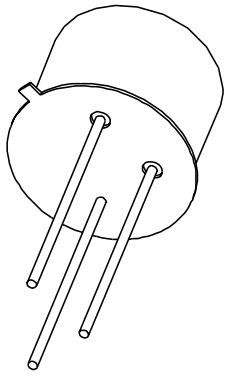
DATA SHEET



2N5415; 2N5416
PNP high-voltage transistors

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

1997 May 21

Philips
Semiconductors

PHILIPS

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

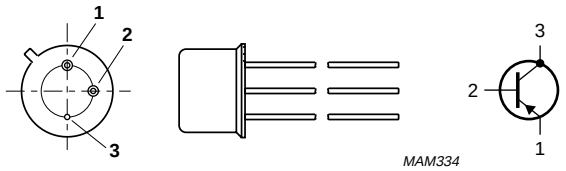


Fig.1 Simplified outline (TO-39) and symbol.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter			
	2N5415		–	–200	V
	2N5416		–	–350	V
V_{CEO}	collector-emitter voltage	open base			
	2N5415		–	–200	V
	2N5416		–	–300	V
I_{CM}	peak collector current		–	400	mA
P_{tot}	total power dissipation	$T_{amb} \leq 50$ °C	–	1	W
h_{FE}	DC current gain	$I_C = -50$ mA; $V_{CE} = -10$ V			
	2N5415		30	150	
	2N5416		30	120	
f_T	transition frequency	$I_C = -10$ mA; $V_{CE} = -10$ V; f = 5 MHz	15	–	MHz

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter			
	2N5415		–	–200	V
	2N5416		–	–350	V
V_{CEO}	collector-emitter voltage	open base			
	2N5415		–	–200	V
	2N5416		–	–300	V
V_{EBO}	emitter-base voltage	open collector			
	2N5415		–	–4	V
	2N5416		–	–6	V
I_C	collector current (DC)		–	–200	mA
I_{CM}	peak collector current		–	–400	mA
I_{BM}	peak base current		–	–200	mA
P_{tot}	total power dissipation	$T_{amb} \leq 50$ °C	–	1	W
		$T_{case} \leq 25$ °C	–	10	W
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–	200	°C
T_{amb}	operating ambient temperature		–65	+150	°C

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	in free air	150	K/W
$R_{th\ j\text{-}c}$	thermal resistance from junction to case		17.5	K/W

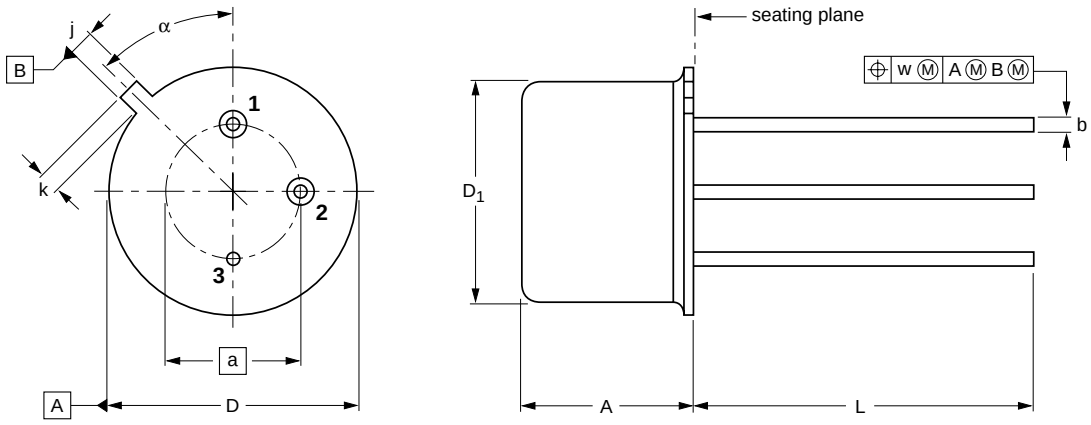
CHARACTERISTICS

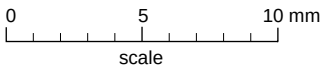
T_{case} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{CBO}	collector cut-off current				
	2N5415	I_E = 0; V_{CB} = –175 V	–	–50	µA
	2N5416	I_E = 0; V_{CB} = –280 V	–	–50	µA
I_{EBO}	emitter cut-off current				
	2N5415	I_C = 0; V_{EB} = –4 V	–	–20	µA
	2N5416	I_C = 0; V_{EB} = –6 V	–	–20	µA
h_{FE}	DC current gain	I_C = –50 mA; V_{CE} = –10 V			
	2N5415		30	150	
	2N5416		30	120	
V_{CEsat}	collector-emitter saturation voltage	I_C = –50 mA; I_B = –5 mA	–	–500	mV
C_c	collector capacitance	$I_E = i_e$ = 0; V_{CB} = –10 V; f = 1 MHz	–	15	pF
C_e	emitter capacitance	$I_C = i_c$ = 0; V_{EB} = –6 V; f = 1 MHz	–	75	pF
f_T	transition frequency	I_C = –10 mA; V_{CE} = –10 V; f = 5 MHz	15	–	MHz

PACKAGE OUTLINE

Metal-can cylindrical single-ended package; 3 leads **SOT5/11**





DIMENSIONS (mm are the original dimensions)

UNIT	A	a	b	D	D_1	j	k	L	w	α
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

DEFINITIONS

Data sheet status	
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.
Limiting values	
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.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.

NOTES