

# 2N5114, 2N5115, 2N5116

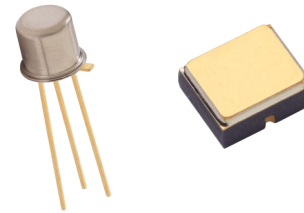


## P Channel J-FET

Rev. V2

### Features

- Available in JAN, JANTX and JANTXV per MIL-PRF-19500/476
- TO-18 and UB Package Types
- Designed for High Reliability Switching Applications



### Electrical Characteristics ( $T_A = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Gate-Source Breakdown Voltage	$V_{DS} = 0, I_G = 1.0 \mu\text{A dc}$	$V_{(BR)GSS}$	V dc	30	—
Drain-Source "On" State Voltage	$V_{GS} = 0 \text{ V}, I_D = -15 \text{ mA dc}$ 2N5114 $V_{GS} = 0 \text{ V}, I_D = -7.0 \text{ mA dc}$ 2N5115 $V_{GS} = 0 \text{ V}, I_D = -3.0 \text{ mA dc}$ 2N5116	$V_{DS(on)}$	V dc	—	-1.3 -0.8 -0.6
Gate Reverse Current	$V_{DS} = 0, V_{GS} = 20\text{V}$	$I_{GSS}$	pA	—	500
Drain Current Cutoff	$V_{GS} = 12 \text{ V dc}, V_{DS} = -15 \text{ V dc}$ 2N5114 $V_{GS} = 7.0 \text{ V dc}, V_{DS} = -15 \text{ V dc}$ 2N5115 $V_{GS} = 5.0 \text{ V dc}, V_{DS} = -15 \text{ V dc}$ 2N5116	$I_{D(off)}$	pA	—	-500 -500 -500
Zero Gate Voltage Drain Current	$V_{GS} = 0 \text{ V}, V_{DS} = -18 \text{ V dc}$ 2N5114 $V_{GS} = 0 \text{ V}, V_{DS} = -15 \text{ V dc}$ 2N5115 $V_{GS} = 0 \text{ V}, V_{DS} = -15 \text{ V dc}$ 2N5116	$I_{DSS}$	mA	-30 -15 -5.0	-90 -60 -25
Gate-Source Cutoff	$V_{GS} = -15 \text{ V dc}, I_D = -1.0 \text{ nA dc}$ 2N5114 $V_{GS} = -15 \text{ V dc}, I_D = -1.0 \text{ nA dc}$ 2N5115 $V_{GS} = -15 \text{ V dc}, I_D = -1.0 \text{ nA dc}$ 2N5116	$V_{GS(off)}$		5.0 3.0 1.0	10 6.0 4.0

### Absolute Maximum Ratings ( $T_A = +25^\circ\text{C}$ unless otherwise specified)

Ratings	Symbol	Value
Gate-Source Voltage <sup>(2)</sup>	$V_{GS}$	30 V dc
Drain-Source Voltage	$V_{DS}$	30 V dc
Drain-Gate Voltage <sup>(2)</sup>	$V_{DG}$	30 V dc
Gate Current	$I_G$	50 mA dc
Steady-State Power Dissipation @ $T_A = 25^\circ\text{C}$ <sup>(1)</sup>	$P_D$	0.500 W
Junction & Storage Temperature Range	$T_J$ and $T_{STG}$	$-65^\circ\text{C}$ to $+200^\circ\text{C}$

(1) Derate linearly 3.0 mW/°C for  $T_A > +25^\circ\text{C}$

(2) Symmetrical geometry allows operation of those units with source / drain leads interchanged

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## Electrical Characteristics (T<sub>A</sub> = +25°C unless otherwise specified)

Parameter	Test Conditions	Symbol	Units	Min.	Max.
<b>Dynamic Characteristics</b>					
Small Signal, Drain-Source "On" State Resistance	V <sub>GS</sub> = 0, I <sub>D</sub> = -1.0 mA dc 2N5114 2N5115 2N5116	r <sub>ds(on)</sub> <sup>1</sup>	Ω	—	75 100 175
Small Signal, Drain-Source "On" State Resistance	V <sub>GS</sub> = 0, I <sub>D</sub> = 0; f = 1kHz 2N5114 2N5115 2N5116	r <sub>ds(on)</sub> <sup>2</sup>	Ω	—	75 100 175
Small-Signal, Common-Source Short Circuit Reverse Transfer Capacitance	V <sub>GS</sub> = 12 V dc, V <sub>DS</sub> = 0 2N5114 V <sub>GS</sub> = 7.0 V dc, V <sub>DS</sub> = 0 2N5115 V <sub>GS</sub> = 5.0 V dc, V <sub>DS</sub> = 0 2N5116	C <sub>rss</sub>	pF	—	7.0
Small-Signal, Common-Source Short Circuit Input Capacitance	V <sub>GS</sub> = 0 V dc, V <sub>DS</sub> = -15 V dc f = 1.0 MHz 2N5114, 2N5115 2N5116	C <sub>iss</sub>	pF	—	25 27

Parameter	Test Conditions	Symbol	Units	Min.	Max.
<b>Switching Characteristics</b>					
Turn-On Delay Time	2N5114 2N5115 2N5116	t <sub>d(on)</sub>	ns	—	6 10 25
Rise Time	2N5114 2N5115 2N5116	t <sub>r</sub>	ns	—	10 20 35
Turn-Off Delay Time	2N5114 2N5115 2N5116	t <sub>d(off)</sub>	ns	—	6 8 20
Fall Time	2N5114 2N5115 2N5116	t <sub>f</sub>	ns	—	15 30 60

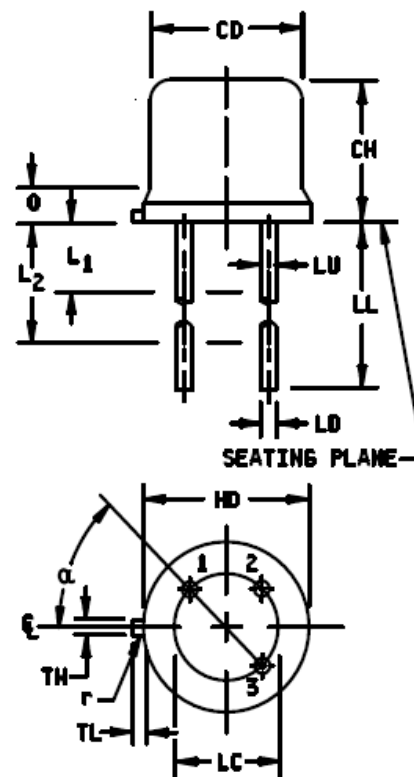
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### Outline Drawing (TO-18)

Symbol	Dimensions				Note
	Inches		Millimeters		
	Min	Max	Min	Max	
CD	.178	.195	4.52	4.95	
CH	.170	.210	4.32	5.33	
HD	.209	.230	5.31	5.84	
LC	.100 TP		2.54 TP		6
LD	.016	.021	0.41	0.53	7,8
LL	.500	.750	12.7	19.05	7,8
LU	.016	.019	0.41	0.48	7,8
L <sub>1</sub>		.050		1.27	7,8
L <sub>2</sub>	.250		6.35		7,8
Q		.030		0.76	5
TL	.028	.048	0.71	1.22	3,4
TW	.036	.046	0.91	1.17	
r		.010		0.25	10
α	45° TP		45° TP		6



#### NOTES:

1. Dimension are in inches.
2. Millimeters are given for general information only.
3. Beyond r (radius) maximum, TL shall be held for a minimum length of .011 (0.28 mm).
4. Dimension TL measured from maximum HD.
5. Body contour optional within zone defined by HD, CD, and Q.
6. Leads at gauge plane .054 +.001 -.000 inch (1.37 +0.03 -0.00 mm) below seating plane shall be within .007 inch (0.18 mm) radius of true position (TP) at maximum material condition (MMC) relative to tab at MMC.
7. Dimension LU applies between L<sub>1</sub> and L<sub>2</sub>. Dimension LD applies between L<sub>2</sub> and LL minimum. Diameter is uncontrolled in L<sub>1</sub> and beyond LL minimum.
8. All three leads.
9. The gate shall be electrically connected to the case.
10. Dimension r (radius) applies to both inside corners of tab.
11. In accordance with ASME Y14.5M, diameters are equivalent to φx symbology.
12. Lead 1 = source, lead 2 = gate, lead 3 = drain.

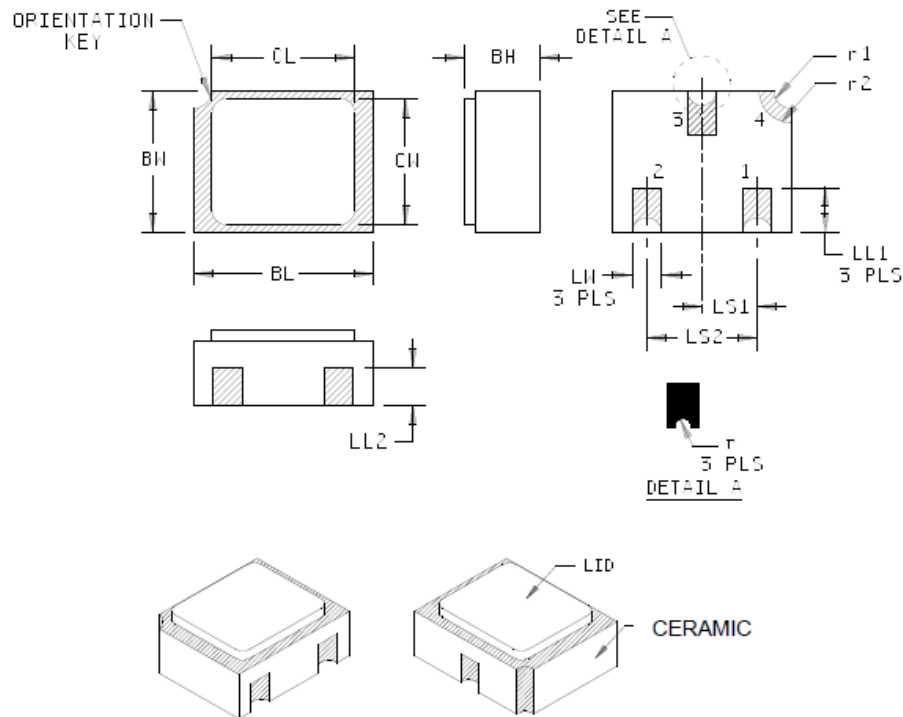
FIGURE 1. Physical dimensions (similar to TO-18).

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### Outline Drawing (UB)



Symbol	Dimensions				Note
	Inches		Millimeters		
	Min	Max	Min	Max	
BH	.046	.056	1.17	1.42	
BL	.115	.128	2.92	3.25	
BW	.085	.108	2.16	2.74	
CL		.128		3.25	
CW		.108		2.74	
LL1	.022	.038	0.56	0.96	
LL2	.017	.035	0.43	0.89	
LS1	.036	.040	0.91	1.02	
LS2	.071	.079	1.81	2.01	
LW	.016	.024	0.41	0.61	
r		.008		.203	
r1		.012		.305	
r2		.022		.559	

#### NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Hatched areas on package denote metallized areas (tungsten with gold plating 60 micro inches min over 80 micro inches min nickel).
4. Pad 1 = drain, Pad 2 = source, Pad 3 = gate, Pad 4 = shielding connected to the lid.

FIGURE 2. Physical dimensions, surface mount (UB version).

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