



## 2N7002LL

Preliminary

Power MOSFET

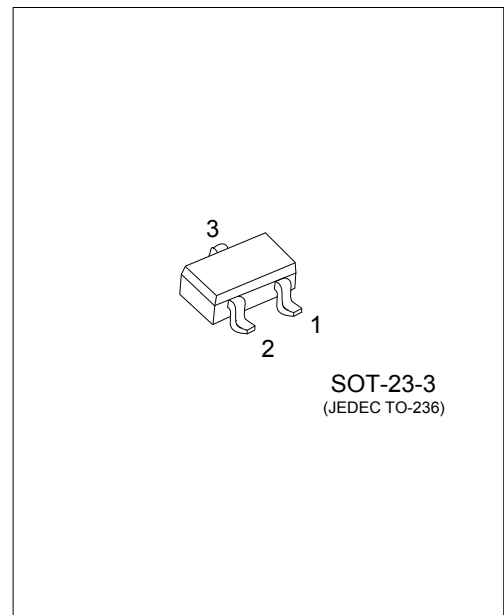
### 60V, 115mA N-CHANNEL POWER MOSFET

#### DESCRIPTION

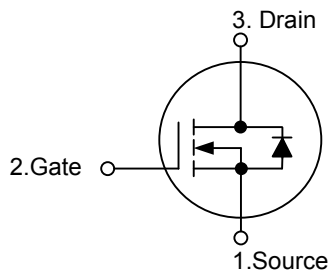
The UTC **2N7002LL** uses advanced technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

#### FEATURES

- \*  $R_{DS(ON)} < 7.5\Omega$  @  $V_{GS}=10V, I_D=115mA$
- \* Low Reverse Transfer Capacitance (  $C_{RSS} = \text{typical } 5 \text{ pF}$  )
- \* Fast Switching Capability
- \* Avalanche Energy Specified
- \* Improved dv/dt Capability, High Ruggedness



#### SYMBOL



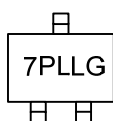
#### ORDERING INFORMATION

Ordering Number	Package	Pin Assignment			Packing
		1	2	3	
2N7002LLG-AE2-R	SOT-23-3	S	G	D	Tape Reel

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

<p>2N7002LLG-AE2-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) AE2: SOT-23-3</li> <li>(3) G: Halogen Free and Lead Free</li> </ul>
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#### MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		$V_{DSS}$	60	V
Drain-Gate Voltage ( $R_G=1.0M\Omega$ )		$V_{DGR}$	60	V
Gate-Source Voltage	Continuous	$V_{GSS}$	$\pm 20$	V
	Non-repetitive ( $t_p \leq 50\mu\text{s}$ )	$V_{GSM}$	$\pm 40$	V
Drain Current	Continuous( $T_C=25^\circ\text{C}$ )	$I_D$	115	mA
	Pulse(Note 2)		460	
Power Dissipation ( $T_A = 25^\circ\text{C}$ )		$P_D$	225	mW
Derate above $25^\circ\text{C}$			1.8	mW/ $^\circ\text{C}$
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. Pulse width  $\leq 300\mu\text{s}$ , Duty cycle  $\leq 2\%$

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	556	$^\circ\text{C}/\text{W}$

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=10\mu\text{A}$	60			V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=60V, V_{GS}=0V (T_J=25^\circ\text{C})$			1.0	$\mu\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	nA
<b>ON CHARACTERISTICS(Note)</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1.0		2.5	V
Drain-Source On-State Voltage	$V_{DS(ON)}$	$V_{GS}=10V, I_D=115\text{mA}$			3.75	V
		$V_{GS}=5V, I_D=50\text{mA}$			0.375	
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=115\text{mA}(T_C=25^\circ\text{C})$			7.5	$\Omega$
		$V_{GS}=5V, I_D=50\text{mA}(T_C=25^\circ\text{C})$			7.5	
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{DS}=25V, V_{GS}=0V, f=1.0\text{MHz}$			50	pF
Output Capacitance	$C_{OSS}$				25	pF
Reverse Transfer Capacitance	$C_{RSS}$				5.0	pF
<b>SWITCHING PARAMETERS</b>						
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=25V, I_D=115\text{mA},$			20	ns
Turn-OFF Delay Time	$t_{D(OFF)}$	$V_{GEN}=10V, R_G=25\Omega, R_L=50\Omega$			40	ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Diode Forward Voltage	$V_{SD}$	$I_S=115\text{mA}, V_{GS}=0V$			1.5	V
Maximum Body-Diode Continuous Current	$I_S$				115	mA
Source Current Pulsed	$I_{SM}$				115	mA

Note: Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

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