N-Channel JFET

J109, MMBFJ108

Features

- This Device is Designed for Digital Switching Applications where Very Low On Resistance is Mandatory
- Sourced from Process 58
- These are Pb−Free Devices

MAXIMUM RATINGS (T_A = 25°C unless otherwise specified) (Notes 1, 2)

Symbol	Parameter	Value	Unit
V_{DG}	Drain−Gate Voltage	25	V
V_{GS}	Gate−Source Voltage	−25	V
I_{GF}	Forward Gate Current	10	mA
T_J, T_{STG}	Operating and Storage Junction Temperature Range	−55 to 150	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. These ratings are based on a maximum junction temperature of 150°C.
2. These are steady−state limits. ON Semiconductor should be consulted on applications involving pulsed or low−duty−cycle operations.

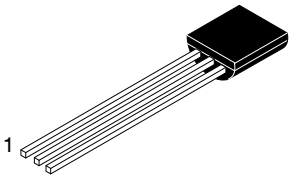
THERMAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

Symbol	Parameter	Max		Unit
		J109 (Note 3)	MMBFJ108 (Note 4)	
P_D	Total Device Dissipation	625	350	mW
	Derate Above 25°C	5.0	2.8	mW/°C
$R_{\theta JC}$	Thermal Resistance, Junction−to−Case	125	–	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction−to−Ambient	200	357	°C/W

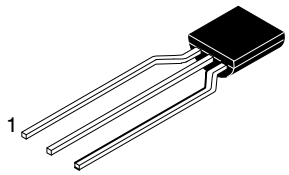
3. PCB size: FR−4, 76 mm x 114 mm x 1.57 mm (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.
4. Device mounted on FR−4 PCB 36 mm x 18 mm x 1.5 mm; mounting pad for the collector lead minimum 6 cm^2.

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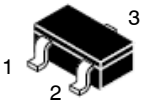
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CASE 135AN



TO−92 3 4.83x4.76
LEADFORMED
CASE 135AR



SOT−23/SUPERSOT™ −23,
3 LEAD, 1.4x2.9
CASE 527AG

1. Drain, 2. Source, 3. Gate

MARKING DIAGRAM



J109 **J109−D26Z** **MMBFJ108**

J109, I8 = Specific Device Code
$Y = ON Semiconductor Logo
&Y = Year Coding
&G = Weekly Date Code
&Z = Assembly Plant Code
&3 = Date Code Format
&K = Lot Run Traceability Code

ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

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ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise noted)

Symbol	Parameter	Test Condition		Min	Max	Unit
OFF CHARACTERISTICS						
$V_{(BR)GSS}$	Gate−Source Breakdown Voltage	I_G = −10 μA, V_{DS} = 0		−25	–	V
I_{GSS}	Gate Reverse Current	V_{GS} = −15 V, V_{DS} = 0		–	−3.0	nA
		V_{GS} = −15 V, V_{DS} = 0, T_A = 100°C		–	−200	
V_{GS}(off)	Gate−Source Cut−Off Voltage	V_{DS} = 15 V, I_D = 10 nA	MMBFJ108	−3.0	−10.0	V
			J109	−2.0	−6.0	
ON CHARACTERISTICS						
I_{DSS}	Zero−Gate Voltage Drain Current (Note 5)	V_{DS} = 15 V, V_{GS} = 0	MMBFJ108	80	–	mA
			J109	40	–	
r_{DS}(on)	Drain−Source On Resistance	V_{DS} ≤ 0.1 V, V_{GS} = 0	MMBFJ108	–	8.0	Ω
			J109	–	12	
SMALL SIGNAL CHARACTERISTICS						
C_{dg}(on) C_{sg}(off)	Drain−Gate & Source−Gate On Capacitance	V_{DS} = 0, V_{GS} = 0, f = 1.0 MHz		–	85	pF
C_{dg}(off)	Drain−Gate Off Capacitance	V_{DS} = 0, V_{GS} = −10 V, f = 1.0 MHz		–	15	pF
C_{sg}(off)	Source−Gate Off Capacitance	V_{DS} = 0, V_{GS} = −10 V, f = 1.0 MHz		–	15	pF

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

5. Pulse test: pulse width ≤ 300 μs, duty cycle ≤ 2%.

TYPICAL PERFORMANCE CHARACTERISTICS

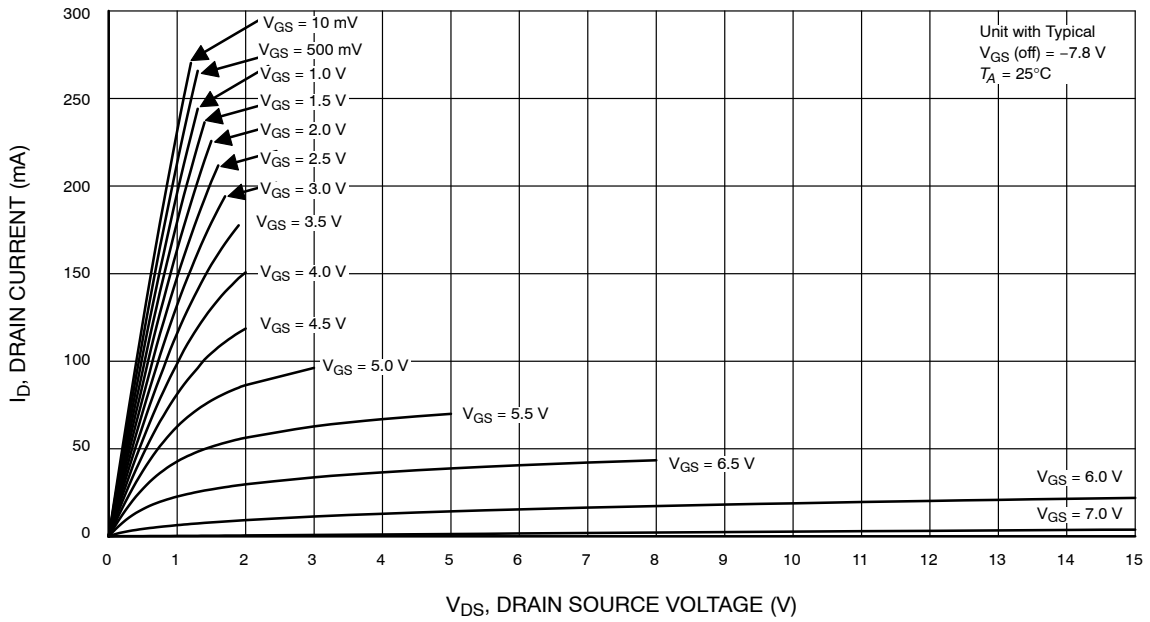


Figure 1. Common Drain−Source, MMBFJ108

TYPICAL PERFORMANCE CHARACTERISTICS (continued)

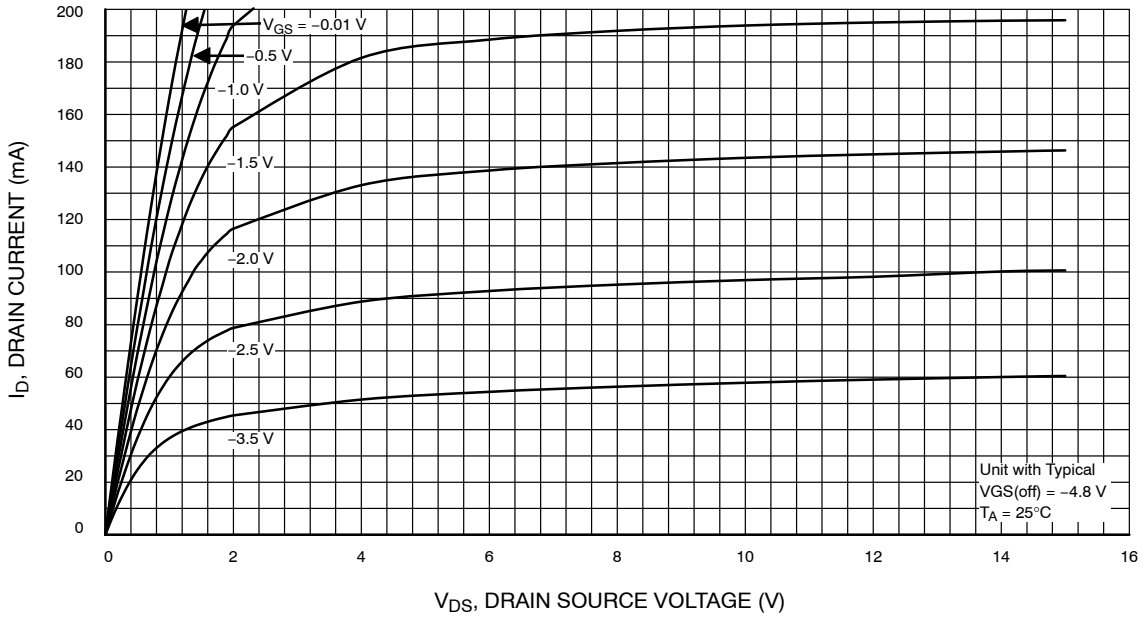


Figure 2. Common Drain−Source,MMBFJ108, J109

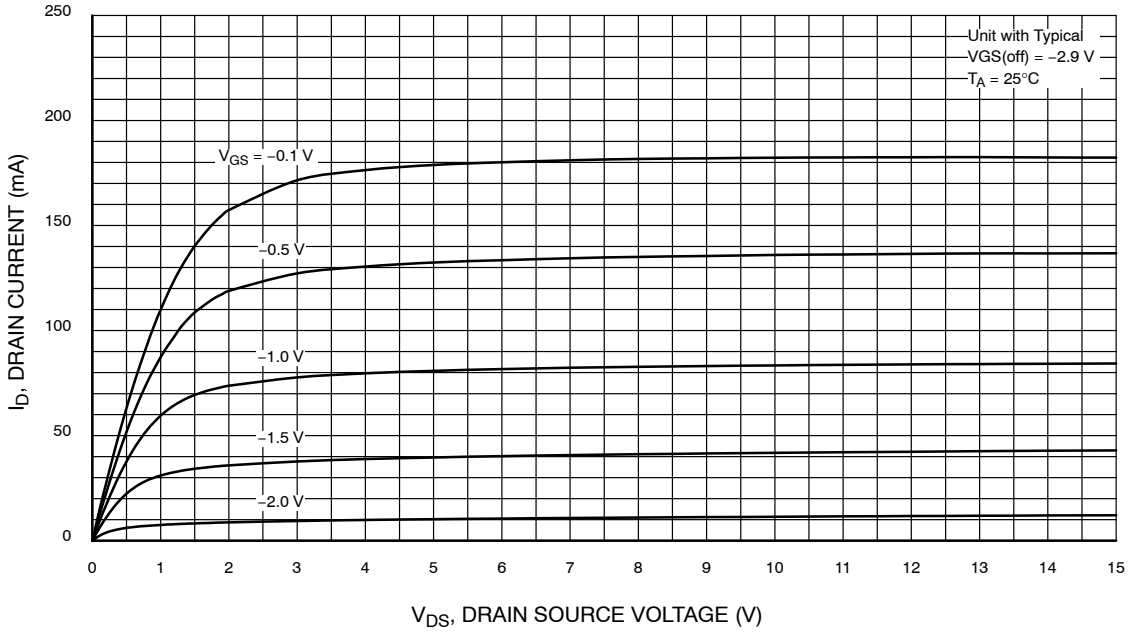


Figure 3. Common Drain−Source, J109

TYPICAL PERFORMANCE CHARACTERISTICS (continued)

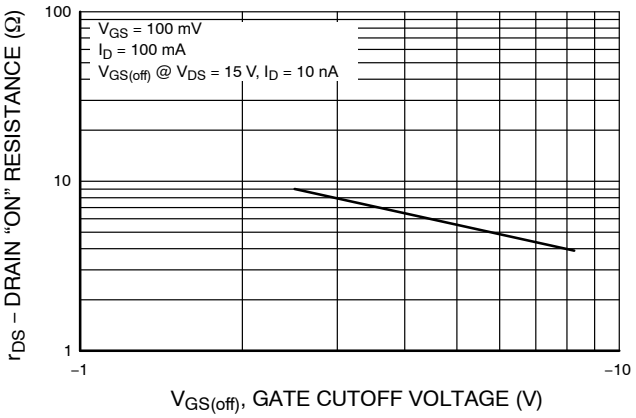


Figure 4. Drain ON Resistance

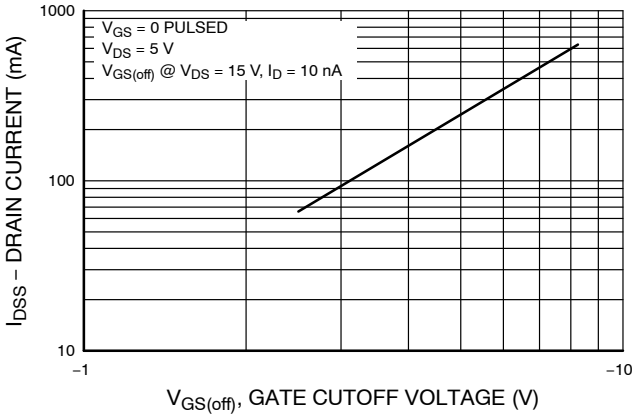


Figure 5. Drain Current vs. Gate−Source Cut−Off Voltage

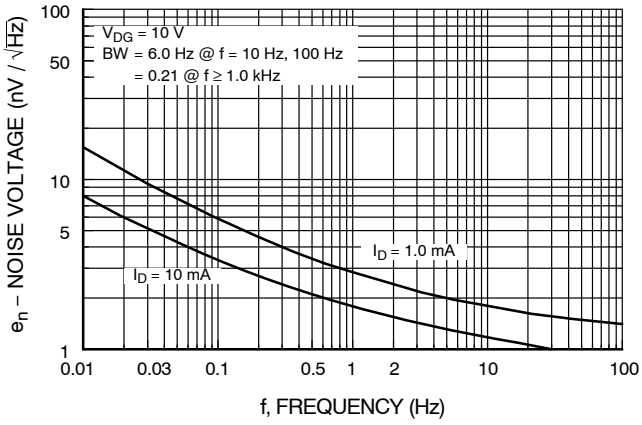


Figure 6. Noise Voltage vs. Frequency

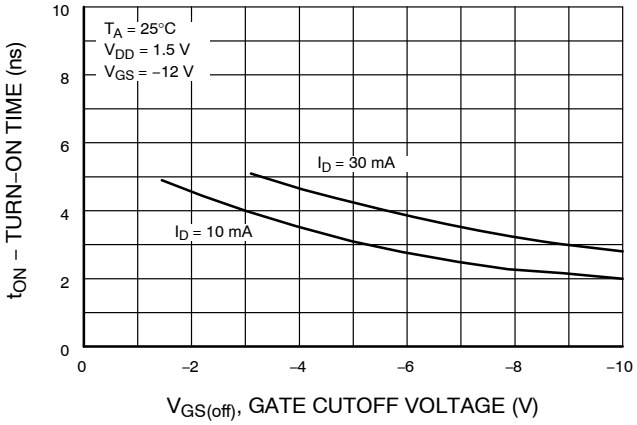


Figure 7. Switching Turn−On Time vs. Gate−Source Cut−Off Voltage

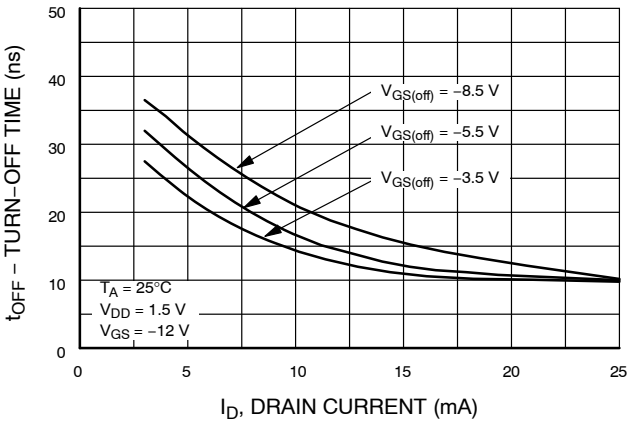


Figure 8. Switching Turn−On Time vs. Drain Current

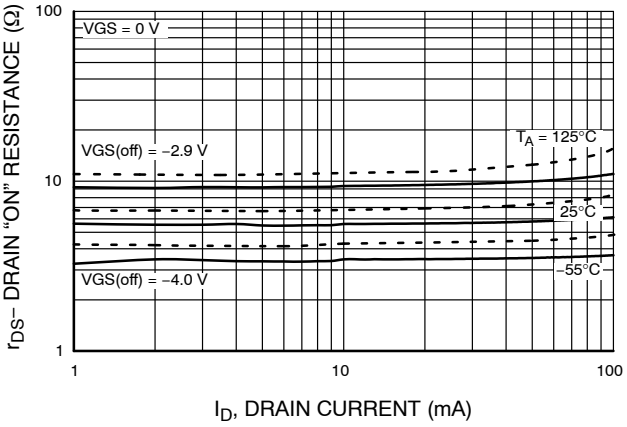


Figure 9. On Resistance vs. Drain Current

TYPICAL PERFORMANCE CHARACTERISTICS (continued)

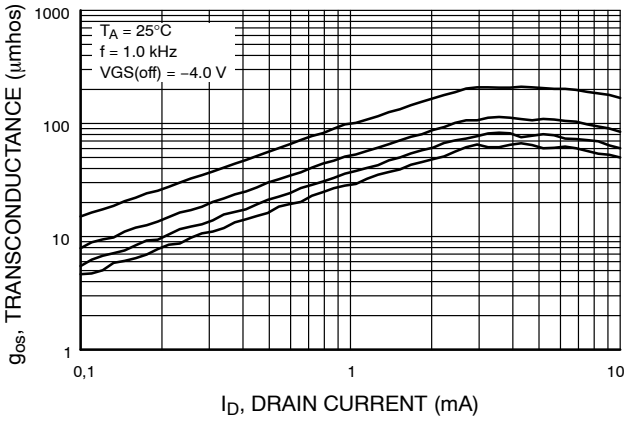


Figure 10. Output Conductance vs. Drain Current

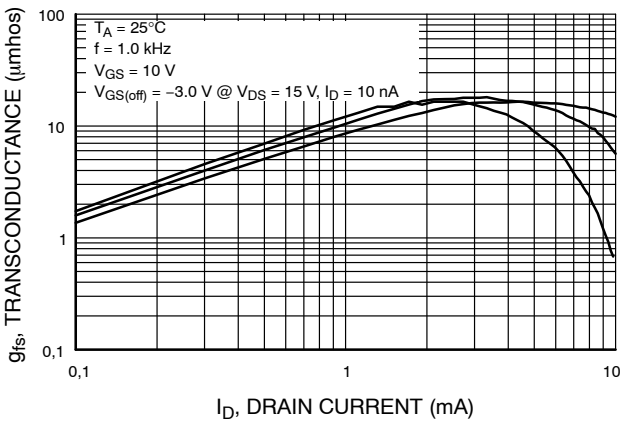


Figure 11. Output Conductance vs. Drain Current

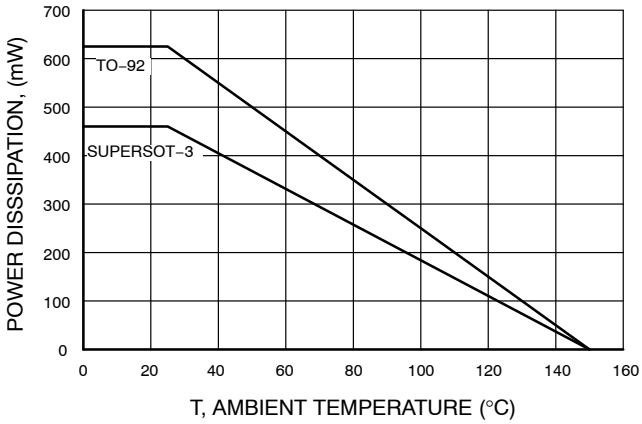


Figure 12. Power Dissipation vs. Ambient Temperature

ORDERING INFORMATION

Part Number	Top Mark	Package	Shipping†
J109	J109	TO−92 3L (Pb−Free)	10000 Units / Bulk
J109−D26Z	J109	TO−92 3L (Pb−Free)	2000 / Tape & Reel
MMBFJ108	I8	SSOT 3L (Pb−Free)	3000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

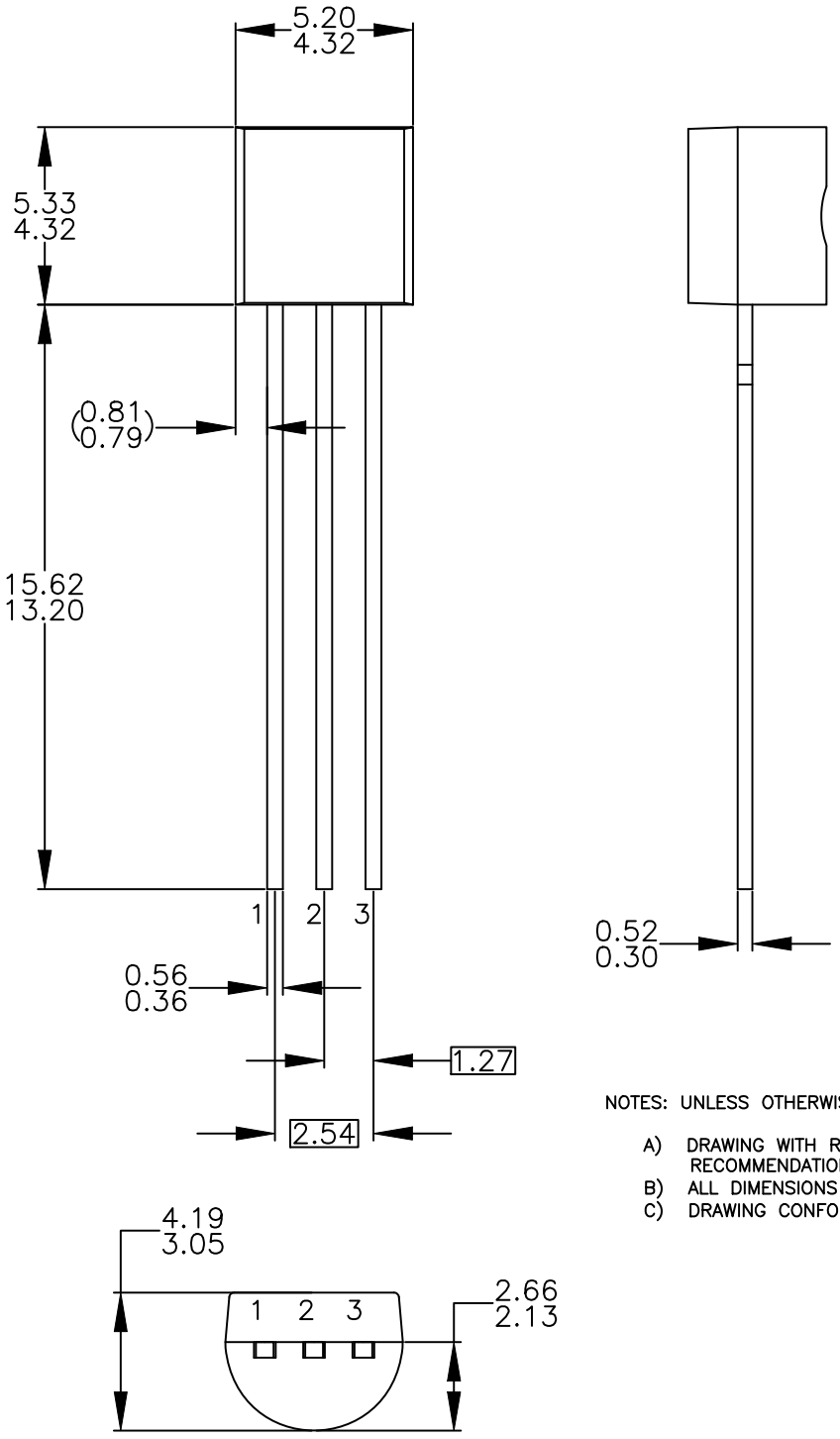
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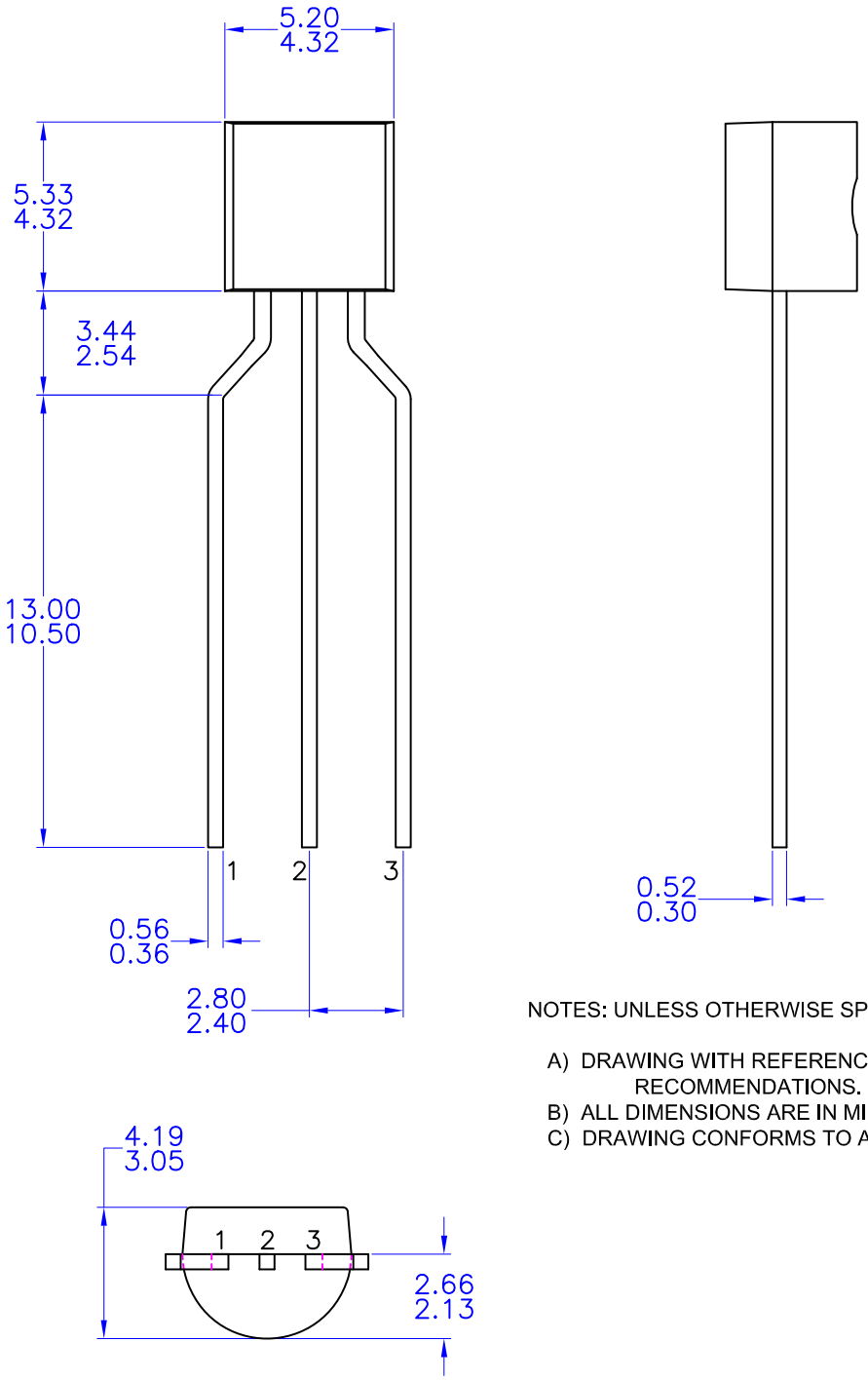
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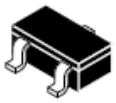
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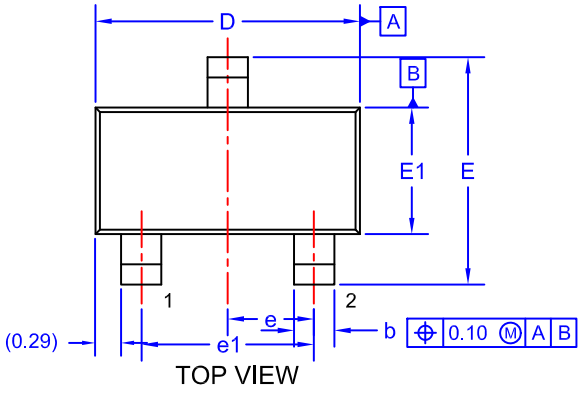
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CASE 527AG
ISSUE A

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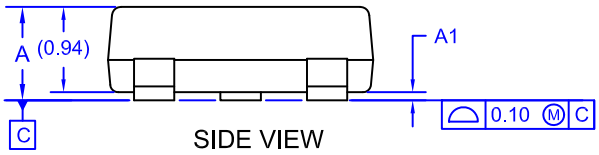


TOP VIEW

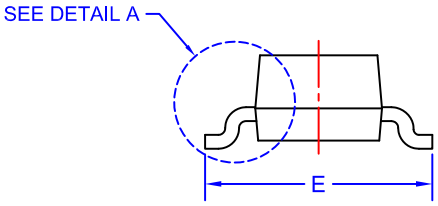
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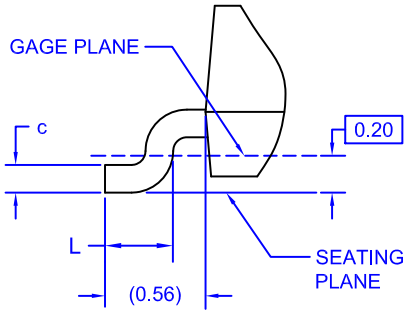
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A	0.85	0.95	1.12
A1	0.00	0.05	0.10
b	0.370	0.435	0.508
c	0.085	0.150	0.180
D	2.80	2.92	3.04
E	2.31	2.51	2.71
E1	1.20	1.40	1.52
e	0.95 BSC		
e1	1.90 BSC		
L	0.33	0.38	0.43

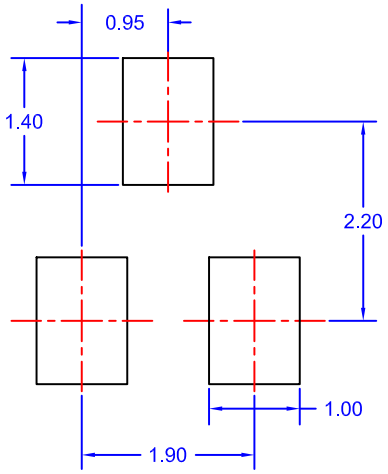


SIDE VIEW





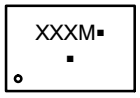
DETAIL A



LAND PATTERN RECOMMENDATION*

*FOR ADDITIONAL INFORMATION ON OUR Pb-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ON SEMICONDUCTOR SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D.

GENERIC MARKING DIAGRAM*



XXX = Specific Device Code
M = Month Code
▪ = Pb−Free Package

(Note: Microdot may be in either location)

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “▪”, may or may not be present. Some products may not follow the Generic Marking.

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