SILICON P-N-P HIGH-VOLTAGE TRANSISTORS

Transistors in TO-39 metal envelopes with the collector connected to the case. They are intended for high-speed switching and linear amplifier applications in military, industrial and commercial equipment.

QUICK REFERENCE DATA

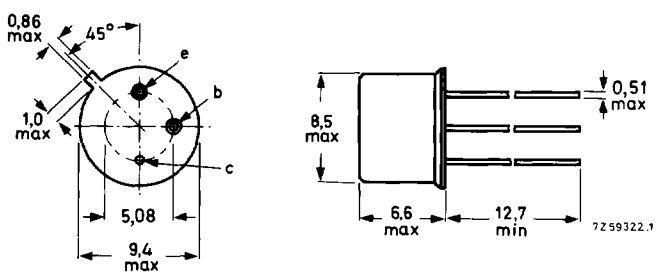
			2N5415	2N5416	
Collector-base voltage (open emitter)	$-V_{CBO}$	max.	200	350	V
Collector-emitter voltage (open base)	$-V_{CEO}$	max.	200	300	V
Collector current (d.c.)	$-I_C$	max.	1	1	A
Total power dissipation up to T_{amb} = 50 °C	P_{tot}	max.	1	1	W
Junction temperature	T_j	max.	200	200	°C
D.C. current gain					
$-I_C$ = 50 mA; $-V_{CE}$ = 10 V	h_{FE}	>	30	30	
		<	150	120	

MECHANICAL DATA

Dimensions in mm

Fig. 1 TO-39.

Collector connected to case



Maximum lead diameter is guaranteed only for 12,7 mm.

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

			2N5415	2N5416	
Collector-base voltage (open emitter)	$-V_{CBO}$	max.	200	350	V
Collector-emitter voltage (open base)	$-V_{CEO}$	max.	200	300	V
Emitter-base voltage (open collector)	$-V_{EBO}$	max.	4	6	V
Collector current (d.c.)	$-I_C$	max.	1		A
Base current (d.c.)	$-I_B$	max.	0,5		A
Total power dissipation up to T_{case} = 25 °C	P_{tot}	max.	10		W
Total power dissipation up to T_{amb} = 50 °C	P_{tot}	max.	1		W

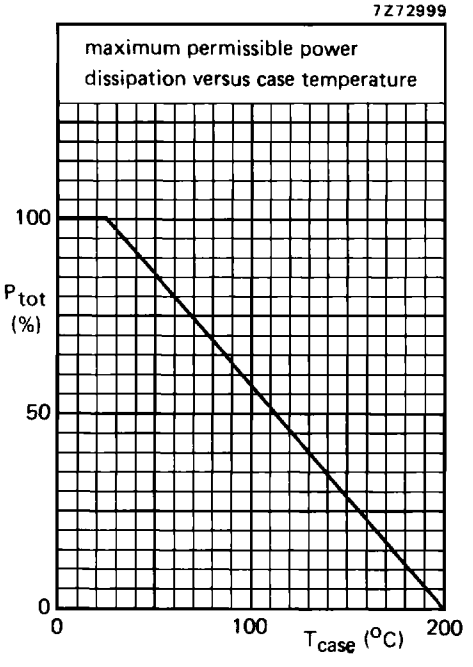


Fig. 2.

Storage temperature	T_{stg}		−65 to +150	°C
Junction temperature	T_j	max.	200	°C

THERMAL RESISTANCE

From junction to case	$R_{th\ j\text{-}c}$	=	17,5	K/W
From junction to ambient in free air	$R_{th\ j\text{-}a}$	=	150	K/W

CHARACTERISTICS

T_{case} = 25 °C unless otherwise specified

			2N5415	2N5416	
Collector cut-off currents					
$I_E = 0; -V_{CB} = 175$ V	$-I_{CBO}$	<	50	–	μA
$I_E = 0; -V_{CB} = 280$ V	$-I_{CBO}$	<	–	50	μA
$I_B = 0; -V_{CE} = 150$ V	$-I_{CEO}$	<	50	–	μA
$I_B = 0; -V_{CE} = 250$ V	$-I_{CEO}$	<	–	50	μA
Emitter cut-off current					
$I_C = 0; -V_{EB} = 4$ V	$-I_{EBO}$	<	20	–	μA
$I_C = 0; -V_{EB} = 6$ V	$-I_{EBO}$	<	–	20	μA
Sustaining voltage					
$I_B = 0; -I_C = 0$ to 50 mA	$-V_{CEOsust}$	>	200	300	V*

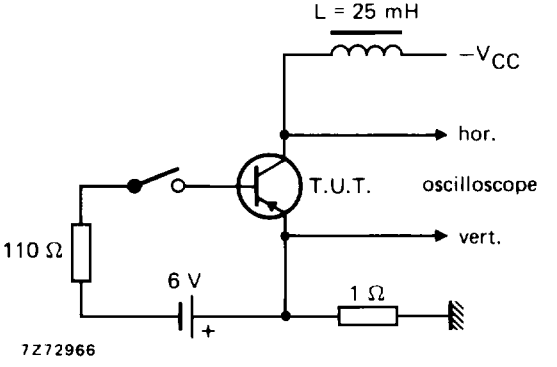


Fig. 3 Test circuit for $V_{CEOsust}$.

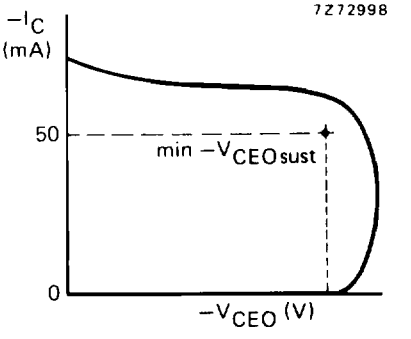


Fig. 4 Oscilloscope display for $V_{CEOsust}$.

Saturation voltages					
$-I_C = 50$ mA; $-I_B = 5$ mA	$-V_{CEsat}$	<	0,5	0,5	V
	$-V_{BEsat}$	<	1,5	1,5	V
D.C. current gain		>	30	30	
$-I_C = 50$ mA; $-V_{CE} = 10$ V	h_{FE}	<	150	120	
Collector capacitance at f = 1 MHz					
$I_E = I_e = 0; -V_{CB} = 10$ V	C_c	<	15		pF
Emitter capacitance at f = 1 MHz					
$I_C = I_c = 0; -V_{EB} = -V_{EBOmax}$	C_e	<	75		pF

* Measured under pulse conditions to avoid excessive dissipation.

Transition frequency at f = 5 MHz			
$-I_C$ = 10 mA; $-V_{CE}$ = 10 V	f_T	>	15 MHz
h-parameters (common emitter)			
$-I_C$ = 5 mA; $-V_{CE}$ = 10 V			
real part of input impedance at f = 1 MHz	$R_e(h_{ie})$	<	300 Ω
small-signal current gain at f = 1 kHz	h_{fe}	>	25