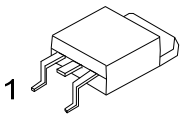
UTD405

Power MOSFET

P-CHANNEL ENHANCEMENT MODE



TO-252

*Pb-free plating product number: UTD405L

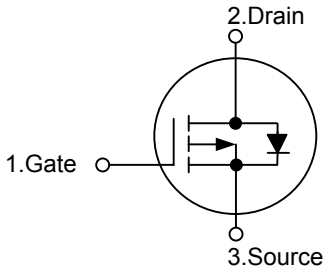
■ DESCRIPTION

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

* $R_{DS(ON)}$ = 32mΩ @V_{GS} = -10 V
* Low capacitance
* Low gate charge
* Fast switching capability
* Avalanche energy specified

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Normal	Lead Free Plating		1	2	3	
UTD405-TN3-R	UTD405L-TN3-R	TO-252	G	D	S	Tape Reel
UTD405-TN3-T	UTD405L-TN3-T	TO-252	G	D	S	Tube

UTD405L-TN3-R (1)Packing Type (2)Package Type (3)Lead Plating	(1) R: Tape Reel, T: Tube (2) TN3: TO-252 (3) L: Lead Free Plating, Blank: Pb/Sn

■ ABSOLUTE MAXIMUM RATINGS (T_A=25°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	I_D	-18	A
Pulsed Drain Current	I_{DM}	-40	A
Avalanche Current	I_{AR}	-18	A
Repetitive Avalanche Energy(L=0.1mH)	E_{AR}	40	mJ
Power Dissipation	P_D	2.5	W
Junction Temperature	T_J	+150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

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	MIN	TYP	MAX	UNIT
Junction-to-Ambient	θ_{JA}		40	50	℃/W

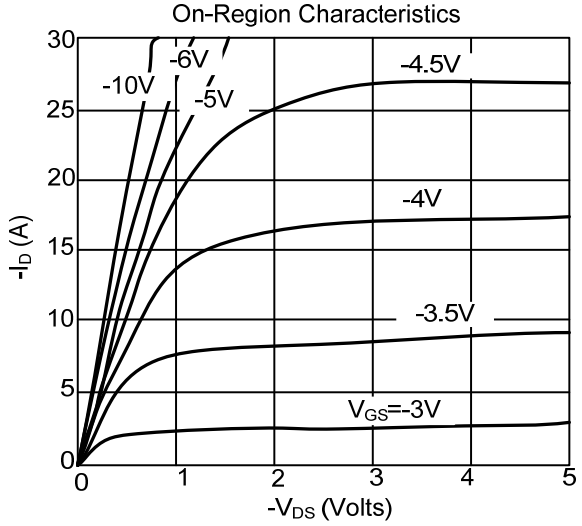
■ ELECTRICAL CHARACTERISTICS (T_J =25°C, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0 V, I_D =-250 μA	-30			V
Drain-Source Leakage Current	I_{DSS}	V_{DS} =-24 V, V_{GS} =0 V		-0.003	-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{DS} =0 V, V_{GS} = ±20V			±100	nA
ON CHARACTERISTICS						
Gate-Threshold Voltage	$V_{GS(TH)}$	V_{DS} =V_{GS}, I_D =-250 μA	-1.2	-2	-2.4	V
On state drain current	$I_{D(ON)}$	V_{GS}=-10V, V_{DS}=-5V	-40			A
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS} =-10 V, I_D =-18A		24.5	32	mΩ
		V_{GS} =-4.5 V, I_D =-10A		41	60	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS} =-15 V, V_{GS} =0V, f=1MHz		920	1100	pF
Output Capacitance	C_{OSS}			190		pF
Reverse Transfer Capacitance	C_{RSS}			122		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{DS} =-15V, V_{GS} =-10V, I_D =-18 A		18.7	23	nC
Gate-Source Charge	Q_{GS}			2.54		nC
Gate-Drain Charge	Q_{GD}			5.4		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{GS}=-10V,V_{DS}=-15V, R_L=0.82Ω, R_{GEN}=3Ω		9	13	ns
Turn-ON Rise Time	t_R			25	35	ns
Turn-OFF Delay Time	$t_{D(OFF)}$			20	30	ns
Turn-OFF Fall-Time	t_F			12	18	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	I_S=-1A,V_{GS}=0V		-0.76	-1	V
Maximum Continuous Drain-Source Diode Forward Current	I_S				-18	A
Body Diode Reverse Recovery Time	t_{RR}	I_F=-18A, dI/dt=100A/μs		21.4	26	ns
Body Diode Reverse Recovery Charge	Q_{RR}	I_F=-18A, dI/dt=100A/μs		13	16	nC

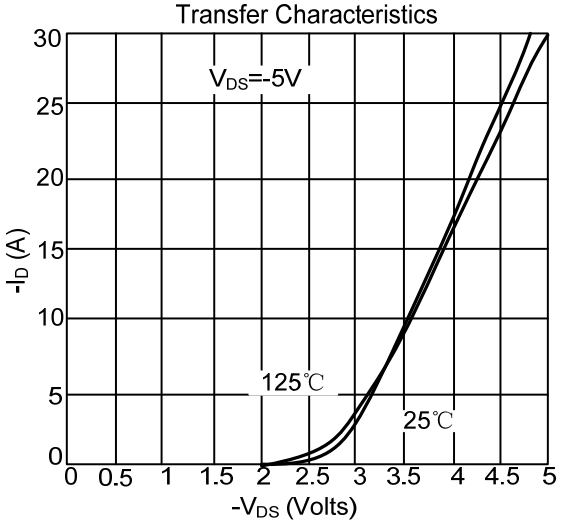
Notes: 1. Pulse width limited by $T_{J(MAX)}$
2. Pulse width ≤300us, duty cycle 0.5% max.

■ TYPICAL CHARACTERISTICS

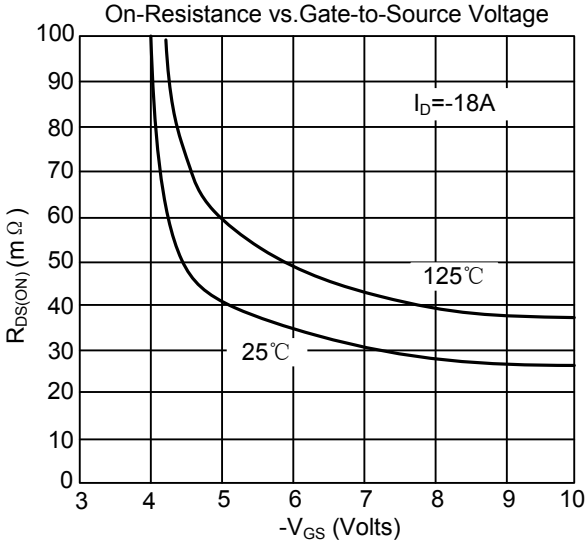
On-Region Characteristics



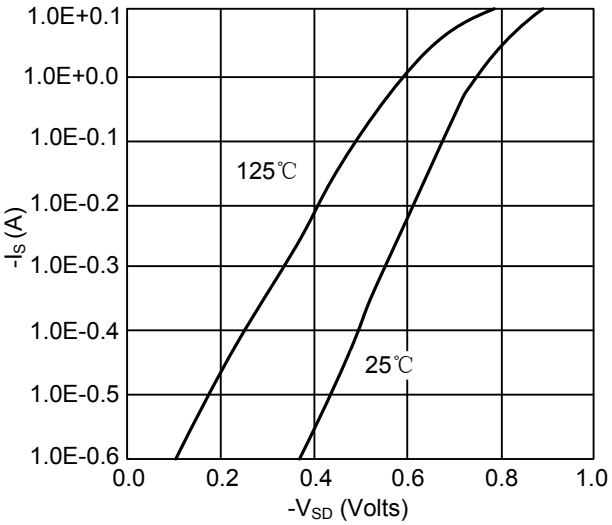
Transfer Characteristics



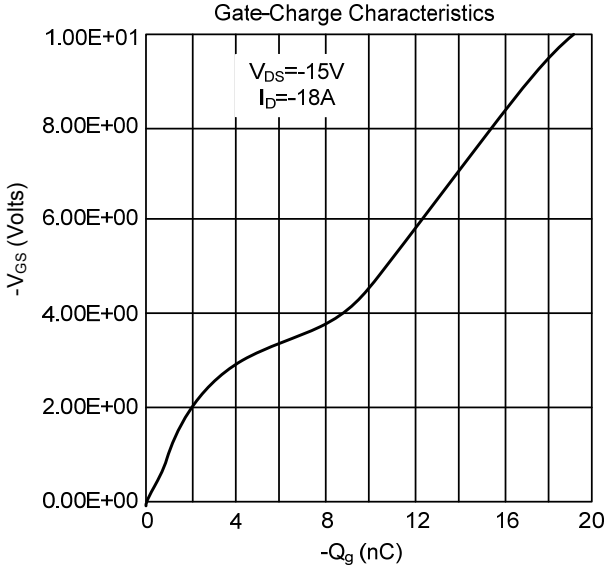
On-Resistance vs.Gate-to-Source Voltage



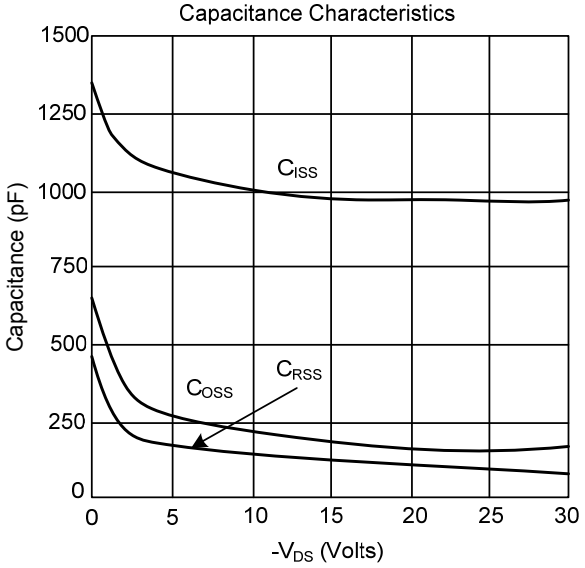
Body-Diode Characteristics



Gate-Charge Characteristics

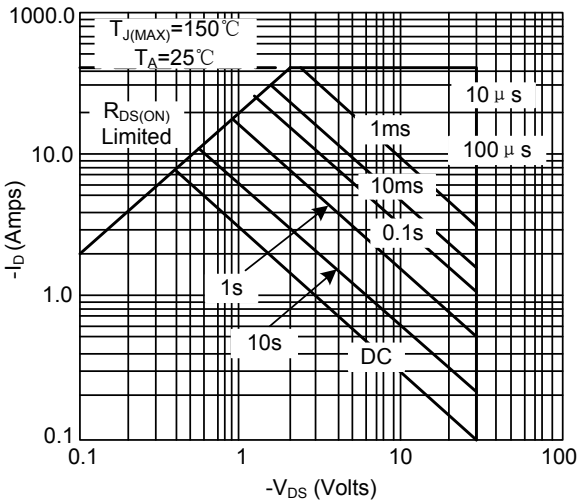


Capacitance Characteristics

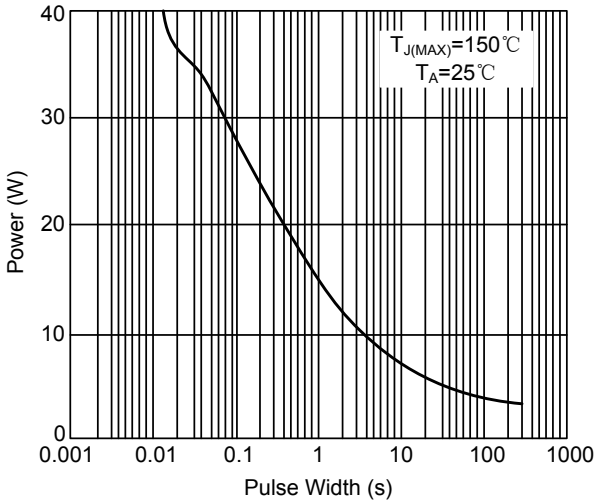


■ TYPICAL CHARACTERISTICS(Cont.)

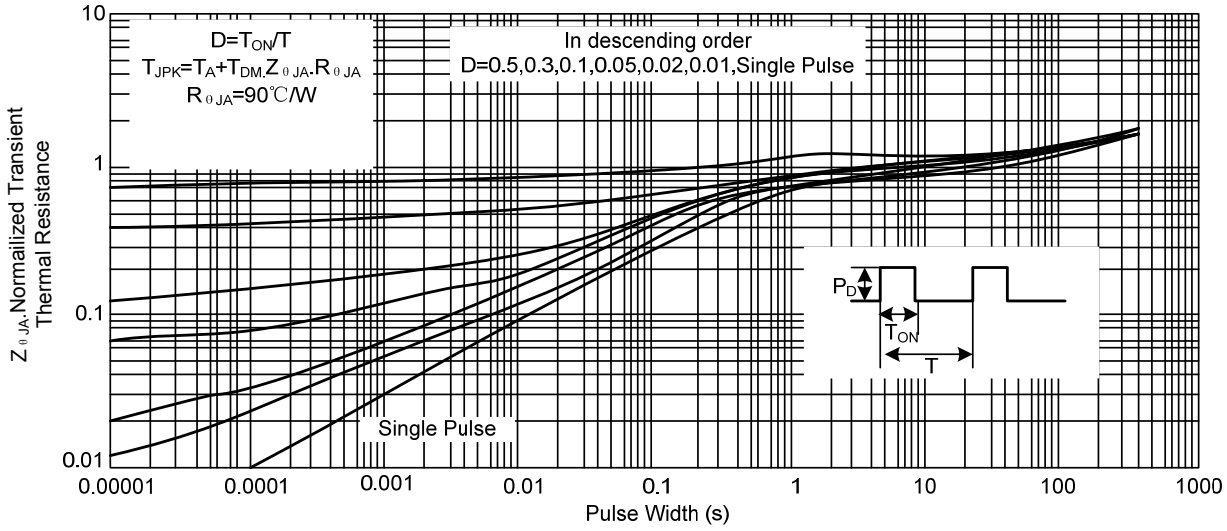
Maximum Forward Biased Safe Operating Area



Single Pulse Power Rating Junction-to-Ambient



Normalized Maximum Transient Thermal Impedance



On-Resistance vs.Drain Current and Gate Voltage