

# 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 @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	50 0.40	Watts 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	Watts 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	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$

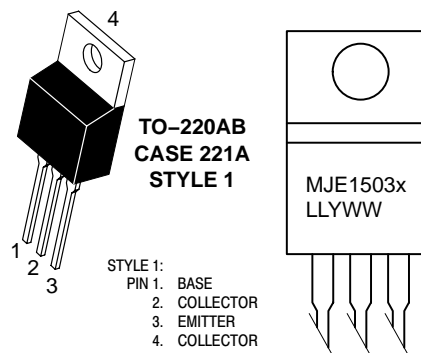


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**4.0 AMPERES  
POWER TRANSISTORS  
COMPLEMENTARY  
SILICON  
350 VOLTS  
50 WATTS**

### 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.

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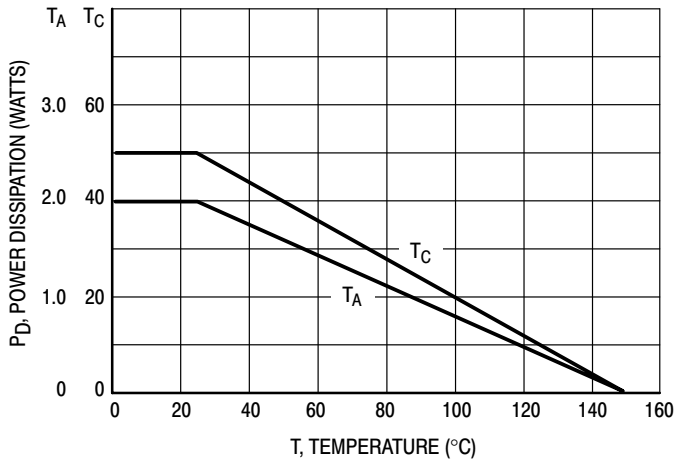


Figure 1. Power Derating

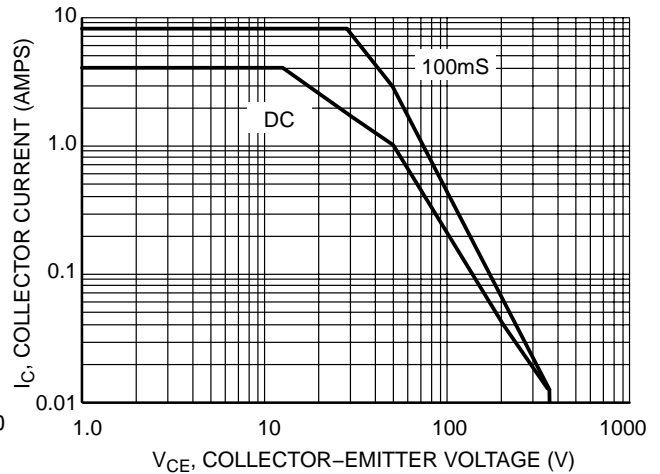


Figure 2. Active Region Safe Operating Area

## 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	$\mu\text{Adc}$

## ON CHARACTERISTICS (Note 1)

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

## DYNAMIC CHARACTERISTICS

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

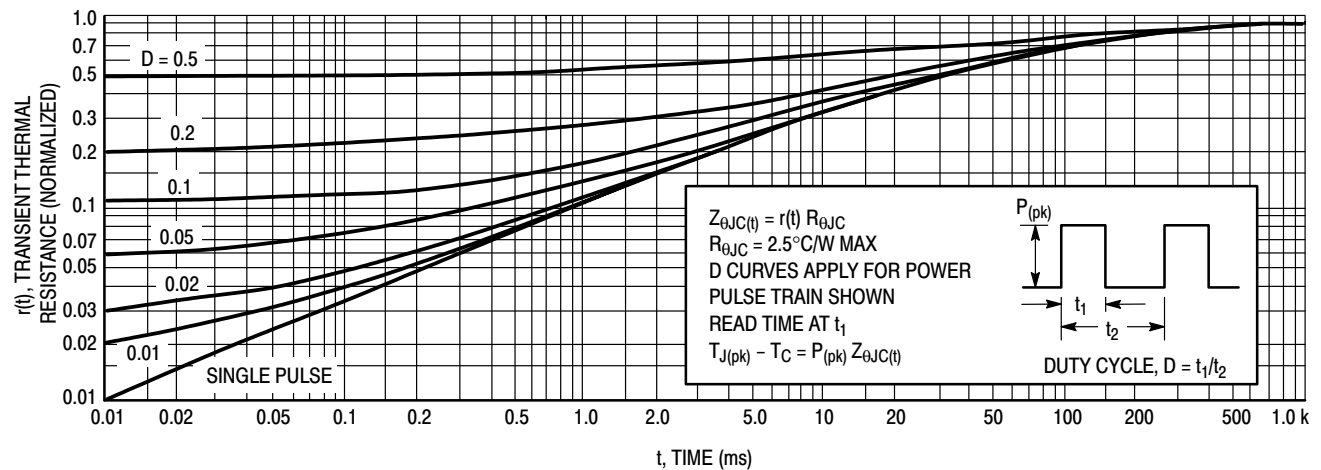
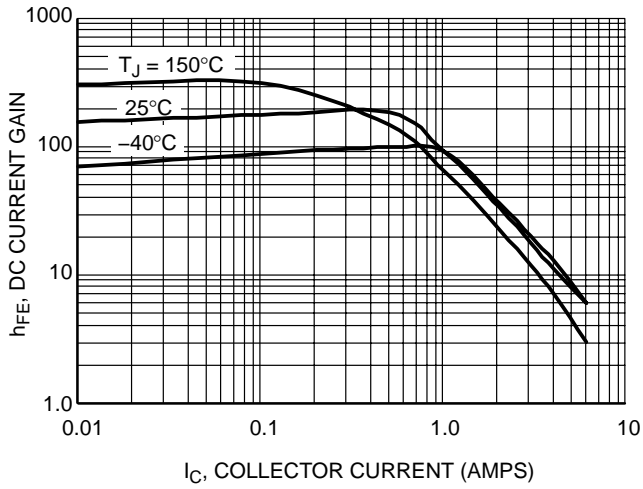
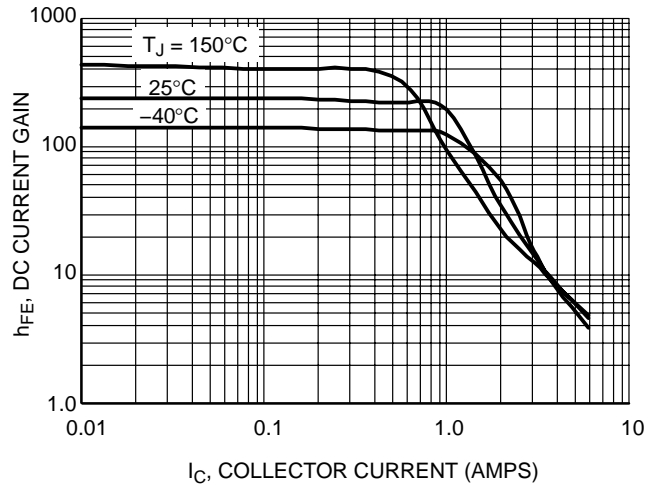


Figure 3. Thermal Response

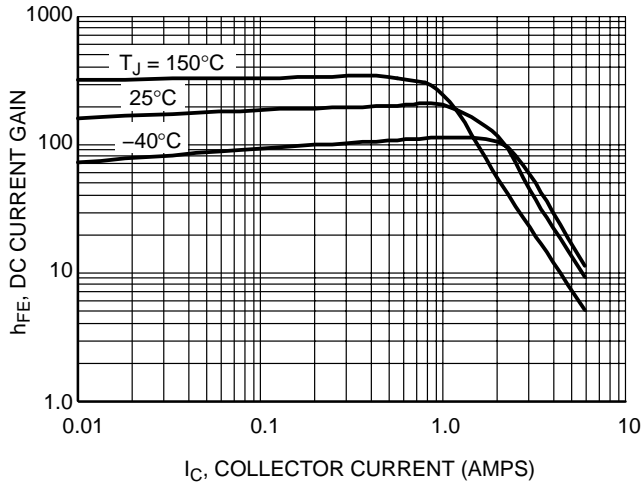
# MJE15034 NPN, MJE15035 PNP



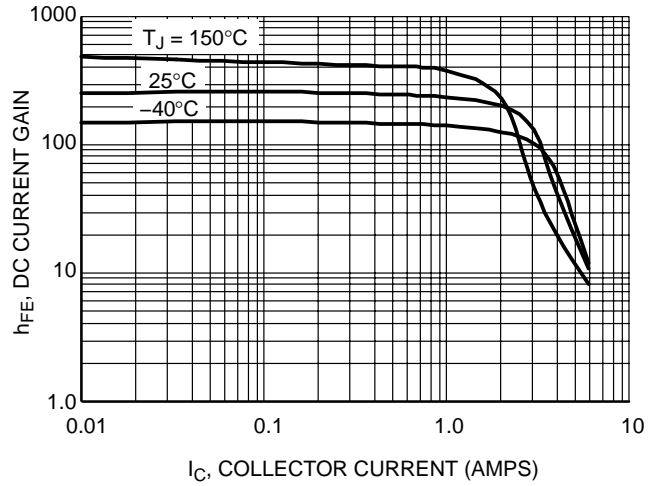
**Figure 4. DC Current Gain,  $V_{CE} = 5.0\text{ V}$   
NPN MJE15034**



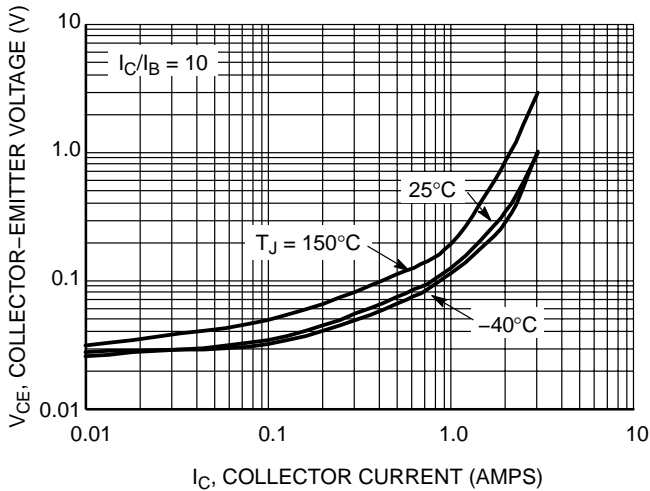
**Figure 5. DC Current Gain,  $V_{CE} = 5.0\text{ V}$   
PNP MJE15035**



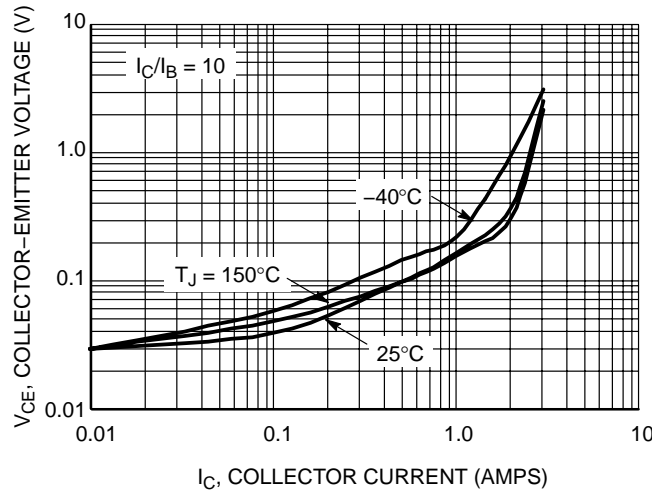
**Figure 6. DC Current Gain,  $V_{CE} = 20\text{ V}$   
NPN MJE15034**



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

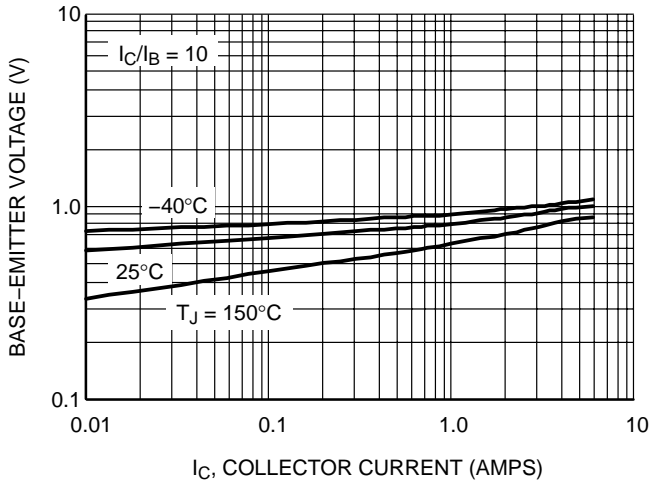


**Figure 8.  $V_{CE(sat)}$   
NPN MJE15034**

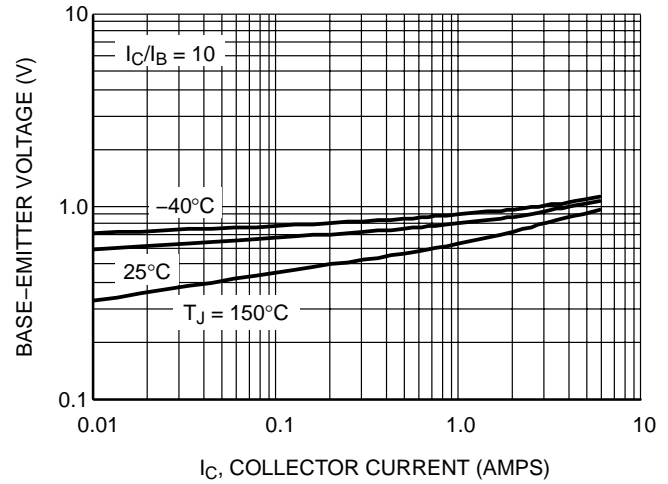


**Figure 9.  $V_{CE(sat)}$   
PNP MJE15035**

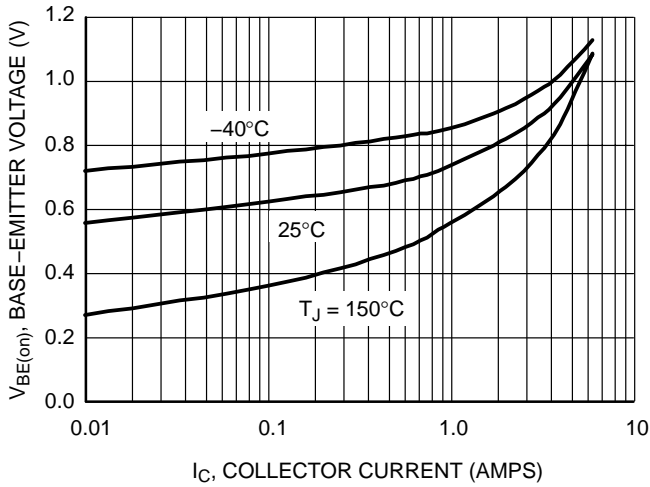
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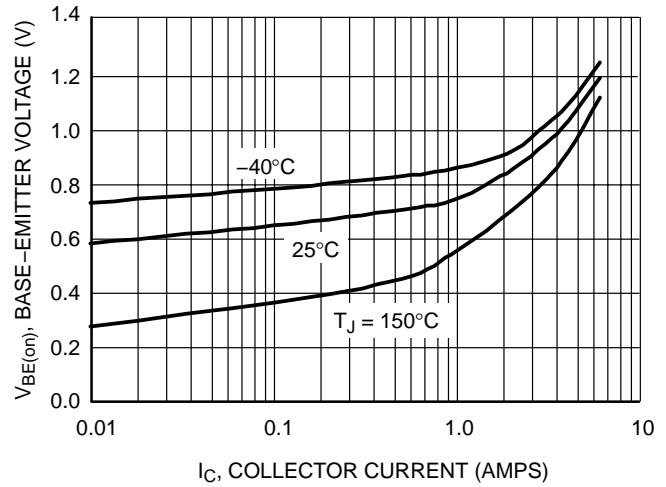
**Figure 10.  $V_{BE(sat)}$   
NPN MJE15034**



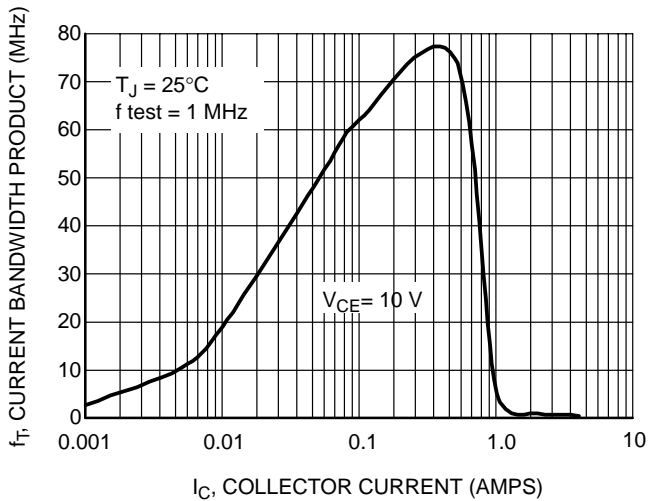
**Figure 11.  $V_{BE(sat)}$   
PNP MJE15035**



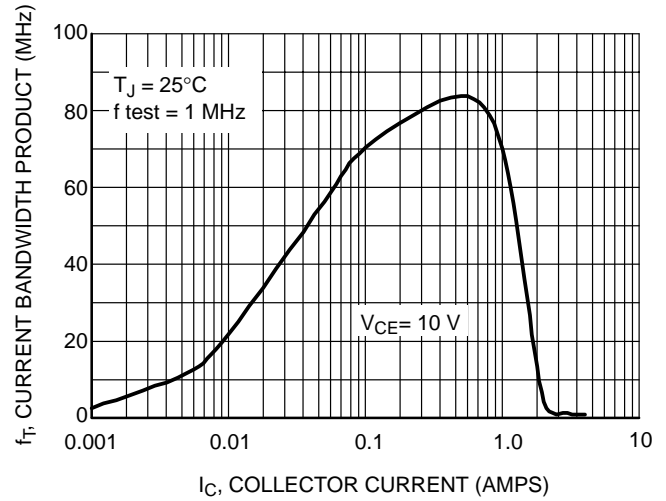
**Figure 12.  $V_{BE(on)}$   
NPN MJE15034**



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



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

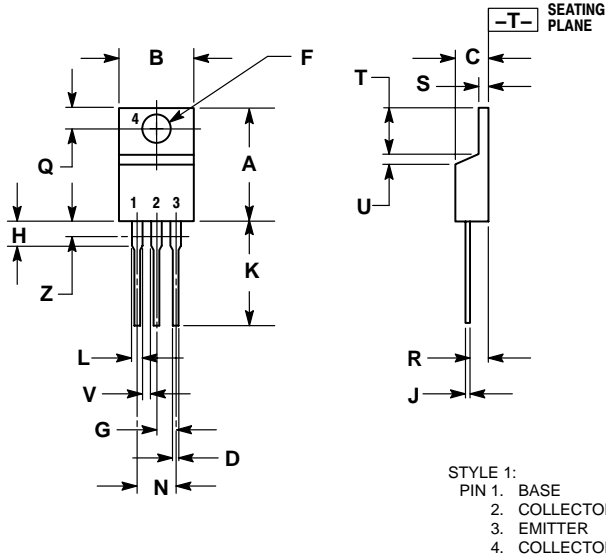


**Figure 15. Typical Current Gain Bandwidth Product  
PNP MJE15035**

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## PACKAGE DIMENSIONS

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




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	0.035	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

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