MJE15034 NPN, MJE15035 PNP

Preferred Device

Complementary Silicon Plastic Power Transistors

TO−220, NPN & PNP Devices

. . . designed for use as high−frequency drivers in audio amplifiers.

- h_{FE} = 100 (Min) @ I_C = 0.5 Adc
  = 10 (Min) @ I_C = 2.0 Adc
- Collector−Emitter Sustaining Voltage −
  $V_{CEO(sus)}$ = 350 Vdc (Min) − MJE15034, MJE15035
- High Current Gain − Bandwidth Product
  f_T = 30 MHz (Min) @ I_C = 500 mAdc
- TO−220AB Compact Package
- Epoxy meets UL 94 V−0 @ 0.125 in
- ESD Ratings: Machine Model: C
  Human Body Model: 3B

MAXIMUM RATINGS

Rating	Symbol	MJE15034 MJE15035	Unit
Collector−Emitter Voltage	V_{CEO}	350	Vdc
Collector−Base Voltage	V_{CB}	350	Vdc
Emitter−Base Voltage	V_{EB}	5.0	Vdc
Collector Current − Continuous − Peak	I_C	4.0 8.0	Adc
Base Current	I_B	1.0	Adc
Total Power Dissipation @ T_C = 25°C Derate above 25°C	P_D	50 0.40	Watts W/°C
Total Power Dissipation @ T_A = 25°C Derate above 25°C	P_D	2.0 0.016	Watts W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.5	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	°C/W

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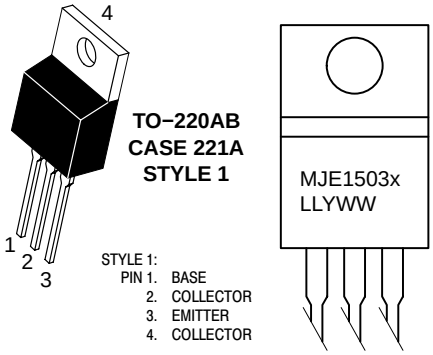
4.0 AMPERES
POWER TRANSISTORS
COMPLEMENTARY
SILICON
350 VOLTS
50 WATTS

MARKING DIAGRAM & PIN ASSIGNMENT



MJE1503x = Device Code
LL = Location Code
Y = Year
WW = Work Week

ORDERING INFORMATION

Device	Package	Shipping
MJE15034	TO−220AB	50 Units/Rail
MJE15035	TO−220AB	50 Units/Rail

Preferred devices are recommended choices for future use and best overall value.

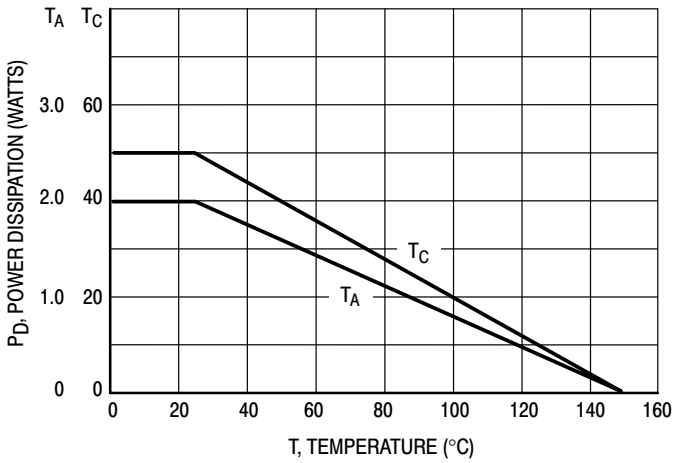


Figure 1. Power Derating

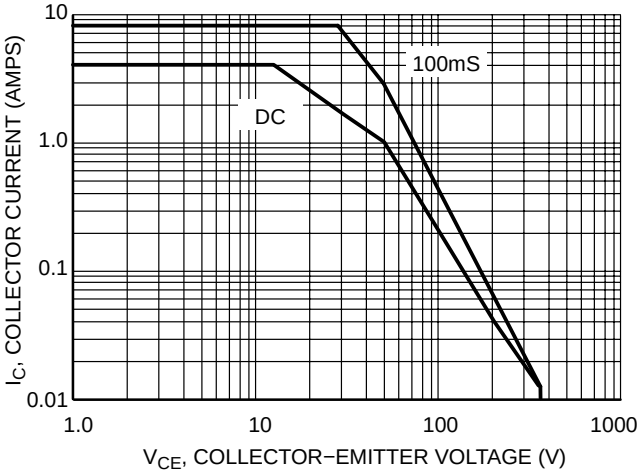


Figure 2. Active Region Safe Operating Area

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector−Emitter Sustaining Voltage (Note 1)	(I_C = 10 mAdc, I_B = 0)	$V_{CEO(sus)}$	350	−	Vdc
Collector Cutoff Current	(V_{CB} = 350 Vdc, I_E = 0)	I_{CBO}	−	10	μAdc
Emitter Cutoff Current	(V_{BE} = 5.0 Vdc, I_C = 0)	I_{EBO}	−	10	μAdc
ON CHARACTERISTICS (Note 1)					
DC Current Gain		h_{FE}			−
	(I_C = 0.1 Adc, V_{CE} = 5.0 Vdc)		100	−	
	(I_C = 0.5 Adc, V_{CE} = 5.0 Vdc)		100	−	
	(I_C = 1.0 Adc, V_{CE} = 5.0 Vdc)		50	−	
	(I_C = 2.0 Adc, V_{CE} = 5.0 Vdc)		10	−	
Collector−Emitter Saturation Voltage	(I_C = 1.0 Adc, I_B = 0.1 Adc)	$V_{CE(sat)}$	−	0.5	Vdc
Base−Emitter On Voltage	(I_C = 1.0 Adc, V_{CE} = 5.0 Vdc)	$V_{BE(on)}$	−	1.0	Vdc
DYNAMIC CHARACTERISTICS					
Current Gain − Bandwidth Product (Note 2) (I_C = 500 mAdc, V_{CE} = 10 Vdc, f_{test} = 1.0 MHz)		f_T	30	−	MHz

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.
2. $f_T = |h_{fe}| \bullet f_{test}$.

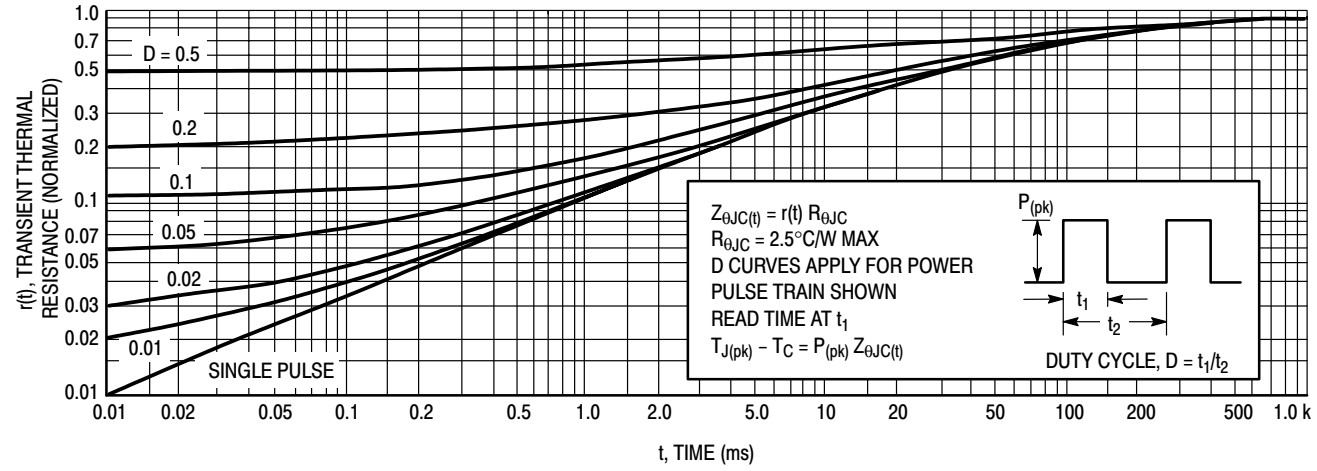


Figure 3. Thermal Response

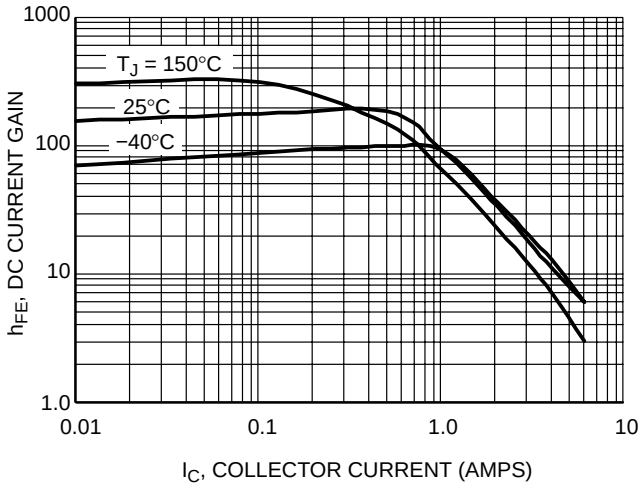


Figure 4. DC Current Gain, V_{CE} = 5.0 V
NPN MJE15034

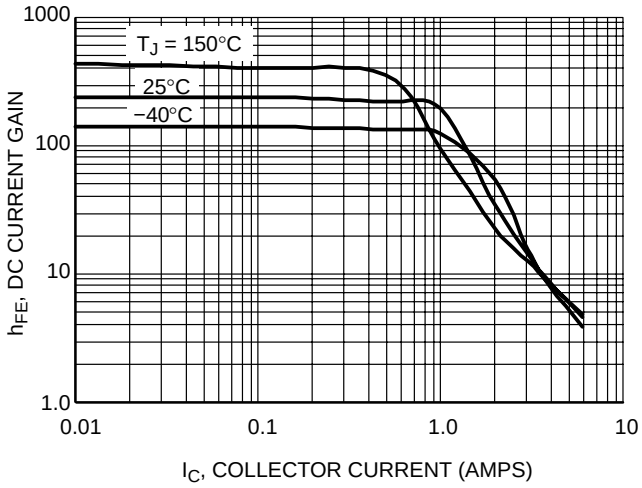


Figure 5. DC Current Gain, V_{CE} = 5.0 V
PNP MJE15035

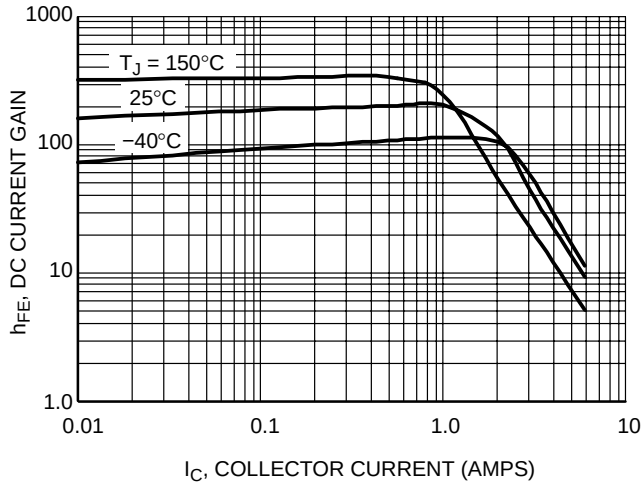


Figure 6. DC Current Gain, V_{CE} = 20 V
NPN MJE15034

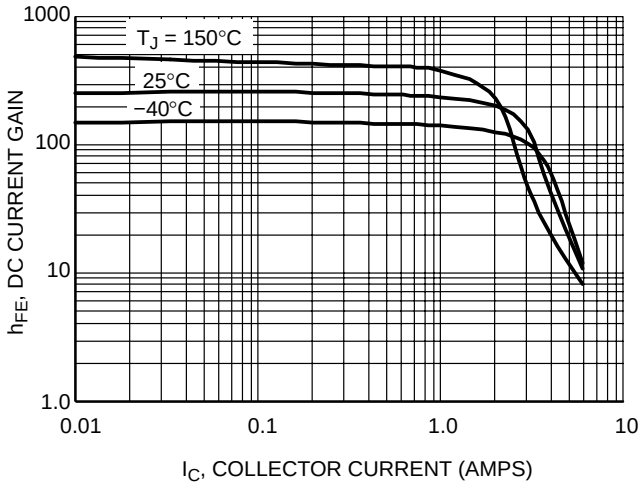


Figure 7. DC Current Gain, V_{CE} = 20 V
PNP MJE15035

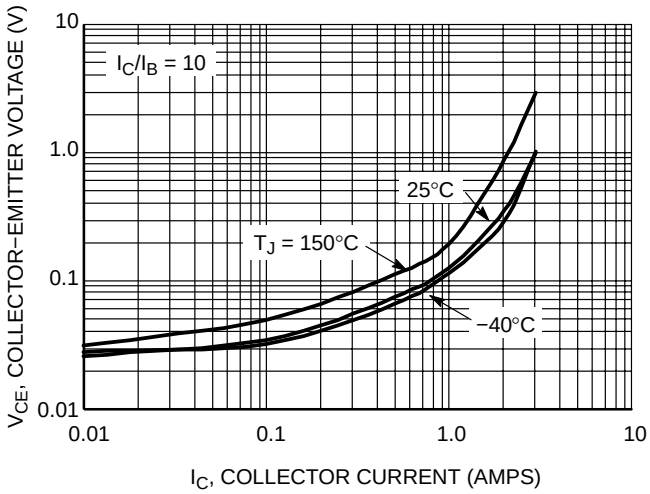


Figure 8. $V_{CE(sat)}$
NPN MJE15034

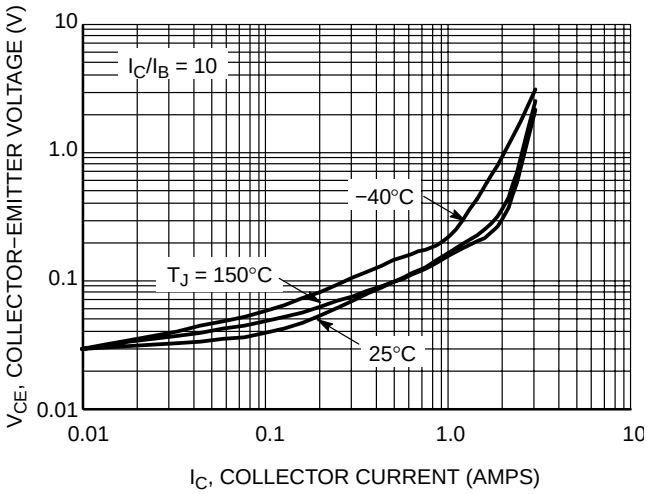


Figure 9. $V_{CE(sat)}$
PNP MJE15035

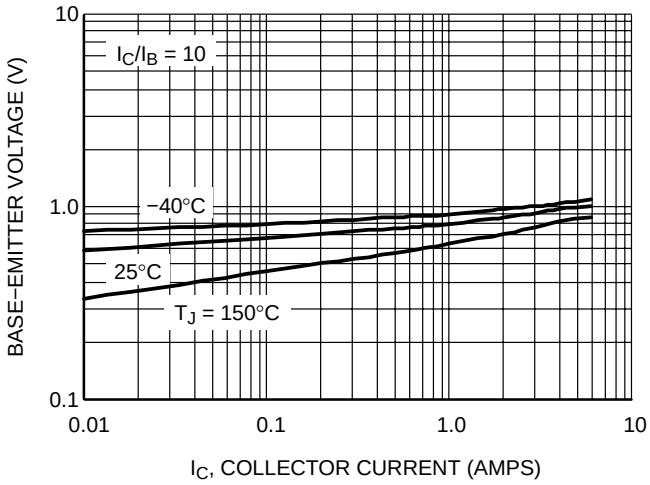


Figure 10. $V_{BE(sat)}$ NPN MJE15034

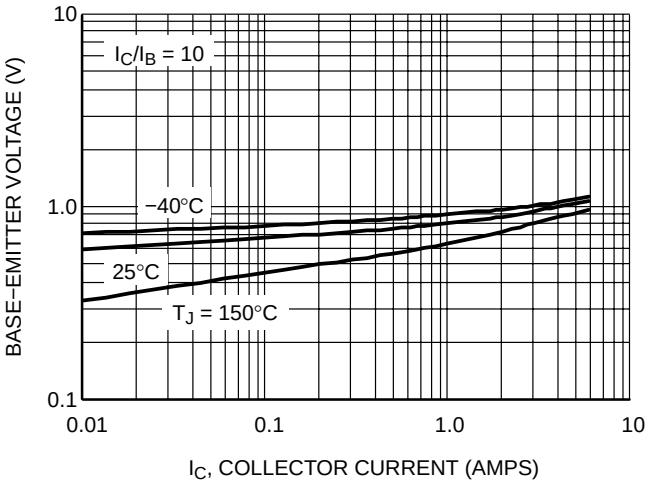


Figure 11. $V_{BE(sat)}$ PNP MJE15035

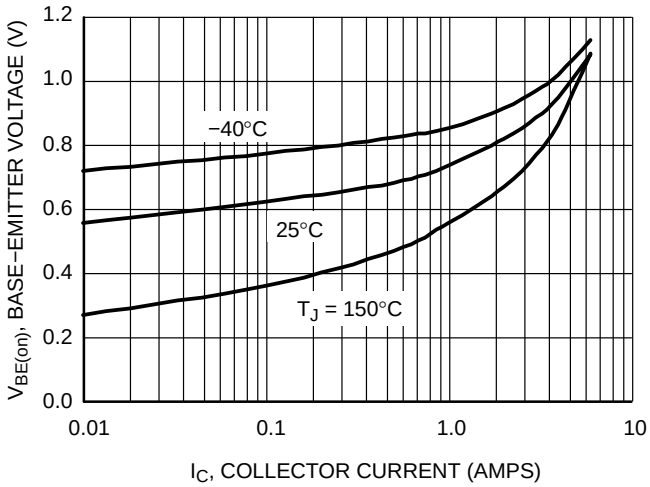


Figure 12. $V_{BE(on)}$ NPN MJE15034

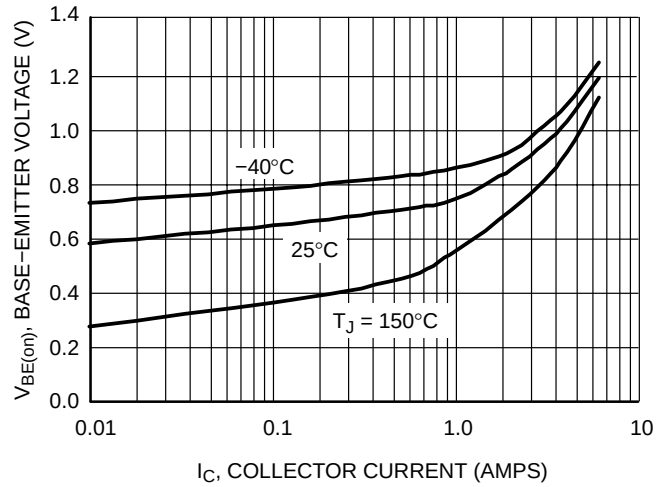


Figure 13. $V_{BE(on)}$ PNP MJE15035

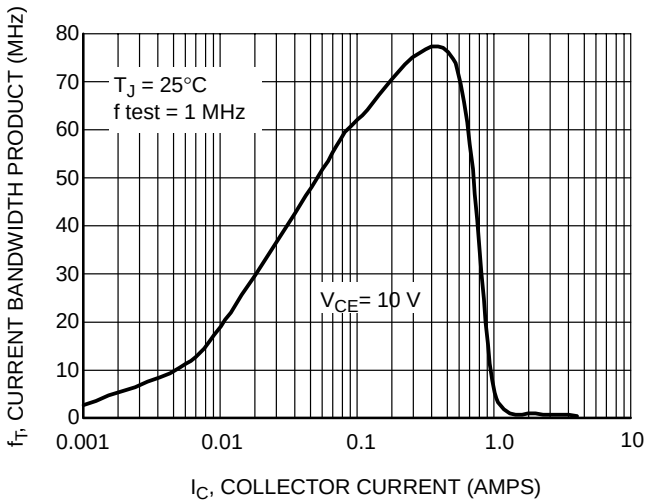


Figure 14. Typical Current Gain Bandwidth Product NPN MJE15034

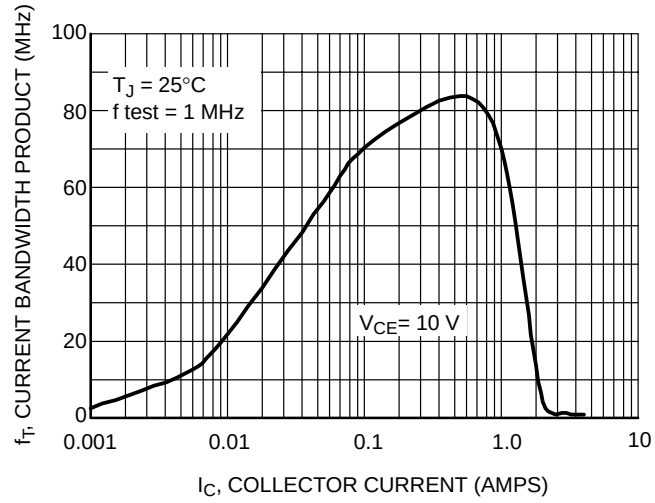
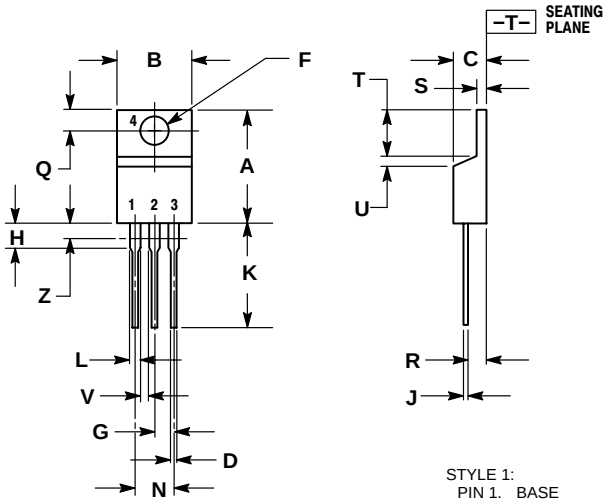


Figure 15. Typical Current Gain Bandwidth Product PNP MJE15035

PACKAGE DIMENSIONS

TO−220 THREE−LEAD
TO−220AB
CASE 221A−09
ISSUE AA



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

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.570	0.620	14.48	15.75
B	0.380	0.405	9.66	10.28
C	0.160	0.190	4.07	4.82
D	0.025	0.035	0.64	0.88
F	0.142	0.147	3.61	3.73
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.018	0.025	0.46	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.15	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
V	0.045	−−−	1.15	−−−
Z	−−−	0.080	−−−	2.04

PUBLICATION ORDERING INFORMATION

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