

2N4856/A, 2N4857/A, 2N4858/A N-Channel JFET

Features

- InterFET [N0132S Geometry](#)
- Low Noise: 1.2 nV/√Hz Typical
- Fast Switching
- RoHS Compliant
- SMT, TH, and Bare Die Package options.

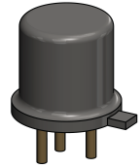
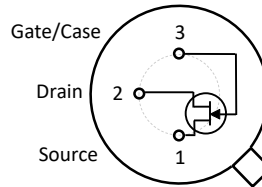
Applications

- Choppers
- Commutators
- Analog Switches

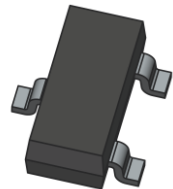
Description

The -40V InterFET 2N4856/A, 2N4857/A, and 2N4858/A JFET's are targeted for very low noise switching applications for mid to high frequency designs. Gate leakages are typically 50pA at room temperatures. The TO-18 package is hermetically sealed and suitable for military applications.

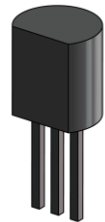
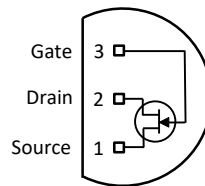
TO-18 Bottom View



SOT23 Top View



TO-92 Bottom View



Product Summary

| Parameters | 2N4856/A Min | 2N4857/A Min | 2N4858/A Min | Unit |
|--|--------------|--------------|--------------|------|
| BV_{GSS} Gate to Source Breakdown Voltage | -40 | -40 | -40 | V |
| I_{DSS} Drain to Source Saturation Current | 50 | 20 | 8 | mA |
| $V_{GS(off)}$ Gate to Source Cutoff Voltage | -4 | -2 | -0.8 | V |

Ordering Information Custom Part and Binning Options Available

| Part Number | Description | Case | Packaging |
|---|---|-------|---------------------------------------|
| 2N4856; 2N4857; 2N4858 2N4856A; 2N4857A; 2N4858A | Through-Hole | TO-18 | Bulk |
| PN4856; PN4857; PN4858 PN4856A; PN4857A; PN4858A | Through-Hole | TO-92 | Bulk |
| SMP4856; SMP4857; SMP4858 SMP4856A; SMP4857A; SMP4858A | Surface Mount | SOT23 | Bulk |
| SMP4856TR; SMP4857TR; SMP4858TR SMP4856ATR; SMP4857ATR; SMP4858ATR | 7" Tape and Reel: Max 3,000 Pieces 13" Tape and Reel: Max 9,000 Pieces | SOT23 | Minimum 1,000 Pieces Tape and Reel |
| 2N4856COT; 2N4857COT; 2N4858COT 2N4856ACOT; 2N4857ACOT; 2N4858ACOT | Chip Orientated Tray (COT Waffle Pack) | COT | 400/Waffle Pack |
| 2N4856CFT; 2N4857CFT; 2N4858CFT 2N4856ACFT; 2N4857ACFT; 2N4858ACFT | Chip Face-up Tray (CFT Waffle Pack) | CFT | 400/Waffle Pack |



Disclaimer: It is the Buyers responsibility for designing, validating and testing the end application under all field use cases and extreme use conditions. Guaranteeing the application meets required standards, regulatory compliance, and all safety and security requirements is the responsibility of the Buyer. These resources are subject to change without notice.

Electrical Characteristics

Maximum Ratings (@ $T_A = 25^\circ\text{C}$, Unless otherwise specified)

| Parameters | Value | Unit |
|--|------------|----------------------|
| V_{RGS} Reverse Gate Source and Gate Drain Voltage | -40 | V |
| I_{FG} Continuous Forward Gate Current | 50 | mA |
| P_D Continuous Device Power Dissipation | 1800 | mW |
| P Power Derating | 10 | mW/ $^\circ\text{C}$ |
| T_J Operating Junction Temperature | -55 to 125 | $^\circ\text{C}$ |
| T_{STG} Storage Temperature | -65 to 150 | $^\circ\text{C}$ |

Static Characteristics (@ $T_A = 25^\circ\text{C}$, Unless otherwise specified, Highlighted values = A variant)

| Parameters | Conditions | 2N4856/A | | 2N4857/A | | 2N4858/A | | Unit |
|--|---|----------|--------------|----------|--------------|----------|--------------|----------|
| | | Min | Max | Min | Max | Min | Max | |
| $V_{(BR)GSS}$ Gate to Source Breakdown Voltage | $I_G = -1\mu\text{A}, V_{DS} = 0\text{V}$ | -40 | | -40 | | -40 | | V |
| I_{GSS} Gate to Source Reverse Current | $V_{GS} = -20\text{V}, V_{DS} = 0\text{V}, T_A = 25^\circ\text{C}$ $V_{GS} = -20\text{V}, V_{DS} = 0\text{V}, T_A = 150^\circ\text{C}$ | | -250 -500 | | -200 -500 | | -200 -500 | pA nA |
| $V_{GS(OFF)}$ Gate to Source Cutoff Voltage | $V_{DS} = 15\text{V}, I_D = 0.5\text{nA}$ | -4 | -10 | -2 | -6 | -0.8 | -4 | V |
| I_{DSS} Drain to Source Saturation Current | $V_{DS} = 15\text{V}, V_{GS} = 0\text{V}$ (Pulsed) | 50 | | 20 | 100 | 8 | 80 | mA |
| $I_{D(OFF)}$ Drain Cutoff Current | $V_{DS} = 15\text{V}, V_{GS} = -10\text{V}, T_A = 25^\circ\text{C}$ $V_{DS} = 15\text{V}, V_{GS} = -10\text{V}, T_A = 150^\circ\text{C}$ | | 250 500 | | 250 500 | | 250 500 | pA nA |
| $V_{DS(ON)}$ Drain to Source ON Voltage | $V_{GS} = 0\text{V}, I_D = ()$ | | 0.75 (20) | | 0.5 (10) | | 0.5 (5) | V mA |

Dynamic Characteristics (@ $T_A = 25^\circ\text{C}$, Unless otherwise specified, Highlighted values = A variant)

| Parameters | Conditions | 2N4856/A | | 2N4857/A | | 2N4858/A | | Unit |
|--|---|----------|---------------|----------|--------------|----------|-------------|-------------|
| | | Min | Max | Min | Max | Min | Max | |
| $R_{DS(ON)}$ Drain to Source ON Resistance | $V_{GS} = 0\text{V}, I_D = 0\text{A},$ $f = 1\text{kHz}$ | | 25 | | 40 | | 60 | Ω |
| C_{iss} Input Capacitance | $V_{DS} = 0\text{V}, V_{GS} = -10\text{V},$ $f = 1\text{MHz}$ | | 18 10 | | 18 10 | | 18 10 | pF |
| C_{rss} Reverse Transfer Capacitance | $V_{DS} = 0\text{V}, V_{GS} = -10\text{V},$ $f = 1\text{MHz}$ | | 8 4 | | 8 3.5 | | 8 3.5 | pF |
| $t_{d(on)}$ Turn-On Delay Time | $V_{DD} = 10\text{V}, V_{GS(ON)} = 0\text{V}$ $I_{D(ON)} = (), V_{GS(OFF)} = []$ | | 6 5 | | 6 6 | | 10 8 | ns |
| | | | (20) [-10] | | (10) [-6] | | (5) [-4] | (mA) [V] |
| t_r Rise Time | $V_{DD} = 10\text{V}, V_{GS(ON)} = 0\text{V}$ $I_{D(ON)} = (), V_{GS(OFF)} = []$ | | 3 3 | | 4 4 | | 10 8 | ns |
| | | | (20) [-10] | | (10) [-6] | | (5) [-4] | (mA) [V] |
| $t_{d(off)}$ Turn-Off Delay Time | $V_{DD} = 10\text{V}, V_{GS(ON)} = 0\text{V}$ $I_{D(ON)} = (), V_{GS(OFF)} = []$ | | 25 25 | | 50 40 | | 100 80 | ns |
| | | | (20) [-10] | | (10) [-6] | | (5) [-4] | (mA) [V] |

SOT23 (TO-236AB) Mechanical and Layout Data

Package Outline Data



1. All linear dimensions are in millimeters.
2. Package weight approximately 0.12 grams
3. Molded plastic case UL 94V-0 rated
4. For Tape and Reel specifications refer to InterFET CTC-021 Tape and Reel Specification, Document number: IF39002
5. Bulk product is shipped in standard ESD shipping material
6. Refer to JEDEC standards for additional information.

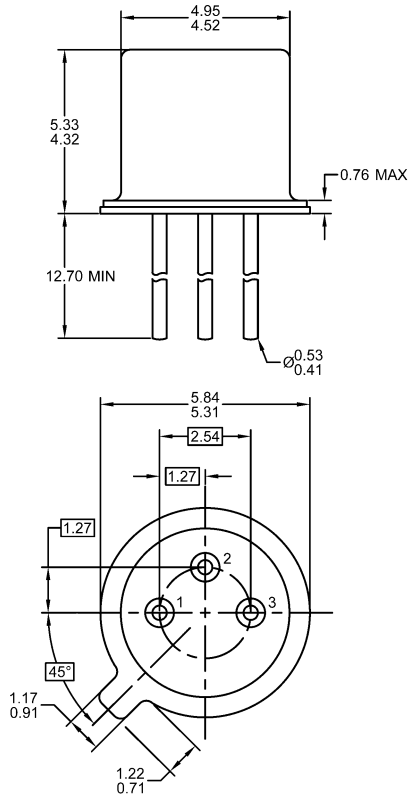
Suggested Pad Layout



1. All linear dimensions are in millimeters.
2. The suggested land pattern dimensions have been provided for reference only. A more robust pattern may be desired for wave soldering.

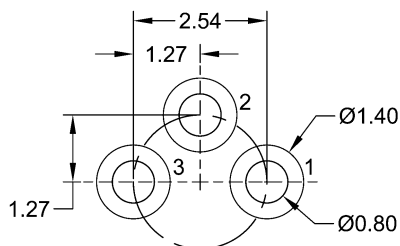
TO-18 Mechanical and Layout Data

Package Outline Data



1. All linear dimensions are in millimeters.
2. Package weight approximately 0.29 grams
3. Bulk product is shipped in standard ESD shipping material
4. Refer to JEDEC standards for additional information.

Suggested Through-Hole Layout



1. All linear dimensions are in millimeters.
2. The suggested land pattern dimensions have been provided as a straight lead reference only. A more robust pattern may be desired for wave soldering and/or bent lead configurations.