



# 25N10

*Power MOSFET*

## N-CHANNEL ENHANCEMENT MODE POWER MOSFET

■ DESCRIPTION

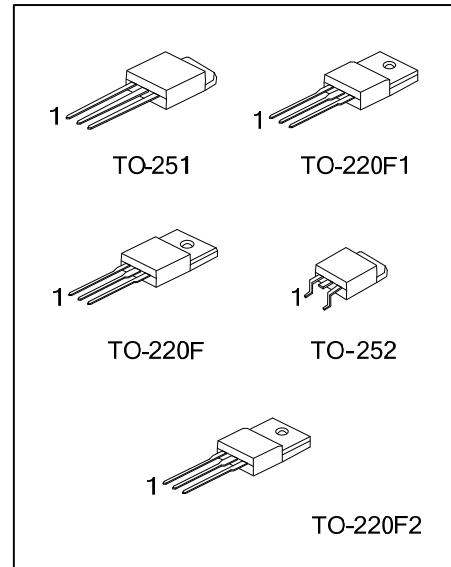
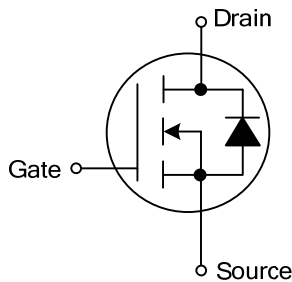
The UTC **25N10** is an N-channel enhancement mode power MOSFET and it uses UTC's perfect technology to provide designers with fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

It is generally suitable for all commercial-industrial applications and DC/DC converters requiring low voltage.

■ FEATURES

- \* Single Drive Requirement
- \* Low Gate Charge
- \* RoHS Compliant

■ SYMBOL

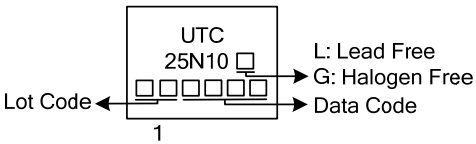


■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free Plating	Halogen Free		1	2	3	
25N10L-TF1-T	25N10G-TF1-T	TO-220F1	G	D	S	Tube
25N10L-TF2-T	25N10G-TF2-T	TO-220F2	G	D	S	Tube
25N10L-TF3-T	25N10G-TF3-T	TO-220F	G	D	S	Tube
25N10L-TM3-T	25N10G-TM3-T	TO-251	G	D	S	Tube
25N10L-TN3-R	25N10G-TN3-R	TO-252	G	D	S	Tape Reel

<p>25N10L-TF1-T</p> <ul style="list-style-type: none"> <li>(1)Packing Type</li> <li>(2)Package Type</li> <li>(3)Lead Free</li> </ul>	<p>(1) T: Tube, R: Tape Reel            (2) TF1: TO-220F1, TF2: TO-220F2, TF3: TO-220F            TM3: TO-251, TN3: TO-252            (3) L: Lead Free, G: Halogen Free</p>
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MARKING INFORMATION

PACKAGE	MARKING
TO-220F1 TO-220F2 TO-220 TO-251 TO-252	 <p>The diagram shows a MOSFET package with the following markings: 'UTC' and '25N10' at the top, a '1' at the bottom, a 'Lot Code' on the left, and a 'Data Code' on the right. A legend indicates 'L: Lead Free' and 'G: Halogen Free'.</p>

### ■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Drain Source Voltage		$V_{DSS}$	100	V
Gate Source Voltage		$V_{GSS}$	$\pm 20$	V
Continuous Drain Current ( $V_{GS}=10V$ )	$T_C=25^\circ C$	$I_D$	23	A
	$T_C=100^\circ C$	$I_D$	14.6	A
Pulsed Drain Current (Note 2)		$I_{DM}$	80	A
Total Power Dissipation ( $T_C=25^\circ C$ )	TO-220F/TO-220F1	$P_D$	50	W
	TO-220F2		52	
	TO-251/TO-252		41	
Operating Junction Temperature		$T_J$	-55 ~ +150	$^\circ C$
Storage Temperature		$T_{STG}$	-55 ~ +150	$^\circ C$

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. Pulse width limited by max. junction temperature

### ■ THERMAL DATA

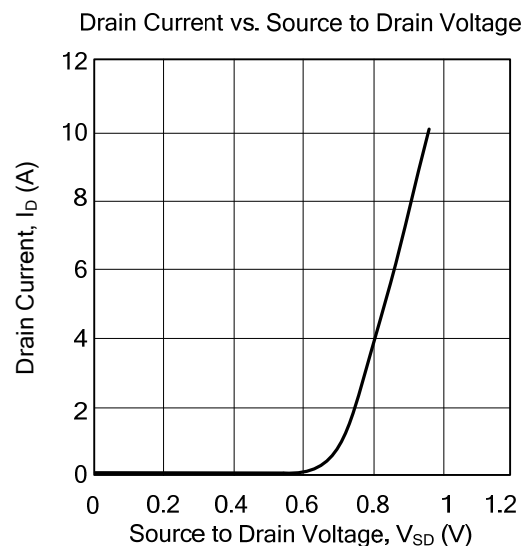
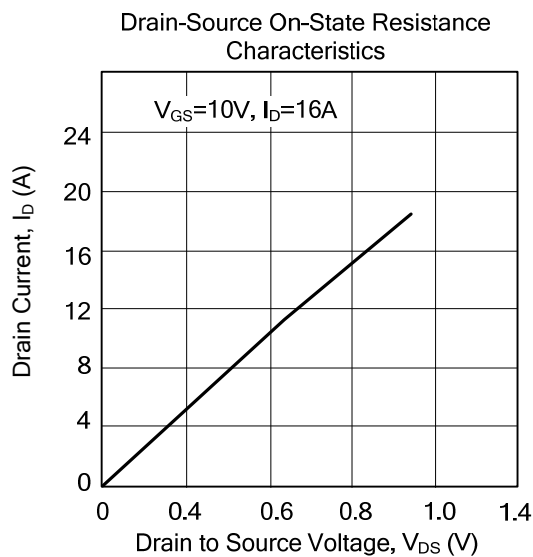
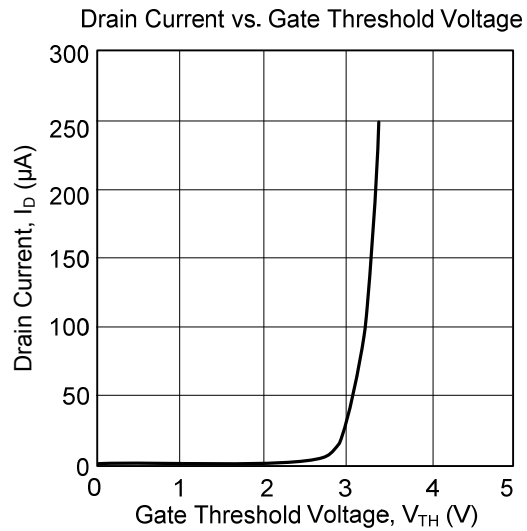
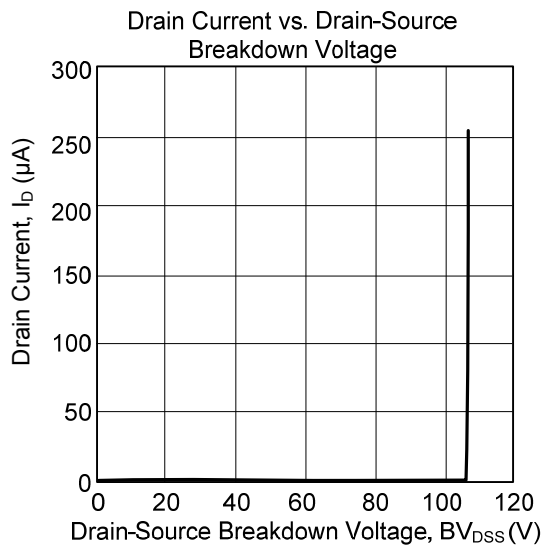
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220F/TO-220F1	$\theta_{JA}$	62.5	$^\circ C/W$
	TO-220F2			
	TO-251/TO-252			
Junction to Case	TO-220F/TO-220F1	$\theta_{JC}$	2.5	$^\circ C/W$
	TO-220F2		2.4	
	TO-251/TO-252		3	

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=1mA$	100			V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^\circ\text{C}$ , $I_D=1mA$		0.14		$V/^\circ\text{C}$
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=100V, V_{GS}=0V, T_J=25^\circ\text{C}$			25	$\mu\text{A}$
		$V_{DS}=80V, V_{GS}=0V, T_J=150^\circ\text{C}$			100	$\mu\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V$			$\pm 100$	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-Resistance (Note)	$R_{DS(ON)}$	$V_{GS}=10V, I_D=16A$			80	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=10V, I_D=16A$		14		S
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{DS}=25V, V_{GS}=0V, f=1.0\text{MHz}$		1060	1700	pF
Output Capacitance	$C_{OSS}$			270		pF
Reverse Transfer Capacitance	$C_{RSS}$			8		pF
Gate Resistance	$R_G$	$f=1.0\text{MHz}$		1.5	2.3	$\Omega$
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge (Note)	$Q_G$	$V_{GS}=10V, V_{DS}=80V, I_D=16A$		19	30	nC
Gate Source Charge	$Q_{GS}$			5		nC
Gate Drain Charge	$Q_{GD}$			6		nC
Turn-ON Delay Time <sup>1</sup>	$t_{D(ON)}$	$V_{DD}=50V, I_D=16A, R_G=3.3\Omega, V_{GS}=10V, R_D=3.125\Omega$		10		ns
Turn-ON Rise Time	$t_R$			28		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			17		ns
Turn-OFF Fall-Time	$t_F$			2		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Drain-Source Diode Forward Voltage (Note)	$V_{SD}$	$I_S=16A, V_{GS}=0V$			1.3	V
Reverse Recovery Time	$t_{RR}$	$I_S=16A, V_{GS}=0V, di/dt=100A/\mu\text{s}$		90		ns
Reverse Recovery Charge	$Q_{RR}$				380	

Note: Pulse Test : Pulse width  $\leq 300\mu\text{s}$ , Duty cycle  $\leq 2\%$ .

## ■ TYPICAL CHARACTERISTICS



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