

**UTC** UNISONIC TECHNOLOGIES CO., LTD

### 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.

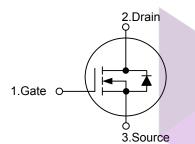
The UTC 20N60 is universally applied in motor control, UPS, DC choppers and switch-mode and resonant-mode power supplies.

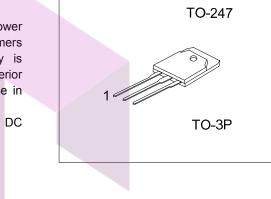
#### **FEATURES**

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

\* High switching speed

**SYMBOL** 



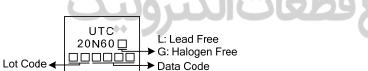


#### **ORDERING INFORMATION**

Ordering Number		Deekege	Pin Assignment			Deaking	
	Lead Free	Halogen Free	Package	1	2	3	Packing
	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:	Note: Pin Assignment: G: Gate D: Drain S: Source						

D: Drain Pin Assignment: G: Gate 20N60L-T47-(1) T: Tube (1)Packing Type (2) T47: TO-247, T3P: TO-3P (2)Package Type (3)Green Package (3) L: Lead Free, G: Halogen Free and Lead Free

MARKING



#### ■ **ABSOLUTE MAXIMUM RATINGS** (T<sub>c</sub> =25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V <sub>DSS</sub>	600	V
Gate-Source Voltage		V <sub>GSS</sub>	±30	V
Ducia Quanant	Continuous	I <sub>D</sub>	20	А
Drain Current	Pulsed	I <sub>DM</sub>	80	A A D mJ
Avalanche Energy	Single Pulsed(Note 2)	E <sub>AS</sub>	1200	mJ
Dower Dissinction	TO-247		370	10/
Power Dissipation	TO-3P	PD	416	W
Junction Temperature		TJ	+150	°C
Storage Temperature		T <sub>STG</sub>	-55 ~ +150	°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<sub>DD</sub>=50V, Starting T<sub>J</sub>=25°C, Peak I<sub>AS</sub>=20A, L=6mH

#### THERMAL DATA

PARAMETER		SYMBOL		RATIN	GS	UNIT	
lunction to Ambient	TO-247	0		40		°C/W	
Junction to Ambient	TO-3P	θ <sub>JA</sub>		30			
lunction to Coop	TO-247	$\theta_{JC}$		0.34		°C/W	
Junction to Case	TO-3P			0.3			

#### ■ ELECTRICAL CHARACTERISTICS (T<sub>J</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> =250μA, V <sub>GS</sub> =0V	600			V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =600V, V <sub>GS</sub> =0V			10	μA
Gate- Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =+30V, V <sub>DS</sub> =0V			+100	nA
Reverse		V <sub>GS</sub> =-30V, V <sub>DS</sub> =0V			-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2		4.0	V
Static Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =10A, Pulse test, t≤300µs, duty cycle d≤2%		0.32	0.45	Ω
DYNAMIC PARAMETERS						
Input Capacitance	CISS			4500		рF
Output Capacitance	Coss	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1MHz		330		рF
Reverse Transfer Capacitance	C <sub>RSS</sub>			140		рF
SWITCHING PARAMETERS						
Total Gate Charge	$Q_{G}$				170	nC
Gate to Source Charge	Q <sub>GS</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =300V, I <sub>D</sub> =10A (Note 1, 2)			40	nC
Gate to Drain Charge	Q <sub>GD</sub>	(NOTE 1, 2)			85	nC
Turn-ON Delay Time	t <sub>D(ON)</sub>			110		ns
Rise Time	t <sub>R</sub>	$V_{GS}$ =10V, $V_{DS}$ =300V, $I_{D}$ =10A, $R_{G}$ =2 $\Omega$ ,		130		ns
Turn-OFF Delay Time	t <sub>D(OFF)</sub>	(Note 1, 2)		800		ns
Fall-Time	t <sub>F</sub>			170		ns
SOURCE- DRAIN DIODE RATINGS AND	CHARACT	ERISTICS				-
Maximum Body-Diode Continuous	11 la 11	V <sub>GS</sub> =0V			20	А
Current	I <sub>S</sub>			**	20	~
Maximum Body-Diode Pulsed Current	I <sub>SM</sub>	Repetitive	22		80	А
Drain-Source Diode Forward Voltage	$V_{\text{SD}}$	I <sub>F</sub> =I <sub>S</sub> , V <sub>GS</sub> =0V, Pulse test, t≤300µs, duty cycle d≤2%	**		1.5	V
Body Diode Reverse Recovery Time	t <sub>rr</sub>	$I_F = I_S, V_R = 100V, -di/dt = 100A/\mu s(Note 1)$		600		ns
Notoe: 1 Pulso Tost: Pulso width < 300us	Duticavala	< <b>20</b> /				

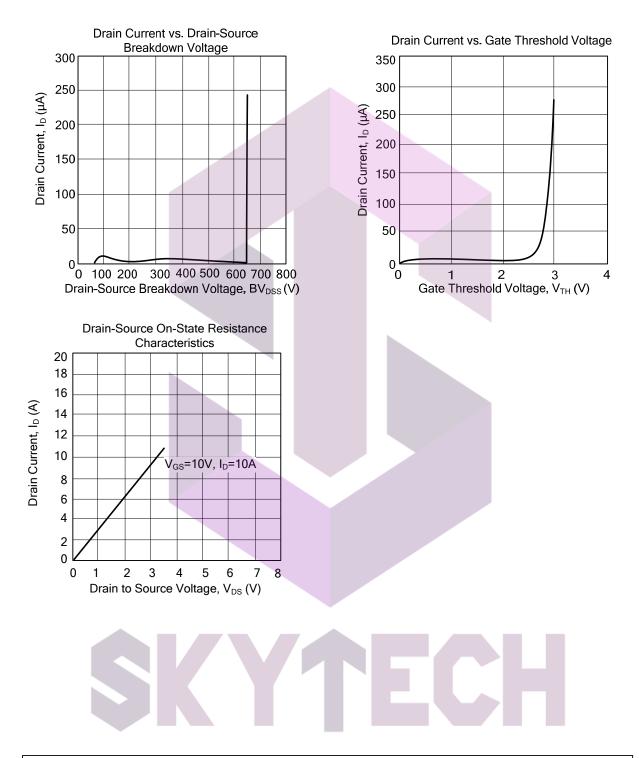
Notes: 1. Pulse Test: Pulse width  $\leq$  300µs, Duty cycle $\leq$ 2%

2. Essentially independent of operating temperature



# 20N60

#### TYPICAL CHARACTERISTICS



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