

TO-18

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	I _{CBO} (μA) Max	V _{CB} (V) Min	h _{FE} Min	h _{FE} Max	I _C & V _{CE} (mA) (V)	V _{CE} (Sat) (V) Max	V _{BE} (Sat) (V) Min	I _C (mA) Max	I _{CES} (μA) Max	V _{CE} (V) Min	C _{ob} (pF) Min	C _{ob} (pF) Max	f _T (MHz) Min	f _T (MHz) Typ	f _T (MHz) Max	t _{off} (ns) Max	NF (dB) Max	Freq (MHz) Max
2N720	120	80	5	2.0	60	40	120	150.0 10.0	5.00	1.30	150				20						
2N720A	120	80	7	0.010	90	20		0.100 10.0	1.20	0.90	50			15		50		50			
						35		10.0 10.0	5.00	1.30	150										
						40	120	150.0 10.0													
2N912	100	80	7	0.025	75	15		10.0 10.0	1.20		50			15			40				
2N2509	125	80	7	0.005	100	40		10.0 5.0	1.00	0.90	5			6		45		5			7.0
						25		0.010 5.0													
2N3700	140	80	7	0.010	90	100	300	150.0 10.0	0.20	1.10	150			12							4.0 .001
						90		10.0 10.0													
						50		10.0 10.0													
						50		500.0 10.0													
						15		1000.0 10.0													
BSX21		80		0.500	50	20		4.0 3.0		0.90	4					60		4			
2N2510	100	65	7	0.005	80	150	500	10.0 5.0	1.00	0.90	5			6		45		5			4.0
						75		0.010 5.0													
2N719	120	60	5	2.0		20	60	150.0 5.0	5.00					20		40					
2N760A	60	60	8	0.100	30	76	333	1.0 5.0	1.00	1.10	10			8		50		1			
						40		0.010 5.0													
2N870	100	60		0.010	75	20		1.0 10.0	1.20	0.90	50			15							
						35		10.0 10.0	5.00	1.30	150										
						40	120	150.0 10.0													
2N871	100	60		0.010	75	100	300	150.0 10.0	1.20	0.90	50			15							
									5.00	1.30	150										
2N910	100	60	7	0.025	75	35		0.100 10.0	0.40	.60	0.80	10		15		60		50			12.0
						75		10.0 10.0	1.20	0.90	50										
2N911	100	60	7	0.025	75	20		0.100 10.0	0.40	.60	0.80	10				50		50			15.0
						75		10.0 10.0	1.20	0.90	50										
						15		10.0 10.0													
2N2484	60	60	6	0.010	45	250		1.0 5.00	0.35			1				10	15				3.0
						200		0.500 5.0													
						175		0.100 5.0													
						100	500	0.010 5.0													
						30		0.001 5.0													
2N3117	60	60	6	0.010	45	400		1.0 5.0	0.35			1				5	2	1			1.0
						300		0.100 5.0													
						250	500	0.010 5.0													
						100		0.001 5.0													
2N718A	75	50	7	0.010	60	20		500.0 10.0	1.50	1.30	150			25		60		50			12.0
						40	120	150.0 10.0													
						35		10.0 10.0													
						20		0.100 10.0													

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	I _{CBO} (μA) Max	V _{CB} (V) ②	h _{FE} ③		I _C (mA) & V _{CE} (V)	V _{CE} (Sat) (V) & V _{BE} (Sat) (V) ④	I _C (mA)	V _{CE} (V) ⑤	I _{CES} (μA) ⑥	V _{CE} (V) ⑦	C _{ob} (pF)	f _T (MHz) ⑧	I _C (mA)	t _{off} (ns)	NF (dB) ⑨	Freq (MHz) ⑩				
2N915	70	50	5	0.010	60	50	200	10.0 5.0	1.00 0.90	10				4									
2N2511	80	50	7	0.005	60	240	750	10.0 5.0	1.00 0.90	5				6	45	5			4.0				
						120		0.010 5.0															
						80		0.001 5.0															
2N760	45	45	8	0.200	30	76	300	1.0 5.0	1.00 .60	1.10 10			8	50		1							
2N929	45	45	5	0.010	45		350	10.0 5.0	1.00 .60	1.00 10			8	30	1			4.0					
						60		0.500 5.0															
						40	120	0.010 5.0															
2N929A	60	45	6	0.002	45		350	10.0 5.0	0.50 .70	0.90 10			6	45	1			4.0					
						60		0.500 5.0															
						40	120	0.010 5.0															
						25		0.001 5.0															
2N930	80	45	5	0.010	45		600	10.0 5.0	1.00 .60	1.00 10		.01	45	8	30	1		3.0					
						150		0.500 5.0															
						100		0.010 5.0															
						300																	
2N2586	60	45	6	0.002	45		600	10.0 5.0	0.50 .70	0.90 10			7	45	1			3.5					
						150		0.500 5.0															
						120	360	0.010 5.0															
						80		0.001 5.0															
2N2897	60	45	7	0.050	60	35		1.0 10.0	1.00	1.30 150			15										
						50	200	150.0 10.0															
BC107	50	45	6	0.015	45	40		0.010 5.0	0.60	1.05 100			5	150	300	10		10.0 .001					
						110	450	2.0 5.0											0.25 0.83 10				
BC107A	50	45	6	0.015	45	110	220	2.0 5.0	0.60	1.05 100			5	150	300	10		10.0 .001					
																			0.25 0.83 10				
BC107B	50	45	6	0.015	45	40		0.010 5.0	0.60	1.05 100			5	150	300	10		10.0 .001					
						7 8	9 10	11 12 13 14											15 16	17 18	19 20 21 22	23 24 25	
BCY56	45	45	5	0.100	20	100		10.0 5.0		.60 2								5.0					
						100	450	2.0 5.0															
						40		0.010 5.0															
								5.0															
BCY59	45	7				40		100.0 1.0	0.35 .60	0.85 10		.01	45	6	125	10	800	6.0 .001					
						80	1000	10.0 1.0															
						120	630	2.0 5.0															
						20		0.010 5.0															
BCY59-10	45	7				60		100.0 1.0	0.35 .60	0.85 10		.01	45	6	125	10	800	6.0 .001					
						240	1000	10.0 1.0															
						380	630	2.0 5.0															
						100																	
BCY59-7	45	7				40		100.0 1.0	0.35 .60	0.85 10		.01	45	6	125	10	800	6.0 .001					
						80		10.0 1.0															
						120	220	2.0 5.0															

TO-18

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Type No.	V _{CBO} (V) Min	V _{CEO} (V) Min	V _{EBO} (V) Min	I _{CBO} (μA) Max	β	V _{CB} (V)	h _{FE}	β	I _C & V _{CE} (mA) (V)	V _{CE} (Sat) & V _{BE} (Sat) (V) (mA)	I _C	I _{CES} (μA) (V)	β	V _{CE} (V)	C _{ob} (pF)	Min	Max	t _T (MHz)	β	I _C (mA)	t _{off} (ns) Max	NF β Freq (dB) (MHz) Max		
BCY59-8		45	7				45		100.0	1.0	0.35	.60	0.85	10	.01	45		6	125		10	800	6.0	.001
							120	400	10.00	1.0	0.70	.75	1.20	100										
							180	310	2.0	5.0														
							20		0.010	5.0														
BCY59-9		45	7				60		100.0	1.0	0.35	.60	0.85	10	.01	45		6	125		10	800	6.0	.001
							160	630	10.0	1.0	0.70	.75	1.20	100										
							250	460	2.0	5.0														
							40		0.010	5.0														
BFY76	45	45	6	0.020	30	30	200	0.010	5.0	0.35				1			6							
						80		0.500	5.0															
						140		1.0	5.0															
2N2221A	75	40	6	0.010	60	25		500.0	10.0	0.30	.60	1.20	150			8	250		20	285				
						40	120	150.00	10.0	.60	2.00	500												
						35		10.0	10.0															
						25		1.0	10.0															
						20		0.100	10.0															
2N2222A	75	40	6	0.010	60	40		500.0	10.0	0.30	.60	1.20	150			8	250		20	285	4.0			
						50		150.0	1.0	1.00	.60	2.00	500											
						100	300	150.0	10.0															
						75		10.0	10.0															
						50		1.0	10.0															
35		0.100	10.0																					
2N3246	60	40	10	0.001	40		800	10.0	5.0	0.50	.70	0.90	5			5	60		180	1	2.0			
						400		1.0	5.0															
						350		0.500	5.0															
						300		0.100	5.0															
						200	600	0.010	5.0															
150		0.001	5.0																					
2N956	75	35	7	0.010	60	40		500.0	10.0	1.50		1.30	150			25	70		50		8.0			
						100	300	150.0	10.0															
						75		10.0	10.0															
						35		0.100	10.0															
						20		0.010	10.0															
BCY58		32	7			20		0.010	5.0	0.35	.60	0.85	10	.01	32		6	125		10	800	6.0	.001	
						40		00.0	1.0	0.70	.75	1.20	100											
						80	1000	10.0	1.0															
						120	630	2.0	5.0															
BCY58-10		32	7			60		00.00	1.0	0.35	.60	0.85	10	.01	32		6	125		10	800	6.0	.001	
						240	1000	10.0	1.0	0.70	.75	1.20	100											
						350	630	2.0	5.0															
						100		0.010	5.0															
BCY58-7		32	7			40		100.0	1.0	0.35	.60	0.85	10	.01	32		6	125		10	800	6.0	.001	
						80		10.0	1.0	0.70	.75	1.20	100											
						120	220	2.0	5.0															
BCY58-8		32	7			45		100.0	1.0	0.35	.60	0.85	10	.01	32		6	125		10	800	6.0	.001	
						120	400	10.0	1.0	0.70	.75	1.20	100											
						185	310	2.0	5.0															
						20		0.010	5.0															

2383394 0000196 769

TO-18

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	I _{CBO} (μA) Max	β ^②	V _{CB} (V)	h _{FE} ③	I _C & V _{CE} (mA) (V)	V _{CE} (Sat) & V _{BE} (Sat) ④	I _C (mA)	I _{CES} (μA) Max	V _{CE} (V) Max	C _{ob} (pF) Min	f _T (MHz) Min	f _T (MHz) Typ	I _C (mA) Max	t _{off} (ns) Max	NF ⑤ (dB) Max	Freq (MHz) Max
BCY58-9		32	7				40 160 630 250 400 40	100.0 10.0 2.0 0.010	1.0 1.0 5.0 5.0	0.35 0.70 0.85 1.20	10 100	.01 32	6	125		10	800	6.0	.001
2N718	60	30	5	1.0	30		40 120	150.0 10.0	1.50	1.30	150		35	50		15			
2N2221	60	30	5	0.010	50		20 20 40 120 35 25 20	500.0 10.0 150.0 1.0 150.0 10.0 10.0 10.0 1.0 10.0 .10 10.0	.40 1.30 1.60 2.60	150 500		8	250		20				
2N2222	60	30	5	0.010	50		30 50 100 300 75 50 35	500.0 10.0 150.0 1.0 150.0 10.0 10.0 10.0 1.0 10.0 0.100 10.0	0.40 1.60 .60	1.30 2.60	150 500		8	250		20			
2N3301	60	30	5	0.010	50		20 20 40 120 35 25 20	500.0 10.0 150.0 1.0 150.0 10.0 10.0 10.0 1.0 10.0 0.100 10.0	0.22 0.60	1.10 1.50	150 500		8	250		50	150		
2N3302	60	30	5				50 50 100 300 75 50 35	500.00 10.0 150.00 1.0 150.0 10.0 10.0 10.0 1.0 10.0 0.100 10.0	0.22 0.60 0.45	1.10 1.50 1.30	150 500 300	.01 50	8	250		50	150		
2N4384	40	30	5	0.010	30		150 120 100 500 60	10.0 5.0 1.0 5.0 0.010 5.0 0.001 5.0	0.20 .65	0.80 10		8	30	120	1		2.0		
2N4386	40	30	5	0.010	30		120 100 40 500	10.0 5.0 1.0 5.0 0.010 5.0	0.20 .65	0.80 10		8	30	120	1		3.0		
2N916	45	25	5	0.010	30		50 200	10.0 1.0	0.50	0.90 10		6							
BC108	30	25	5	0.015	25		40 110 800	0.010 5.0 2.0 5.0	0.60 0.25	1.05 0.83	100 10		5	150 300		10		10.0	.001
BC108A	30	25	5	0.015	25		40 110 220	0.010 5.0 2.0 5.0	0.60 0.25	1.05 0.83	100 10		5	150 300		10		10.0	.001
BC108B	30	25	5	0.015	25		40 200 450	0.010 5.0 2.0 5.0	0.60 0.25	1.05 0.83	100 10		5	150 300		10		10.0	.001
BC108C	30	25	5	0.015	25		40 420 800	0.010 5.0 2.0 5.0	0.60 0.25	1.05 0.83	100 10		5	150 300		10		10.0	.001

2383394 0000197 675

TO-18

METAL-CAN PACKAGE TRANSISTORS (NPN)

Maximum Ratings						Electrical Characteristics												(Ta=25°C, Unless Otherwise Specified)			
Type No.	V _{CB0} (V) Min	V _{CE0} (V) Min	V _{EB0} (V) Min	I _{CB0} (μA) Max	V _{CB} (V) Max	h _{FE}		I _C (mA)	V _{CE} (V)	V _{CE} (Sat) (V) Max	V _{BE} (Sat) (V) Min	I _C (mA) Max	I _{CES} (μA) Max	V _{CE} (V) Max	C _{ob} (pF) Min	f _T (MHz)		I _C (mA) Max	t _{off} (ns) Max	NF (dB)	Freq (MHz)
BC109	30	25	5	0.015	25	100		0.010	5.0	0.60	1.05	100			5	150	300	10		4.0	.001
						200	800	2.0	5.0	0.25	0.83	10									
BC109B	30	25	5	0.015	25	100		0.010	5.0	0.60	1.05	100			5	150	300	10		4.0	.001
						200	450	2.0	5.0	0.25	0.83	10									
BC109C	30	25	5	0.015	25	100		0.010	5.0	0.60	1.05	100			5	150	300	10		4.0	.001
						420	800	2.0	5.0	0.25	0.83	10									
BSX48	50	25	5	0.120	50	17		100.0	1.0	1.50	1.50	500			6	250		30			
2N835	40	20	5	0.500	20	25		10.0	1.0	0.30	0.90	10			4	350		10			
										0.40		50									
2N3115	60	20	5	0.025	50	40	120	150.0	10.0	0.50	1.30	150			8	250		20	500		
2N3116	60	20	5	0.025	50	100	300	150.0	10.0	0.50	1.30	150			8	250		20	500		
BCY57	25	20	5	0.100	20	200		10.0	5.0	.60		2								5.0	
						200	800	2.0	5.0												
						100		0.010	5.0												
									5.0												
2N706	25	15	5	0.500	15	20		10.0	1.0	0.60	.70	0.90	10		6	200		10	75		
#2N706A		15	5	0.500	15	20	60	10.0	1.0	0.60	.70	0.90	10		6	200		10	75		
2N708	40	15	5	0.025	20	30	120	10.0	1.0	0.40	.72	0.80	10		6	300		10	70		
						15		0.500	1.0												
2N2368	40	15	5	0.400	20	20	60	10.0	1.0	0.25	.70	0.85	10		4	400		10			
						10		100.0	1.0												
2N2369	40	15	5	0.400	20	20	120	100.0	2.0	0.25	.70	0.85	10		4	500		10	30		
						40	120	10.0	1.0												
2N2369A	40	15	5	0.400	20	20	120	100.0	1.0	0.20	.70	0.85	10		4	500		10	18		
						30	120	30.0	0.4	0.25	.70	1.50	30								
						40	120	10.0	1.0	0.50	.70	1.60	100								
						40	120	10.0	0.4												
2N2615	30	15	3	0.001	15	20		3.0	1.0	0.40		10			3		500			6.0	
2N2616	30	15	3	0.001	15	10		3.0	1.0	0.40		10			3		600			6.0	
2N783	40		5	0.250	25	20	60	10.0	1.0	0.25	.70	0.90	10		4						
2N839	45		2	1.0	45	15	50	10.0	5.0	2.00		10			15						