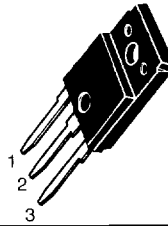


STYLE 1:  
PIN 1. BASE  
2. COLLECTOR  
3. EMITTER



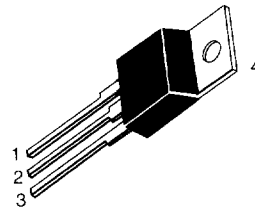
CASE 340B-03

I <sub>C</sub> Cont Amps Max	V <sub>CEO(sus)</sub> Volts Min	Device Type		hFE Min/Max	@ I <sub>C</sub> Amp	Resistive Switching			f <sub>T</sub> MHz Min	P <sub>D</sub> (Case) Watts @ 25°C
		NPN	PNP			t <sub>s</sub> μs Max	t <sub>f</sub> μs Max	@ I <sub>C</sub> Amp		
		8	500			MJF16006A		5 min		
	700	BU1008AF BU1008ADF†		3 min 3 min	4.5 4.5	8** 8**	0.5** 0.5**	4.5 4.5	7 typ 7 typ	50 50
10	400	MJF10012##		100/12k	6	15	15	6		50
	650	MJF16212★		4/10	10				2.75 typ	50
	800	MJF16018★		4 min	5	4.5 typ	0.2 typ	5		50
12	500*	MJF16206★		5/13	10	2.25	0.25	6.5	3 typ	50
15	500	MJF16010A		5 min	15	3	0.4	10		50
		MJF16210★		5/13	15		0.24**	8.5	2.5 typ	50
20	100	MJF6284##	MJF6287##	750/18k	10	1.0	2.0	10	4#	50

† "D" designator indicates internal Collector-emitter diode  
# I<sub>hfe</sub> @ 1 MHz, ## Darlington  
\* V<sub>CES</sub> = 1200 volts

\*\* Switching tests performed w/special application simulator circuit. See data sheet for details.  
★ New Product

STYLE 1:  
PIN 1. BASE  
2. COLLECTOR  
3. EMITTER  
4. COLLECTOR



CASE 221A-04 (TO-220AB)

I <sub>C</sub> Cont Amps Max	V <sub>CEO(sus)</sub> Volts Min	Device Type		hFE Min/Max	@ I <sub>C</sub> Amp	Resistive Switching			f <sub>T</sub> MHz Min	P <sub>D</sub> (Case) Watts @ 25°C
		NPN	PNP			t <sub>s</sub> μs Max	t <sub>f</sub> μs Max	@ I <sub>C</sub> Amp		
		0.5	350			MJE2360T MJE2361T		15 min 40 min		
1	80	TIP29B	TIP30B	15/75	1	0.6 typ	0.3 typ	1	3	30
	100	TIP29C	TIP30C	15/75	1	0.6 typ	0.3 typ	1	3	30
	250	TIP47		30/150	0.3	2 typ	0.18 typ	0.3	10	40
	300	TIP48	MJE5730	30/150	0.3	2 typ	0.18 typ	0.3	10	40
	350	TIP49	MJE5731	30/150	0.3	2 typ	0.18 typ	0.3	10	40
	400	TIP50	MJE5731A*	30/150	0.3	2 typ	0.18 typ	0.3	10	40
2	60	BD239A	BD240A	15 min	1				3	30
		TIP110##	TIP115##	500 min	2	1.7 typ	1.3 typ	2	25#	50
	80	BD239B	BD240B	15 min	1				3	30
		TIP111##	TIP116##	500 min	2	1.7 typ	1.3 typ	2	25#	50
	100	BD239C	BD240C	25 min	1				3	30
		TIP112## [C]	TIP117## [C]	500 min	2	1.7 typ	1.3 typ	2	25#	50

# I<sub>hfe</sub> @ 1 MHz, ## Darlington  
\* V<sub>CEO</sub> = 375 V

[C] Available as preferred chip  
Device Numbers in **Bold** type are preferred.

(continued)

TABLE 3 – PLASTIC TO-220 (continued)

I <sub>C</sub> Cont Amps Max	V <sub>CEO(sus)</sub> Volts Min	Device Type		h <sub>FE</sub> Min/Max	@ I <sub>C</sub> Amp	Resistive Switching			f <sub>T</sub> MHz Min	P <sub>D</sub> (Case) Watts @ 25°C
		NPN	PNP			t <sub>s</sub> μs Max	t <sub>f</sub> μs Max	@ I <sub>C</sub> Amp		
2	400	BUL44★		14/36	0.4	2**	0.2**	1	12 typ	40
	450	BUX85		30	0.1	3.5	1.4	1	4	50
		MJE18002★		14/36	0.2	3**	0.17**	1	12 typ	40
	900	MJE1320		3 min	1	4 typ	0.8 typ	1		80
2.5	700	MJE8500		7.5 min	0.5	4	2	1		65
	750	MJE12007ⓐ		1.1 min	2		1	2	4 typ	65
	800	MJE8501		7.5 min	0.5	4	2	1		65
3	60	BD241A	BD242A	25 min	1				3	40
		TIP31A	TIP32A	25 min	1	0.6 typ	0.3 typ	1	3	40
	80	BD241B	BD242B	25 min	1				3	40
		TIP31B	TIP32B	25 min	1	0.6 typ	0.3 typ	1	3	40
100	BD241C	BD242C	25 min	1				3	40	
	TIP31Cⓐ	TIP32Cⓐ	25 min	1	0.6 typ	0.3 typ	1	3	40	
4	60	BD535	BD536	25 min	2	0.5 Typ	0.05 Typ		3	50
		MJE800T##	MJE700T##	750 min	1.5				1#	40
	80	D44C12★	D45C12★	40/120	0.2			1	40 typ	30
	300	MJE13004		6/30	3	3	0.7	3	4	60
400	MJE13005		6/30	3	3	0.7	3	4	60	
5	60	TIP120##	TIP125##	1k min	3	1.5 typ	1.5 typ	3	4#	65
	80	TIP121##	TIP126##	1k min	3	1.5 typ	1.5 typ	3	4#	65
	100	TIP122##ⓐ	TIP127##ⓐ	1k min	3	1.5 typ	1.5 typ	4	4#	75
	250	2N6497		10/75	2.5	1.8	0.8	2.5	5	80
	300	2N6498		10/75	2.5	1.8	0.8	2.5	5	80
	400	BUL45★		16/40	1	1.7**	0.12**	1	12 typ	100
	450	MJE16002		5 min	5	3	0.3	3		80
		MJE16004		7 min	5	2.7	0.35	3		80
		MJE18004		10 min	2	3	0.5	2.5	12	100
700	MJE8502		7.5 min	1	4	2	2.5		80	
800	MJE8503		7.5 min	1	4	2	2.5		80	
6	60	BD243A	BD244A	15 min	3				3	65
		TIP41A	TIP42A	15/75	3	0.4 typ	0.15 typ	3	3	65
	80	BD243B	BD244B	15 min	3				3	65
		TIP41B	TIP42B	15/75	3	0.4 typ	0.15 typ	3	3	65
	100	BD243C	BD244C	15 min	3				3	65
	TIP41C	TIP42C	15/75	3	0.4 typ	0.15 typ	3	3	65	
400	BUV46		5 min	3.5	3	0.8	2.5	12	85	
550*	MJE16204		5 min	6	1.5**	0.15**	1	10	80	

# |h<sub>FE</sub>| @ 1 MHz, ## Darlington

(continued)

\* V<sub>(BR)CEV</sub>

\*\* Switching tests performed w/special application simulator circuit. See data sheet for details.

★ New Product

ⓐ Available as preferred chip

Device Numbers in **Bold** type are preferred

**TABLE 3 – PLASTIC TO-220 (continued)**

I <sub>C</sub> Cont Amps Max	V <sub>CEO(sus)</sub> Volts Min	Device Type		h <sub>FE</sub> Min/Max	@ I <sub>C</sub> Amp	Resistive Switching			f <sub>T</sub> MHz Min	P <sub>D</sub> (Case) Watts @ 25°C
		NPN	PNP			t <sub>s</sub> μs Max	t <sub>f</sub> μs Max	@ I <sub>C</sub> Amp		
7	30	2N6288	2N6111	30/150	3	0.4 typ	0.15 typ	3	4	40
	50		2N6109	30/150	2.5	0.4 typ	0.15 typ	3	4	40
	60	BD797	BD798	25 min	3				3	65
	70	<b>2N6292</b>	<b>2N6107</b>	30/150	2	0.4 typ	0.15 typ	3	4	40
	80	<b>BD799</b>	<b>BD800</b>	15 min	3				3	65
	100	<b>BD801</b>	<b>BD802</b>	15 min	3				3	65
	150	<b>BU407,D</b>		30 min	1.5		0.75	5	10	60
	200	<b>BU406,D</b>		30 min	1.5		0.75	5	10	60
	375	<b>BU522##</b>		250 min	2.5				7.5	75
	425	<b>BU522A##</b>		250 min	2.5				7.5	75
450	<b>BU522B##</b>		250 min	2.5				7.5	75	
8	60	2N6043##	2N6040##	1k/10k	4	1.5 typ	1.5 typ	3	4#	75
		BDX53A##	BDX54A##	750 min	3				4#	60
		BD897##	BD898##	750 min	3				1#	70
		BD897A##	BD898A##	750 min	4				1#	70
		TIP100##	TIP105##	1k/20k	3	1.5 typ	1.5 typ	3	4#	80
	80	<b>2N6044##</b>	<b>2N6041##</b>	1k/10k	4	1.5 typ	1.5 typ	3	4#	75
		<b>BDX53B##</b>	<b>BDX54B##</b>	750 min	3				4#	60
		<b>BD899##</b>	<b>BD900##</b>	750 min	3				1#	70
		<b>BD899A##</b>	<b>BD900A##</b>	750 min	4				1#	70
		<b>TIP101##</b>	<b>TIP106##</b>	1k/20k	3	1.5 typ	1.5 typ	3	4#	80
	100	<b>2N6045##</b>	<b>2N6042##</b>	1k/10k	3	1.5 typ	1.5 typ	3	4#	75
		<b>BDX53C##</b>	<b>BDX54C##</b>	750 min	3					
		<b>BD901##</b>	<b>BD902##</b>	750 min	3				1#	70
		<b>TIP102##</b>	<b>TIP107##</b>	1k/20k	3	1.5 typ	1.5 typ	3	4#	80
	120	<b>BDX53D##</b>	<b>BDX54D##</b>	750 min	3				4#	60
		<b>MJE15028</b>	<b>MJE15029</b>	20 min	4				30	50
	150	<b>MJE15030</b> <span style="border: 1px solid black; border-radius: 50%; padding: 0 2px;">C</span>	<b>MJE15031</b> <span style="border: 1px solid black; border-radius: 50%; padding: 0 2px;">C</span>	20 min	4				30	50
		<b>BU807##</b>		100 min	5	0.55 typ	0.2 typ	5		60
	200	<b>BU806##</b>		100 min	5	0.55 typ	0.2 typ	5		60

# I<sub>hFE</sub> @ 1 MHz, ## Darlington

(continued)

C Available as preferred chip

Device Numbers in **Bold** type are preferred

**TABLE 3 – PLASTIC TO-220 (continued)**

I <sub>C</sub> Cont Amps Max	V <sub>CE0(sus)</sub> Volts Min	Device Type		h <sub>FE</sub> Min/Max	@ I <sub>C</sub> Amp	Resistive Switching			f <sub>T</sub> MHz Min	P <sub>D</sub> (Case) Watts @ 25°C
		NPN	PNP			t <sub>s</sub> μs Max	t <sub>f</sub> μs Max	@ I <sub>C</sub> Amp		
8	300	MJE13006		5/30	5	3	0.7	5	4	80
		MJE5740##		200 min	4	8 typ	2 typ	6	4	80
			MJE5850	15 min	2	2	0.5	4		80
	350	MJE5741##		200 min	4	8 typ	2 typ	6		80
			MJE5851	15 min	2	2	0.5	4		80
	400	BUL146		14/36	2	4**	0.17**	4	12 typ	100
MJE5742##			200 min	4	8 typ	2 typ	6		80	
MJE13007 [C]			5/30	5	3	0.7	5		80	
MJE16106 ★		MJE5852 [C]	15 min	2	2	0.5	4		80	
450	BUT56A		10 min	2	3	0.5	2	12	100	
	MJE18006 ★		14/36	1.5	1.5 typ**	0.1 typ**	3	12 typ	100	
550	BUT47C		8 min	2	4		4	12	100	
10	20	MJE5420Z##(1)★		6k min	6					100
	60	BDX33A##	BDX34A##	750 min	4				3	70
		BD807	BD808	15 min	4				1.5	90
		D44H8	D45H8	40 min	4					50
		MJE3055T	MJE2955T	20/70	4					75
		2N6387##	2N6667##	1k/20k	5				20#	65
	80	BDX33B##	BDX34B##	750 min	3				3	70
		BD809	BD810	15 min	4				1.5	90
D44E3##			1000 min	5	2 typ	0.5 typ	10		50	
2N6388##		2N6668##	1k/20k	5				20#	65	
D44H10		D45H10	20 min	4	0.5 typ	0.14 typ	5	50 typ	50	
D44H11 [C]	D45H11 [C]	40 min	4	0.5 typ	0.14 typ	5	50 typ	50		
100	BDX33C##	BDX34C##	750 min	3				3	70	
400	BUL147		14/36	2	4**	0.17**	4	12 typ	125	
450	MJE18008 ★		16/36	2	3 typ**	0.1 typ**	4	12 typ	125	
12	300	MJE13008		6/30	8	3	0.7	8	4	100
	400	MJE13009		6/30	8	3	0.7	8	4	100
15	60	2N6487	2N6490	20/150	5	0.6 typ	0.3 typ	5	5	75
		BDW40##	BDW45##	1k min	5	1 typ	1.5 typ	5	4	85
	80	2N6488	2N6491	20/150	5	0.6 typ	0.3 typ	5	5	75
		BDW41##	BDW46##	1k min	5	1 typ	1.5 typ	5	4	85
		D44VH10	D45VH10	20 min	4	0.5	0.09	8	50 typ	83
100	BDW42##	BDW47##	1k min	5	1 typ	1.5 typ	5	4	85	

\*\* Switching tests performed w/special application simulator circuit. See data sheet for details.

# I<sub>hfe1</sub> @ 1 MHz, ## Darlington

★ New Product

(1) Self protected Darlington

[C] Available as preferred chip

Device Numbers in **Bold** type are preferred