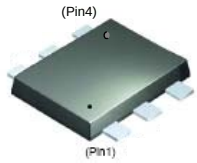
FAIRCHILD SEMICONDUCTOR®

April 2010

2N7002V/VA
N-Channel Enhancement Mode Field Effect Transistor

Features

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



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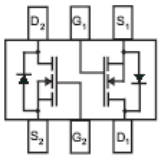
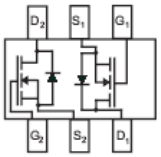
* Pin1 and Pin4 are exchangeable.



2N7002V
Marking : AB



2N7002VA
Marking : AC

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 Pulsed	280 1.5	mA A
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	250 2.0	mW mW/°C
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient *	500	°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=10μA	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	±100	nA
On Characteristics (Note1)						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	1.0	1.76	2.5	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

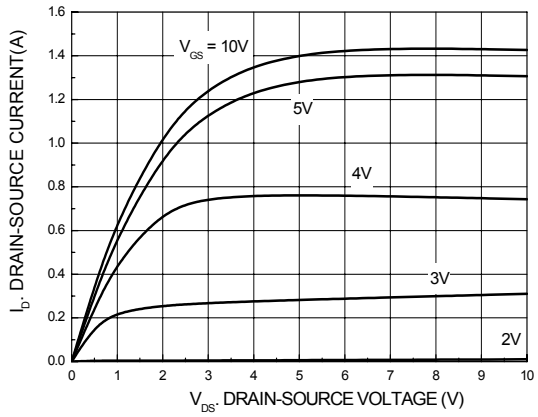


Figure 2. On-Resistance Variation with Gate Voltage and Drain Current

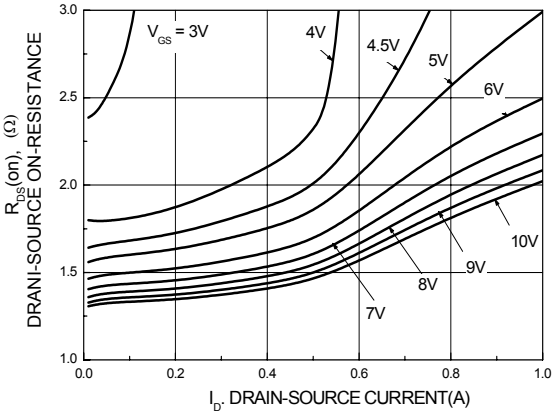


Figure 3. On-Resistance Variation with Temperature

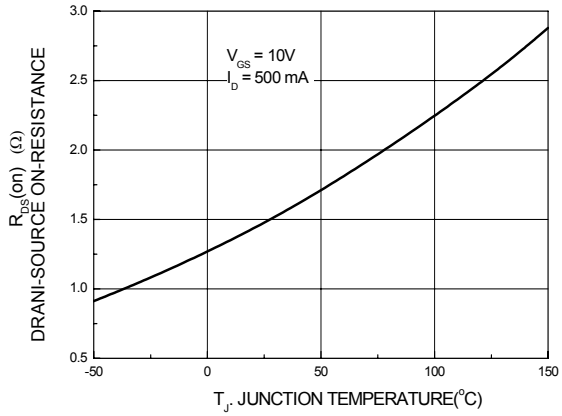


Figure 4. On-Resistance Variation with Gate-Source Voltage

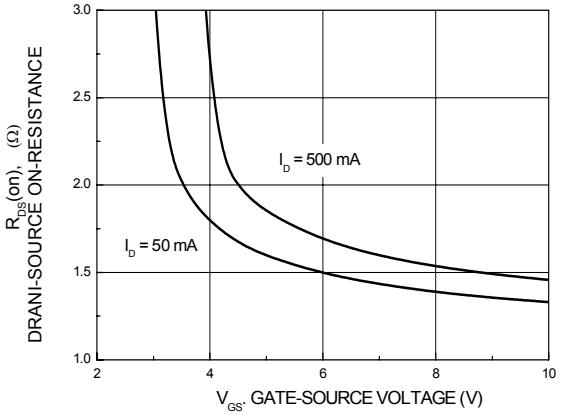


Figure 5. Transfer Characteristics

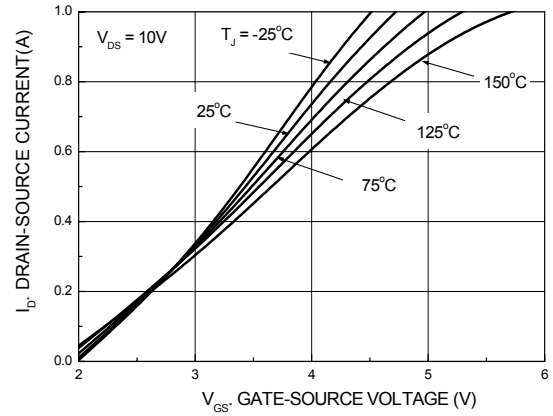
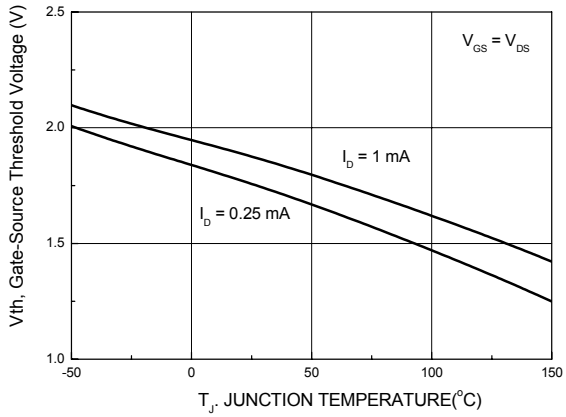


Figure 6. Gate Threshold Variation with Temperature



Typical Performance Characteristics

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

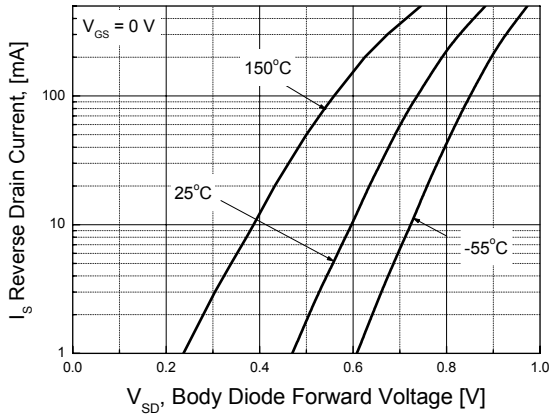
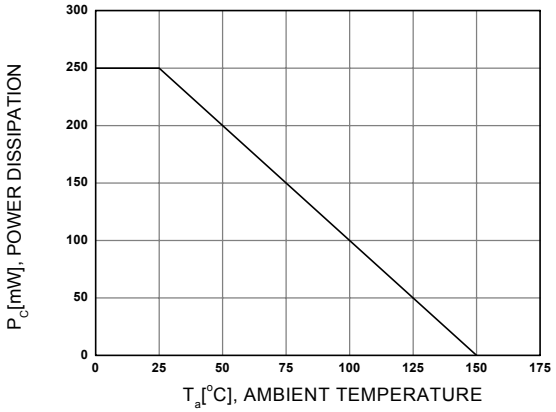
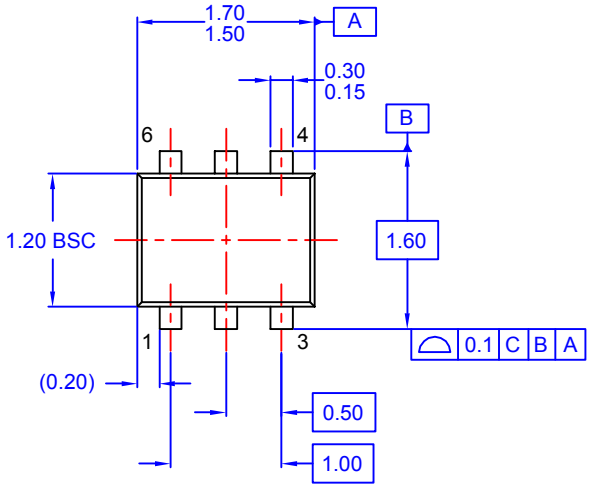


Figure 8. Power Derating

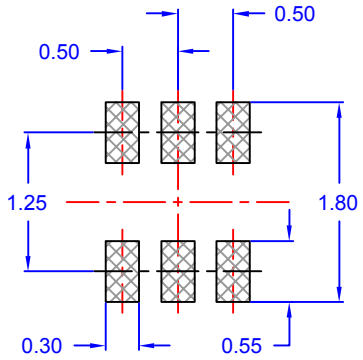


Package Dimensions

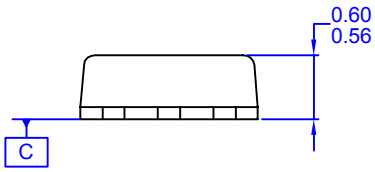
SOT-563F

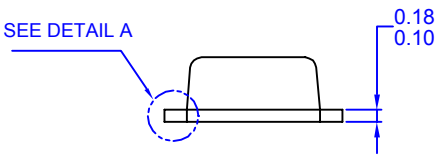


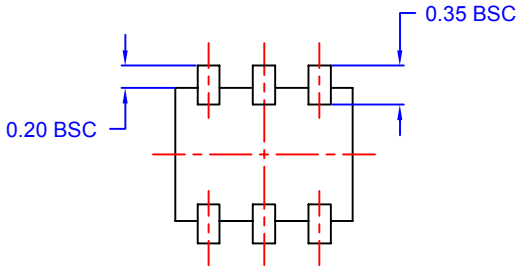
TOP VIEW



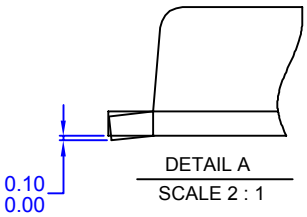
LAND PATTERN RECOMMENDATION







BOTTOM VIEW



DETAIL A
SCALE 2 : 1

Dimensions in Millimeters

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