

# 2N5545, 2N5546, 2N5547



## Monolithic Dual N Channel JFET

Rev. V1

### Features

- Available in JAN, JANTX and JANTXV per MIL-PRF-19500/430
- Monolithic Design
- Low Offset/Drift Voltage
- Low Noise, Low Gate Leakage
- Ideal for Hi-Rel High Speed, Temp-Compensated, Single-Ended Input Amps
- High-Speed Comparators
- TO-71 package



### Electrical Characteristics ( $T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Reverse Gate Current	$V_{GS} = -50 \text{ V dc}; V_{DS} = 0$	$I_{GSS1}$	$\mu\text{A dc}$	—	-1.0
Reverse Gate Current	$V_{GS} = -30 \text{ V dc}; V_{DS} = 0$	$I_{GSS2}$	$\text{nA dc}$	—	-0.1
Drain Current	$V_{DS} = 15 \text{ V dc}; V_{GS} = 0$	$I_{DSS}$	$\text{mA dc}$	0.5	8.0
Gate Current	$V_{DG} = 15 \text{ V dc}; I_D = 200 \mu\text{A dc}$	$I_G$	$\text{pA dc}$	—	-50
Gate Source Cutoff Voltage	$V_{DS} = 15 \text{ V dc}; I_D = 0.5 \text{ nA dc}$	$V_{GS(off)}$	$\text{V dc}$	-0.5	-4.5
Gate-Source Voltage Differential	$V_{DG} = 15 \text{ V dc}; I_D = 50 \mu\text{A dc}$ 2N5545 2N5546 2N5547	$ V_{GS1} - V_{GS2} ^1$	$\text{mV dc}$	—	5 10 15
Gate-Source Voltage Differential	$V_{DG} = 15 \text{ V dc}; I_D = 200 \mu\text{A dc};$ 2N5545 2N5546 2N5547	$ V_{GS1} - V_{GS2} ^2$	$\text{mV dc}$	—	5 10 15
Gate-Source Voltage Differential Change With Temperature	$V_{DG} = 15 \text{ V dc}; I_D = 200 \mu\text{A dc}; T_{A(1)} = +25^\circ\text{C}; T_{A(2)} = -55^\circ\text{C}$ 2N5545 2N5546 2N5547	$  \Delta V_{GS1} - V_{GS2}  _{\Delta T_A}$	$\text{mV dc}$	—	.8 1.6 3.2

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### Electrical Characteristics ( $T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Gate-Source Voltage Differential Change With Temperature	$V_{DG} = 15\text{ V dc}; I_D = 200\ \mu\text{A dc}; T_{A(1)} = +25^\circ\text{C}; T_{A(2)} = +125^\circ\text{C}$ 2N5545 2N5546 2N5547	$I_{\Delta V_{GS1}-V_{GS2}, T_A}$	mV dc	—	1 2 4
Zero-Gate-Voltage Drain Current Ratio	$V_{DS} = 15\text{ V dc}; V_{GS} = 0;$ 2N5545 2N5546 2N5547	$I_{DSS1}$ $I_{DSS2}$		0.95 0.90 0.90	1.05 1.10 1.10
Small-Signal Common-Source Short-Circuit Forward Transfer Admittance Ratio	$V_{DG} = 15\text{ V dc}; I_D = 200\ \mu\text{A dc}; f = 1\text{ kHz}$	$\frac{I_{y_{fs}I^1}}{I_{y_{fs}I^2}}$		0.97 0.95 0.90	1.03 1.05 1.10
Small-Signal Common-Source Short-Circuit Output Admittance Differential	$V_{DS} = 15\text{ V dc}; V_{GS} = 0; f = 1\text{ kHz}$ 2N5545 2N5546 2N5547	$I_{y_{os}I^1} - I_{y_{os}I^2}$	$\mu\text{mho}$		1 2 3

### Electrical Characteristics ( $T_A = 150^\circ\text{C}$ unless otherwise noted)

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Reverse Gate Current	$V_{GS} = -30\text{ V dc}; V_{DS} = 0$	$I_{GSS3}$	nA dc	—	-150
Gate Current Differential	$V_{DG} = 15\text{ V dc}; I_D = 200\ \mu\text{A dc};$ $T_A = +125^\circ\text{C}$	$I_{G1} - I_{G2}$	nA dc	—	5

### Electrical Characteristics

Parameter	Test Conditions	Symbol	Units	Min.	Max.
<b>Dynamic Characteristics</b>					
Spot Noise Figure (2N5545, 2N5546 only)	$V_{DS} = 15\text{ V dc}; I_D = 200\text{ }\mu\text{A dc}; f = 10\text{ Hz};$ $R_G = 1\text{ M}\Omega; \text{Noise Bandwidth} = 5\text{ Hz}$ 2N5545 2N5546	NF	dB	—	3.5 5.0
Small-Signal, Common-Source Short-Circuit Forward Transfer Admittance	$V_{DS} = 15\text{ V dc}; V_{GS} = 0;$ $f = 100\text{ kHz} \leq f \leq 1\text{ MHz}$	$ y_{fs} $	mmho	1.5	6.0
Small-Signal, Common-Source Short-Circuit Reverse Transfer Capacitance	$V_{DS} = 15\text{ V dc}; V_{GS} = 0\text{ V dc};$ $f = 100\text{ kHz} \leq f \leq 1\text{ MHz}$	$C_{rss}$	pF	—	2
Small-Signal, Common-Source Short-Circuit Input Capacitance	$V_{DS} = 15\text{ V dc}; V_{GS} = 0\text{ V dc};$ $f = 100\text{ kHz} \leq f \leq 1\text{ MHz}$	$C_{iss}$	pF	—	6
Small-Signal, Common-Source Short-Circuit Output Admittance	$V_{DS} = 15\text{ V dc}; V_{GS} = 0\text{ V};$ $f = 100\text{ kHz} \leq f \leq 1\text{ MHz}$	$ y_{os} $	$\mu\text{mho}$	—	25
Equivalent Input Noise Voltage	$V_{DS} = 15\text{ V dc}; I_D = 200\text{ }\mu\text{A dc}; \text{Noise}$ $\text{bandwidth} = 5\text{ Hz}$ 2N5545 2N5546	$V_n$	$nV\sqrt{\text{Hz}}$		180 200
Magnitude of Small-Signal, Common-Source, Short-Circuit Forward Transfer Admittance	$V_{DS} = 15\text{ V dc}; V_{GS} = 0; F = 1\text{ kHz}$ $T_A = -65^\circ\text{C}$	$ y_{fs} $	mmho		10.0

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### Absolute Maximum Ratings (25°C unless otherwise specified)

Ratings	Symbol	Value
Voltage Drain-Gate Breakdown	$V_{DG}$	50 V dc
Voltage Gate-Source Breakdown	$V_{GS}$	-50 V dc
Gate Current	$I_G$	30 mA dc
Maximum Power Dissipation @ $T_A = +25^\circ\text{C}$ One section Both sections	$P_T^{(1)}$	250 mW 400 mW
Storage Temperature Range	$T_{STG}$	-65°C to +200°C

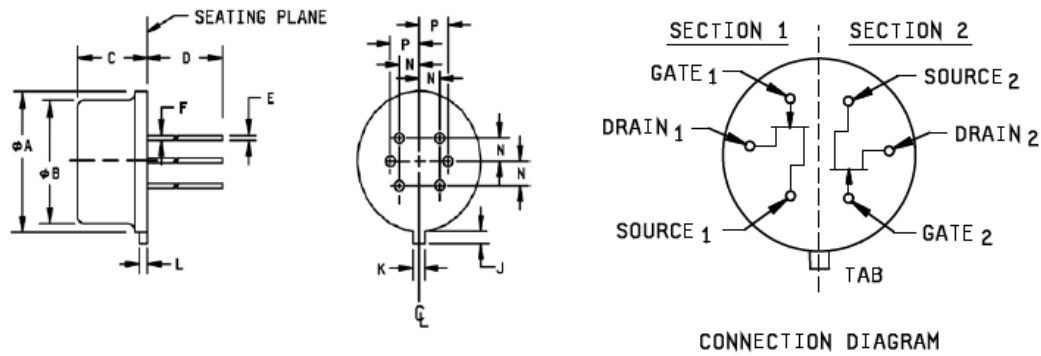
(1) Derate linearly 1.6 mW/°C for  $T_A > +25^\circ\text{C}$  one section, 2.67 mW/°C both sections

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### Outline Drawing TO-71



Ltr	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
$\phi A$	.209	.230	5.31	5.84	
$\phi B$	.178	.195	4.52	4.95	
C	.170	.210	4.32	5.33	
D	.500	.750	12.70	19.05	
E		.021		0.53	3
F	.016	.019	0.41	0.48	4
J	.028	.048	0.71	1.22	7
K	.036	.046	0.91	1.17	
L		.020		0.51	
N	.0146 Nom.		.037 Nom.		5
P	.0354 Nom.		.90 Nom.		5

#### NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Measured in the zone beyond .250 inch (6.35 mm) from the seating plane.
4. Measured in the zone from .50 inch (1.27 mm) to .250 inch (6.35 mm) from the seating plane.
5. When measured in a gauging plane .054 +.001, -.000 inch (1.37 -0.03, -0.00 mm) below the seating plane of the transistor, maximum diameter leads shall be within .007 inch (0.18 mm) of their true location relative to a maximum width tab. Smaller diameter leads shall fall within the outline of the maximum diameter lead tolerance.
6. All leads electrically insulated from case and each section electrically isolated from the other.
7. Measured from the maximum diameter of the actual device.

FIGURE 1. Physical dimensions (similar to TO-71).

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