DONGGUAN NANJING ELECTRONICS LTD.,

TO-92 Plastic-Encapsulate Transistors

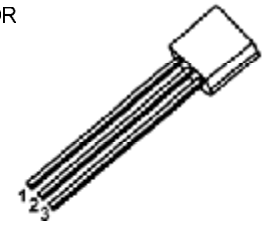
BC237 / BC238 / BD239 TRANSISTOR (NPN)

FEATURES

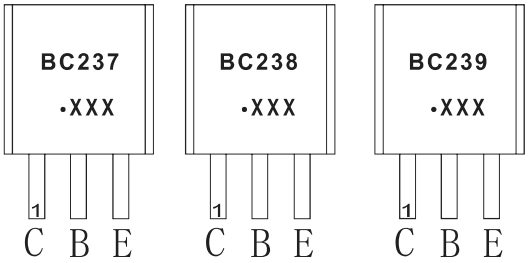
Amplifier dissipation NPN Silicon

TO-92

1. COLLECTOR
2. BASE
3. EMITTER



MARKING

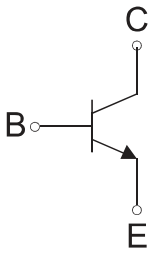


BC237,BC238,BC239=Device code

Solid dot=Green molding compound device, if none,the normal device

XXX=Code

Equivalent Circuit



ORDERING INFORMATION

Part Number	Package	Packing Method	Pack Quantity
BC237	TO-92	Bulk	1000pcs/Bag
BC237-TA	TO-92	Tape	2000pcs/Box
BC238	TO-92	Bulk	1000pcs/Bag
BC238-TA	TO-92	Tape	2000pcs/Box
BC239	TO-92	Bulk	1000pcs/Bag
BC239-TA	TO-92	Tape	2000pcs/Box

MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

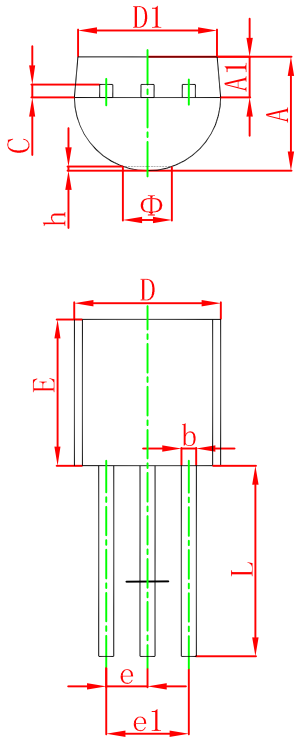
Symbol	Parameter		Value	Unit
V_{CEO}	Collector-Emitter Voltage	BC237	45	V
		BC238/239	25	
V_{EBO}	Emitter-Base Voltage	BC237	6	V
		BC238/239	5	
I_C	Collector Current -Continuous		0.1	A
P_C	Collector Power Dissipation		350	mW
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		357	℃/W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		125	℃/W
T_j	Junction Temperature		150	℃
T_{stg}	Storage Temperature		-55~150	℃

ELECTRICAL CHARACTERISTICS

T_a=25℃ unless otherwise specified

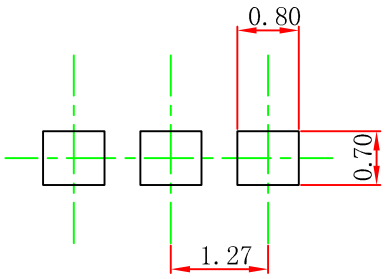
Parameter	Symbol	Test conditions		Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	I_C=100μA, I_E=0	BC237	50			V
			BC238/239	30			
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	I_C=2mA, I_B=0	BC237	45			V
			BC238/239	25			
Emitter-base breakdown voltage	$V_{(BR)EBO}$	I_E=100μA, I_C=0	BC237	6			V
			BC238/239	5			
Collector cut-off current	I_{CBO}	V_{CE}=50V, V_{BE}=0	BC237			15	nA
		V_{CB}=30V,I_E=0	BC238/239				
DC current gain	$h_{FE(1)}$	V_{CE}=5V, I_C=10μA	BC237A		90		
			BC237B/238B		150		
			BC237C/238C/239C		270		
	$h_{FE(2)}$	V_{CE}=5V, I_C=2mA	BC237	120		800	
			BC239	120		800	
			BC237A	120		220	
			BC237B/238B	200		460	
			BC237C/238C/239C	380		800	
	$h_{FE(3)}$	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,					dB
		f=1kHZ, Rs=2KΩ	BC239		2	4	
		V_{CE}=5V, I_c=0.2mA,					
		f=1kHZ, Rs=2KΩ, Δf=200Hz	BC237		2	10	
			BC238		2	10	
			BC239		2	4	

TO-92 Package Outline Dimensions



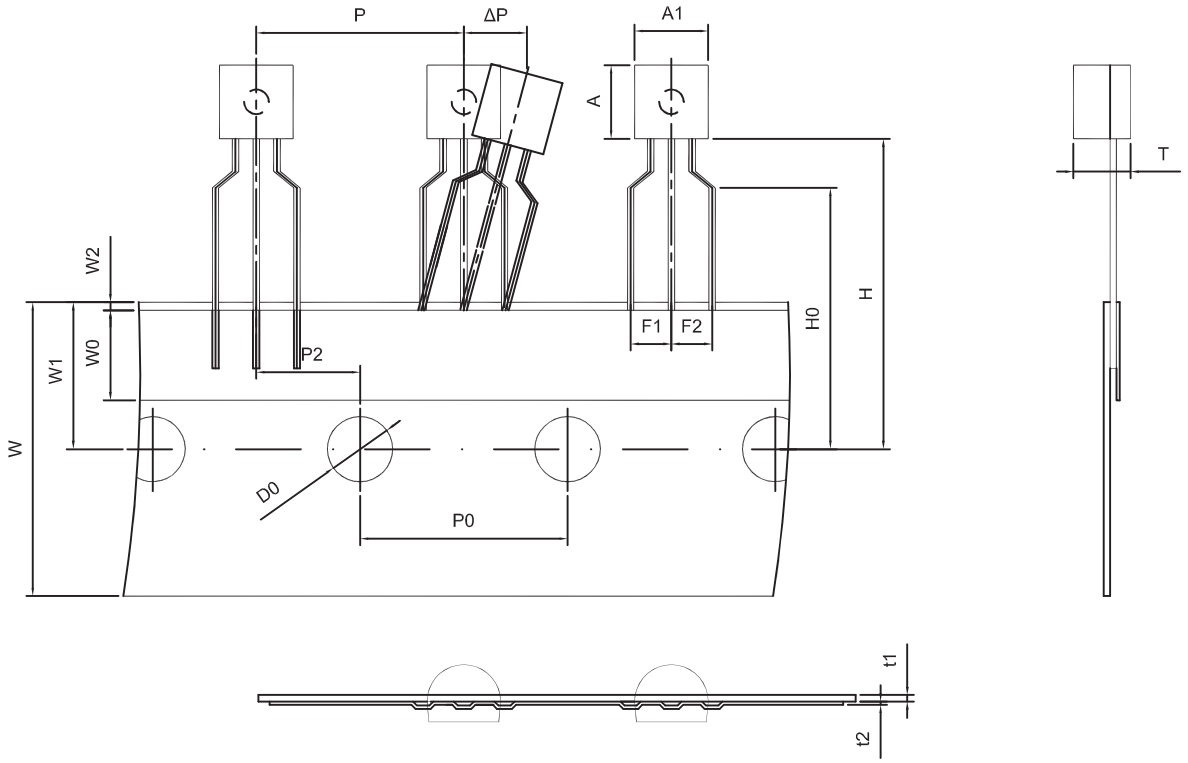
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.300	4.700	0.169	0.185
D1	3.430		0.135	
E	4.300	4.700	0.169	0.185
e	1.270 TYP		0.050 TYP	
e1	2.440	2.640	0.096	0.104
L	14.100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

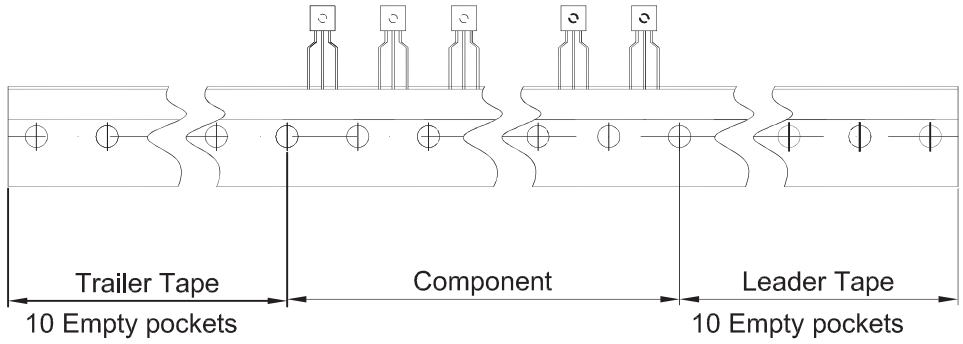


Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

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