



# UNISONIC TECHNOLOGIES CO., LTD

## 18N60

Preliminary

Power MOSFET

### POLARHV HIPERFET POWER MOSFET

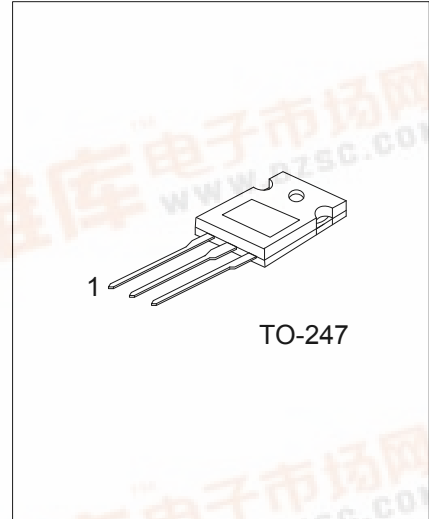
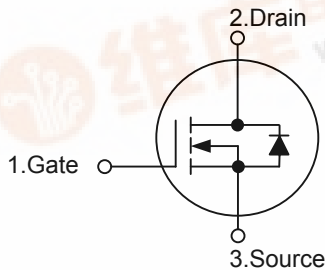
#### DESCRIPTION

The UTC **18N60** uses UTC's advanced proprietary, planar stripe, DMOS technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

#### FEATURES

- \*  $R_{DS(ON)} \leq 400m\Omega @ V_{GS} = 10V$
- \* Ultra low gate charge ( typical 50nC )
- \* Low reverse transfer capacitance (  $C_{RSS} =$  typical 23pF )
- \* Fast switching capability
- \* Avalanche energy specified
- \* Improved dv/dt capability, high ruggedness

#### SYMBOL



Lead-free: 18N60L  
Halogen-free : 18N60G

#### ORDERING INFORMATION

Ordering Number			Package	Pin Assignment			Packing
Normal	Lead Free	Halogen Free		1	2	3	
18N60-T47-T	18N60L-T47-T	18N60G-T47-T	TO-247	G	D	S	Tube

<p>18N60L-T47-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Lead Plating</p>	<p>(1) T: Tube</p> <p>(2) T47: TO-247</p> <p>(3) G: Halogen Free, L: Lead Free, Blank: Pb/Sn</p>
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■ ABSOLUTE MAXIMUM RATINGS ( $T_C = 25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	$V_{DSS}$	600	V
Gate-Source Voltage	$V_{GSS}$	$\pm 30$	V
Continuous Drain Current	$I_D$	18	A
Pulsed Drain Current	$I_{DM}$	45	A
Avalanche Current	$I_{AR}$	18	A
Avalanche Energy	Single Pulsed	$E_{AS}$	1000
	Repetitive	$E_{AR}$	30
Peak Diode Recovery dv/dt	dv/dt	10	V/ns
Power Dissipation	$P_D$	360	W
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-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 DATA

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Junction-to-Case	$\theta_{JC}$			0.35	$^\circ\text{C}/\text{W}$

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$	600			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=V_{DSS}, V_{GS}=0\text{V}$			25	$\mu\text{A}$
Gate-Body Leakage Current	$I_{GSS}$	$V_{DS}=0\text{V}, V_{GS}=\pm 30\text{V}$			$\pm 100$	nA
<b>ON CHARACTERISTICS</b>						
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-Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}, I_D=0.5I_{D25}$ (Note 1)			400	m $\Omega$
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{DS}=25\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$		2500		pF
Output Capacitance	$C_{OSS}$			280		pF
Reverse Transfer Capacitance	$C_{RSS}$			23		pF
<b>SWITCHING PARAMETERS</b>						
Turn-ON Delay Time	$t_{D(ON)}$	$V_{GS}=10\text{V}, V_{DS}=0.5V_{DSS}, I_D=I_{D25}, R_G=5\Omega$ (External)		21		ns
Turn-ON Rise Time	$t_R$			22		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			62		ns
Turn-OFF Fall-Time	$t_F$			22		ns
Total Gate Charge	$Q_G$	$V_{GS}=10\text{V}, V_{DS}=0.5V_{DSS}, I_D=0.5I_{D25}$		50		nC
Gate Source Charge	$Q_{GS}$			15		nC
Gate Drain Charge	$Q_{GD}$			18		nC
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Drain-Source Diode Forward Voltage	$V_{SD}$	$I_F=I_S, V_{GS}=0\text{V}$ (Note 1)			1.5	V
Maximum Continuous Drain-Source Diode Forward Current	$I_S$	$V_{GS}=0\text{V}$			18	A
Maximum Pulsed Drain-Source Diode Forward Current	$I_{SM}$	Repetitive			54	A
Reverse Recovery Time	$t_{RR}$	$V_{GS}=0\text{V}, di/dt=100\text{A/s}, I_S=18\text{A}, V_R=100\text{V}$			200	ns
Reverse Recovery Charge	$Q_{RR}$			0.8		$\mu\text{C}$

Note 1. Pulse Test: Pulse Width  $\leq 300$  s, Duty Cycle  $\leq 2\%$ .

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