

Type No.	Case Style	V <sub>CES</sub> * V <sub>CB0</sub> (V) Min	V <sub>CEO</sub> (V) Min	V <sub>EB0</sub> (V) Min	I <sub>CES</sub> * I <sub>CB0</sub> (mA) @ V <sub>CB</sub> (V) Max	H <sub>FE</sub> h <sub>FE</sub> @ I <sub>C</sub> (mA) V <sub>CE</sub> (V)			V <sub>CE(SAT)</sub> (V) & V <sub>BE(SAT)</sub> (V) @ I <sub>C</sub> (mA)	C <sub>ob</sub> (pF) Max	f <sub>T</sub> (MHz) @ I <sub>C</sub> (mA)		t <sub>off</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
						Min	Max	1 kHz*			Max	Min				
BC327	TO-92 (97)	50*	45	5	100* 45	40 100	300 600	1 100	0.7		500 300					67
BC327A	TO-92 (97)	60*	60	5	100* 45	40 100	300 400	1 100	0.7		300 500					67
BC327-10	TO-92 (97)	50*	45	5	100* 45	40 63	300 160	1 100	0.7		500 300					67
BC327-16	TO-92 (97)	50*	45	5	100* 45	40 100	300 250	1 100	0.7		500 300					67
BC327-25	TO-92 (97)	50*	45	5	100* 45	40 160	300 400	1 100	0.7		500 300					67
BC328	TO-92 (97)	30*	25	5	100* 25	40 100	300 600	1 100	0.7		500 300					67
BC328-10	TO-92 (97)	30*	25	5	100* 25	40 63	300 160	1 100	0.7		500 300					67
BC328-16	TO-92 (97)	30*	25	5	100* 25	40 100	300 250	1 100	0.7		500 300					67
BC328-25	TO-92 (97)	30*	25	5	100* 25	40 160	300 400	1 100	0.7		500 300					67
BC337	TO-92 (97)	50*	45	5	100 20	100 40	600 500	100 1	0.7		500					12
BC337A	TO-92 (97)	60*	60	5	100 20	100 40	400 500	100 1	0.7		500					12
BC337-16	TO-92 (97)	50*	45	5	100 20	100 40	250 500	100 1	0.7		500					12
BC337-25	TO-92 (97)	50*	45	5	100 20	160 40	400 500	100 1	0.7		500					12

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## Bipolar Pro Electron Series (Continued)

Type No.	Case Style	V <sub>CES</sub> <sup>*</sup> V <sub>CB0</sub> (V) Min	V <sub>CEO</sub> (V) Min	V <sub>EBO</sub> (V) Min	I <sub>CES</sub> <sup>*</sup> I <sub>CB0</sub> (nA) @ Max	V <sub>CB</sub> (V) Min	h <sub>FE</sub> @ 1 kHz		I <sub>C</sub> (mA) @	V <sub>CE</sub> (V) Min	V <sub>CE(SAT)</sub> (V) Max	V <sub>BE(SAT)</sub> V <sub>BE(ON)</sub> (V) @		I <sub>C</sub> (mA) Max	C <sub>ob</sub> (pF) Max	f <sub>T</sub> (MHz) @ I <sub>C</sub> (mA)		t <sub>off</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.	
							Min	Max				Min	Max			Min	Max					Min
BC338	TO-92 (97)	30*	20	5	100	20	100	600	100	1	0.7			500								12
BC338-16	TO-92 (97)	30*	20	5	100	20	100	250	100	1	0.7			500								12
BC338-25	TO-92 (97)	30*	20	5	100	20	100	250	100	1	0.7			500								12
BC368	TO-92 (94)	25*	20	5	10 μA	25	60		5	10	0.5			1A								37
							85	375	500	1												77
							60		1A	1												
BC369	TO-92 (94)	25*	20	5	10 μA	25	50		5	10	0.5			1A								77
							85	375	500	1												
							60		1A	1												
BC546	TO-92 (97)	80	65	6	15	30	110	800	2	5	0.25			10					10	(Notes 1, 11)		11
											0.6			100								
BC546A	TO-92 (97)	80	65	6	15	30	110		0.01	5	0.25			10					10	(Notes 1, 11)		11
								220	2	5	0.6			100								
BC546B	TO-92 (97)	80	65	6	15	30	200		0.01	5	0.25			10					10	(Notes 1, 11)		11
								450	2	5	0.6			100								
BC547	TO-92 (97)	50	45	6	10	20					0.25		0.77*	10	4.5				10	(Notes 1, 11)		10
											0.6			100								
							125	900*	2	5			0.55	0.70*	2							
BC547A	TO-92 (97)	50	45	6	10	20					0.25		0.77*	10	4.5				10	(Notes 1, 11)		10
											0.6			100								
							125	260*	2	5			0.55	0.70*	2							
BC547B	TO-92 (97)	50	45	6	10	20					0.25		0.77*	10	4.5				10	(Notes 1, 11)		10
											0.6			100								
							240	500*	2	5			0.55	0.70*	2							
BC547C	TO-92 (97)	50	45	5	15	30					0.25		0.77*	10	4.5				10	(Notes 1, 11)		10
											0.6			100								
							420	900	2	5			0.55	0.70*	2							

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### Bipolar Pro Electron Series (Continued)

Type No.	Case Style	V <sub>CE(SAT)</sub> V <sub>CE(O)</sub> (V) Min	V <sub>CE(O)</sub> (V) Min	V <sub>BE(O)</sub> (V) Min	I <sub>CE(SAT)</sub> I <sub>CE(O)</sub> (mA) @ V <sub>CE</sub> (V) Max	H <sub>FE</sub> h <sub>FE</sub> 1 kHz* Min		I <sub>C</sub> (mA) @ V <sub>CE</sub> (V) Max	V <sub>CE(SAT)</sub> (V) & Max	V <sub>BE(SAT)</sub> V <sub>BE(ON)</sub> (V) @ I <sub>C</sub> (mA) Max		C <sub>ob</sub> (pF) Max	f <sub>T</sub> (MHz) @ I <sub>C</sub> (mA) Max		t <sub>off</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
						Min	Max			Min	Max		Min	Max				
BC548	TO-92 (97)	30	20	5	10 20				0.25 0.6	0.77* 0.70*	10 100 2	4.5			10	(Note 1)	10	
BC548A	TO-92 (97)	30	20	5	10 20	125	900*	2	5	0.55	0.70*	2	4.5			10	(Note 1)	10
BC548B	TO-92 (97)	30	20	5	10 20	240	500*	2	5	0.55	0.70*	2	4.5			10	(Note 1)	10
BC548C	TO-92 (97)	30	20	5	10 20	450	900*	2	5	0.55	0.70*	2	4.5			10	(Note 1)	10
BC549	TO-92 (97)	30	20	5	10 20	240	900*	2	5	0.55	0.70*	2	4.5			4	(Note 1)	10
BC549B	TO-92 (97)	30	20	5	10 20	240	500*	2	5	0.55	0.70*	2	4.5			4	(Note 1)	10
BC549C	TO-92 (97)	30	20	5	10 20	450	900*	2	5	0.55	0.70*	2	4.5			4	(Note 1)	10
BC550	TO-92 (97)	50	45	5	10 45	240	900*	2	5	0.55	0.70*	2				3	(Note 1)	10
BC550B	TO-92 (97)	50	45	5	10 45	240	500*	2	5	0.55	0.70*	2				3	(Note 1)	10
BC556	TO-92 (97)	80	65	5	15 30	75	475	2	5	0.3		10				10	(Note 1)	69
										0.65		100						

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Bipolar Pro Electron Series (Continued)

Type No.	Case Style	V <sub>CES</sub> * V <sub>CB0</sub> (V) Min	V <sub>CEO</sub> (V) Min	V <sub>EBO</sub> (V) Min	I <sub>CES</sub> * I <sub>CB0</sub> @ V <sub>CB</sub> (nA) (V) Max	h <sub>FE</sub>		I <sub>C</sub> (mA)	V <sub>CE</sub> (V)	V <sub>CE(SAT)</sub> (V) & Max	V <sub>BE(SAT)</sub> V <sub>BE(ON)*</sub> @ I <sub>C</sub> (V) (mA)		C <sub>ob</sub> (pF) Max	f <sub>T</sub> (MHz) @ I <sub>C</sub> (mA)		t <sub>off</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
						Min	Max				Min	Max		Min	Max				
BC556A	TO-92 (97)	80	65	5	15 30	125	250	2	5	0.3 0.65	10 100					10	(Note 1)	69	
BC556B	TO-92 (97)	80	65	5	15 30	220	475	2	5	0.3 0.65	10 100					10	(Note 1)	69	
BC557	TO-92 (97)	50	45	5	100 20	75	900*	2	5	0.3 0.65	0.82* 100 0.6 0.75* 2					10	(Note 1)	68	
BC557A	TO-92 (97)	50	45	5	100 20	125	260*	2	5	0.3 0.65	0.82* 100 0.6 0.75* 2					10	(Note 1)	68	
BC557B	TO-92 (97)	50	45	5	100 20	240	500*	2	5	0.3 0.65	0.82* 100 0.6 0.75* 2					10	(Note 1)	68	
BC558	TO-92 (97)	30	25	5	100 20	75	500*	2	5	0.3 0.65	0.82* 100 0.6 0.75* 2					10	(Note 1)	68	
BC558A	TO-92 (97)	30	25	5	100 20	125	260*	2	5	0.3 0.65	0.82* 100 0.6 0.75* 2					10	(Note 1)	68	
BC558B	TO-92 (97)	30	25	5	100 20	240	500*	2	5	0.3 0.65	0.82* 100 0.6 0.75* 2					10	(Note 1)	68	
BC558C	TO-92 (97)	30	25	5	100 20	450	900*	2	5	0.3 0.65	0.82* 100 0.6 0.75* 2					10	(Note 1)	68	
BC559	TO-92 (97)	25	20	5	100 20	125	500*	2	5	0.3 0.65	0.82* 100 0.6 0.75* 2					4	(Note 1)	68	

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**Bipolar Pro Electron Series** (Continued)

Type No.	Case Style	V <sub>CE(S)</sub> V <sub>CE(S)</sub> Min	V <sub>CE(O)</sub> V <sub>CE(O)</sub> Min	V <sub>EB(O)</sub> V <sub>EB(O)</sub> Min	I <sub>CE(S)</sub> I <sub>CE(S)</sub> (nA) @ Max	V <sub>CB</sub> (V)	H <sub>FE</sub> h <sub>FE</sub> 1 kHz* @		I <sub>C</sub> (mA)	V <sub>CE</sub> (V)	V <sub>CE(SAT)</sub> (V) & Max	V <sub>BE(SAT)</sub> V <sub>BE(ON)</sub> * (V) @		I <sub>C</sub> (mA)	C <sub>ob</sub> (pF) Max	f <sub>T</sub> (MHz) @		I <sub>C</sub> (mA)	t <sub>off</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.		
							Min	Max				Min	Max			Min	Max						Min	Max
BC559B	TO-92 (97)	25	20	5	100	20					0.3	0.82*	10								4	(Note 1)	68	
							240	500*	2	5	0.65	0.6	0.75*	100	2									
BC559C	TO-92 (97)	25	20	5	100	20					0.3	0.82*	10								4	(Note 1)	68	
							450	900*	2	5	0.65	0.6	0.75*	100	2									
BC560	TO-92 (97)	50	45	5	100	45					0.3	0.82*	10								3	(Note 1)	68	
							125	500*	2	5	0.65	0.6	0.75*	100	2									
BC560B	TO-92 (97)	50	45	5	100	45					0.3	0.82*	10								3	(Note 1)	68	
							240	500*	2	5	0.65	0.6	0.75*	100	2									
BC635	TO-92 (94)	45	45	5			25		5	2	0.5		500											38
							40	250	150	2														
							25		500	2														
BC636	TO-92 (94)	45	45	5	100	30	25		5	2	0.5		500											78
							40	250	150	2														
							25		500	2														
BC637	TO-92 (94)	60	60	5			25		5	2	0.5		500										38	
							40	250	150	2														
							25		500	2														
BC638	TO-92 (94)	60	60	5	100	30	25		5	2	0.5		500										78	
							40	250	150	2														
							25		500	2														
BC639	TO-92 (94)	100	80	5			25		5	2	0.5		500										39	
							40	250	150	2														
							25		500	2														
BC640	TO-92 (94)	100	80	5	100	30	25		5	2	0.5		500										79	
							40	250	150	2														
							25		500	2														
BC807	TO-236 (49)	50*	45	5	100	20	100	600	100	1	0.7		500										67	
							40		500	1														

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## Bipolar Pro Electron Series (Continued)

Type No.	Case Style	V <sub>CES</sub> * V <sub>CB0</sub> (V) Min	V <sub>CEO</sub> (V) Min	V <sub>EBO</sub> (V) Min	I <sub>CES</sub> * I <sub>CB0</sub> (nA) Max	V <sub>CB</sub> (V) Min	H <sub>FE</sub> h <sub>FE</sub> @ I <sub>C</sub>		V <sub>CE</sub> (V) Min	V <sub>CE(SAT)</sub> (V) & Max	V <sub>BE(SAT)</sub> (V) & V <sub>BE(ON)</sub> * (V) @ I <sub>C</sub>		I <sub>C</sub> (mA) Max	C <sub>ob</sub> (pF) Max	f <sub>T</sub> (MHz) @ I <sub>C</sub>		t <sub>off</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
							Min	Max			Min	Max			Min	Max				
BC807-16	TO-236 (49)	50*	45	5	100	20	100	250	100	1	0.7		500							67
BC807-25	TO-236 (49)	50*	45	5	100	20	160	400	100	1	0.7		500							67
BC807-40	TO-236 (49)	50*	45	5	100	20	250	600	100	1	0.7		500							67
BC808	TO-236 (49)	30*	25	5	100	20	100	600	100	1	0.7		500							67
BC808-16	TO-236 (49)	30*	25	5	100	20	100	250	100	1	0.7		500							67
BC808-25	TO-236 (49)	30*	25	5	100	20	160	400	100	1	0.7		500							67
BC808-40	TO-236 (49)	30*	25	5	100	20	250	600	100	1	0.7		500							67
BC817	TO-236 (49)	30*	25	5	100	20	100	600	100	1	0.7		500							12
BC817-16	TO-236 (49)	30*	25	5	100	20	100	250	100	1	0.7		500							12
BC817-25	TO-236 (49)	30*	25	5	100	20	160	400	100	1	0.7		500							12
BC817-40	TO-236 (49)	30*	25	5	100	20	250	600	100	1	0.7		500							12
BC818	TO-236 (49)	30*	25	5	100	20	100	600	100	1	0.7		500							12
BC818-16	TO-236 (49)	30*	25	5	100	20	100	250	100	1	0.7		500							12
BC818-25	TO-236 (49)	30*	25	5	100	20	160	400	100	1	0.7		500							12

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## Bipolar Pro Electron Series (Continued)

Type No.	Case Style	V <sub>CES</sub> * V <sub>CB0</sub> (V) Min	V <sub>CEO</sub> (V) Min	V <sub>EBO</sub> (V) Min	I <sub>CES</sub> * I <sub>CB0</sub> @ V <sub>CB</sub> (mA) (V)		H <sub>FE</sub> h <sub>fe</sub> 1 kHz* @ I <sub>C</sub> Min Max (mA)		V <sub>CE</sub> (V)	V <sub>CE(SAT)</sub> (V) & Max	V <sub>BE(SAT)</sub> V <sub>BE(ON)*</sub> (V) @ I <sub>C</sub> Min Max (mA)		C <sub>ob</sub> (pF) Max	f <sub>T</sub> (MHz) @ I <sub>C</sub> Min Max (mA)		t <sub>off</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
					Max	Max	Min	Max			Min	Max		Min	Max				
BC818-40	TO-236 (49)	30*	25	5	100	20	250 40	600	100 500	1 1	0.7		500						12
BC846	TO-236 (49)	80	65	6	15	30	110		0.01	5	0.25		10				10	(Note 1)	11
							800		2	5	0.6		100						
BC846-A	TO-236 (49)	80	65	6	15	30	110		0.01	5	0.25		10				10	(Note 1)	11
							220		2	5	0.6		100						
BC846-B	TO-236 (49)	80	65	6	15	30	200		0.01	5	0.25		10				10	(Note 1)	11
							450		2	5	0.6		100						
BC847	TO-236 (49)	50	45	6	15	30	110		0.01	5	0.25		10				10	(Note 1)	10
							800		2	5	0.6		100						
BC847-A	TO-236 (49)	50	45	6	15	30	110		0.01	5	0.25		10				10	(Note 1)	10
							220		2	5	0.6		100						
BC847-B	TO-236 (49)	50	45	6	15	30	200		0.01	5	0.25		10				10	(Note 1)	10
							450		2	5	0.6		100						
BC848	TO-236 (49)	30	30	5	15	30	110		0.01	5	0.25		10				10	(Note 1)	10
							800		2	5	0.6		100						
BC848-A	TO-236 (49)	30	30	5	15	30	110		0.01	5	0.25		10				10	(Note 1)	10
							220		2	5	6		100						
BC848-B	TO-236 (49)	30	30	5	15	30	200		0.01	5	0.25		10				10	(Note 1)	10
							450		2	5	6		100						
BC848-C	TO-236 (49)	30	30	5	15	30	420		0.01	5	0.25		10				10	(Note 1)	10
							800		2	5	6		100						

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Bipolar Pro Electron Series (Continued)

Type No.	Case Style	V <sub>CES</sub> <sup>*</sup> V <sub>CB0</sub> (V) Min	V <sub>CEO</sub> (V) Min	V <sub>EBO</sub> (V) Min	I <sub>CES</sub> <sup>*</sup> I <sub>CB0</sub> (nA) Max	V <sub>CB</sub> (V) Max	H <sub>FE</sub> h <sub>FE</sub> 1 kHz <sup>*</sup>		I <sub>C</sub> (mA) @	V <sub>CE</sub> (V)	V <sub>CE(SAT)</sub> (V) & Max	V <sub>BE(SAT)</sub> V <sub>BE(ON)</sub> <sup>*</sup> (V) Min Max		I <sub>C</sub> (mA) @	C <sub>ob</sub> (pF) Max	f <sub>T</sub> (MHz) @ I <sub>C</sub> (mA)		t <sub>off</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
							Min	Max				Min	Max			Min	Max				
BC849	TO-236 (49)	30	30	5	15	30	200	0.01	5	0.25			10					4	(Note 1)	10	
							800	2	5	6	100										
BC849B	TO-236 (49)	30	30	5	15	30	200	0.01	5	0.25			10					4	(Note 1)	10	
							450	2	5	0.6	100										
BC849C	TO-236 (49)	30	30	5	15	30	420	0.01	5	0.25			10					4	(Note 1)	10	
							800	2	5	0.6	100										
BC850	TO-236 (49)	50	45	5	15	30	200	0.01	5	0.25			10					3	(Note 1)	10	
							800	2	5	0.6	100										
BC850-B	TO-236 (49)	50	45	5	15	30	200	0.01	5	0.25			10						(Note 1)	10	
							450	2	5	6	100										
BC856	TO-236 (49)	80	65	5	15	30	75	475	2	5	0.3		10					10	(Note 1)	69	
												0.65	100								
BC856-A	TO-236 (49)	80	65	5	15	30	125	250	2	5	0.3		10					10	(Note 1)	69	
												0.65	100								
BC856-B	TO-236 (49)	80	65	5	15	30	220	475	2	5	0.3		10					10	(Note 1)	69	
												0.65	100								
BC857	TO-236 (49)	50	45	5	15	30	75	475	2	5	0.3		10					10	(Note 1)	68	
												0.65	100								
BC857-A	TO-236 (49)	50	45	5	15	30	125	250	2	5	0.3		10					10	(Note 1)	68	
												0.65	100								

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**Bipolar Pro Electron Series** (Continued)

Type No.	Case Style	V <sub>CES</sub> <sup>*</sup> V <sub>CB0</sub> (V) Min	V <sub>CEO</sub> (V) Min	V <sub>EBO</sub> (V) Min	I <sub>CES</sub> <sup>*</sup>		H <sub>FE</sub>			V <sub>CE</sub> (V)	V <sub>CE(SAT)</sub> (V) & Max	V <sub>BE(SAT)</sub> V <sub>BE(ON)</sub> <sup>*</sup> (V) @		I <sub>C</sub> (mA)	C <sub>ob</sub> (pF) Max	f <sub>T</sub> (MHz) @		t <sub>off</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
					I <sub>CB0</sub> (nA) Max	V <sub>CB</sub> (V)	Min	Max	@			I <sub>C</sub> (mA)	Min			Max	Min				
BC857-B	TO-236 (49)	50	45	5	15	30	220	475	2	5	0.3			10					10	(Note 1)	68
											0.65			100							68
BC858	TO-236 (49)	30	30	5	15	30	75	800	2	5	0.3			10					10	(Note 1)	68
											0.65			100							68
BC858-B	TO-236 (49)	30	30	5	15	30	220	475	2	5	0.3			10					10	(Note 1)	68
											0.65			100							68
BC858-C	TO-236 (49)	30	30	5	15	30	420	800	2	5	0.3			10					10	(Note 1)	68
											0.65			100							68
BC859	TO-236 (49)	30	30	5	15	30	220	800	2	5	0.65			100					4	(Note 1)	68
BC859-A	TO-236 (49)	30	30	5	15	30	125	250	2	5	0.65			100					4	(Note 1)	68
BC859-B	TO-236 (49)	30	30	5	15	30	220	475	2	5	0.65			100					4	(Note 1)	68
BC859-C	TO-236 (49)	30	30	5	15	30	420	800	2	5	0.65			100					4	(Note 1)	68
BC860	TO-236 (49)	50	45	5	15	30	220	800	2	5	0.3			10					3	(Note 1)	68
											0.65			100							68
BC860-B	TO-236 (49)	50	45	5	15	30	220	475	2	5	0.3			10					3	(Note 1)	68
											0.65			100							68
BCF29	TO-236 (49)	32	32	5	100	32	120		0.01	5	0.3			10					4	(Note 1)	68
								260	2	5											68
BCF30	TO-236 (49)	32	32	5	100	32	200		0.01	5	0.25			10					4	(Note 1)	68
								450	2	5											68
BCF32	TO-236 (49)	50	45	5	100	20	215		0.01	5	0.3			10					4	(Note 1)	10
								500	2	5											10

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Bipolar Pro Electron Series (Continued)

Type No.	Case Style	V <sub>CE(S)</sub> V <sub>CB0</sub> (V) Min	V <sub>CEO</sub> (V) Min	V <sub>EBO</sub> (V) Min	I <sub>CE(S)</sub> I <sub>CB0</sub> (nA) @ V <sub>CB</sub> (V) Max	H <sub>FE</sub> h <sub>FE</sub> 1 kHz*			V <sub>CE</sub> (V)	V <sub>CE(SAT)</sub> (V) & V <sub>BE(ON)</sub> (V) @ I <sub>C</sub> (mA) Max	V <sub>BE(SAT)</sub> (V) @ I <sub>C</sub> (mA) Max	C <sub>ob</sub> (pF) Max	f <sub>T</sub> (MHz) @ I <sub>C</sub> (mA)		t <sub>off</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
						Min	Max	@ I <sub>C</sub> (mA)					Min	Max				
BCF33	TO-236 (49)	50	45	5	100 20	200		0.01	5	0.3						4	(Note 1)	10
						450		2	5									
BCF70	TO-236 (49)	50	45	5	100 20	215		0.01	5	0.3						4	(Note 1)	10
						500		2	5									
BCV26	TO-236 (49)	40	30	10	100 30	4,000		1	5	1.0	1.5	100						61
						10,000		10	5									
						20,000		100	5									
BCV27	TO-236 (49)	40	30	10	100 30	4,000		1	5	1.0	1.5	100						05
						10,000		10	5									
						20,000		100	5									
BCV71	TO-236 (49)	80	60	5	100 20	110	220	2	5	0.25		10				10	(Note 1)	11
BCV72	TO-236 (49)	80	60	5	100 20	200	450	2	5	0.25		10				10	(Note 1)	11
BCW29	TO-236 (49)	32	32	5	100 32	120		0.01	5	0.3		10				10	(Note 1)	68
						260		2	5									
BCW30	TO-236 (49)	32	32	5	100 32	215		0.01	5	0.3		10				10	(Note 1)	68
						500		2	5									
BCW31	TO-236 (49)	32	32	5	100 32	150		0.01	5	0.25		10				10	(Note 1)	10
						270		2										
BCW32	TO-236 (49)	32	32	5	100 32	200		0.01	5	0.25		10				10	(Note 1)	10
						420		2										
BCW33	TO-236 (49)	32	32	5	100 32	450		0.01	5	0.25		10				10	(Note 1)	10
						800		2										
BCW60	TO-236 (49)	32*	32	5	20 32	50		50	1	0.35	0.6	0.85	50	125	10	6	(Note 1)	10
						120	630	2	5									
BCW61	TO-236 (49)	32*	32	5	20 32	50		50	1	0.25	0.6	0.85	50			6	(Note 1)	68
						120	630	2	5									
BCW65	TO-236 (49)	60	32	5	20* 32	35		0.1	10		2.0	500	12	100	20	10	(Note 1)	10
						75	220	10	1									
						100	250	100	1									
						35		500	1									

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**Bipolar Pro Electron Series** (Continued)

Type No.	Case Style	V <sub>CES</sub> * V <sub>CB0</sub> (V) Min	V <sub>CEO</sub> (V) Min	V <sub>EBO</sub> (V) Min	I <sub>CES</sub> * I <sub>CB0</sub> (nA) Max	V <sub>CB</sub> (V) Min	H <sub>FE</sub> h <sub>fe</sub> @ I <sub>C</sub> (mA)		V <sub>CE</sub> (V)	V <sub>CE(SAT)</sub> (V) & Max	V <sub>BE(SAT)</sub> V <sub>BE(ON)</sub> * (V) @ I <sub>C</sub> (mA)		C <sub>ob</sub> (pF) Max	f <sub>T</sub> (MHz) @ I <sub>C</sub> (mA)		t <sub>off</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.	
							Min	Max			Min	Max		Min	Max					Min
BCW66	TO-236 (49)	75	45	5	20*	45	35	0.1	10		2.0 500		12	100	20		10	(Note 1)	10	
							75	10	1											
							100	250	100											1
							35	500	1											
BCW68	TO-236 (49)	75	45	5	20*	45	35	0.1	10		2.0 500		12	100	20		10	(Note 1)	10	
							75	10	1											
							100	250	100											1
							35	500	1											
BCW69	TO-236 (49)	50	45	5	100	20	120	260	2	5	0.3		10			10	(Note 1)	68		
BCW70	TO-236 (49)	50	45	5	100	20	215	500	2	5	0.3		10			10	(Note 1)	68		
BCW71	TO-236 (49)	50	45	5	100	20	110	220	2	5	0.25		10			10	(Note 1)	68		
BCW72	TO-236 (49)	50	45	5	100	20	200	450	2	5	0.25		10			10	(Note 1)	68		
BCW81	TO-236 (49)	50	45	5	100	20	420	800	2	5	0.25		10			10	(Note 1)	10		
BCW89	TO-236 (49)	80	60	5	100	20	120	260	2	5	0.3		10			10	(Note 1)	68		
BCX17	TO-236 (49)	50*	45	5	100	20	100	600	100	1	0.62	500								67
							70	300	1											
							40	500	1											
BCX18	TO-236 (49)	30*	25	5	100	20	100	600	100	1	0.62	500								67
							70	300	1											
							40	500	1											
BCX19	TO-236 (49)	50*	45	5	100	20	100	600	100	1	0.62	1.2 500								12
							70	300	1											
							40	500	1											
BCX20	TO-236 (49)	30*	25	5	100	20	100	600	100	1	0.62	1.2 500								12
							70	300	1											
							40	500	1											

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Bipolar Pro Electron Series (Continued)

Type No.	Case Style	$V_{CES}^*$	$V_{CEO}$	$V_{EBO}$	$I_{CES}^*$	$I_{CBO}$ @ $V_{CB}$	$H_{FE}$		$I_C$	$V_{CE}$	$V_{CE(SAT)}$ (V) & Max	$V_{BE(SAT)}$ / $V_{BE(ON)}^*$		$I_C$	$C_{ob}$ (pF) Max	$f_T$ (MHz) @ $I_C$		$t_{off}$ (ns) Max	NF (dB) Max	Test Conditions	Process No.
		$V_{CB0}$ (V) Min	(V) Min	(V) Min	(nA) @ (V) Max		Min	Max				Min	Max			Min	Max				
BCX58	TO-92 (97)		32	7	10	32	120	630	2	5					125	10	800	6	(Notes 3 & 4)	10	
							80	1000	10	1											
							40		100	1											
BCX58-7	TO-92 (97)		32	7	10	32	120	220	2	5					125	10	800	6	(Notes 3 & 4)	10	
							80		10	1											
							40		100	1											
BCX58-8	TO-92 (97)		32	7	10	32	20		0.01	5					125	10	800	6	(Notes 3 & 4)	10	
							180	310	2	5											
							120	400	10	1											
							45		100	1											
BCX58-9	TO-92 (97)		32	7	10	32	40		0.01	5					125	10	800	6	(Notes 3 & 4)	10	
							250	460	2	5											
							160	630	10	1											
							60		100	1											
BCX58-10	TO-92 (97)		32	7	10	32	100		0.01	5					125	10	800	6	(Notes 3 & 4)	10	
							380	630	2	5											
							240	1000	10	1											
							60		100	1											
BCX59	TO-92 (97)		45	7			120	630	2	5	0.5	1.0	100		125	10	800		(Note 5)	10	
							80	1000	10	1											
							40		100	1											
BCX59-7	TO-92 (97)		45	7			120	220	2	5	0.5	1.0	100		125	10	800		(Note 5)	10	
							80		10	1											
							40		100	1											
BCX59-8	TO-92 (97)		45	7			20		0.01	5	0.5	1.0	100		125	10	800		(Note 5)	10	
							180	310	2	5											
							120	400	10	1											
							45		100	1											

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**Bipolar Pro Electron Series** (Continued)

Type No.	Case Style	V <sub>CES</sub> <sup>*</sup> V <sub>CB0</sub> (V) Min	V <sub>CEO</sub> (V) Min	V <sub>EBO</sub> (V) Min	I <sub>CES</sub> <sup>*</sup> I <sub>CB0</sub> @ V <sub>CB</sub> (V)		H <sub>FE</sub> h <sub>FE</sub> @ I <sub>C</sub> V <sub>CE</sub> (V)			V <sub>CE(SAT)</sub> (V) & Max	V <sub>BE(SAT)</sub> V <sub>BE(ON)</sub> <sup>*</sup> @ I <sub>C</sub> (mA)		C <sub>ob</sub> (pF) Max	f <sub>T</sub> (MHz) @ I <sub>C</sub> (mA)		t <sub>off</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.		
					Max	Max	Min	Max	Min		Max	Min		Max							
BCX59-9	TO-92 (97)		45	7			40	0.01	5	0.5	1.0	100		125	10	800		(Note 5)	10		
							250	460	2											5	
							160	630	10											1	
							60	100	1											1	
BCX59-10	TO-92 (97)		45	7			100	0.01	5	0.5	1.0	100		125	10	800		(Note 5)	10		
							380	630	2											5	
							240	1000	10											1	
							60	100	1											1	
BCX70G	TO-236 (49)	45	45	5	20	32	120	220	2	5	0.55	0.7	1.05	50	4.5	125	10	800	6	(Notes 17, 19)	10
							60	50	1	1											
BCX70H	TO-236 (49)	45	45	5	20	32	180	310	2	5	0.55	0.7	1.05	50	4.5	125	10	800	6	(Notes 17, 19)	10
							70	50	1	1											
							20	0.01	5	5											
BCX70J	TO-236 (49)	45	45	5	20	32	250	460	2	5	0.55	0.7	1.05	50	4.5	125	10	800	6	(Notes 17, 19)	10
							90	50	1	1											
							40	0.01	5	5											
BCX71G	TO-236 (49)	45	45	5	20	32	120	220	2	5	0.55	0.7	1.05	50	4.5	125	10	800	6	(Notes 17, 19)	68
							60	50	1	1											
BCX71H	TO-236 (49)	45	45	5	20	32	180	310	2	5	0.55	0.7	1.05	50	4.5	125	10	800	6	(Notes 17, 19)	68
							70	50	1	1											
							20	0.01	5	5											
BCX71J	TO-236 (49)	45	45	5	20	32	250	460	2	5	0.55	0.7	1.05	50	4.5	125	10	800	6	(Notes 17, 19)	68
							90	50	1	1											
							40	0.01	5	5											
BCX78	TO-92 (97)		32	5			120	630	2	5	0.6	1.0	100	4.5	200	10		6	(Note 1)	68	
							80	1000	10	1											
							40	100	1	1											
BCX78-7	TO-92 (97)		32	5			120	220	2	5	0.6	1.0	100	4.5	200	10		6	(Note 1)	68	
							80	10	1	1											
							40	100	1	1											

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## Bipolar Pro Electron Series (Continued)

Type No.	Case Style	V <sub>CES</sub> <sup>*</sup> V <sub>CBO</sub> (V) Min	V <sub>CEO</sub> (V) Min	V <sub>EB0</sub> (V) Min	I <sub>CES</sub> <sup>*</sup> I <sub>CBO</sub> (nA) @ V <sub>CB</sub> Max	h <sub>FE</sub>		I <sub>C</sub> (mA)	V <sub>CE</sub> (V)	V <sub>CE(SAT)</sub> (V) & Max	V <sub>BE(SAT)</sub> V <sub>BE(ON)</sub> <sup>*</sup> (V) @ I <sub>C</sub> (mA)		C <sub>ob</sub> (pF) Max	f <sub>T</sub> (MHz) @ I <sub>C</sub> (mA)		t <sub>off</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
						Min	Max				Min	Max		Min	Max				
BCX78-8	TO-92 (97)		32	5		30	0.01	5	0.6	1.0	100	4.5	200	10		6	(Note 1)	68	
						180	310	2											5
						120	400	10											1
						45	100	1											1
BCX78-9	TO-92 (97)		32	5		40	0.01	5	0.6	1.0	100	4.5	200	10		6	(Note 1)	68	
						250	460	2											5
						160	630	10											1
						60	100	1											1
BCX78-10	TO-92 (97)		32	5		100	0.01	5	0.6	1.0	100	4.5	200	10		6	(Note 1)	68	
						380	630	2											5
						240	1000	10											1
						60	100	1											1
BCX79	TO-92 (97)		45	5		80	1000	10	0.6	1.0	100	4.5	200	10		6	(Note 1)	68	
						40	100	1											
						120	630	2											5
BCX79-7	TO-92 (97)		45	5		120	220	2	5	0.6	1.0	100	4.5	200	10		6	(Note 1)	68
BCX79-8	TO-92 (97)		45	5		120	400	10	0.6	1.0	100	4.5	200	10		6	(Note 1)	68	
						45	100	1											
						30	0.01	5											
						180	310	2											5
BCX79-9	TO-92 (97)		45	5		160	630	10	0.6	1.0	100	4.5	200	10		6	(Note 1)	68	
						60	100	1											
						40	0.01	5											
						250	460	2											5
BCX79-10	TO-92 (97)		45	5		240	1000	10	0.6	1.0	100	4.5	200	10		6	(Note 1)	68	
						60	100	1											
						100	0.01	5											
						380	630	2											5
BD370A	TO-237 (91)	80	45		100 45	25	500	2	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	78	
						40	400	100											1

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**Bipolar Pro Electron Series** (Continued)

Type No.	Case Style	V <sub>CES</sub> *	V <sub>CEO</sub>	V <sub>EB0</sub>	I <sub>CBO</sub> *	V <sub>CB</sub>	H <sub>FE</sub>		I <sub>C</sub>	V <sub>CE</sub>	V <sub>CE(SAT)</sub> (V) & Max	V <sub>BE(SAT)</sub> V <sub>BE(ON)</sub> *		I <sub>C</sub>	C <sub>ob</sub> (pF) Max	f <sub>T</sub>		t <sub>off</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
		(V) Min	(V) Min	(V) Min	(nA) @ Max	(V)	h <sub>FE</sub> 1 kHz*	@ I <sub>C</sub>				(V)	(V) Min			(V) Max	(mA) @ I <sub>C</sub>				
BD370A-10	TO-237 (91)	80	45		100	45	25	500	2		0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	78	
BD370A-16	TO-237 (91)	80	45		100	45	25	500	2		0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	78	
BD370A-25	TO-237 (91)	80	45		100	45	25	500	2		0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	78	
BD370B	TO-237 (91)	80	60		100	60	25	500	2		0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	78	
BD370B-10	TO-237 (91)	80	60		100	60	25	500	2		0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	78	
BD370B-16	TO-237 (91)	80	60		100	60	25	500	2		0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	78	
BD370B-25	TO-237 (91)	80	60		100	60	25	500	2		0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	78	
BD370C	TO-237 (91)	80	80		100	80	25	500	2		0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	78	
BD370C-6	TO-237 (91)	80	80		100	80	25	500	2		0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	78	
BD370C-10	TO-237 (91)	80	80		100	80	25	500	2		0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	78	
BD370C-16	TO-237 (91)	80	80		100	80	25	500	2		0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	78	
BD370D	TO-237 (91)	80	100		100	80	25	500	2		0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38	
BD370D-6	TO-237 (91)	80	100		100	80	25	500	2		0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38	
BD370D-10	TO-237 (91)	80	100		100	80	25	500	2		0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38	
BD371A	TO-237 (91)	80	45		100	45	25	500	2		0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38	

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## Bipolar Pro Electron Series (Continued)

Type No.	Case Style	$V_{CES}^*$	$V_{CEO}$	$V_{EBO}$	$I_{CES}^*$	$I_{CBO}$	$V_{CB}$	$H_{FE}$		$I_C$	$V_{CE}$	$V_{CE(SAT)}$	$V_{BE(SAT)}$	$I_C$	$C_{ob}$	$f_T$		$t_{off}$	NF	Test Conditions	Process No.
		$V_{CBO}$	(V) Min	(V) Min	(nA) Max	(V) Max	(mA) @ 1 kHz	(mA) @	(V) Min	(V) Max	(mA) @	(V) & Max	(V) Min	(mA) Max	(pF) Max	(MHz) Min	(MHz) Max	(ns) Max	(dB) Max		
BD371A-10	TO-237 (91)	80	45		100	45		25 63	500 160	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38
BD371A-16	TO-237 (91)	80	45		100	45		25 100	500 250	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38
BD371A-25	TO-237 (91)	80	45		100	45		25 180	500 400	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38
BD371B	TO-237 (91)	80	60		100	60		25 40	500 400	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38
BD371B-10	TO-237 (91)	80	60		100	60		25 63	500 160	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38
BD371B-16	TO-237 (91)	80	60		100	60		25 100	500 250	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38
BD371B-25	TO-237 (91)	80	60		100	60		25 160	500 400	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38
BD371C	TO-237 (91)	80	80		100	80		25 40	500 400	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38
BD371C-6	TO-237 (91)	80	80		100	80		25 40	500 100	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38
BD371C-10	TO-237 (91)	80	80		100	80		25 63	500 160	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38
BD371C-16	TO-237 (91)	80	80		100	80		25 100	500 250	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38
BD371D	TO-237 (91)	80	100		100	100		25 40	500 400	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	39
BD371D-6	TO-237 (91)	80	100		100	100		25 40	500 100	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	39
BD371D-10	TO-237 (91)	80	100		100	100		25 63	500 160	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	39
BD372A	TO-237 (90)	80	45		100	45		25 40	500 400	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	78

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## Bipolar Pro Electron Series (Continued)

Type No.	Case Style	$V_{CES}^*$	$V_{CEO}$	$V_{EBO}$	$I_{CES}^*$	$V_{CB}$	$H_{FE}$		$I_C$	$V_{CE}$	$V_{CE(SAT)}$	$V_{BE(SAT)}$		$C_{ob}$	$f_T$		$t_{off}$	NF	Test Conditions	Process No.
		(V) Min	(V) Min	(V) Min	(nA) Max	(V)	$h_{fe}$ 1 kHz*	@				(V) & Max	(V) Min		(V) Max	(pF) Max				
BD372A-10	TO-237 (90)	80	45		100	45	25 63	500 160	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	78
BD372A-16	TO-237 (90)	80	45		100	45	25 100	500 250	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	78
BD372A-25	TO-237 (90)	80	45		100	45	25 160	500 400	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	78
BD372B	TO-237 (90)	80	60		100	60	25 40	500 400	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	78
BD372B-10	TO-237 (90)	80	60		100	60	25 63	500 160	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	78
BD372B-16	TO-237 (90)	80	60		100	60	25 100	500 250	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	78
BD372B-25	TO-237 (90)	80	60		100	60	25 160	500 400	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	78
BD372C	TO-237 (90)	80	80		100	80	25 40	500 400	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	78
BD372C-6	TO-237 (90)	80	80		100	80	25 40	500 100	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	78
BD372C-10	TO-237 (90)	80	80		100	80	25 63	500 160	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	78
BD372C-16	TO-237 (90)	80	100		100	100	25 100	500 250	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	78
BD372D	TO-237 (90)	80	100		100	100	25 40	500 400	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	79
BD372D-6	TO-237 (90)	80	100		100	100	25 40	500 100	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	79
BD372D-10	TO-237 (90)	80	100		100	100	25 63	500 160	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	79
BD373A	TO-237 (90)	80	45		100	45	25 40	500 400	2 100	2 1	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38

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## Bipolar Pro Electron Series (Continued)

Type No.	Case Style	V <sub>CES</sub> * V <sub>CB0</sub> (V) Min	V <sub>CEO</sub> (V) Min	V <sub>EB0</sub> (V) Min	I <sub>CES</sub> * I <sub>CB0</sub> @ V <sub>CB</sub> (nA) Max	H <sub>FE</sub> h <sub>FE</sub> @ I <sub>C</sub> (mA)		V <sub>CE</sub> (V)	V <sub>CE(SAT)</sub> (V) & Max	V <sub>BE(SAT)</sub> V <sub>BE(ON)*</sub> (V) @ I <sub>C</sub> (mA)		C <sub>ob</sub> (pF) Max	f <sub>T</sub> (MHz) @ I <sub>C</sub> (mA)		t <sub>off</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
						Min	Max			Min	Max		Min	Max				
BD373A-10	TO-237 (90)	80	45		100 45	25 63	500 160	2 100	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38
BD373A-16	TO-237 (90)	80	45		100 45	25 100	500 250	2 100	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38
BD373A-25	TO-237 (90)	80	45		100 45	25 160	500 400	2 100	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38
BD373B	TO-237 (90)	80	80		100 80	25 40	500 400	2 100	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38
BD373B-10	TO-237 (90)	80	60		100 80	25 63	500 160	2 100	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38
BD373B-16	TO-237 (90)	80	60		100 60	25 100	500 250	2 100	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38
BD373B-25	TO-237 (90)	80	60		100 60	25 160	500 400	2 100	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38
BD373C	TO-237 (90)	80	80		100 80	25 40	500 400	2 100	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38
BD373C-6	TO-237 (90)	80	80		100 80	25 40	500 100	2 100	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38
BD373C-10	TO-237 (90)	80	80		100 80	25 63	500 160	2 100	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38
BD373C-16	TO-237 (90)	80	80		100 80	25 100	500 250	2 100	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38
BD373D	TO-237 (90)	80	100		100 100	25 40	500 400	2 100	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38
BD373D-6	TO-237 (90)	80	100		100 100	25 40	500 100	2 100	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38
BD373D-10	TO-237 (90)	80	100		100 100	25 63	500 160	2 100	0.7	1.2*	1A	30	50	200	420	6	(Notes 5 & 6)	38
BF240	TO-92 (98)	40	40	4	100 20	65 6	225 12	1 7	0.65	0.74*	1	0.34		1	3.5	(Note 7)	47	

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**Bipolar Pro Electron Series** (Continued)

Type No.	Case Style	V <sub>CE(S)</sub> (V) Min	V <sub>CEO</sub> (V) Min	V <sub>EBO</sub> (V) Min	I <sub>CE(S)</sub> <sup>*</sup>		H <sub>FE</sub>				V <sub>CE(SAT)</sub> (V) &		V <sub>BE(SAT)</sub> V <sub>BE(ON)</sub> <sup>*</sup>		C <sub>ob</sub> (pF) Max	f <sub>T</sub> (MHz) @ I <sub>C</sub>		t <sub>off</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.					
					I <sub>CB0</sub> (nA) Max	V <sub>CB</sub> (V)	1 kHz <sup>*</sup> Min	@ Max	I <sub>C</sub> (mA)	V <sub>CE</sub> (V)	Max	Min	Max	I <sub>C</sub> (mA)		Min	Max									
BF241	TO-92 (98)	40	40	4	100	20	35	125	1	10		0.65	0.74*	1	0.34		1			3.5	(Note 7)	47				
BF494	TO-92 (98)	30	20	5			65	220	1	10												49				
BF495	TO-92 (98)	30	20	5			35	250	1	10												49				
BF536	TO-236 (49)	30	30	4	50	20	25		1	10												42				
BF840	TO-236 (49)	40	40	4	100	20	65	220	1	10												47				
BF841	TO-236 (49)	40	40	4	100	20	35	125	1	10												47				
BF936	TO-92 (97)	30	20	4	50	20	25		1	10									6	(Note 7)		75				
BFS18	TO-236 (49)	30	30	5	100	20	35	125	1	10												49				
BFS19	TO-236 (49)	30	30	5	100	25	65	225	1	10												49				
BSR13	TO-236 (49)	60	30	5	30	50	35		0.1	10	0.4		1.3	150	8	250	20						19			
							50		1	10																
							75		10	10																
							100	300	150	10														1.6	2.6	500
							50		150	1																
30		500	10																							
BSR14	TO-236 (49)	75	40	6	10	60	35		0.1	10	0.3	0.6	1.2	150	8	300	20						19			
							50		1	10																
							75		10	10																
							100	300	150	10														1.0	2.0	500
							50		150	1																
40		500	10																							

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Bipolar Pro Electron Series

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Bipolar Pro Electron Series (Continued)

Type No.	Case Style	V <sub>CES</sub> <sup>*</sup> V <sub>CBO</sub> (V) Min	V <sub>CEO</sub> (V) Min	V <sub>EBO</sub> (V) Min	I <sub>CES</sub> <sup>*</sup> I <sub>CBO</sub> (nA) Max	V <sub>CB</sub> (V)	H <sub>FE</sub>		I <sub>C</sub> (mA)	V <sub>CE</sub> (V)	V <sub>CE(SAT)</sub> (V) & Max	V <sub>BE(SAT)</sub> V <sub>BE(ON)</sub> <sup>*</sup> (V)		I <sub>C</sub> (mA)	C <sub>ob</sub> (pF) Max	f <sub>T</sub> (MHz)		t <sub>off</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.		
							Min	Max				Min	Max			Min	Max					Min	Max
BSR15	TO-236 (49)	60	40	5	20	50	35	0.1	10	0.4	1.3	150	8	200	50	100			(Note 9)	63			
							50	1	10														
							75	10	10												1.6	2.6	500
							100	300	150												10	10	
BSR16	TO-236 (49)	60	60	5	10	50	75	0.1	10	0.4	1.3	150	8	200	50	100			(Note 9)	63			
							100	1	10														
							100	10	10												1.6	2.6	500
							100	300	150												10	10	
BSR17	TO-236 (49)	60	40	6	5 μA	50	20	0.1	1	0.2	0.65	0.85	10		250	20	250			(Note 5)	23		
							35	1	1														
							50	150	10													1	
							30	50	1													0.3	0.95
BSR18	TO-236 (49)	60	40	6	5 μA	50	20	0.1	1	0.2	0.65	0.85	10		200	20	300			(Note 5)	66		
							35	1	1														
							50	150	10													1	
							30	50	1													0.3	0.95
BSR19	TO-236 (49)	160	140	6	100	100	60	1	5	0.15	1.0	10	6	100	300	10			10	(Note 16)	16		
							60	10	5														
							20	250	50													5	0.25
BSR20	TO-236 (49)	130	120	5	100	100	30		5	0.2	1.0	10	6	100	400	10			8	(Note 16)	16		
							40	180	10													5	
							40	50	5													0.5	1.0
BSS38	TO-236 (49)	120	100	5	200	90	20	4	1	0.7		4		60	4	1000			(Notes 17, 18)	16			
BSS63	TO-236 (49)	110	100	6	100	90	30	10	1	0.25	0.9	25		50	25						74		
							30	25	1														
BSS64	TO-236 (49)	120	80	5	100	90	20	10	1	0.15	1.2	4		60	4	1000			(Note 5)	16			

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**Bipolar Pro Electron Series** (Continued)

Type No.	Case Style	V <sub>CE</sub> <sup>*</sup> V <sub>CB0</sub> (V) Min	V <sub>CEO</sub> (V) Min	V <sub>EB0</sub> (V) Min	I <sub>CE</sub> <sup>*</sup>		H <sub>FE</sub>			V <sub>CE</sub> (V)	V <sub>CE(SAT)</sub> (V) & Max	V <sub>BE(SAT)</sub> V <sub>BE(ON)</sub> <sup>*</sup> (V) @ I <sub>C</sub>			C <sub>ob</sub> (pF) Max	f <sub>T</sub> (MHz) @ I <sub>C</sub>		t <sub>off</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
					I <sub>CB0</sub> (mA) Max	V <sub>CB</sub> (V)	h <sub>FE</sub> 1 kHz <sup>*</sup>	@ I <sub>C</sub> (mA)	V <sub>CE</sub> (V)			Min	Max	Min		Max	Min				
BSS79-B	TO-236 (49)	60	40	5	10	50	40	120	150	10	0.4 1.6		150 500	6	200	20				19	
BSS79-C	TO-236 (49)	60	40	5	100	50	100	300	150	10	0.4 1.6		150 500	6	200	20				19	
BSS80-B	TO-236 (49)	60	40	5	10	50	40	120	150	10	0.4 1.6		150 500	8	200	20				63	
BSS80-C	TO-236 (49)	60	40	5	100	50	100	300	150	10	0.4 1.6		150 500	8	200	20				63	
BSV52	TO-236 (49)	20	12	5	100	10	25	1	1		0.3		10		400	10	18		(Note 18)	21	
							40	120	10	1	0.25	0.7	0.85								10
							25	50	1	0.4		1.2	50								
BSX39	TO-236 (49)		14		100	12	25	1	1		0.25	0.7	0.85	10			18		(Note 1)	21	
							40	200	10	1											
							25	50	1	0.4		1.2	5								

**TEST CONDITIONS:**

- Note 1: I<sub>C</sub> = 200 μA, V<sub>CE</sub> = 5V, f = 1 kHz.
- Note 2: I<sub>C</sub> = 100 mA, V<sub>CC</sub> = 20V, I<sub>B</sub><sup>1</sup> = I<sub>B</sub><sup>2</sup> = 5 mA.
- Note 3: I<sub>C</sub> = 200 μA, V<sub>CE</sub> = 2V, f = 1 kHz.
- Note 4: I<sub>C</sub> = 100 mA, V<sub>CC</sub> = 10V, I<sub>B</sub><sup>1</sup> = I<sub>B</sub><sup>2</sup> = 10 mA.
- Note 5: I<sub>C</sub> = 10 mA, V<sub>CC</sub> = 3V, I<sub>B</sub><sup>1</sup> = I<sub>B</sub><sup>2</sup> = 1 mA.
- Note 6: I<sub>C</sub> = 100 μA, V<sub>CE</sub> = 5V, f = 1 kHz.
- Note 7: I<sub>C</sub> = 1 mA, V<sub>CE</sub> = 10V, f = 200 MHz.
- Note 8: I<sub>C</sub> = 1 mA, V<sub>CE</sub> = 5V, f = 1 kHz.
- Note 9: I<sub>C</sub> = 150 mA, V<sub>CC</sub> = 6V, I<sub>B</sub><sup>1</sup> = I<sub>B</sub><sup>2</sup> = 15 mA.
- Note 10: I<sub>C</sub> = 10 μA, V<sub>CE</sub> = 5V, f = WB.
- Note 11: I<sub>C</sub>/I<sub>B</sub> = 20.
- Note 12: I<sub>C</sub> = 200 μA, V<sub>CE</sub> = 5V, f = 30 Hz to 15 kHz.
- Note 13: I<sub>C</sub>/I<sub>B</sub> = 40.
- Note 14: I<sub>C</sub>/I<sub>B</sub> = 1000.
- Note 15: I<sub>C</sub>/I<sub>B</sub> = 33.
- Note 16: I<sub>C</sub> = 250 μA, V<sub>CE</sub> = 5V, f = 10 Hz to 15.7 kHz.
- Note 17: I<sub>C</sub> = 15 mA, I<sub>B</sub><sup>1</sup> = I<sub>B</sub><sup>2</sup> = 1 mA.
- Note 18: I<sub>C</sub>/I<sub>B</sub> = 3.3.
- Note 19: I<sub>CE</sub> = 200 μA, V<sub>CE</sub> = 5V, f = 200 Hz.

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