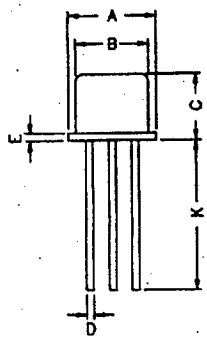
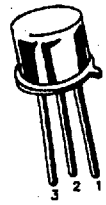
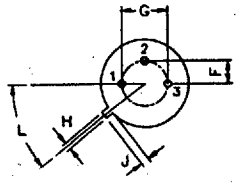




PIN CONFIGURATION
1. EMITTER
2. BASE
3. COLLECTOR



DIM	MIN	MAX
A	8,50	9,39
B	7,74	8,50
C	6,09	6,60
D	0,40	0,53
E	–	0,88
F	2,41	2,66
G	4,82	5,33
H	0,71	0,86
J	0,73	1,02
K	12,7	–
L	42 DEG	48 DEG

ALL DIMENSIONS ARE IN M.M.

TO-39 Metal-Can Package Transistors (NPN)

Type No.	Maximum Ratings						Electrical Characteristics (Ta=25°C, Unless Otherwise Specified)																	
	V_{CBO} (V) Min	V_{CEO} (V) Min	V_{EBO} (V) Min	P_D (W) @Tc=25°c	I_C (A)	I_{CM} (A)	I_{CBO} (µA) Max	V_{CB} @ (V)	I_{CES} (µA) Max	V_{CE} @ (V)	h_{FE} Min	@ Max	I_C & (mA)	V_{CE} (V)	$V_{CE(SAT)}$ (V) Max	& $V_{BE(SAT)}$ (V) Min	Max	I_C @ (mA)	C_{ob} (pF) Min	Max	Typ	f_t (MHz) Min	Typ	@ I_C (mA) Max	t(off) (ns) Max	NF (dB) Max	@ Freq (MHz)
2N656	60	60	8				10	30			30	90	200	10	4			200									
2N657	100	100	8	1	0.5		10	30			30	90	200	10	4			200									
2N696	60	40	5	0.8	0.5		1	30			20	60	150	10	1.5		1.3	150		35							
2N697	60	40	5	0.6	0.5		1	30			40	120	150	10	1.5		1.3	150		35							
2N699	120	80	5	0.8	0.5		2	60			40	120	150	10	5		1.3	150		20		50		50			
2N1507	60	30	5	0.6	1		1	30			100	300	150	10	1.5			150		35			50				
2N1613	75	50	7	0.8	0.5		0.01	60			20 40 35 20	 120 	500 150 10 0.1	10 10 10 10	1.5		1.3	150		25		60		50		12	0.001
2N1644	60		5	2			1	30			40		150	10	1.5		1.3	150									
2N1711	75	50	7	0.8	1		0.01	60			40 100 75 35 20	 300 	500 150 10 0.1 0.01	10 10 10 10 10	1.5		1.3	150		25		70		50		8	
2N1837	80	30	8	0.6	1	1	0.5	30			40	120	150	10	0.8		1.3	150		18							
2N1838	45	20	5	0.6	0.5		1.5	30			40	150	100	10	1.4		1.5	100		27							
2N1840	25	15	5	0.6		0.5	0.3	10			10 10	 100	150 150	1.4 10	1.4		1.75	150		27							
2N1889	100	80	7	0.8			0.01	75			20 35 40	 120	0.1 10 150	10 10 10	1.2 5		0.9 1.3	50 150		15		50		50			
2N1890	100	80	7	0.8			0.01	75			100	300	150	10	1.2 5		0.9 1.3	50 150		15		60		50			
2N1893	120	80	7	0.8	0.5	1	0.01	90			20 35 40	 120	0.1 10 150	10 10 10	1.2 5		0.9 1.3	50 150		15		50		50			

TO-39 Metal-Can Package Transistors (NPN)

CDIL

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_{CM} (A)	I_{CBO} (µA) Max	@	V_{CB} (V)	I_{CES} (µA) Max	@	V_{CE} (V)	h_{FE} Min	@	Max	I_C & (mA)	V_{CE} (V)	$V_{CE(SAT)}$ (V) Max	&	$V_{BE(SAT)}$ (V) Min	Max	I_C @ (mA)	C_{ob} (pF) Min	Max	Typ	f_t (MHz) Min	Typ	@	Max	I_C (mA)	t(off) (ns) Max	NF (dB) Max	@ Freq (MHz)
2N1972	60	30	5	0.6			1		30				110		350	50	10	2				50		25					50				
2N1973	100	80	7	0.8			0.025		75				75			10	10	1.2				50		15					60				
2N1974	100	80	7	0.8			0.025		75				35			10	10	1.2				50		15					50				
2N1975	100	80	7	0.8			0.025		75				15			10	10	1.2				50		15					40				
2N1986	50	25	5	0.6	1		5		30				60			30	10	0.6			0.9	30	20	35									
													60		240	150	10	1.5			1.3	150											
2N1987	50	25	5	0.6	1		5		30				20			30	10	0.6			0.9	30	20	35									
													20		80	150	10	1.5			1.3	150											
2N1988	100	45	5	0.6		1	5		50				35		120	30	10	2			1	30		20									
2N1989	100	45	5	0.6		1	5		50				20		60	30	10	2			1	30		20									
2N1990	100		3	0.6									20			30	10	0.5			1	2											
2N2049	75	50	7	0.8	0.5		0.01		60				100		300	150	10	0.4				10		25					50				
2N2102	120	65	7	1	1		0.002		60				10			1000	10	0.5			1.1	150		15		60			50		6	0.001
													25			500	10																
													40		120	150	10																
													35			10	10																
													20			0.1	10																
2N2192	60	40	5	0.8	1		0.01		30				15			0.1	10	0.35			1.3	150		20		50			50				
													75			10	10																
													100		300	150	10																
													35			500	10																
													15			1000	10																
													70			150	1																
2N2193	80	50	8	0.8	1		0.01		60				15			0.1	10	0.35			1.3	150		20		50			50				
													30			10	10																
													40		120	150	10																
													20			500	10																
													15			1000	10																
													30			150	1																
2N2194	60	40	5	0.8	1		0.01		30				15			10	10	0.35			1.3	150		20		50			50				
													20		60	150	10																
													12			500	10																
													15			150	1																
2N2195	45	25	5	0.6		1	0.1		30				20			150	10	0.35			1.3	150		20		50			50				
													10			150	1																
2N2218	60	30	5	0.8	0.8		0.01		50				20			500	10	0.4	0.6		1.3	150		8		250			20				
													20			150	1	1.6			2.6	500											
													40		120	150	10																
													35			10	10																
													25			1	10																
													20			0.1	10																
2N2218A	75	40	6	0.8	0.8		0.01		60	* 0.01		60	20			0.1	10	0.3	0.6		1.2	150		8		300			20				
													25			1	10	1			2	500											
													35			10	10																
													40		120	150	10																
													20			150	1																
													25			500	1																
2N2219	60	30	5	0.8	0.8		0.01		50				35			0.1	10	0.4	0.6		1.3	150		8		250			20				
													50			1	10	1.6			2.6	500											
													75			10	10																
													100		300	150	10																
													50			150	1																
													30			500	1																

* NOTE : I_{CEX}

CDIL TO-39 Metal-Can Package Transistors (NPN)

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_{CM} (A)	I_{CBO} (µA) Max	V_{CB} @ (V)	I_{CES} (µA) Max	V_{CE} @ (V)	h_{FE} Min	@ Max	I_C & (mA)	V_{CE} (V)	$V_{CE(SAT)}$ (V) Max	&	$V_{BE(SAT)}$ (V) Min	Max	I_C @ (mA)	C_{ob} (pF) Min	Max	Typ	f_t (MHz) Min	Typ	@ Max	I_C (mA)	t(off) (ns) Max	NF Max	@ Freq (MHz)			
2N2219A	75	40	6	0.8	0.8		0.01	60	* 0.01	60	35		0.1	10	0.3	0.6	1.2	150		8			300			20						
											50		1	10	1		2	500													
											75		10	10																	
											100	300	150	10																	
											50		150	1																	
											40		500	1																	
2N2243	120	80	7	0.8	1		0.01	60			15		500	10	0.35		1.3	150		15			50			50					
											40	120	150	10																	
											30		10	10																	
											30		150	1																	
											15		0.1	10																	
2N2270	60	45	7	1	1		0.05	60			50	200	150	10	0.9		1.2	150		15			100			50		10	0.001		
											30		1	10																	
2N2440	120	80	7	0.8	0.5		0.001	90			35		0.1	10	0.4		0.9	50		15											
											100	300	150	10	3		1.3	150													
2N3019	140	80	7	0.8		1	0.01	90			50		0.1	10	0.2		1.1	150		12			100	400		50		4	0.001		
											90		10	10	0.5			500													
											100	300	150	10																	
											50		500	10																	
											15		* 1	10																	
2N3020	140	80	7	0.8		1	0.01	90			30	100	0.1	10	0.2		1.1	150		12			80			50					
											40	120	10	10	0.5			500													
											40	120	150	10																	
											30	100	500	10																	
											15		1000	10																	
2N3053	60	40	5	5	0.7				* 0.25	30	50	250	150	10	1.4		1.7	150		15				100		50					
											25		150	2.5																	
2N3300	60	30	5	0.8	0.5				0.01	50	50		500	10	0.22		1.1	150		8			250			50	150				
											50		150	1	0.6		1.5	500													
											100	300	150	10																	
											75		10	10																	
											50		1	10																	
											35		0.1	10																	
2N3440	300	250	7	1	1		20	360			40	160	20	10	0.5		1.3	50		10					15	10					
2N3498	100	100	6	1.0	0.5		0.05	50			20		0.1	10	0.6		1.4	300		10			150			20					
											25		1	10	0.2		0.8	10													
											35		10	10	0.25		0.9	50													
											40	120	150	10																	
											15		500	10																	
											95		300	10																	
2N3499	100	100	6	1	0.5		0.05	50			35		0.1	10	0.2		0.8	10		10			150			20					
											50		1	10	0.25		0.9	50													
											75		10	10	0.6		1.4	300													
											100	300	150	10																	
											20		500	10																	
											20		300	10																	
2N3500	150	150	6	1	0.3		0.05	75			20		0.1	10	0.2		0.8	10		8			150			20					
											25		1	10	0.25		0.9	50													
											35		10	10	0.4		1.2	150													
											40	120	150	10																	
											15		300	10																	
											15		500	10																	

* NOTE : I_{CEX}

TO-39 Metal-Can Package Transistors (NPN)

CDIL

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_{CM} (A)	I_{CBO} (μA) Max	V_{CB} @ (V)	I_{CES} (μA) Max	V_{CE} @ (V)	h_{FE} Min	@	Max	I_C & (mA)	V_{CE} (V)	$V_{CE(SAT)}$ (V) Max	&	$V_{BE(SAT)}$ (V) Min	Max	@ I_C (mA)	C_{ob} (pF) Min	Max	Typ	f_t (MHz) Min	Typ	@	Max	I_C (mA)	t(off) (ns) Max	NF @ Freq (dB) Max	(MHz)
2N3501	150	150	6	1	0.3		0.05	75			35			0.1	10	0.4			1.2	150			8	150			20				
											50			1	10	0.2			0.8	10											
											100	300		150	10	0.25			0.9	50											
											20			300	10																
											75			10	10																
											20			500	10																
2N3678	75	55	6	0.8	0.8		0.01	60			25			500	10	0.4	.6		1.2	150								250		
											20			150	1	1			2	500										
											40	120		150	10																
											35			10	10																
											25			1	10																
											20			0.1	10																
2N3742	300	300	7	1	0.05		0.2	200			10			3	10	0.75			1	10			6	30			10				
											15			10	10	1			1.2	30										
											20	200		30	10																
											20			50	20																
2N4237	50	40	6	1	1		0.01	50			15			1000	1	0.6			1.5	1000			100								
											30			500	1	0.3				500											
											30	150		250	1																
											30			50	1																
2N4926	200	200	7	1	0.05		0.1	100			10			3	10	1			1.2	10				30	300		10				
											15			10	10	2				30											
											20	200		30	10				1.5	50											
											20			50	20																
2N5320	100	75	7	10	2				*100	100	30	130		500	4	0.5			1.1	500								800		
											10			1000	2																
2N5321	75	50	5	10	2				*100	75	40	250		500	4	0.8			1.4	500								800		
2N5681	100	100	4	1	1		1	100	* 1	100	5			1000	2	0.6				250			50	30			100				
											40	150		250	2	1				500											
																2				1											
2N5682	120	120	4	1	1		1	120	* 1	120	5			1000	2	0.6				250			50	30			100				
											40	150		250	2	1				500											
BC140	80	40	7	0.8	1				0.1	60	40	400		100	1	1				1000			25	50			50	850		
BC140-6	80	40	7	0.8	1				0.1	60	40	100		100	1	1				1000			25	50			50	850		
BC140-10	80	40	7	0.8	1				0.1	60	63	160		100	1	1				1000			25	50			50	850		
BC140-16	80	40	7	0.8	1				0.1	60	100	250		100	1	1				1000			25	50			50	850		
BC141	100	60	7	0.8	1				0.1	60	40	400		100	1	1				1000			25	50			50	850		
BC141-6	100	60	7	0.8	1				0.1	60	40	100		100	1	1				1000			25	50			50	850		
BC141-10	100	60	7	0.8	1				0.1	60	63	160		100	1	1				1000			25	50			50	850		
BC141-16	100	60	7	0.8	1				0.1	60	100	250		100	1	1				1000			25	50			50	850		
BC300	120	80	7	0.85	0.5		0.02	120			40	240		150	10	0.5				150				100	400		50				
BC300-4	120	80	7	0.85	0.5		0.02	120			40	80		150	10	0.5				150				100	400		50				
BC300-5	120	80	7	0.85	0.5		0.02	120			70	140		150	10	0.5				150				100	400		50				

* NOTE : ICEX

CDIL TO-39 Metal-Can Package Transistors (NPN)

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_{CM} (A)	I_{CBO} (µA) Max	@	V_{CB} @ (V)	I_{CES} (µA) Max	@	V_{CE} @ (V)	h_{FE} Min	@	Max	I_C & (mA)	V_{CE} (V)	$V_{CE(SAT)}$ (V) Max	&	$V_{BE(SAT)}$ (V) Min	Max	I_C @ (mA)	C_{ob} (pF) Min	Max	Typ	f_t (MHz) Min	Typ	@	Max	I_C (mA)	t(off) (ns) Max	NF (dB) Max	@ Freq (MHz)
BC300-6	120	80	7	0.85	0.5		0.02		120				120		240	150	10	0.5				150				100			400				
BC301	90	60	7	0.85	0.5		0.02		90				40		240	150	10	0.5				150				100			400	50			
BC301-4	90	60	7	0.85	0.5		0.02		90				40		80	150	10	0.5				150				100			400	50			
BC301-5	90	60	7	0.85	0.5		0.02		90				70		140	150	10	0.5				150				100			400	50			
BC301-6	90	60	7	0.85	0.5		0.02		90				120		240	150	10	0.5				150				100			400	50			
BC302	60	45	7	0.85	0.5		0.02		60				40		240	150	10	0.5				150				100			400	50			
BC302-4	60	45	7	0.85	0.5		0.02		60				40		80	150	10	0.5				150				100			400	50			
BC302-5	60	45	7	0.85	0.5		0.02		60				70		140	150	10	0.5				150				100			400	50			
BC302-6	60	45	7	0.85	0.5		0.02		60				120		240	150	10	0.5				150				100			400	50			
BD115	245	180	5	0.875	0.2								22			50	10	9				100											
BF257	160	160	5	1	0.1		0.05		100				25			30	10	1				30	3.5				110			30		3.5	
BF258	250	250	5	1	0.1		0.05		200				25			30	10	1				30						110		30			
BF259	300	300	5	1	0.1		0.05		250				25			30	10	1				30						110		30			
BF336	185	180	5	0.8		0.2							20			30	10									80	130			30			
BF337	250	200	5	0.8		0.2							20			30	10									80				30			
BF338	300	225	5	0.8	0.2								20			30	10									80	130			30			
BFX84	45	45	6	0.8	1		0.5		100				15			1000	10	0.15		1.2		10	12			50				50	360		
													20			500	10	0.35		1.3		150											
													30			150	10	1		1.5		500											
													20			10	10	1.6		2		1000											
BFX85	100	60	6	0.8	1		0.5		100				15			1000	10	0.15		1.2		10	12			50				50			
							0.05		80				30			500	10	0.35		1.3		150											
													70			150	10	1		1.5		500											
													50			10	10	1.6		2		1000											
BFX86	45	45	6	0.8	1		0.05		30				15			1000	10	0.15		1.2		10	12			50				50	360		
													30			500	10	0.35		1.3		150											
													70			150	10	1		1.5		500											
													50			10	10	1.6		2		1000											
BFY50	80	35	6	0.8	1		0.05		60				20			10	6	0.2				150	12			60				50			
													30			150	6	1		2		1000											
													15			1000	6																
BFY51	60	30	6	0.8	1		0.05		40				30			10	6	0.35				150	12			50				50			
													40			150	6	1.6		2		1000											
													15			1000	6																
BFY52	40	20	6	0.8	1		0.05		30				30			10	6	0.35				150	12			50				50			
													60			150	6	1.6		2		1000											
													15			1000	6																
BFY56	85	45	7	0.8	1					0.02		50	15			0.1	10	0.3		1.5		150	25			40				50			
													20			500	10	1.2		2.3		1000											
													30	150		150	1																

TO-39 Metal-Can Package Transistors (NPN)

CDIL

| Type No. | Maximum Ratings | | | | | | Electrical Characteristics (Ta=25°C, Unless Otherwise Specified) | | | | | |

CDIL TO-39 Metal-Can Package Transistors (NPN)

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_{CM} (A)	I_{CBO} (µA) Max	@ V_{CB} (V)	I_{CES} (µA) Max	@ V_{CE} (V)	h_{FE} Min		@ I_C & (mA)	V_{CE} (V)	$V_{CE(SAT)}$ (V) Max	& $V_{BE(SAT)}$ (V) Min	Max	@ I_C (mA)	C_{ob} (pF) Min	Max	Typ	f_t (MHz) Min	Typ	@	I_C (mA) Max	t(off) (ns) Max	NF (dB) Max	@ Freq (MHz)		
BSX63-6	# 80	60	5	5	3				0.1	60	30		100	1	0.8		1.3	2000	70			30			200					
											40	100	1000	1	0.7		1.2	1000												
											25		2000	5																
BSX63-10	# 80	60	5	5	3				0.1	60	30		100	1	0.8		1.3	2000	70			30			200					
											63	160	1000	1	0.7		1.2	1000												
											25		2000	5																
BSX63-16	# 80	60	5	5	3				0.1	60	30		100	1	0.8		1.3	2000	70			30			200					
											100	250	1000	1	0.7		1.2	1000												
											25		2000	5																
BSY51	60	35	5	0.8	0.5				0.1	30	40	120	150	10	1		1.3	150	9			130			50					
BSY52	60	25	5	0.8	0.5				0.1	30	100	300	150	10	1		1.3	150	9			130			50					
BSY53	75	30	7	0.8	0.75				0.01	60	20		0.1	10	0.6		1.2	150				150			50					
											35		10	10	1.2			500												
											40	120	150	10																
											20		500	10																
BSY54	75	30	7	0.8	0.75				0.01	60	35		0.1	10	0.6		1.3	150				150			50					
											75		10	10																
											100	300	150	10																
											40		500	10																
CL21	20	20	5	0.75			0.5	15			150	350	100	3	0.6			150					80							
CL100	60	50	5	0.8		1	0.05	40			50	280	150	10	0.6			150												
CL150	35	30	5	0.8			0.05	25			50	280	150	1	0.6			150												

NOTE : V_{CES}

TO-39 Metal-Can Package Transistors (PNP)

CDIL

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_{CM} (A)	I_{CBO} (µA) Max	V_{CB} @ (V)	I_{CES} (µA) Max	V_{CE} @ (V)	h_{FE} Min	@	Max	I_C & (mA)	V_{CE} (V)	$V_{CE(SAT)}$ (V) Max	&	$V_{BE(SAT)}$ (V) Min	Max	I_C @ (mA)	C_{ob} (pF) Min	Max	Typ	f_t (MHz) Min	Typ	@	Max	I_C (mA)	t(off) (ns) Max	NF (dB) Max	@	Freq (MHz)
2N2904	60	40	5	0.6	0.6		0.02	50			20			500	10	0.4			1.3	150		8		200			50	100			
											40		120	150	10	1.6			2.6	500											
											35			10	10																	
											25			1	10																	
											20			0.1	10																	
2N2904A	60	60	5	0.6	0.6		0.01	50			40			500	10	0.4			1.3	150		8		200			50	100			
											40		120	150	10	1.6			2.6	500											
											40			10	10																	
											40			1	10																	
											40			0.1	10																	
2N2905	60	40	5	0.6	0.6		0.02	50			30			500	10	0.4			1.3	150		8		200			50	100			
											100		300	150	10	1.6			2.6	500											
											75			10	10																	
											50			1	10																	
											35			0.1	10																	
2N2905A	60	60	5	0.6	0.6		0.01	50			50			500	10	0.4			1.3	150		8		200			50	100			
											100		300	150	10	1.6			2.6	500											
											100			10	10																	
											100			1	10																	
											75			0.1	10																	
2N3072	60	60	4	0.8	0.5				0.01	30	15			300	2	0.25			1.2	50		10		130			50	100			
											30		130	50	1	1			2	300											
2N3073	60	60	4						0.01	30	15			300	2	0.25			1.2	50		10		130			50	100			
											30		130	50	1	1			2	300											
2N3502	45	45	5	0.6	0.6		0.01	30			50			500	10	0.25			1	50		8		200			50	100	4		
											100		300	150	10	0.4			1.3	150											
											140			10	10	1.6			2	500											
											135			1	10																	
											120			0.1	10																	
											80			0.01	10																	
2N3503	60	60	5	0.6	0.6		0.01	50			50			500	10	0.25			1	50		8		200			50	100	4		
											100		300	150	10	0.4			1.3	150											
											140			10	10	1.6			2	500											
											135			1	10																	
											120			0.1	10																	
											80			0.01	10																	
2N3635	140	140	5	1	1		0.1	100			80			0.1	10	0.3			0.8	10		10		200			30	600	3		0.001
											90			1	10	0.5		0.65	0.9	50											
											100			10	10																	
											100		300	50	10																	
											50			150	10																	
2N3636	175	175	5	1	1		0.1	100			40			0.1	10	0.3			0.8	10		10		150			30	600	3		0.001
											45			1	10	0.5		0.65	0.9	50											
											50			10	10																	
											50		150	50	10																	
											25			150	10																	
2N3637	175	175	5	1	1		0.1	100			80			0.1	10	0.3			0.8	10		10		200			30	600	3		0.001
											90			1	10	0.5		0.65	0.9	50											
											100			10	10																	
											100		300	50	10																	
											50			150	10																	
2N4030	60	60	5	0.8		1	0.05	50			15			1000	5	1				1000		20										
											25			500	5	0.5				500												
											40		120	100	5	0.15			0.9	150											
											30			0.1	5																	

CDIL TO-39 Metal-Can Package Transistors (PNP)

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_{CM} (A)	I_{CBO} (µA) Max	V_{CB} @ (V)	I_{CES} (µA) Max	V_{CE} @ (V)	h_{FE} Min	@ Max	I_C & (mA)	V_{CE} (V)	$V_{CE(SAT)}$ (V) Max	& $V_{BE(SAT)}$ (V) Min	Max	I_C @ (mA)	C_{ob} (pF) Min	Max	Typ	f_t (MHz) Min	Typ	@ Max	I_C (mA)	t(off) (ns) Max	NF @ Freq. (dB) Max	(MHz)						
2N4031	80	80	5	0.8		1	0.05	60			10		1000	5	0.5			500		20													
											25		500	5	0.15		0.9	150															
											40	120	100	5																			
											30		0.1	5																			
2N4032	60	60	5	0.8		1	0.05	50			40		1000	5	1			1000		20													
											70		500	5	0.5			500															
											100	300	100	5	0.15		0.9	150															
											75		0.1	5																			
2N4033	80	80	5	0.8		1	0.05	60			25		1000	5	0.5			500		20													
											70		500	5	0.15		0.9	150															
											100	300	100	5																			
											75		0.1	5																			
2N4036	90	65	7	1	1		0.02	90			20		500	10	0.65		1.4	150		700													
											40	140	150	10																			
											20		0.1	10																			
2N4037	60	40	7	1	1		0.25	60			50	250	150	10	1.4			150															
											15		1	10																			
2N4314	90	65		1	1		0.25	60			50	250	150	10	1.4			150		30			60		50							
											15		1	10																			
2N5322	100	75	7	1					*100	100	30	130	500	4	0.7		1.1	500								1000							
											10		1000	2																			
2N5323	75	50	5	10	2				*100	75	40	250	500	4	1.2		1.4	500								1000							
2N5415	200	200	4	1	1		50	175			30	150	50	10						15													
2N5416	350	300	6	1	1		50	280			30	120	50	10						15													
2N5679	100	100	4	1	1		1	100	* 1	100	5		1	2	0.6			250		50			30		100							
											40	150	250	2	1			500															
															2			1000															
2N5680	120	120	4	1	1		1	120	* 1	120	5		1000	2	0.6			250		50			30		100	10							
											40	150	250	2	1			500															
															2			1000															
BC160	40	40	5	0.8	1				0.1	40	40	400	100	1	1			1000		30			50		50	650							
BC160-6	40	40	5	0.8	1				0.1	40	40	100	100	1	1			1000		25			50		50	850							
BC160-10	40	40	5	0.8	1				0.1	40	63	160	100	1	1			1000		25			50		50	850							
BC160-16	40	40	5	0.8	1				0.1	40	100	250	100	1	1			1000		25			50		50	850							
BC161	60	60	5	0.8	1				0.1	60	40	400	100	1	1			1000		30			50		1	650							
BC161-6	60	60	5	0.8	1				0.1	60	40	100	100	1	1			1000		25			50		50	850							
BC161-10	60	60	5	0.8	1				0.1	60	63	160	100	1	1			1000		25			50		50	850							
BC161-16	60	60	5	0.8	1				0.1	60	100	250	100	1	1			1000		30			50		50	650							
BC303	85	60	7	0.85	0.5		0.02	85			40	240	150	10	0.65			150					75	400	50								
BC303-4	85	60	7	0.85	0.5		0.02	85			40	80	150	10	0.65			150					75	400	50								
BC303-5	85	60	7	0.85	0.5		0.02	85			70	140	150	10	0.65			150					75	400	50								

* NOTE : I_{CES}

TO-39 Metal-Can Package Transistors (PNP)

CDIL

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_{CM} (A)	I_{CBO} (µA) Max		V_{CB} @ (V)	I_{CES} (µA) Max		V_{CE} @ (V)	h_{FE} Min	@	Max	I_C & (mA)	V_{CE} (V)	$V_{CE(SAT)}$ (V) Max	&	$V_{BE(SAT)}$ (V) Min	Max	I_C @ (mA)	C_{ob} (pF) Min	Max	Typ	f_t (MHz) Min	Typ	@	Max	I_C (mA)	t(off) (ns) Max	NF @ Freq (dB) Max	(MHz)
BC303-6	85	60	7	0.85	0.5		0.02		85				120	240		150	10	0.65				150				75		400	50			
BC304	60	45	7	0.85	0.5		0.02		60				40	240		150	10	0.65				150				75		400	50			
BC304-4	60	45	7	0.85	0.5		0.02		60				40	80		150	10	0.65				150				75		400	50			
BC304-5	60	45	7	0.85	0.5		0.02		60				70	140		150	10	0.65				150				75		400	50			
BC304-6	60	45	7	0.85	0.5		0.02		60				120	240		150	10	0.65				150				75		400	50			
BFX29	20	15	5	0.5	0.6		0.05		50				40			150	10	0.4		1.3		150	12			100			50		150	
													50			50	10			0.9		30										
													50			10	10															
													40			1	10															
													20			0.1	10															
BFX30	65	65	5	0.5	0.6		0.05		50				10			150	0.4			0.9		30	12								290	
													20			50	0.4			1.3		150										
													50		200	10	0.4															
													40			1	0.4															
BFX38	55	55	5	0.8	1		0.05		40				60			0.1	5	0.15		0.9		150	20			100			50		350	
													85			100	5	0.5		1.1		500										
													60			500	5															
													30			1000	5															
BFX40	75	75	5	0.8	1		0.05		50				60			0.1	5	0.15		0.9		150	20			100			50		350	
													85			100	5	0.5		1.1		500										
													60			500	5															
													25			1000	5															
BFX41	75	75	5	0.8	1		0.05		50				35			0.1	5	0.15		0.9		150	20			100			50			
													40			100	5	0.5		1.1		500										
													25			500	5															
													10			1000	5															
BFX87	45	50	6	0.6	0.6		0.05		40				25			500	10	0.4		1.3		150	12			100			50		150	
													40			150	10	0.9				30										
													40			10	10															
													40			1	10															
BFX88	45	40	6	0.8	0.8		0.05		30				25			500	10	0.4		1.3		150	12			100			50		150	
													40			150	10			0.9		30										
													40			10	10															
													40			1	10															
CK100	60	50	5	0.8	1		0.05		40				50		280	150	10	0.6				150										
CK150	35	30	5	0.8			0.05		25				50		280	150	1	0.6				150										