MJW3281A (NPN)
MJW1302A (PNP)

Preferred Devices

Complementary NPN-PNP Silicon Power Bipolar Transistors

The MJW3281A and MJW1302A are PowerBase™ power transistors for high power audio, disk head positioners and other linear applications.

- Designed for 100 W Audio Frequency
- Gain Complementary:
  Gain Linearity from 100 mA to 7 A
  h_{FE} = 45 (Min) @ I_C = 8 A
- Low Harmonic Distortion
- High Safe Operation Area – 1 A/100 V @ 1 Second
- High f_T – 30 MHz Typical

MAXIMUM RATINGS (T_J = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CEO}	230	Vdc
Collector–Base Voltage	V_{CBO}	230	Vdc
Emitter–Base Voltage	V_{EBO}	5.0	Vdc
Collector–Emitter Voltage – 1.5 V	V_{CEX}	230	Vdc
Collector Current – Continuous – Peak (Note 1)	I_C	15 25	Adc
Base Current – Continuous	I_B	1.5	Adc
Total Power Dissipation @ T_C = 25°C Derate Above 25°C	P_D	200 1.43	Watts W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	–65 to +150	°C

THERMAL CHARACTERISTICS

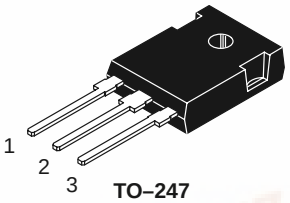
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.7	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	40	°C/W

1. Pulse Test: Pulse Width = 5 ms, Duty Cycle < 10%.

ON Semiconductor™

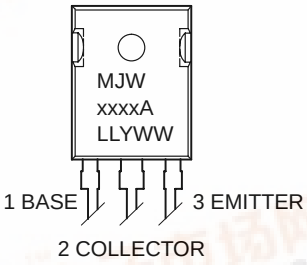
http://onsemi.com

15 AMPERES COMPLEMENTARY SILICON POWER TRANSISTORS 230 VOLTS 200 WATTS



TO–247
CASE 340K
STYLE 3

MARKING DIAGRAM



MJWxxxxA = Device Code
xxxx = 3281 OR 1302
LL = Location Code
Y = Year
WW = Work Week

ORDERING INFORMATION

Device	Package	Shipping
MJW3281A	TO–247	30 Units/Rail
MJW1302A	TO–247	30 Units/Rail

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

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Sustaining Voltage (I_C = 100 mAdc, I_B = 0)	$V_{CEO(sus)}$	230	–	–	Vdc
Collector Cutoff Current (V_{CB} = 230 Vdc, I_E = 0)	I_{CBO}	–	–	50	μAdc
Emitter Cutoff Current (V_{EB} = 5 Vdc, I_C = 0)	I_{EBO}	–	–	5	μAdc
SECOND BREAKDOWN					
Second Breakdown Collector with Base Forward Biased (V_{CE} = 50 Vdc, t = 1 s (non–repetitive) (V_{CE} = 100 Vdc, t = 1 s (non–repetitive)	$I_{S/b}$	4 1	– –	– –	Adc
ON CHARACTERISTICS					
DC Current Gain (I_C = 100 mAdc, V_{CE} = 5 Vdc) (I_C = 1 Adc, V_{CE} = 5 Vdc) (I_C = 3 Adc, V_{CE} = 5 Vdc) (I_C = 5 Adc, V_{CE} = 5 Vdc) (I_C = 7 Adc, V_{CE} = 5 Vdc) (I_C = 8 Adc, V_{CE} = 5 Vdc) (I_C = 15 Adc, V_{CE} = 5 Vdc)	h_{FE}	 50 50 50 50 50 45 12	 125 – – – 115 – 35	 200 200 200 200 200 – –	–
Collector–Emitter Saturation Voltage (I_C = 10 Adc, I_B = 1 Adc)	$V_{CE(sat)}$	–	0.4	2	Vdc
Base–Emitter On Voltage (I_C = 8 Adc, V_{CE} = 5 Vdc)	$V_{BE(on)}$	–	–	2	Vdc
DYNAMIC CHARACTERISTICS					
Current–Gain – Bandwidth Product (I_C = 1 Adc, V_{CE} = 5 Vdc, f_{test} = 1 MHz)	f_T	–	30	–	MHz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f_{test} = 1 MHz)	C_{ob}	–	–	600	pF

PNP MJW1302A

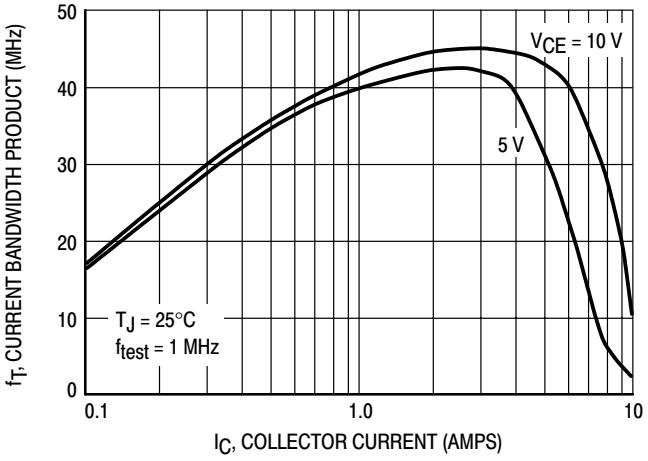


Figure 1. Typical Current Gain Bandwidth Product

NPN MJW3281A

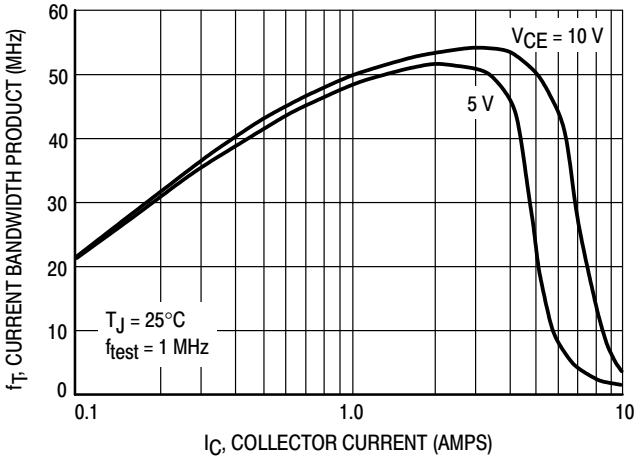


Figure 2. Typical Current Gain Bandwidth Product

TYPICAL CHARACTERISTICS

PNP MJW1302A

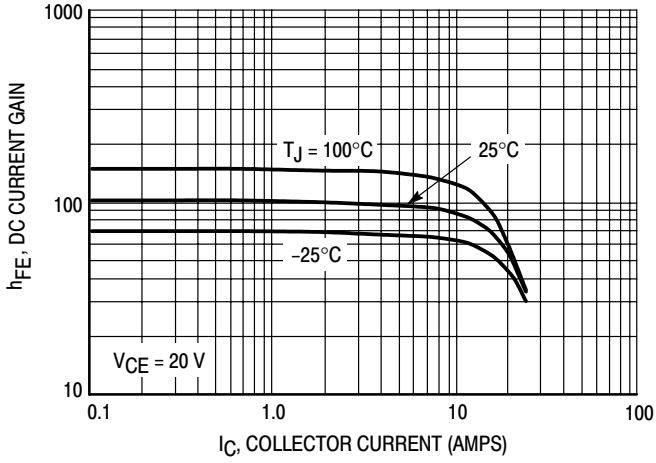


Figure 3. DC Current Gain, V_{CE} = 20 V

NPN MJW3281A

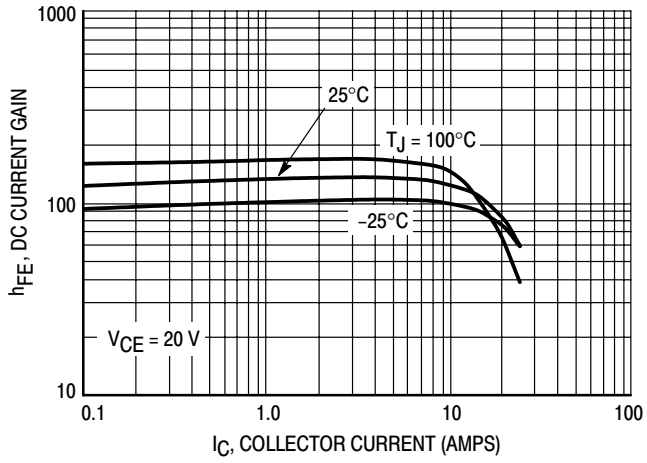


Figure 4. DC Current Gain, V_{CE} = 20 V

PNP MJW1302A

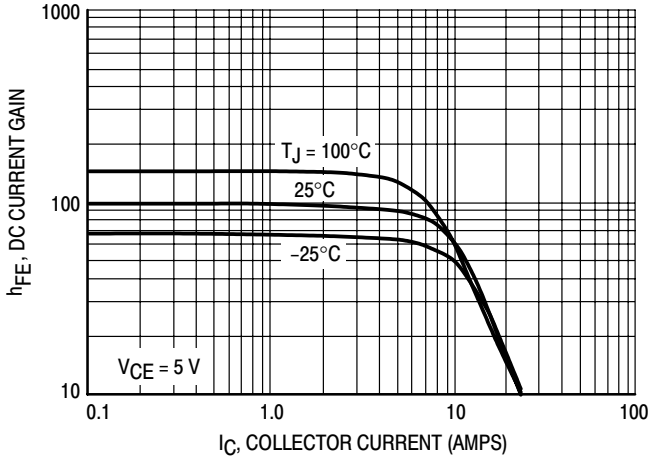


Figure 5. DC Current Gain, V_{CE} = 5 V

NPN MJW3281A

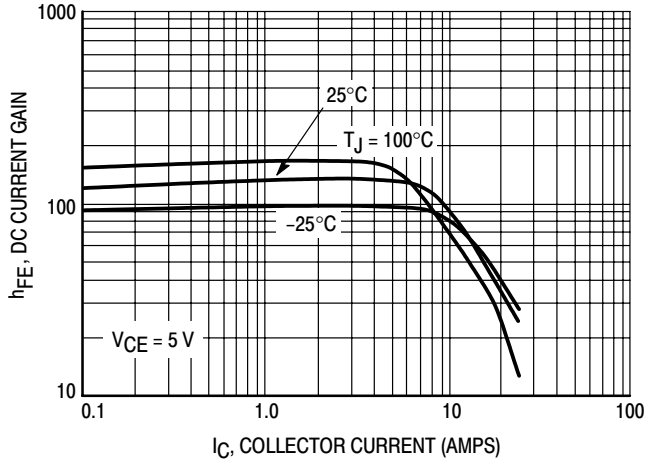


Figure 6. DC Current Gain, V_{CE} = 5 V

PNP MJW1302A

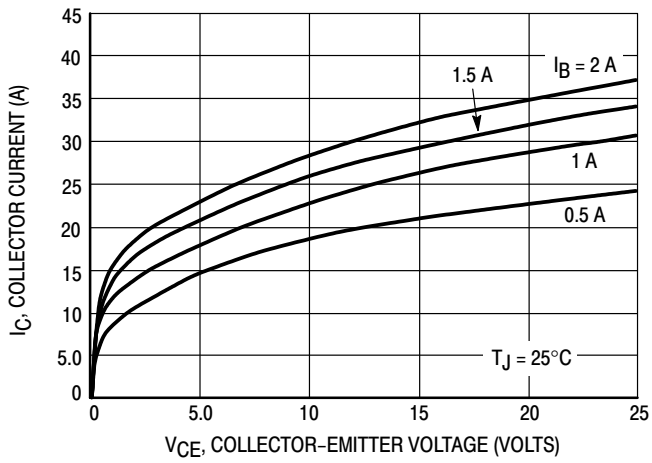


Figure 7. Typical Output Characteristics

NPN MJW3281A

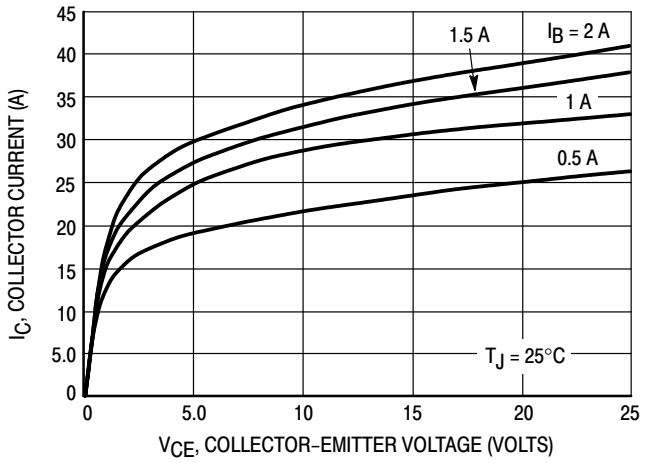


Figure 8. Typical Output Characteristics

TYPICAL CHARACTERISTICS

PNP MJW1302A

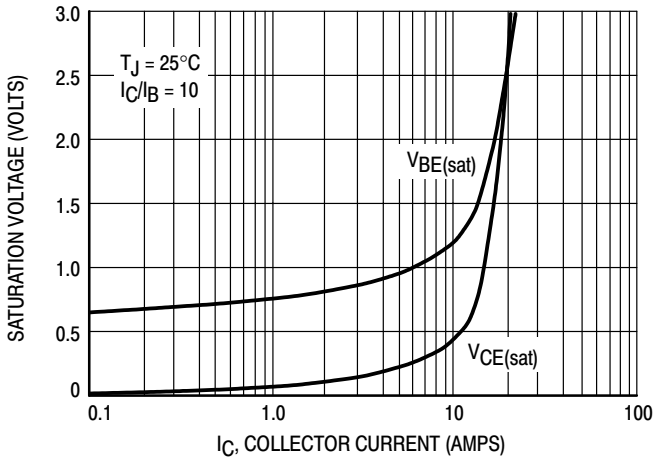


Figure 9. Typical Saturation Voltages

NPN MJW3281A

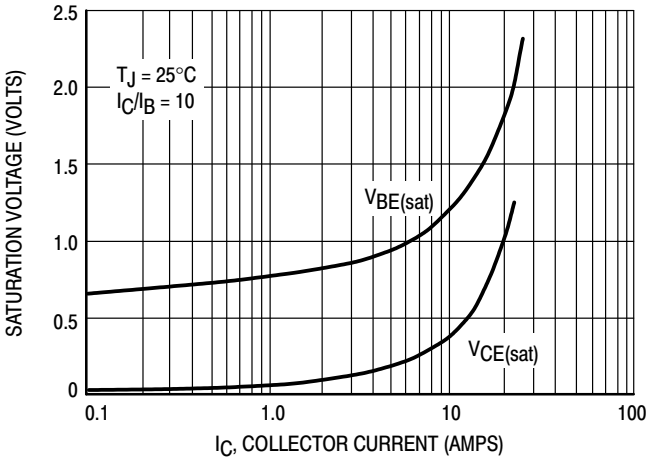


Figure 10. Typical Saturation Voltages

PNP MJW1302A

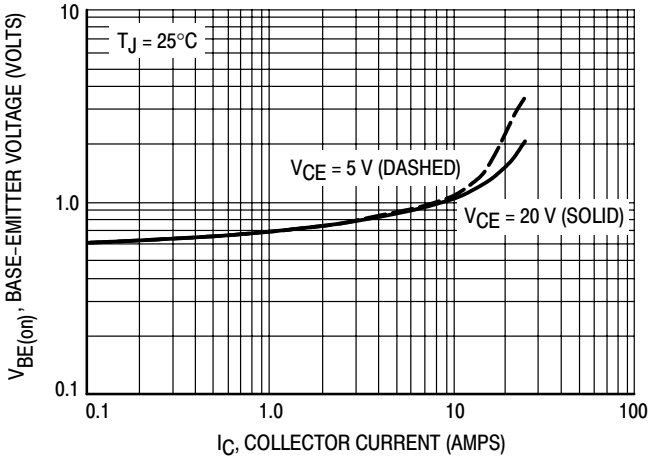


Figure 11. Typical Base–Emitter Voltage

NPN MJW3281A

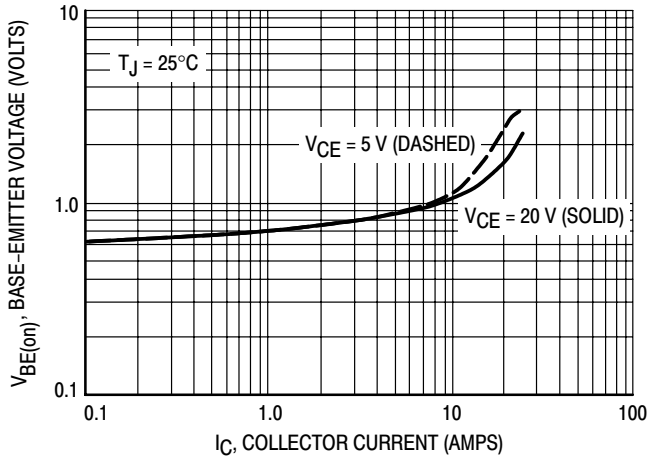


Figure 12. Typical Base–Emitter Voltage

PNP MJW1302A

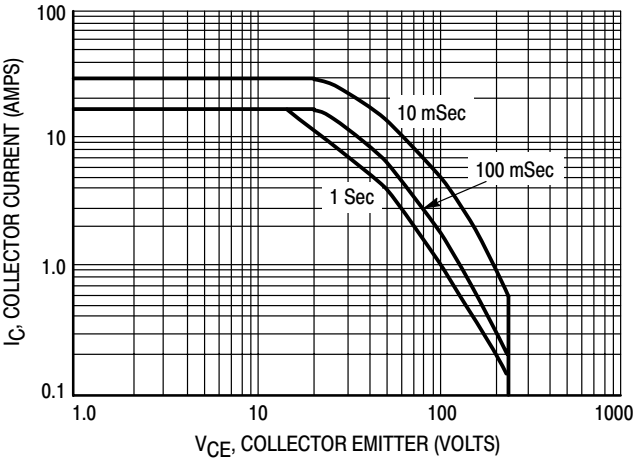


Figure 13. Active Region Safe Operating Area

NPN MJW3281A

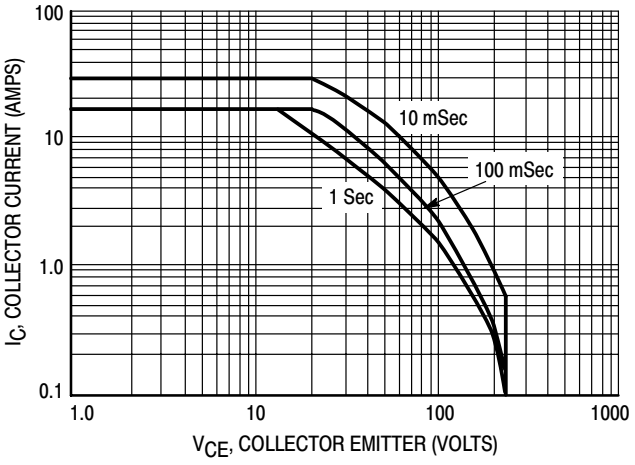


Figure 14. Active Region Safe Operating Area

There are two limitations on the power handling ability of a transistor; average junction temperature and secondary breakdown. Safe operating area curves indicate $I_C - V_{CE}$ limits of the transistor that must be observed for reliable operation; i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data of Figures 13 and 14 is based on $T_{J(pk)} = 150°C$; T_C is variable depending on conditions. At high case temperatures, thermal limitations will reduce the power than can be handled to values less than the limitations imposed by second breakdown.

TYPICAL CHARACTERISTICS

PNP MJW1302A

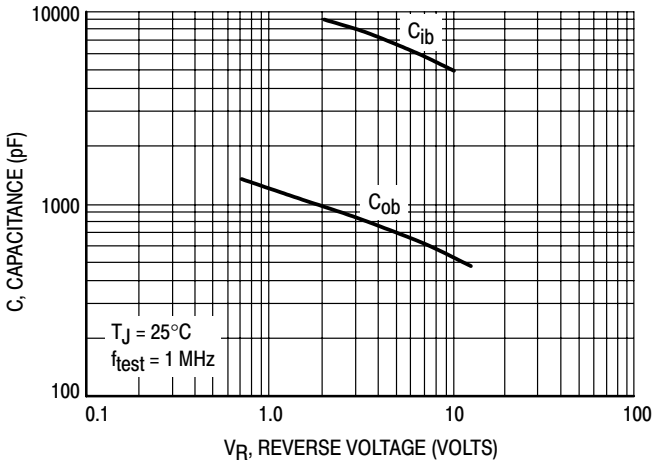


Figure 15. MJW1302A Typical Capacitance

NPN MJW3281A

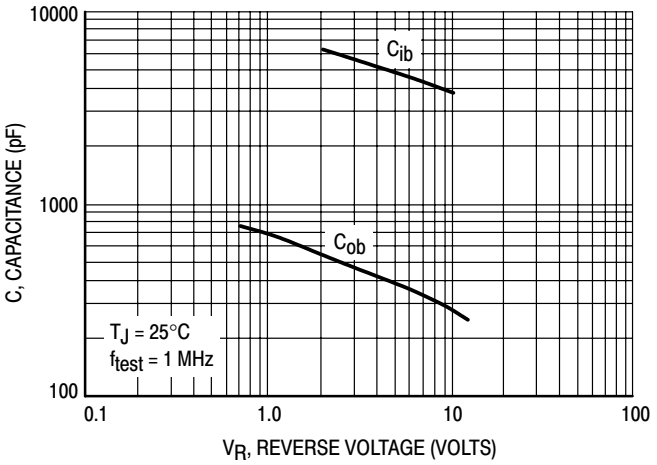
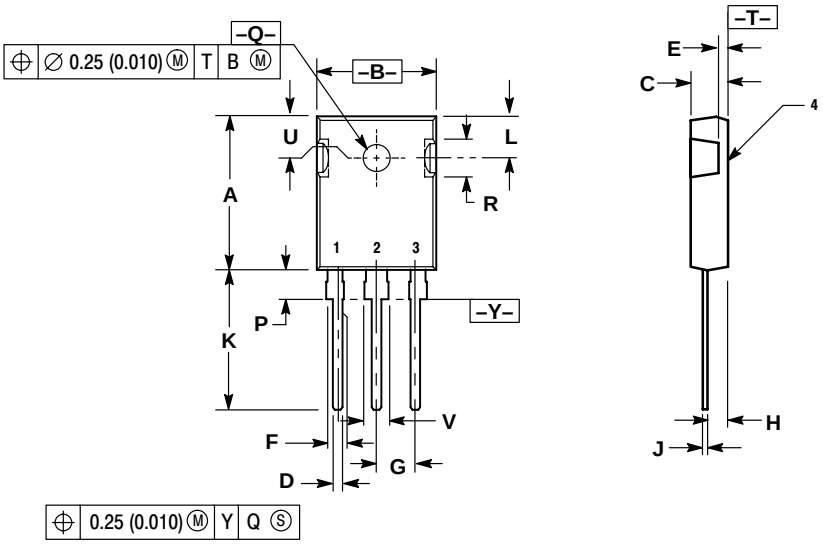


Figure 16. MJW3281A Typical Capacitance

MJW3281A (NPN) MJW1302A (PNP)

PACKAGE DIMENSIONS

TO–247
CASE 340K–01
ISSUE C



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	19.7	20.3	0.776	0.799
B	15.3	15.9	0.602	0.626
C	4.7	5.3	0.185	0.209
D	1.0	1.4	0.039	0.055
E	1.27 REF		0.050 REF	
F	2.0	2.4	0.079	0.094
G	5.5 BSC		0.216 BSC	
H	2.2	2.6	0.087	0.102
J	0.4	0.8	0.016	0.031
K	14.2	14.8	0.559	0.583
L	5.5 NOM		0.217 NOM	
P	3.7	4.3	0.146	0.169
Q	3.55	3.65	0.140	0.144
R	5.0 NOM		0.197 NOM	
U	5.5 BSC		0.217 BSC	
V	3.0	3.4	0.118	0.134

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

Notes

PowerBase is a trademark of Semiconductor Components Industries, LLC.

PUBLICATION ORDERING INFORMATION

Literature Fulfillment:
Literature Distribution Center for ON Semiconductor
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Fax: 303–675–2176 or 800–344–3867 Toll Free USA/Canada
Email: ONlit@hibbertco.com

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Email: r14525@onsemi.com

ON Semiconductor Website: http://onsemi.com

For additional information, please contact your local
Sales Representative.