



# 40N15

**Power MOSFET**

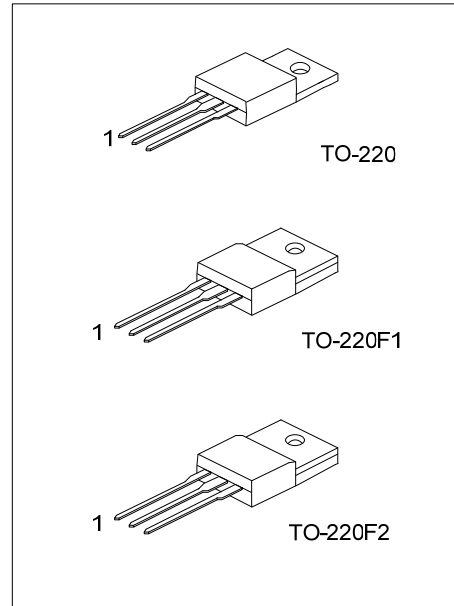
## 40A, 150V N-CHANNEL POWER MOSFET

### DESCRIPTION

The UTC **40N15** is a N-channel enhancement MOSFET, it uses UTC's advanced technology to provide the customers with perfect  $R_{DS(ON)}$ , high switching speed, high current capacity and low gate charge.

### FEATURES

- \*  $R_{DS(ON)} < 50m\Omega @ V_{GS}=10V, I_D=20A$
- \* High Switching Speed
- \* High Current Capacity



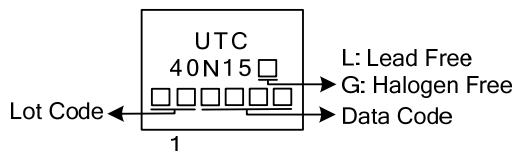
### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
40N15L-TA3-T	40N15G-TA3-T	TO-220	G	D	S	Tube
40N15L-TF1-T	40N15G-TF1-T	TO-220F1	G	D	S	Tube
40N15L-TF2-T	40N15G-TF2-T	TO-220F2	G	D	S	Tube

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

<p>40N15G-TA3-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) T: Tube</p> <p>(2) TA3: TO-220, TF1: TO-220F1, TF2: TO-220F2</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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### MARKING



### ■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		$V_{DSS}$	150	V
Gate-Source Voltage		$V_{GSS}$	$\pm 25$	V
Drain Current	Continuous	$I_D$	40	A
	Pulsed	$I_{DM}$	180	A
Avalanche Current		$I_{AR}$	45.6	A
Avalanche Energy	Single Pulsed	$E_{AS}$	650	mJ
	Repetitive	$E_{AR}$	21	mJ
Peak Diode Recovery dv/dt		dv/dt	7	V/ns
Power Dissipation	TO-220	$P_D$	166	W
	TO-220F1/TO-220F2		40	W
Junction Temperature		$T_J$	-50 ~ +150	$^{\circ}\text{C}$
Storage Temperature Range		$T_{STG}$	-50 ~ +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.

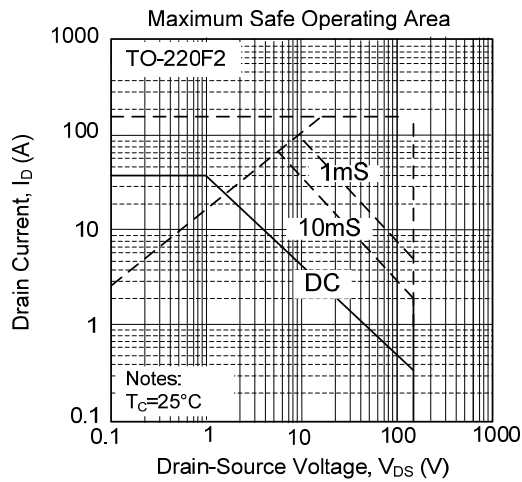
### ■ THERMAL CHARACTERISTICS

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient		$\theta_{JA}$	62.5	$^{\circ}\text{C/W}$
Junction to Case	TO-220	$\theta_{JC}$	0.9	$^{\circ}\text{C/W}$
	TO-220F1/TO-220F2		3.125	$^{\circ}\text{C/W}$

### ■ ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	150			V
Drain-Source Leakage Current	$I_{DSS}$	$V_{GS}=0V, V_{DS}=150V$			900	nA
Gate-Source Leakage Current	Forward	$I_{GSS}$			+100	nA
	Reverse				-100	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.2		3.8	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$			50	m $\Omega$
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{DS}=25V, V_{GS}=0V, f=1.0\text{MHz}$		2500		pF
Output Capacitance	$C_{OSS}$			520		pF
Reverse Transfer Capacitance	$C_{RSS}$			100		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge	$Q_G$	$V_{GS}=10V, V_{DD}=50V, I_D=1.3A, I_G=100\mu A$		85		nC
Gate to Source Charge	$Q_{GS}$			15		nC
Gate to Drain Charge	$Q_{GD}$			41		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{GS}=0\sim 10V, V_{DD}=30V, I_D=0.5A, R_G=25\Omega$		35		ns
Rise Time	$t_R$			320		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			210		ns
Fall-Time	$t_F$			200		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Body-Diode Continuous Current	$I_S$				40	A
Maximum Body-Diode Pulsed Current	$I_{SM}$				160	A
Drain-Source Diode Forward Voltage	$V_{SD}$	$I_S=40A, V_{GS}=0V$			1.48	V
Body Diode Reverse Recovery Time	$t_{RR}$	$V_{GS}=0V, I_S=30A$		150		ns
Body Diode Reverse Recovery Charge	$Q_{RR}$	$di_F/dt=100A/\mu s$		0.9		$\mu\text{C}$

■ TYPICAL CHARACTERISTICS



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