



## UTD408

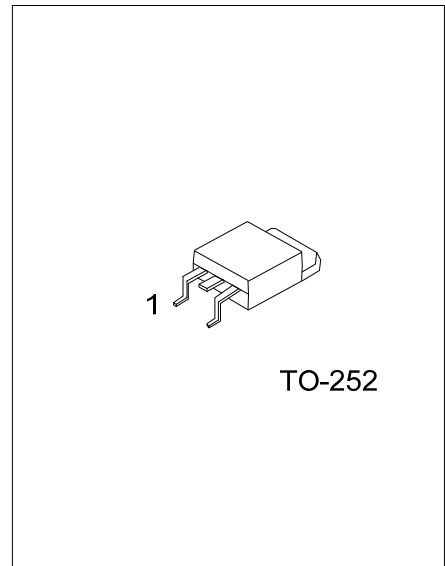
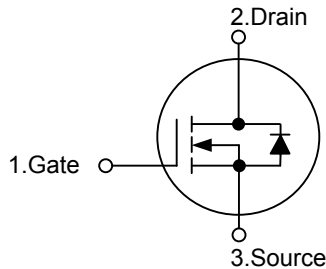
Power MOSFET

### N-CHANNEL ENHANCEMENT MODE

#### FEATURES

- \*  $R_{DS(ON)} = 18m\Omega @ V_{GS} = 10V$
- \* Low capacitance
- \* Optimized gate charge
- \* Fast switching capability
- \* Avalanche energy specified

#### SYMBOL



TO-252

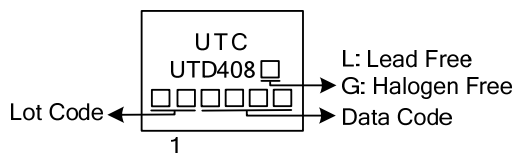
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTD408L-TN3-R	UTD408G-TN3-R	TO-252	G	D	S	Tape Reel

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

<p>UTD408L-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) L: Lead Free, G: Halogen Free and Lead Free</p>
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#### MARKING



■ 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 ( $T_C=25^\circ\text{C}$ ) (Note 4)	$I_D$	18	A	
Pulsed Drain Current (Note 3)	$I_{DM}$	40	A	
Avalanche Current (Note 3)	$I_{AR}$	18	A	
Repetitive Avalanche Energy ( $L=0.1\text{mH}$ ) (Note 3)	$E_{AR}$	40	mJ	
Power Dissipation	$P_D$	$T_A=25^\circ\text{C}$ (Note 1)	2.5	W
		$T_C=25^\circ\text{C}$ (Note 2)	60	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	RATING	UNIT
Junction to Ambient (Note 1)	$\theta_{JA}$	50	$^\circ\text{C/W}$
Junction to Case (Note 3)	$\theta_{JC}$	2.08	$^\circ\text{C/W}$

- Notes: 1. The value of  $R_{\theta_{JA}}$  is measured with the device mounted on  $1\text{in}^2$  FR-4 board with 2oz. Copper, and the maximum temperature of  $150^\circ\text{C}$  may be used if the PCB or heat-sink allows it.
2. The power dissipation  $P_D$  is based on  $T_{J(\text{MAX})} = 150^\circ\text{C}$ , using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heat-sinking is used.
3. Repetitive rating, pulse width limited by junction temperature  $T_{J(\text{MAX})} = 150^\circ\text{C}$ .
4. The maximum current rating is limited by bond-wires.

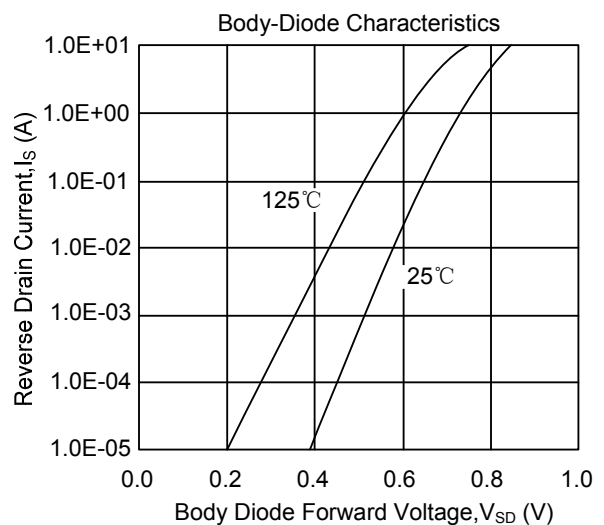
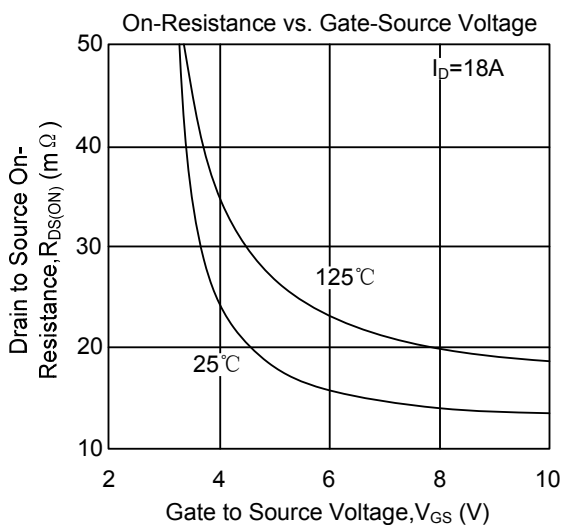
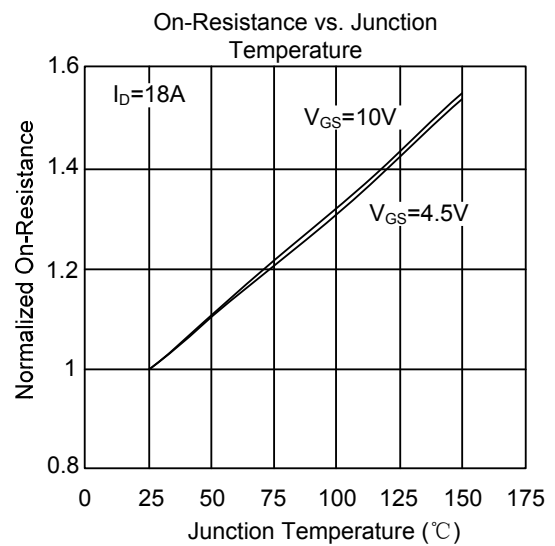
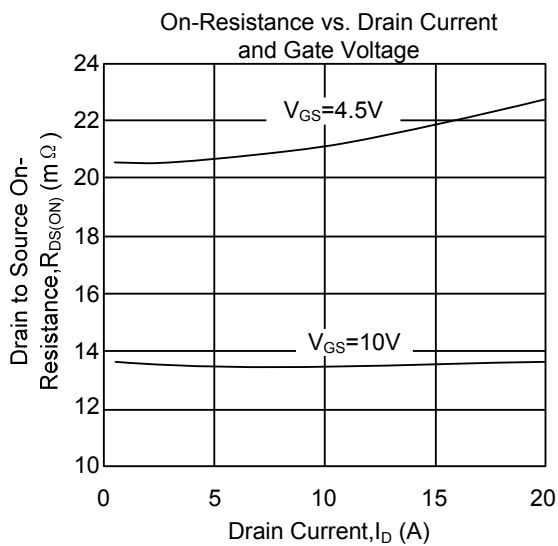
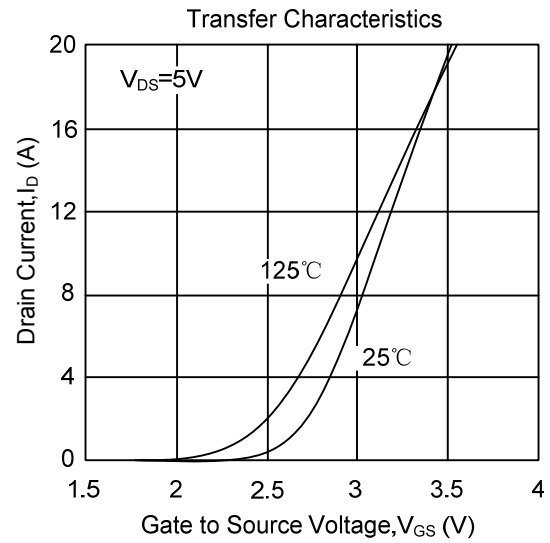
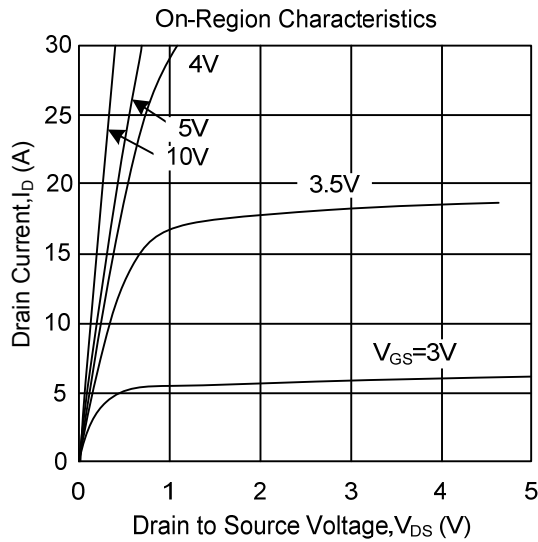
■ ELECTRICAL CHARACTERISTICS (T<sub>J</sub> =25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0 V, I <sub>D</sub> =250μA	30			V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =24V, V <sub>GS</sub> =0 V			1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0 V, 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> =250 μA	1	1.8	2.5	V
On State Drain Current	I <sub>D(ON)</sub>	V <sub>DS</sub> =5V, V <sub>GS</sub> =4.5V	40			A
Static Drain-Source On-Resistance	R <sub>Ds(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =18A		13.6	18	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =10A		20.6	27	mΩ
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =15 V, V <sub>GS</sub> =0V, f=1MHz		1040	1250	pF
Output Capacitance	C <sub>OSS</sub>			180		pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			110		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge	Q <sub>G</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =10V, I <sub>D</sub> =18A		19.8	25	nC
Gate Source Charge	Q <sub>GS</sub>			2.5		nC
Gate Drain Charge	Q <sub>GD</sub>			3.5		nC
Turn-ON Delay Time	t <sub>D(ON)</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, R <sub>L</sub> =0.82Ω, R <sub>GEN</sub> =3Ω		4.5		ns
Turn-ON Rise Time	t <sub>R</sub>			3.9		ns
Turn-OFF Delay Time	t <sub>D(OFF)</sub>			17.4		ns
Turn-OFF Fall-Time	t <sub>F</sub>			3.2		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Continuous Drain-Source Diode Forward Current	I <sub>S</sub>				18	A
Drain-Source Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =1A, V <sub>GS</sub> =0V		0.75	1	V
Body Diode Reverse Recovery Time	t <sub>RR</sub>	I <sub>F</sub> =18 A, dI/dt=100A/μs		19	25	ns
Body Diode Reverse Recovery Charge	Q <sub>RR</sub>	I <sub>F</sub> =18 A, dI/dt=100A/μs		8		nC

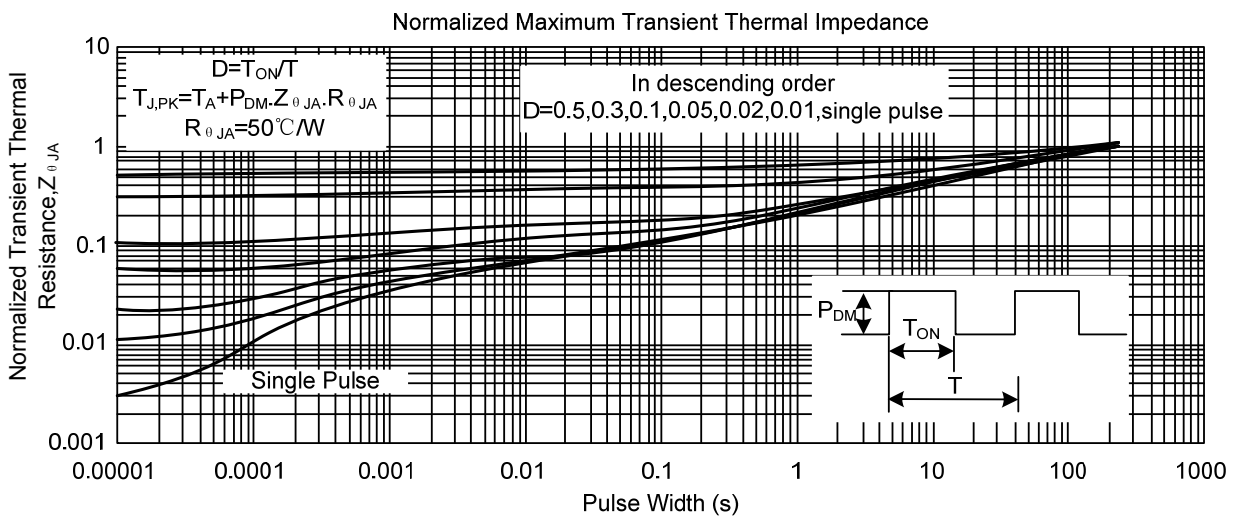
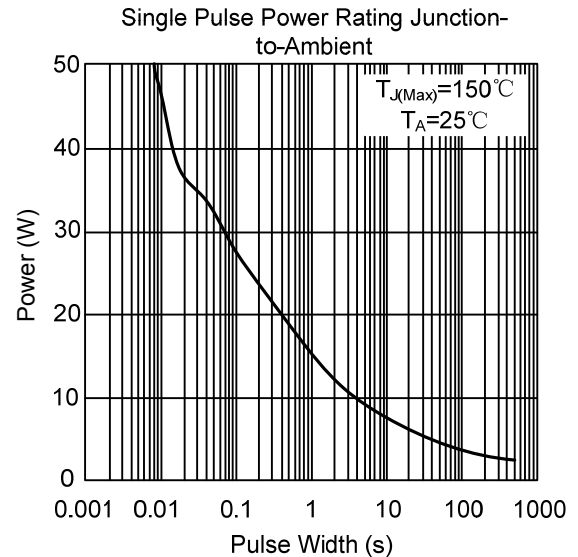
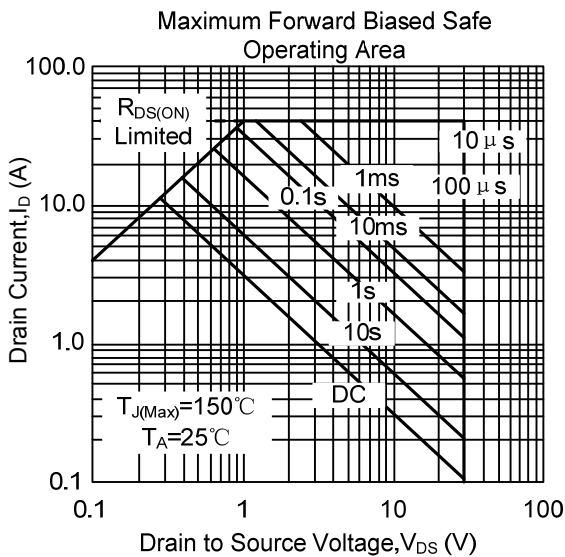
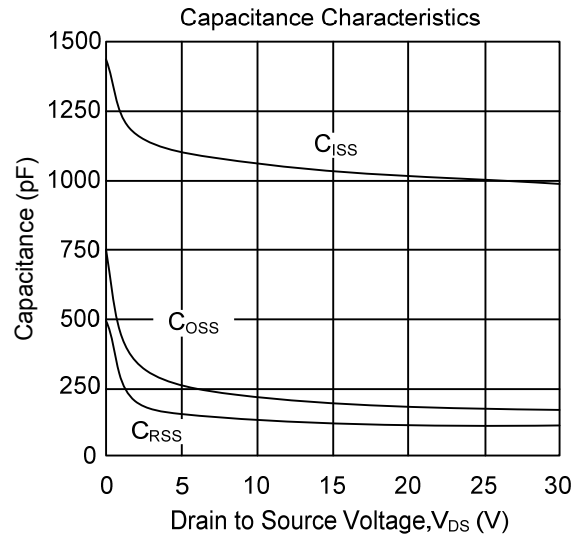
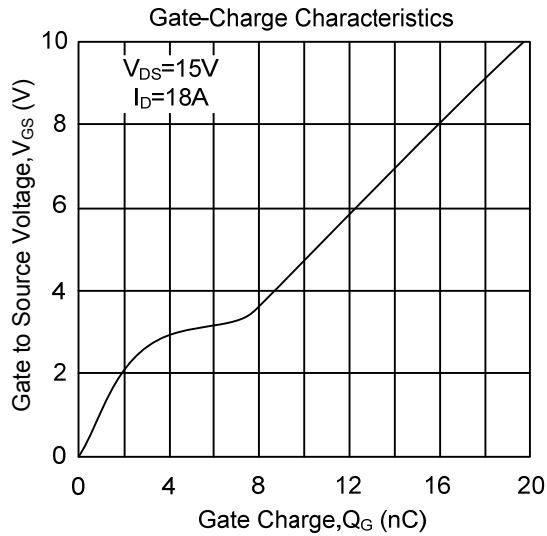
Notes: 5. Pulse width limited by T<sub>J(MAX)</sub>

6. Pulse width ≤300us, duty cycle ≤2%.

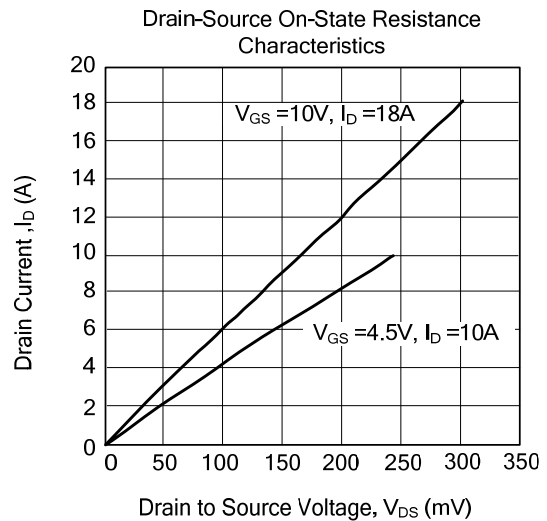
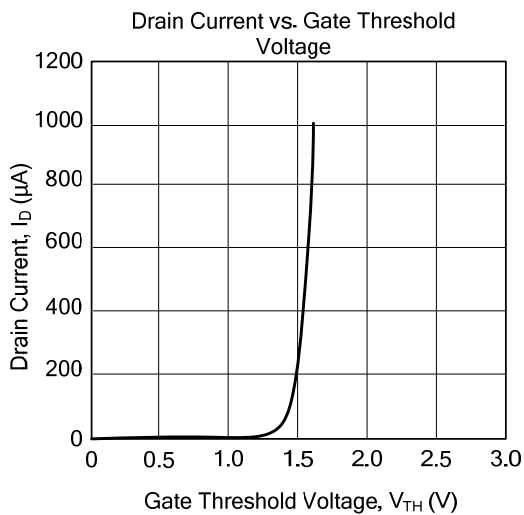
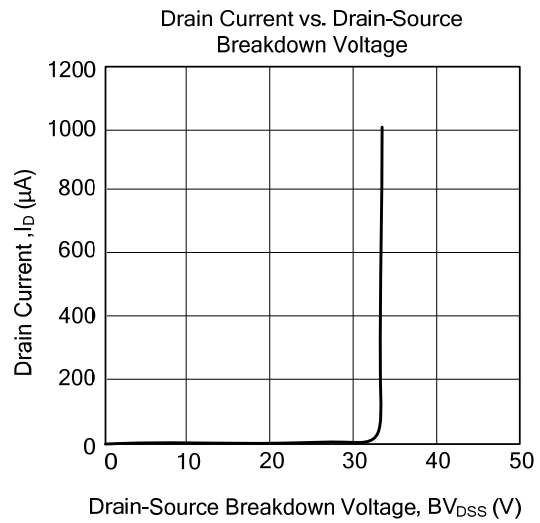
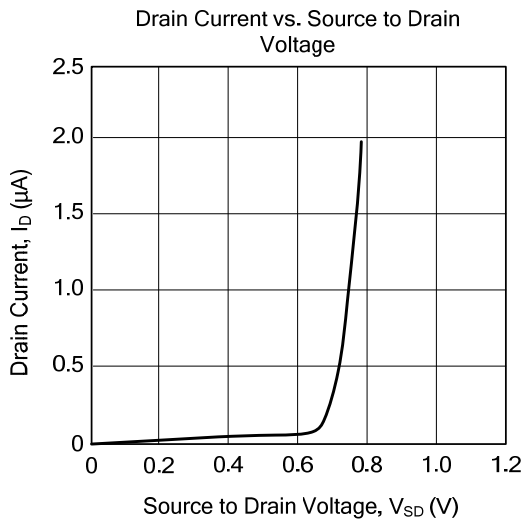
## TYPICAL CHARACTERISTICS



## TYPICAL CHARACTERISTICS (Cont.)



## ■ TYPICAL CHARACTERISTICS (Cont.)



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