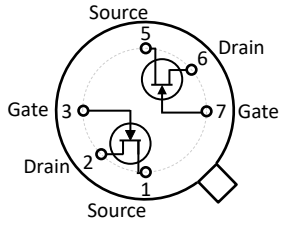
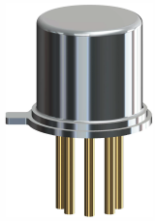
IFN3957, IFN3958 Dual Matched N-Channel JFET

Features

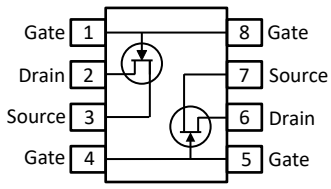
- InterFET N0016H Geometry
- Typical Noise: 6 nV/√Hz
- Low Ciss: 3.5pF Typical
- High Input Impedance
- Replacement for 2N3957,8 Parts
- RoHS Compliant
- SMT, TH, and Bare Die Package options.

TO-71 Bottom View





SOIC8 Top View



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	µS

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

Electrical Characteristics

Maximum Ratings (@ T_A = 25°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/°C
T_J	Operating Junction Temperature	-55 to 150	°C
T_{STG}	Storage Temperature	-65 to 175	°C

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

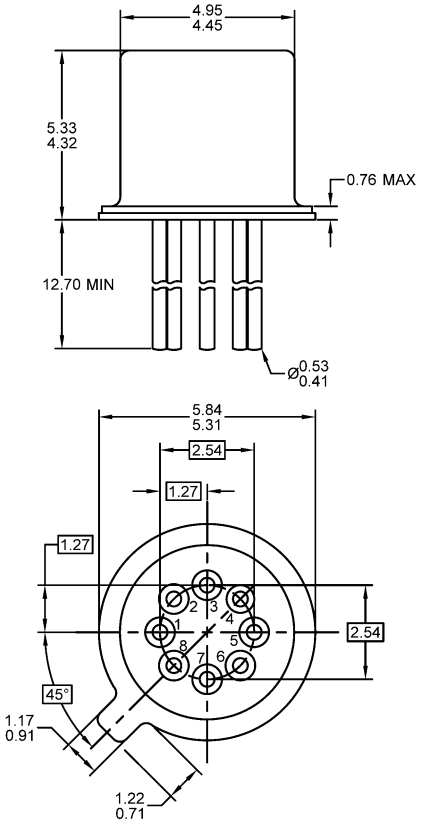
Parameters		Conditions	IFN3957, IFN3958			Unit
			Min	Typ	Max	
$V_{(BR)GSS}$	Gate to Source Breakdown Voltage	I_G = -1µA, V_{DS} = 0V	-50			V
I_{GSS}	Gate to Source Reverse Current	V_{GS} = -30V, V_{DS} = 0V, T_A = 25°C V_{GS} = -30V, V_{DS} = 0V, T_A = 125°C			-100 -500	pA nA
I_G	Gate Operating Current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

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

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

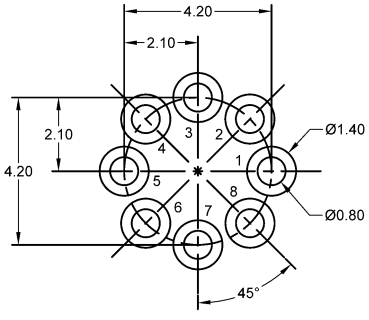
TO-71 Mechanical and Layout Data

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.

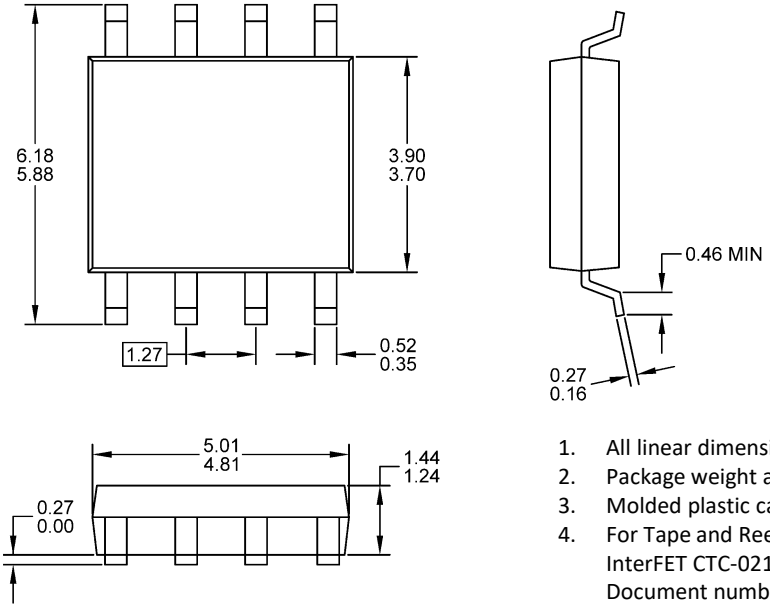
Suggested Bent Lead Through-Hole Layout



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.

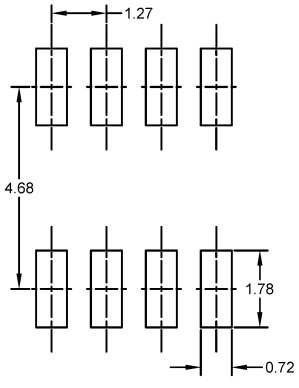
SOIC8 Mechanical and Layout Data

Package Outline Data



1. All linear dimensions are in millimeters.
2. Package weight approximately 0.21 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.