



## UT136N03

Preliminary

Power MOSFET

### N-CHANNEL ENHANCEMENT MODE

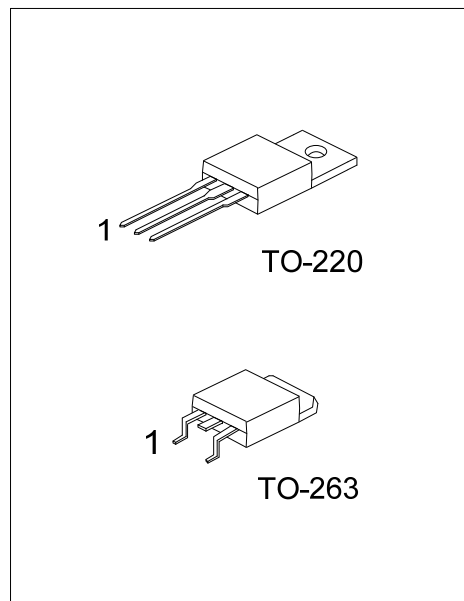
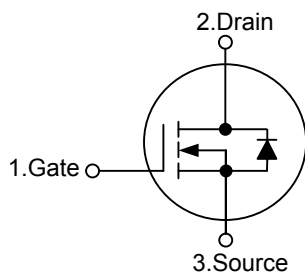
#### DESCRIPTION

The **UT136N03** 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

- \*  $V_{DS}(V) = 30\text{ V}$
- \*  $I_D = 136\text{ A}$
- \*  $R_{DS(ON)} = 4.5\text{ m}\Omega @ V_{GS} = 10\text{ V}$
- \*  $R_{DS(ON)} = 5.6\text{ m}\Omega @ V_{GS} = 4.5\text{ V}$

#### SYMBOL



#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT136N03L-TA3-R	UT136N03G-TA3-T	TO-220	G	D	S	Tube
UT136N03L-TQ2-T	UT136N03G-TQ2-T	TO-263	G	D	S	Tube
UT136N03L-TQ2-R	UT136N03G-TQ2-R	TO-263	G	D	S	Tape Reel

<p>UT136N03L-TA3-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) TA3: TO-220, TQ2: TO-263</p> <p>(3) G: Halogen Free, L: Lead 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	$V_{DSS}$	30	V
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	136	A
Pulsed Drain Current (Note1)	$I_{DM}$	400	A
Single Pulsed Avalanche Energy (Note4)	$E_{AS}$	875	mJ
Power Dissipation	$P_D$	100	W
Junction Temperature	$T_J$	+175	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55 ~ +175	$^\circ\text{C}$

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	$\theta_{JA}$	62.5	$^\circ\text{C/W}$
Junction to Case	$\theta_{JC}$	1.4	$^\circ\text{C/W}$

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	30			V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$			1	$\mu\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			$\pm 100$	nA
<b>ON CHARACTERISTICS (Note2)</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	1		3	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS} = 10\text{ V}, I_D = 40\text{ A}$		3.6	4.5	m $\Omega$
		$V_{GS} = 4.5\text{ V}, I_D = 40\text{ A}$			5.6	
<b>DYNAMIC PARAMETERS (Note3)</b>						
Input Capacitance	$C_{ISS}$	$V_{DS} = 15\text{ V}, V_{GS} = 0\text{ V}, f = 1.0\text{ MHz}$		3800		pF
Output Capacitance	$C_{OSS}$			800		
Reverse Transfer Capacitance	$C_{RSS}$			600		
<b>SWITCHING PARAMETERS (Note3)</b>						
Total Gate Charge	$Q_G$	$V_{DS} = 15\text{ V}, V_{GS} = 5\text{ V}, I_D = 16\text{ A}$		60	72	nC
Gate Source Charge	$Q_{GS}$			20.8		
Gate Drain Charge	$Q_{GD}$			22		
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD} = 15\text{ V}, I_D = 1\text{ A}, R_{GEN} = 6\ \Omega$ $V_{GS} = 10\text{ V}$		25.7	50	ns
Turn-ON Rise Time	$t_R$			10	20	
Turn-OFF Delay Time	$t_{D(OFF)}$			128	200	
Turn-OFF Fall-Time	$t_F$			34	70	
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Drain-Source Diode Forward Voltage	$V_{SD}$	$I_S = 20\text{ A}, V_{GS} = 0\text{ V}$			1.5	V
Drain-Source Diode Forward Current	$I_S$				90	A

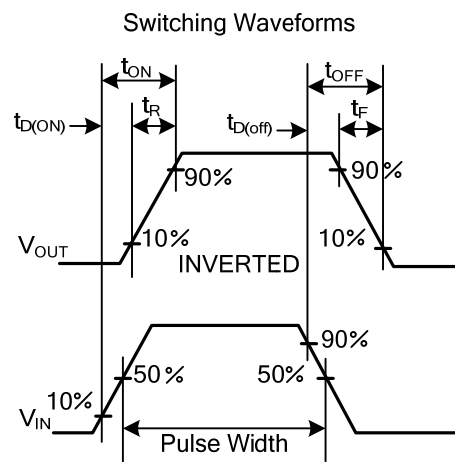
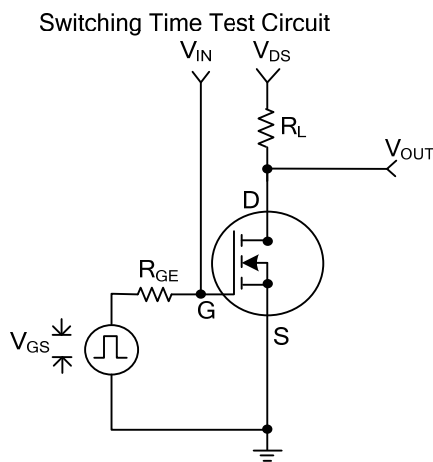
Note : 1. Pulse width limited by maximum junction temperature

2. Pulse Test : Pulse Width < 300 $\mu\text{s}$ , Duty Cycle < 2%.

3. Guaranteed by design, not subject to production testing.

4. L = 0.5mH,  $I_{AS} = 35\text{ A}, V_{DD} = 25\text{ V}, R_G = 25\ \Omega$ , Starting  $T_J = 25^\circ\text{C}$ .

■ TEST CIRCUIT AND WAVEFORM



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