

## IFN152 N-Channel JFET

### Features

- InterFET [N0132L Geometry](#)
- Low noise: 1.0 nV/VHz typical
- High gain: 30mS typical
- Low gate leakage: 750fA typical @10V
- Typical I<sub>SS</sub>: 15mA
- High radiation tolerance
- RoHS, REACH, CMR compliant
- Custom test and binning options available
- SMT, TH, and bare die package options
- Edge case SPICE modeling: [InterFET SPICE](#)

### Industry Standard Crosses

- 2SK152, 2SK170, 2N6451, 2N6452, 2N3972, 2N4393
- NSVJ3557SA3, NSVJ5908DSG5, NSVJ2394SA3
- MMBF4393L

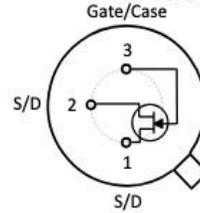
### InterFET Similar Parts

- IF170A, IF170B, IF170C, IF170D, IF1320
- SMP6451, SMP6452, SMP3972, SMP4393

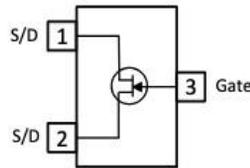
### InterFET Dual Parts

- IF389A, IF389B, IF389C, IF389D
- IFN146, IF1322, IF1322A

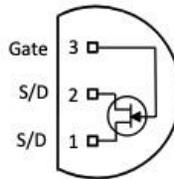
**TO-18 Bottom View**



**SOT23 Top View**



**TO-92 Bottom View**



NOTE: S/D pins are interchangeable Source Drain connections

### Applications

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

### Description

The -20V InterFET IFN152 is a low noise high gain replacement for the Japanese 2SK152 JFET. Gate leakages are typically 750fA at room temperatures. The InterFET proprietary JFET materials and processes result in highest radiation tolerance and lowest leakage JFETs on the market. Custom binning options available.

### Ordering Information

Part Number	Description	Case	Packaging
IFN152	Through-Hole	TO-18	Bulk
PN152	Through-Hole	TO-92	Bulk
SMP152	Surface Mount	SOT23	Bulk
SMP152TR	7" Tape and Reel: Max 3,000 Pieces 13" Tape and Reel: Max 9,000 Pieces	SOT23	Minimum 1,000 Pieces Tape and Reel
IFN152COT	Chip Orientated Tray (COT Waffle Pack)	COT	400/Waffle Pack
IFN152CFT	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 (@ $T_A = 25^\circ\text{C}$ , Unless otherwise specified)

Parameters	TO-18	SOT-23	TO-92	Unit
$V_{\text{RGS}}$ Reverse Gate Source and Gate Drain Voltage	-20	-20	-20	V
$I_{\text{FG}}$ Continuous Forward Gate Current	50	50	50	mA
$P_{\text{D}}$ Continuous Device Power Dissipation <sup>1</sup>	500	350	500	mW
$P$ Power Derating <sup>1</sup>	3.3	2.8	4	mW/°C
$T_{\text{J}}$ Operating Junction Temperature	-65 to 175	-55 to 150	-55 to 150	°C
$T_{\text{STG}}$ Storage Temperature	-65 to 175	-55 to 150	-55 to 150	°C

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

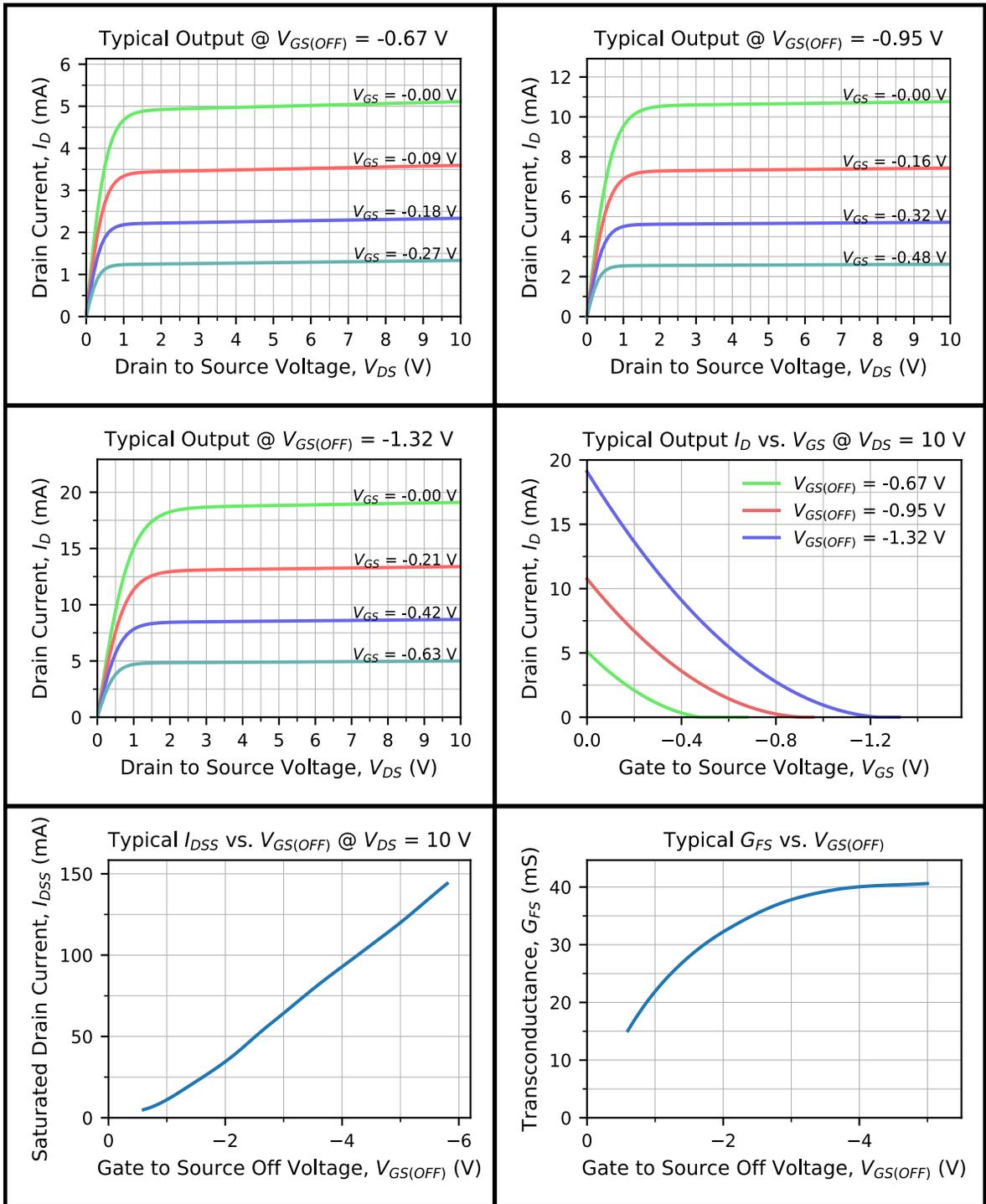
### Static Characteristics (@ $T_A = 25^\circ\text{C}$ , Unless otherwise specified)

Parameters	Conditions	IFN152		Unit
		Min	Max	
$V_{(\text{BR})\text{GSS}}$ Gate to Source Breakdown Voltage	$V_{\text{DS}} = 0\text{V}, I_{\text{G}} = -1\mu\text{A}$	-20		V
$I_{\text{GSS}}$ Gate to Source Reverse Current	$V_{\text{GS}} = -10\text{V}, V_{\text{DS}} = 0\text{V}$		1	nA
$V_{\text{GS}(\text{OFF})}$ Gate to Source Cutoff Voltage	$V_{\text{DS}} = 10\text{V}, I_{\text{D}} = 1\text{nA}$	-0.5	-2	V
$I_{\text{DSS}}$ Drain to Source Saturation Current	$V_{\text{GS}} = 0\text{V}, V_{\text{DS}} = 10\text{V}$ (Pulsed)	5	20	mA

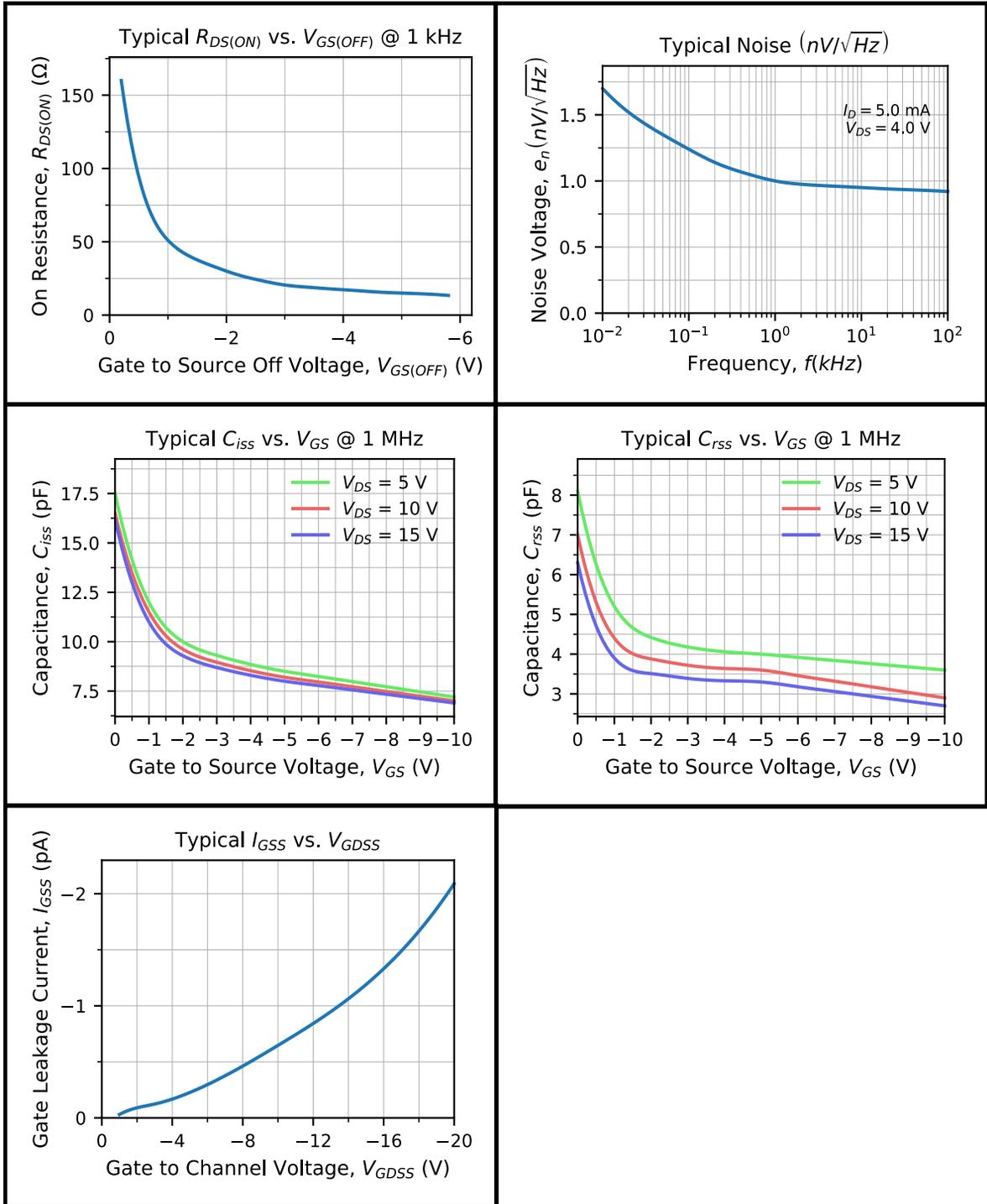
### Dynamic Characteristics (@ $T_A = 25^\circ\text{C}$ , Unless otherwise specified)

Parameters	Conditions	IFN152	Unit
		Typ	
$G_{\text{FS}}$ Forward Transconductance	$V_{\text{DS}} = 10\text{V}, V_{\text{GS}} = 0\text{V}, f = 1\text{kHz}$	30	mS
$C_{\text{iSS}}$ Input Capacitance	$V_{\text{DS}} = 10\text{V}, V_{\text{GS}} = 0\text{V}, f = 1\text{MHz}$	15	pF
$C_{\text{rSS}}$ Reverse Transfer Capacitance	$V_{\text{DS}} = 10\text{V}, I_{\text{D}} = 0\text{A}, f = 1\text{MHz}$	4	pF

### Typical IFN152 Characteristics

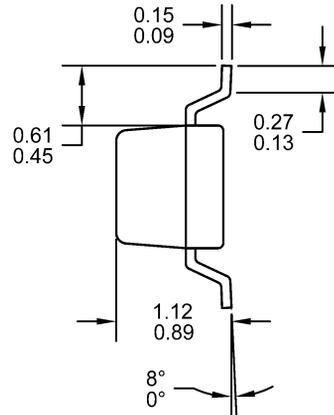
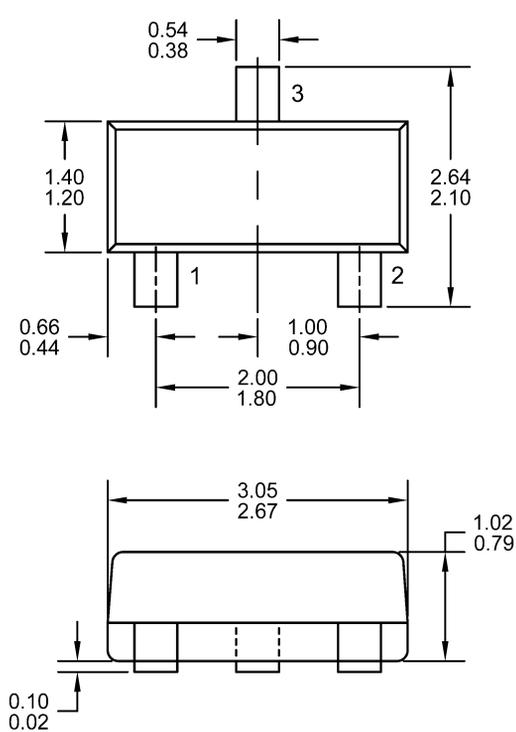


## Typical IFN152 Characteristics (Continued)



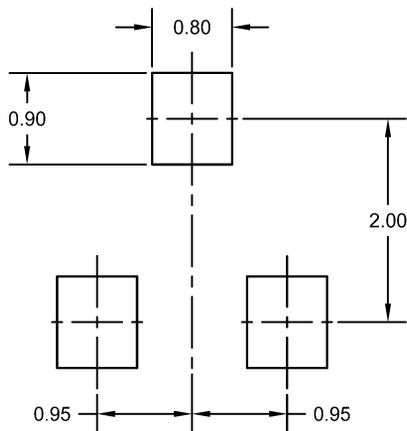
## SOT23 (TO-236AB) Mechanical and Layout Data

### 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.

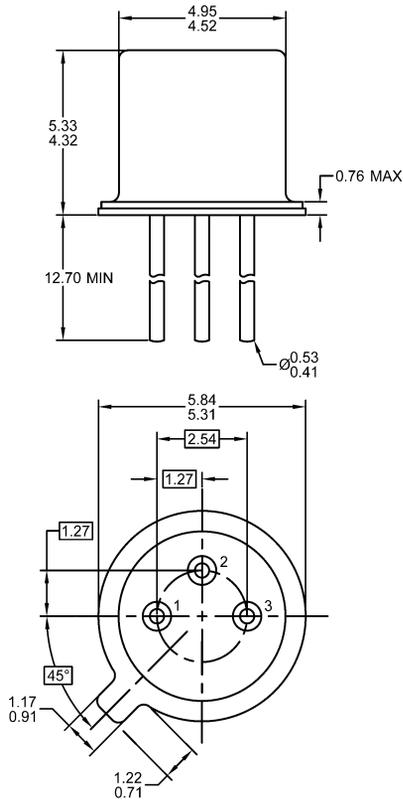
### Suggested Pad Layout



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.

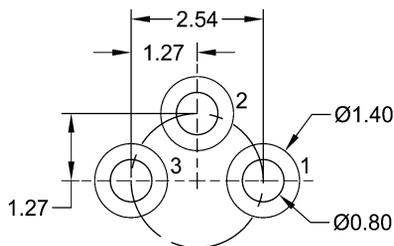
## TO-18 Mechanical and Layout Data

### 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.

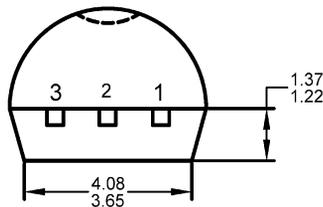
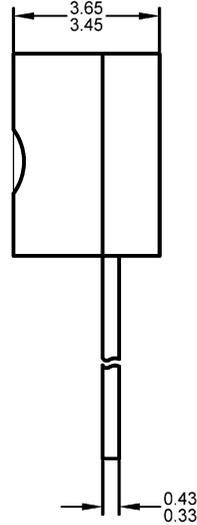
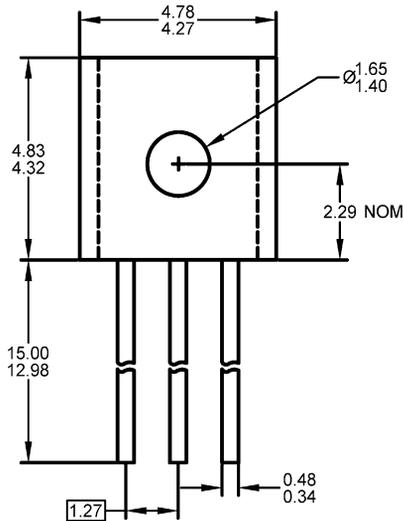
### Suggested Through-Hole Layout



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.

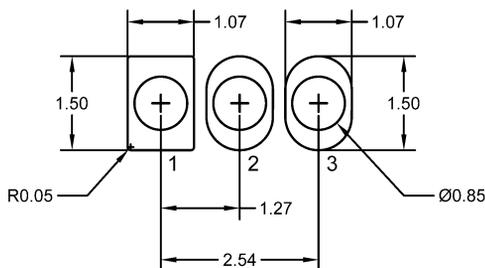
## TO-92 Mechanical and Layout Data

### Package Outline Data



1. All linear dimensions are in millimeters.
2. Package weight approximately 0.19 grams
3. Molded plastic case UL 94V-0 rated
4. Bulk product is shipped in standard ESD shipping material
5. 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.

## 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/](http://www.InterFET.com/environmental/).

### Package materials

Parameters	SOT23	TO-92	Metal Case
Alloy	CDA194	C194 1/2H	Kovar
Cu	Balance	97% min	
Fe	2.1 – 2.6%	2.1 – 2.6%	53%
Zn	0.05 – 0.2%	0.05 – 0.15%	
P	0.015 – 0.15%	0.015 – 0.15%	
Pb	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	TO-92	Metal Case
MSL	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

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