



# UM6K31N

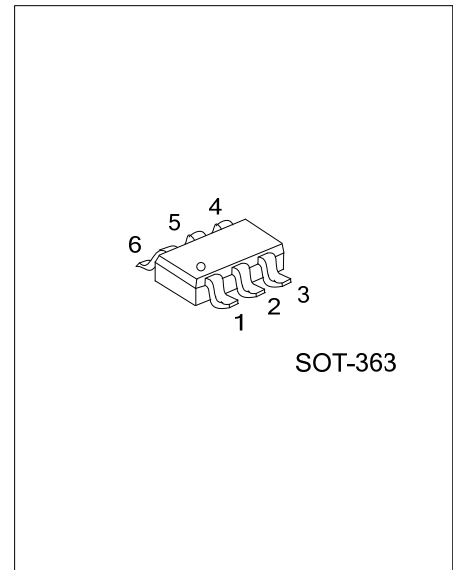
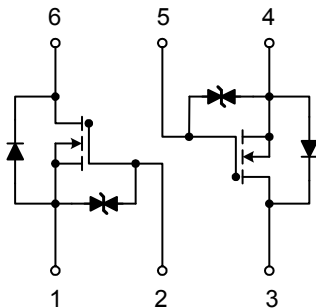
*Power MOSFET*

## SILICON N-CHANNEL MOSFET TRANSISTOR

■ DESCRIPTION

The UTC **UM6K31N** is a silicon N-channel MOS Field Effect Transistor. It can be used in switching applications.

■ SYMBOL



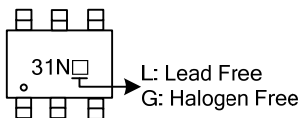
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment						Packing
Lead Free	Halogen Free		1	2	3	4	5	6	
UM6K31NL-AL6-R	UM6K31NG-AL6-R	SOT-363	S1	G1	D2	S2	G2	D1	Tape Reel

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

<p>UM6K31NG-AL6-R</p> <ul style="list-style-type: none"> <li>(1) Packing Type</li> <li>(2) Package Type</li> <li>(3) Green Package</li> </ul>	<ul style="list-style-type: none"> <li>(1) R: Tape Reel</li> <li>(2) AL6: SOT-363</li> <li>(3) G: Halogen Free and Lead Free, L: Lead Free</li> </ul>
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■ MARKING



■ ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C, it is the same rating for the Tr1 AND Tr2)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V <sub>DSS</sub>	60	V
Gate-Source Voltage		V <sub>GSS</sub>	±20	V
Drain Current Continuous	Continuous	I <sub>D</sub>	±250	mA
	Pulsed (Note1)	I <sub>DP</sub>	±1	A
Source Current Continuous (Body Diode)	Continuous	I <sub>S</sub>	125	mA
	Pulsed (Note1)	I <sub>SP</sub>	1	A
Power Dissipation		P <sub>D</sub>	150	mW
Channel Temperature		T <sub>CH</sub>	150	°C
Strage Temperature		T <sub>STG</sub>	-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	RATINGS	UNIT
Channel to Ambient	θ <sub>JA</sub>	833	°C/W

■ ELECTRICAL CHARACTERISTICS (T<sub>a</sub> =25°C, it is the same rating for the Tr1 And Tr2)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> =1mA, V <sub>GS</sub> =0V	60			V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V			1	μA
Gate- Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20 V, V <sub>DS</sub> =0 V			±10	μA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =1mA	1.0		2.5	V
Static Drain-Source On-State Resistance (Note1)	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =250mA		1.7	2.4	Ω
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =250mA		2.1	3.0	Ω
		V <sub>GS</sub> =4.0V, I <sub>D</sub> =250mA		3.3	4.0	Ω
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =10mA		9.4	12	Ω
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1MHz		26		pF
Output Capacitance	C <sub>OSS</sub>			12		pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			5		pF
<b>SWITCHING PARAMETERS (Note1)</b>						
Total Gate Charge (Note 1)	Q <sub>G</sub>	V <sub>DS</sub> =48V, V <sub>GS</sub> =10V, I <sub>D</sub> =250mA I <sub>G</sub> = 1mA (Note1, 2)		6.6		nC
Gate to Source Charge	Q <sub>GS</sub>			2.48		nC
Gate to Drain Charge	Q <sub>GD</sub>			0.92		nC
Turn-ON Delay Time	t <sub>D(ON)</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =10V, I <sub>D</sub> =250mA, R <sub>G</sub> =25Ω		6		ns
Rise Time	t <sub>R</sub>			9		ns
Turn-OFF Delay Time	t <sub>D(OFF)</sub>			14		ns
Fall-Time	t <sub>F</sub>			12		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS (Note1)</b>						
Drain-Source Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =250mA, V <sub>GS</sub> =0V			1.2	V

Note: P<sub>w</sub> ≤ 10μs DUTY CYCLE≤1%.

## ■ TEST CIRCUIT

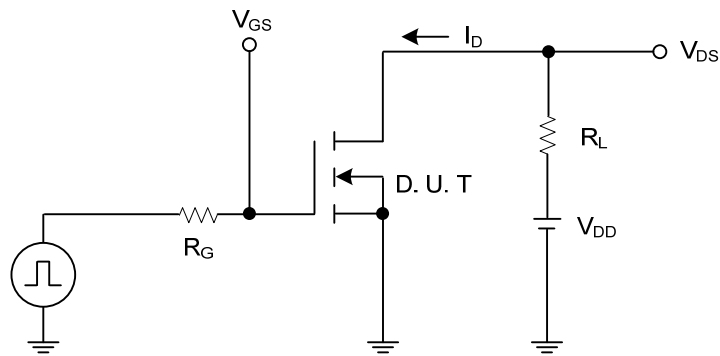


Fig.1-1 Switching Time Measurement Circuit

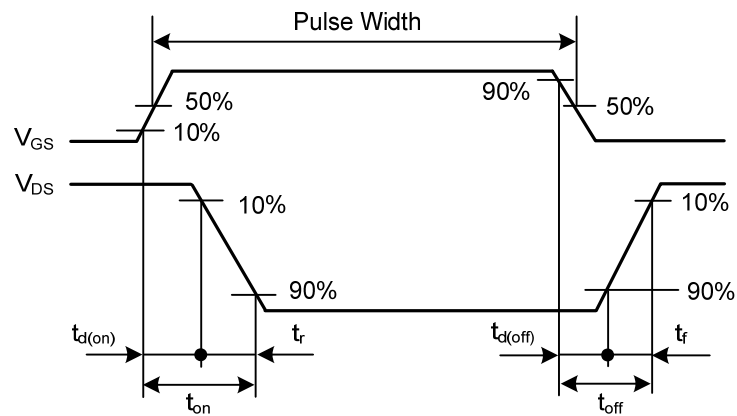
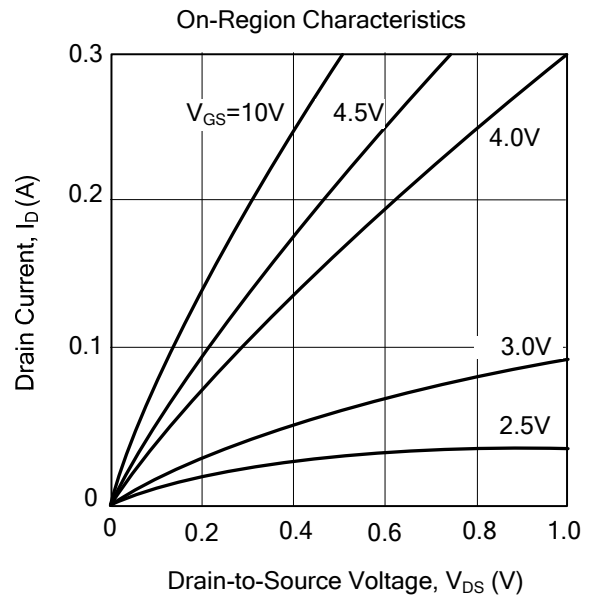
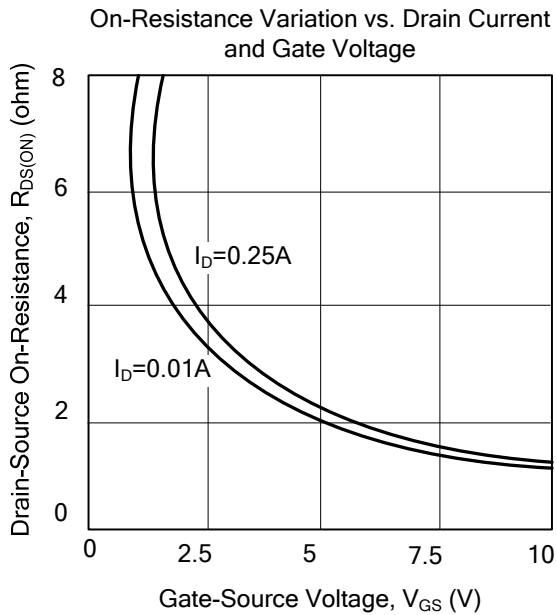
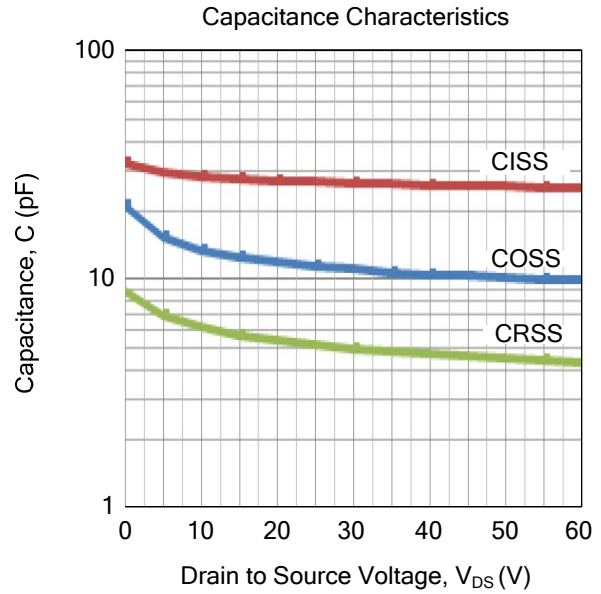
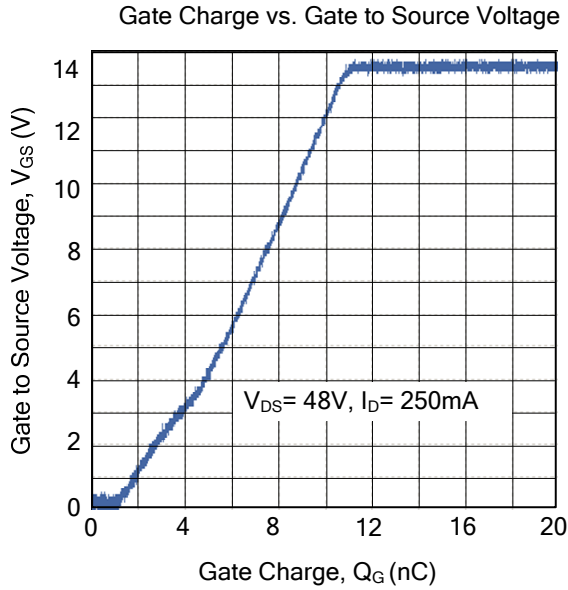


Fig.1-2 Switching Waveforms

## TYPICAL CHARACTERISTICS



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