

# MJE15034 NPN, MJE15035 PNP

## Complementary Silicon Plastic Power Transistors

### TO-220, NPN & PNP Devices

Complementary silicon plastic power transistors are designed for use as high-frequency drivers in audio amplifiers.

#### Features

- $h_{FE} = 100$  (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
- Pb-Free Packages are Available\*

#### MAXIMUM RATINGS

Rating	Symbol	Value	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 @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	50 0.40	W W/ $^\circ\text{C}$
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	2.0 0.016	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +150	$^\circ\text{C}$

#### THERMAL CHARACTERISTICS

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

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

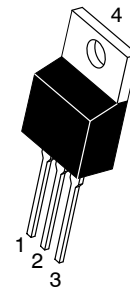
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



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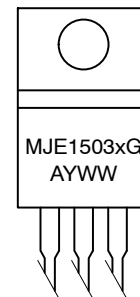
<http://onsemi.com>

**4.0 AMPERES  
POWER TRANSISTORS  
COMPLEMENTARY SILICON  
350 VOLTS, 50 WATTS**



TO-220AB  
CASE 221A  
STYLE 1

#### MARKING DIAGRAM



MJE1503x = Device Code  
x = 4 or 5  
A = Location Code  
Y = Year  
WW = Work Week  
G = Pb-Free Package

#### ORDERING INFORMATION

Device	Package	Shipping
MJE15034	TO-220AB	50 Units / Rail
MJE15034G	TO-220AB (Pb-Free)	50 Units / Rail
MJE15035	TO-220AB	50 Units / Rail
MJE15035G	TO-220AB (Pb-Free)	50 Units / Rail

# MJE15034 NPN, MJE15035 PNP

## ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

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

1. Pulse Test: Pulse Width  $\leq 300\ \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .
2.  $f_T = |h_{fe}| \cdot f_{test}$ .

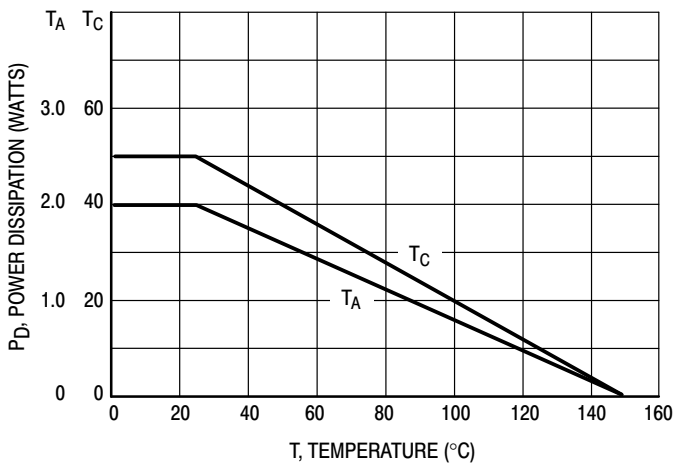


Figure 1. Power Derating

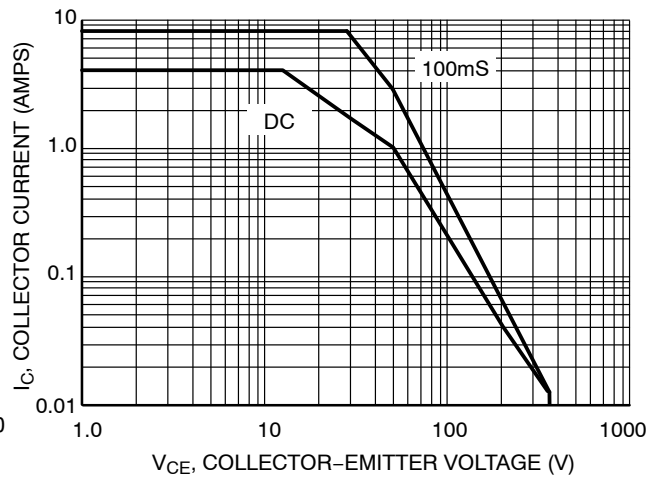


Figure 2. Active Region Safe Operating Area

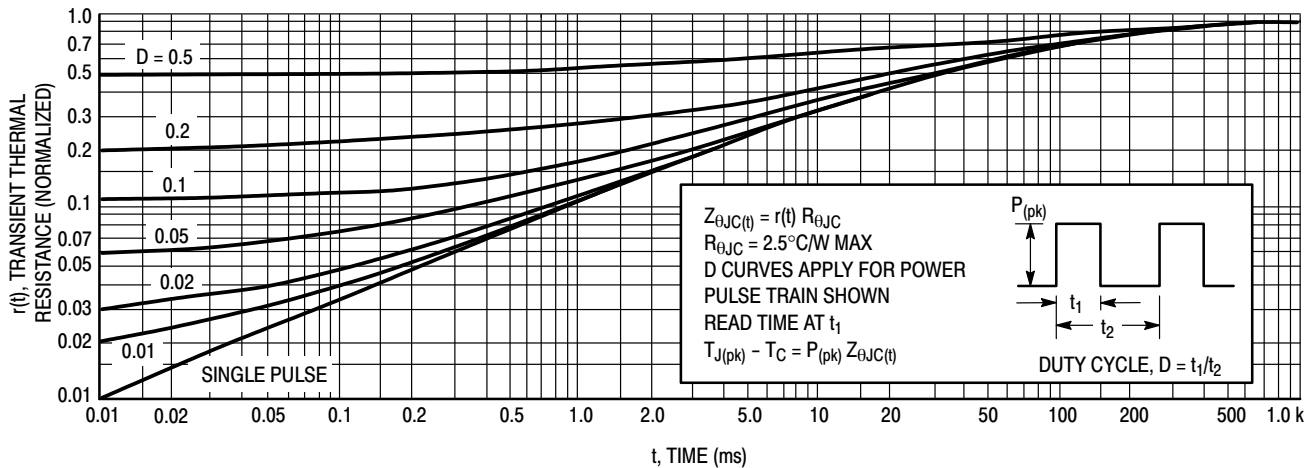
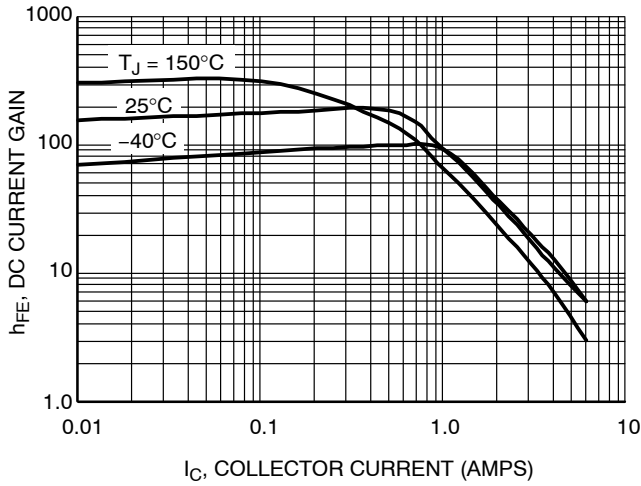
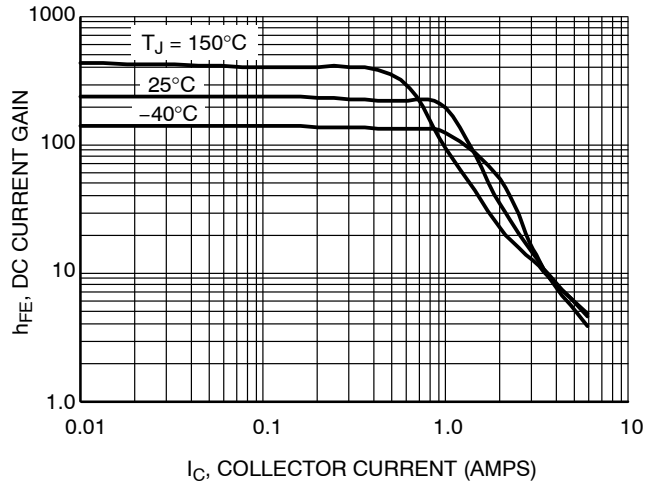


Figure 3. Thermal Response

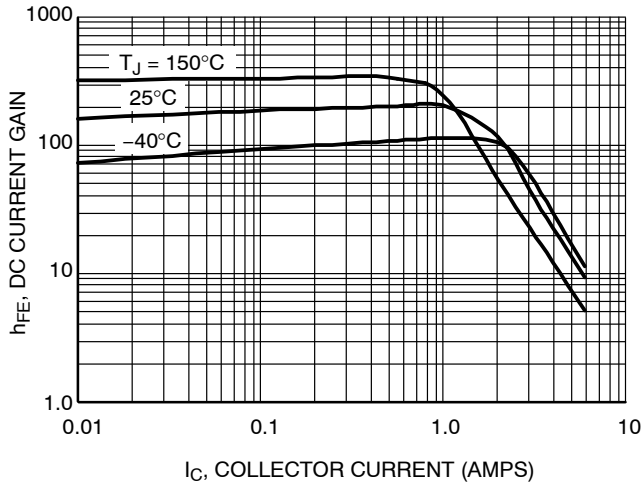
# MJE15034 NPN, MJE15035 PNP



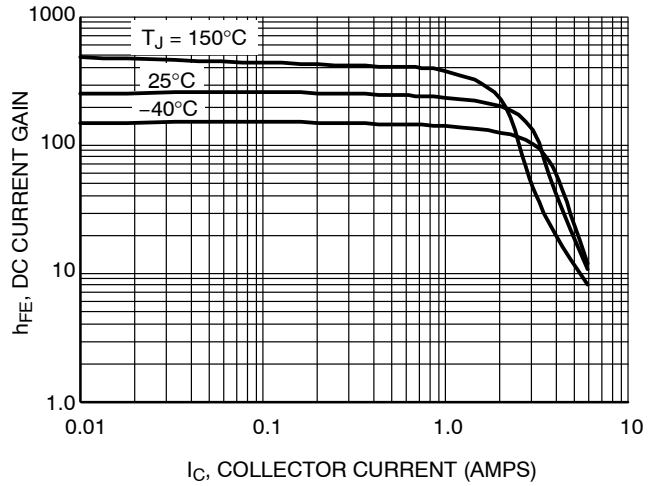
**Figure 4. DC Current Gain,  $V_{CE} = 5.0\text{ V}$   
NPN MJE15034**



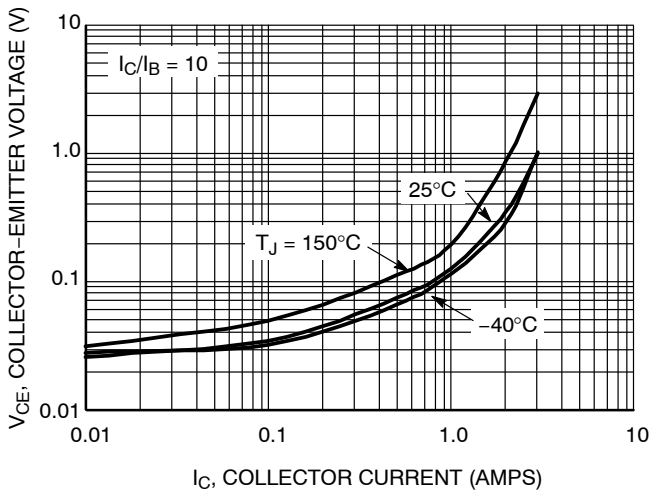
**Figure 5. DC Current Gain,  $V_{CE} = 5.0\text{ V}$   
PNP MJE15035**



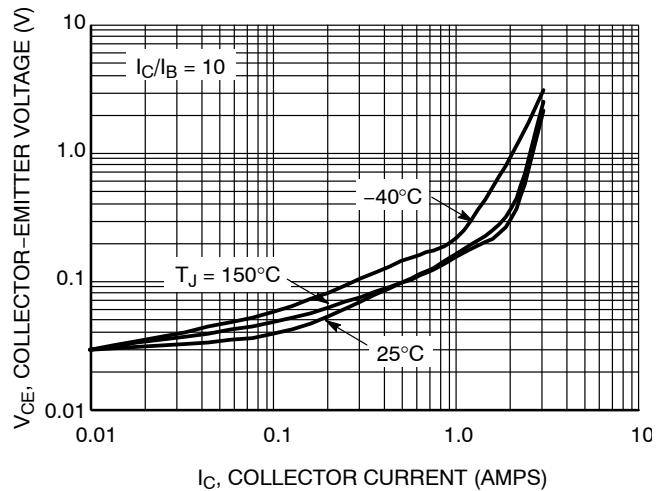
**Figure 6. DC Current Gain,  $V_{CE} = 20\text{ V}$   
NPN MJE15034**



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

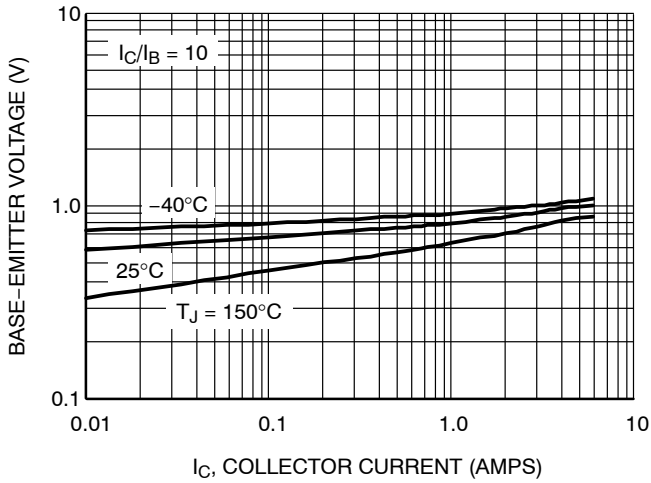


**Figure 8.  $V_{CE(sat)}$   
NPN MJE15034**

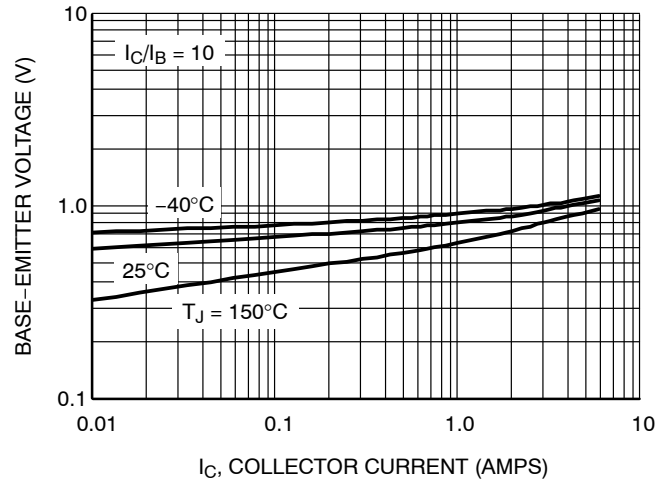


**Figure 9.  $V_{CE(sat)}$   
PNP MJE15035**

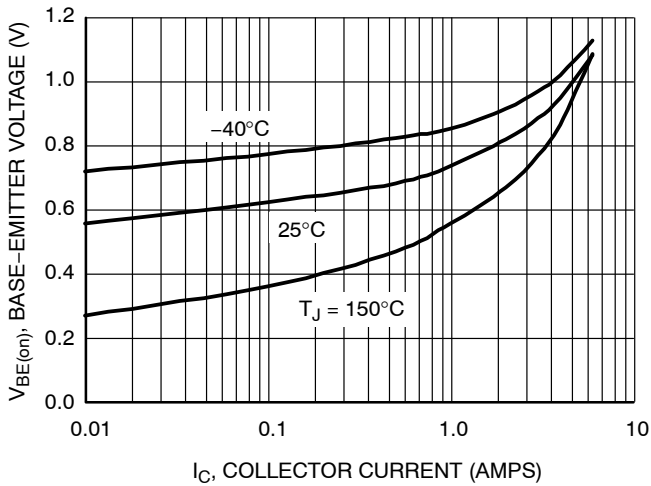
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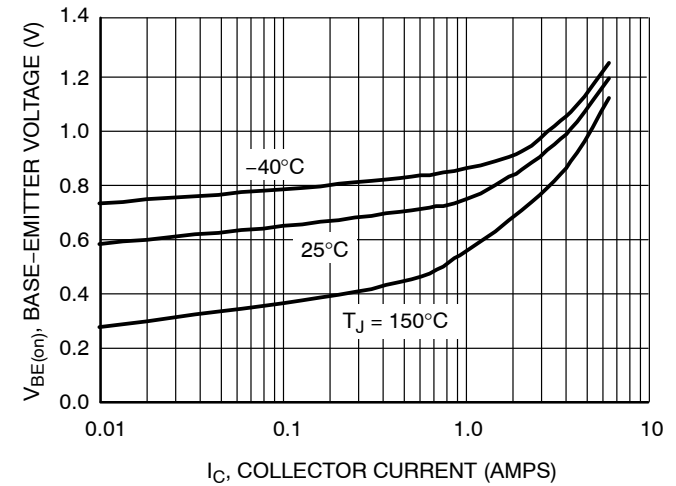
**Figure 10.  $V_{BE(sat)}$   
NPN MJE15034**



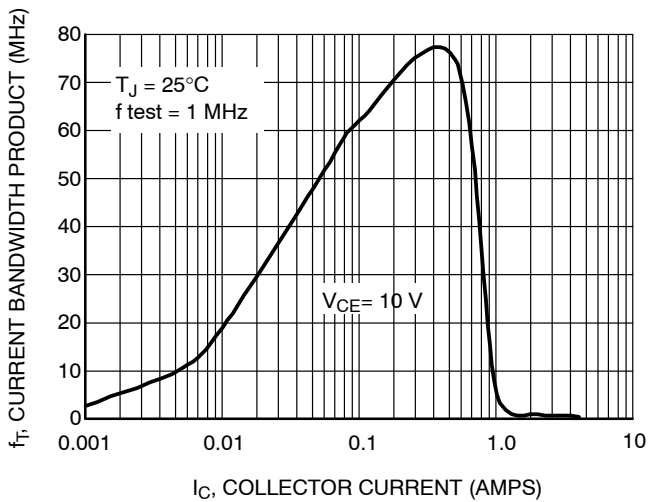
**Figure 11.  $V_{BE(sat)}$   
PNP MJE15035**



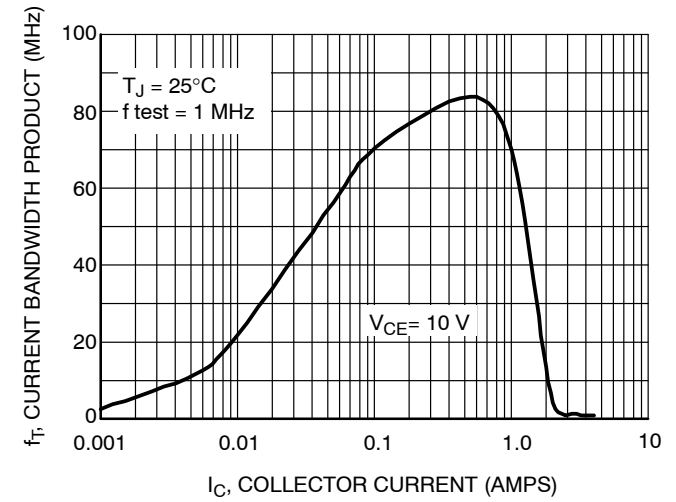
**Figure 12.  $V_{BE(on)}$   
NPN MJE15034**



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



**Figure 14. Typical Current Gain Bandwidth Product  
NPN MJE15034**

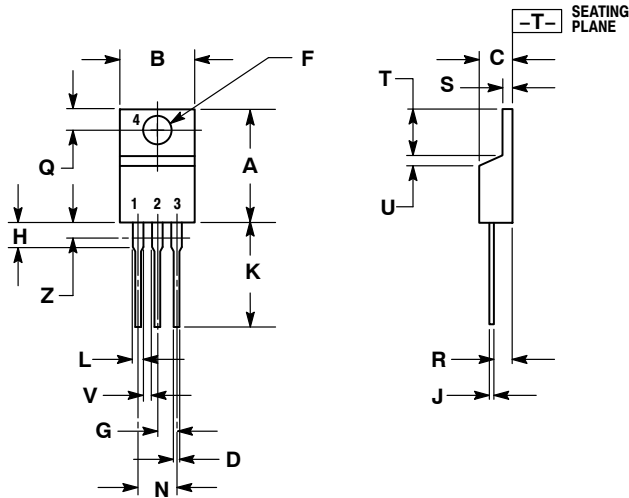


**Figure 15. Typical Current Gain Bandwidth Product  
PNP MJE15035**

# MJE15034 NPN, MJE15035 PNP

## PACKAGE DIMENSIONS

TO-220  
CASE 221A-09  
ISSUE AG



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.

DIM	INCHES		MILLIMETERS	
	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	0.036	0.64	0.91
F	0.142	0.161	3.61	4.09
G	0.095	0.105	2.42	2.66
H	0.110	0.161	2.80	4.10
J	0.014	0.025	0.36	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

STYLE 1:

- PIN 1. BASE  
2. COLLECTOR  
3. EMITTER  
4. COLLECTOR

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