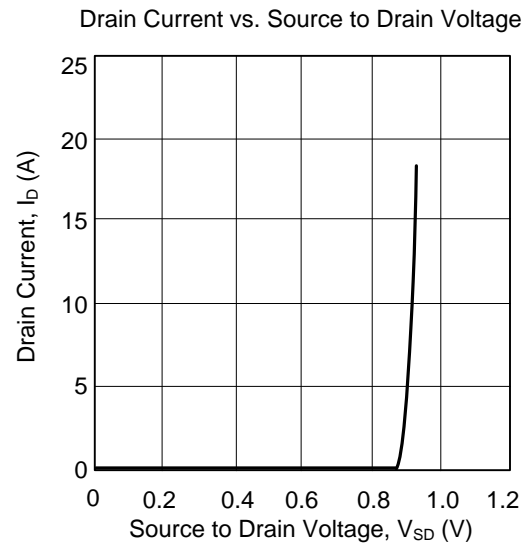
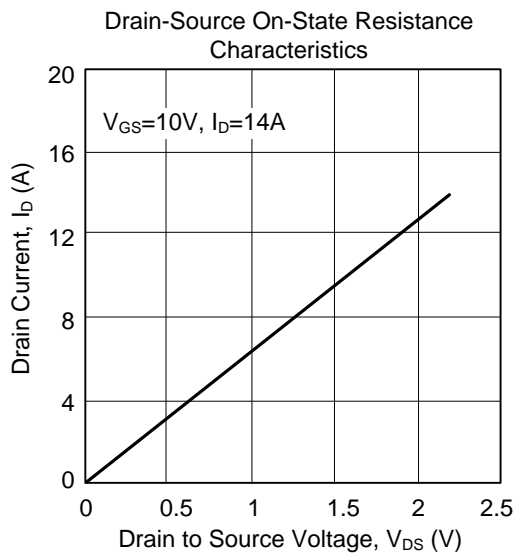
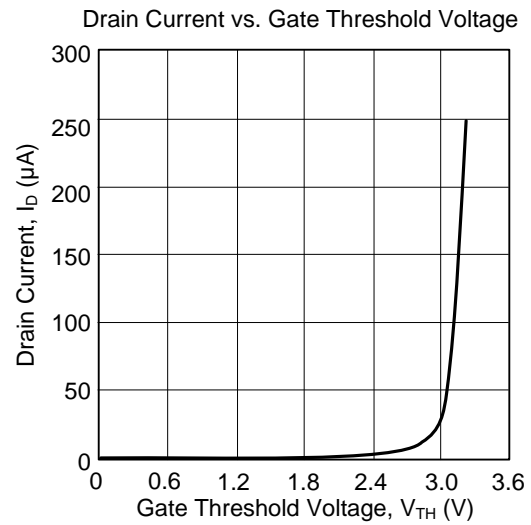
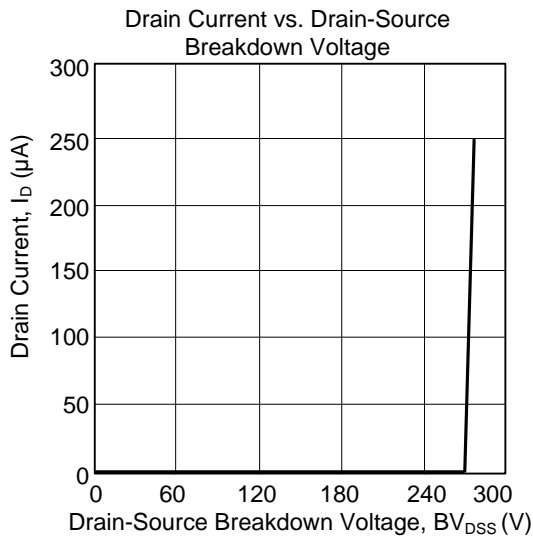
Resistive Switching



Unclamped Inductive Switching



■ TYPICAL CHARACTERISTICS



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