



2N7002K

Power MOSFET

300mA, 60V N-CHANNEL ENHANCEMENT MODE MOSFET

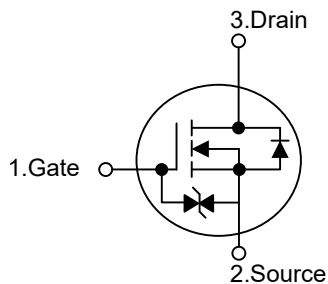
DESCRIPTION

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
- * Fast Switching Capability
- * Avalanche Energy Specified
- * Improved dv/dt Capability, High Ruggedness
- * ESD Protected

SYMBOL



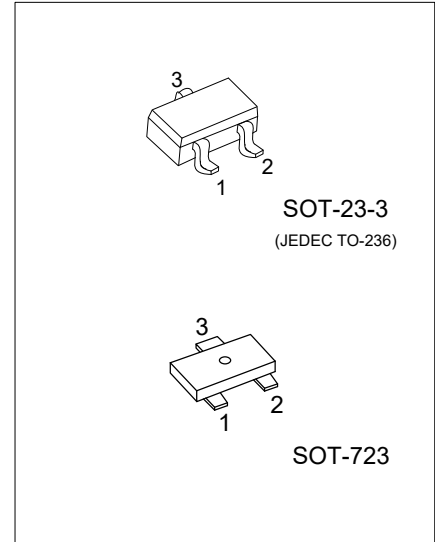
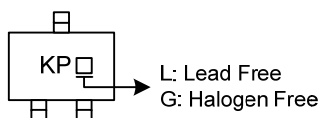
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
2N7002KL-AE2-R	2N7002KG-AE2-R	SOT-23-3	G	S	D	Tape Reel
2N7002KL-AQ3-R	2N7002KG-AQ3-R	SOT-723	G	S	D	Tape Reel

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

2N7002KG-AE2-R (1) Packing Type (2) Package Type (3) Green Package	(1) R: Tape Reel (2) AE2: SOT-23-3, AQ3: SOT-723 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING



■ ABSOLUTE MAXIMUM RATINGS (T_A=25°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	SOT-23-3	P _D	350	mW
	SOT-723		150	mW
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.

■ THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	SOT-23-3	θ _{JA}	357 (Note)	°C/W
	SOT-723		833 (Note)	°C/W

Note: Device mounted on FR-4 substrate P_c board, 2oz copper, with 1inch square copper plate.

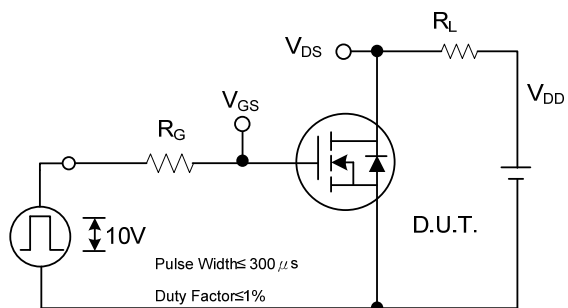
■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified.)

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} =V _{GS} , I _D =250μA	1.0		2.5	V
Static Drain-Source On-Resistance (Note)	R _{DS(ON)}	V _{GS} =10V, I _D =300mA			4.0	Ω
		V _{GS} =4.5V, I _D =50mA			6.0	Ω
DYNAMIC PARAMETERS						
Input Capacitance (Note 1)	C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz		22		pF
Output Capacitance	C _{OSS}			9		pF
Reverse Transfer Capacitance	C _{RSS}			4		pF
SWITCHING PARAMETERS						
Turn-ON Delay Time	t _{D(ON)}	I _D =0.2 A, V _{DD} =30V, V _{GS} =10V,		1.3		ns
Turn-OFF Delay Time	t _{D(OFF)}	R _L =150Ω, R _G =10Ω		4.2		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

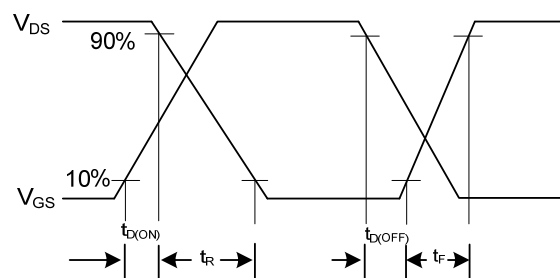
Notes: 1. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch. Minimum land pad size.

2. Pulse width ≤ 300μs, Duty cycle ≤ 1%

■ TEST CIRCUITS AND WAVEFORMS

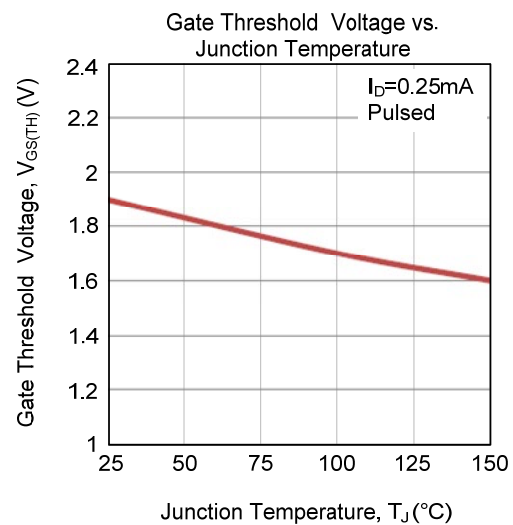
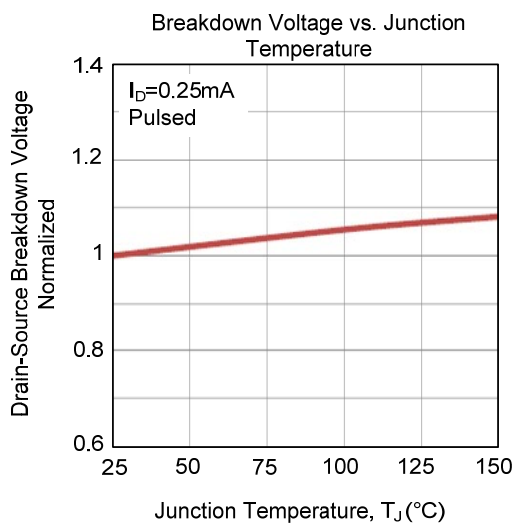
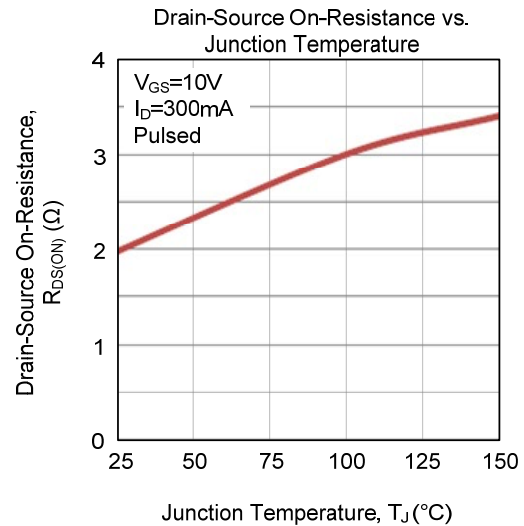
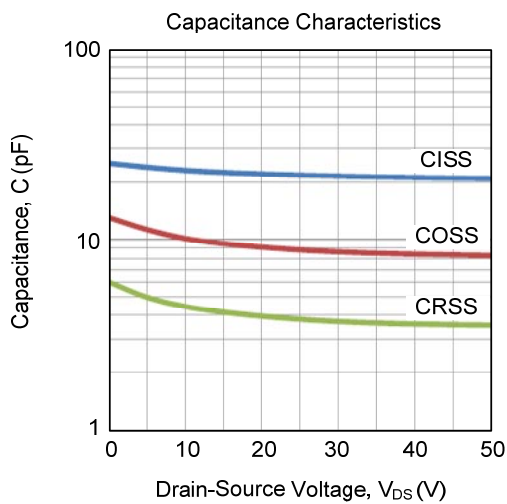
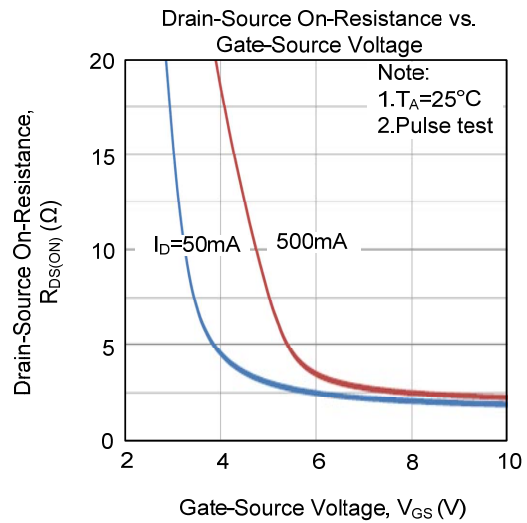
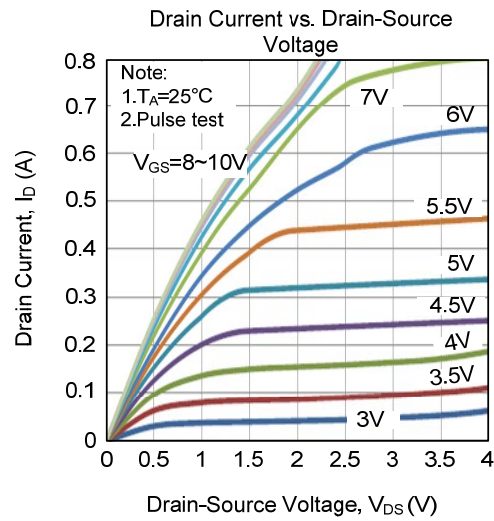


Switching Test Circuit

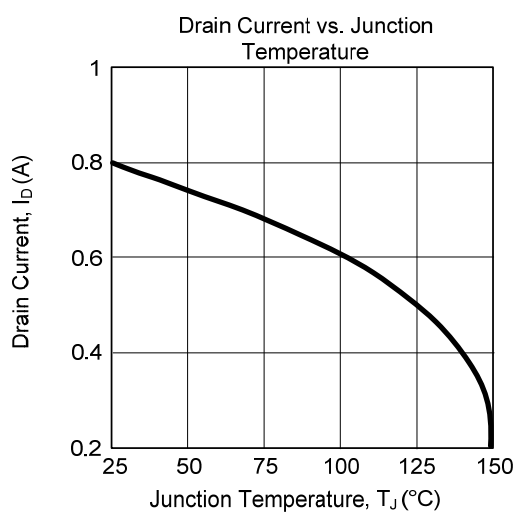
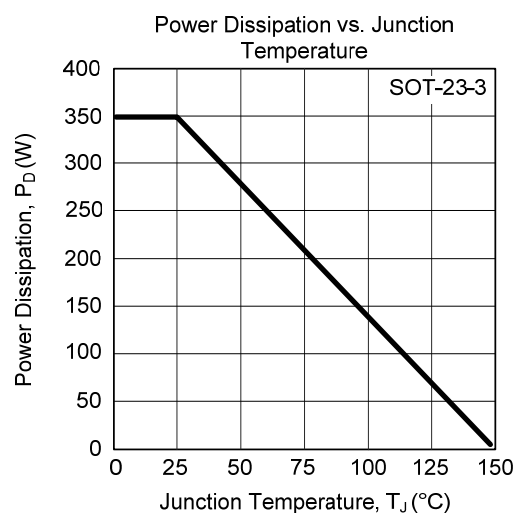
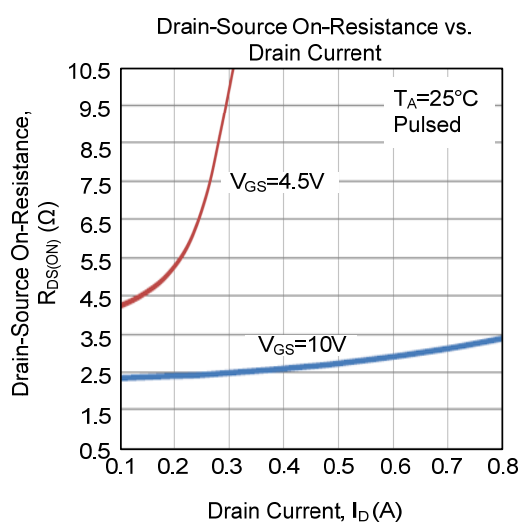
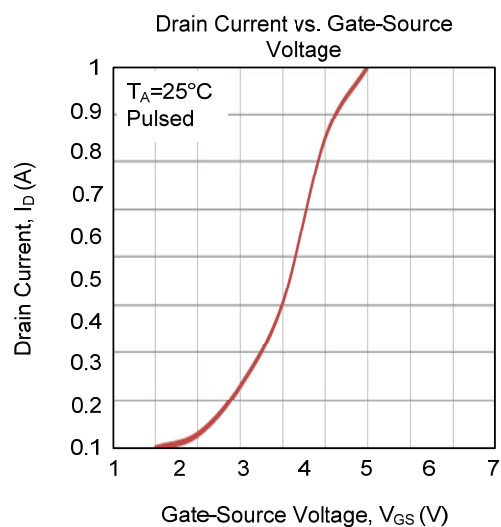
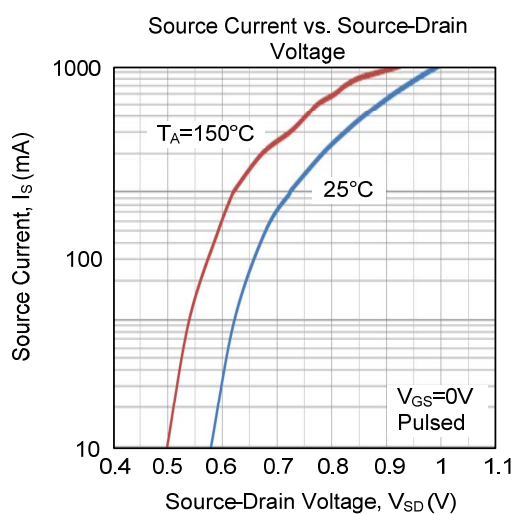


Switching Waveforms

■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



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