



20N60

Power MOSFET

20A, 600V N-CHANNEL POWER MOSFET

■ DESCRIPTION

The UTC **20N60** is an N-channel enhancement mode power MOSFET using UTC's advanced technology to provide customers with planar stripe and DMOS technology. This technology is specialized in allowing a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

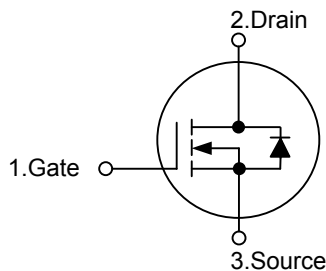
The UTC **20N60** is universally applied in motor control, UPS, DC choppers and switch-mode and resonant-mode power supplies.

■ FEATURES

* $R_{DS(ON)} < 0.45\Omega @ V_{GS}=10V, I_D=10A$

* High switching speed

■ SYMBOL



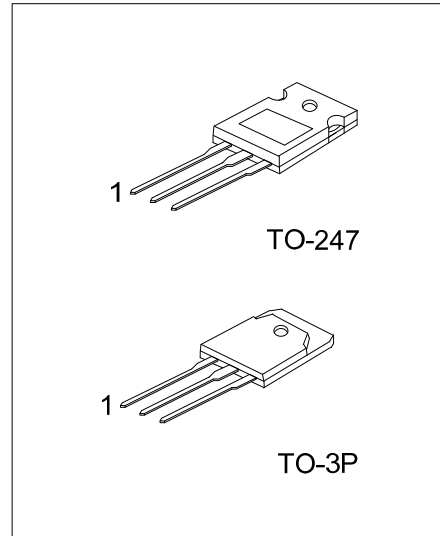
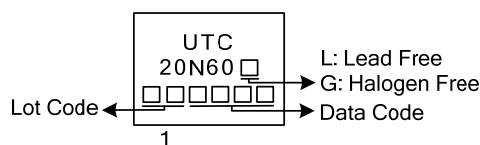
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
20N60L-T47-T	20N60G-T47-T	TO-247	G	D	S	Tube
20N60L-T3P-T	20N60G-T3P-T	TO-3P	G	D	S	Tube

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

<p>20N60L-T47-T</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) T: Tube</p> <p>(2) T47: TO-247, T3P: TO-3P</p> <p>(3) L: Lead Free, G: Halogen Free and Lead Free</p>
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■ MARKING



■ ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	600	V
Gate-Source Voltage		V_{GSS}	± 30	V
Drain Current	Continuous	I_D	20	A
	Pulsed	I_{DM}	80	A
Avalanche Energy	Single Pulsed(Note 2)	E_{AS}	1200	mJ
Power Dissipation	TO-247	P_D	370	W
	TO-3P		416	
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55 ~ +150	$^\circ\text{C}$

Notes: 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. $V_{DD}=50\text{V}$, Starting $T_J=25^\circ\text{C}$, Peak $I_{AS}=20\text{A}$, $L=6\text{mH}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-247	θ_{JA}	40	$^\circ\text{C/W}$
	TO-3P		30	
Junction to Case	TO-247	θ_{JC}	0.34	$^\circ\text{C/W}$
	TO-3P		0.3	

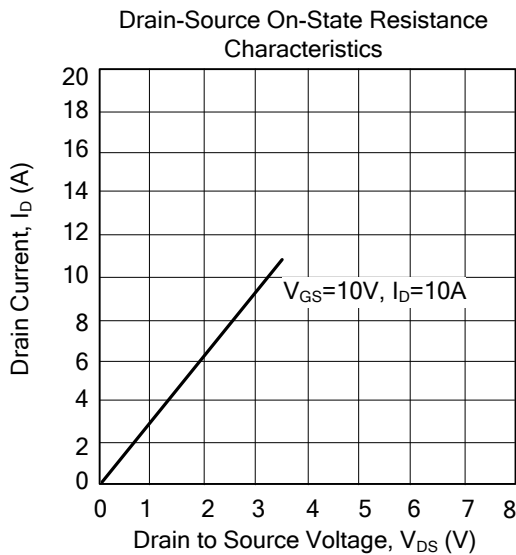
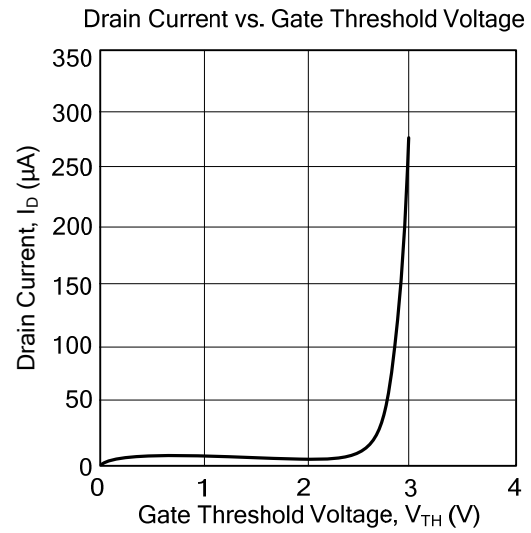
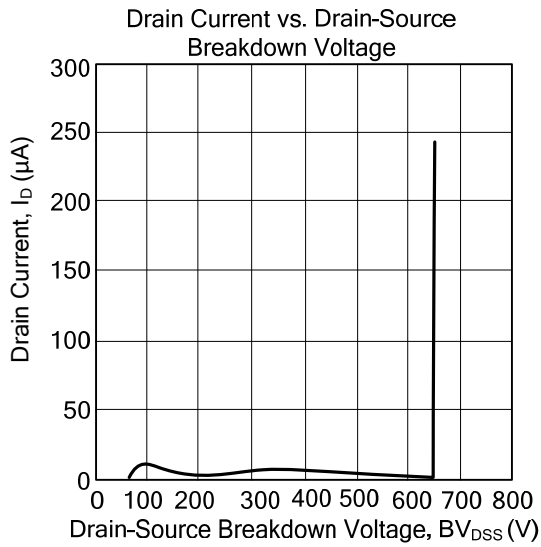
■ ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	600			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=600\text{V}$, $V_{GS}=0\text{V}$			10	μA
Gate- Source Leakage Current	I_{GSS}	Forward			+100	nA
		Reverse	$V_{GS}=+30\text{V}$, $V_{DS}=0\text{V}$			-100
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	2		4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=10\text{A}$, Pulse test, $t \leq 300\mu\text{s}$, duty cycle $d \leq 2\%$		0.32	0.45	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=25\text{V}$, $f=1\text{MHz}$		4500		pF
Output Capacitance	C_{OSS}			330		pF
Reverse Transfer Capacitance	C_{RSS}			140		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	$V_{GS}=10\text{V}$, $V_{DS}=300\text{V}$, $I_D=10\text{A}$ (Note 1, 2)			170	nC
Gate to Source Charge	Q_{GS}				40	nC
Gate to Drain Charge	Q_{GD}				85	nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{GS}=10\text{V}$, $V_{DS}=300\text{V}$, $I_D=10\text{A}$, $R_G=2\Omega$, (Note 1, 2)		110		ns
Rise Time	t_R			130		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			800		ns
Fall-Time	t_F			170		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S	$V_{GS}=0\text{V}$			20	A
Maximum Body-Diode Pulsed Current	I_{SM}	Repetitive			80	A
Drain-Source Diode Forward Voltage	V_{SD}	$I_F=I_S$, $V_{GS}=0\text{V}$, Pulse test, $t \leq 300\mu\text{s}$, duty cycle $d \leq 2\%$			1.5	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F=I_S$, $V_R=100\text{V}$, $-di/dt=100\text{A}/\mu\text{s}$ (Note 1)		600		ns

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

2. Essentially independent of operating temperature

TYPICAL CHARACTERISTICS



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