



## 15N10

Power MOSFET

### 14.7A, 100V (D-S) N-CHANNEL POWER MOSFET

#### DESCRIPTION

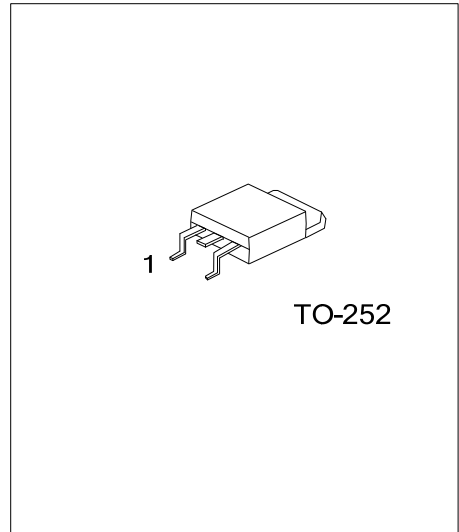
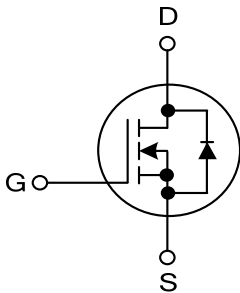
The UTC **15N10** is an N-Channel enhancement MOSFET, it uses UTC's advanced technology to provide customers with a minimum on-state resistance, high switching speed and low gate charge.

The UTC **15N10** is suitable for high efficiency switching DC/DC converter, LCD display inverter and load switch.

#### FEATURES

- \*  $R_{DS(ON)}=0.08\Omega$  @  $V_{GS}=10V, I_D=8A$
- \* Low gate charge (Typ=24nC)
- \* Low  $C_{RSS}$  (Typ=23pF)
- \* High switching speed

#### SYMBOL



#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
15N10L-TN3-T	15N10G-TN3-T	TO-252	G	D	S	Tube
15N10L-TN3-R	15N10G-TN3-R	TO-252	G	D	S	Tape Reel

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

<p>15N10L-TN3-R</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) TN3: TO-252</p> <p>(3) L: Lead Free, G: Halogen Free</p>
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■ ABSOLUTE MAXIMUM RATINGS ( $T_A=25^\circ\text{C}$ , unless otherwise noted)

PARAMETER		SYMBOL	RATINGS	UNIT	
Drain-Source Voltage		$V_{DSS}$	100	V	
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V	
Drain Current	Continuous	$I_D$	$T_C=25^\circ\text{C}, T_J=150^\circ\text{C}$	14.7	A
			$T_C=70^\circ\text{C}, T_J=150^\circ\text{C}$	13.6	A
Pulsed		$I_{DM}$	59	A	
Power Dissipation		$P_D$	$T_C=25^\circ\text{C}$	34.7	W
			$T_C=70^\circ\text{C}$	22.2	W
Operating Junction Temperature		$T_J$	-55~+150	$^\circ\text{C}$	

Note: 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.

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

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Case (Note)	$\theta_{JC}$	3.6	$^\circ\text{C/W}$

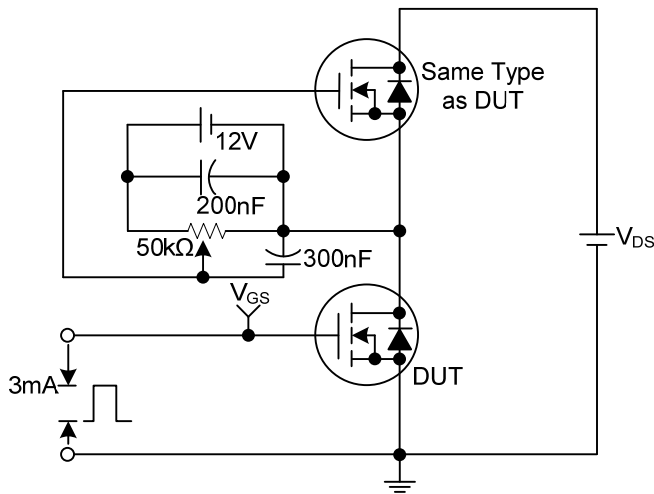
Note: The device mounted on  $1\text{in}^2$  FR4 board with 2 oz copper.

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

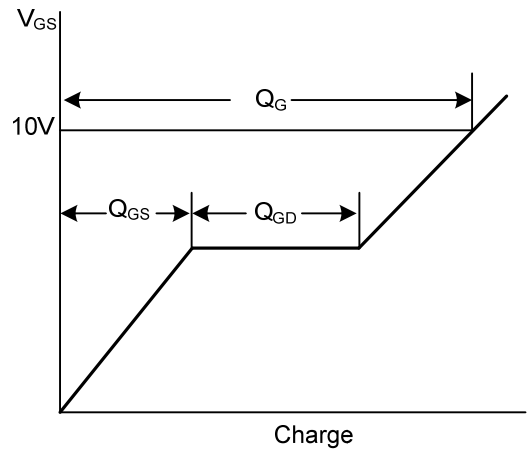
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$	100			V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=80\text{V}, V_{GS}=0\text{V}$			1	$\mu\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=+20\text{V}, V_{DS}=0\text{V}$			+100	nA
		$V_{GS}=-20\text{V}, V_{DS}=0\text{V}$			-100	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1		3	V
Drain-Source On-State Resistance (Note)	$R_{DS(ON)}$	$V_{GS}=10\text{V}, I_D=8\text{A}$		80	100	m $\Omega$
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{GS}=0\text{V}, V_{DS}=15\text{V}, f=1\text{MHz}$		890		pF
Output Capacitance	$C_{OSS}$			58		pF
Reverse Transfer Capacitance	$C_{RSS}$			23		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge	$Q_G$	$V_{GS}=10\text{V}, V_{DS}=80\text{V}, I_D=10\text{A}$		24		nC
Total Gate Charge	$Q_G$	$V_{GS}=4.5\text{V}, V_{DS}=80\text{V}, I_D=10\text{A}$		13		nC
Gate to Source Charge	$Q_{GS}$			4.6		nC
Gate to Drain Charge	$Q_{GD}$			7.6		nC
Gate-Resistance	$R_G$	$V_{DS}=0\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$		0.9		$\Omega$
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DS}=50\text{V}, R_L=5\Omega, V_{GEN}=10\text{V}, R_G=1\Omega$		14		ns
Rise Time	$t_R$			33		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			39		ns
Fall-Time	$t_F$			5		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Drain-Source Diode Forward Voltage	$V_{SD}$	$I_S=8\text{A}, V_{GS}=0\text{V}$		0.9	1.2	V

Note: Pulse test: pulse width $\leq 300\mu\text{s}$ , duty cycle $\leq 2\%$ , Guaranteed by design, not subject to production testing.

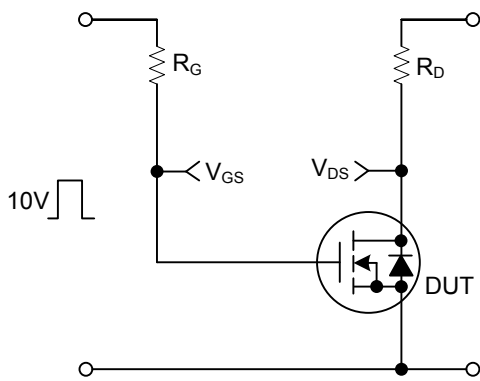
■ TEST CIRCUITS AND WAVEFORMS



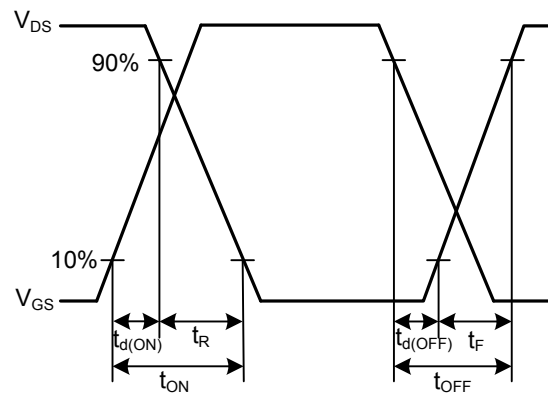
Gate Charge Test Circuit



Gate Charge Waveforms

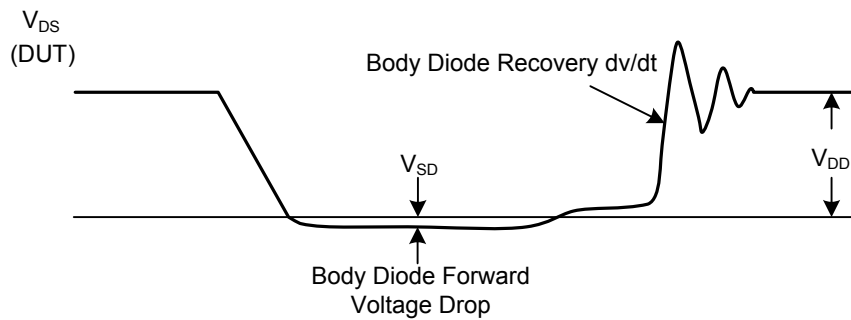
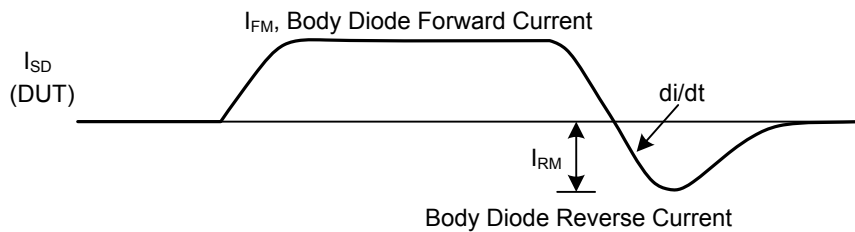
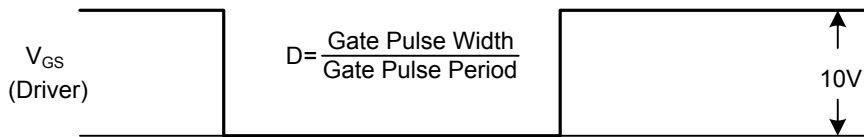
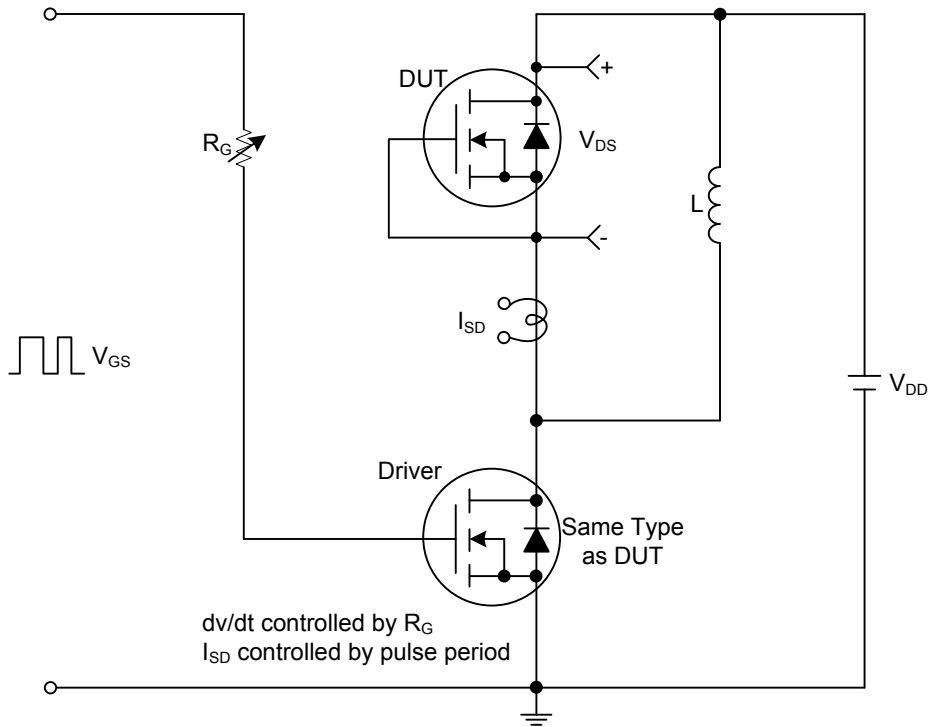


Resistive Switching Test Circuit



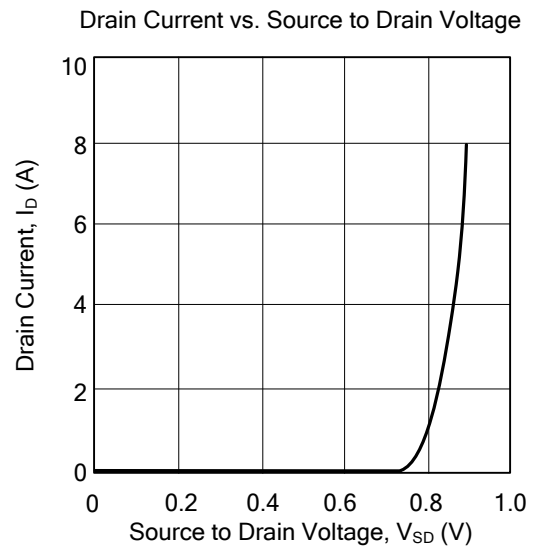
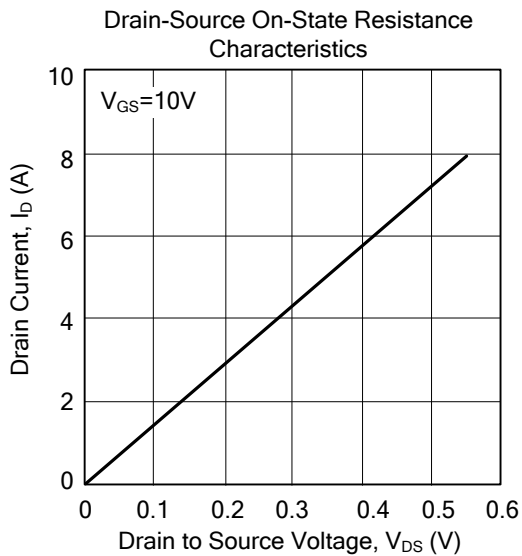
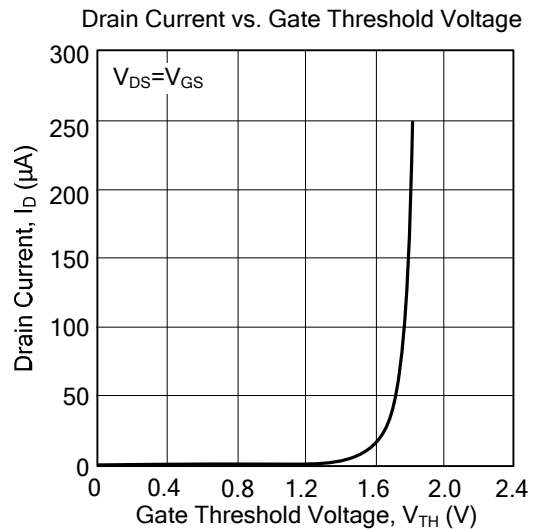
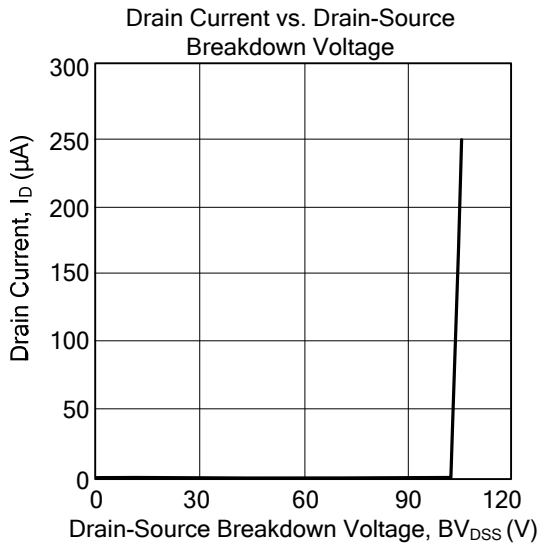
Resistive Switching Waveforms

■ TEST CIRCUITS AND WAVEFORMS



Peak Diode Recovery dv/dt Test Circuit and Waveforms

### TYPICAL CHARACTERISTICS



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