Rochester Electronics

Datasheet

Rochester Electronics Manufactured Components

Rochester branded components are manufactured using either die/wafers purchased from the original suppliers or Rochester wafers recreated from the original IP. All recreations are done with the approval of the OCM.

Parts are tested using original factory test programs or Rochester developed test solutions to guarantee product meets or exceed the OCM data sheet.

Quality Overview

- ISO-9001
- AS9120 certification
- Qualified Manufacturers List (QML) MIL-PRF-35835
    - Class Q Military
    - Class V Space Level
- Qualified Suppliers List of Distributors (QSLD)

    - Rochester is a critical supplier to DLA and meets all industry and DLA standards.

Rochester Electronics, LLC is committed to supplying products that satisfy customer expectations for quality and are equal to those originally supplied by industry manufacturers.

The original manufacturer's datasheet accompanying this document reflects the performance and specifications of the Rochester manufactured version of this device. Rochester Electronics guarantees the performance of its semiconductor products to the original OEM specifications. 'Typical' values are for reference purposes only. Certain minimum or maximum ratings may be based on product characterization, design, simulation, or sample testing.

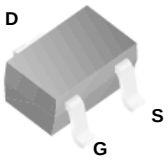
FAIRCHILD SEMICONDUCTOR®

February 2010

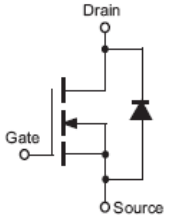
2N7002W
N-Channel Enhancement Mode Field Effect Transistor

Features

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Ultra-Small Surface Mount Package
- Lead Free/RoHS Compliant



SOT−323
Marking : 2N



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 — Continuous Pulsed	±20 ±40	V
I_D	Drain Current — Continuous Continuous @ 100°C Pulsed	115 73 800	mA
T_J , T_{STG}	Junction and 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	200 1.6	mW mW/°C
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient *	625	°C/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°C unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristics (Note1)						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=10uA	60	78	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V, V_{GS}=0V V_{DS}=60V, V_{GS}=0V, @T_C=125°C	-	0.001 7	1.0 500	μA
I_{GSS}	Gate-Body Leakage	V_{GS}=±20V, V_{DS}=0V	-	0.2	±10	nA
On Characteristics (Note1)						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	1.0	1.76	2.0	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=5V, I_D=0.05A, V_{GS}=10V, I_D=0.5A, @T_J=125°C	- -	1.6 2.53	7.5 13.5	Ω
$I_{D(ON)}$	On-State Drain Current	V_{GS}=10V, V_{DS}=7.5V	0.5	1.43	-	A
g_{FS}	Forward Transconductance	V_{DS}=10V, I_D=0.2A	80	356.5	-	mS
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1.0MHz	-	37.8	50	pF
C_{oss}	Output Capacitance		-	12.4	25	pF
C_{rss}	Reverse Transfer Capacitance		-	6.5	7.0	pF
Switching Characteristics						
$t_{D(ON)}$	Turn-On Delay Time	V_{DD}=30V, I_D=0.2A, V_{GEN}=10V R_L=150Ω, R_{GEN}=25Ω	-	5.85	20	ns
$t_{D(OFF)}$	Turn-Off Delay Time		-	12.5	20	

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

Typical Performance Characteristics

Figure 1. On-Region Characteristics

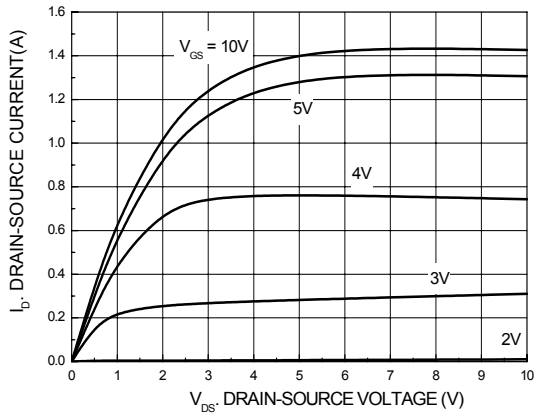


Figure 2. On-Resistance Variation with Gate Voltage and Drain Current

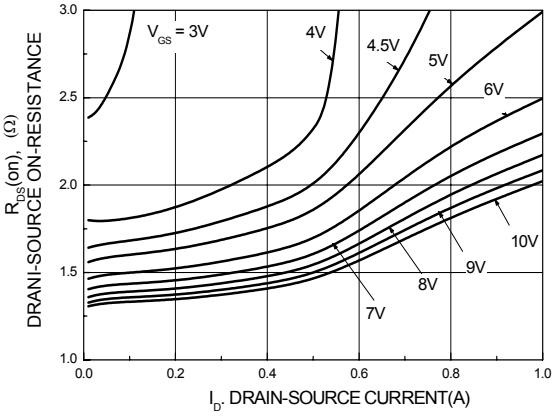


Figure 3. On-Resistance Variation with Temperature

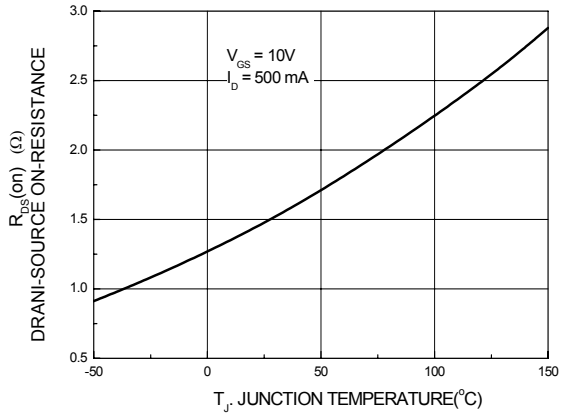


Figure 4. On-Resistance Variation with Gate-Source Voltage

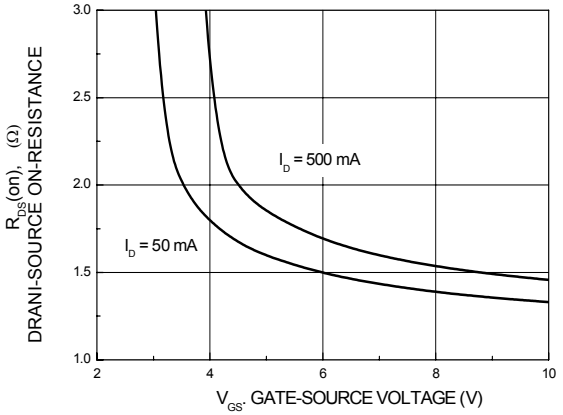


Figure 5. Transfer Characteristics

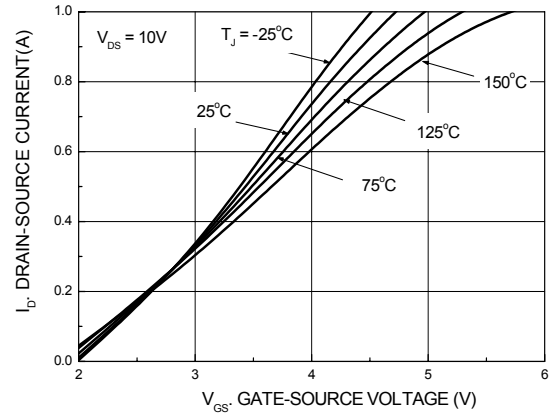
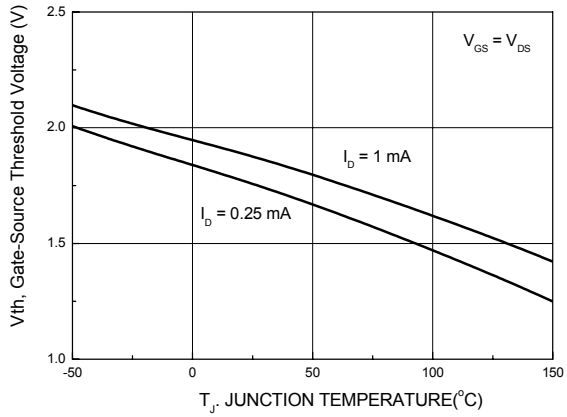


Figure 6. Gate Threshold Variation with Temperature



Typical Performance Characteristics

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

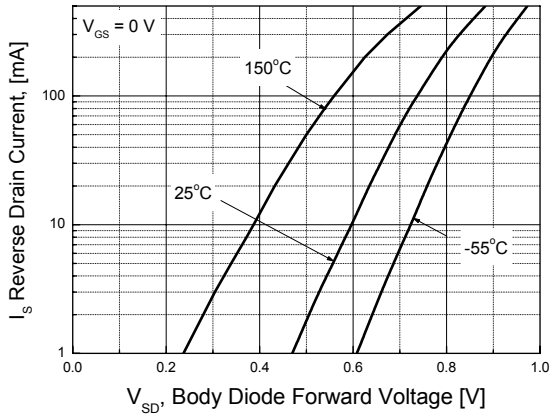
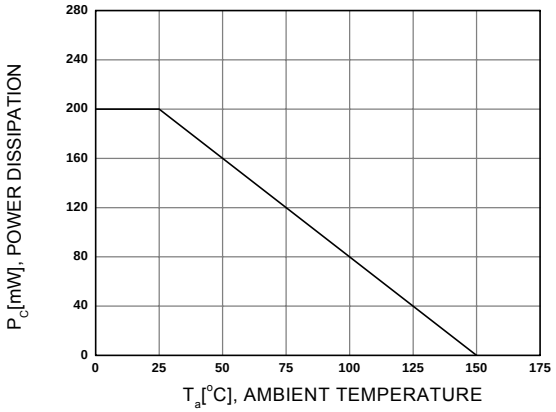


Figure 8. Power Derating



Package Dimensions

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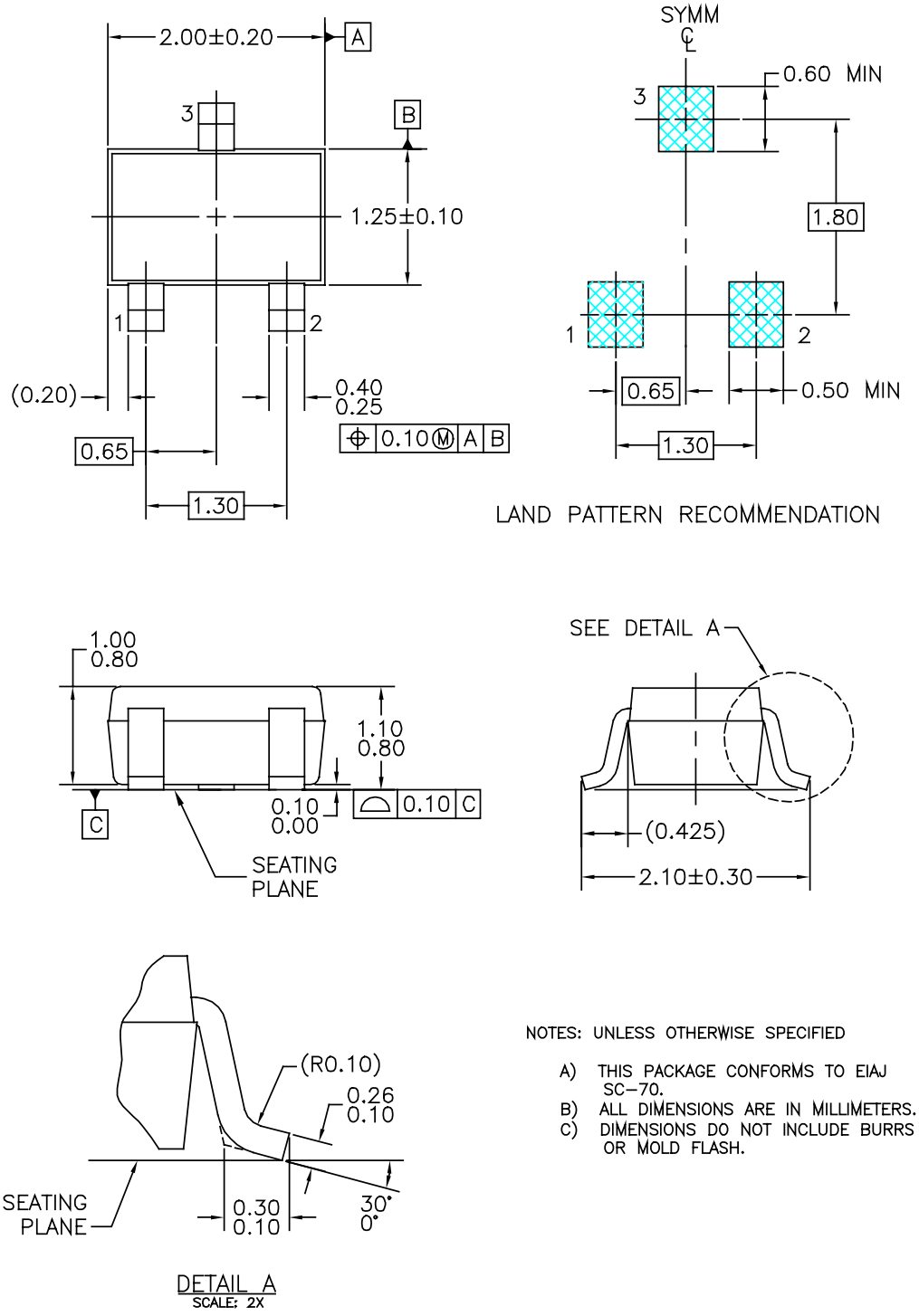

NOTES: UNLESS OTHERWISE SPECIFIED

A) THIS PACKAGE CONFORMS TO EIAJ SC-70.
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DIMENSIONS DO NOT INCLUDE BURRS OR MOLD FLASH.

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Definition of Terms

Datasheet Identification	Product Status	Definition
Advance Information	Formative / In Design	Datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
No Identification Needed	Full Production	Datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design.
Obsolete	Not In Production	Datasheet contains specifications on a product that is discontinued by Fairchild Semiconductor. The datasheet is for reference information only.

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