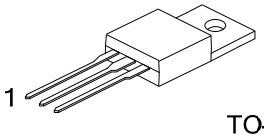
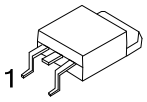
15A, 200V N-CHANNEL POWER MOSFET



TO-220



TO-252

■ DESCRIPTION

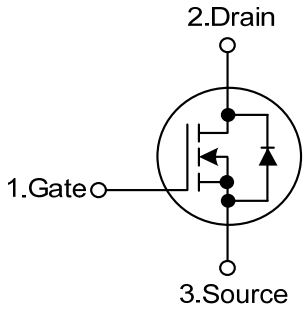
The UTC **15N20** is an N-channel enhancement MOSFET using UTC's advanced technology to provide the customers with perfect $R_{DS(ON)}$, high switching speed, high current capacity and low gate charge.

The UTC **15N20** is universally applied in low voltage such as automotive, high efficiency switching for DC/DC converters and DC motor control, etc.

■ FEATURES

* $R_{DS(ON)}$<0.28Ω @ V_{GS}=10V
* High Switching Speed

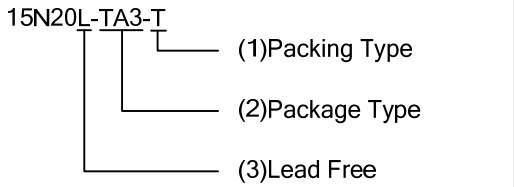
■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
15N20L-TA3-T	15N20G-TA3-T	TO-220	G	D	S	Tube
15N20L-TN3-R	15N20G-TN3-R	TO-252	G	D	S	Tape Reel

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

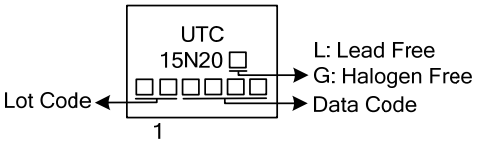


(1) T: Tube, R: Tape Reel

(2) TA3: TO-220, TN3: TO-252

(3) L: Lead Free, G: Halogen Free

■ MARKING



■ ABSOLUTE MAXIMUM RATINGS (unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	200	V
Gate-Source Voltage		V_{GSS}	±30	V
Continuous Drain Current	Continuous	I_D	15	A
	Pulsed	I_{DM}	60	A
Single Pulsed Avalanche Current		I_{AS}	15	A
Single Pulsed Avalanche Energy		E_{AS}	340	mJ
Power Dissipation	TO-220	P_D	145	W
	TO-252		83	
Junction Temperature		T_J	+150	°C
Storage Temperature		T_{STG}	-55 ~ +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 DATA

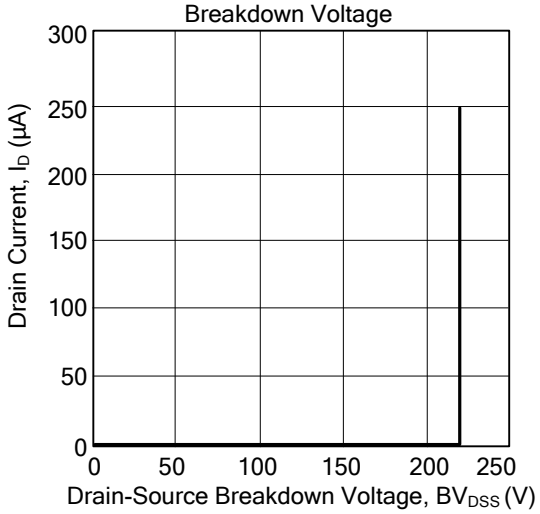
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220	θ_{JA}	62.5	°C/W
	TO-252		110	
Junction to Case	TO-220	θ_{JC}	0.86	°C/W
	TO-252		1.5	

■ ELECTRICAL CHARACTERISTICS

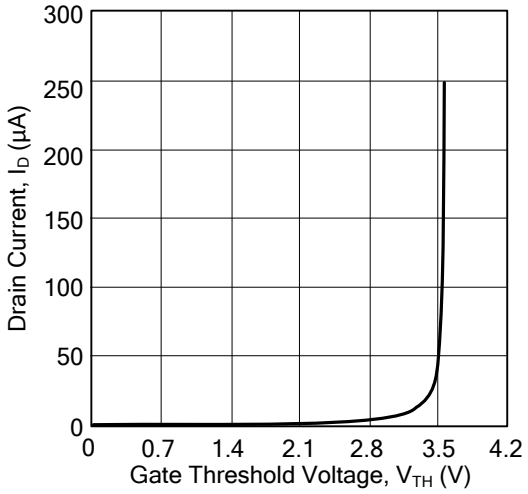
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	200			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=200V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+30V, V_{DS}=0V			+100	nA
	Reverse		V_{GS}=-30V, V_{DS}=0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	3		5	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=7.5A		0.18	0.28	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		610	800	pF
Output Capacitance		C_{OSS}			145	200	pF
Reverse Transfer Capacitance		C_{RSS}			42	60	pF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{GS}=10V, V_{DD}=50V, I_D=1.3A		27	32	nC
Gate to Source Charge		Q_{GS}			5.6		nC
Gate to Drain Charge		Q_{GD}			10		nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{DD}=30V, I_D=0.5A, R_G=25Ω, V_{GS}=10V, R_L=30 Ω		39	45	ns
Rise Time		t_R			63	90	ns
Turn-OFF Delay Time		$t_{D(OFF)}$			210	230	ns
Fall-Time		t_F			83	110	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				15	A
Maximum Body-Diode Pulsed Current		I_{SM}				60	A
Drain-Source Diode Forward Voltage		V_{SD}	I_S=15A, V_{GS}=0V			1.5	V

■ TYPICAL CHARACTERISTICS

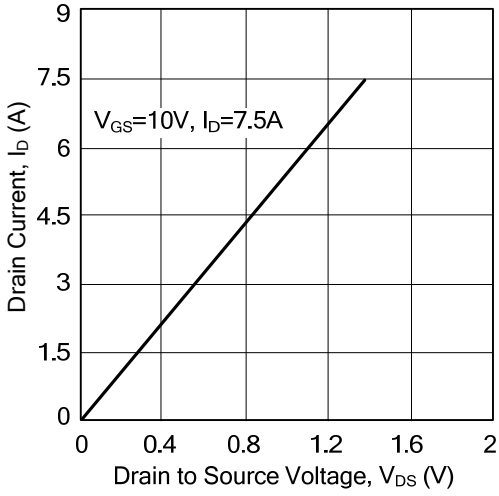
Drain Current vs. Drain-Source Breakdown Voltage



Drain Current vs. Gate Threshold Voltage



Drain-Source On-State Resistance Characteristics



Body-Diode Continuous Current vs. Source to Drain Voltage