

# IFN3957, IFN3958 Dual Matched N-Channel JFET

## Features

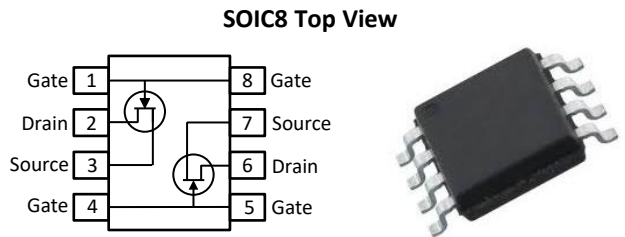
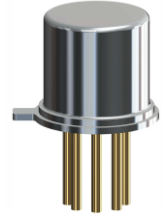
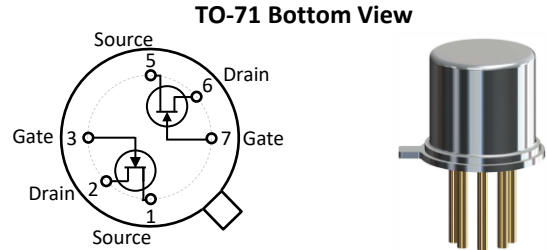
- InterFET [N0016H Geometry](#)
- Typical Noise: 6 nV/VHz
- Low Ciss: 3.5pF Typical
- High Input Impedance
- Replacement for 2N3957,8 Parts
- RoHS Compliant
- SMT, TH, and Bare Die Package options.

## Applications

- Differential Amplifiers
- Low Noise Pre-Amplifier
- High Impedance Amplifier

## Description

The -50V InterFET IFN3957 and IFN3958 matched pair JFET's are targeted for high input impedance applications for mid to high frequency designs. Gate leakages are typically 10pA at room temperatures. Parts are matched down to 5mV. The TO-71 package is hermetically sealed and suitable for military applications. Custom specifications, matching, and packaging options are available.



## Product Summary

Parameters	IFN3957 Min	IFN3958 Min	Unit
$BV_{GSS}$ Gate to Source Breakdown Voltage	-50	-50	V
$I_{DSS}$ Drain to Source Saturation Current	0.5	0.5	mA
$V_{GS(off)}$ Gate to Source Cutoff Voltage	-1	-1	V
$G_{FS}$ Forward Transconductance	1000	1000	$\mu S$

## Ordering Information Custom Part and Binning Options Available

Part Number	Description	Case	Packaging
IFN3957; IFN3958	Through-Hole	TO-72	Bulk
SMP3957; SMP3958	Surface Mount	SOIC8	Bulk
SMP3957TR; SMP3958TR	7" Tape and Reel: Max 500 Pieces 13" Tape and Reel: Max 2,500 Pieces	SOIC8	Minimum 500 Pieces Tape and Reel
IFN3957COT; IFN3958COT *	Chip Orientated Tray (COT Waffle Pack)	COT	70/Waffle Pack
IFN3957CFT; IFN3958CFT *	Chip Face-up Tray (CFT Waffle Pack)	CFT	70/Waffle Pack

\* Bare die packaged options are designed for matched specifications but not 100% tested



**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	-50	V
$I_{FG}$ Continuous Forward Gate Current	50	mA
$P_D$ Continuous Device Power Dissipation	250	mW
$P$ Power Derating	4.3	mW/ $^\circ\text{C}$
$T_J$ Operating Junction Temperature	-55 to 150	$^\circ\text{C}$
$T_{STG}$ Storage Temperature	-65 to 175	$^\circ\text{C}$

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

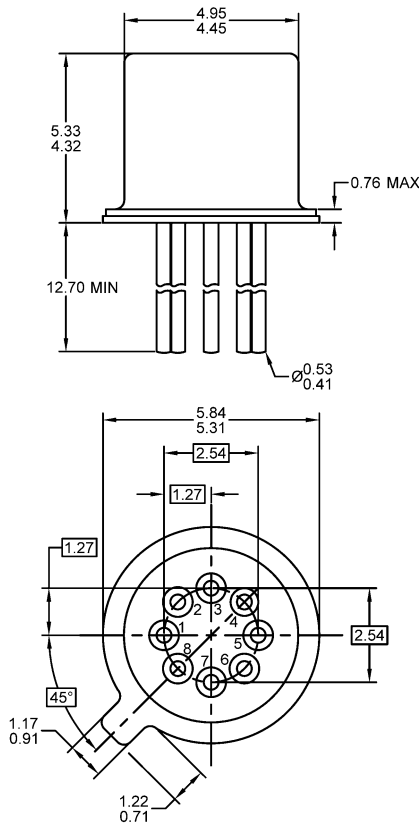
Parameters	Conditions	IFN3957, IFN3958			Unit
		Min	Typ	Max	
$V_{(BR)GSS}$ Gate to Source Breakdown Voltage	$I_G = -1\mu\text{A}, V_{DS} = 0\text{V}$	-50			V
$I_{GSS}$ Gate to Source Reverse Current	$V_{GS} = -30\text{V}, V_{DS} = 0\text{V}, T_A = 25^\circ\text{C}$			-100	pA
	$V_{GS} = -30\text{V}, V_{DS} = 0\text{V}, T_A = 125^\circ\text{C}$			-500	nA
$I_G$ Gate Operating Current	$V_{DS} = 20\text{V}, I_D = 200\mu\text{A}, T_A = 25^\circ\text{C}$			-50	pA
	$V_{DS} = 20\text{V}, I_D = 200\mu\text{A}, T_A = 125^\circ\text{C}$			-250	nA
$V_{GS(OFF)}$ Gate to Source Cutoff Voltage	$V_{DS} = -20\text{V}, I_G = 1\text{nA}$	-1		-4.5	V
$V_{GS}$ Gate Source Voltage	$V_{DS} = 20\text{V}, I_D = 50\mu\text{A}$			-4.2	V
	$V_{DS} = 20\text{V}, I_D = 200\mu\text{A}$	-0.5		-4	
$V_{GS(F)}$ Gate Source Forward Voltage	$V_{DS} = 0\text{V}, I_G = 1\text{mA}$			2	
$I_{DSS}$ Drain to Source Saturation Current	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}$ (Pulsed)	0.5		5	mA

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

Parameters	Conditions	IFN3957, IFN3958			Unit
		Min	Typ	Max	
$G_{FS}$ Forward Transconductance	$V_{DS} = 10\text{V}, V_{GS} = 0\text{V}, f = 1\text{kHz}$	1000		3000	$\mu\text{S}$
	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}, f = 200\text{MHz}$	1000			
$G_{OS}$ Output Conductance	$V_{DS} = 20\text{V}, f = 1\text{kHz}$			35	$\mu\text{S}$
$C_{ISS}$ Input Capacitance	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$			4	pF
$C_{RSS}$ Reverse Capacitance	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$			1.2	pF
NF Noise Figure	$V_{DS} = 20\text{V}, f = 10\text{Hz}, R_G = 10\text{M}\Omega$			0.5	dB
$ I_{G1} - I_{G2} $ Differential Gate Current	$V_{DS} = 20\text{V}, I_D = 200\mu\text{A}, T_A = 125^\circ\text{C}$			10	nA
$I_{DSS1}/I_{DSS2}$ Saturation Drain Current Ratio	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}$ IFN3957	0.90		1	
	IFN3958	0.85		1	
$ V_{GS1} - V_{GS2} $ Differential Gate Source Voltage	$V_{DS} = 20\text{V}, I_D = 200\mu\text{A}$ IFN3957			20	mV
	IFN3958			25	
$\frac{ V_{GS1} - V_{GS2} }{\Delta T}$ Differential Gate Source Voltage with Temperature	$V_{DS} = 20\text{V}, I_D = 200\mu\text{A}$ IFN3957			5	mV/ $^\circ\text{C}$
	$T_O = -55^\circ\text{C}$ to $125^\circ\text{C}$ IFN3958			5	
$g_{fs1}/g_{fs2}$ Transconductance Ratio	$V_{DS} = 20\text{V}, I_D = 200\mu\text{A}, f = 1\text{kHz}$ IFN3957	0.90		1	
	IFN3958	0.85		1	

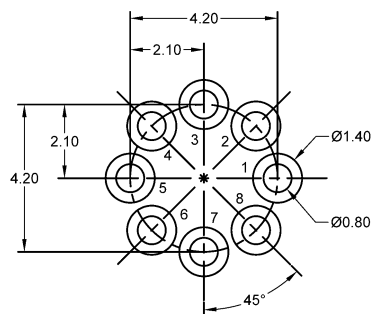
## TO-71 Mechanical and Layout Data

### Package Outline Data



1. All linear dimensions are in millimeters.
2. Eight leaded device. Not all leads are shown in drawing views.
3. Some package configurations will not populate pin 8 and/or pin 4.
4. Package weight approximately 0.35 grams
5. Bulk product is shipped in standard ESD shipping material
6. Refer to JEDEC standards for additional information.

### Suggested Bent Lead Through-Hole Layout



1. All linear dimensions are in millimeters.
2. Pads 8 and/or pad 4 can be eliminated for devices with less pins.
3. The suggested land pattern dimensions have been provided as an eight pin bent lead reference only. A more robust pattern may be desired for wave soldering or reduced pin count.