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# 2N5457, 2N5458

## JFETs - General Purpose

### N-Channel – Depletion

N-Channel Junction Field Effect Transistors, depletion mode (Type A) designed for audio and switching applications.

#### Features

- N-Channel for Higher Gain
- Drain and Source Interchangeable
- High AC Input Impedance
- High DC Input Resistance
- Low Transfer and Input Capacitance
- Low Cross-Modulation and Intermodulation Distortion
- Plastic Encapsulated Package
- Pb-Free Packages are Available\*

#### MAXIMUM RATINGS

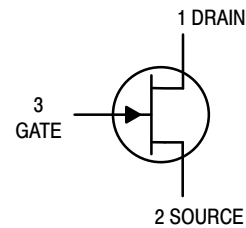
Rating	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	25	Vdc
Drain-Gate Voltage	$V_{DG}$	25	Vdc
Reverse Gate-Source Voltage	$V_{GSR}$	-25	Vdc
Gate Current	$I_G$	10	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	310 2.82	mW mW/ $^\circ\text{C}$
Operating Junction Temperature	$T_J$	135	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-65 to +150	$^\circ\text{C}$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

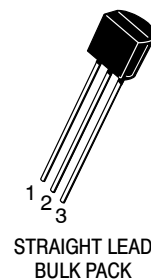


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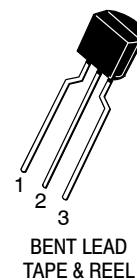
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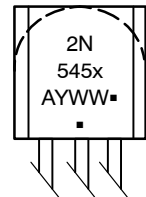
#### MARKING DIAGRAM



STRAIGHT LEAD  
BULK PACK



BENT LEAD  
TAPE & REEL  
AMMO PACK



TO-92  
CASE 29  
STYLE 5

2N545x = Device Code

x = 7 or 8

A = Assembly Location

Y = Year

WW = Work Week

▪ = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

Device	Package	Shipping
2N5457	TO-92	1000 Units/Box
2N5457G	TO-92 (Pb-Free)	1000 Units/Box
2N5458	TO-92	1000 Units/Box
2N5458G	TO-92 (Pb-Free)	1000 Units/Box

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

## 2N5457, 2N5458

### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>						
Gate-Source Breakdown Voltage ( $I_G = -10 \mu\text{Adc}$ , $V_{DS} = 0$ )		$V_{(BR)GSS}$	-25	-	-	Vdc
Gate Reverse Current ( $V_{GS} = -15 \text{Vdc}$ , $V_{DS} = 0$ ) ( $V_{GS} = -15 \text{Vdc}$ , $V_{DS} = 0$ , $T_A = 100^\circ\text{C}$ )		$I_{GSS}$	-	-	-1.0 -200	nAdc
Gate-Source Cutoff Voltage ( $V_{DS} = 15 \text{Vdc}$ , $i_D = 10 \text{nAdc}$ )	2N5457 2N5458	$V_{GS(off)}$	-0.5 -1.0	-	-6.0 -7.0	Vdc
Gate-Source Voltage ( $V_{DS} = 15 \text{Vdc}$ , $i_D = 100 \mu\text{Adc}$ ) ( $V_{DS} = 15 \text{Vdc}$ , $i_D = 200 \mu\text{Adc}$ )	2N5457 2N5458	$V_{GS}$	-	-2.5 -3.5	-	Vdc
<b>ON CHARACTERISTICS</b>						
Zero-Gate-Voltage Drain Current (Note 1) ( $V_{DS} = 15 \text{Vdc}$ , $V_{GS} = 0$ )	2N5457 2N5458	$I_{DSS}$	1.0 2.0	3.0 6.0	5.0 9.0	mAdc
<b>DYNAMIC CHARACTERISTICS</b>						
Forward Transfer Admittance (Note 1) ( $V_{DS} = 15 \text{Vdc}$ , $V_{GS} = 0$ , $f = 1 \text{kHz}$ )	2N5457 2N5458	$ Y_{fs} $	1000 1500	3000 4000	5000 5500	$\mu\text{hos}$
Output Admittance Common Source (Note 1) ( $V_{DS} = 15 \text{Vdc}$ , $V_{GS} = 0$ , $f = 1 \text{kHz}$ )		$ Y_{os} $	-	10	50	$\mu\text{hos}$
Input Capacitance ( $V_{DS} = 15 \text{Vdc}$ , $V_{GS} = 0$ , $f = 1 \text{kHz}$ )		$C_{iss}$	-	4.5	7.0	pF
Reverse Transfer Capacitance ( $V_{DS} = 15 \text{Vdc}$ , $V_{GS} = 0$ , $f = 1 \text{kHz}$ )		$C_{rss}$	-	1.5	3.0	pF

1. Pulse Width  $\leq 630 \text{ms}$ , Duty Cycle  $\leq 10\%$ .

# 2N5457, 2N5458

## TYPICAL CHARACTERISTICS For 2N5457 Only

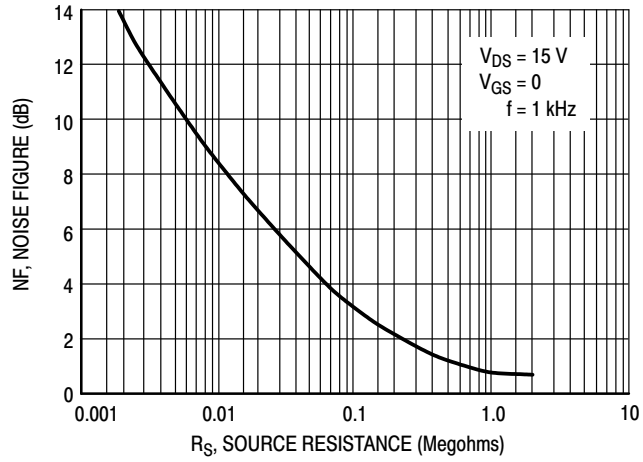


Figure 1. Noise Figure versus Source Resistance

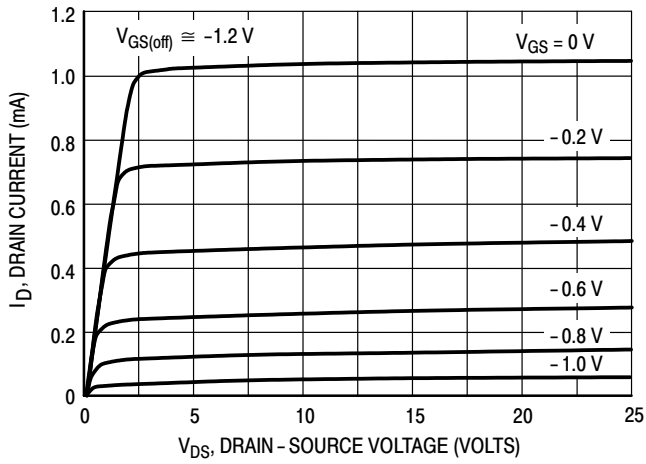


Figure 2. Typical Drain Characteristics

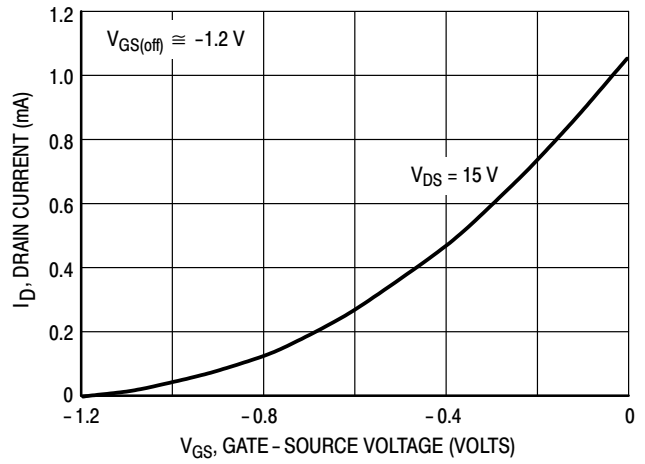


Figure 3. Common Source Transfer Characteristics

# 2N5457, 2N5458

## TYPICAL CHARACTERISTICS For 2N5457 Only

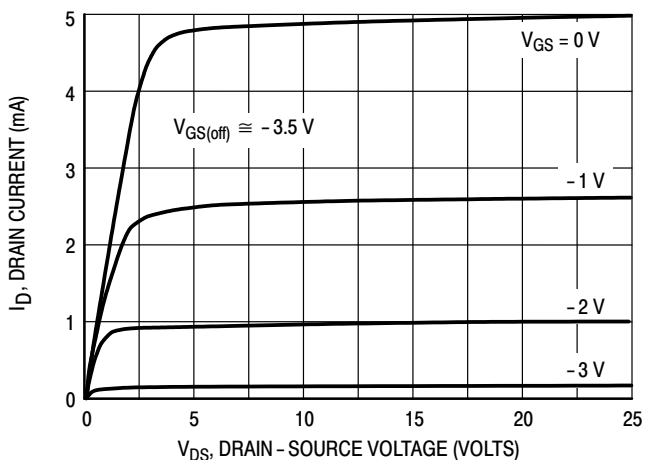


Figure 4. Typical Drain Characteristics

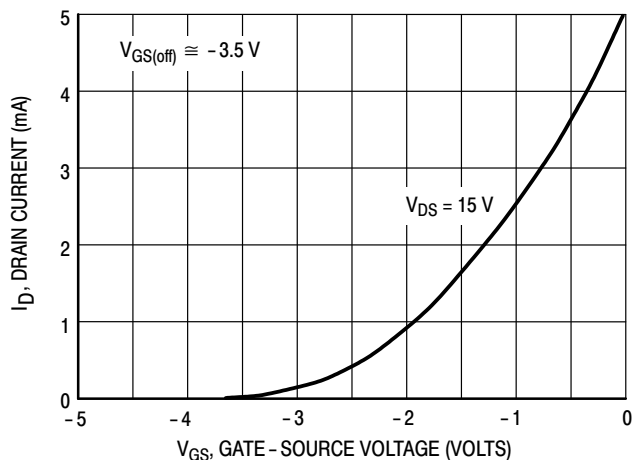


Figure 5. Common Source Transfer Characteristics

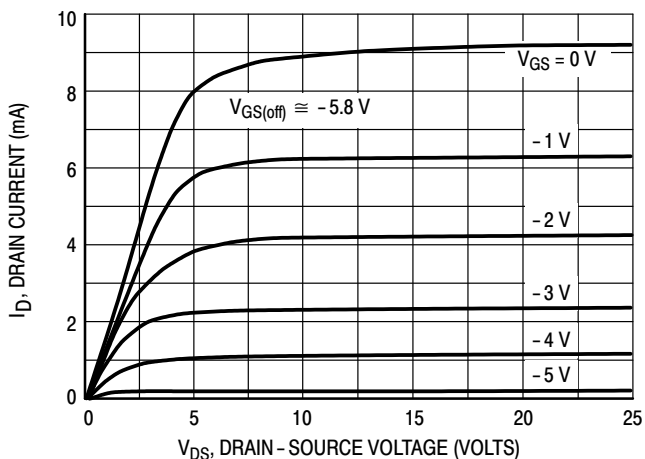


Figure 6. Typical Drain Characteristics

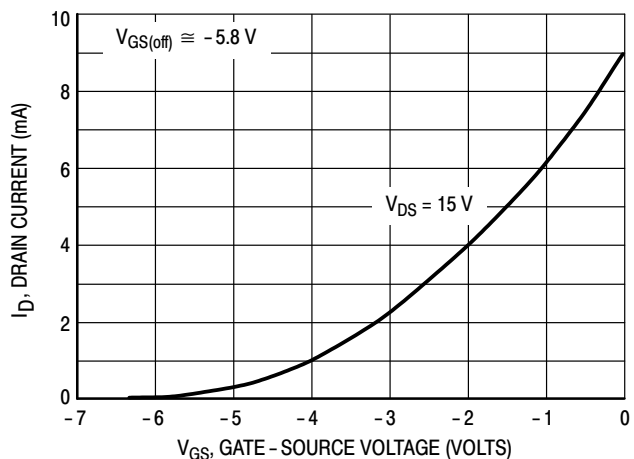


Figure 7. Common Source Transfer Characteristics

NOTE: Note: Graphical data is presented for dc conditions. Tabular data is given for pulsed conditions (Pulse Width = 630 ms, Duty Cycle = 10%). Under dc conditions, self heating in higher  $I_{DSS}$  units reduces  $I_{DSS}$ .

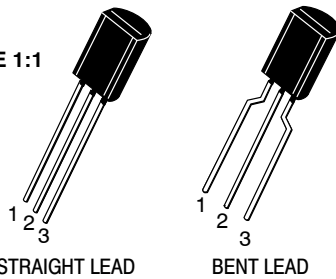
# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

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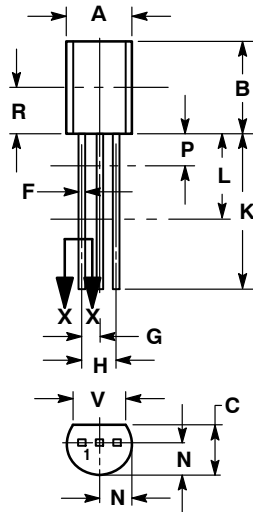


SCALE 1:1

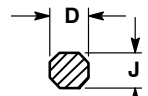


TO-92 (TO-226) 1 WATT  
CASE 29-10  
ISSUE A

DATE 08 MAY 2012



STRAIGHT LEAD

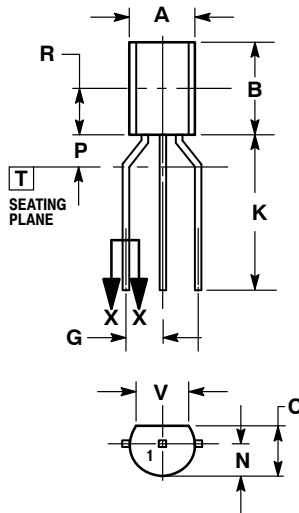


SECTION X-X

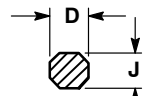
NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. DIMENSION F APPLIES BETWEEN DIMENSIONS P AND L. DIMENSIONS D AND J APPLY BETWEEN DIMENSIONS L AND K MINIMUM. THE LEAD DIMENSIONS ARE UNCONTROLLED IN DIMENSION P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.44	5.21
B	0.290	0.310	7.37	7.87
C	0.125	0.165	3.18	4.19
D	0.018	0.021	0.46	0.53
F	0.016	0.019	0.41	0.48
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.018	0.024	0.46	0.61
K	0.500	---	12.70	---
L	0.250	---	6.35	---
N	0.080	0.105	2.04	2.66
P	---	0.100	---	2.54
R	0.135	---	3.43	---
V	0.135	---	3.43	---



BENT LEAD



SECTION X-X

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. DIMENSION F APPLIES BETWEEN DIMENSIONS P AND L. DIMENSIONS D AND J APPLY BETWEEN DIMENSIONS L AND K MINIMUM. THE LEAD DIMENSIONS ARE UNCONTROLLED IN DIMENSION P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.44	5.21
B	0.290	0.310	7.37	7.87
C	0.125	0.165	3.18	4.19
D	0.018	0.021	0.46	0.53
G	0.094	0.102	2.40	2.80
J	0.018	0.024	0.46	0.61
K	0.500	---	12.70	---
N	0.080	0.105	2.04	2.66
P	---	0.100	---	2.54
R	0.135	---	3.43	---
V	0.135	---	3.43	---

STYLES ON PAGE 2

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CASE 29-10  
ISSUE A**

DATE 08 MAY 2012

- |   |  |  |   |   |
|---|--|--|---|---|
| <p>STYLE 1:<br/>PIN 1. EMITTER<br/>2. BASE<br/>3. COLLECTOR</p>             | <p>STYLE 2:<br/>PIN 1. BASE<br/>2. EMITTER<br/>3. COLLECTOR</p>                | <p>STYLE 3:<br/>PIN 1. ANODE<br/>2. ANODE<br/>3. CATHODE</p>               | <p>STYLE 4:<br/>PIN 1. CATHODE<br/>2. CATHODE<br/>3. ANODE</p>            | <p>STYLE 5:<br/>PIN 1. DRAIN<br/>2. SOURCE<br/>3. GATE</p>            |
| <p>STYLE 6:<br/>PIN 1. GATE<br/>2. SOURCE &amp; SUBSTRATE<br/>3. DRAIN</p>  | <p>STYLE 7:<br/>PIN 1. SOURCE<br/>2. DRAIN<br/>3. GATE</p>                     | <p>STYLE 8:<br/>PIN 1. DRAIN<br/>2. GATE<br/>3. SOURCE &amp; SUBSTRATE</p> | <p>STYLE 9:<br/>PIN 1. BASE 1<br/>2. EMITTER<br/>3. BASE 2</p>            | <p>STYLE 10:<br/>PIN 1. CATHODE<br/>2. GATE<br/>3. ANODE</p>          |
| <p>STYLE 11:<br/>PIN 1. ANODE<br/>2. CATHODE &amp; ANODE<br/>3. CATHODE</p> | <p>STYLE 12:<br/>PIN 1. MAIN TERMINAL 1<br/>2. GATE<br/>3. MAIN TERMINAL 2</p> | <p>STYLE 13:<br/>PIN 1. ANODE 1<br/>2. GATE<br/>3. CATHODE 2</p>           | <p>STYLE 14:<br/>PIN 1. EMITTER<br/>2. COLLECTOR<br/>3. BASE</p>          | <p>STYLE 15:<br/>PIN 1. ANODE 1<br/>2. CATHODE<br/>3. ANODE 2</p>     |
| <p>STYLE 16:<br/>PIN 1. ANODE<br/>2. GATE<br/>3. CATHODE</p>                | <p>STYLE 17:<br/>PIN 1. COLLECTOR<br/>2. BASE<br/>3. EMITTER</p>               | <p>STYLE 18:<br/>PIN 1. ANODE<br/>2. CATHODE<br/>3. NOT CONNECTED</p>      | <p>STYLE 19:<br/>PIN 1. GATE<br/>2. ANODE<br/>3. CATHODE</p>              | <p>STYLE 20:<br/>PIN 1. NOT CONNECTED<br/>2. CATHODE<br/>3. ANODE</p> |
| <p>STYLE 21:<br/>PIN 1. COLLECTOR<br/>2. EMITTER<br/>3. BASE</p>            | <p>STYLE 22:<br/>PIN 1. SOURCE<br/>2. GATE<br/>3. DRAIN</p>                    | <p>STYLE 23:<br/>PIN 1. GATE<br/>2. SOURCE<br/>3. DRAIN</p>                | <p>STYLE 24:<br/>PIN 1. EMITTER<br/>2. COLLECTOR/ANODE<br/>3. CATHODE</p> | <p>STYLE 25:<br/>PIN 1. MT 1<br/>2. GATE<br/>3. MT 2</p>              |
| <p>STYLE 26:<br/>PIN 1. V<sub>CC</sub><br/>2. GROUND 2<br/>3. OUTPUT</p>    | <p>STYLE 27:<br/>PIN 1. MT<br/>2. SUBSTRATE<br/>3. MT</p>                      | <p>STYLE 28:<br/>PIN 1. CATHODE<br/>2. ANODE<br/>3. GATE</p>               | <p>STYLE 29:<br/>PIN 1. NOT CONNECTED<br/>2. ANODE<br/>3. CATHODE</p>     | <p>STYLE 30:<br/>PIN 1. DRAIN<br/>2. GATE<br/>3. SOURCE</p>           |
| <p>STYLE 31:<br/>PIN 1. GATE<br/>2. DRAIN<br/>3. SOURCE</p>                 | <p>STYLE 32:<br/>PIN 1. BASE<br/>2. COLLECTOR<br/>3. EMITTER</p>               | <p>STYLE 33:<br/>PIN 1. RETURN<br/>2. INPUT<br/>3. OUTPUT</p>              | <p>STYLE 34:<br/>PIN 1. INPUT<br/>2. GROUND<br/>3. LOGIC</p>              | <p>STYLE 35:<br/>PIN 1. GATE<br/>2. COLLECTOR<br/>3. EMITTER</p>      |

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