



## UT70N03

Preliminary

Power MOSFET

### N-CHANNEL ENHANCEMENT MODE

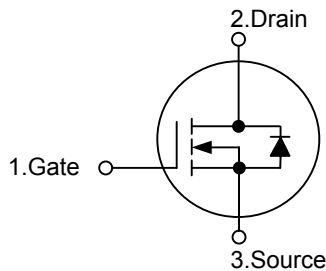
#### DESCRIPTION

The **UT70N03** uses advanced trench 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

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

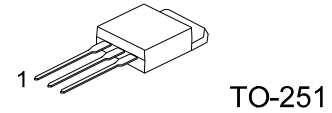
#### SYMBOL



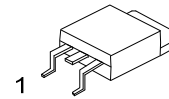
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
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

<p>UT70N03L-TN3-R</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Lead Free</p>	<p>(1) R: Tape Reel, T: Tube</p> <p>(2) TN3: TO-252</p> <p>(3) G: Halogen Free, L: Lead Free</p>
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TO-251



TO-252

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

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	$V_{DSS}$	30	V
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	60	A
Pulsed Drain Current	$I_{DM}$	195	A
Power Dissipation	$P_D$	53	W
Linear Derating Factor		0.36	W/ $^{\circ}\text{C}$
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	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	110	$^{\circ}\text{C}/\text{W}$
Junction to Case	$\theta_{JC}$	2.8	$^{\circ}\text{C}/\text{W}$

■ 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 <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	μA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V			±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	1		3	V
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =33A			9	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A			18	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =33A		35		S
DYNAMIC PARAMETERS						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0MHz		1485		pF
Output Capacitance	C <sub>OSS</sub>			245		pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			170		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q <sub>G</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =33A		16.5		nC
Gate Source Charge	Q <sub>GS</sub>			5		nC
Gate Drain Charge	Q <sub>GD</sub>			10.3		nC
Turn-ON Delay Time	t <sub>D(ON)</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, I <sub>D</sub> =33A, R <sub>D</sub> =0.45Ω, R <sub>G</sub> =3.3Ω		8.2		ns
Turn-ON Rise Time	t <sub>R</sub>			105		ns
Turn-OFF Delay Time	t <sub>D(OFF)</sub>			21.4		ns
Turn-OFF Fall-Time	t <sub>F</sub>			8.5		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Diode Forward Voltage (Note 2)	V <sub>SD</sub>	I <sub>S</sub> =60A, V <sub>GS</sub> =0V			1.3	V
Maximum Body-Diode Continuous Current	I <sub>S</sub>	V <sub>D</sub> =V <sub>G</sub> =0V, V <sub>S</sub> =1.3V			60	A
Pulsed Source Current (Body Diode)	I <sub>SM</sub>	(Note 1)			195	A

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

2. Pulse width < 300us, duty cycle < 2%.

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