



**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.

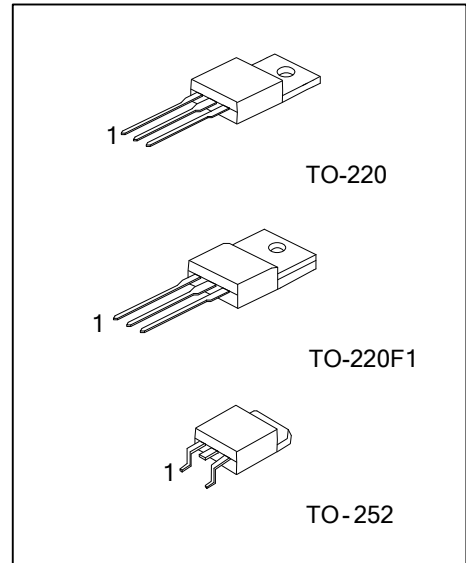
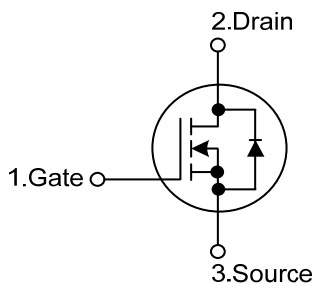
The UTC **10N15** is suitable for switching converters, switching regulators, relay drivers and motor drivers, etc.

■ **FEATURES**

* $R_{DS(ON)} < 0.3\Omega$ @ $V_{GS} = 10V$, $I_D = 10A$

* High breakdown voltage

■ **SYMBOL**



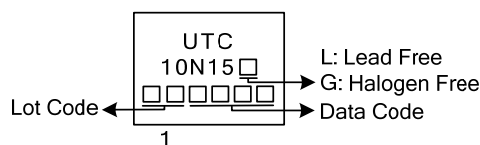
■ **ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
10N15L-TA3-T	10N15G-TA3-T	TO-220	G	D	S	Tube
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-TA3-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) TA3: TO-220, TF1: TO-220F1, 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 (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}	± 20	V
Drain Current	Continuous	I_D	10	A
	Pulsed	I_{DM}	25 (Note 2)	A
Power Dissipation	TO-220	P_D	100	W
	TO-220F1		62	W
	TO-252		54	W
Linear Derating Factor	TO-220		0.8	W/ $^\circ\text{C}$
	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.

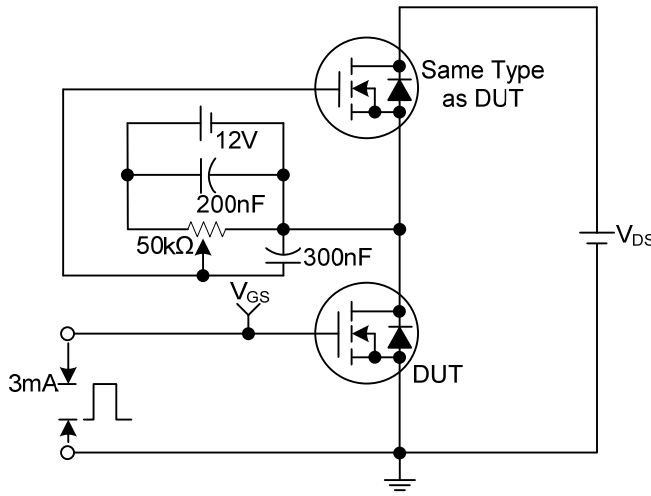
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F1	θ_{JA}	62.5	$^\circ\text{C/W}$
	TO-252		110	
Junction to Case	TO-220	θ_{JC}	1.25	$^\circ\text{C/W}$
	TO-220F1		2	
	TO-252		2.3	

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

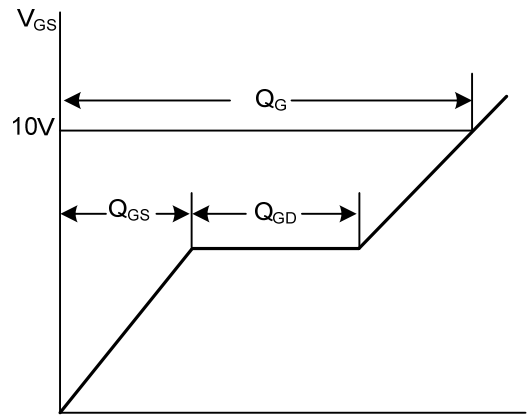
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	150			V
Drain-Source Leakage Current		I_{DSS}	$V_{DS}=\text{Rated } BV_{DSS}$, $V_{GS}=0\text{V}$			1	μA
Gate-Source Leakage Current	Forward	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	nA
ON CHARACTERISTICS							
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	Ω
Drain-Source On Voltage (Note 1)		$V_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=10\text{A}$			3.0	V
DYNAMIC PARAMETERS							
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
SWITCHING PARAMETERS							
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
SOURCE TO DRAIN DIODE SPECIFICATIONS							
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 $\leq 2\%$.

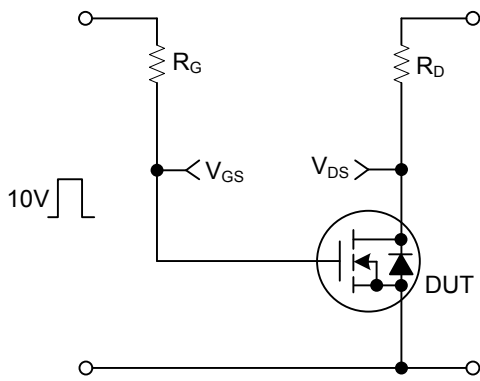
■ TEST CIRCUITS AND WAVEFORMS



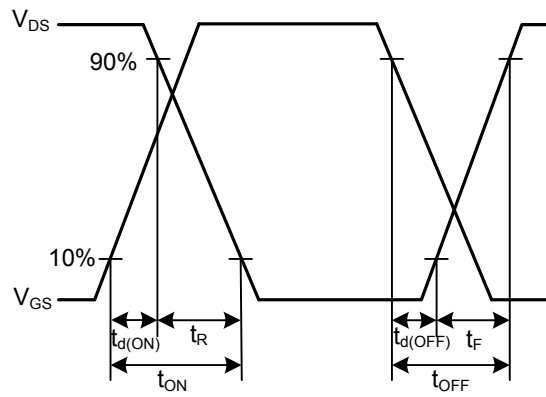
Gate Charge Test Circuit



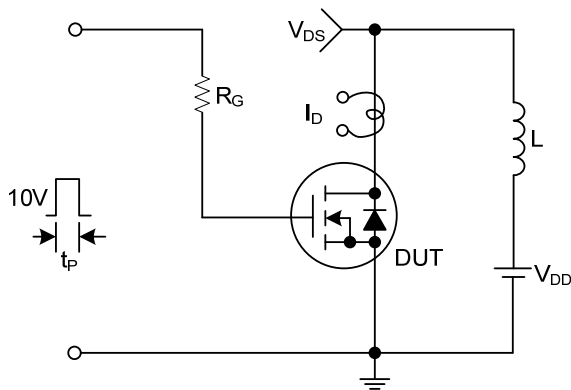
Gate Charge Waveforms



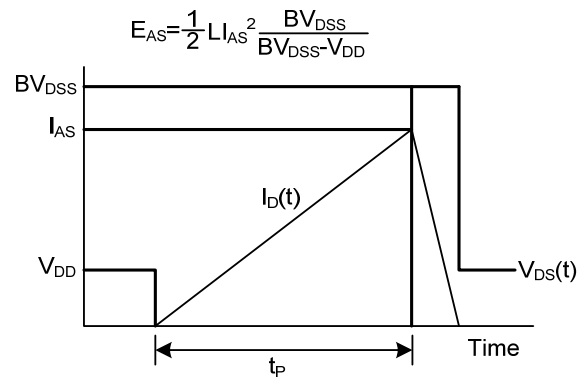
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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