Complementary Silicon Plastic Power Transistors

TO−220, NPN & PNP Devices

MJE15034 (NPN), MJE15035 (PNP)

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

Features

- High Current Gain − Bandwidth Product
- TO−220 Compact Package
- Epoxy meets UL 94 V−0 @ 0.125 in
- These Devices are Pb−Free and are RoHS Compliant*

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	I_C	4.0	Adc
Collector Current − Peak	I_{CM}	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	W W/°C
Total Power Dissipation @ T_A = 25°C Derate above 25°C	P_D	2.0 0.016	W W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +150	°C
ESD − Human Body Model	HBM	3B	V
ESD − Machine Model	MM	C	V

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

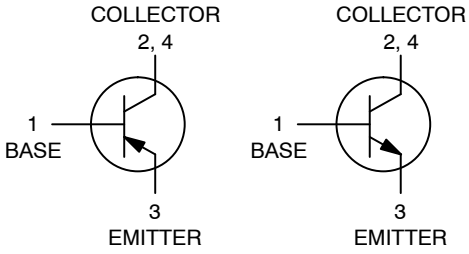
THERMAL CHARACTERISTICS

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

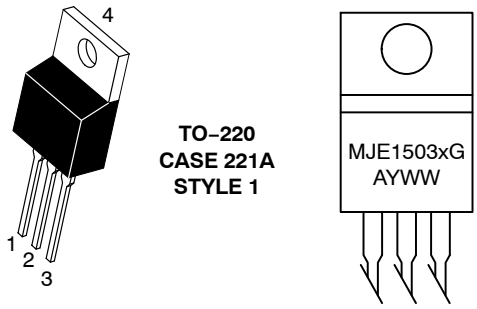
*For additional information on our Pb−Free strategy and soldering details, please download the **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

4.0 AMPERES POWER TRANSISTORS COMPLEMENTARY SILICON 350 VOLTS, 50 WATTS

COMPLEMENTARY



MARKING DIAGRAM



TO−220
CASE 221A
STYLE 1

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

ORDERING INFORMATION

Device	Package	Shipping
MJE15034G	TO−220 (Pb−Free)	50 Units / Rail
MJE15035G	TO−220 (Pb−Free)	50 Units / Rail

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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

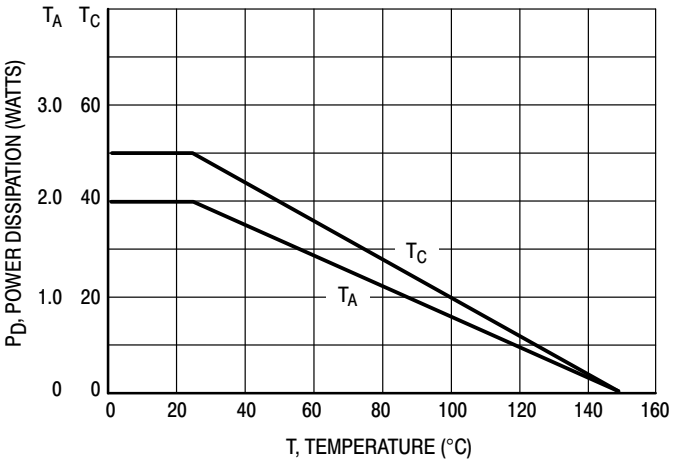


Figure 1. Power Derating

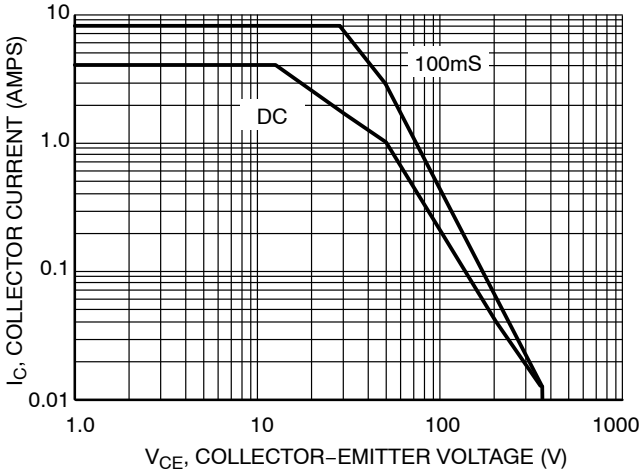


Figure 2. Active Region Safe Operating Area

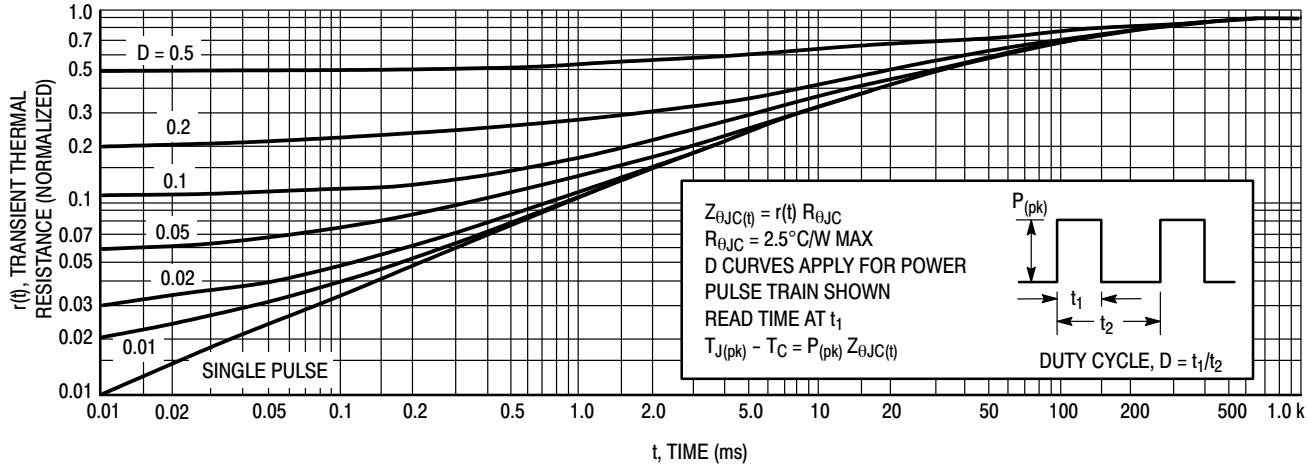


Figure 3. Thermal Response

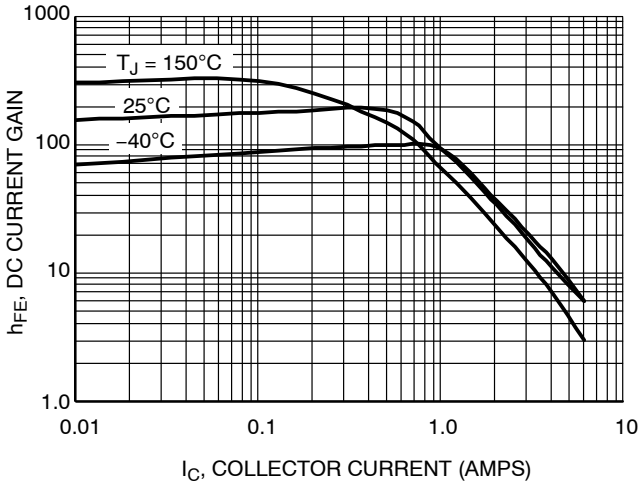


Figure 4. DC Current Gain, V_{CE} = 5.0 V
NPN MJE15034

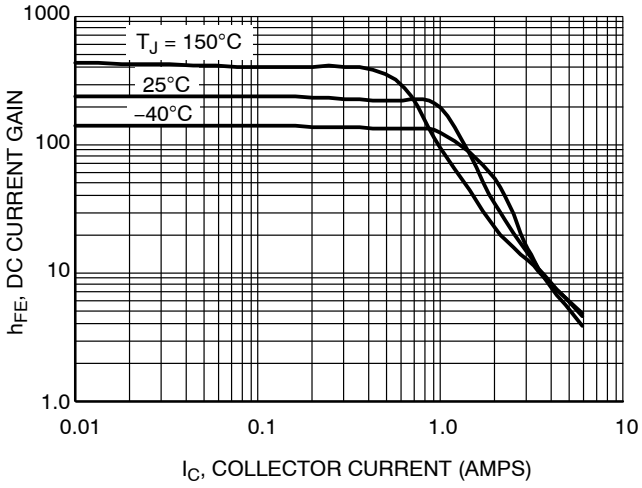


Figure 5. DC Current Gain, V_{CE} = 5.0 V
PNP MJE15035

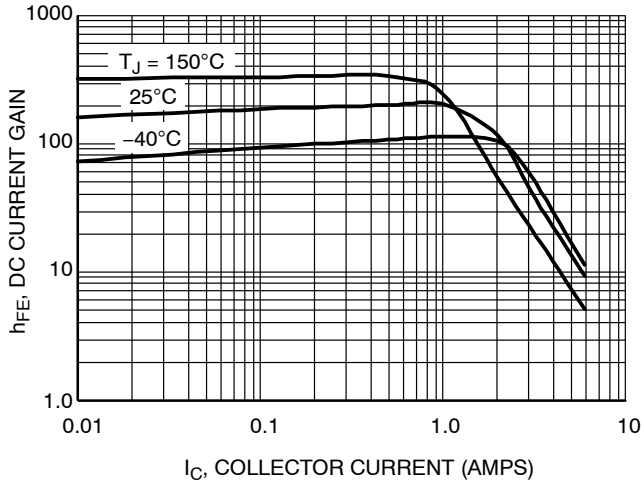


Figure 6. DC Current Gain, V_{CE} = 20 V
NPN MJE15034

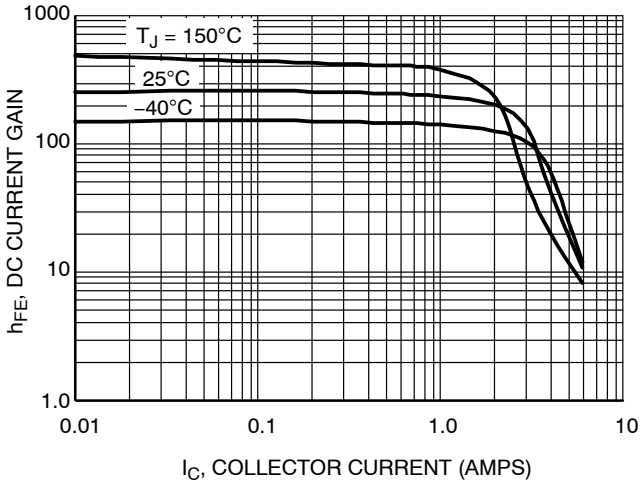


Figure 7. DC Current Gain, V_{CE} = 20 V
PNP MJE15035

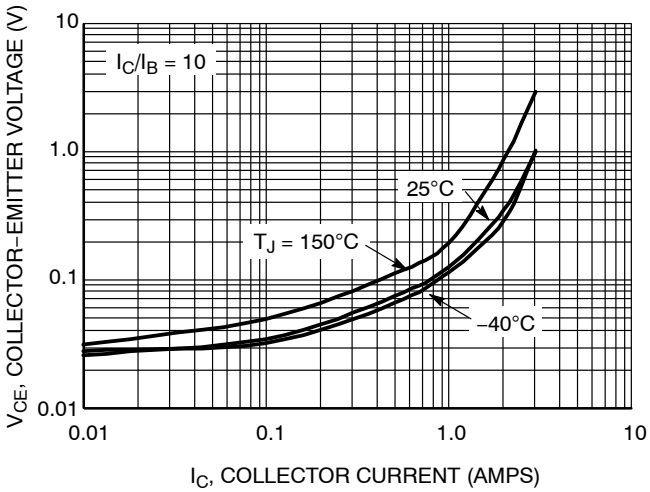


Figure 8. $V_{CE(sat)}$
NPN MJE15034

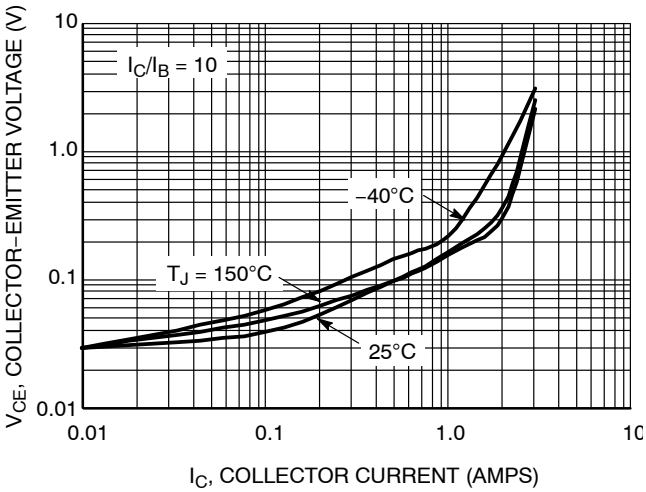


Figure 9. $V_{CE(sat)}$
PNP MJE15035

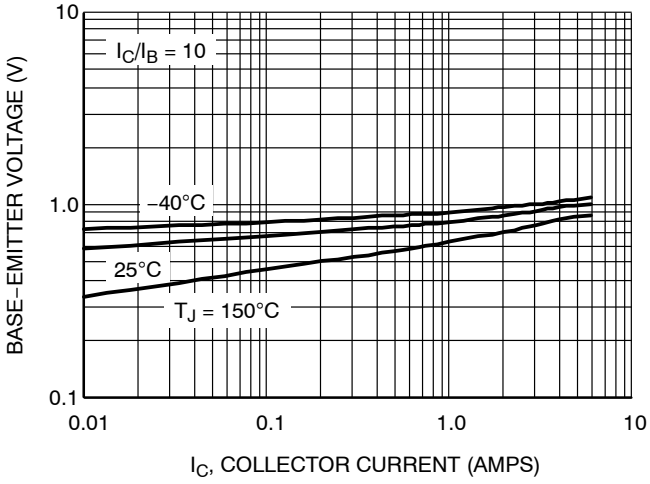


Figure 10. $V_{BE(sat)}$ NPN MJE15034

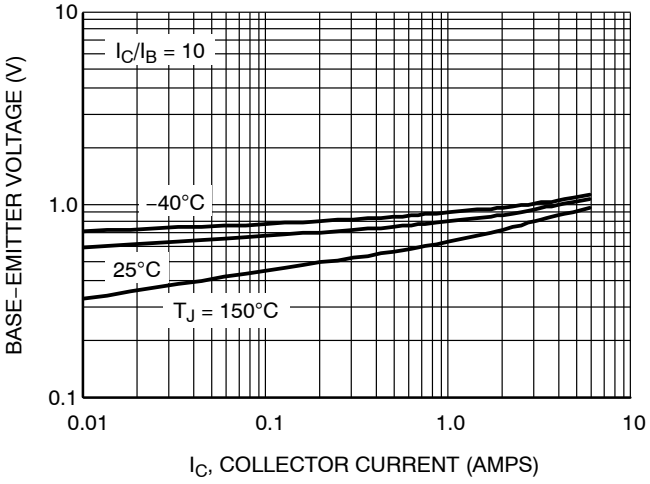


Figure 11. $V_{BE(sat)}$ PNP MJE15035

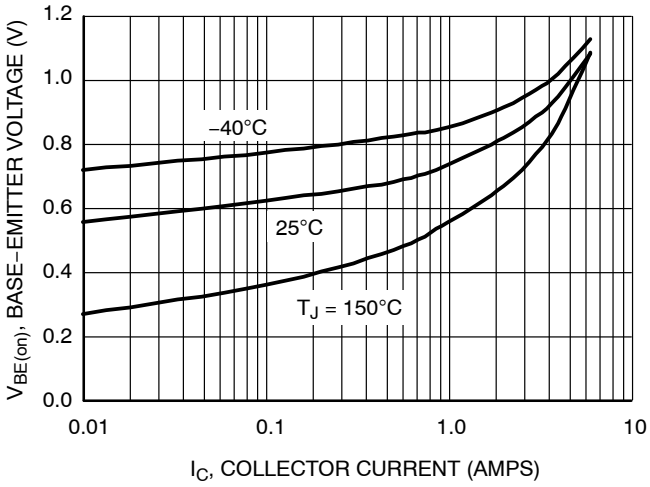


Figure 12. $V_{BE(on)}$ NPN MJE15034

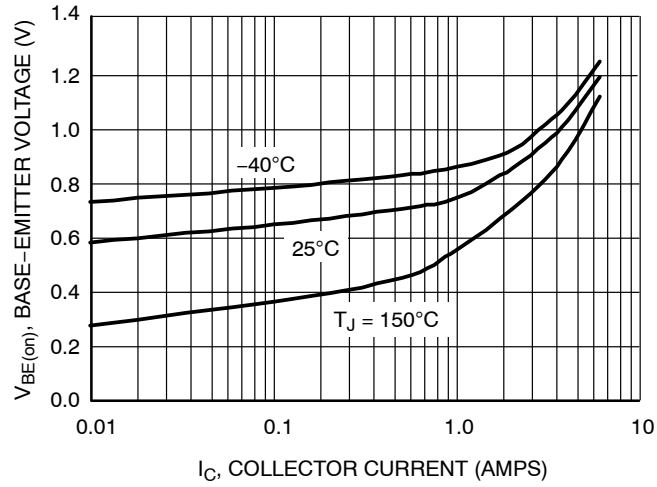


Figure 13. $V_{BE(on)}$ PNP MJE15035

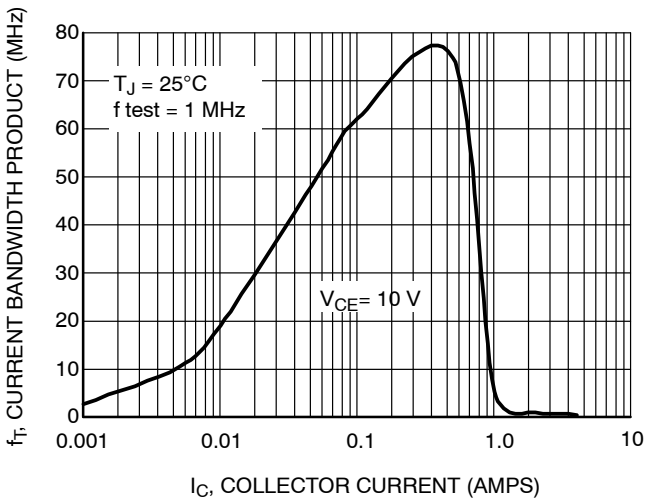


Figure 14. Typical Current Gain Bandwidth Product NPN MJE15034

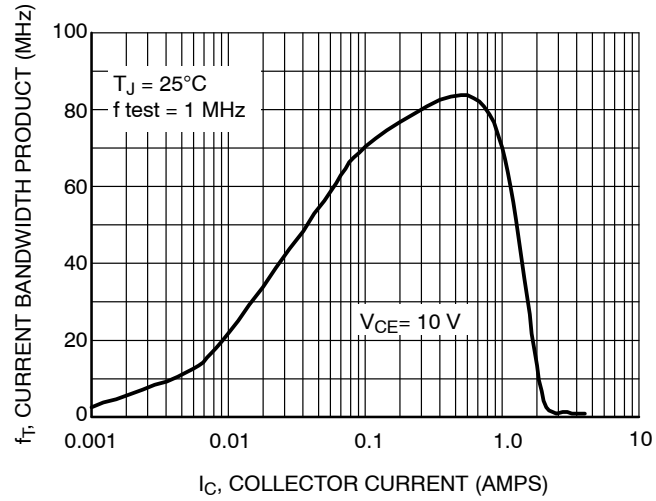
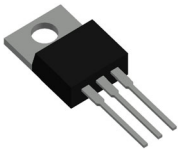
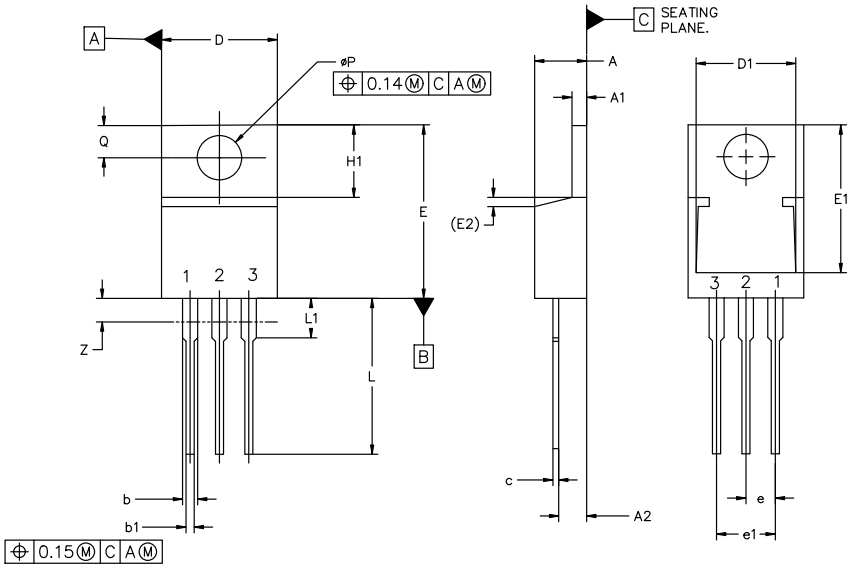


Figure 15. Typical Current Gain Bandwidth Product PNP MJE15035



TO−220−3 10.10x15.12x4.45, 2.54P
CASE 221A
ISSUE AL

DATE 05 FEB 2025



MILLIMETERS			
DIM	MIN	NOM	MAX
A	4.07	4.45	4.83
A1	1.15	1.28	1.41
A2	2.04	2.42	2.79
b	1.15	1.34	1.52
b1	0.64	0.80	0.96
c	0.36	0.49	0.61
D	9.66	10.10	10.53
D1	8.43	8.63	8.83
E	14.48	15.12	15.75
E1	12.58	12.78	12.98
E2	1.27 REF		

MILLIMETERS			
DIM	MIN	NOM	MAX
e	2.42	2.54	2.66
e1	4.83	5.08	5.33
H1	5.97	6.22	6.47
L	12.70	13.49	14.27
L1	2.80	3.45	4.10
Q	2.54	2.79	3.04
øP	3.60	3.85	4.09
Z	−.−−	−.−−	3.48

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

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

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

STYLE 3:
PIN 1. CATHODE
2. ANODE
3. GATE
4. ANODE

STYLE 4:
PIN 1. MAIN TERMINAL 1
2. MAIN TERMINAL 2
3. GATE
4. MAIN TERMINAL 2

STYLE 5:
PIN 1. GATE
2. DRAIN
3. SOURCE
4. DRAIN

STYLE 6:
PIN 1. ANODE
2. CATHODE
3. ANODE
4. CATHODE

STYLE 7:
PIN 1. CATHODE
2. ANODE
3. CATHODE
4. ANODE

STYLE 8:
PIN 1. CATHODE
2. ANODE
3. EXTERNAL TRIP/DELAY
4. ANODE

STYLE 9:
PIN 1. GATE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

STYLE 10:
PIN 1. GATE
2. SOURCE
3. DRAIN
4. SOURCE

STYLE 11:
PIN 1. DRAIN
2. SOURCE
3. GATE
4. SOURCE

STYLE 12:
PIN 1. MAIN TERMINAL 1
2. MAIN TERMINAL 2
3. GATE
4. NOT CONNECTED

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DESCRIPTION:	**TO−220−3 10.10x15.12x4.45, 2.54P**	**PAGE 1 OF 1**

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