

# UNISONIC TECHNOLOGIES CO., LTD

UT70N03 Preliminary Power MOSFET

# N-CHANNEL ENHANCEMENT MODE

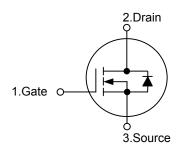
### DESCRIPTION

The **UT70N03** uses advanced trench technology to provide excellent  $R_{\text{DS(ON)}}$ , low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

## ■ FEATURES

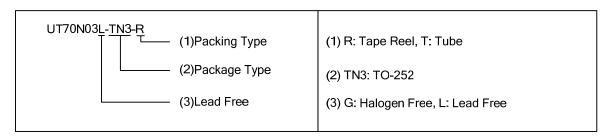
- \*  $R_{DS(ON)}$ < 9m $\Omega$  @  $V_{GS}$ =10V,  $I_D$ =33A
- \*  $R_{DS(ON)}$ < 18m $\Omega$  @  $V_{GS}$ =4.5V,  $I_D$ =20A
- \* Low capacitance
- \* Low gate charge
- \* Fast switching capability
- \* Avalanche energy specified

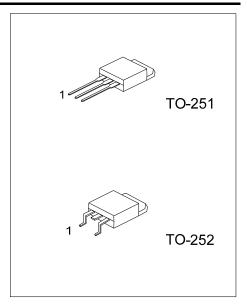
#### ■ SYMBOL



## ORDERING INFORMATION

Ordering Number		Dookogo	Pin Assignment			Dooking	
Lead Free	Halogen Free	Package	1	2	3	Packing	
UT70N03L-TM3-T	UT70N03G-TM3-T	TO-251	G	D	S	Tube	
UT70N03L-TN3-T	UT70N03G-TN3-T	TO-252	G	D	S	Tube	
UT70N03L-TN3-R	UT70N03G-TN3-R	TO-252	G	D	S	Tape Reel	





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

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	$V_{DSS}$	30	V
Gate-Source Voltage	$V_{GSS}$	±20	V
Continuous Drain Current	I <sub>D</sub>	60	Α
Pulsed Drain Current	I <sub>DM</sub>	195	Α
Power Dissipation	Б	53	W
Linear Derating Factor	$P_D$	0.36	W/°C
Junction Temperature	TJ	+150	$^{\circ}\!\mathbb{C}$
Storage Temperature	T <sub>STG</sub>	-55 ~ <b>+</b> 150	$^{\circ}\!\mathbb{C}$

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	$\theta_{JA}$	110	°C/W
Junction to Case	$\theta_{JC}$	2.8	°C/W

## ■ 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>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	30			V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V			1	μΑ
Gate-Source Leakage Current	$I_{GSS}$	V <sub>GS</sub> =±20V			±100	nΑ
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$ , $I_D=250\mu A$	1		3	٧
Static Drain-Source On-Resistance		V <sub>GS</sub> =10V, I <sub>D</sub> =33A			9	mΩ
	$R_{DS(ON)}$	$V_{GS}$ =4.5V, $I_D$ =20A			18	
Forward Transconductance	<b>g</b> FS	V <sub>DS</sub> =10V, I <sub>D</sub> =33A		35		S
DYNAMIC PARAMETERS	_					
Input Capacitance	C <sub>ISS</sub>	V 05) ( ) ( 0) (		1485		pF
Output Capacitance	Coss	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, -f=1.0MHz		245		pF
Reverse Transfer Capacitance	$C_{RSS}$	1 - 1.0IVIH2		170		pF
SWITCHING PARAMETERS						
Total Gate Charge	$Q_{\mathrm{G}}$	\\ -20\\ \\ -4.5\\		16.5		nC
Gate Source Charge	$Q_GS$	V <sub>DS</sub> =20V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =33A		5		nC
Gate Drain Charge	$Q_GD$	ID-33A		10.3		nC
Turn-ON Delay Time	$t_{D(ON)}$			8.2		ns
Turn-ON Rise Time	$t_R$	$V_{GS}$ =10V, $V_{DS}$ =15V, $I_{D}$ =33A,		105		ns
Turn-OFF Delay Time	t <sub>D(OFF)</sub>	$R_D=0.45\Omega$ , $R_G=3.3\Omega$		21.4		ns
Turn-OFF Fall-Time	$t_{F}$			8.5		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Diode Forward Voltage (Note 2)	$V_{SD}$	I <sub>S</sub> =60A, V <sub>GS</sub> =0V			1.3	V
Maximum Body-Diode Continuous Current	Is	$V_D = V_G = 0V, V_S = 1.3V$			60	Α
Pulsed Source Current (Body Diode)	I <sub>SM</sub>	(Note 1)			195	Α

Note: 1. Pulse width limited by safe operating area.

<sup>2.</sup> Pulse width < 300us, duty cycle < 2%.

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