

2N4856 - 2N4861 Series

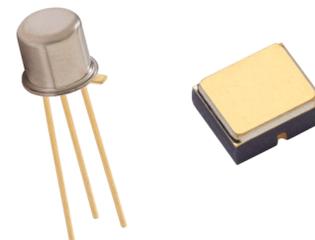


N Channel JFET

Rev. V2

Features

- Available in JAN, JANTX and JANTXV per MIL-PRF-19500/385
- Applications include Choppers, Commutators, Analog Switches and Current Limiters
- Low error voltage
- High Radiation Tolerance
- High Speed Analog Circuit Performance
- TO-18 and UB packages



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

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Gate - Source Breakdown Voltage	$I_G = -1.0 \mu\text{A dc}$; $V_{DS} = 0$ 2N4856, 2N4857, 2N4858 2N4859, 2N4860, 2N4861	$V_{(BR)GSS}$	V dc	—	-40 -30
Gate Reverse Current	$V_{DS} = 0$; 2N4856, 2N4857, 2N4858 $V_{GS} = -20$ V dc 2N4859, 2N4860, 2N4861 $V_{GS} = -15$ V dc	I_{GSS1}	nA dc	—	-0.25 -0.25
Drain Current Cutoff	$V_{DS} = 15$ V dc; $V_{GS} = -10$ V dc	$I_{D(off)}^1$	nA dc		0.25
Drain Current Zero-Gate Voltage	$V_{DS} = 15$ V dc; $V_{GS} = 0$ 2N4856, 2N4859 2N4857, 2N4860 2N4858, 2N4861	I_{DSS}	mA dc	50 20 8	175 100 80
Drain - Source On-State Voltage	$V_{GS} = 0$ 2N4856, 2N4859 $I_D = 20$ mA dc 2N4857, 2N4860 $I_D = 10$ mA dc 2N4858, 2N4861 $I_D = 5$ mA dc	$V_{DS(on)}$	V dc		0.75 0.50 0.50
Gate - Source Off-State Voltage	$V_{DS} = 15$ V dc; $I_D = 0.5$ nA dc 2N4856, 2N4859 2N4857, 2N4860 2N4858, 2N4861	$V_{GS(off)}$	V dc	-4 -2 -0.8	-10 -6 -4
Static Drain To Source On-State Resistance	$V_{GS} = 0$; $I_D = 1.0$ mA dc; 2N4856, 2N4859 2N4857, 2N4860 2N4858, 2N4861	$r_{ds(on)}$	Ω	—	25 40 60

1

VPT Components and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.
Visit www.vptcomponents.com for additional data sheets and product information.

For further information and support please visit:
info@vptcomponents.com

2N4856 - 2N4861 Series



N Channel JFET

Rev. V2

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

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Small-Signal Common-Source, Short-Circuit Input Capacitance	$V_{DS} = 0, V_{GS} = -10\text{V}; f = 1 \text{ MHz}; C_1 = .1 \mu\text{F}, C_2 = 20.1 \mu\text{F}; L_1 = L_2 = \geq 500 \mu\text{H}$	C_{iss}	pF	—	18
Small-Signal Common-Source, Short-Circuit Reverse Transfer Capacitance	$V_{DS} = 0, V_{GS} = -10\text{V}; f = 1 \text{ MHz}; C_1 = .1 \mu\text{F}, L_1 = L_2 = \geq 500 \mu\text{H}$	C_{rss}	pF		8
Turn-On Delay Time	See figure 3 of MIL-PRF-19500/385 2N4856, 2N4859 2N4857, 2N4860 2N4858, 2N4861	$t_{d(on)}$	ns		6 6 10
Rise Time	See figure 3 of MIL-PRF-19500/385 2N4856, 2N4859 2N4857, 2N4860 2N4858, 2N4861	t_r	ns		3 4 10
Turn-Off Delay Time	See figure 3 of MIL-PRF-19500/385 2N4856, 2N4859 2N4857, 2N4860 2N4858, 2N4861	$t_{d(off)}$	ns		25 50 100

Electrical Characteristics ($T_A = 150^\circ\text{C}$ unless otherwise specified)

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Gate Reverse Current 2N4856, 2N4857, 2N4858 2N4859, 2N4860, 2N4861	$V_{DS} = 0$ $V_{GS} = -20 \text{ V dc}$ $V_{GS} = -15 \text{ V dc}$	I_{GSS2}	$\mu\text{A dc}$	—	-0.5 -0.5
Drain Current	$V_{DS} = 15 \text{ V dc}; V_{GS} = -10\text{V dc}$	$I_{D(off)2}$	$\mu\text{A dc}$	—	0.5

2N4856 - 2N4861 Series



N Channel JFET

Rev. V2

Absolute Maximum Ratings (25°C unless otherwise specified) ⁽¹⁾

Ratings	Symbol	Value
Voltage Drain-Gate Breakdown 2N4856, 2N4857, 2N4858 2N4859, 2N4860, 2N4861	V_{DS}, V_{DG}	40 V dc 30 V dc
Voltage Gate-Source Breakdown 2N4856, 2N4857, 2N4858 2N4859, 2N4860, 2N4861	V_{GS}	-40 V dc -30 V dc
Gate Current	I_G	50 mA dc
Maximum Power Dissipation @ $T_A = +25^\circ\text{C}$ ⁽²⁾ @ $T_C = +25^\circ\text{C}$ ⁽³⁾	P_T	0.36 W, 0.40 W UB ⁽⁴⁾ 1.8 W
Junction and Storage Temperature Range	T_J, T_{STG}	-65°C to +200°C
Thermal Resistance, Junction To Ambient	$R_{\theta JA}$	486 °C/W 325 °C/W (UB package)
Thermal Resistance, Junction To Case	$R_{\theta JC}$	0.097 °C/mW

(1) These characteristics applicable to all package styles, unless otherwise noted.

(2) Derate linearly 2.06 mW/°C for $T_A > +25^\circ\text{C}$

(3) Derate linearly 10.3 mW/°C for $T_C > +25^\circ\text{C}$

(4) Derate linearly 3.08 mW/°C for $T_C > +70^\circ\text{C}$

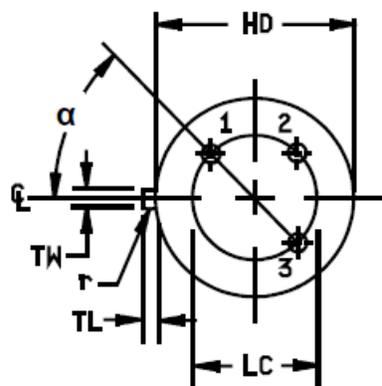
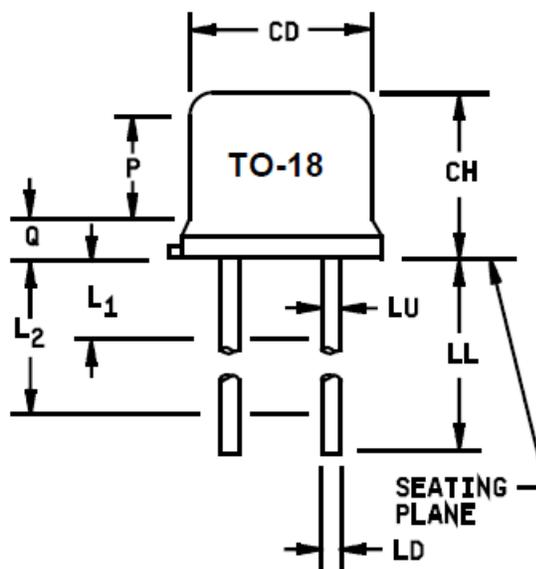
2N4856 - 2N4861 Series

N Channel JFET

Rev. V2

Outline Drawing TO-18

Symbol	Dimensions				Note
	Inches		Millimeters		
	Min	Max	Min	Max	
CD	.178	.195	4.52	4.95	5
CH	.170	.210	4.32	5.33	
HD	.209	.230	5.31	5.84	4, 5
LC	.100 TP		2.54 TP		6
LD	.016	.021	0.41	0.53	7, 8
LL	.500	.750	12.70	19.05	7, 8
LU	.016	.019	0.41	0.48	7, 8
L ₁		.050		1.27	7, 8
L ₂	.250		6.35		7, 8
P	.100		2.54		
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	3, 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 -.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 L₁ and L₂. Dimension LD applies between L₂ and LL minimum. Diameter is uncontrolled in L₁ and beyond LL minimum.
8. All three leads.
9. The gate shall be internally 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 ϕ x symbology.
12. Lead 1 = source, lead 2 = drain, lead 3 = gate.

FIGURE 1. Physical dimensions TO-18.

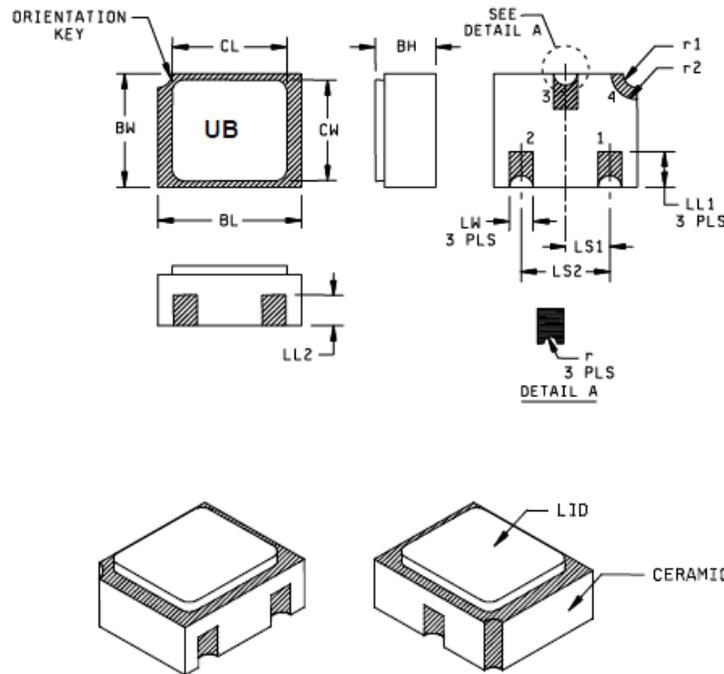
2N4856 - 2N4861 Series



N Channel JFET

Rev. V2

Outline Drawing UB



Ltr.	Dimensions				Note	Ltr.	Dimensions				Note
	Inches		Millimeters				Inches		Millimeters		
	Min	Max	Min	Max			Min	Max	Min	Max	
BH	.046	.056	1.17	1.42		LS1	.035	.040	0.89	1.02	
BL	.115	.128	2.92	3.25		LS2	.071	.079	1.80	2.01	
BW	.085	.108	2.16	2.74		LW	.016	.024	0.41	0.61	
CL		.128		3.25		r		.008		0.20	
CW		.108		2.74		r1		.012		0.31	
LL1	.022	.038	0.56	0.96		r2		.022		0.56	
LL2	.017	.035	0.43	0.89							

NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Hatched areas on package denote metallized areas.
4. Lid material: Kovar.
5. Pad 1 = Drain, Pad 2 = Source, Pad 3 = Gate, Pad 4 = Shielding connected to the lid.
6. In accordance with ASME Y14.5M, diameters are equivalent to ϕx symbology.

* FIGURE 2. Physical dimensions for surface mount.

2N4856 - 2N4861 Series



N Channel JFET

Rev. V2

VPT COMPONENTS. ALL RIGHTS RESERVED.

Information in this document is provided in connection with VPT Components products. These materials are provided by VPT Components as a service to its customers and may be used for informational purposes only. Except as provided in VPT Components Terms and Conditions of Sale for such products or in any separate agreement related to this document, VPT Components assumes no liability whatsoever. VPT Components assumes no responsibility for errors or omissions in these materials. VPT Components may make changes to specifications and product descriptions at any time, without notice. VPT Components makes no commitment to update the information and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to its specifications and product descriptions. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document.

THESE MATERIALS ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, RELATING TO SALE AND/OR USE OF VPT COMPONENTS PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, CONSEQUENTIAL OR INCIDENTAL DAMAGES, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT. VPT COMPONENTS FURTHER DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THE INFORMATION, TEXT, GRAPHICS OR OTHER ITEMS CONTAINED WITHIN THESE MATERIALS. VPT COMPONENTS SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOST REVENUES OR LOST PROFITS, WHICH MAY RESULT FROM THE USE OF THESE MATERIALS.

VPT Components products are not intended for use in medical, lifesaving or life sustaining applications. VPT Components customers using or selling VPT Components products for use in such applications do so at their own risk and agree to fully indemnify VPT Components for any damages resulting from such improper use or sale.