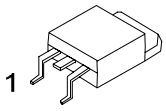
UD4809

Power MOSFET

N-CHANNEL ENHANCEMENT MODE



TO-252

*Pb-free plating product number: UD4809L

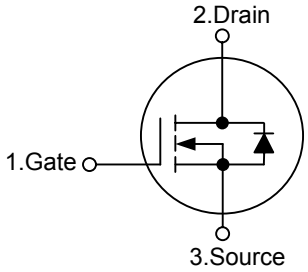
■ DESCRIPTION

This **UD4809** N-Channel MOSFET is produced using UTC advanced process which has been tailored to make the on-state resistance minimum and yet maintain low gate charge for superior switching performance especially. The **UD4809** is well suited for where low in-line power loss is needed in a very small outline surface mount package, such as low voltage and battery powered applications.

■ FEATURES

* Low $R_{DS(ON)}$
* Low capacitance
* Optimized gate charge

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Normal	Lead Free Plating		1	2	3	
UD4809-TN3-R	UD4809L-TN3-R	TO-252	G	D	S	Tape Reel
UD4809-TN3-T	UD4809L-TN3-T	TO-252	G	D	S	Tube

UD4809L-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	
Continuous Drain Current (Note 3)	I_D	9.0	A
Drain to Source dv/dt	dv/dt	6.0	V/ns
Power Dissipation (Note 3)	P_D	1.3	W
Junction Temperature	T_J	+150	°C
Storage Temperature	T_{STG}	-55 ~ +150	°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 (Note 3)	θ_{JA}			116	°C/W
Junction-to-Case	θ_{JC}			2.9	°C/W

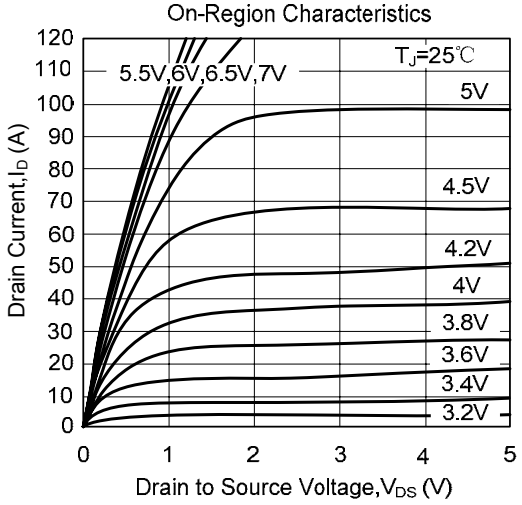
■ ELECTRICAL CHARACTERISTICS (T_J =25°C, unless otherwise specified)

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				1.0	μA
Gate-Source 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		1.5		2.5	V
Static Drain-Source On-Resistance (Note 2)	$R_{DS(ON)}$	V_{GS} =10~11.5 V	I_D =30 A		7.0	9.0	mΩ
			I_D =15 A		7.0		
		V_{GS} =4.5 V	I_D =30 A		12	14	mΩ
			I_D =15 A		11		
DYNAMIC PARAMETERS							
Input Capacitance	C_{ISS}	V_{DS} =12 V, V_{GS} =0V, f=1MHz			1456		pF
Output Capacitance	C_{OSS}				315		
Reverse Transfer Capacitance	C_{RSS}				200		
SWITCHING PARAMETERS							
Turn-ON Delay Time	$t_{D(ON)}$	V_{GS}=4.5V,V_{DS}=15V, I_D =15A, R_G =3.0Ω			12.3		ns
Turn-ON Rise Time	t_R				21.3		
Turn-OFF Delay Time	$t_{D(OFF)}$				15.1		
Turn-OFF Fall-Time	t_F				5.3		
Turn-ON Delay Time	$t_{D(ON)}$	V_{GS}=11.5V,V_{DS}=15V, I_D =15A, R_G =3.0Ω			7.0		ns
Turn-ON Rise Time	t_R				22.7		
Turn-OFF Delay Time	$t_{D(OFF)}$				25.3		
Turn-OFF Fall-Time	t_F				2.8		
Total Gate Charge	$Q_{G(TOT)}$	V_{DS} =15V, V_{GS} =4.5V, I_D =30A			11	13	nC
Threshold Gate Charge	$Q_{G(TH)}$				2.5		
Gate-Source Charge	Q_{GS}				4.8		
Gate-Drain Charge	Q_{GD}				5.0		
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Diode Forward Voltage	V_{SD}	I_S=30A,V_{GS}=0V			0.95	1.2	V
Source Current (Body Diode)	I_S					43	A
Reverse Recovery Time	t_{RR}	V_{GS} = 0 V, dIs/dt= 100 A/ s, I_S = 30 A			19.5		ns
Reverse Recovery Time	Q_{RR}				9.2		nC

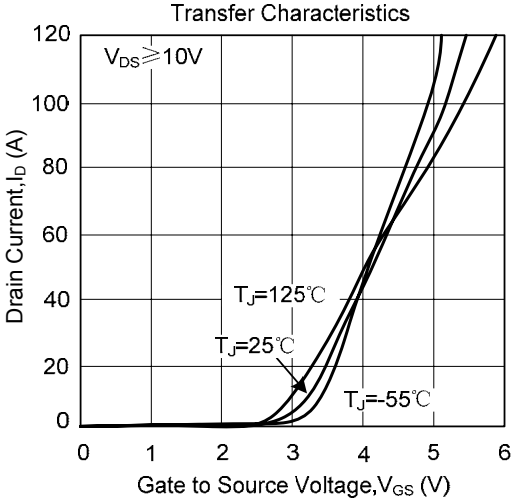
Note: 1. Pulse width limited by $T_{J(MAX)}$
2. Pulse Test: Pulse Width ≤ 300 s, Duty Cycle ≤ 2%.
3. Surface-mounted on FR4 board using the minimum recommended pad size.

■ TYPICAL CHARACTERISTICS

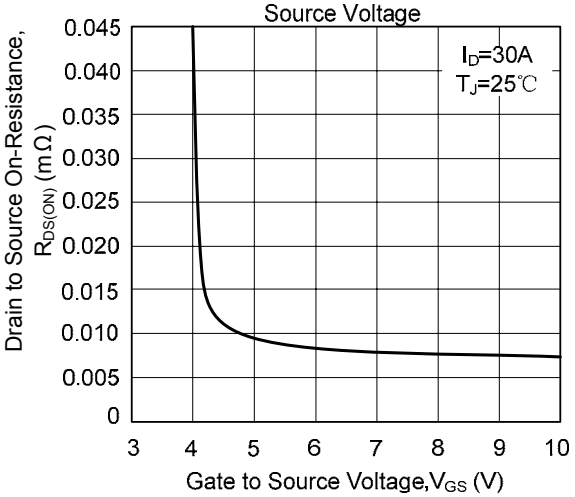
On-Region Characteristics



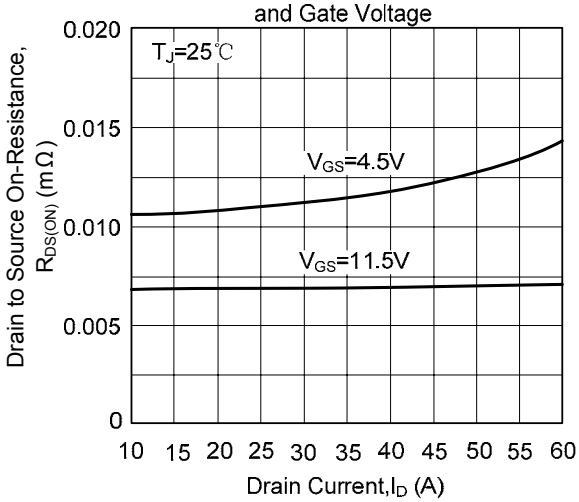
Transfer Characteristics



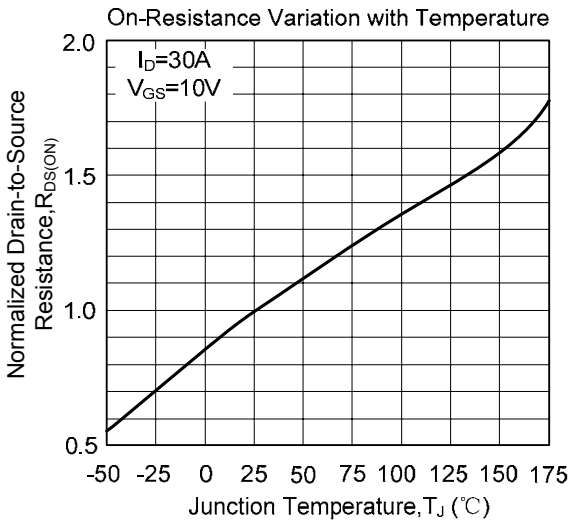
On-Resistance vs. and Gate-to-Source Voltage



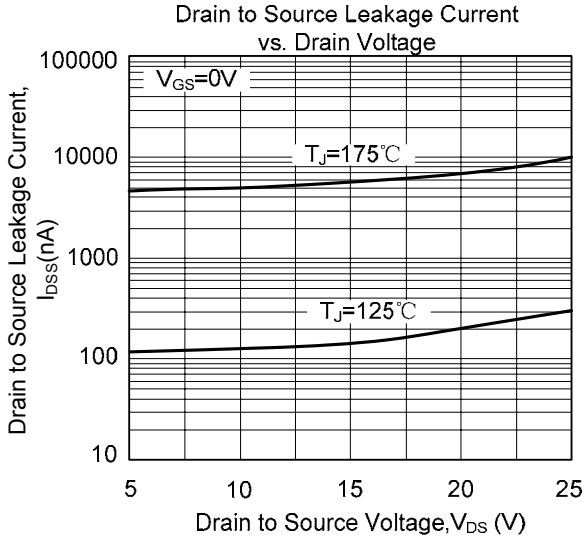
On-Resistance vs. Drain Current and Gate Voltage



On-Resistance Variation with Temperature

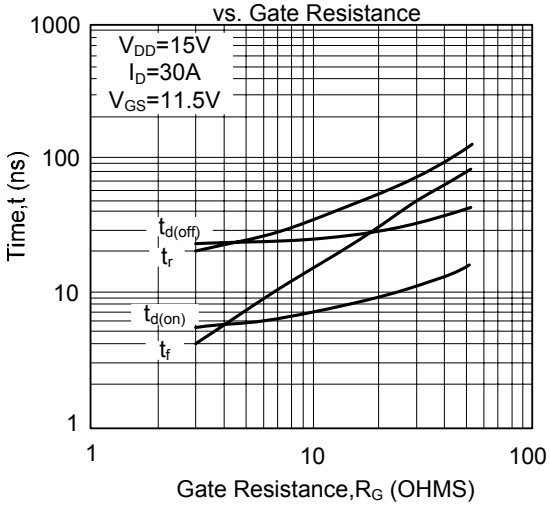


Drain to Source Leakage Current vs. Drain Voltage

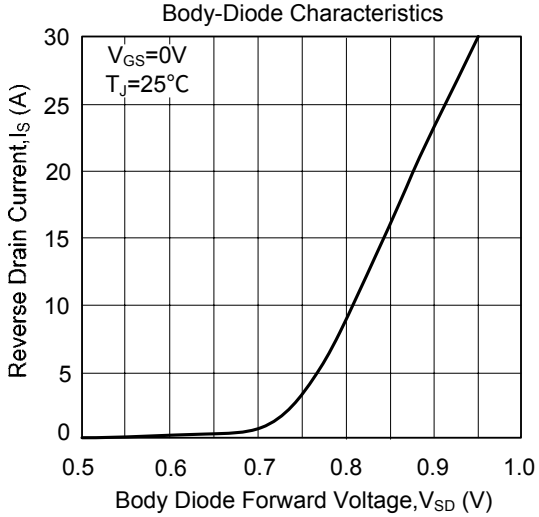


■ TYPICAL CHARACTERISTICS(Cont.)

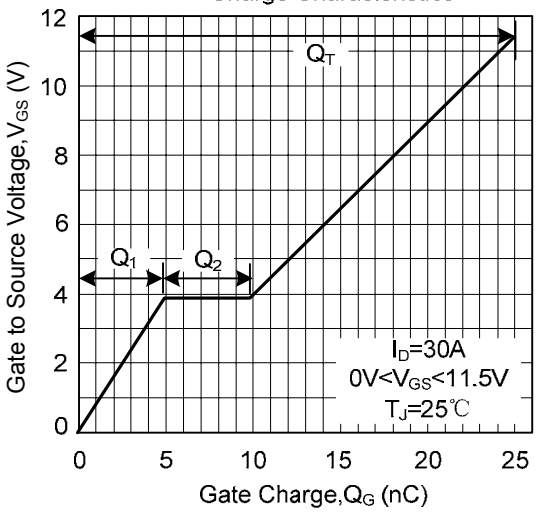
Resistive Switching Time Variation vs. Gate Resistance



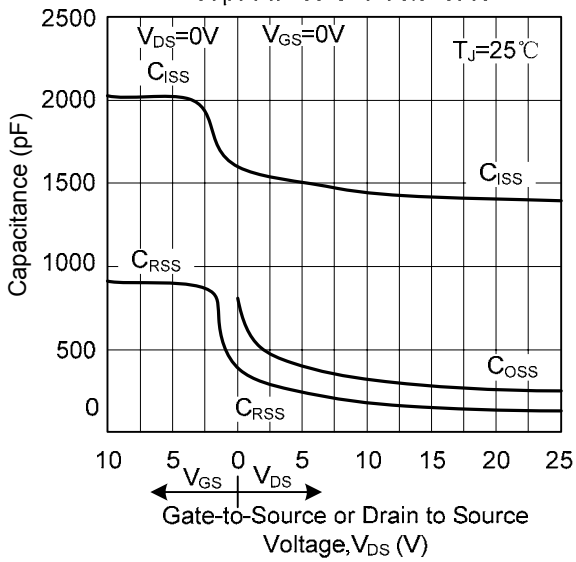
Body-Diode Characteristics



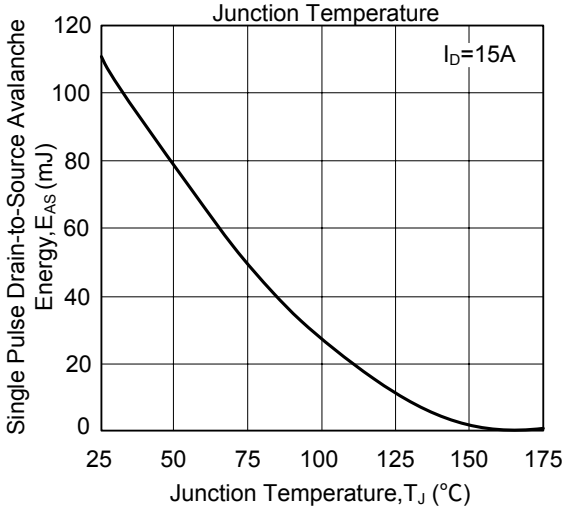
Gate-Charge Characteristics



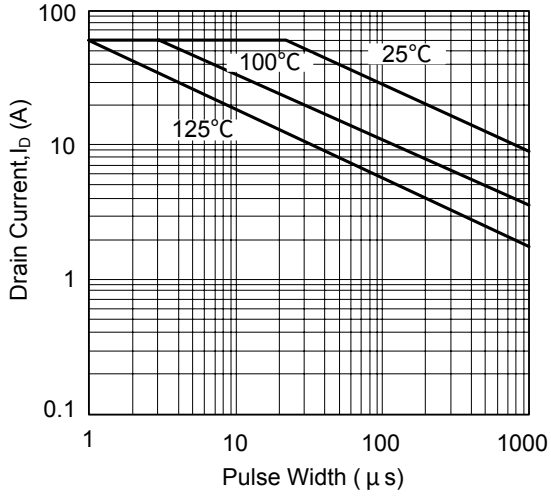
Capacitance Characteristics



Maximum Avalanche Energy vs. Starting Junction Temperature



Avalanche Characteristics



■ TYPICAL CHARACTERISTICS(Cont.)