



## UTD436

Preliminary

Power MOSFET

### N-CHANNEL ENHANCEMENT MODE

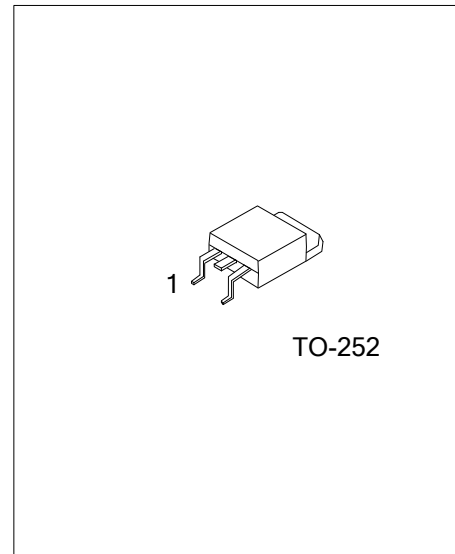
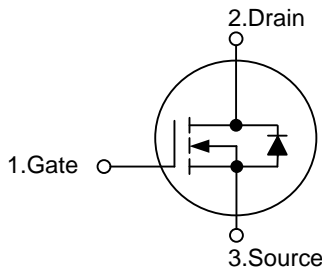
#### DESCRIPTION

The **UTD436** uses UTC's 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

- \*  $R_{DS(ON)} \leq 7.5 \text{ m}\Omega @ V_{GS}=10V, I_D = 20A$
- \*  $R_{DS(ON)} \leq 13 \text{ m}\Omega @ V_{GS}=4.5V, I_D = 20A$
- \* Low capacitance
- \* Low gate charge
- \* Fast switching capability
- \* Avalanche energy specified

#### SYMBOL



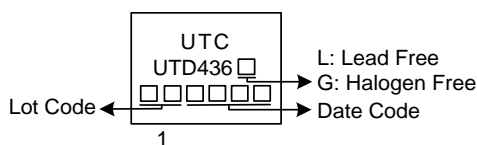
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTD436L-TN3-R	UTD436G-TN3-R	TO-252	G	D	S	Tape Reel

Note: Pin Assignment: G: Gate D: Drain S: Source

<p>UTD436G-TN3-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) TN3: TO-252</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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#### MARKING



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

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V <sub>DSS</sub>	30	V
Gate-Source Voltage	V <sub>GSS</sub>	±20	V
Continuous Drain Current	I <sub>D</sub>	60	A
Pulsed Drain Current	I <sub>DM</sub>	130	A
Avalanche Current	I <sub>AR</sub>	30	A
Repetitive Avalanche Energy L=0.1mH	E <sub>AR</sub>	113	mJ
Power Dissipation	P <sub>D</sub>	50	W
Junction Temperature	T <sub>J</sub>	+175	°C
Storage Temperature	T <sub>STG</sub>	-55 ~ +175	°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. Repetitive Rating: Pulse width limited by maximum junction temperature

### ■ THERMAL DATA

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Junction-to-Ambient	θ <sub>JA</sub>		39	50	°C/W
Junction-to-Case	θ <sub>JC</sub>		2	3	°C/W

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
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> =24V, V <sub>GS</sub> =0V			1	μA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			100	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1	1.8	3	V
On State Drain Current	I <sub>D(ON)</sub>	V <sub>DS</sub> =5V, V <sub>GS</sub> =10V	85			A
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A		5.4	7.5	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A		9.8	13	mΩ
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =20A		88		S
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=100kHz		1520	1825	pF
Output Capacitance	C <sub>OSS</sub>			306		pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			214		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge	10V	Q <sub>G</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A	31.9	39	nC
	4.5V			16.2	20	
Gate Source Charge	Q <sub>GS</sub>	5			nC	
Gate Drain Charge	Q <sub>GD</sub>	9.6			nC	
Turn-ON Delay Time	t <sub>D(ON)</sub>	7			ns	
Turn-ON Rise Time	t <sub>R</sub>	11.6			ns	
Turn-OFF Delay Time	t <sub>D(OFF)</sub>	24.2			ns	
Turn-OFF Fall-Time	t <sub>F</sub>	7.7			ns	
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Body-Diode Continuous Current	I <sub>S</sub>			85		A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =1A, V <sub>GS</sub> =0V		0.71	1	V
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =20A, di/dt=100A/μs		23.8	30	ns
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>			15.7		nC

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