



20N65

Power MOSFET

20A, 650V N-CHANNEL POWER MOSFET

DESCRIPTION

The UTC **20N65** 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.

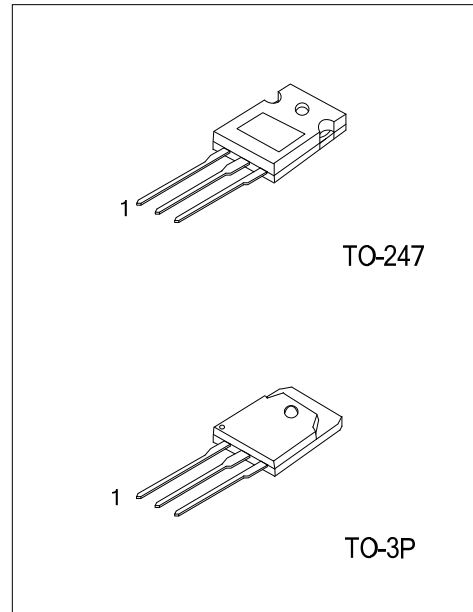
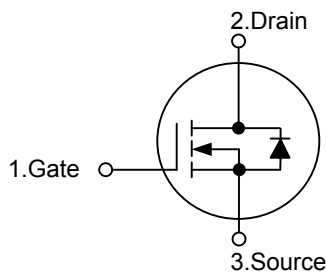
The UTC **20N65** is universally applied in motor control, UPS, DC choppers and switch-mode and resonant-mode power supplies.

FEATURES

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

* High switching speed

SYMBOL



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
20N65L-T47-T	20N65G-T47-T	TO-247	G	D	S	Tube
20N65L-T3P-T	20N65G-T3P-T	TO-3P	G	D	S	Tube

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

<p>20N65L-T47-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Lead Free</p>	<p>(1) T: Tube</p> <p>(2) T47: TO-247, T3P: TO-3P</p> <p>(3) L: Lead Free , G: Halogen Free</p>
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■ ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	650	V
Gate-Source Voltage		V_{GSS}	± 30	V
Drain Current ($T_C = 25^\circ\text{C}$)	Continuous	I_D	20	A
	Pulsed	I_{DM}	80	A
Avalanche Energy		Single Pulsed (Note 2)	E_{AS}	1200
Power Dissipation	TO-247	P_D	367	W
	TO-3P		416	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55~+150	$^\circ\text{C}$

Note: 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	$^\circ\text{C/W}$
Junction to Case	TO-247	θ_{JC}	0.34	$^\circ\text{C/W}$
	TO-3P		0.3	$^\circ\text{C/W}$

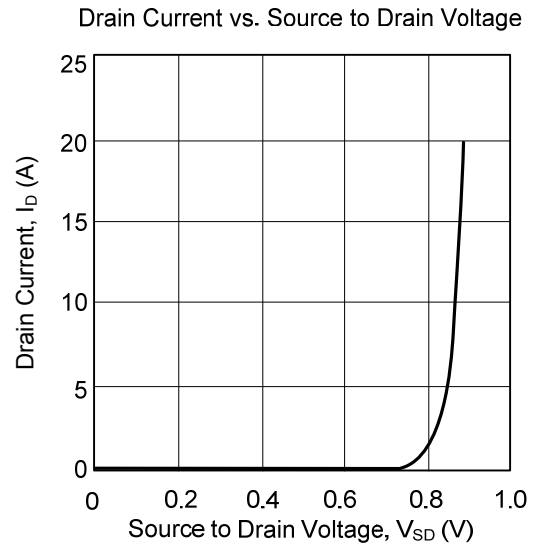
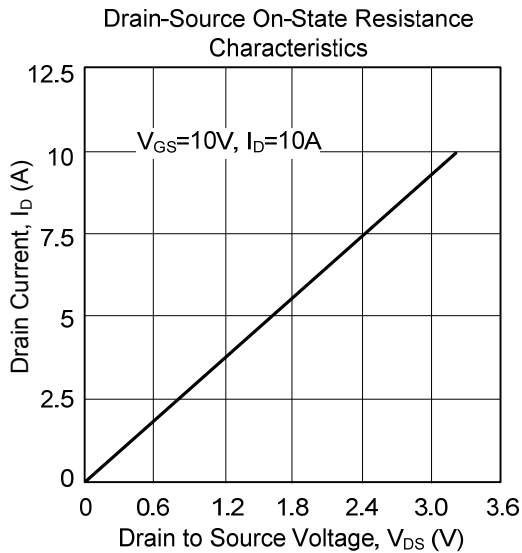
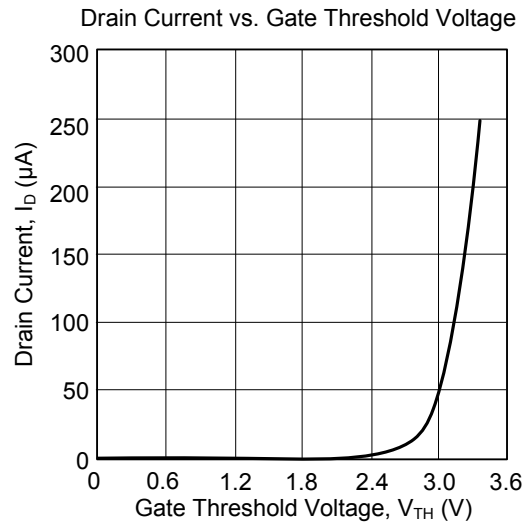
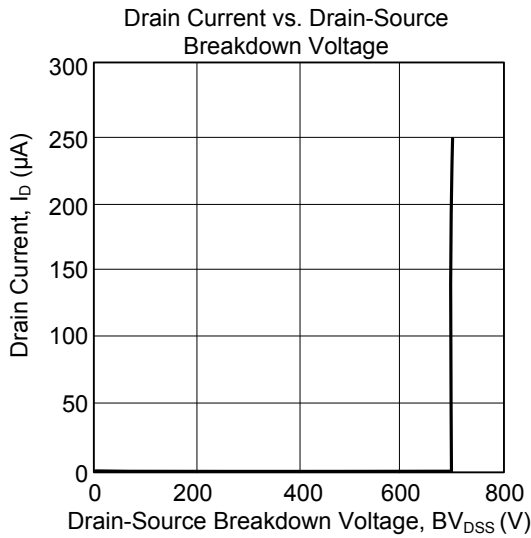
■ ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
OFF CHARACTERISTICS								
Drain-Source Breakdown Voltage		BV_{DSS}	$I_D = 250\mu\text{A}$, $V_{GS} = 0\text{V}$	650			V	
Drain-Source Leakage Current		I_{DSS}	$V_{DS} = 650\text{V}$, $V_{GS} = 0\text{V}$			10	μA	
Gate- Source Leakage Current	Forward	I_{GSS}	$V_{GS} = +30\text{V}$, $V_{DS} = 0\text{V}$			+100	nA	
	Reverse		$V_{GS} = -30\text{V}$, $V_{DS} = 0\text{V}$			-100	nA	
ON CHARACTERISTICS								
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS} = V_{GS}$, $I_D = 250\mu\text{A}$	2.0		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}				300		pF
Reverse Transfer Capacitance		C_{RSS}				140		pF
SWITCHING PARAMETERS								
Total Gate Charge		Q_G	$V_{GS} = 10\text{V}$, $V_{DS} = 520\text{V}$, $I_D = 10\text{A}$ (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		$t_{D(ON)}$	$V_{GS} = 10\text{V}$, $V_{DS} = 325\text{V}$, $I_D = 10\text{A}$, $R_G = 2\Omega$ (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	

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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