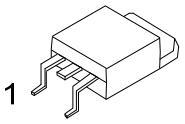
UTD452

Power MOSFET

N-CHANNEL ENHANCEMENT MODE



TO-252

Lead-free: UTD452L
Halogen-free: UTD452G

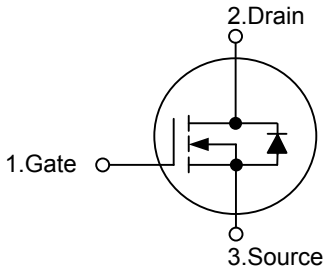
■ DESCRIPTION

The **UTD452** 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

* $R_{DS(ON)}$< 8.5mΩ @V_{GS}=10V
* $R_{DS(ON)}$< 14mΩ @V_{GS}=4.5V
* Low capacitance
* Low gate charge
* Fast switching capability
* Avalanche energy specified

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number			Package	Pin Assignment			Packing
Normal	Lead Free	Halogen Free		1	2	3	
UTD452-TN3-R	UTD452L-TN3-R	UTD452G-TN3-R	TO-252	G	D	S	Tape Reel
UTD452-TN3-T	UTD452L-TN3-T	UTD452G-TN3-T	TO-252	G	D	S	Tube

UTD452L-TN3-R (1)Packing Type (2)Package Type (3)Lead Plating	(1) R: Tape Reel, T: Tube (2) TN3: TO-252 (3) G: Halogen Free, L: Lead Free, Blank: Pb/Sn

■ ABSOLUTE MAXIMUM RATINGS (T_a=25℃, unless otherwise specified)

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PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	25	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current	T_C=25°C	I_D	55	A
Pulsed Drain Current		I_{DM}	100	A
Avalanche Current		I_{AR}	30	A
Repetitive avalanche energy L=0.1mH		E_{AR}	135	mJ
Power Dissipation	T_C=25°C	P_D	50	W
Junction Temperature		T_J	+175	℃
Storage Temperature		T_{STG}	-55 ~ +175	℃

Note: 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. Pulse width limited by $T_{J(MAX)}$

■ THERMAL DATA

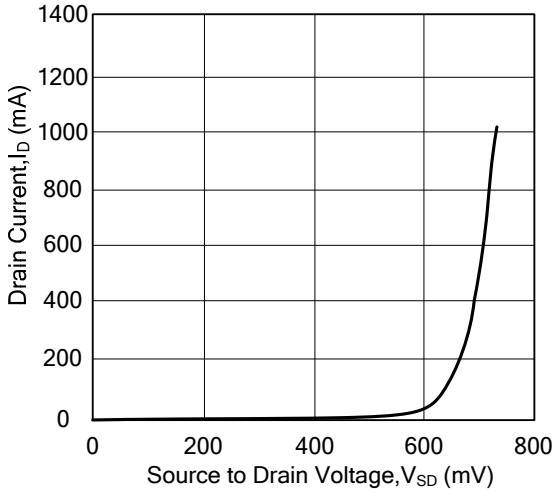
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Junction-to-Ambient	θ_{JA}		39	50	℃/W
Junction-to-Case	θ_{JC}		2.5	3	℃/W

■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

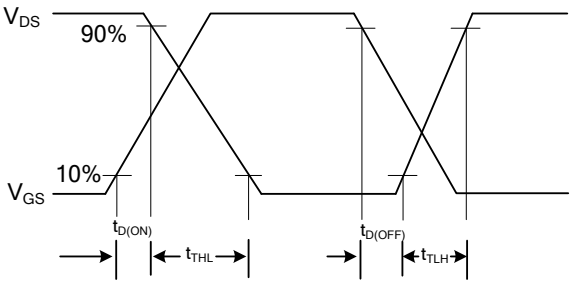
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS}=0V, I_D=250μA	25			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=20V, V_{GS}=0V			1	μA
Gate-Source Leakage Current		I_{GSS}	V_{DS}=0V, V_{GS}=±20V			100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	1	1.8	3	V
On State Drain Current		$I_{D(ON)}$	V_{DS}=5V, V_{GS}=10V	100			A
Static Drain-Source On-Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=30A		6.5	8.5	mΩ
			V_{GS}=4.5V, I_D=20A		11.5	14	
Forward Transconductance		g_{FS}	V_{DS}=5V, I_D=10A		35		S
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{DS}=12.5V, V_{GS}=0V, f=1MHz		1230	1476	pF
Output Capacitance		C_{OSS}			315		pF
Reverse Transfer Capacitance		C_{RSS}			190		pF
SWITCHING PARAMETERS							
Total Gate Charge	10V	Q_G	V_{DS}=12.5V, V_{GS}=10V, I_D=20A		26.4	32	nC
	4.5V				13.5		
Gate Source Charge		Q_{GS}			3.9		nC
Gate Drain Charge		Q_{GD}			7.75		nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{GS}=10V, V_{DS}=12.5V, R_L=0.6Ω, R_G=3Ω		6.5		ns
Turn-ON Rise Time		t_R			10		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			22.7		ns
Turn-OFF Fall-Time		t_F			6.2		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Diode Forward Voltage		V_{SD}	I_S=1A, V_{GS}=0V		0.72	1	V
Maximum Body-Diode Continuous Current		I_S				55	A
Body Diode Reverse Recovery Time		t_{RR}	I_F=20A, dI/dt=100A/μs		23.06	27.5	ns
Body Diode Reverse Recovery Charge		Q_{RR}	I_F=20A, dI/dt=100A/μs		15.25		nC

■ TYPICAL CHARACTERISTICS

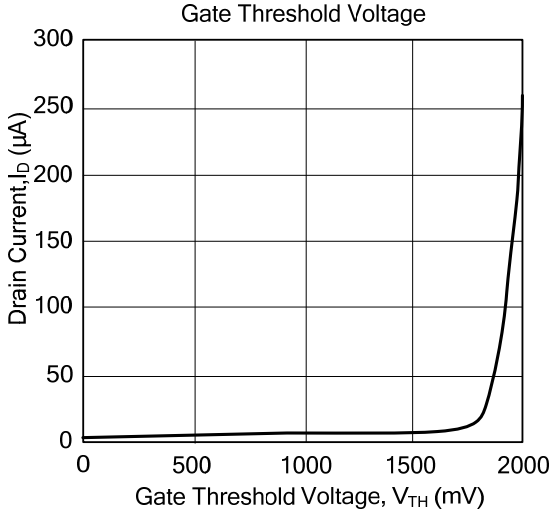
Drain Current vs. Source to Drain Voltage



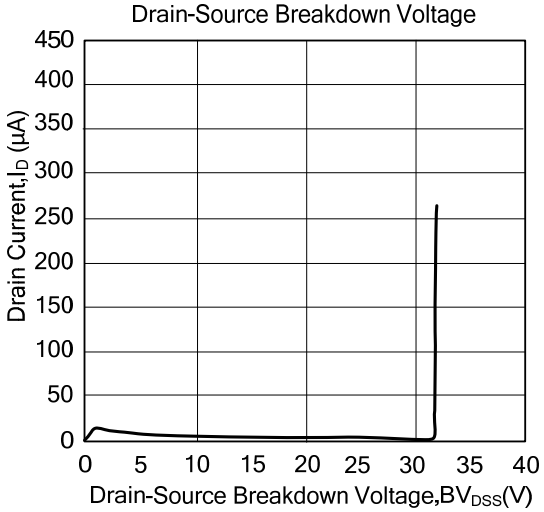
Switching Time Waveforms



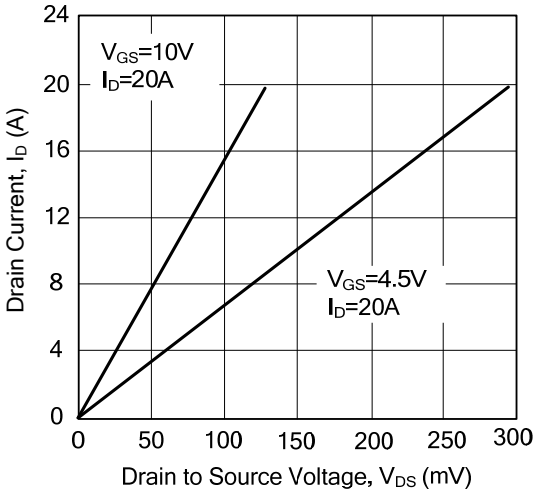
Drain Current vs.
Gate Threshold Voltage



Drain Current vs.
Drain-Source Breakdown Voltage



Drain-Source On-State
Resistance Characteristics



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