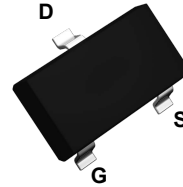
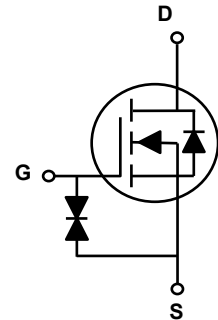


Main Product Characteristics

$V_{(BR)DSS}$	60V
$R_{DS(ON)}$	2.5Ω (Max.)
I_D	0.34A



SOT-23



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



Description

The 2N7002K utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supplies and a wide variety of other applications.

Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-to-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, @ Steady-State ($T_A=25^{\circ}\text{C}$) ¹	I_D	0.34	A
Continuous Drain Current, @ Steady-State ($T_A=70^{\circ}\text{C}$)		0.272	A
Pulsed Drain Current ²	I_{DM}	1.5	A
Power Dissipation ($T_A=25^{\circ}\text{C}$)	P_D	430	mW
Linear Derating Factor ($T_A=25^{\circ}\text{C}$)		2.8	mW/°C
Thermal Resistance, Junction-to-Ambient (PCB Mounted, Steady-State) ³	$R_{\theta JA}$	357	°C/W
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +150	°C

Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	60	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V$	-	-	1	μA
		$T_J=125^\circ\text{C}$	-	-	50	
Gate-to-Source Forward Leakage	I_{GSS}	$V_{GS}=\pm 20V$	-	-	± 10	μA
		$V_{GS}=\pm 10V$	-	-	± 5	
Static Drain-to-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=0.3A$	-	1.2	2.5	Ω
		$V_{GS}=4.5V, I_D=0.2A$	-	1.3	2.9	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.5	2.5	V
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=30V,$ $f=1\text{MHz}$	-	16.4	-	pF
Output Capacitance	C_{oss}		-	10.5	-	
Reverse Transfer Capacitance	C_{rss}		-	5.6	-	
Total Gate Charge	Q_g	$I_D=0.3A, V_{DS}=30V, V_{GS}=10V$	-	1.7	2.4	nC
Turn-on Delay Time	$t_{d(on)}$	$V_{GS}=10V, V_{DS}=30V,$ $R_{GEN}=6\Omega, I_D=0.3A$	-	5.5	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	17.2	-	
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	0.34	A
Pulsed Source Current (Body Diode)	I_{SM}		-	-	0.68	A
Diode Forward Voltage	V_{SD}	$I_S=0.3A, V_{GS}=0V$	-	0.82	1.2	V
Reverse Recovery Time	T_{rr}	$T_J=25^\circ\text{C}, I_F=0.3A,$ $di/dt=100A/\mu s, V_R=25V$	-	30.2	-	nS

Notes:

1. Pulse test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Typical Electrical and Thermal Characteristics

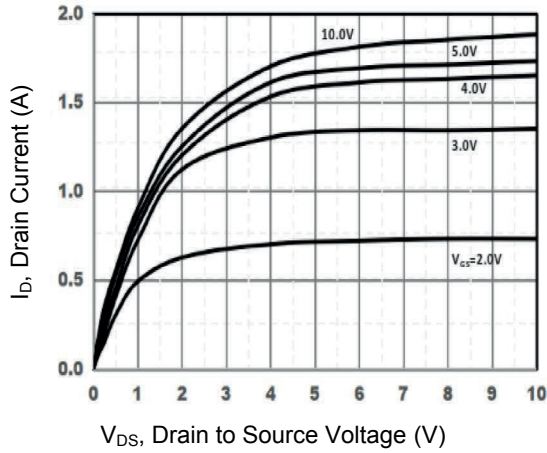


Figure 1. Output Characteristics

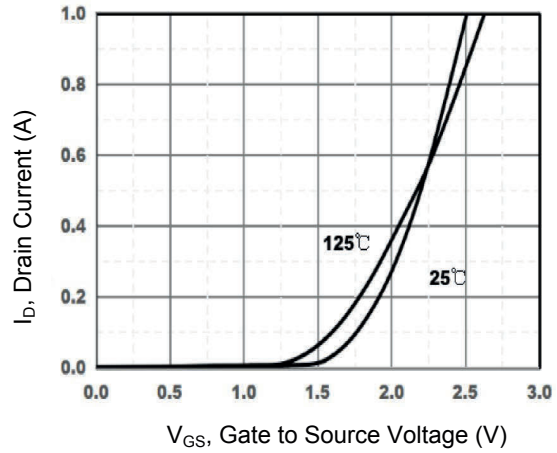


Figure 2. Transfer Characteristics

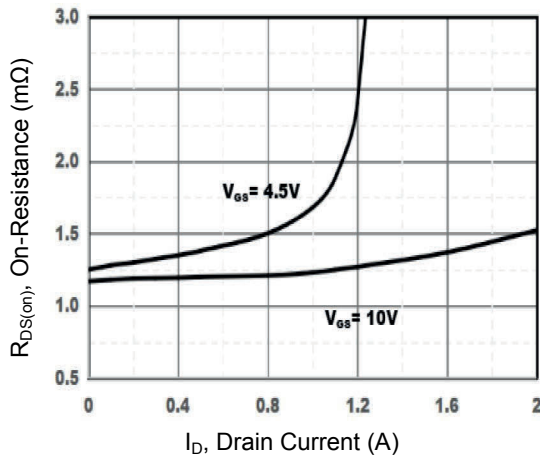


Figure 3. On-Resistance vs. I_D

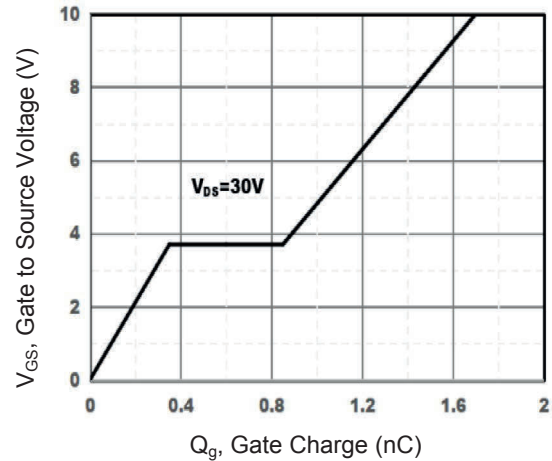


Figure 4. Gate Charge

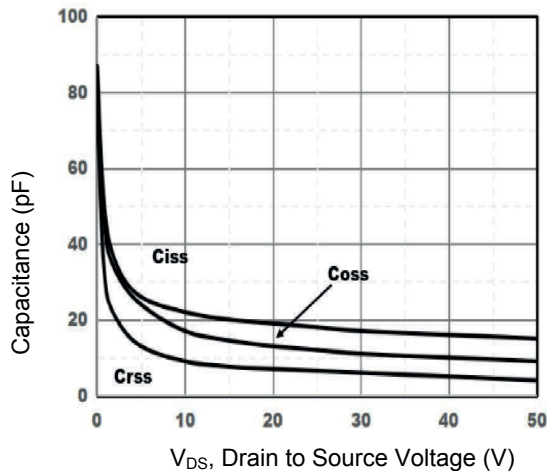


Figure 5. Capacitance Characteristics

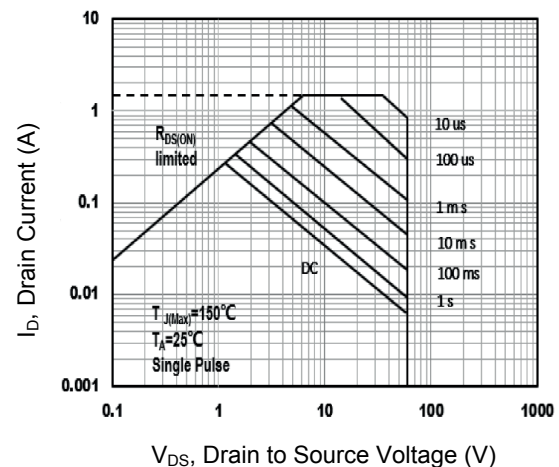
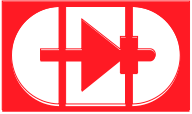
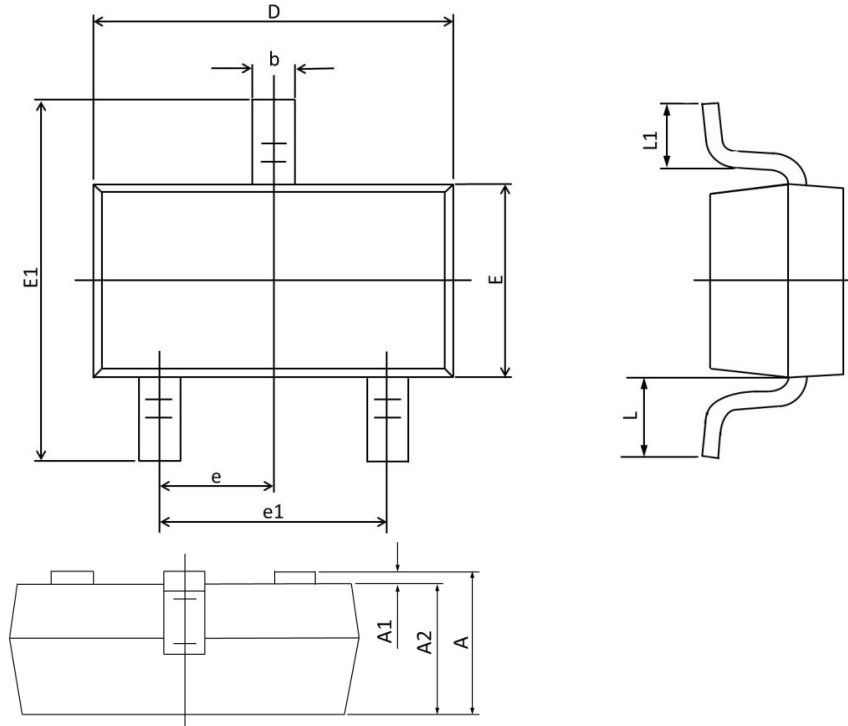


Figure 6. Safe Operation Area



Package Outline Dimensions (SOT-23)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.200	0.035	0.047
A1	0.000	0.100	0.000	0.004
A2	0.900	1.150	0.035	0.045
b	0.300	0.500	0.012	0.020
D	2.800	3.040	0.110	0.120
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.95 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.55 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020

Order Information

Device	Package	Marking	Packaging	SPQ
2N7002K	SOT-23	S72	Tape & Reel	3,000pcs / Reel

For more information, please contact us at: inquiry@goodarksemi.com