



## UM6K1N

Preliminary

Power MOSFET

### SILICON N-CHANNEL MOSFET

#### DESCRIPTION

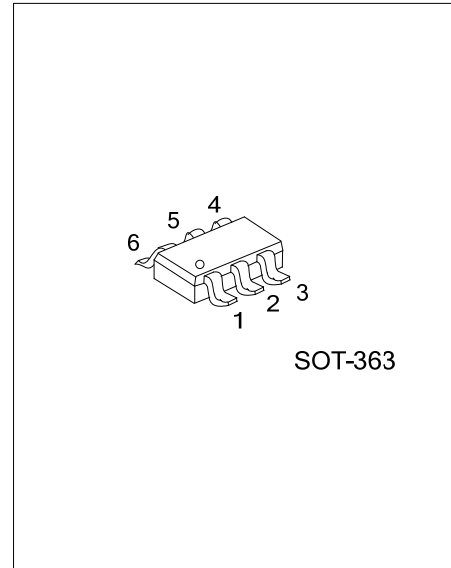
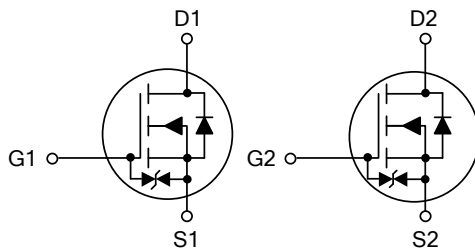
The UTC **UM6K1N** is a silicon N-channel MOSFET. it uses UTC's advanced technology to provide the customers with a minimum on state resistance, high switching speed and low gate threshold voltage.

The UTC **UM6K1N** is suitable for switching and interfacing applications.

#### FEATURES

- \*  $R_{DS(on)} < 8\Omega$  @  $V_{GS}=4V, I_D=10mA$
- \*  $R_{DS(on)} < 13\Omega$  @  $V_{GS}=2.5V, I_D=1mA$
- \* High switching speed
- \* Low gate threshold voltage

#### SYMBOL



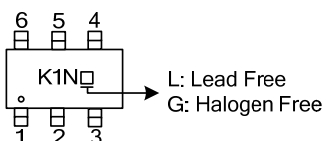
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment						Packing
Lead Free	Halogen Free		1	2	3	4	5	6	
UM6K1NL-AL6-R	UM6K1NG-AL6-R	SOT-363	S1	G1	D2	S2	G2	D1	Tape Reel

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

<p>UM6K1NL-AL6-R</p> <ul style="list-style-type: none"> <li>(1) Packing Type</li> <li>(2) Package Type</li> <li>(3) Lead Free</li> </ul>	<ul style="list-style-type: none"> <li>(1) R: Tape Reel</li> <li>(2) AL6: SOT-363</li> <li>(3) L: Lead Free, G: Halogen Free</li> </ul>
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#### MARKING



■ ABSOLUTE MAXIMUM RATINGS ( $T_A=25^\circ\text{C}$ )

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		$V_{DSS}$	30	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Drain Current	Continuous	$I_D$	100	mA
	Pulsed (Note 1)	$I_{DM}$	200	mA
Power Dissipation (Note 2)	$T_C=25^\circ\text{C}$	$P_D$	150	mW
Channel Temperature		$T_{CH}$	150	$^\circ\text{C}$
Storage Temperature Range		$T_{STG}$	-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.

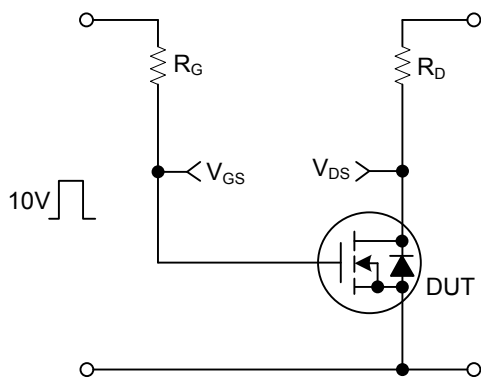
2.  $P_w \leq 10\mu\text{s}$ , Duty cycle  $\leq 50\%$ .

3. With each pin mounted on the recommended lands.

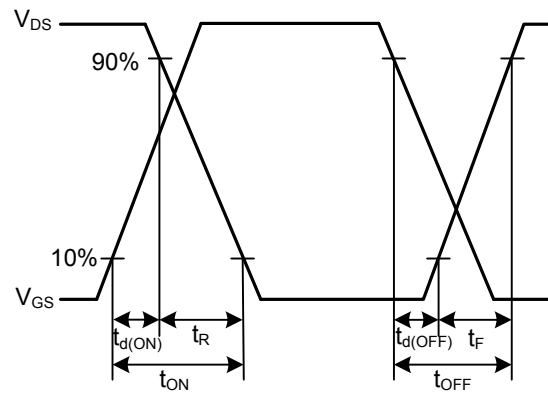
■ ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$ )

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
<b>OFF CHARACTERISTICS</b>								
Drain-Source Breakdown Voltage		$BV_{DSS}$	$I_D=10\mu\text{A}$ , $V_{GS}=0\text{V}$	30			V	
Drain-Source Leakage Current		$I_{DSS}$	$V_{DS}=30\text{V}$ , $V_{GS}=0\text{V}$			1.0	$\mu\text{A}$	
Gate-Source Leakage Current	Forward	$I_{GSS}$	$V_{GS}=+20\text{V}$ , $V_{DS}=0\text{V}$			+1	$\mu\text{A}$	
	Reverse		$V_{GS}=-20\text{V}$ , $V_{DS}=0\text{V}$			-1	$\mu\text{A}$	
<b>ON CHARACTERISTICS</b>								
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS}=3\text{V}$ , $I_D=100\mu\text{A}$	0.8		1.5	V	
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	$V_{GS}=4\text{V}$ , $I_D=10\text{mA}$		5	8	$\Omega$	
			$V_{GS}=2.5\text{V}$ , $I_D=1\text{mA}$		7	13	$\Omega$	
Forward Transfer Admittance		$ Y_{FS} $	$V_{DS}=3\text{V}$ , $I_D=10\text{mA}$	20			mS	
<b>DYNAMIC PARAMETERS</b>								
Input Capacitance		$C_{ISS}$	$V_{GS}=0\text{V}$ , $V_{DS}=5\text{V}$ , $f=1.0\text{MHz}$		13		pF	
Output Capacitance		$C_{OSS}$				9		pF
Reverse Transfer Capacitance		$C_{RSS}$				4		pF
<b>SWITCHING PARAMETERS</b>								
Turn-ON Delay Time		$t_{D(ON)}$	$V_{DD} \approx 5\text{V}$ , $V_{GS}=5\text{V}$ , $I_D=10\text{mA}$ , $R_{GS}=10\Omega$ , $R_L=500\Omega$		15		ns	
Rise Time		$t_R$				35		ns
Turn-OFF Delay Time		$t_{D(OFF)}$				80		ns
Fall-Time		$t_F$				80		ns

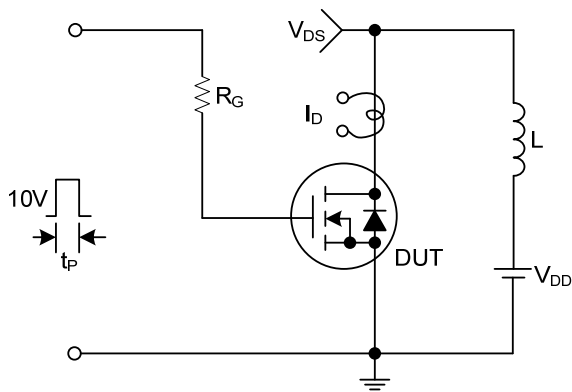
■ TEST CIRCUITS AND WAVEFORMS



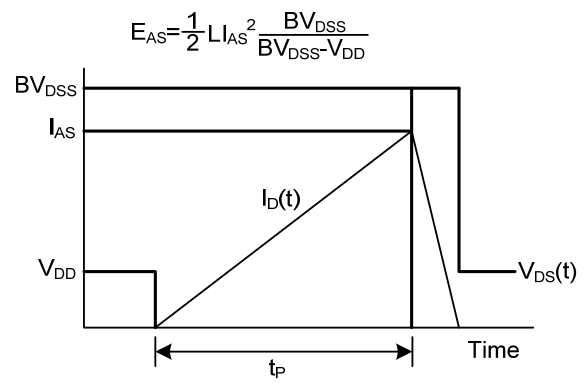
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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