

# TO-220 Power Package Transistors (NPN)

Maximum Ratings					Electrical Characteristics (Ta=25°C, Unless Otherwise Specified)															
Type No.	V <sub>CBO</sub> (V)	V <sub>CEO</sub> (V)	V <sub>EBO</sub> (V)	P <sub>D</sub> (W)	I <sub>C</sub> (A)	I <sub>CBO</sub> (μA)	V <sub>CB</sub> (V)	I <sub>CES</sub> (μA)	V <sub>CE</sub> (V)	h <sub>FE</sub>	@	I <sub>C</sub> & V <sub>CE</sub> (A)	V <sub>CE(SAT)</sub> (V)	V <sub>BE(SAT)</sub> (V)	I <sub>C</sub> (A)	C <sub>ob</sub> (pF)	f <sub>i</sub> (MHz)	I <sub>C</sub> (mA)		
	Min	Min	Min	@ Tc=25°C		Max	@ (V)	Max	@ (V)	Min	Max		Max	Min	Max	Max	Typ	Min	Typ	Max
2SC2335R	500	400	7	40	7	10	400			20	80	0.1	5	1	1.2	3				
										20	40	1	5							
										10		3	5							
2SC2335Y	500	400	7	40	7	10	400			20	80	0.1	5	1	1.2	3				
										40	80	1	5							
										10		3	5							
2SC3039	500	400	7	50	7	10	400			15		0.8	5	1	1.5	4	80	20	800	
										8		4	5							
2SD1163	300	120		40	7	5000	300			25		5	5	2	1.2	5				
2SD1163A	350	150		40	7	5000	350			25		5	5	1	1.2	5				
2SD288	80	55	5	25	3	50	50			40	240	0.5	5	1		1				
2SD288O	80	55	5	25	3	50	50			70	140	0.5	5	1		1				
2SD288R	80	55	5	25	3	50	50			40	80	0.5	5	1		1				
2SD288Y	80	55	5	25	3	50	50	120	240	0.5	5	1	1							
2SD362	150	70	8	40	5	20	100			20	140	5	5	1	1.5	5				
2SD880	60	60	7	30	3	100	60			60	300	0.5	5	1		3	70	3	500	
2SD880GR	60	60	7	30	3	100	60			150	300	0.5	5	1		3	70	3	500	
2SD880O	60	60	7	30	3	100	60			60	120	0.5	5	1		3	70	3	500	
2SD880Y	60	60	7	30	3	100	60			100	200	0.5	5	1		3	70	3	500	
BD239	55	45	5	30	2			200	45	40		0.2	4	0.7		1		3	200	
										15		1	4							
BD239A	70	60	5	30	2			200	60	40		0.2	4	0.7		1		3	200	
										15		1	4							
BD239B	90	80	5	30	2			200	80	40		0.2	4	0.7		1		3	200	
										15		1	4							
BD239C	115	100	5	30	2			200	100	40		0.2	4	0.7		1		3	200	
										15		1	4							
BD241	## 55	45	5	40	3			200	45	25		1	4	1.2		3		3	500	
										10		3	4							
BD241A	## 70	60	5	40	3			200	60	25		1	4	1.2		3		3	500	
										10		3	4							
BD241B	## 90	80	5	40	3			200	80	25		1	4	1.2		3		3	500	
										10		3	4							
BD241C	## 115	100	5	40	3			200	100	25		1	4	1.2		3		3	500	
										10		3	4							
BD243	45	45	5	65	6			400	45	30		0.3	4	1.5		6		3	500	
										15		3	4							
BD243A	60	60	5	65	6			400	60	30		0.3	4	1.5		6		3	500	
										15		3	4							

## NOTE : V<sub>CES</sub>