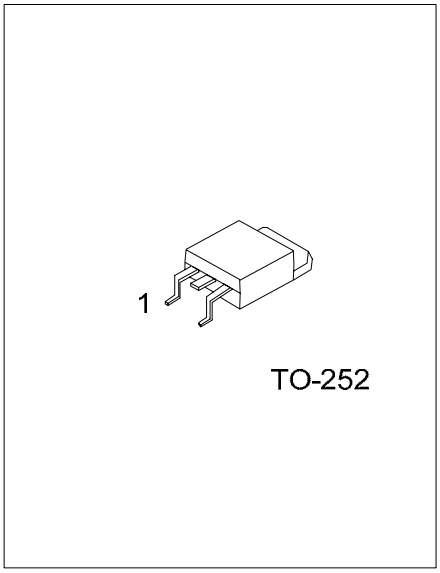
UTD420

Power MOSFET

N-CHANNEL ENHANCEMENT MODE

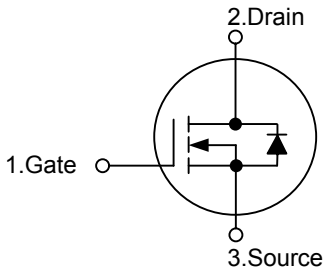


*Pb-free plating product number: UTD420L

■ FEATURES

* $R_{DS(ON)}$ = 28mΩ @V_{GS} = 10 V
* Low capacitance
* Optimized gate charge
* Fast switching capability
* Avalanche energy specified

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Normal	Lead Free Plating		1	2	3	
UTD420-TN3-R	UTD420L-TN3-R	TO-252	G	D	S	Tape Reel
UTD420-TN3-T	UTD420L-TN3-T	TO-252	G	D	S	Tube

UTD420L-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	10	A
Pulsed Drain Current	I_{DM}	30	A
Avalanche Current	I_{AR}	15	A
Repetitive Avalanche Energy (L=0.1mH)	E_{AR}	36	mJ
Power Dissipation (T_C=25°C)	P_D	60	W
Junction Temperature	T_J	+175	°C
Strong Temperature	T_{STG}	-55 ~ +175	°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	MIN	TYP	MAX	UNIT
Junction-to-Ambient	θ_{JA}		40	50	°C/W

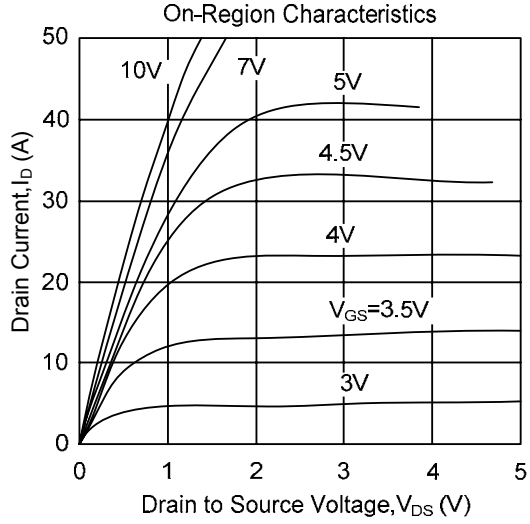
■ ELECTRICAL CHARACTERISTICS (T_J =25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0 V, I_D =250μA	30			V
Drain-Source Leakage Current	I_{DSS}	V_{DS} =24V, V_{GS} =0 V			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	1.8	3	V
On State Drain Current	$I_{D(ON)}$	V_{DS} =5V, V_{GS} =4.5V	40			A
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS} =10V, I_D =10A		21	28	mΩ
		V_{GS} =4.5V, I_D =7A		32.5	42	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS} =15 V, V_{GS} =0V, f=1MHz		710	850	pF
Output Capacitance	C_{OSS}			120		pF
Reverse Transfer Capacitance	C_{RSS}			72		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{DS} =15V, V_{GS} =10V, I_D =10A		14.4	18	nC
Gate Source Charge	Q_{GS}			2.6		nC
Gate Drain Charge	Q_{GD}			2.7		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{GS}=10V,V_{DS}=15V,R_L=1.5Ω, R_{GEN} =3Ω		5.6		ns
Turn-ON Rise Time	t_R			2.4		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			15.6		ns
Turn-OFF Fall-Time	t_F			2.2		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	I_S=1A,V_{GS}=0V		0.75	1	V
Maximum Continuous Drain-Source Diode Forward Current	I_S				10	A
Body Diode Reverse Recovery Time	t_{RR}	I_F=10 A, dI/dt=100A/μs		13.4	21	ns
Body Diode Reverse Recovery Charge	Q_{RR}	I_F=10 A, dI/dt=100A/μs		4.4		nC

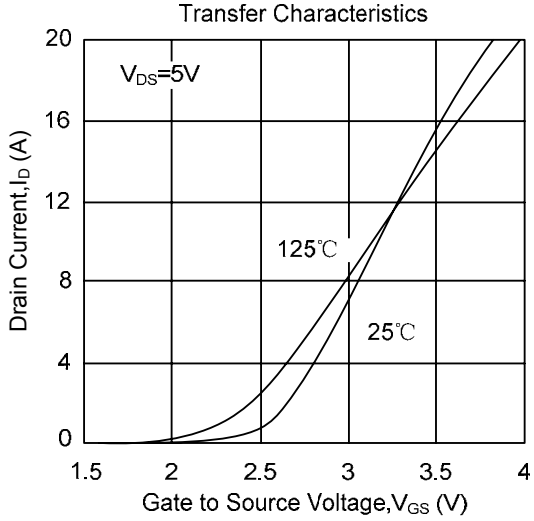
Notes: 1. Pulse width limited by $T_{J(MAX)}$
2. Pulse width ≤300us, duty cycle 0.5% max.

■ TYPICAL CHARACTERISTICS

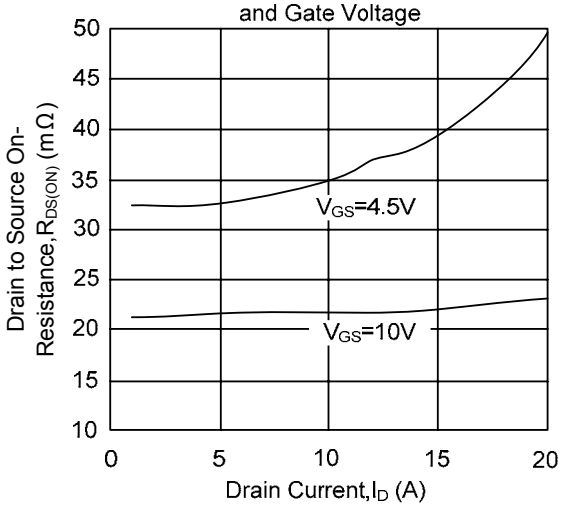
On-Region Characteristics



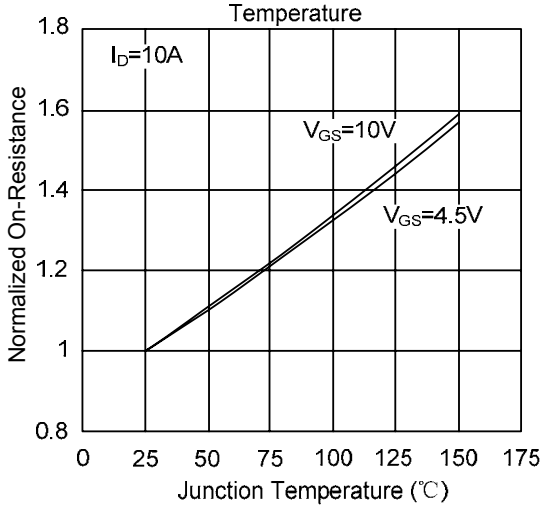
Transfer Characteristics



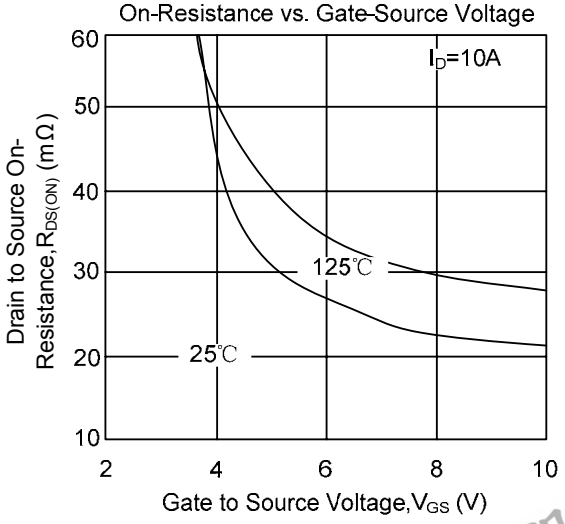
On-Resistance vs. Drain Current and Gate Voltage



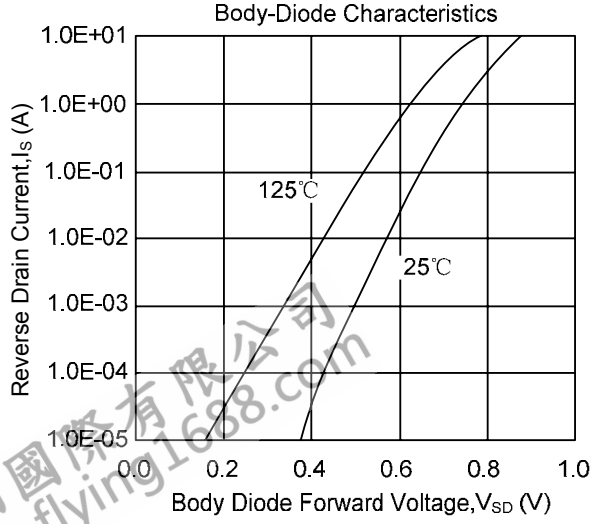
On-Resistance vs. Junction Temperature



On-Resistance vs. Gate-Source Voltage



Body-Diode Characteristics



■ TYPICAL CHARACTERISTICS(Cont.)