

**2N7002K**

Preliminary

Power MOSFET**300mA, 60V N-CHANNEL
ENHANCEMENT MODE
MOSFET**

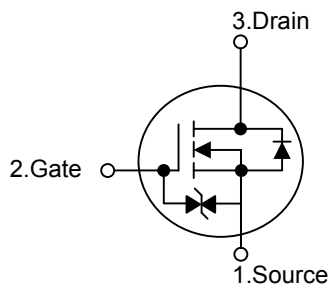
■ DESCRIPTION

The UTC **2N7002K** uses advanced technology to provide excellent $R_{DS(ON)}$, low gate charge and low gate voltages during operation. This device is suitable for use as a load switch or in PWM applications.

■ FEATURES

- * Low Reverse Transfer Capacitance (C_{RSS} = typical 3.0 pF)
- * ESD Protected
- * Fast Switching Capability
- * Avalanche Energy Specified
- * Improved dv/dt Capability, High Ruggedness

■ SYMBOL

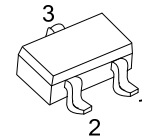
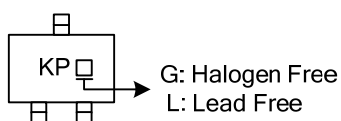


■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment						Packing
Lead Free	Halogen Free		1	2	3	4	5	6	
2N7002KL-AE2-R	2N7002KG-AE2-R	SOT-23-3	S	G	D	-	-	-	Tape Reel

2N7002KG-AE2-R	(1)Packing Type	(1) R: Tape Reel
	(2)Package Type	(2) AE2: SOT-23-3
	(3)Halogen Free	(3) G: Halogen Free, L: Lead Free

■ MARKING



SOT-23-3
(JEDEC TO-236)

■ 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}	±20	V
Drain Current	Continuous	I _D	300	mA
	Pulse(Note 2)		800	
Power Dissipation		P _D	350	mW
Derating above T _A =25°C			2.8	mW/°C
Junction Temperature		T _J	+150	°C
Storage Temperature		T _{STG}	-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.

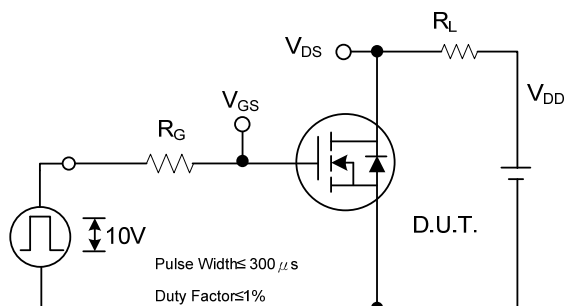
■ ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$, unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =10μA	60			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V			1.0	μA
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±10	μA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =10V, I _D =1mA	1.0	1.85	2.5	V
Static Drain-Source On-Resistance (Note)	R _{DS(ON)}	V _{GS} =10V, I _D =300m A			2	Ω
		V _{GS} =4.5V, I _D =200mA			4	
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz		25	50	pF
Output Capacitance	C _{OSS}			10	25	pF
Reverse Transfer Capacitance	C _{RSS}			3.0	5.0	pF
SWITCHING PARAMETERS						
Turn-ON Delay Time	t _{D(ON)}	I _D =0.2 A, V _{DD} =30V, V _{GS} =10V,		12	20	ns
Turn-OFF Delay Time	t _{D(OFF)}	R _L =150Ω, R _G =10Ω		20	30	ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =300mA (Note)		0.88	1.5	V
Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}				0.8	A
Maximum Continuous Drain-Source Diode Forward Current	I _S				300	mA

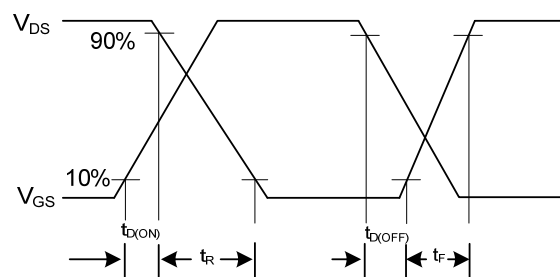
Note: 1. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch. Minimum land pad size.

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

■ TEST CIRCUITS AND WAVEFORMS



Switching Test Circuit



Switching Waveforms

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