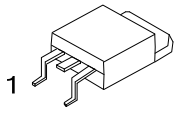
UTD452

Power MOSFET

N-CHANNEL ENHANCEMENT MODE



TO-252

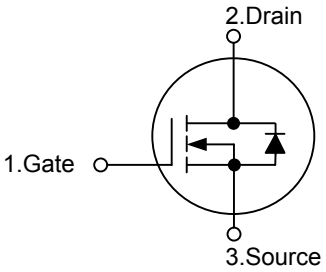
■ DESCRIPTION

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

* $R_{DS(ON)} \leq 8.5\ m\Omega$ @ V_{GS}=10V, I_D=30A
* $R_{DS(ON)} \leq 14\ m\Omega$ @ 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	
UTD452L-TN3-R	UTD452G-TN3-R	TO-252	G	D	S	Tape Reel

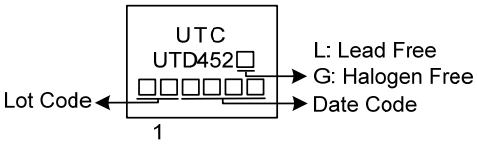
Note: Pin Assignment: G: Gate D: Drain S: Source

UTD452G-TN3-R

(1)Packing Type
(2)Package Type
(3)Green Package

(1) R: Tape Reel
(2) TN3: TO-252
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ ABSOLUTE MAXIMUM RATINGS (T_C=25°C, unless otherwise specified)

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_{AS}	24.8	A
Avalanche Energy (Note 3)		E_{AS}	30.8	mJ
Power Dissipation	T_C=25°C	P_D	50	W
Junction Temperature		T_J	+150	°C
Storage Temperature		T_{STG}	-55 ~ +150	°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.
3. L = 0.1mH, I_{AS} = 24.8A, V_{DD} = 20V, R_G = 25 Ω Starting T_J = 25°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction-to-Ambient	θ_{JA}	110	°C/W
Junction-to-Case	θ_{JC}	2.5 (Note)	°C/W

Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

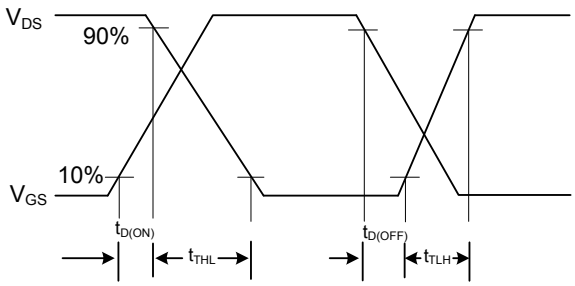
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER		SYMBO	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	1.0	1.5	3.0	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		7.6	8.5	mΩ
			V_{GS}=4.5V, I_D=20A		12.4	14	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{DS}=12.5V, V_{GS}=0V, f=1MHz		1429	1476	pF
Output Capacitance		C_{OSS}			332		pF
Reverse Transfer Capacitance		C_{RSS}			294		pF
Forward Transconductance		g_{FS}	V_{DS}=5V, I_D=10A		18.1		S
SWITCHING PARAMETERS							
Total Gate Charge	10V	Q_G	V_{DS}=12.5V, V_{GS}=10V, I_D=20A (Note 1, 2)		40		nC
	5V				21		nC
Gate Source Charge		Q_{GS}			5.5		nC
Gate Drain Charge		Q_{GD}			11		nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{DS}=12.5V, V_{GS}=10V, R_L=0.6Ω, R_G=3Ω (Note 1, 2)		8		ns
Turn-ON Rise Time		t_R			16		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			27		ns
Turn-OFF Fall-Time		t_F			20		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				55	A
Diode Forward Voltage		V_{SD}	I_S=1.0A, V_{GS}=0V		0.72	1	V
Body Diode Reverse Recovery Time		t_{rr}	I_S=30A, V_{GS}=0V, dI_F/dt=100A/μs		153		ns
Body Diode Reverse Recovery Charge		Q_{rr}			471		nC

Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

Switching Time Waveforms



■ TYPICAL CHARACTERISTICS