

N-CHANNEL J-FET DEPLETION MODE

Equivalent to MIL-PRF-19500/375

DEVICES

| | |
|---------------|-----------------|
| 2N3821 | 2N3821UB |
| 2N3822 | 2N3822UB |
| 2N3823 | 2N3823UB |

LEVELS

MQ = JAN Equivalent
MX = JANTX Equivalent
MV = JANTXV Equivalent

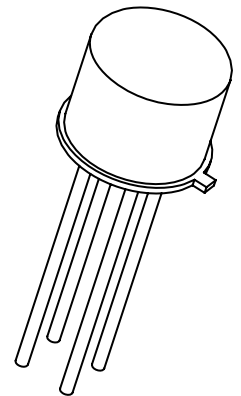
ABSOLUTE MAXIMUM RATINGS ($T_C = +25^\circ\text{C}$ unless otherwise noted)

| Parameters / Test Conditions | Symbol | 2N3821, UB 2N3822, UB | 2N3823, UB | Unit |
|---|----------------|--------------------------|------------|------------------|
| Gate-Source Voltage | V_{GSR} | 50 | 30 | V |
| Drain-Source Voltage | V_{DS} | 50 | 30 | V |
| Drain-Gate Voltage | V_{DG} | 50 | 30 | V |
| Gate Current | I_{GF} | 10 | | mA |
| Power Dissipation $T_A = +25^\circ\text{C}^{(1)}$ | P_T | 300 | | mW |
| Operating Junction & Storage Temperature Range | T_j, T_{stg} | -55 to +200 | | $^\circ\text{C}$ |

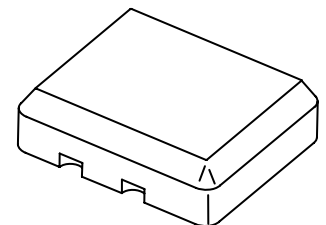
Note: (1) Derate linearly 1.7mW/ $^\circ\text{C}$ for $T_A > +25^\circ\text{C}$.

ELECTRICAL CHARACTERISTICS ($T_A = +25^\circ\text{C}$, unless otherwise noted)

| Parameters / Test Conditions | Symbol | Min. | Max. | Unit |
|---|---|----------------|-------------------|--------------------------|
| OFF CHARACTERISTICS | | | | |
| Gate-Source Breakdown Voltage $V_{DS} = 0, I_G = 1.0\mu\text{A dc}$ | 2N3821 / UB 2N3822 / UB 2N3823 / UB | $V_{(BR)GSSR}$ | 50 50 30 | Vdc |
| Gate Reverse Current $V_{DS} = 0, V_{GS} = 30\text{V dc}$ $V_{DS} = 0, V_{GS} = 30\text{V dc}$ $V_{DS} = 0, V_{GS} = 20\text{V dc}$ | 2N3821 / UB 2N3822 / UB 2N3823 / UB | I_{GSSR} | 0.1 0.1 0.5 | ηA |
| Zero-Gate-Voltage Drain Current $V_{GS} = 0, V_{DS} = 15\text{V dc}$ | 2N3821 / UB 2N3822 / UB 2N3823 / UB | I_{DSS} | 0.5 2.0 4.0 | 2.5 10 20 mA |
| Gate-Source Voltage $V_{DS} = 15\text{V dc}, I_D = 50\mu\text{A dc}$ $V_{DS} = 15\text{V dc}, I_D = 200\mu\text{A dc}$ $V_{DS} = 15\text{V dc}, I_D = 400\mu\text{A dc}$ | 2N3821 / UB 2N3822 / UB 2N3823 / UB | V_{GS} | 0.5 1.0 1.0 | 2.0 4.0 7.5 Vdc |
| Gate-Source Cutoff Voltage $V_{DS} = 15\text{V dc}, I_D = 0.5\eta\text{A dc}$ | 2N3821 / UB 2N3822 / UB 2N3823 / UB | $V_{GS(off)}$ | 4.0 6.0 8.0 | Vdc |



TO-72 (TO-206AF)

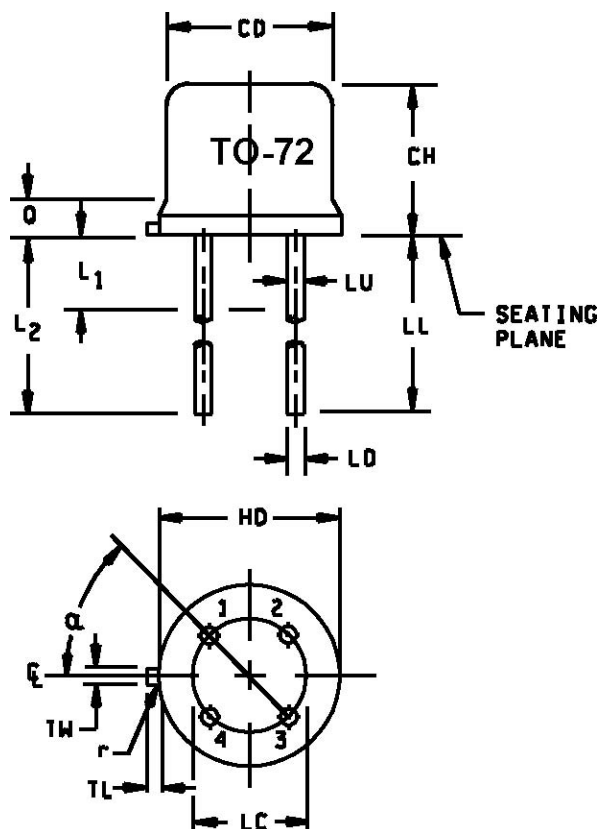


UB - Package

DYNAMIC CHARACTERISTICS

| Parameters / Test Conditions | Symbol | Min. | Max. | Unit |
|---|-----------------|----------------------|----------------------|---------|
| Small-Signal Common Source, Short-Circuit Forward Transfer Admittance $V_{GS} = 0$, $V_{DS} = 15V$ dc, $f = 1.0kHz$ 2N3821 / UB 2N3822 / UB 2N3823 / UB | $ y_{fs} ^1$ | 1500 3000 3500 | 4500 6500 6500 | μS |
| Small-Signal, Common Source, Short-Circuit Output Admittance $V_{GS} = 0$, $V_{DS} = 15V$ dc, $f = 1.0kHz$ 2N3821 / UB 2N3822 / UB 2N3823 / UB | $ y_{os} $ | | 10 20 35 | μS |
| Small-Signal, Common-Source Short-Circuit Input Capacitance $V_{GS} = 0V$ dc, $V_{DS} = 15V$ dc, $100kHz \leq f \leq 1.0MHz$ | C_{iss} | | 6.0 | pF |
| Small-Signal, Common-Source Reverse Transfer Capacitance $V_{DS} = 15V$ dc, $V_{GS} = 0$, $100kHz \leq f \leq 1.0MHz$ 2N3821 / UB 2N3822 / UB 2N3823 / UB | C_{rss} | | 3.0 3.0 2.0 | pF |
| Small-Signal, Common-Source, Short-Circuit Forward Transfer Admittance $V_{GS} = 0$, $V_{DS} = 15V$ dc, $f = 100MHz$ $f = 100MHz$ $f = 200MHz$ 2N3821 / UB 2N3822 / UB 2N3823 / UB | $ y_{fs} ^3$ | 1500 3000 3200 | | μS |
| Small-Signal, Common-Source Short-Circuit Input Conductance $V_{GS} = 0$, $V_{DS} = 15V$ dc, $f = 200MHz$ 2N3823 (only) | g_{is} | | 800 | μS |
| Small-Signal, Common-Source Short-Circuit Output Conductance $V_{GS} = 0$, $V_{DS} = 15V$ dc, $f = 200MHz$ 2N3823 (only) | g_{os} | | 200 | μS |
| Common Source Spot Noise Figure $V_{GS} = 0$, $V_{DS} = 15V$ dc, $R_G = 1M\Omega$ $f = 10Hz$ $f = 1.0kHz$ 2N382, 2N3822 / UB 2N3821, 2N3822, 2N3823 / UB | NF ¹ | | 5.0 2.0 | dB |
| Common Source Spot Noise Figure $V_{GS} = 0$, $V_{DS} = 15V$ dc, $R_G = 1k\Omega$ $f = 105MHz$ 2N3823 / UB (only) | NF ² | | 2.5 | dB |

PACKAGE DIMENSIONS

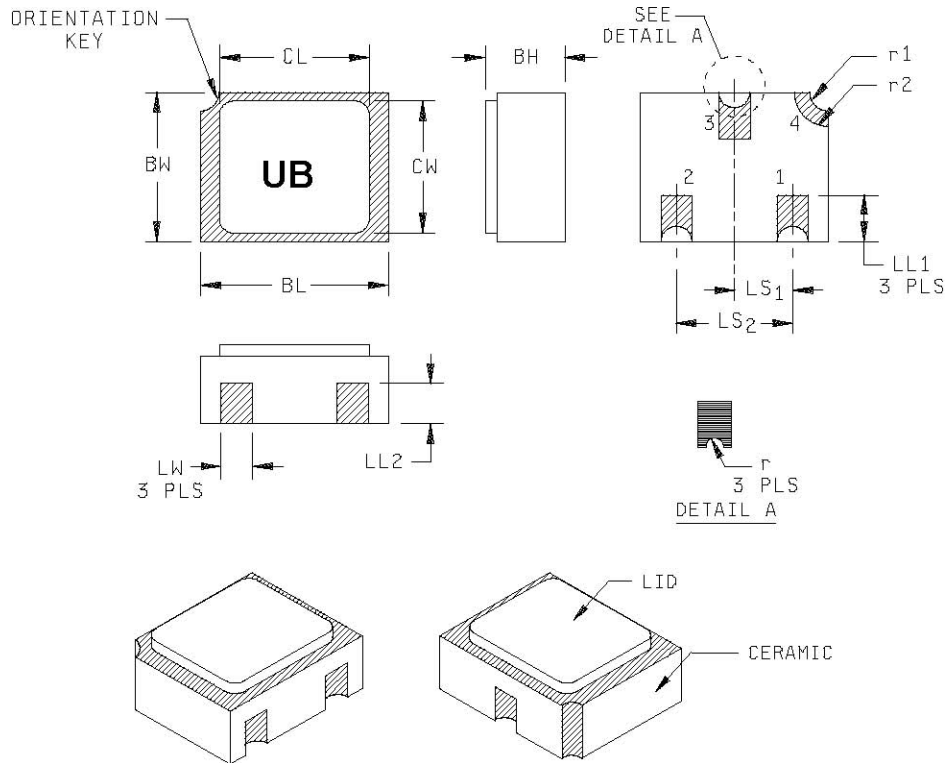


| Ltr | Dimensions | | | | Notes |
|----------|------------|------|-------------|-------|-------|
| | Inches | | Millimeters | | |
| | Min | Max | Min | Max | |
| CD | .178 | .195 | 4.52 | 4.95 | |
| CH | .170 | .210 | 4.32 | 5.33 | |
| HD | .209 | .230 | 5.31 | 5.84 | |
| L1 | | .050 | | 1.27 | |
| L2 | .250 | | 6.35 | | |
| LC | .100 TP | | 2.54 TP | | |
| LD | .016 | .021 | 0.41 | 0.53 | 2, 6 |
| LL | .500 | .750 | 12.70 | 19.05 | 6 |
| LU | .016 | .019 | 0.41 | 0.48 | 3, 6 |
| Q | | .040 | | 1.02 | |
| r | | .007 | | 0.18 | |
| TL | .028 | .048 | 0.71 | 1.22 | 8 |
| TW | .036 | .046 | 0.91 | 1.17 | |
| α | 45° TP | | | | |

NOTE:

- * 1 Dimensions are in inches. Millimeters are given for general information only.
- 2 Measured in the zone beyond .250 (6.35 mm) from the seating plane.
- 3 Measured in the zone .050 (1.27 mm) and .250 (6.35 mm) from the seating plane.
- 4 When measured in a gauging plane .054 +.001, -.000 (1.37 +.3, -.00 mm) before the seating plane of the transistor, maximum diameter leads shall be within .007 (.18 mm) of their true location relative to a maximum width tab. Smaller diameter leads shall fall within the outline of the maximum diameter lead tolerance.
- 5 The active elements are electrically insulated from the case.
- 6 All 4 leads.
- 7 Lead 1 is the source, lead 2 is the drain, lead 3 is the gate, and lead 4 is the case.
- 8 Symbol TL is measured from HD maximum.
- 9 In accordance with ASME Y14.5M, diameters are equivalent to ϕx symbology.

*FIGURE 1 Physical dimensions (similar to TO-72)



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.

| 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 | |
| LL ₁ | .022 | .038 | 0.56 | 0.96 | |
| LL ₂ | .017 | .035 | 0.43 | 0.89 | |
| LS ₁ | .036 | .040 | 0.91 | 1.02 | |
| LS ₂ | .071 | .079 | 1.81 | 2.01 | |
| LW | .016 | .024 | 0.41 | 0.61 | |
| r | | .008 | | .203 | |
| r1 | | .012 | | .305 | |
| r2 | | .022 | | .559 | |

* **FIGURE 2.** Physical dimensions, surface mount (2N3821UB, 2N3822UB, AND 2N3823UB).