



## UD4809

Power MOSFET

### N-CHANNEL ENHANCEMENT MODE

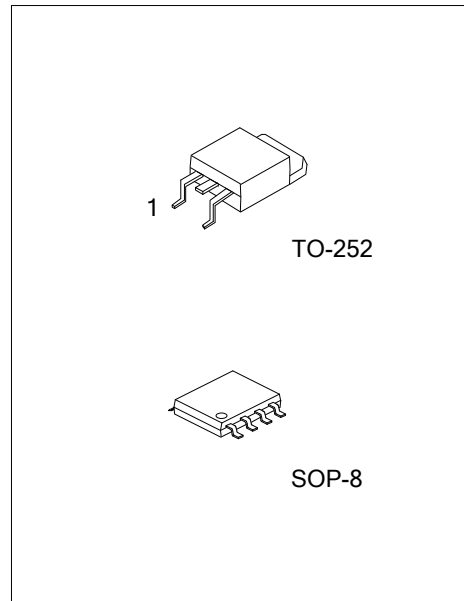
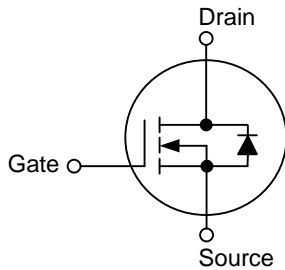
#### DESCRIPTION

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



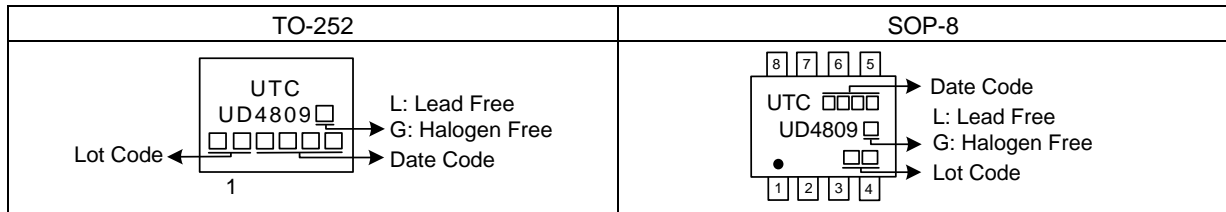
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UD4809L-TN3-R	UD4809G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UD4809L-S08-R	UD4809G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UD4809G-TN3-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) TN3: TO-252, S08: SOP-8</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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## 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		$V_{GSS}$	$\pm 20$	V
Continuous Drain Current (Note 3)		$I_D$	30	A
Drain to Source dv/dt		dv/dt	6.0	V/ns
Power Dissipation (Note 3)	TO-252	$P_D$	1.3	W
	SOP-8		0.69	W
Junction Temperature		$T_J$	+150	$^\circ\text{C}$
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. Surface-mounted on FR4 board using the minimum recommended pad size.

■ **THERMAL DATA**

PARAMETER		SYMBOL	RATINGS	UNIT
Junction-to-Ambient (Note)	TO-252	$\theta_{JA}$	116	$^\circ\text{C/W}$
	SOP-8		180	$^\circ\text{C/W}$
Junction-to-Case	TO-252	$\theta_{JC}$	2.9	$^\circ\text{C/W}$
	SOP-8		20	$^\circ\text{C/W}$

Note. Surface-mounted on FR4 board using the minimum recommended pad size.

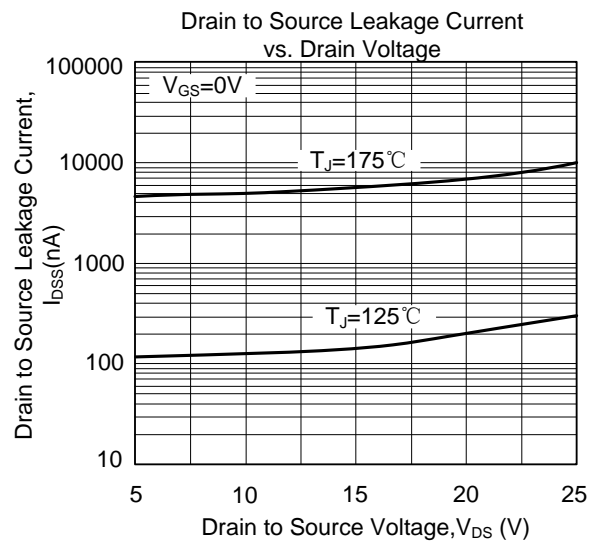
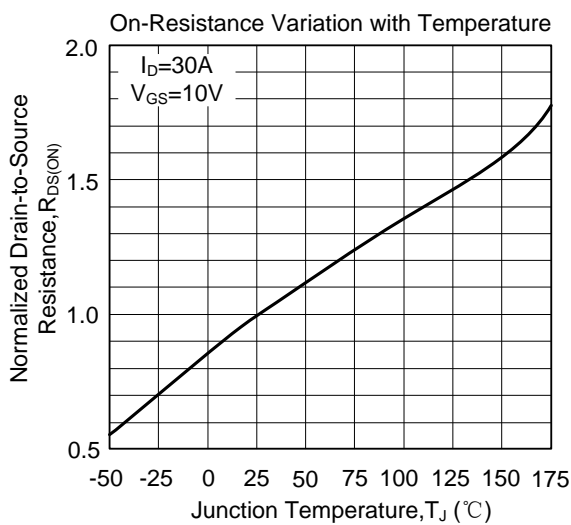
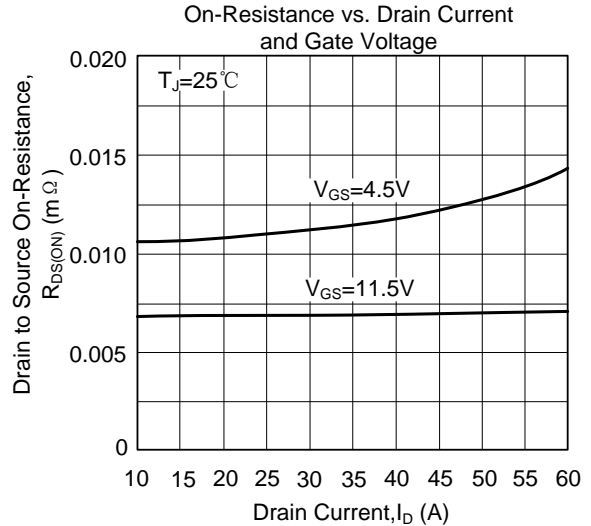
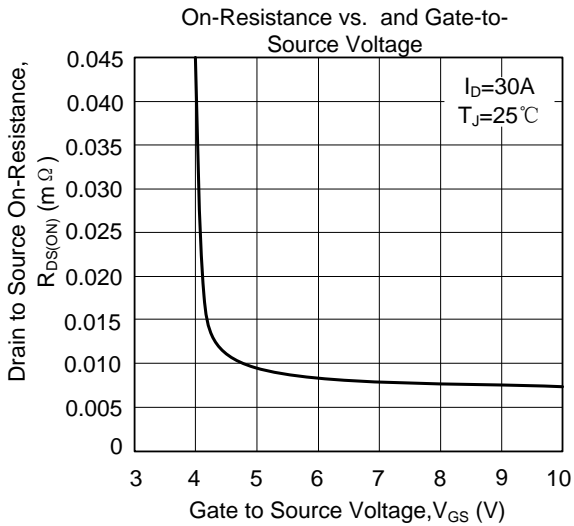
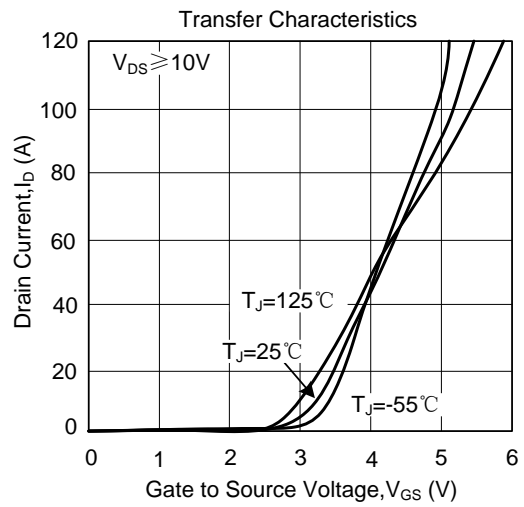
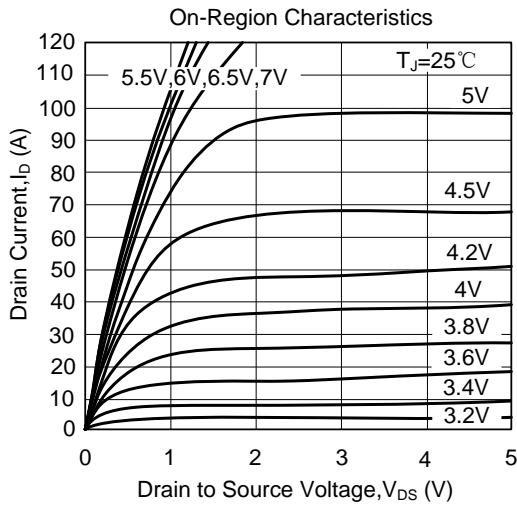
■ **ELECTRICAL CHARACTERISTICS** ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0\text{ V}, I_D=250\mu\text{A}$	30			V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=24\text{ V}, V_{GS}=0\text{ V}$			1.0	$\mu\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0\text{ V}, V_{GS}=\pm 20\text{ V}$			$\pm 100$	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1.0		2.5	V
Static Drain-Source On-Resistance (Note 2)	$R_{DS(ON)}$	$V_{GS}=10\sim 11.5\text{ V}$	$I_D=30\text{ A}$	7.0	9.0	m $\Omega$
			$I_D=15\text{ A}$	7.0		
		$V_{GS}=4.5\text{ V}$	$I_D=30\text{ A}$	12	14	m $\Omega$
			$I_D=15\text{ A}$	11		
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{DS}=12\text{ V}, V_{GS}=0\text{ V}, f=1\text{ MHz}$		1456		pF
Output Capacitance	$C_{OSS}$			315		
Reverse Transfer Capacitance	$C_{RSS}$			200		
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge	$Q_{G(TOT)}$	$V_{DS}=15\text{ V}, V_{GS}=4.5\text{ V}, I_D=30\text{ A}$		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		
Turn-ON Delay Time	$t_{D(ON)}$	$V_{GS}=4.5\text{ V}, V_{DS}=15\text{ V}, I_D=15\text{ A}, R_G=3.0\Omega$		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	$t_{D(ON)}$	$V_{GS}=11.5\text{ V}, V_{DS}=15\text{ V}, I_D=15\text{ A}, R_G=3.0\Omega$		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		
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Source Current (Body Diode)	$I_S$				43	A
Diode Forward Voltage	$V_{SD}$	$I_S=30\text{ A}, V_{GS}=0\text{ V}$		0.95	1.2	V
Reverse Recovery Time	$t_{rr}$	$V_{GS}=0\text{ V}, di/dt=100\text{ A/s},$		19.5		ns
Reverse Recovery Time	$Q_{rr}$	$I_S=30\text{ A}$		9.2		nC

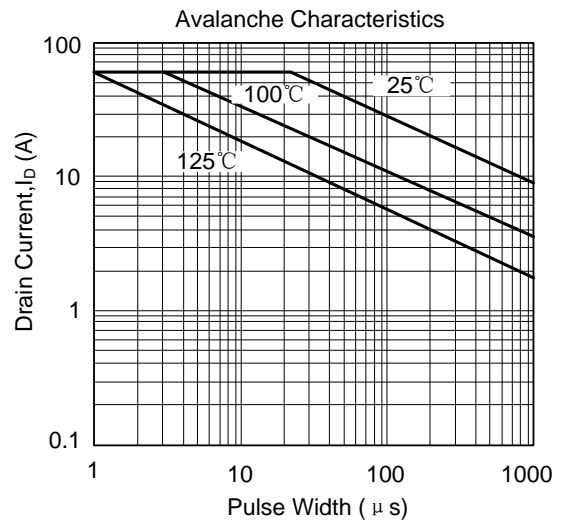
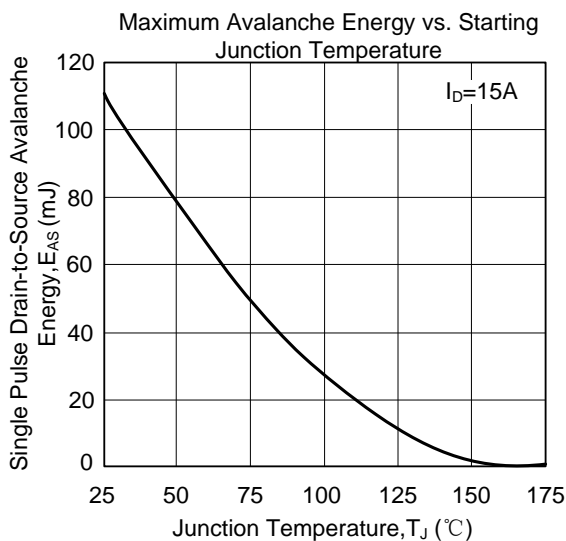
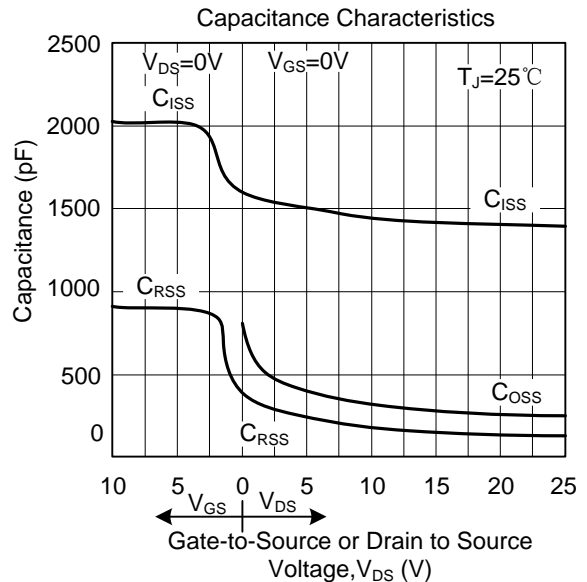
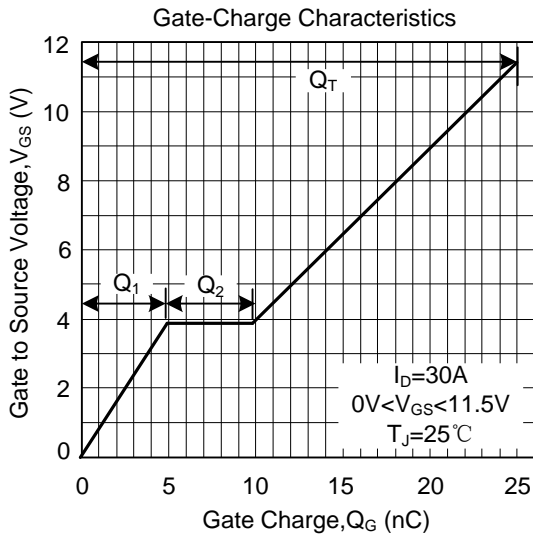
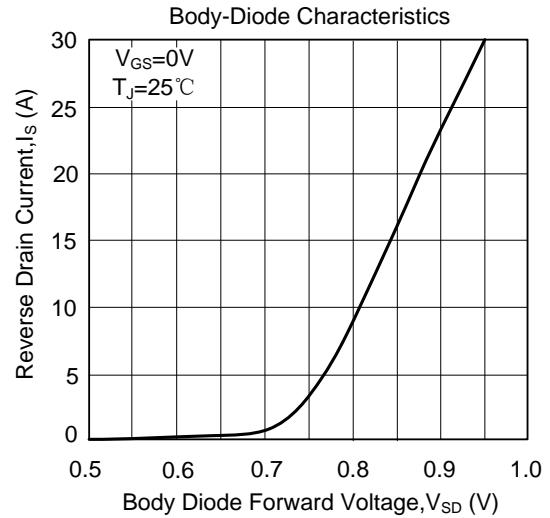
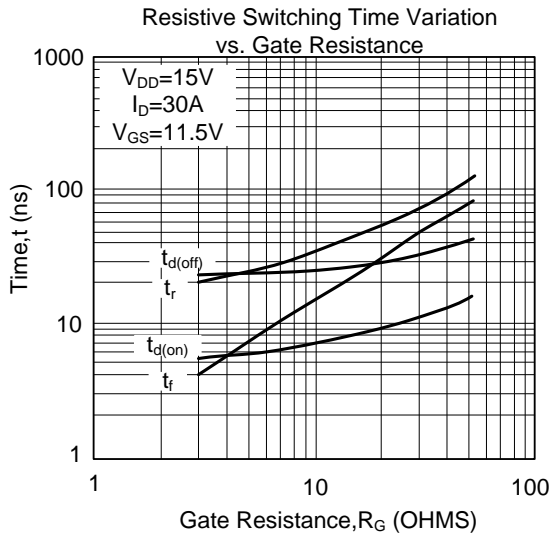
Note: 1. Pulse width limited by  $T_{J(MAX)}$

2. Pulse Test: Pulse Width  $\leq 300\text{ s}$ , Duty Cycle  $\leq 2\%$ .

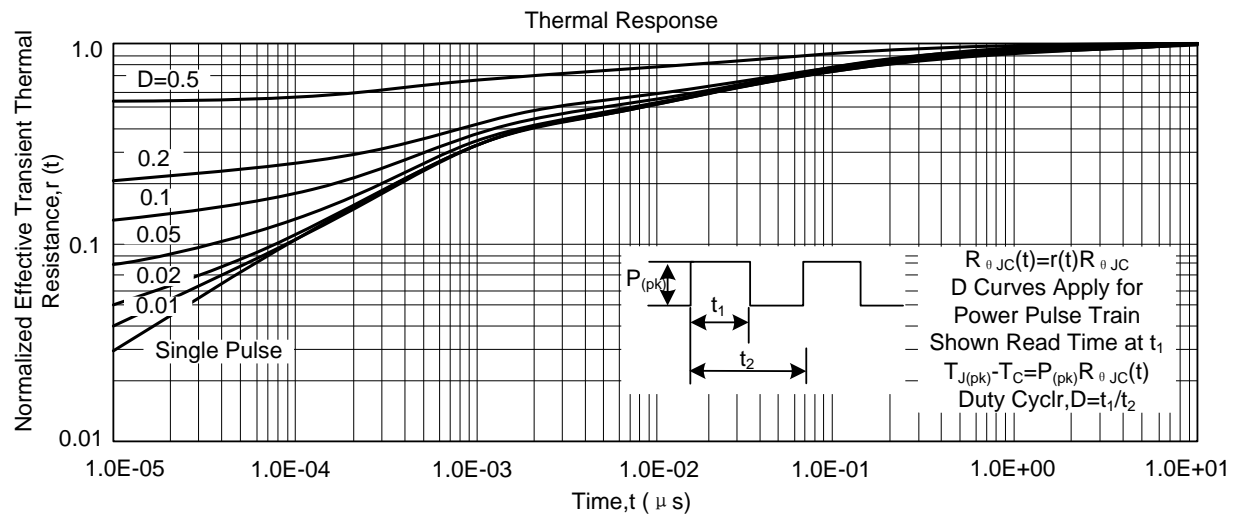
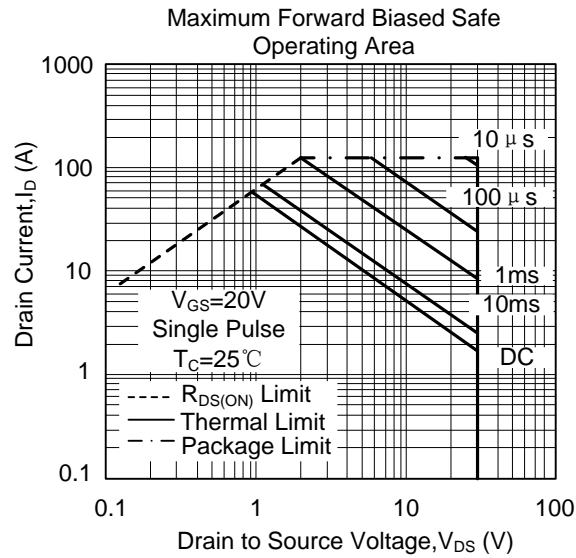
## TYPICAL CHARACTERISTICS



## ■ TYPICAL CHARACTERISTICS (Cont.)



## ■ TYPICAL CHARACTERISTICS (Cont.)



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