



## 2N7002A

Power MOSFET

### N-CHANNEL SILICON MOSFET GENERAL-PURPOSE SWITCHING DEVICE APPLICATIONS

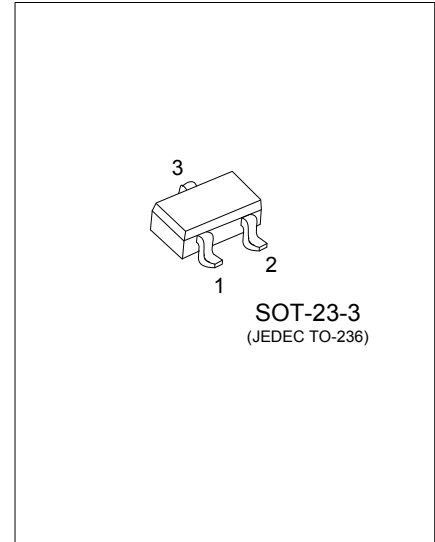
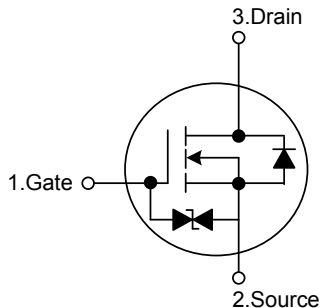
#### DESCRIPTION

The **2N7002A** uses UTC advanced technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with low gate voltages. This device's general purpose is for switching device applications.

#### FEATURES

- \*  $R_{DS(ON)} \leq 5.0 \Omega$  @  $V_{GS}=10V$ ,  $I_D=300mA$
- \*  $R_{DS(ON)} \leq 8.0 \Omega$  @  $V_{GS}=4.5V$ ,  $I_D=50mA$
- \* Fast switching capability
- \* With ESD Protected

#### SYMBOL



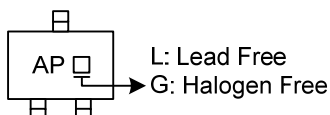
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
2N7002AL-AE2-R	2N7002AG-AE2-R	SOT-23-3	G	S	D	Tape Reel

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

2N7002AG-AE2-R	(1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) AE2: SOT-23-3 (3) G: Halogen Free and Lead Free, L: Lead Free
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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
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
Drain Current	Continuous	300	mA
	Pulse	800	mA
Power Dissipation	$P_D$	225	mW
Derating above $T_A=25^\circ\text{C}$		1.8	mW/ $^\circ\text{C}$
Junction Temperature	$T_J$	+150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55 ~ +150	$^\circ\text{C}$

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.

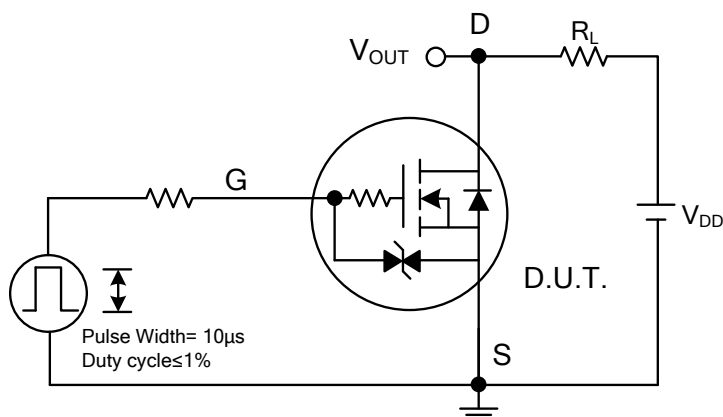
■ ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=10\mu A$	60			V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=60V, V_{GS}=0V$			1	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 10$	$\mu A$
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0		2.0	V
Static Drain-Source On-Resistance (Note)	$R_{DS(ON)}$	$V_{GS}=10V, I_D=300mA$			5.0	$\Omega$
		$V_{GS}=4.5V, I_D=50mA$			8.0	$\Omega$
DYNAMIC PARAMETERS						
Input Capacitance	$C_{ISS}$	$V_{DS}=25V, V_{GS}=0V, f=1.0MHz$		15	50	pF
Output Capacitance	$C_{OSS}$			9	25	pF
Reverse Transfer Capacitance	$C_{RSS}$			4	5	pF
SWITCHING PARAMETERS						
Turn-ON Delay Time	$t_{D(ON)}$	$I_D=0.2A, V_{DD}=30V, V_{GS}=10V, R_L=150\Omega, R_G=10\Omega$		2.4	20	ns
Turn-OFF Delay Time	$t_{D(OFF)}$			5.6	30	ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Maximum Continuous Drain-Source Diode Forward Current	$I_S$				300	mA
Maximum Pulsed Drain-Source Diode Forward Current	$I_{SM}$				0.8	A
Drain-Source Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=300mA$ (Note)		0.88	1.5	V

Notes: 1. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch. Minimum land pad size.

2. Pulse width  $\leq 300\mu\text{s}$ , Duty cycle  $\leq 1\%$ .

■ SWITCHING TIME TEST CIRCUIT



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