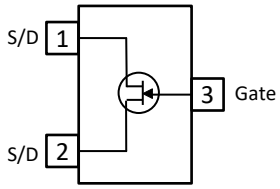
# IFN3556, IFN3557 N-Channel JFET

## Features

- InterFET N0132L Geometry
- Low noise: 1.0 nV/√Hz typical
- High gain: 22mS typical
- Low gate leakage: 750fA typical @10V
- Low cutoff voltage: -1.0 typical
- High radiation tolerance
- RoHS, REACH, CMR compliant
- Custom test and binning options available
- SMT and bare die package options
- Edge case SPICE modeling: InterFET SPICE

**SOT23 Top View**




NOTE: S/D pins are interchangeable Source Drain connections

## Industry Standard Crosses

- 2SK3557

## InterFET Similar Parts

- IF1320

## InterFET Dual Parts

- IF1322,IF1322A

## Applications

- General: Amplifiers; Switches; Voltage regulators; Oscillators; Signal mixers; Noise generators
- Military/Aero: Radar; Communications; Satellites; Missiles guidance; Hydrophone Pre-Amps
- Medical: Medical imaging systems; Medical monitors and recorders; Ultrasound equipment
- Audio: Tone control circuits; Headphone amplifiers; Audio filters; Electret Microphone

## Description

InterFET's flagship low noise, low leakage N-CH JFET. High gain and high radiation tolerance for military and standard applications. The IFN3556 and IFN3557 have a cutoff voltage of less than -1.5V ideal for low-voltage supply applications. The InterFET proprietary JFET recipes result in highest radiation tolerance and lowest leakage JFETs on the market. Custom binning options available.

## Ordering Information Custom Part and Binning Options Available

| Part Number | Description | Case | Packaging |
|---|---|---|---|
| IFN3556ST3; IFN3557ST3 | Surface Mount | SOT23 | Bulk |
| IFN3556ST3TR;<br>IFN3557ST3TR | 7" Tape and Reel: 1,000 and 3,000 Pieces<br>13" Tape and Reel: 9000 Pieces | SOT23<br>SOT23 | Minimum 1,000 Pieces<br>Tape and Reel |
| IFN3556COT; IFN3557COT | Chip Orientated Tray (COT Waffle Pack) | COT | 400/Waffle Pack |
| IFN3556CFT; IFN3557CFT | Chip Face-up Tray (CFT Waffle Pack) | CFT | 400/Waffle Pack |

**NOTICE:** Please refer to the end of this document for information on product materials, compliance, safety, and legal statements.

# Electrical Characteristics

## Maximum Ratings (@ $T_A$ = 25°C, Unless otherwise specified)

| Parameters | | SOT-23 | Unit |
|---|---|---|---|
| $V_{RGS}$ | Reverse Gate Source and Gate Drain Voltage | -20 | V |
| $I_{FG}$ | Continuous Forward Gate Current | 50 | mA |
| $P_D$ | Continuous Device Power Dissipation[1] | 350 | mW |
| P | Power Derating[1] | 2.8 | mW/°C |
| $T_J$ | Operating Junction Temperature | -55 to 150 | °C |
| $T_{STG}$ | Storage Temperature | -55 to 150 | °C |

[1] Thermal power dissipation and derating values obtained with gate pin (substrate) thermally connected to pad and/or internal layer.

## Static Characteristics (@ TA = 25°C, Unless otherwise specified)

| Parameters | | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| $V_{(BR)GSS}$ | Gate to Source Breakdown Voltage | $I_G$ = -1µA, $V_{DS}$ = 0V | -20 | | | V |
| $I_{GSS}$ | Gate to Source Reverse Current | $V_{DS}$ = 0V, $V_{GS}$ = -10V | | -0.75 | -100 | pA |
| $V_{GS(OFF)}$ | Gate to Source Cutoff Voltage | $V_{DS}$ = 10V, $I_D$ = 0.5 nA | -0.35 | | -1.5 | V |
| $I_{DSS}$ | Drain to Source Saturation Current | $V_{DS}$ = 10V, $V_{GS}$ = 0V (Pulsed) | 10* | | 32* | mA |

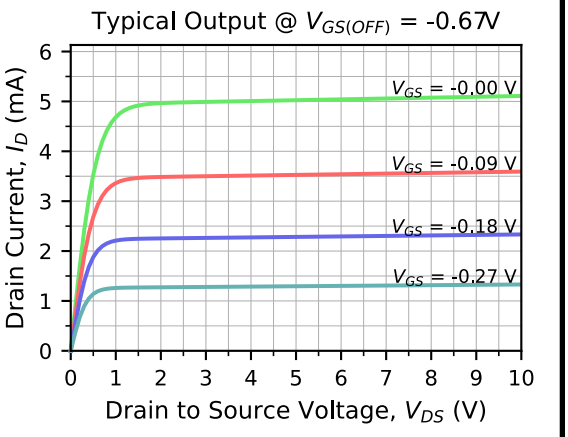
## Dynamic Characteristics (@ TA = 25°C, Unless otherwise specified)

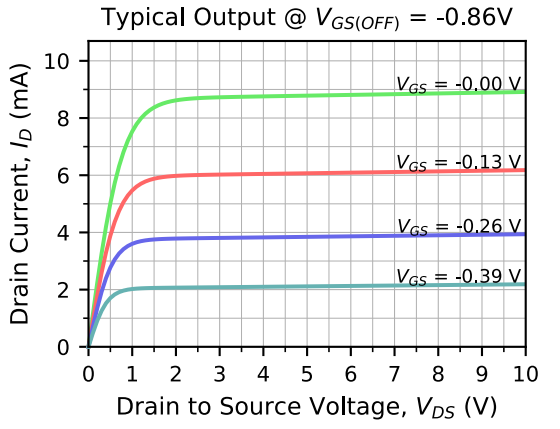
| Parameters | | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| $G_{FS}$ | Forward Transconductance | $V_{DS}$ = 10V, $I_D$ = 5 mA, f = 1kHz | 15 | 22 | | mS |
| $C_{iss}$ | Input Capacitance | $V_{DS}$ = 10V, $I_D$ = 5 mA, f = 1MHz | | | 20 | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | $V_{DS}$ = 10V, $I_D$ = 5 mA, f = 1MHz | | | 5 | pF |
| $e_n$ | Equivalent Circuit Input Noise Voltage | $V_{DS}$ = 10V, $I_D$ = 5 mA, f = 1kHz | | 1.0 | | nV/√Hz |

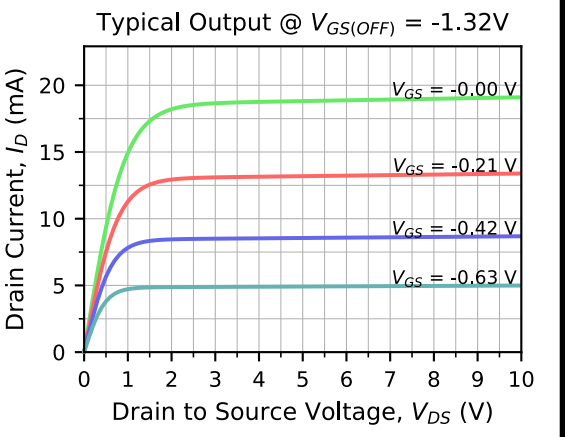
## Class Characteristics (@ TA = 25°C, Unless otherwise specified)

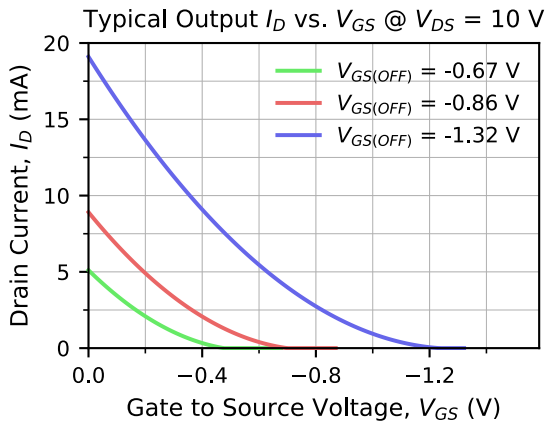
| Rank | IFN3556 | IFN3557 |
|---|---|---|
| $I_{DSS}$ | 10.0 to 20.0 | 16.0 to 32.0 |

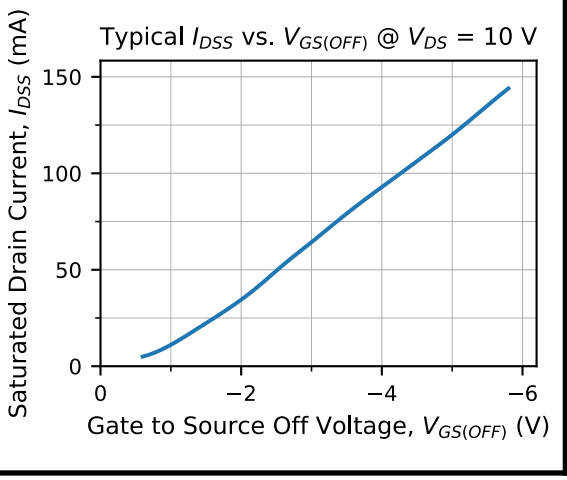
## Typical IFN3556, IFN3557 Characteristics

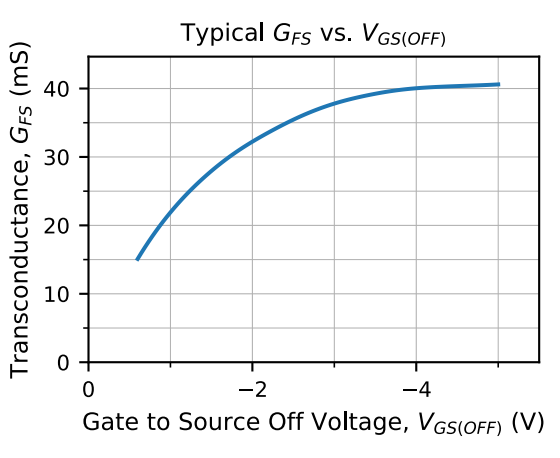


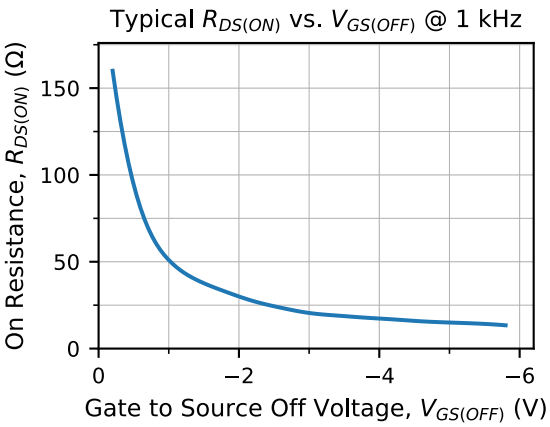



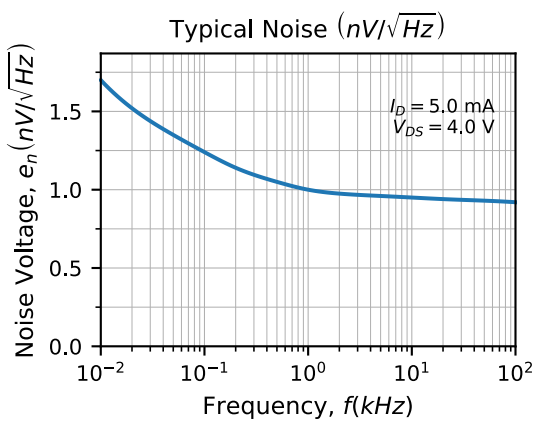



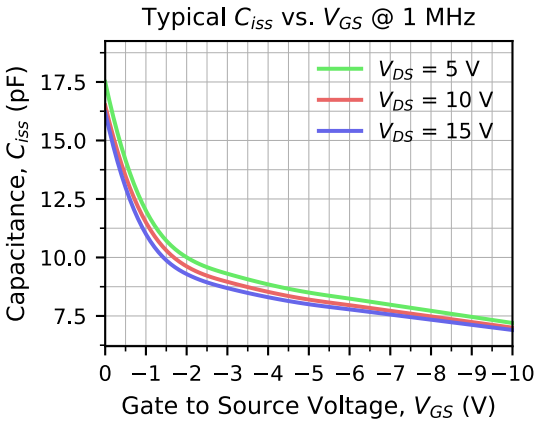



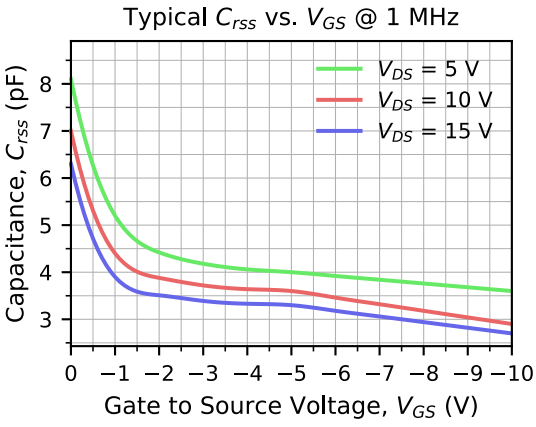



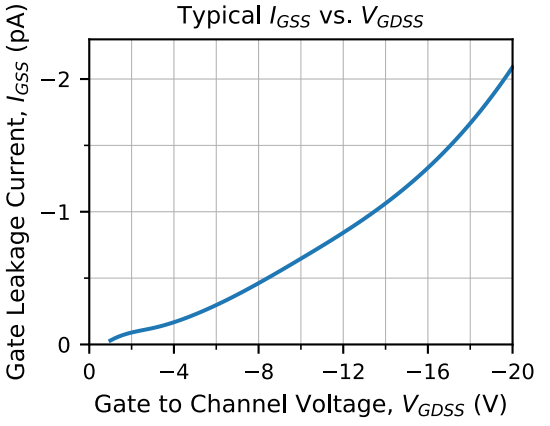
## Typical IFN3556, IFN3557 Characteristics (Continued)



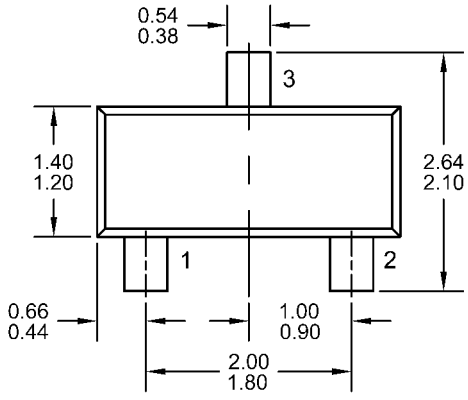



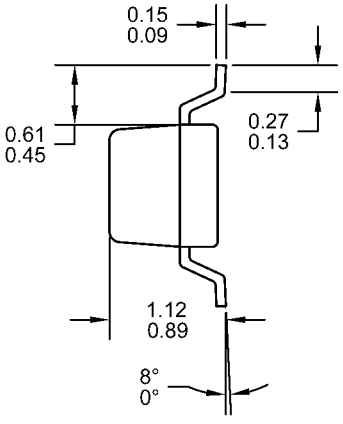



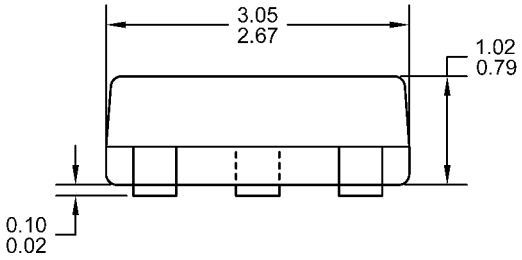



# SOT23 (TO-236AB) Mechanical and Layout Data

## Package Outline Data

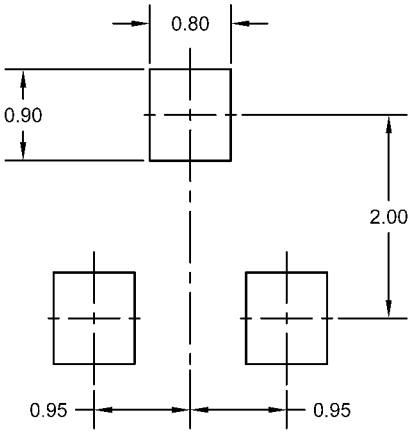



1. All linear dimensions are in millimeters.
2. Package weight approximately 0.01 grams
3. Molded plastic case UL 94V-0 rated
4. For Tape and Reel specifications refer to InterFET CTC-021 Tape and Reel Specification, Document number: IF39002
5. Bulk product is shipped in standard ESD shipping material
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.

# Compliance and Legal

## Environment

InterFET parts follow the latest RoHS Compliance, REACH Compliance, Proposition 65 Statement, TSCA Statement, and Chemical Disposal and Waste Mitigation requirement and guidelines. For more on InterFET's Environmental Commitment please visit www.InterFET.com/environmental/.

## Package materials

| Parameters | SOT23 | SOIC8 | TO-92 | Metal Case |
|---|---|---|---|---|
| Alloy | CDA194 | C194 1/2H | C194 1/2H | Kovar |
| Cu | Balance | 97% min | 97% min | |
| Fe | 2.1 – 2.6% | 2.1 – 2.6% | 2.1 – 2.6% | 53% |
| Zn | 0.05 – 0.2% | 0.05 – 0.2% | 0.05 – 0.15% | |
| P | 0.015 – 0.15% | 0.015 – 0.15% | 0.015 – 0.15% | |
| Pb | 0.03% max | 0.03% max | 0.03% max | |
| Ni | | | | 29% |
| Co | | | | 17% |
| Mn | | | | 0.3% |
| Si | | | | 0.2% |
| C | | | | <0.01% |
| Au | | | | Plating |

## Package tests

| Parameters | SOT23 | SOIC8 | TO-92 | Metal Case |
|---|---|---|---|---|
| MSL | Level 1 | Level 1 | N/A | N/A |
| ESD | Class M4 Machine Model Class 3B HBM | Class M4 Machine Model Class 3B HBM | Class M4 Machine Model Class 3B HBM | Class M4 Machine Model Class 3B HBM |

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