



**10A, 150V, 0.3Ω, N-CHANNEL  
POWER MOSFETS**

■ **DESCRIPTION**

The UTC **10N15** is an N-channel enhancement mode silicon-gate power field effect transistors, it uses UTC's advanced technology to provide the customers with high breakdown voltage etc.

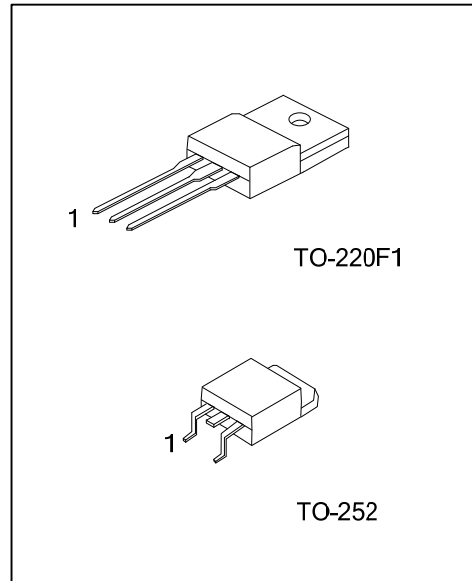
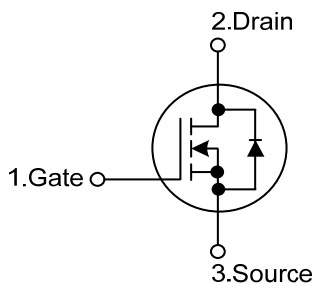
The UTC **10N15** is suitable for switching converters, switching regulators, relay drivers and motor drivers, etc.

■ **FEATURES**

\*  $R_{DS(ON)} < 0.300\Omega$  @  $V_{GS}=10V, I_D=10A$

\* High breakdown voltage

■ **SYMBOL**



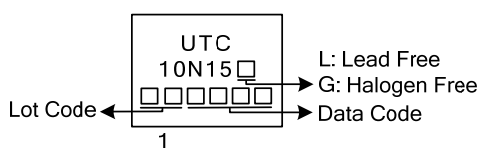
■ **ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
10N15L-TF1-T	10N15G-TF1-T	TO-220F1	G	D	S	Tube
10N15L-TN3-T	10N15G-TN3-T	TO-252	G	D	S	Tape Reel

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

<p>10N15L-TF1-T</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) TF1: TO-220F1, TN3: TO-252</p> <p>(3) L: Lead Free, G: Halogen Free and Lead Free</p>
---------------------	---

■ **MARKING**



**■ ABSOLUTE MAXIMUM RATINGS** ( $T_c=25^\circ\text{C}$  unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage (Note 1)		$V_{DSS}$	150	V
Drain-Gate Voltage ( $R_{GS}=20\text{k}\Omega$ ) ( $T_J=25\sim 125^\circ\text{C}$ )		$V_{DGR}$	150	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Drain Current	Continuous	$I_D$	10	A
	Pulsed (Note 2)	$I_{DM}$	25	A
Power Dissipation	TO-220F1	$P_D$	62	W
	TO-252		54	W
Linear Derating Factor	TO-220F1		0.48	W/ $^\circ\text{C}$
	TO-252		0.43	W/ $^\circ\text{C}$
Junction Temperature		$T_J$	-55~+150	$^\circ\text{C}$
Storage Temperature Range		$T_{STG}$	-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 is limited by maximum junction temperature.

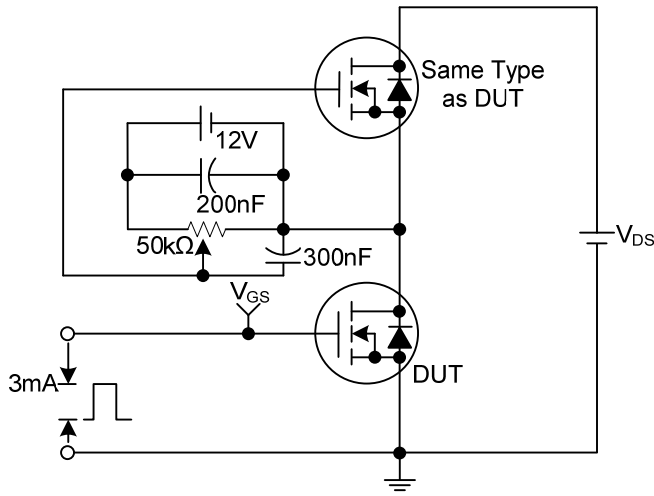
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220F1	$\theta_{JA}$	62.5	$^\circ\text{C/W}$
	TO-252		110	
Junction to Case	TO-220F1	$\theta_{JC}$	2	$^\circ\text{C/W}$
	TO-252		2.3	

**■ ELECTRICAL CHARACTERISTICS** ( $T_c=25^\circ\text{C}$ , unless otherwise specified)

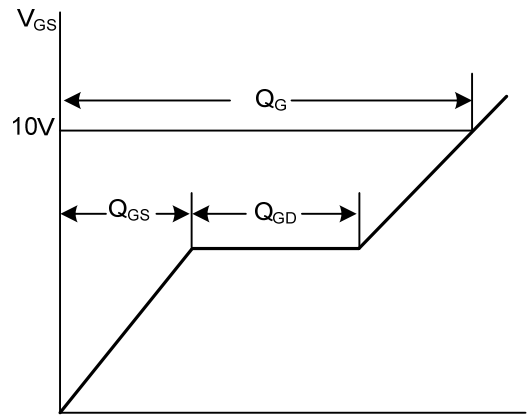
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>							
Drain-Source Breakdown Voltage		$BV_{DSS}$	$I_D=250\mu\text{A}$ , $V_{GS}=0\text{V}$	150			V
Drain-Source Leakage Current		$I_{DSS}$	$V_{DS}=\text{Rated } BV_{DSS}$ , $V_{GS}=0\text{V}$			1	$\mu\text{A}$
Gate-Source 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	nA
<b>ON CHARACTERISTICS</b>							
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS}=V_{GS}$ , $I_D=250\mu\text{A}$	2		4	V
Static Drain-Source On-State Resistance (Note 1)		$R_{DS(ON)}$	$V_{GS}=10\text{V}$ , $I_D=10\text{A}$			0.3	$\Omega$
Drain-Source On Voltage (Note 1)		$V_{DS(ON)}$	$V_{GS}=10\text{V}$ , $I_D=10\text{A}$			3.0	V
<b>DYNAMIC PARAMETERS</b>							
Input Capacitance		$C_{ISS}$	$V_{GS}=0\text{V}$ , $V_{DS}=25\text{V}$ , $f=1.0\text{MHz}$			850	pF
Output Capacitance		$C_{OSS}$				230	pF
Reverse Transfer Capacitance		$C_{RSS}$				100	pF
<b>SWITCHING PARAMETERS</b>							
Turn-ON Delay Time		$t_{D(ON)}$	$V_{DD}=75\text{V}$ , $V_{GS}=10\text{V}$ , $I_D\approx 5\text{A}$ , $R_G=50\Omega$ , $R_L=14.7\Omega$		40	60	ns
Rise Time		$t_R$			165	250	ns
Turn-OFF Delay Time		$t_{D(OFF)}$			90	135	ns
Fall-Time		$t_F$			90	135	ns
<b>SOURCE TO DRAIN DIODE SPECIFICATIONS</b>							
Source to Drain Diode Voltage (Note 1)		$V_{SD}$	$I_{SD}=5\text{A}$			1.4	V
Diode Reverse Recovery Time		$t_{RR}$	$I_{SD}=4\text{A}$ , $di_{SD}/dt=100\text{A}/\mu\text{s}$		200		ns

Note: 1. Pulse Test: Pulse Width $\leq 300\mu\text{s}$ , Duty Cycle $\leq 2\%$ .

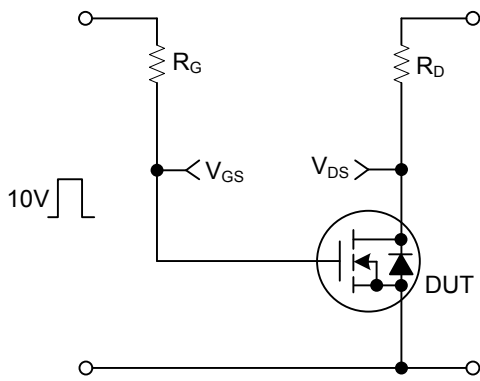
■ TEST CIRCUITS AND WAVEFORMS



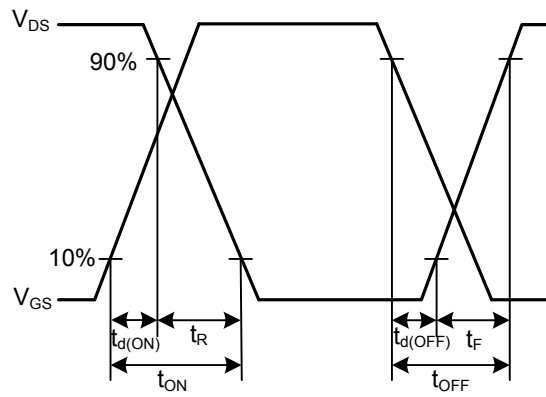
Gate Charge Test Circuit



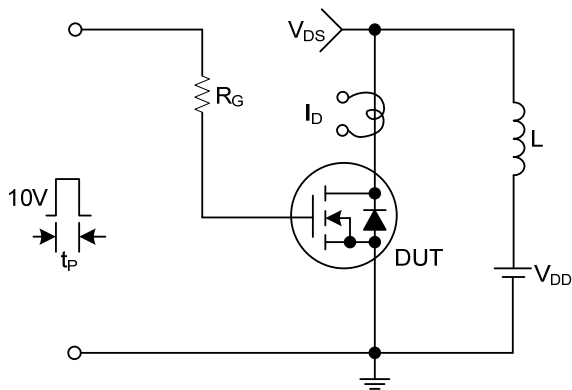
Gate Charge Waveforms



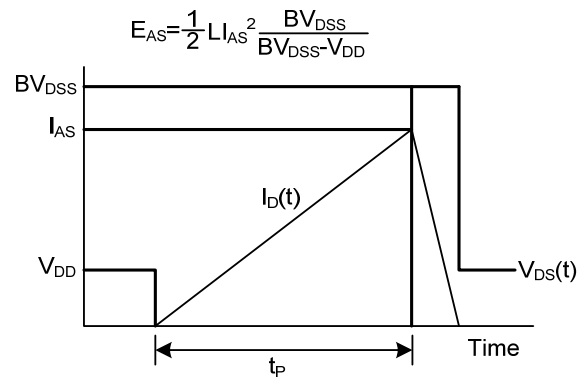
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.