

TO-92 Plastic-Encapsulate Transistors

BC237/238/239 TRANSISTOR (NPN)

FEATURES

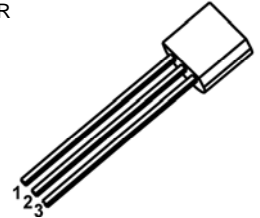
- Amplifier dissipation NPN Silicon

MAXIMUM RATINGS (T_a=25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
V _{CEO}	Collector-Emitter Voltage BC237	45	V
	BC238/239	25	
V _{EBO}	Emitter-Base Voltage BC237	6	V
	BC238/239	5	
I _c	Collector Current -Continuous	0.1	A
P _C	Collector Power Dissipation	350	mW
R _{θJA}	Thermal Resistance, Junction to Ambient	357	°C/W
R _{θJC}	Thermal Resistance, Junction to Case	125	°C/W
T _j	Junction Temperature	150	°C
T _{stg}	Storage Temperature	-55-150	°C

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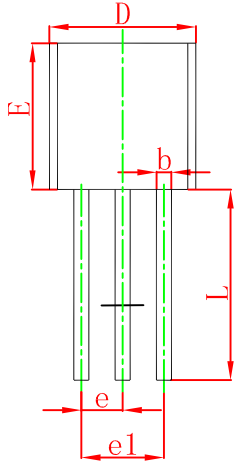
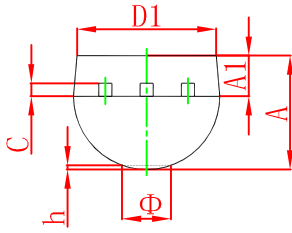
1. COLLECTOR
2. BASE
3. EMITTER



ELECTRICAL CHARACTERISTICS (T_a=25°C unless otherwise specified)

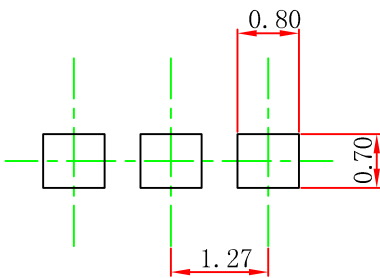
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	V _{(BR)CBO}	I _C =100μA, I _E =0 BC237	50			V
		BC238/239	30			
Collector-emitter breakdown voltage	V _{(BR)CEO}	I _C =2mA, I _B =0 BC237	45			V
		BC238/239	25			
Emitter-base breakdown voltage	V _{(BR)EBO}	I _E =100μA, I _C =0 BC237	6			V
		BC238/239	5			
Collector cut-off current	I _{CBO}	V _{CE} =50V, V _{BE} =0 BC237 V _{CB} =30V, I _E =0 BC238/239			15	nA
DC current gain	h _{FE(1)}	V _{CE} =5V, I _C =10μA BC237A		90		
		BC237B/238B		150		
		BC237C/238C/239C		270		
DC current gain	h _{FE(2)}	V _{CE} =5V, I _C =2mA BC237	120		800	
		BC239	120		800	
		BC237A	120		220	
		BC237B/238B	200		460	
		BC237C/238C/239C	380		800	
DC current gain	h _{FE(3)}	V _{CE} =5V, I _C =100mA BC237A		120		
		BC237B/238B		180		
		BC237C/238C/239C		300		
Collector-emitter saturation voltage	V _{CE(sat)}	I _C =10mA, I _B =0.5mA BC237/238/239			0.2	V
		I _C =100mA, I _B =5mA BC237/239			0.6	
		BC238			0.8	
Base-emitter saturation voltage	V _{BE(sat)}	I _C =10mA, I _B =0.5mA			0.83	V
		I _C =100mA, I _B =5mA			1.05	
Base-emitter voltage	V _{BE}	V _{CE} =5V, I _C =0.1mA		0.5		V
		V _{CE} =5V, I _C =2mA	0.55		0.7	
		V _{CE} =5V, I _C =100mA		0.83		
Transition frequency	f _T	V _{CE} =3V, I _C =0.5mA, f=100MHz BC237		100		MHz
		BC238		120		
		BC239		140		
		V _{CE} =5V, I _C =10mA, f=100MHz BC237	150		200	
		BC238	150		240	
BC239	150		280			
Collector output capacitance	C _{ob}	V _{CB} =10V, I _E =0, f=1MHz			4.5	pF
Emitter-base capacitance	C _{ib}	V _{EB} =0.5V, I _C =0, f=1MHz		8		Pf
Noise figure	NF	V _{CE} =5V, I _C =0.2mA, f=1kHz, R _s =2KΩ BC239		2	4	dB
		V _{CE} =5V, I _C =0.2mA, f=1kHz, R _s =2KΩ, Δf=200Hz BC237		2	10	
		BC238		2	10	
		BC239		2	4	

TO-92 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.300	4.700	0.169	0.185
D1	3.430		0.135	
E	4.300	4.700	0.169	0.185
e	1.270 TYP		0.050 TYP	
e1	2.440	2.640	0.096	0.104
L	14.100	14.500	0.555	0.571
Φ		1.600		0.063
h	0.000	0.380	0.000	0.015

TO-92 Suggested Pad Layout



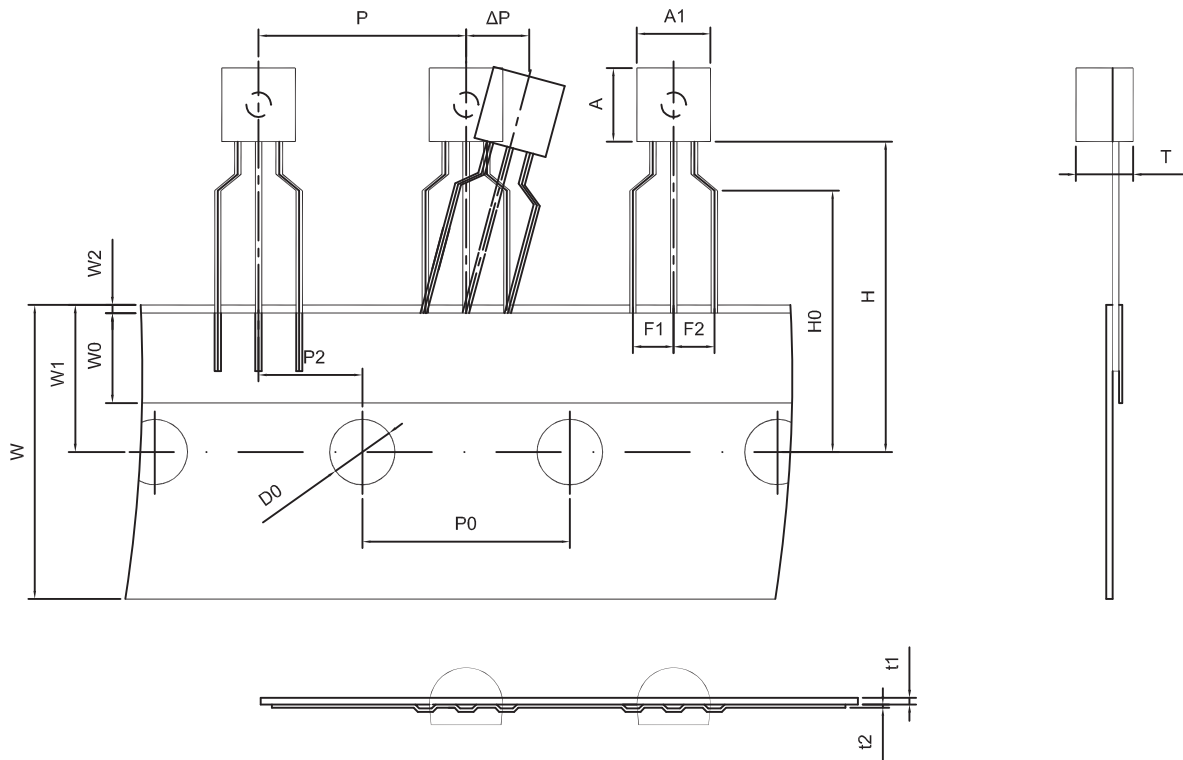
Note:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.

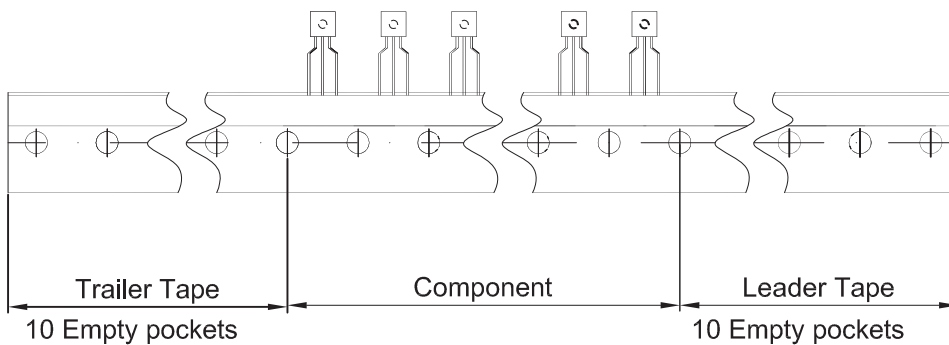
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TO-92 PACKAGE TAPEING DIMENSION



Dimiensions are in millimeter								
A1	A	T	P	P0	P2	F1	F2	W
4.5	4.5	3.5	12.7	12.7	6.35	2.5	2.5	18.0
W0	W1	W2	H	H0	D0	t1	t2	ΔP
6.0	9.0	1.0 MAX.	19.0	16.0	4.0	0.4	0.2	0



Package	Box	Box Size(mm)	Carton	Carton Size(mm)
TO-92	2000 pcs	333×162×43	20,000 pcs	350×340×250