

# P-N-P GERMANIUM MEDIUM POWER TRANSISTORS

# AC188 AC188/01

The AC188 is a p-n-p alloy junction medium power audio transistor in a TO-1 metal envelope. Primarily intended for use as a matched pair 2-AC188 or together with the AC187 as a matched pair in complementary class B output stages with output power up to 3W.

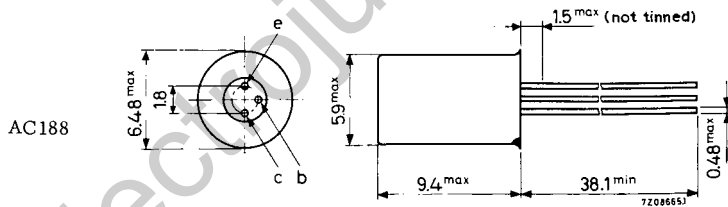
The AC188/01 is electrically equivalent to the AC188, constructed integrally with a heat conducting block. It is also available as a matched pair with the AC187/01 or as 2-AC188/01.

## QUICK REFERENCE DATA

$-V_{CBO}$ max.	25	V
$-V_{CEO}$ max.	15	V
$-I_{CM}$ max.	2.0	A
$P_{tot}$ max. ( $T_{amb} \leq 35^{\circ}C$ )	1.0	W
$T_j$ max.	90	$^{\circ}C$
$h_{FE}$ ( $-I_C = 300mA$ , $-V_{CE} = 1V$ )	100 to 500	
$f_{hfe}$ typ. ( $-I_C = 10mA$ , $-V_{CE} = 2V$ )	10	kHz

## OUTLINE AND DIMENSIONS (see also page 2)

Conforming to BS 3934 SO-21/SB3-10  
J. E. D. E. C. TO-1



All dimensions in mm

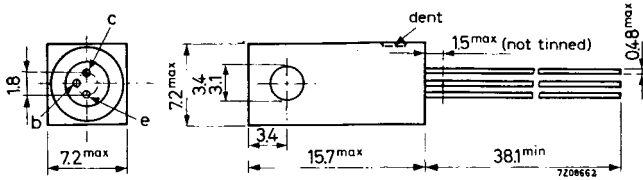
The coloured dot indicates the collector

Accessories available: 56200 56209, 56226, 56227

# Mullard

OUTLINE AND DIMENSIONS (contd.)

AC188/01



All dimensions in mm  
The dent indicates the collector

RATINGS

Limiting values of operation according to the absolute maximum system.

Electrical

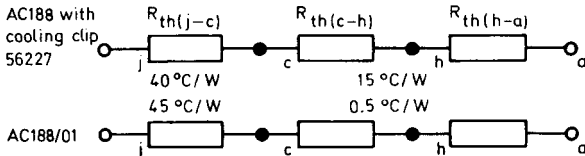
$-V_{CBO}$ max.	25	V
$-V_{CEO}$ max.	15	V
$-V_{CER}$ max. ( $-I_C \leq 600\text{mA}$ , $R_{BE} \leq 1\Omega$ )	18	V
$-V_{EBO}$ max.	10	V
$-I_C$ max. (d.c. or averaged over any 50ms period)	1.0	A
$-I_{CM}$ max. (peak)	2.0	A
$P_{tot}$ max. ( $T_{amb} \leq 35^\circ\text{C}$ , see also graph on page 5)	1.0	W

Temperature

$T_{stg}$	-55 to +75	$^\circ\text{C}$
$T_j$ max.	90	$^\circ\text{C}$

THERMAL CHARACTERISTICS

$R_{th(j-a)}$	Thermal resistance from junction to ambient in free air	AC188	AC188/01	$^\circ\text{C/W}$
		without cooling clip	290	
	with cooling clip 56227	140	-	$^\circ\text{C/W}$
	with cooling clip 56227 on 1.5mm blackened aluminium heatsink of 12.5cm <sup>2</sup>	80	70.5	$^\circ\text{C/W}$
	with cooling clip 56227 on infinite heatsink	55	-	$^\circ\text{C/W}$
$R_{th(j-c)}$	Thermal resistance from junction to case	40	45	$^\circ\text{C/W}$

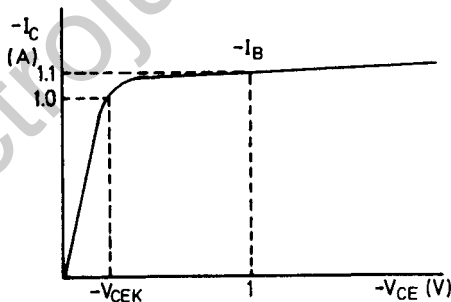


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# AC188 AC188/01

ELECTRICAL CHARACTERISTICS ( $T_j = 25^{\circ}\text{C}$  unless otherwise stated)

	Collector cut-off current	Min.	Typ.	Max.	
$-I_{\text{CBO}}$	$I_{\text{E}} = 0, -V_{\text{CB}} = 25\text{V}$	-	20	200	$\mu\text{A}$
$-I_{\text{CBO}}$	$I_{\text{E}} = 0, -V_{\text{CB}} = 25\text{V}, T_j = 90^{\circ}\text{C}$	-	-	1.4	mA
$-I_{\text{CEX}}$	$+V_{\text{BE}} = 1.0\text{V}, -V_{\text{CE}} = 25\text{V}$	-	-	200	$\mu\text{A}$
$-I_{\text{EBO}}$	Emitter cut-off current				
	$I_{\text{C}} = 0, -V_{\text{EB}} = 10\text{V}$	-	15	200	$\mu\text{A}$
	$I_{\text{C}} = 0, -V_{\text{EB}} = 10\text{V}, T_j = 90^{\circ}\text{C}$	-	0.4	1.4	mA
$-V_{\text{BE}}$	Base-emitter voltage				
	$-I_{\text{C}} = 5.0\text{mA}, -V_{\text{CE}} = 10\text{V}$	115	-	145	mV
	$-I_{\text{C}} = 300\text{mA}, -V_{\text{CE}} = 1.0\text{V}$	-	-	450	mV
$-V_{\text{EB(f)}}$	Emitter-base floating potential				
	$I_{\text{E}} = 0, -V_{\text{CB}} = 25\text{V}, T_j = 90^{\circ}\text{C}$	-	-	400	mV
$-V_{\text{CEK}}$	Collector knee voltage				
	$-I_{\text{C}} = 1.0\text{A}, -I_{\text{B}}$ = the value for which $-I_{\text{C}} = 1.1\text{A}$ at $-V_{\text{CE}} = 1.0\text{V}$	-	-	600	mV



$h_{\text{FE}}$

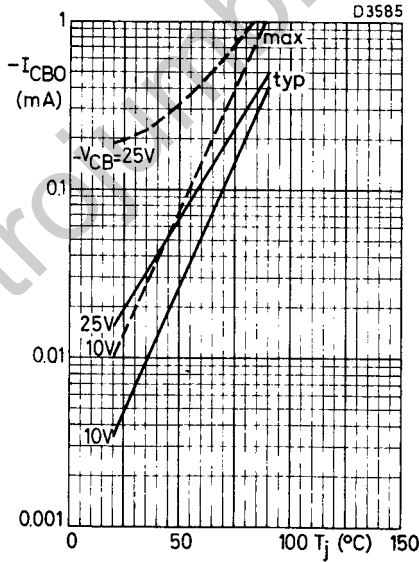
Static forward current transfer ratio

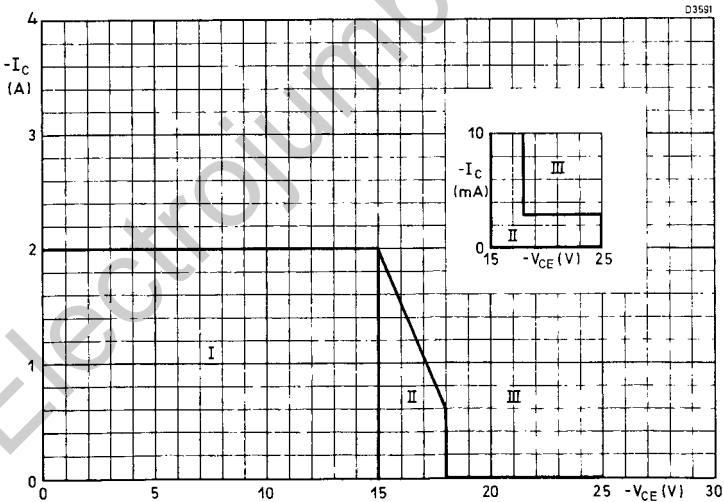
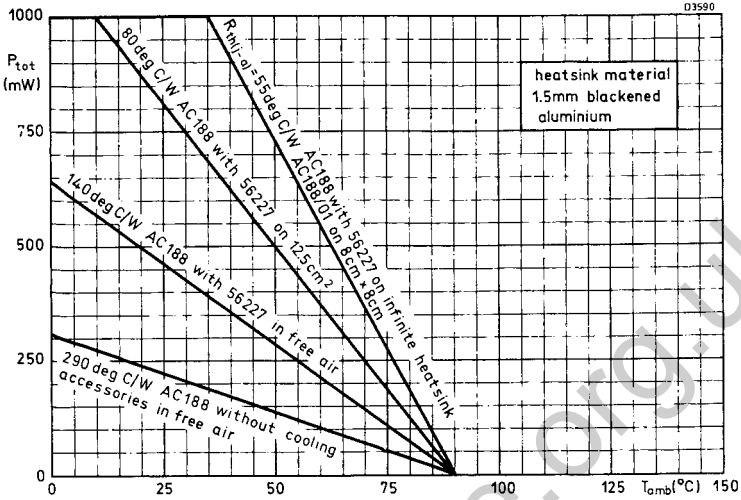
$-I_{\text{C}} = 5.0\text{mA}, -V_{\text{CE}} = 10\text{V}$	70	-	-
$-I_{\text{C}} = 300\text{mA}, -V_{\text{CE}} = 1.0\text{V}$	100	200	500
$-I_{\text{C}} = 1.0\text{A}, -V_{\text{CE}} = 1.0\text{V}$	80	-	-

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ELECTRICAL CHARACTERISTICS (contd.)

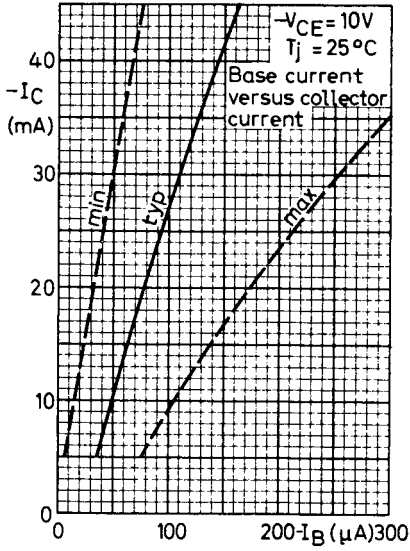
		Min.	Typ.	Max.	
$f_T$	Transition frequency $-I_C = 10\text{mA}$ , $-V_{CE} = 2.0\text{V}$	1.0	1.5	-	MHz
$f_{hfe}$	Cut-off frequency $-I_C = 10\text{mA}$ , $-V_{CE} = 2.0\text{V}$	-	10	-	kHz
$C_{Tc}$	Collector capacitance $I_E = I_e = 0$ , $-V_{CB} = 5.0\text{V}$ , $f = 450\text{kHz}$	-	90	110	pF
$\frac{h_{FE1}}{h_{FE2}}$	D. C. current gain ratio of matched pairs AC187/AC188; AC187/01/AC188/01 $ I_C  = 500\text{mA}$ , $ V_{CE}  = 1.0\text{V}$ matched pairs 2-AC188; 2-AC188/01 $-I_C = 50\text{mA}$ $-V_{CE} = 1.0\text{V}$ $-I_C = 500\text{mA}$ , $-V_{CE} = 1.0\text{V}$	-	-	1.25	



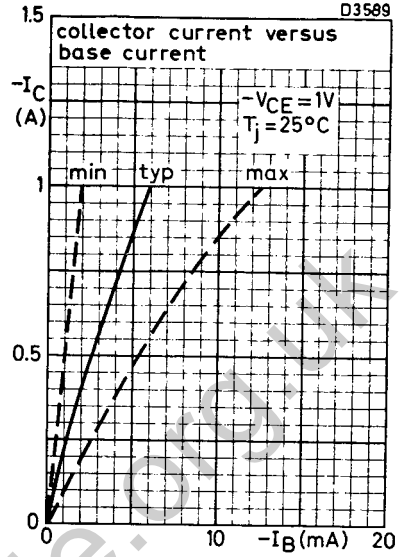


I = Region of permissible operation under all base-emitter conditions  
 II = Additional region of operation when the transistor is cut-off  
 III = Outside regions I and II, the transistor can withstand transient energies of 1.0 mWs, provided it is cut-off with  $-V_{EB(fl)} > -0.6V$

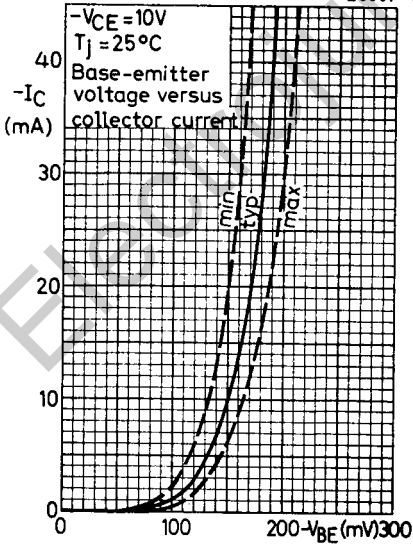
D3586



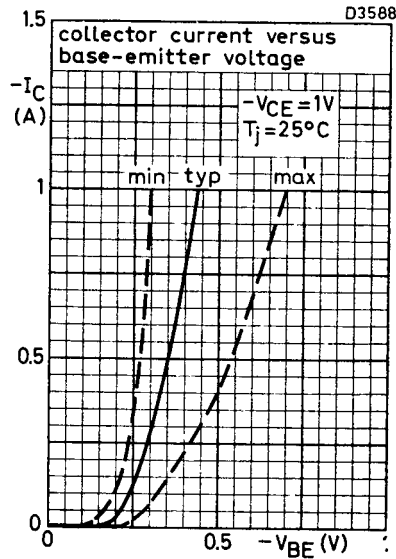
D3589



D3587



D3588



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