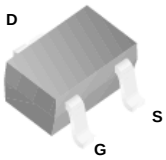
FAIRCHILD SEMICONDUCTOR®

January 2012

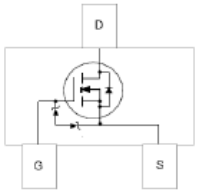
2N7002K
N-Channel Enhancement Mode Field Effect Transistor

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



SOT−23
Marking : 7K



Absolute Maximum Ratings * T_A = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V_{DSS}	Drain-Source Voltage	60	V
V_{DGR}	Drain-Gate Voltage $R_{GS} \leq 1.0M\Omega$	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 by impaired.

Thermal Characteristics

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

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

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Electrical Characteristics T_A = 25°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	1.5		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.

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Typical Performance Characteristics

Figure 1. On-Region Characteristics

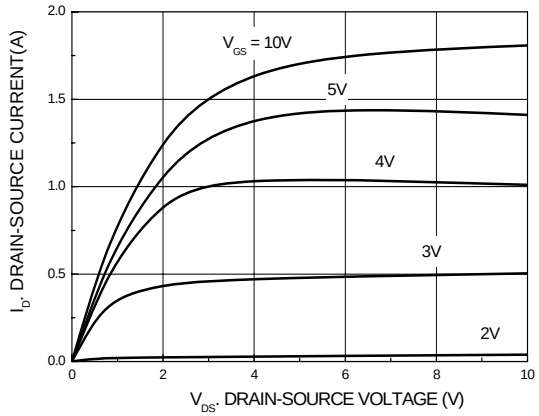


Figure 2. On-Resistance Variation with Gate Voltage and Drain Current

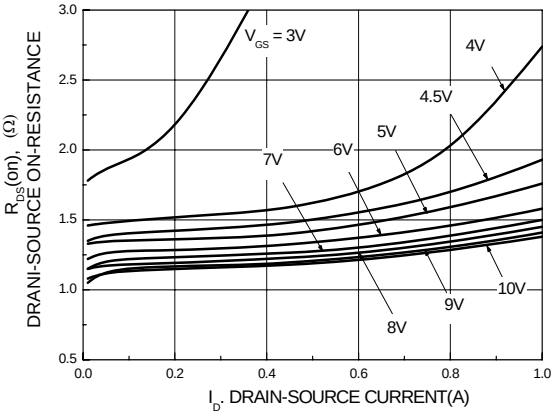


Figure 3. On-Resistance Variation with Temperature

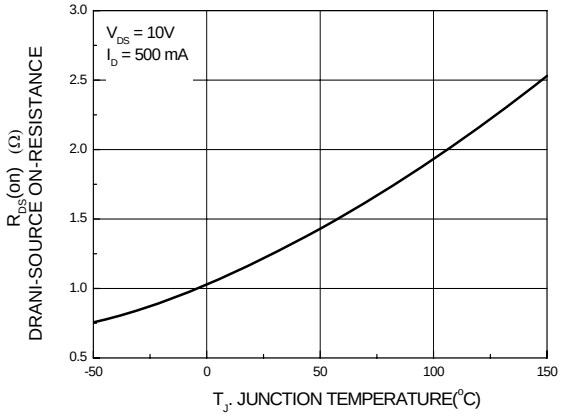


Figure 4. On-Resistance Variation with Gate-Source Voltage

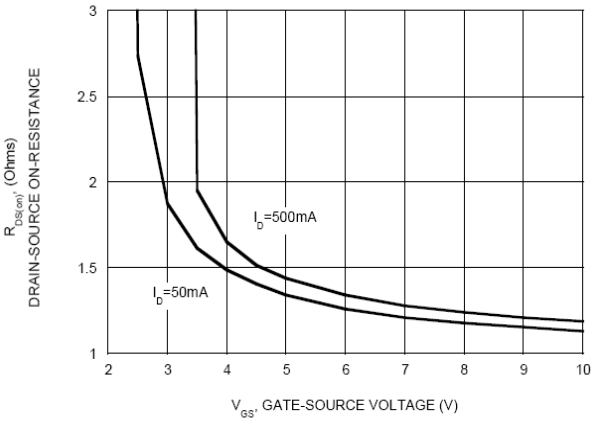


Figure 5. Transfer Characteristics

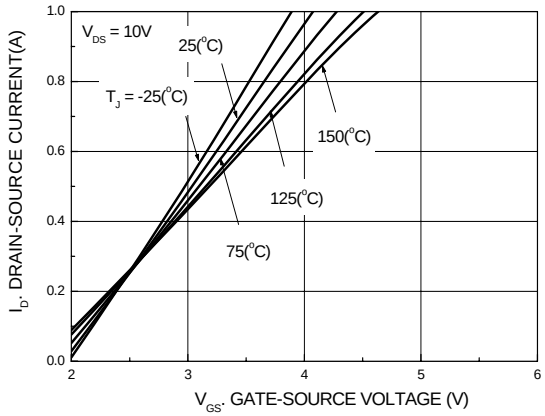
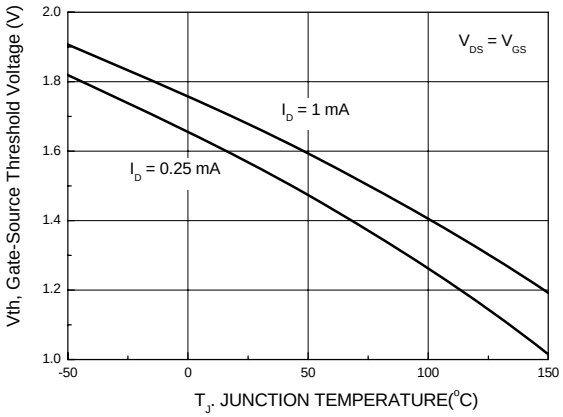


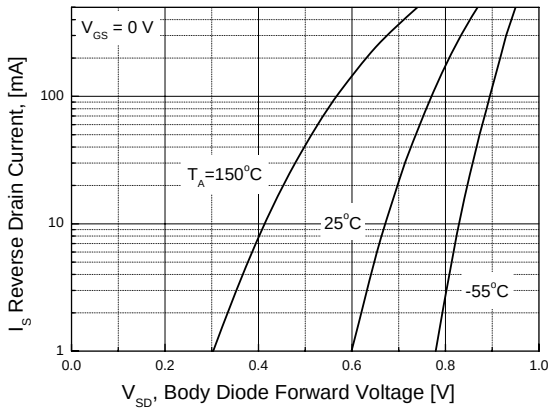
Figure 6. Gate Threshold Variation with Temperature



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Typical Performance Characteristics (Continue)

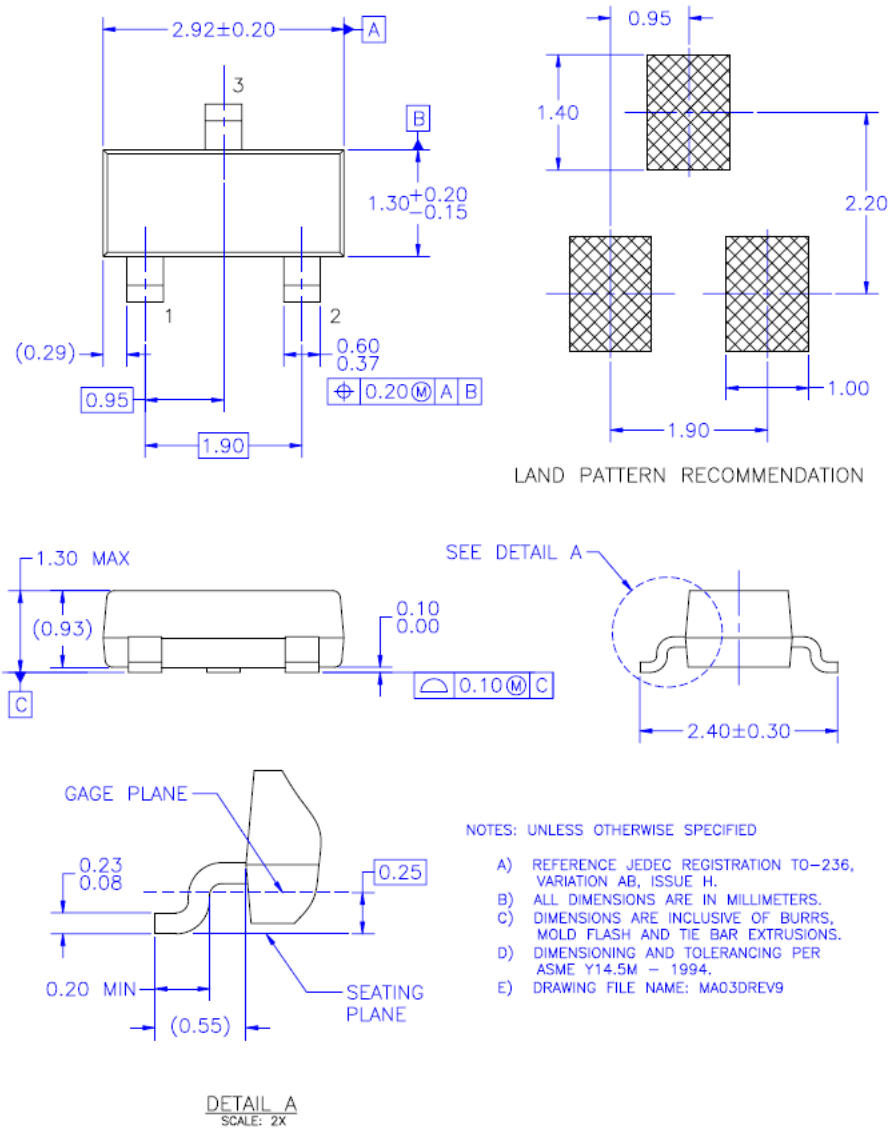
Figure 7. Reverse Drain Current Variation with Diode Forward Voltage and Temperature



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Physical Dimensions

SOT-23



Dimensions in Millimeters

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