



40N15

Preliminary

Power MOSFET

40A, 150V N-CHANNEL POWER MOSFET

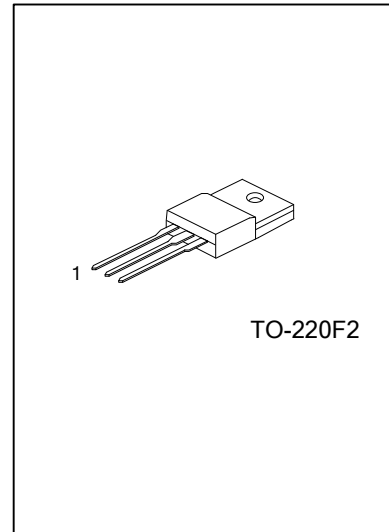
DESCRIPTION

The UTC **40N15** is an 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

- * $R_{DS(ON)} < 42m\Omega$ @ $V_{GS}=10V, I_D=20A$
- * High Switching Speed
- * High Current Capacity
- * Low Gate Charge (typical 85nC)

ORDERING INFORMATION



Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
40N15L-TF2-T	40N15LG-TF2-T	TO-220F2	G	D	S	Tube

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

<p>40N15L-TF2-T</p> <p>(1) Packing Type (2) Package Type (3) Lead Free</p>	<p>(1) T: Tube (2) TF2: TO-220F2 (3) G: Halogen Free, L: Lead Free</p>
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■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	150	V
Gate-Source Voltage	V_{GSS}	± 25	V
Drain Current	Continuous I	I_D	40
	Pulsed	I_{DM}	180
Avalanche Current	I_{AR}	45.6	A
Avalanche Energy	Single Pulsed	E_{AS}	650
	Repetitive	E_{AR}	21
Peak Diode Recovery dv/dt	dv/dt	6	V/ns
Power Dissipation	P_D	210	W
Junction Temperature	T_J	-50~+150	°C
Storage Temperature Range	T_{STG}	-50~+150	°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	θ_{JA}	62.5	°C/W
Junction to Case	θ_{JC}	0.7	°C/W

■ ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	150			V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$			0.16		V/°C
Drain-Source Leakage Current	I_{DSS}	$V_{GS}=0V, V_{DS}=150V$			900	nA
Gate-Source Leakage Current	Forward	$V_{GS}=+20V, V_{DS}=0V$			+100	nA
	Reverse V	$V_{GS}=-20V, V_{DS}=0V$			-100	nA
ON CHARACTERISTICS						
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	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$	5		42	mΩ
Forward Transconductance	g_{FS}			33		s
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}		250	0	3250	pF
Output Capacitance	C_{OSS}			520	670	pF
Reverse Transfer Capacitance	C_{RSS}			100	130	pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	$V_{GS}=10V, V_{DD}=50V,$ $I_D=1.3A, I_G=100\mu A$	85		110	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		80	ns
Rise Time	t_R			320	650	ns
Turn-OFF Delay Time	$t_{D(OFF)}$			210	430	ns
Fall-Time	t_F			200	410	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				45.6	A
Maximum Body-Diode Pulsed Current	I_{SM}				182.4	A
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=40A, V_{GS}=0V$	0.1		1.48	V
Body Diode Reverse Recovery Time	t_{RR}	$V_{GS}=0V, I_S=45.6A$		30		ns
Body Diode Reverse Recovery Charge	Q_{RR}	$dI_F/dt=100A/\mu s$		0.55		μC

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