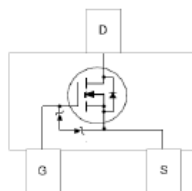
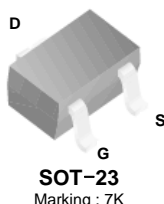


2N7002K

N-Channel Enhancement Mode Field Effect Transistor

Features

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Ultra-Small Surface Mount Package
- Pb Free/RoHS Compliant
- ESD HBM=2000V (Typical:3000V) as per JESD22 A114 and ESD CDM=2000V as per JESD22 C101



Absolute Maximum Ratings * $T_A = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Value	Units
V _{DSS}	Drain-Source Voltage	60	V
V _{DGR}	Drain-Gate Voltage R _{GS} ≤ 1.0MΩ	60	V
V _{GSS}	Gate-Source Voltage	±20	V
I _D	Drain Current Continuous Pulsed	300 800	mA
T _J	Operating Junction Temperature Range	-55 to +150	°C
T _{STG}	Storage Temperature Range	-55 to +150	°C

* These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

Thermal Characteristics

Symbol	Parameter	Value	Units
P_D	Total Device Dissipation Derating above $T_A = 25^\circ\text{C}$	350 2.8	mW mW/ $^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient *	350	$^\circ\text{C}/\text{W}$

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

Electrical Characteristics $T_A = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Condition	MIN	MAX	Units
Off Characteristics (Note1)					
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D =10uA	60		V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 60V, V _{GS} = 0V V _{DS} = 60V, V _{GS} = 0V, @T _C = 125°C		1.0 500	μA
I _{GSS}	Gate-Body Leakage	V _{GS} = ±20V, V _{DS} = 0V		±10	μA
On Characteristics (Note1)					
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250uA	1.0	2.5	V
R _{DS(ON)}	Satic Drain-Source On-Resistance	V _{GS} = 10V, I _D = 0.5A V _{GS} = 4.5V, I _D = 200mA		2 4	Ω
I _{D(ON)}	On-State Drain Current	V _{GS} = 10V, V _{DS} = 7.5V V _{GS} = 4.5V, V _{DS} = 10V	1.5 1.2		A
g _{FS}	Forward Transconductance	V _{DS} = 10V, I _D = 0.2A	200		mS
Dynamic Characteristics					
C _{iSS}	Input Capacitance	V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz		50	pF
C _{oSS}	Output Capacitance			15	pF
C _{rSS}	Reverse Transfer Capacitance			6	pF
Switching Characteristics					
t _{D(ON)}	Turn-On Delay Time	V _{DD} = 30V, I _{DSS} = 200mA, R _G = 10Ω, V _{GS} = 10V		5	ns
t _{D(OFF)}	Turn-Off Delay Time			30	

Note1 : Short duration test pulse used to minimize self-heating effect.

Typical Performance Characteristics

Figure 1. On-Region Characteristics

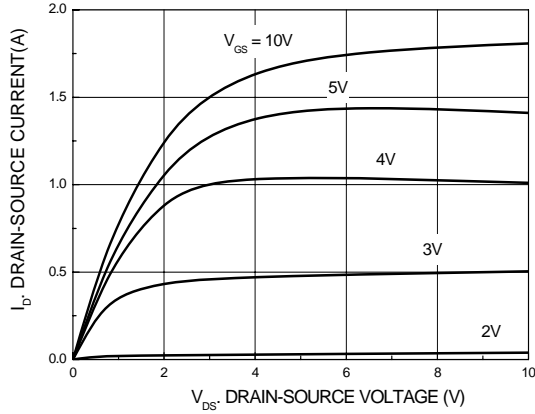


Figure 2. On-Resistance Variation with Gate Voltage and Drain Current

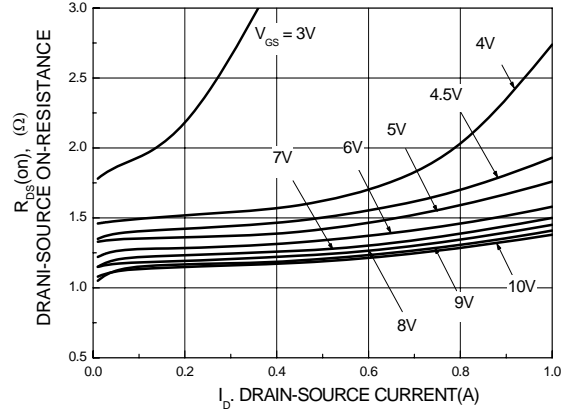


Figure 3. On-Resistance Variation with Temperature

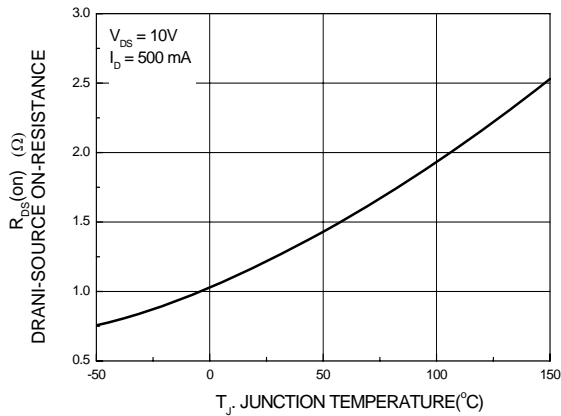


Figure 4. On-Resistance Variation with Gate-Source Voltage

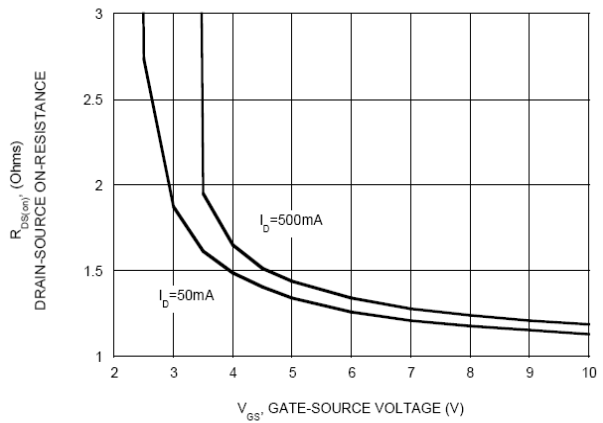


Figure 5. Transfer Characteristics

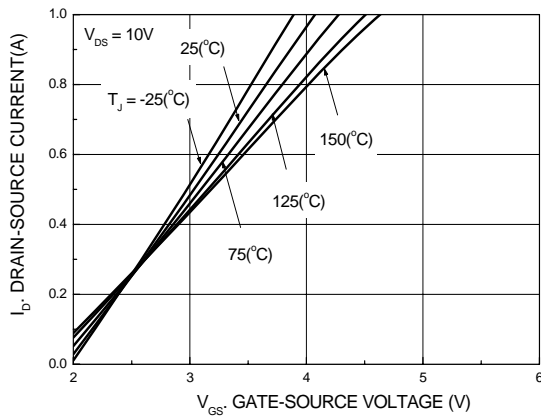
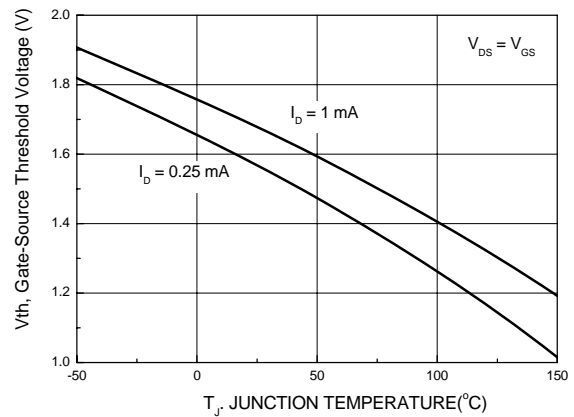
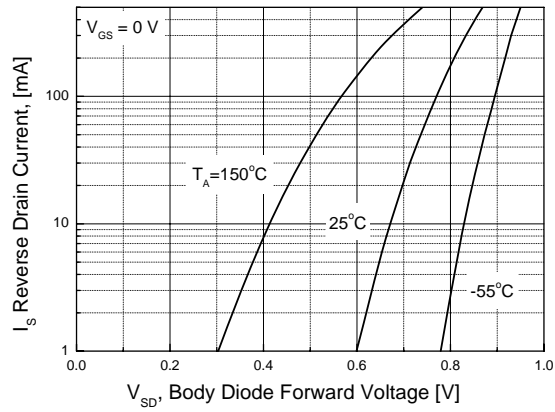


Figure 6. Gate Threshold Variation with Temperature



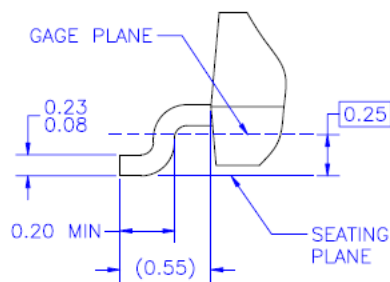
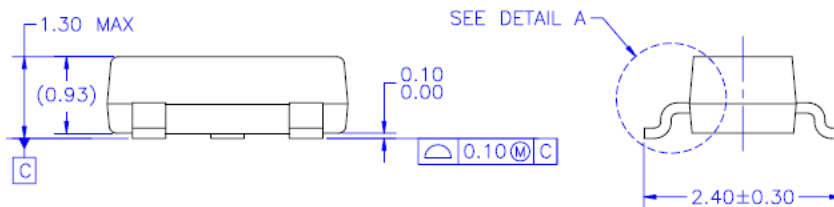
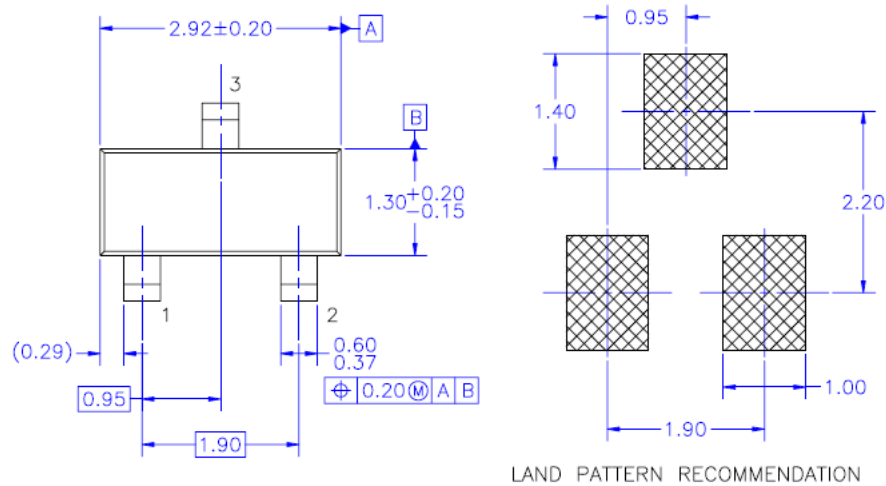
Typical Performance Characteristics (Continue)

Figure 7. Reverse Drain Current Variation with Diode Forward Voltage and Temperature



Physical Dimensions

SOT-23



DETAIL A
SCALE: 2X

NOTES: UNLESS OTHERWISE SPECIFIED





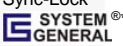
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- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DIMENSIONS ARE INCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR EXTRUSIONS.
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Dimensions in Millimeters



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