



UTD405

Power MOSFET

P-CHANNEL ENHANCEMENT MODE

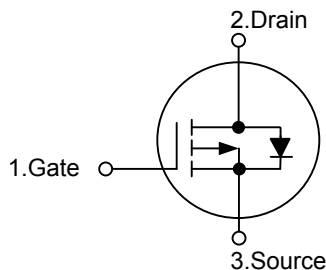
DESCRIPTION

The **UTD405** can provide excellent $R_{DS(ON)}$, low gate charge and low gate resistance by using advanced trench technology. This device is well suited for high current load applications with the excellent thermal resistance.

FEATURES

- * $R_{DS(ON)} \leq 26 \text{ m}\Omega$ @ $V_{GS} = -10\text{V}$, $I_D = -18\text{A}$
- * $R_{DS(ON)} \leq 45 \text{ m}\Omega$ @ $V_{GS} = -4.5\text{V}$, $I_D = -10\text{A}$
- * Low capacitance
- * Low gate charge
- * Fast switching capability
- * Avalanche energy specified

SYMBOL

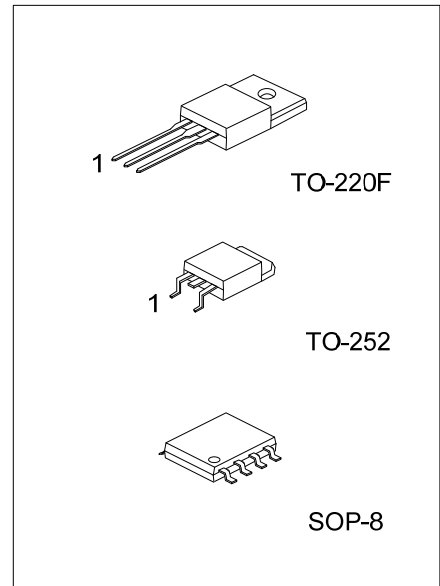


ORDERING INFORMATION

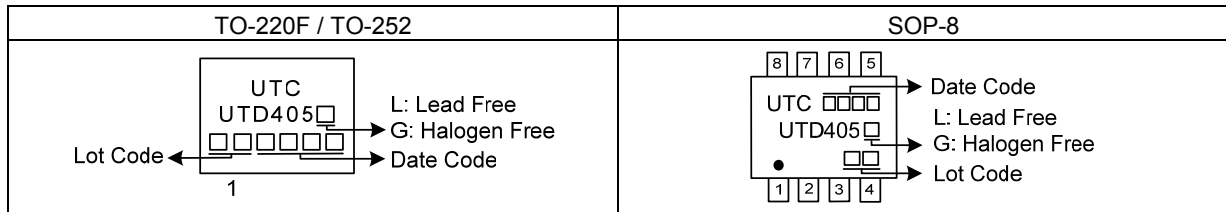
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTD405L-TF3-T	UTD405G-TF3-T	TO-220F	G	D	S	-	-	-	-	-	Tube
UTD405L-TN3-R	UTD405G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UTD405L-S08-R	UTD405G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UTD405G-TF3-T</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) TF3: TO-220F, TN3: TO-252, S08: SOP-8</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
----------------------	------------------------------------------------------------------------------------------------------------------------------------------



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}	± 20	V
Continuous Drain Current	Continuous	I_D	TO-220F/TO-252	-18
			SOP-8	-8
Pulsed Drain Current	Pulsed (Note 2)	I_{DM}	-36	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	20	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	1.1	V/ns
Power Dissipation	TO-220F	P_D	20	W
	TO-252		46	W
	SOP-8		1.7	W
Junction Temperature		T_J	+150	$^{\circ}\text{C}$
Operation and Storage Temperature		T_{STG}	-55 ~ +150	$^{\circ}\text{C}$

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. $L=0.1\text{mH}$, $I_{AS}=-20\text{A}$, $V_{DD}=-20\text{V}$, $R_G=25\Omega$, Starting $T_J=25^{\circ}\text{C}$.

4. $I_{SD} \leq -18\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^{\circ}\text{C}$.

■ THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	TO-220F	θ_{JA}	62.5	$^{\circ}\text{C}/\text{W}$
	TO-252		50	$^{\circ}\text{C}/\text{W}$
	SOP-8		90	$^{\circ}\text{C}/\text{W}$
Junction to Case	TO-220F	θ_{JC}	6.25	$^{\circ}\text{C}/\text{W}$
	TO-252		2.7	$^{\circ}\text{C}/\text{W}$
	SOP-8		73	$^{\circ}\text{C}/\text{W}$

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	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250μA	-30			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =-24V, V _{GS} =0V			-1	μA
Gate-Body 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 =-250 μA	-1.0		-3.0	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-18A			26	mΩ
		V _{GS} =-4.5V, I _D =-10A			45	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{DS} =-15 V, V _{GS} =0V, f=1MHz		1240		pF
Output Capacitance	C _{OSS}			210		pF
Reverse Transfer Capacitance	C _{RSS}			175		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q _G	V _{DS} =-24V, V _{GS} =-10V, I _D =-18A		26		nC
Gate-Source Charge	Q _{GS}			4.5		nC
Gate-Drain Charge	Q _{GD}			6		nC
Turn-ON Delay Time	t _{D(ON)}	V _{DS} =-15V, V _{GS} =-10V, I _D =-18A, R _G =3Ω		5		ns
Turn-ON Rise Time	t _R			3		ns
Turn-OFF Delay Time	t _{D(OFF)}			31		ns
Turn-OFF Fall-Time	t _F			16		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I _S				-18	A
Drain-Source Diode Forward Voltage	V _{SD}	I _S =-1A, V _{GS} =0V			-1	V
Body Diode Reverse Recovery Time	T _{rr}	I _F =-18A, dI/dt=100A/μs		110		ns
Body Diode Reverse Recovery Charge	Q _{rr}				156	

Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. Pulse width ≤ 300us, duty cycle 0.5% max.

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.