

MJE15034 NPN, MJE15035 PNP

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ON Semiconductor®

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Complementary Silicon Plastic Power Transistors

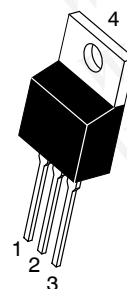
TO-220, NPN & PNP Devices

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*

4.0 AMPERES POWER TRANSISTORS COMPLEMENTARY SILICON 350 VOLTS, 50 WATTS



TO-220AB
CASE 221A
STYLE 1

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°C	P_D	50 0.40	W W/ $^\circ\text{C}$
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°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	$^\circ\text{C}$

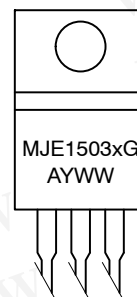
THERMAL CHARACTERISTICS

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

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.

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

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
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	μAdc
Emitter Cutoff Current $(V_{BE} = 5.0\text{ Vdc}, I_C = 0)$	I_{EBO}	–	10	μAdc
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

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

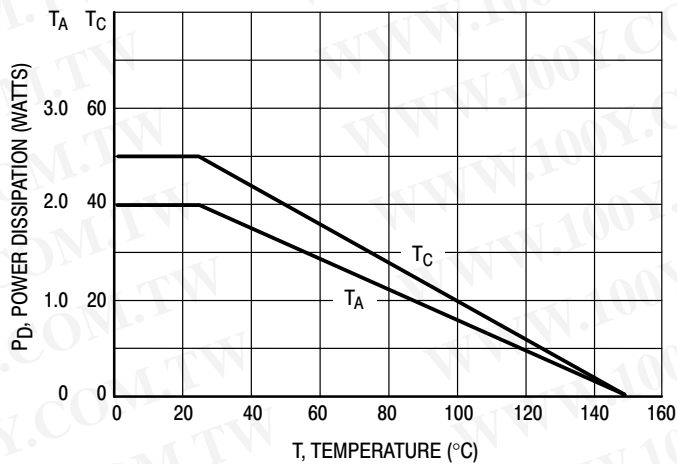


Figure 1. Power Derating

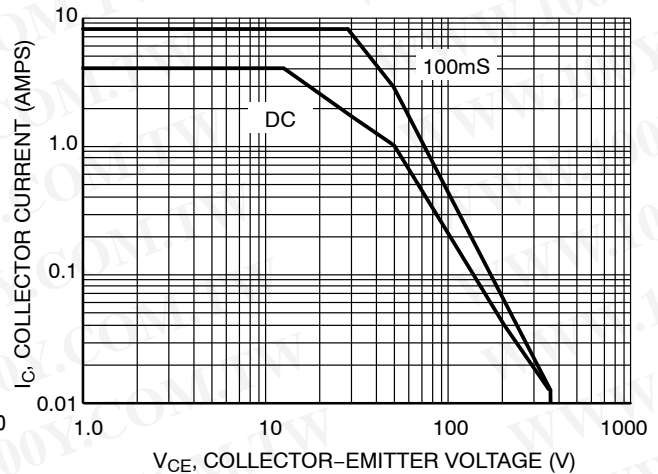


Figure 2. Active Region Safe Operating Area

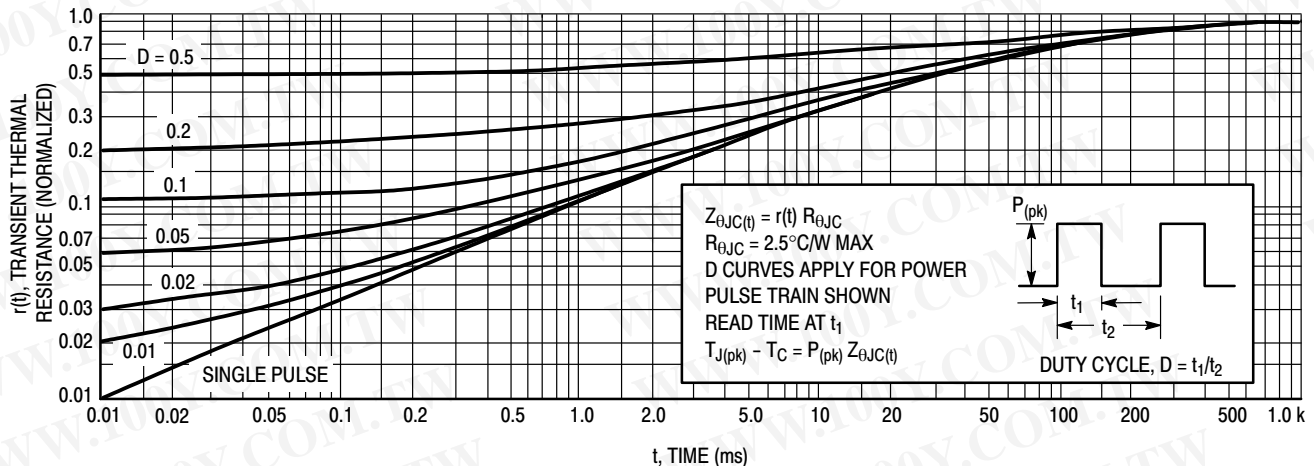
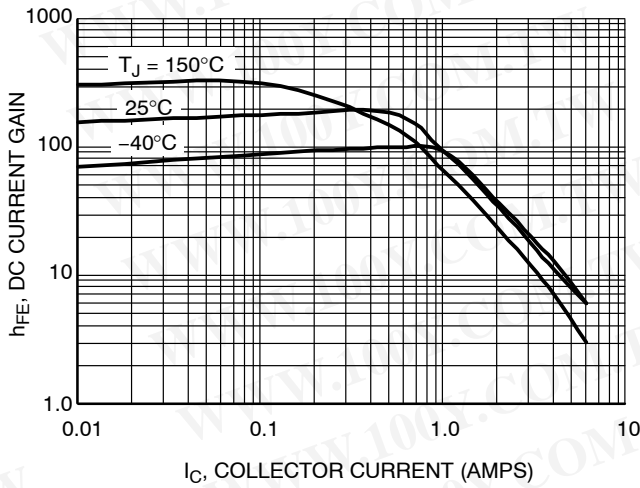
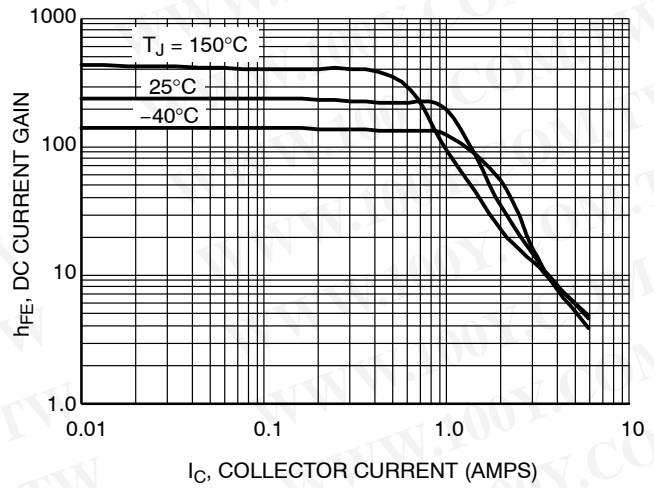


Figure 3. Thermal Response

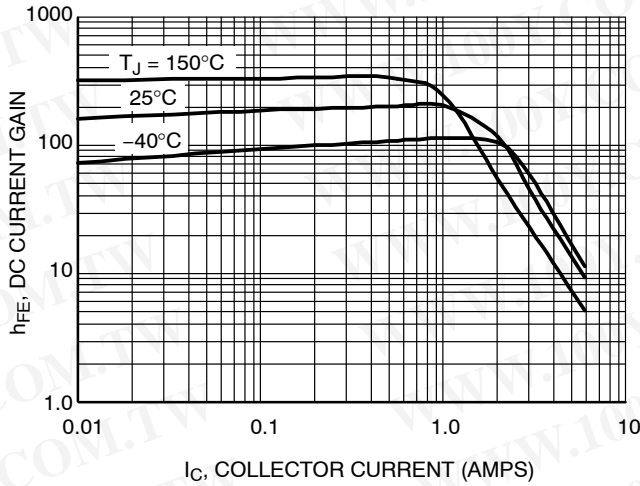
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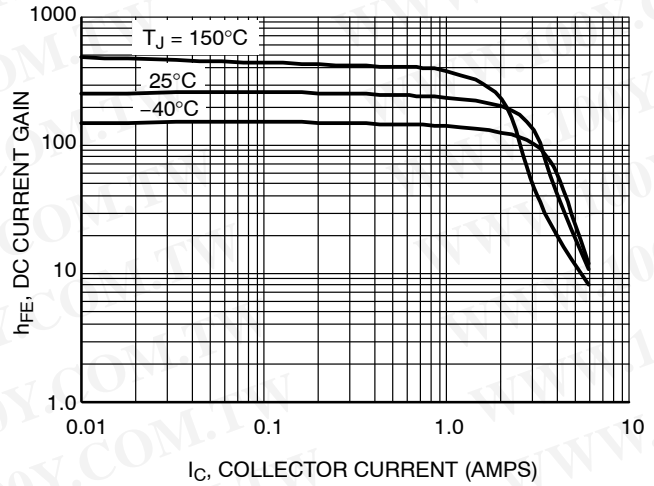
**Figure 4. DC Current Gain, $V_{CE} = 5.0$ V
NPN MJE15034**



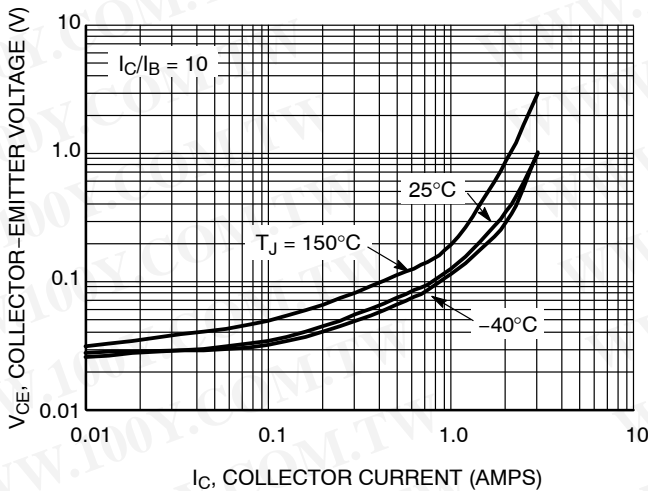
**Figure 5. DC Current Gain, $V_{CE} = 5.0$ V
PNP MJE15035**



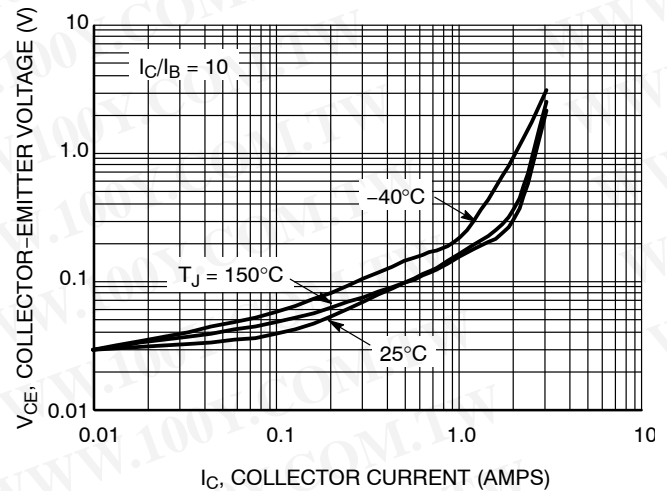
**Figure 6. DC Current Gain, $V_{CE} = 20$ V
NPN MJE15034**



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

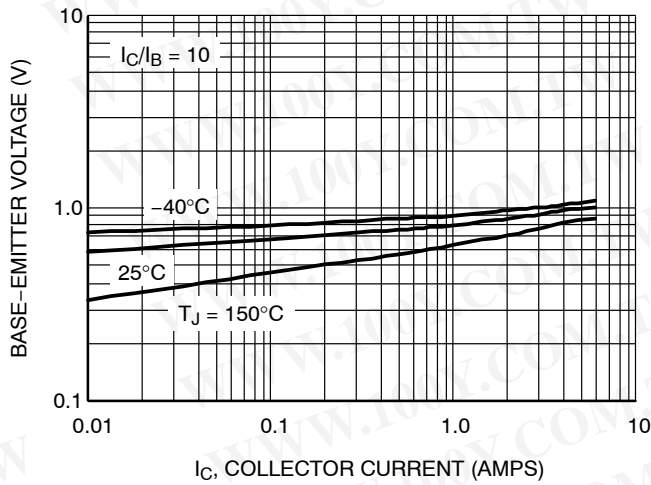


**Figure 8. $V_{CE(sat)}$
NPN MJE15034**

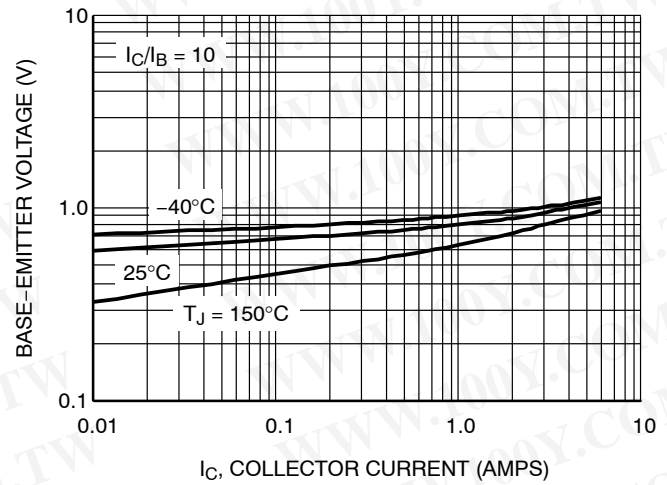


**Figure 9. $V_{CE(sat)}$
PNP MJE15035**

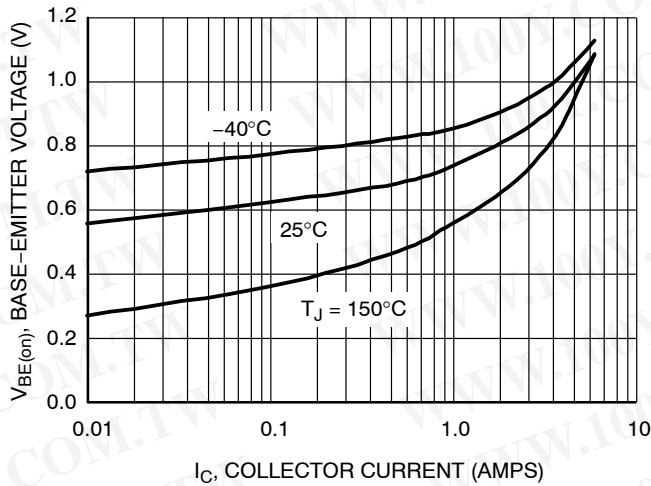
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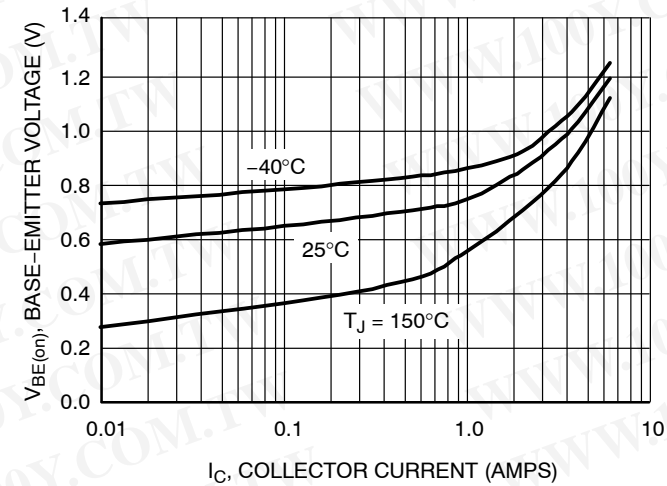
**Figure 10. $V_{BE(sat)}$
NPN MJE15034**



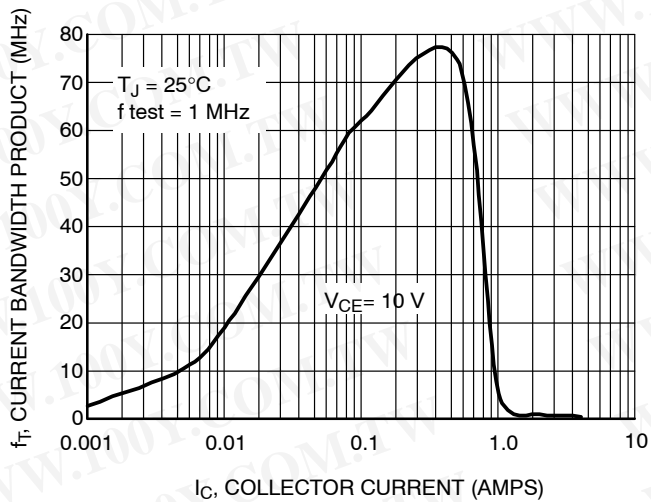
**Figure 11. $V_{BE(sat)}$
PNP MJE15035**



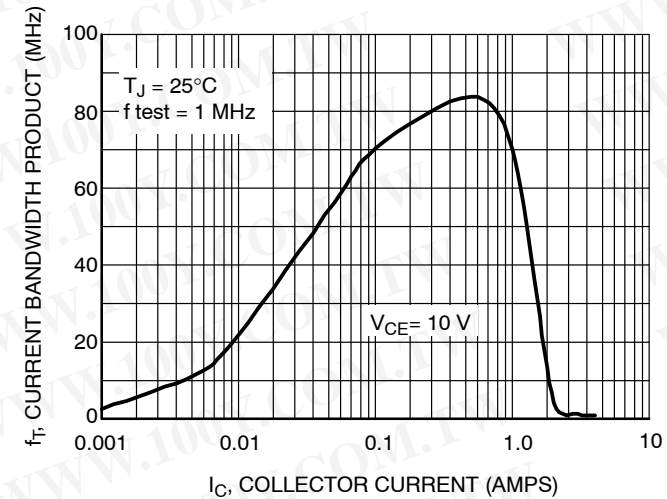
**Figure 12. $V_{BE(on)}$
NPN MJE15034**



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



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

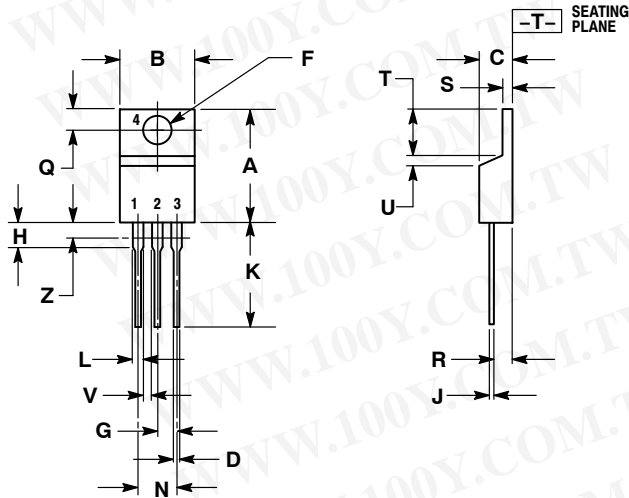


**Figure 15. Typical Current Gain Bandwidth Product
PNP MJE15035**

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PACKAGE DIMENSIONS

TO-220
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:

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

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