



## 2N7002KW

Power MOSFET

### 300mA, 60V N-CHANNEL ENHANCEMENT MODE MOSFET

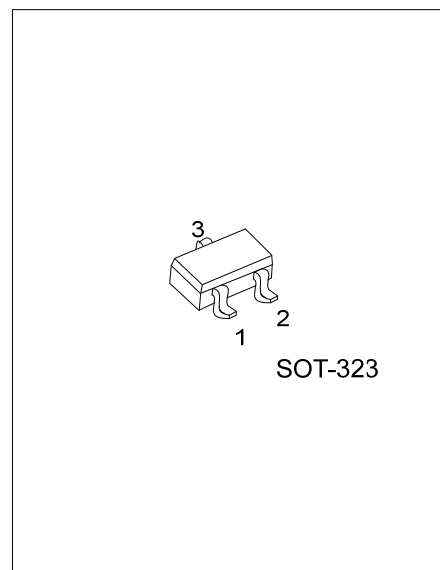
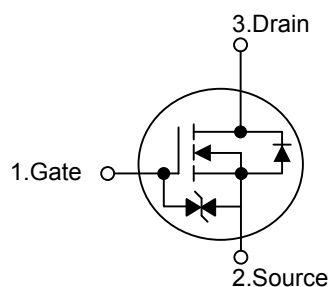
#### DESCRIPTION

The UTC **2N7002KW** 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
- \* ESD Protected
- \* Fast Switching Capability
- \* Avalanche Energy Specified
- \* Improved  $dv/dt$  Capability, High Ruggedness

#### SYMBOL



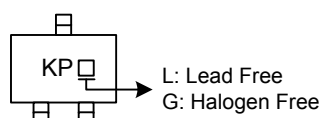
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
2N7002KWL-AL3-R	2N7002KWG-AL3-R	SOT-323	G	S	D	Tape Reel

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

2N7002KWG-AL3-R	(1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) AL3: SOT-323 (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	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current	Continuous	300	mA
	Pulse(Note 2)	800	
Power Dissipation	$P_D$	200	mW
Derating above $T_A=25^\circ\text{C}$		1.6	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.

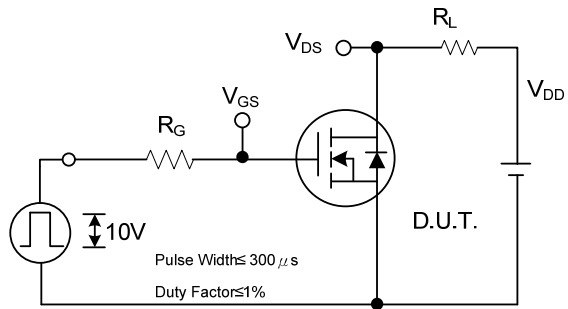
■ ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$ , unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =10μA	60			V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V			1.0	μA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±10	μA
ON CHARACTERISTICS						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0		2.5	V
Static Drain-Source On-Resistance (Note)	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =300mA			4.0	Ω
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =50mA			6.0	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0MHz		22	50	pF
Output Capacitance	C <sub>OSS</sub>			9	25	pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			4	5.0	pF
SWITCHING PARAMETERS						
Turn-ON Delay Time	t <sub>D(ON)</sub>	I <sub>D</sub> =0.2 A, V <sub>DD</sub> =30V, V <sub>GS</sub> =10V, R <sub>L</sub> =150Ω, R <sub>G</sub> =10Ω		1.3	20	ns
Turn-OFF Delay Time	t <sub>D(OFF)</sub>			4.2	30	ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Maximum Continuous Drain-Source Diode Forward Current	I <sub>S</sub>				300	mA
Maximum Pulsed Drain-Source Diode Forward Current	I <sub>SM</sub>				0.8	A
Drain-Source Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =300mA (Note)		0.88	1.5	V

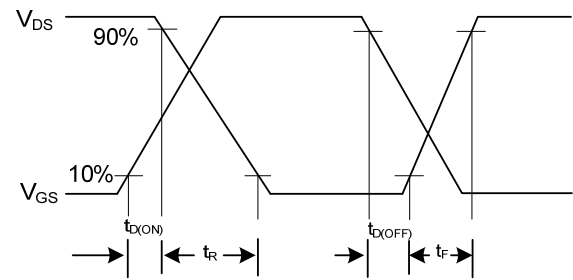
Notes: 1. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch. Minimum land pad size.

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

## ■ TEST CIRCUITS AND WAVEFORMS

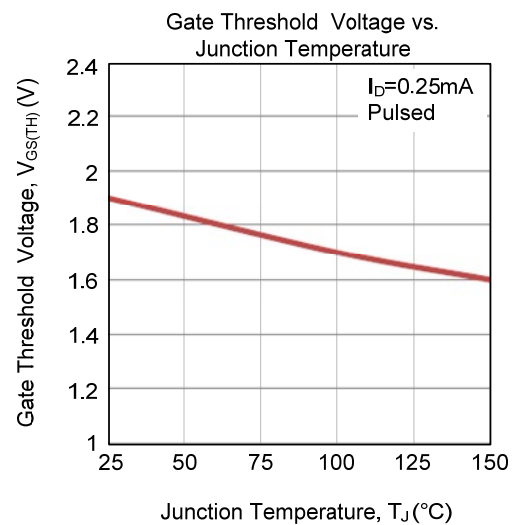
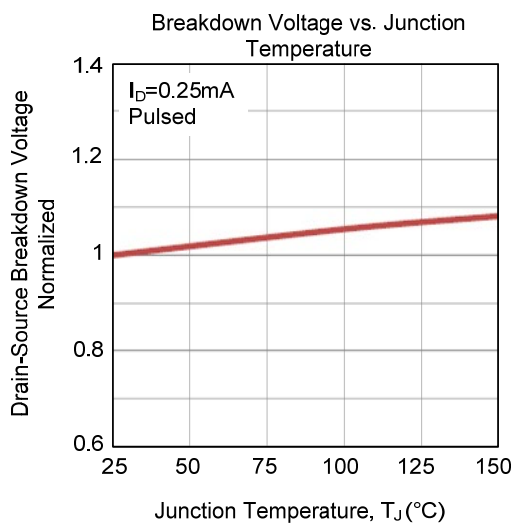
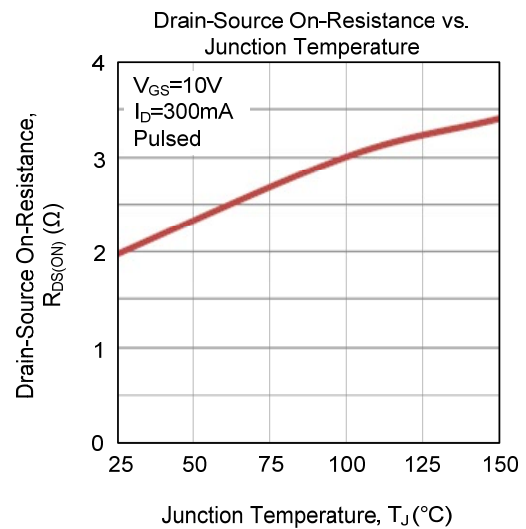
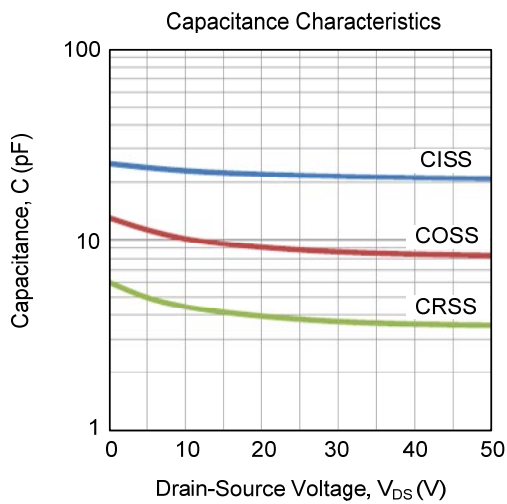
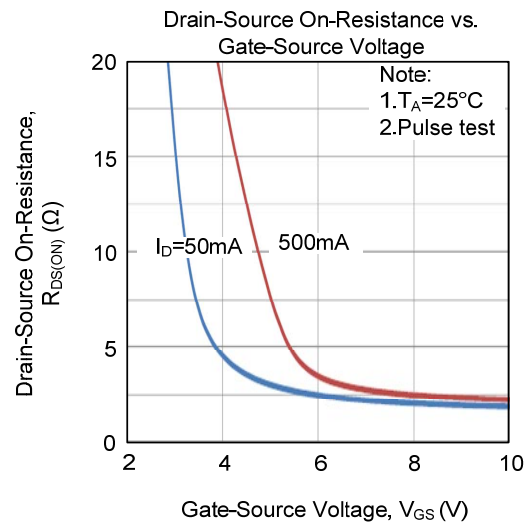
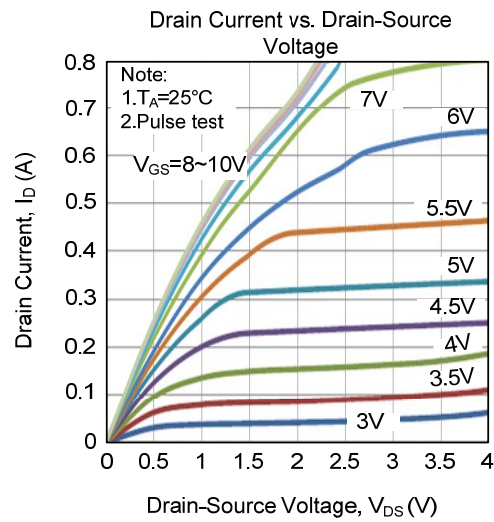


Switching Test Circuit

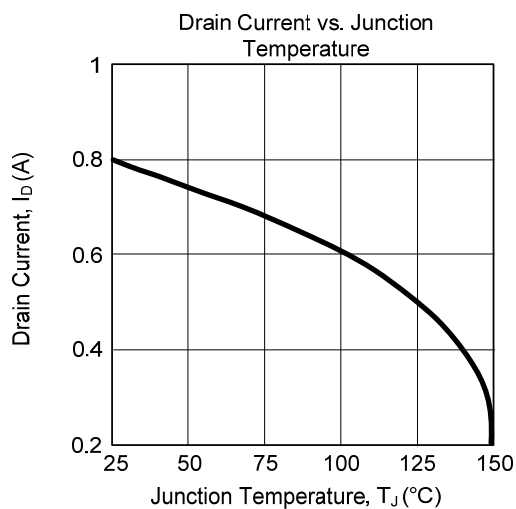
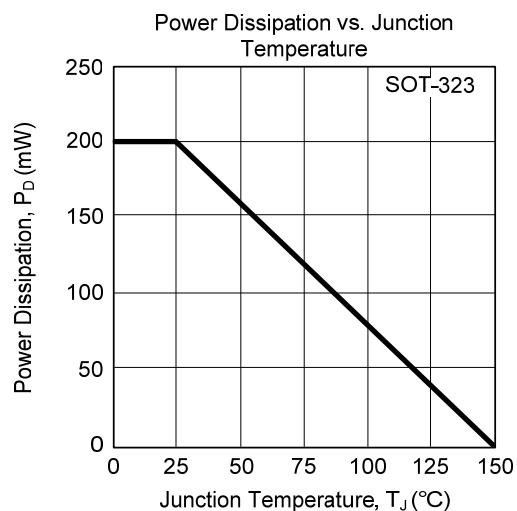
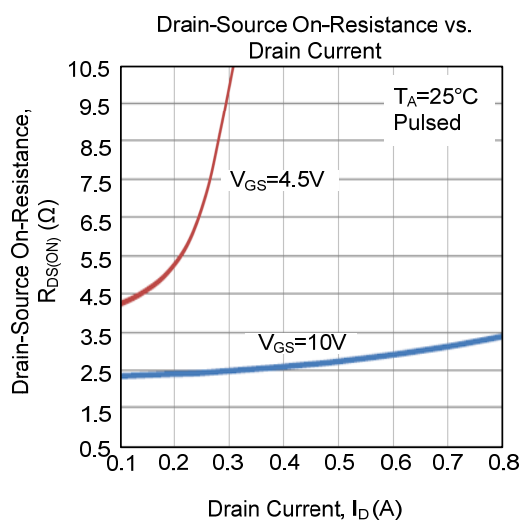
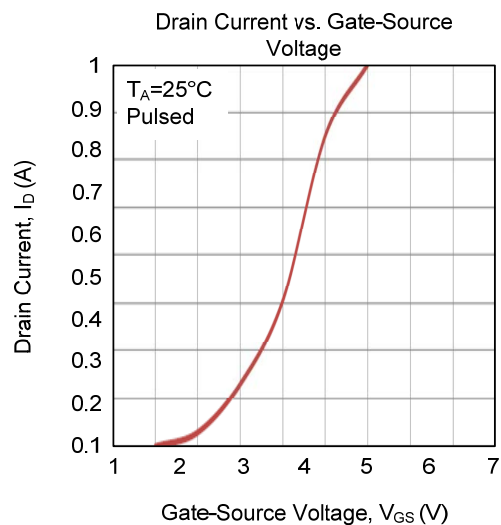
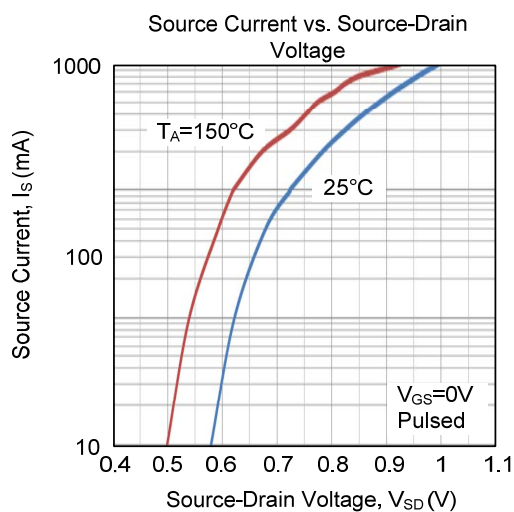


Switching Waveforms

# TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



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