



20N15V

Preliminary

Power MOSFET

20A, 150V N-CHANNEL POWER MOSFET

DESCRIPTION

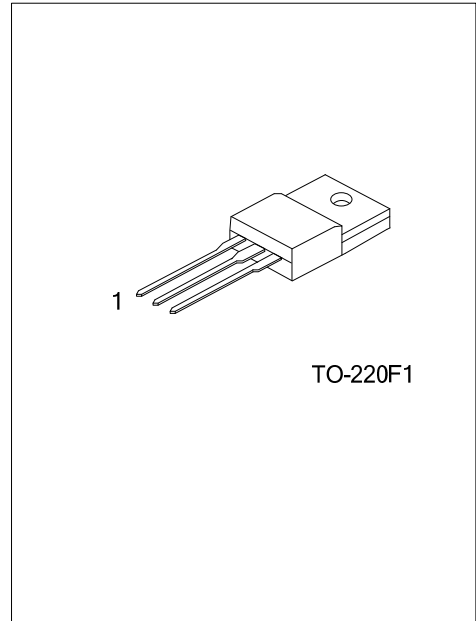
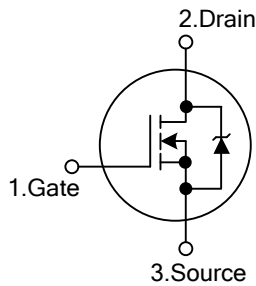
The UTC **20N15V** is an N-Channel POWER MOSFET, it uses UTC's advanced technology to provide customers with high switching speed and low gate charge.

The UTC **20N15V** is suitable for bridge circuits, power converters and PWM motor controls.

FEATURES

- * $R_{DS(on)} < 0.13\Omega$ @ $V_{GS} = 10V, I_D = 10A$
- * High switching speed
- * Low gate charge

SYMBOL



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
20N15VL-TF1-T	20N15VLG-TF1-T	TO-220F1	G	D	S	Tube

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

<p>20N15VL-TF1-T</p> <p>(1) Packing Type (2) Package Type (3) Lead Free</p>	<p>(1) T: Tube (2) TF1: TO-220F1 (3) L: Lead Free, G: Halogen Free</p>
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■ ABSOLUTE MAXIMUM RATINGS ($T_c=25^\circ\text{C}$, unless otherwise noted)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	150	V
Gate-Source Voltage	Continuous	V_{GSS}	± 20	V
Drain Current	Continuous	I_D	20	A
	Single Pulsed ($t_p \leq 10\mu\text{s}$)	I_{DM}	60	A
Single Drain-to-Source Avalanche Energy	Starting $T_J=25^\circ\text{C}$ ($V_{DD}=120\text{V}$, $V_{GS}=10\text{V}$, $I_L=20\text{A}$, $L=0.3\text{mH}$)	E_{AS}	60	mJ
Power Dissipation		P_D	50	W
Derate above 25°C			0.4	W/ $^\circ\text{C}$
Operating Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature Range		T_{STG}	-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

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62.5	$^\circ\text{C}/\text{W}$
Junction to Case	θ_{JC}	2.5	$^\circ\text{C}/\text{W}$

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

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	$I_D=0.25\text{mA}$, $V_{GS}=0\text{V}$	150			V
Drain-Source Leakage Current		I_{DSS}	$V_{DS}=150\text{V}$, $V_{GS}=0\text{V}$			10	μA
			$V_{DS}=150\text{V}$, $V_{GS}=0\text{V}$, $T_J=125^\circ\text{C}$			100	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 (Note 1)							
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=0.25\text{mA}$	1.0		2.5	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=10\text{A}$		0.12	0.13	Ω
Drain-Source On-Voltage		$V_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=20\text{A}$			2.8	V
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=25\text{V}$, $f=1.0\text{MHz}$		1133	1627	pF
Output Capacitance		C_{OSS}			332	474	pF
Reverse Transfer Capacitance		C_{RSS}			105	174	pF
SWITCHING PARAMETERS (Note 2)							
Gate Charge	Q_G	$V_{GS}=10\text{V}$, $V_{DS}=75\text{V}$, $I_D=20\text{A}$		39.1	55.9		nC
	Q_{GS}			7.5			nC
	Q_{GD}			22			nC
Turn-ON Delay Time		$t_{D(ON)}$	$V_{DD}=75\text{V}$, $V_{GS}=10\text{V}$, $I_D=20\text{A}$, $R_G=9.1\Omega$		11	25	ns
Rise Time		t_R			77	153	ns
Turn-OFF Delay Time		$t_{D(OFF)}$			33	67	ns
Fall-Time		t_F			49	97	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Drain-Source Diode Forward Voltage (Note 1)		V_{SD}	$I_S=20\text{A}$, $V_{GS}=0\text{V}$			1.5	V
Maximum Continuous Drain-Source Diode Forward Current		I_S				20	A
Pulsed Drain-Source Current		I_{SM}				60	A
Body Diode Reverse Recovery Time		t_{RR}	$I_S=20\text{A}$, $V_{GS}=0\text{V}$, $di_s/dt=100\text{A}/\mu\text{s}$		160		ns
Body Diode Reverse Recovery Charge		Q_{RR}			1.1		μC

Notes: 1. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycles $\leq 2\%$.

2. Switching characteristics are independent of operating junction temperature.

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