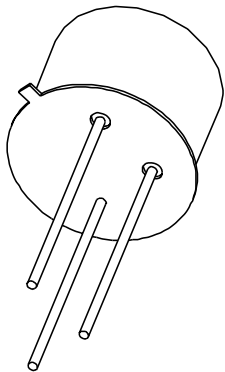


# DATA SHEET



## **2N5415; 2N5416** PNP high-voltage transistors

Product specification  
Supersedes data of September 1994  
File under Discrete Semiconductors, SC04

1997 May 21

# PNP high-voltage transistors

# 2N5415; 2N5416

### FEATURES

- Low current (max. 200 mA)
- High voltage (max. 300 V).

### APPLICATIONS

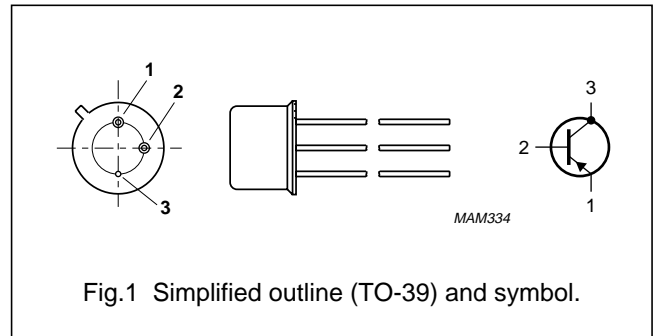
- Switching and linear amplification in military, industrial and consumer equipment.

### DESCRIPTION

PNP high-voltage transistor in a TO-39 metal package.

### PINNING

PIN	DESCRIPTION
1	emitter
2	base
3	collector, connected to case



### QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V <sub>CBO</sub>	collector-base voltage	open emitter			
	2N5415		–	–200	V
	2N5416		–	–350	V
V <sub>CEO</sub>	collector-emitter voltage	open base			
	2N5415		–	–200	V
	2N5416		–	–300	V
I <sub>CM</sub>	peak collector current		–	400	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 50 °C	–	1	W
h <sub>FE</sub>	DC current gain	I <sub>C</sub> = –50 mA; V <sub>CE</sub> = –10 V			
	2N5415		30	150	
	2N5416		30	120	
f <sub>T</sub>	transition frequency	I <sub>C</sub> = –10 mA; V <sub>CE</sub> = –10 V; f = 5 MHz	15	–	MHz

## PNP high-voltage transistors

## 2N5415; 2N5416

**LIMITING VALUES**

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V <sub>CBO</sub>	collector-base voltage 2N5415 2N5416	open emitter	–	–200	V
			–	–350	V
V <sub>CEO</sub>	collector-emitter voltage 2N5415 2N5416	open base	–	–200	V
			–	–300	V
V <sub>EBO</sub>	emitter-base voltage 2N5415 2N5416	open collector	–	–4	V
			–	–6	V
I <sub>C</sub>	collector current (DC)		–	–200	mA
I <sub>CM</sub>	peak collector current		–	–400	mA
I <sub>BM</sub>	peak base current		–	–200	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 50 °C	–	1	W
		T <sub>case</sub> ≤ 25 °C	–	10	W
T <sub>stg</sub>	storage temperature		–65	+200	°C
T <sub>j</sub>	junction temperature		–	200	°C
T <sub>amb</sub>	operating ambient temperature		–65	+150	°C

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R <sub>th j-a</sub>	thermal resistance from junction to ambient	in free air	150	K/W
R <sub>th j-c</sub>	thermal resistance from junction to case		17.5	K/W

## PNP high-voltage transistors

## 2N5415; 2N5416

**CHARACTERISTICS**

$T_{\text{case}} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_{\text{CBO}}$	collector cut-off current 2N5415 2N5416	$I_{\text{E}} = 0; V_{\text{CB}} = -175\text{ V}$	–	–50	$\mu\text{A}$
		$I_{\text{E}} = 0; V_{\text{CB}} = -280\text{ V}$	–	–50	$\mu\text{A}$
$I_{\text{EBO}}$	emitter cut-off current 2N5415 2N5416	$I_{\text{C}} = 0; V_{\text{EB}} = -4\text{ V}$	–	–20	$\mu\text{A}$
		$I_{\text{C}} = 0; V_{\text{EB}} = -6\text{ V}$	–	–20	$\mu\text{A}$
$h_{\text{FE}}$	DC current gain 2N5415 2N5416	$I_{\text{C}} = -50\text{ mA}; V_{\text{CE}} = -10\text{ V}$	30	150	
			30	120	
$V_{\text{CEsat}}$	collector-emitter saturation voltage	$I_{\text{C}} = -50\text{ mA}; I_{\text{B}} = -5\text{ mA}$	–	–500	mV
$C_{\text{c}}$	collector capacitance	$I_{\text{E}} = i_{\text{e}} = 0; V_{\text{CB}} = -10\text{ V}; f = 1\text{ MHz}$	–	15	pF
$C_{\text{e}}$	emitter capacitance	$I_{\text{C}} = i_{\text{c}} = 0; V_{\text{EB}} = -6\text{ V}; f = 1\text{ MHz}$	–	75	pF
$f_{\text{T}}$	transition frequency	$I_{\text{C}} = -10\text{ mA}; V_{\text{CE}} = -10\text{ V}; f = 5\text{ MHz}$	15	–	MHz

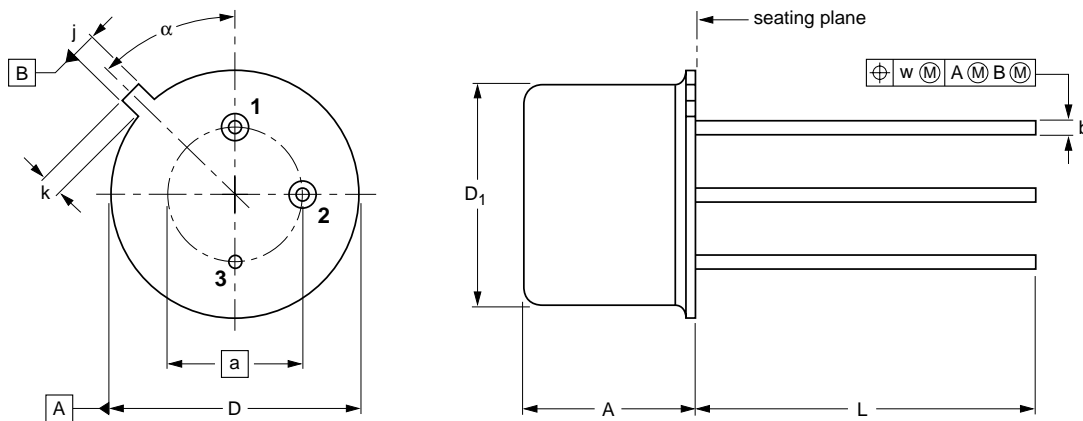
PNP high-voltage transistors

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PACKAGE OUTLINE

Metal-can cylindrical single-ended package; 3 leads

SOT5/11



DIMENSIONS (mm are the original dimensions)

UNIT	A	a	b	D	D <sub>1</sub>	j	k	L	w	$\alpha$
mm	6.60 6.35	5.08	0.48 0.41	9.39 9.08	8.33 8.18	0.85 0.75	0.95 0.75	14.2 12.7	0.2	45°

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT5/11		TO-39				97-04-11

## PNP high-voltage transistors

2N5415; 2N5416

**DEFINITIONS**

<b>Data sheet status</b>	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
<b>Limiting values</b>	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	

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PNP high-voltage transistors

2N5415; 2N5416

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