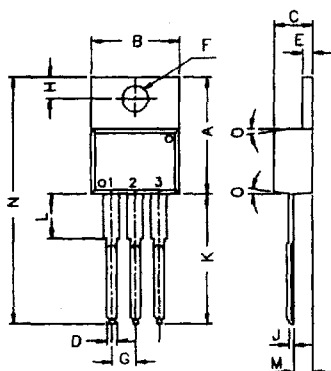
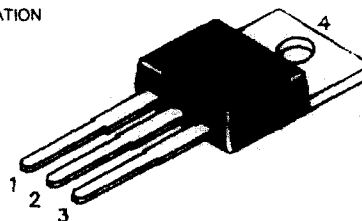


PIN CONFIGURATION

1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR



ALL DIMENSIONS ARE IN M.M.

DIM	MIN	MAX
A	14,42	16,51
B	9,63	10,67
C	3,56	4,83
D	—	0,90
E	1,15	1,40
F	3,75	3,88
G	2,29	2,79
H	2,54	3,43
J	—	0,56
K	12,70	14,73
L	—	6,35
M	2,03	2,92
N	—	31,24
O	7	DEG

TO-220 Power Package Transistors (NPN)

Maximum Ratings						Electrical Characteristics (Ta=25°C, Unless Otherwise Specified)													
Type No.	V _{CBO} (V) Min	V _{CEO} (V) Min	V _{EB0} (V) Min	P _D (W) @Tc=25°C	I _C (A)	I _{CBO} (μA) Max	V _{CB} (V) @	I _{CES} (μA) Max	V _{CE} (V) @	h _{FE} Min	β Max	I _C & V _{CE} (A) (V)	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Min Max	I _C (A)	C _{ob} (pF) Max Typ	f _t (MHz) Min Typ	θ Max	I _C (mA)
2N5294	80	70	7	36	4			*500	50	30	120	0.5 4	1		0.5		0.8		200
2N5296	60	40	5	36	4			*500	50	30	120	1 4	1		1		0.8		200
2N5298	80	60	5	36	4			*500	50	20	80	1.5 4	1		1.5		0.8		200
2N6101	80	70	8	75	10			*2000	75	20 5	80 10	5 4 10 4	2.5		10				
2N6121	45	45	5	40	4	100	45	*100	45	25 10	100	1.5 2 4 2	0.6 1.4		1.5 4		2.5		1000
2N6122	60	60	5	40	4	100	60	*100	60	25 10	100	1.5 2 4 2	0.6 1.4		1.5 4		2.5		1000
2N6123	80	80	5	40	4	100	80	*100	80	20 7	80	1.5 2 4 2	0.6 1.4		1.5 4		2.5		1000
2N6288	40	30	5	40	7			*1000	40	30 2.3	150	3 4 7 4	1 3.5		3 7	250	4		500
2N6290	60	50	5	40	7			*100	60	30 2.3	150	2.5 4 7 4	1 3.5		2.5 7	250	4		500
2N6292	80	70	5	40	7			*100	75	30 2.3	150	2 4 7 4	1 3.5		2 7	250	4		500
2N6486	50	40	5	75	15			*500	45	20 5	150	5 4 15 4	1.3 3.5		5 15		5		1000
2N6487	70	60	5	75	15			*500	65	20 5	150	5 4 15 4	1.3 3.5		5 15		5		1000
2N6488	90	80	5	75	15			*500	85	20 5	150	5 4 15 4	1.3 3.5		5 15		5		1000

* NOTE : I_{CEX}
#* NOTE : I_{CER}

Maximum Ratings						Electrical Characteristics (Ta=25°C, Unless Otherwise Specified)															
Type No.	V _{CBO} (V) Min	V _{CEO} (V) Min	V _{EBO} (V) Min	P _D (W) @Tc=25°C	I _C (A)	I _{CBO} (μA) Max	V _{CB} (V) @	I _{CES} (μA) Max	V _{CE} (V) @	h _{FE} Min	@ Max	I _C & (A)	V _{CE} (V)	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Min Max	I _C (A)	C _{ob} (pF) Max Typ	f _i (MHz) Min Typ Max			
2N6740	**650	400	8	100	8			* 100	650	10	40	5	3	1 2	1.6 5 8		300	15 60 200			
BD201	60	45	5	60	8			**200	30	30		3	2	1 1.5		3 6		7 300			
BD203	60	60	5	60	8			**200	30	30		2	2	1 1.5		3 6		7 300			
BD239	55	45	5	30	2			200	45	40 15		0.2 1	4 4	0.7		1		3 200			
BD239A	70	60	5	30	2			200	60	40 15		0.2 1	4 4	0.7		1		3 200			
BD239B	90	80	5	30	2			200	80	40 15		0.2 1	4 4	0.7		1		3 200			
BD239C	115	100	5	30	2			200	100	40 15		0.2 1	4 4	0.7		1		3 200			
BD241	## 55	45	5	40	3			200	45	25 10		1 3	4 4	1.2		3		3 500			
BD241A	## 70	60	5	40	3			200	60	25 10		1 3	4 4	1.2		3		3 500			
BD241B	## 90	80	5	40	3			200	80	25 10		1 3	4 4	1.2		3		3 500			
BD241C	##115	100	5	40	3			200	100	25 10		1 3	4 4	1.2		3		3 500			
BD243	45	45	5	65	6			400	45	30 15		0.3 3	4 4	1.5		6		3 500			
BD243A	60	60	5	65	6			400	60	30 15		0.3 3	4 4	1.5		6		3 500			
BD243B	80	80	5	65	6			400	80	30 15		0.3 3	4 4	1.5		6		3 500			
BD243C	100	100	5	65	6			400	100	30 15		0.3 3	4 4	1.5		6		3 500			
BD533	45	45	5	50	8	100	45	100	45	20 40 25		0.01 0.5 2	5 2 2	0.8		2		3 500			
BD533J	45	45	5	50	8	100	45	100	45	20 40 30 15	75	0.01 0.5 2 3	5 2 2 2	0.8		2		3 500			
BD533K	45	45	5	50	8	100	45	100	45	20 40 40 20	100	0.01 0.5 2 3	5 2 2 2	0.8		2		3 500			
BD535	60	60	5	50	8	100	60	100	60	20 40 25		0.01 0.5 2	5 2 2	0.8		2		3 500			
BD535J	60	60	5	50	8	100	60	100	60	20 40 30 15	75	0.01 0.5 2 3	5 2 2 2	0.8		2		3 500			

NOTE : V_{CE}* I_{CEV}** V_{CEV}** I_{CEO}

Maximum Ratings						Electrical Characteristics (Ta=25°C, Unless Otherwise Specified)																	
Type No.	V _{CEO} (V) Min	V _{CEO} (V) Min	V _{EB0} (V) Min	P _D (W) @Tc=25°C	I _C (A)	I _{CEO} (μA) Max	V _{CE} (V) @ (V)	I _{CES} (μA) Max	V _{CE} (V) @ (V)	h _{FE} Min	β Max	I _C (A)	V _{CE} (V)	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Min	V _{BE(SAT)} (V) Max	I _C (A)	C _{ob} (pF) Max	Typ	f _t (MHz) Min	Typ	β Max	I _C (mA)
BD535K	60	60	5	50	8	100	60	100	60	20 40 40 20	100	0.01 0.5 2 3	5 2 2 2	0.8			2			3			500
BD537	80	80	5	50	8	100	80	100	80	15 40 15		0.01 0.5 2	5 2 2	0.8			2			3			500
BD537J	80	80	5	50	8	100	80	100	80	15 40 30 15	75	0.01 0.5 2 3	5 2 2 2	0.8			2			3			500
BD537K	80	80	5	50	8	100	80	100	80	15 40 40 20	100	0.01 0.5 2 3	5 2 2 2	0.8			2			3			500
BD905	45	45	5	90	15	500	45	**1000	30	40 15 5	250 150	0.5 5 10	4 4 4	1 3		5 2.5 10	5			3			500
BD907	60	60	5	90	15	500	60	**1000	30	40 15 5	250 150	0.5 5 10	4 4 4	1 3		5 2.5 10	5			3			500
BD909	80	80	5	90	15	500	90	**1000	80	40 15 5	250 150	0.5 5 10	4 4 4	1 3		5 2.5 10	5			3			500
BD911	100	100	5	90	15	500	100	**1000	50	40 15 5	250 150	0.5 5 10	4 4 4	1 3		5 2.5 10	5			3			500
BD949	60	60	5	40	5	50	60			40 20		0.5 2	4 4	1			2			3			500
BD951	80	80	5	40	5	50	80			40 20		0.5 2	4 4	1			2			3			500
BD953	100	100	5	40	5	50	100			40 20		0.5 2	4 4	1			2			3			500
BD955	120	120	5	40	5	50	120			40 20		0.5 2	4 4	1			2			3			500
BDX33	45	45	5	70	10	1000	45	**500	23	750		4	3	2.5			4	200		3			1000
BDX33A	60	60	5	70	10	1000	60	**500	30	750		4	3	2.5			4	200		3			1000
BDX33B	80	80	5	70	10	1000	80	**500	40	750		3	3	2.5			3	200		3			1000
BDX33C	100	100	5	70	10	1000	100	**500	50	750		3	3	2.5			3	200		3			1000
BDX53	45	45	5	60	8	200	45			750		3	3	2		2.5	3	300					
BDX53A	60	60	5	60	8	200	60			750		3	3	2		2.5	3	300					
BDX53B	80	80	5	60	8	200	80			750		3	3	2		2.5	3	300					
BDX53C	100	100	5	60	8	200	100			750		3	3	2		2.5	3	300					

** I_{CEO}

Maximum Ratings						Electrical Characteristics (Ta=25°C, Unless Otherwise Specified)																	
Type No.	V _{CBO} (V) Min	V _{CEO} (V) Min	V _{EB0} (V) Min	P _D (W) @Tc=25°C	I _C (A)	I _{CBO} (μA) Max	V _{CB} @ (V)	I _{CES} (μA) Max	V _{CE} @ (V)	h _{FE} Min	β Max	I _C & (A)	V _{CE} (V)	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Min	V _{BE(SAT)} (V) Max	I _C (A)	C _{ob} (pF) Max	Typ	f _t (MHz) Min	Typ	β Max	I _C (mA)
BDX77	100	80	5	60	8			\$5200	30	30		1	2	1 1.5		3 6				7		300	
BU407	330	150	6	60	7			100	200					1		1.3	5	80		10		500	
BUX84	##800	400	5	40	2			200	800	30		0.1	5	1.5 3		0.3 1				20		200	
BUX84A	##800	400	5	40	2			200	800	30		0.1	5	0.8 1		0.3 1				20		200	
C44C8	##70	60	5	30	4			10	70	100 20	220	0.2 2	1 1	0.5		1	100			50		20	
C44C11	##90	80	5	30	4			10	90	100 20	220	0.2 2	1 1	0.5		1	100			50		20	
CD909	100	90	5	90	15	500	100	\$51000	40	60 15 5	150 150 10	0.5 5 10	4 4 4	1.0 3.0		1.5 2.5	5 10			3		500	
CD3968	500	400	5	40	1			1000	500	30 10	150	0.3 1	10 10	1		1				10		200	
CSC1061	50	50	4	25	3	100	20			35 35		0.1 1	4 4	1		2				8		500	
CSC1061A	50	50	4	25	3	100	20			35 35		0.1 1	4 4	1		2				8		500	
CSC1061B	50	50	4	25	3	100	20			35 60	120	0.1 1	4 4	1		2				8		500	
CSC1061C	50	50	4	25	3	100	20			35 100	200	0.1 1	4 4	1		2				8		500	
CSC1061D	50	50	4	25	3	100	20			35 160	320	0.1 1	4 4	1		2				8		500	
CSC1398	70	50	5	15	2	1	40			30 50		0.1 1	5 5	1		1.5	2						
CSC1398P	70	50	5	15	2	1	40			30 50		0.1 1	5 5	1		1.5	2						
CSC1398Q	70	50	5	15	2	1	40			30 80		0.1 1	5 5	1		1.5	2						
CSC1398R	70	50	5	15	2	1	40			30 120		0.1 1	5 5	1		1.5	2						
CSC2073	150	150	5	25	1.5	10	120			40	140	0.5	10	1.5		0.5	35			4		500	
CSC2233	200	60	5	40	4	10	170			30 20	150	1 4	5 5	1		1.5	4			8		500	
CSC2238	160	160	5	25	1.5	1	160			70	240	0.1	5	1.5		0.5	25			100		100	
CSC2238A	180	180	5	25	1.5	1	160			70	240	0.1	5	1.5		0.5	25			100		100	
CSC2238AO	180	180	5	25	1.5	1	160			70	140	0.1	5	1.5		0.5	25			100		100	
CSC2238AY	180	180	5	25	1.5	1	160			120	240	0.1	5	1.5		0.5	25			100		100	
CSC2238B	200	200	5	25	1.5	1	160			70	240	0.1	5	1.5		0.5	25			100		100	
CSC2238BO	200	200	5	25	1.5	1	160			70	140	0.1	5	1.5		0.5	25			100		100	
CSC2238BY	200	200	5	25	1.5	1	160			120	240	0.1	5	1.5		0.5	25			100		100	
CSC2238O	160	160	5	25	1.5	1	160			70	140	0.1	5	1.5		0.5	25			100		100	
CSC2238Y	160	160	5	25	1.5	1	160			120	240	0.1	5	1.5		0.5	25			100		100	

V_{CES}
\$\$ I_{CEO}

Maximum Ratings						Electrical Characteristics (Ta=25°C, Unless Otherwise Specified)																	
Type No.	V _{CBO} (V) Min	V _{CEO} (V) Min	V _{EB0} (V) Min	P _D (W) @Tc=25°C	I _C (A)	I _{CBO} (μA) Max	V _{CE} (V) @ I _C	I _{CES} (μA) Max	V _{CE} (V) @ I _{CES}	h _{FE} Min	β Max	I _C (A) @ V _{CE}	V _{CE} (V) @ I _C	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Min	V _{BE(SAT)} (V) Max	I _C (A)	C _{ob} (pF) Max	Typ	f _t (MHz) Min	Typ	β Max	I _C (mA)
CSC2562	60	50	5	25	5	1	50			70	240	1	1	0.4		1.2	3		80		120		1000
CSC2562O	60	50	5	25	5	1	50			70	140	1	1	0.4		1.2	3		80		120		1000
CSC2562Y	60	50	5	25	5	1	50			120	240	1	1	0.4		1.2	3		80		120		1000
CSC3039	500	400	7	50	7	10	400			15		0.8	5	1		1.5	4		80		20		800
CSC3968	400	400	7	20	2	10	400			16	50	0.1	5	1		1.5	1		30		10		500
CSC3968A	400	400	7	20	2	10	400			16	34	0.1	5	1		1.5	1		30		10		500
CSC3968B	400	400	7	20	2	10	400			25	50	0.1	5	1		1.5	1		30		10		500
CSD288	80	55	5	25	3	50	50			40	240	0.5	5	1			1						
CSD288O	80	55	5	25	3	50	50			70	140	0.5	5	1			1						
CSD288R	80	55	5	25	3	50	50			40	80	0.5	5	1			1						
CSD288Y	80	55	5	25	3	50	50	120	240	0.5	5	1	1										
CSD313	60	60	5	30	3	100	20			40		0.1	2	1			2			8		500	
CSD313C	60	60	5	30	3	100	20			40	320	1	2	1			2			8		500	
CSD313D	60	60	5	30	3	100	20			40		0.1	2	1			2			8		500	
CSD313E	60	60	5	30	3	100	20			40		0.1	2	1			2			8		500	
CSD313F	60	60	5	30	3	100	20			40	200	1	2	1			2			8		500	
CSD362	150	70	8	40	5	20	100			20	140	5	5	1		1.5	5						
CSD362N	150	70	8	40	5	20	100			20	50	5	5	1		1.5	5			10		500	
CSD362O	150	70	8	40	5	20	100			70	140	5	5	1		1.5	5			10		500	
CSD362R	150	70	8	40	5	20	100			40	80	5	5	1		1.5	5			10		500	
CSD363	300	120	8	40	6	1000	250			40	240	1	5	1		1.5	1			10		500	
CSD363O	300	120	8	40	6	1000	250			70	140	1	5	1		1.5	1			10		500	
CSD363R	300	120	8	40	6	1000	250			40	80	1	5	1		1.5	1			10		500	
CSD363Y	300	120	8	40	6	1000	250			120	240	1	5	1		1.5	1			10		500	
CSD401	200	150	5	25	2	50	150			40	400	0.4	10	1			0.5			5		400	
CSD401G	200	150	5	25	2	50	150			200	400	0.4	10	1			0.5			5		400	
CSD401O	200	150	5	25	2	50	150			70	140	0.4	10	1			0.5			5		400	
CSD401R	200	150	5	25	2	50	150			40	80	0.4	10	1			0.5			5		400	

Maximum Ratings						Electrical Characteristics (Ta=25°C, Unless Otherwise Specified)																		
Type No.	V _{CBO} (V) Min	V _{CEO} (V) Min	V _{EBO} (V) Min	P _D (W) @Tc=25°C	I _C (A)	I _{CBO} (μA) Max	V _{CB} @ (V)	I _{CES} (μA) Max	V _{CE} @ (V)	h _{FE} Min	β Max	I _C & (A)	V _{CE} (V)	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Min	V _{BE(SAT)} (V) Max	I _C (A)	C _{ob} (pF) Max	Typ	f _t (MHz) Min	Typ	β Max	I _C (mA)	
CSD401Y	200	150	5	25	2	50	150			120	240	0.4	10	1			0.5				5			400
CSD880	60	60	7	30	3	100	60			60	300	0.5	5	1			3	70			3			500
CSD880GR	60	60	7	30	3	100	60			150	300	0.5	5	1			3	70			3			500
CSD880O	60	60	7	30	3	100	60			60	120	0.5	5	1			3	70			3			500
CSD880Y	60	60	7	30	3	100	60			100	200	0.5	5	1			3	70			3			500
CSD1025	200	200	7	50	8	100	200			1500	30000	5	3	1.5		2	5							
CSD1133	70	50	5	40	4	1	50			35 60		0.1 1	4 4	1			2				7			500
CSD1133B	70	50	5	40	4	1	50			35 60	120	0.1 1	4 4	1			2				7			500
CSD1133C	70	50	5	40	4	1	50			35 100	200	0.1 1	4 4	1			2				7			500
CSD1133D	70	50	5	40	4	1	50			35 160	320	0.1 1	4 4	1			2				7			500
CSD1134	70	60	5	40	4	1	50			35 60	320	0.1 1	4 4	1			2				7			500
CSD1134B	70	60	5	40	4	1	50			35 60	120	0.1 1	4 4	1			2				7			500
CSD1134C	70	60	5	40	4	1	50			35 100	200	0.1 1	4 4	1			2				7			500
CSD1134D	70	60	5	40	4	1	50			35 160	320	0.1 1	4 4	1			2				7			500
CSD1163	300	120		40	7	5000	300			25		5	5	2		1.2	5							
CSD1163A	350	150		40	7	5000	350			25		5	5	1		1.2	5							
CSD2495	110	110	5	30	6	100	110			5000	30000	5	4	2.5		3	5		55		60			500
CSD24950/P	110	110	5	30	6	100	110			5000	20000	5	4	2.5		3	5		55		60			500
MJE3055T	70	60	5	75	10	1000	70			20 5	100	4 10	4 4	1.1 8			4 10			2				500
MJE15028	120	120	5	50	8	10	120	**100	120	40 40 40 20		0.1 2 3 4	2 2 2 2	0.5			1			30				500
MJE15030	150	150	5	50	8	10	150	**100	150	40 40 40 20		0.1 2 3 4	2 2 2 2	0.5			1			30				500
SJE1349	73	63	7	65	6	300	63	300	73	43		4	4	1.07 3			4 10			20				500
TIP29	40	40	5	30	1			200	40	40 15		0.2 1	4 4	0.7			1			3				200

** I_{CEO}

Maximum Ratings						Electrical Characteristics (T _a =25°C, Unless Otherwise Specified)																		
Type No.	V _{CEO} (V) Min	V _{CEO} (V) Min	V _{EB0} (V) Min	P _D (W) @T _C =25°C	I _C (A)	I _{CEO} (μA) Max	V _{CE} (V) @ I _C	I _{CES} (μA) Max	V _{CE} (V) @ I _{CES}	h _{FE} Min	β Max	I _C & β (A)	V _{CE} (V)	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Min	V _{BE(SAT)} (V) Max	I _C (A)	C _{ob} (pF) Max	Typ	f _t (MHz) Min	Typ	β Max	I _C (mA)	
TIP29A	60	60	5	30	1			200	60	40 15		0.2 1	4 4	0.7			1				3			200
TIP29B	80	80	5	30	1			200	80	40 15		0.2 1	4 4	0.7			1				3			200
TIP29C	100	100	5	30	1			200	100	40 15		0.2 1	4 4	0.7			1				3			200
TIP31	40	40	5	40	3			200	40	10 25	50	3 1	4 4	1.2			3				3			500
TIP31A	60	60	5	40	3			200	60	10 25	50	3 1	4 4	1.2			3				3			500
TIP31B	80	80	5	40	3			200	80	10 25	50	3 1	4 4	1.2			3				3			500
TIP31C	100	100	5	40	3			200	100	10 25	50	3 1	4 4	1.2			3				3			500
TIP41	40	40	5	65	6			400	40	15 30	75	3 0.3	4 4	1.5			6				3			500
TIP41A	60	60	5	65	6			400	60	15 30	75	3 0.3	4 4	1.5			6				3			500
TIP41B	80	80	5	65	6			400	80	15 30	75	3 0.3	4 4	1.5			6				3			500
TIP41C	100	100	5	65	6			400	100	15 30	75	3 0.3	4 4	1.5			6				3			500
TIP47	350	250	5	40	1			1000	350	30 10	150	0.3 1	10 10	1			1				10			200
TIP48	400	300	5	40	1			1000	400	30 10	150	0.3 1	10 10	1			1				10			200
TIP49	450	350	5	40	1			1000	450	30 10	150	0.3 1	10 10	1			1				10			200
TIP50	500	400	5	40	1			1000	500	30 10	150	0.3 1	10 10	1			1				10			200
TIP100	60	60	5	80	8	50	60	**50	30	1000 200	20000	3 8	4 4	2 2.5			3 8	200						
TIP101	80	80	5	80	8	50	80	**50	40	1000 200	20000	3 8	4 4	2 2.5			3 8	200						
TIP102	100	100	5	80	8	50	100	**50	50	1000 200	20000	3 8	4 4	2 2.5			3 8	200						
TIP110	60	60	5	50	2	1000	30			1000 500		1 2	4 4	2.5			2							
TIP111	80	80	5	50	2	1000	40			1000 500		1 2	4 4	2.5			2							
TIP112	100	100	5	50	2	1000	50			1000 500		1 2	4 4	2.5			2							
TIP120	60	60	5	65	5	200	60			1000 1000		0.5 3	3 3	2 4			3 5	200						
TIP121	80	80	5	65	5	200	80			1000 1000		3 0.5	3 3	2 4			3 5	200						

** I_{CEO}

Maximum Ratings						Electrical Characteristics (Ta=25°C, Unless Otherwise Specified)													
Type No.	V _{CBO} (V) Min	V _{CEO} (V) Min	V _{EBO} (V) Min	P _D (W) ● Tc=25°C	I _C (A)	I _{CBO} (μA) Max	V _{CB} @ (V)	I _{CES} (μA) Max	V _{CE} @ (V)	h _{FE} Min	β Max	I _C & V _{CE} (A) (V)	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Min Max	I _C (A)	C _{ob} (pF) Max Typ	f _T (MHz) Min Typ Max		
TIP122	100	100	5	65	5	200	100			1000 1000		3 3 0.5 3	2 4		3 5	200			
TIP130	60	60	5	70	8	200	60	**500	30	500 1000 15000		1 4 4 4	2 3		4 6				
TIP131	80	80	5	70	8	200	80	**500	40	500 1000 15000		1 4 4 4	2 3		4 6				
TIP132	100	100	5	70	8	200	100	**500	50	500 1000 15000		1 4 4 4	2 3		4 6				

** I_{CEO}