MJL0281A (NPN)
MJL0302A (PNP)

Preferred Devices

Complementary NPN-PNP Power Bipolar Transistors

These complementary devices are lower power versions of the popular MJL3281A and MJL1302A audio output transistors. With superior gain linearity and safe operating area performance, these transistors are ideal for high fidelity audio amplifier output stages and other linear applications.

Features

- Exceptional Safe Operating Area
- NPN/PNP Gain Matching within 10% from 50 mA to 3.0 A
- Excellent Gain Linearity
- High BVCEO
- High Frequency
- Pb−Free Packages are Available*

Benefits

- Reliable Performance at Higher Powers
- Symmetrical Characteristics in Complementary Configurations
- Accurate Reproduction of Input Signal
- Greater Dynamic Range
- High Amplifier Bandwith

Applications

- High−End Consumer Audio Products
  - Home Amplifiers
  - Home Receivers
- Professional Audio Amplifiers
  - Theater and Stadium Sound Systems
  - Public Address Systems (PAs)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector−Emitter Voltage	V_{CEO}	260	Vdc
Collector−Base Voltage	V_{CBO}	260	Vdc
Emitter−Base Voltage	V_{EBO}	5.0	Vdc
Collector−Emitter Voltage − 1.5 V	V_{CEX}	260	Vdc
Collector Current − Continuous − Peak (Note 1)	I_C	15 30	Adc
Base Current − Continuous	I_B	1.5	Adc
Total Power Dissipation @ T_C = 25°C	P_D	180	Watts
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +150	°C

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.

1. Pulse Test: Pulse Width = 5.0 ms, Duty Cycle < 10%.

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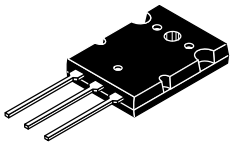
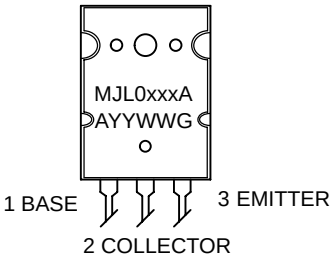
15 AMPERES COMPLEMENTARY SILICON POWER TRANSISTORS 260 VOLTS − 180 WATTS

TO−264
CASE 340G
STYLE 2



MARKING DIAGRAM



MJL0xxxA = Device Code
xxx = 281 or 302
A = Location Code
YY = Year
WW = Work Week
G = Pb−Free Package

ORDERING INFORMATION

Device	Package	Shipping
MJL0281A	TO−264	25 Units/Rail
MJL0281AG	TO−264 (Pb−Free)	25 Units/Rail
MJL0302A	TO−264	25 Units/Rail
MJL0302AG	TO−264 (Pb−Free)	25 Units/Rail

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

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

THERMAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction−to−Case	$R_{\theta JC}$	0.69	°C/W

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector−Emitter Sustaining Voltage (I_C = 30 mA, I_B = 0)	$V_{CEO(sus)}$	260	−	V
Collector Cutoff Current (V_{CB} = 260 V, I_E = 0)	I_{CBO}	−	10	μA
Emitter Cutoff Current (V_{EB} = 5.0 V, I_C = 0)	I_{EBO}	−	5.0	μA
ON CHARACTERISTICS				
DC Current Gain (I_C = 0.5 A, V_{CE} = 5.0 V) (I_C = 1.0 A, V_{CE} = 5.0 V) (I_C = 3.0 A, V_{CE} = 5.0 V)	h_{FE}	 75 75 75	 150 150 150	−
Collector−Emitter Saturation Voltage (I_C = 5.0 A, I_B = 0.5 A)	$V_{CE(sat)}$	−	1.0	V
Base−Emitter On Voltage (I_C = 5.0 A, V_{CE} = 5.0 V)	$V_{BE(on)}$	−	1.2	V
DYNAMIC CHARACTERISTICS				
Current−Gain − Bandwidth Product (I_C = 1.0 A, V_{CE} = 5.0 V, f_{test} = 1.0 MHz)	f_T	30	−	MHz
Output Capacitance (V_{CB} = 10 V, I_E = 0, f_{test} = 1.0 MHz)	C_{ob}	−	400	pF

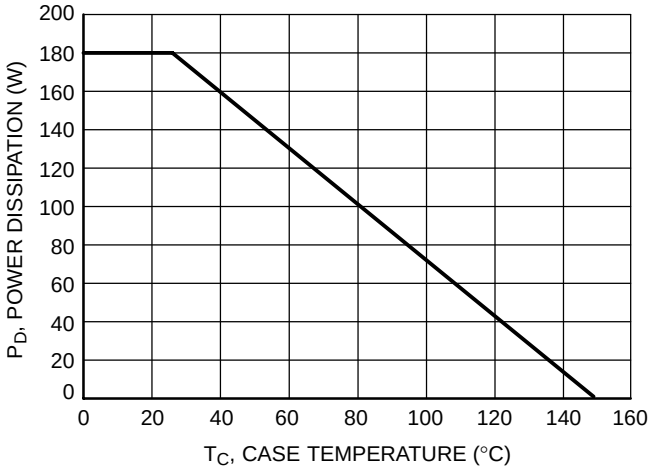


Figure 1. Power Derating

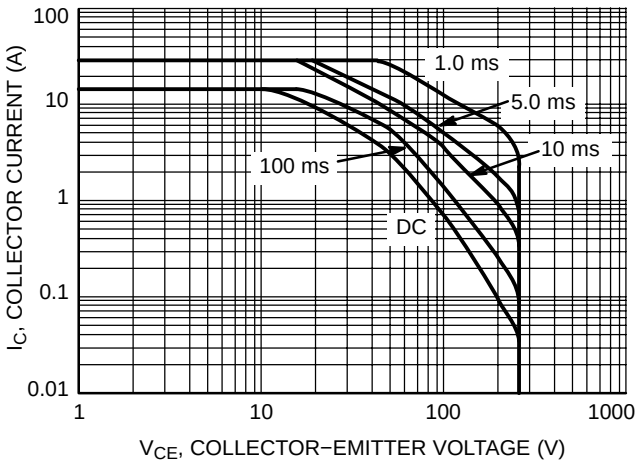


Figure 2. Safe Operating Area

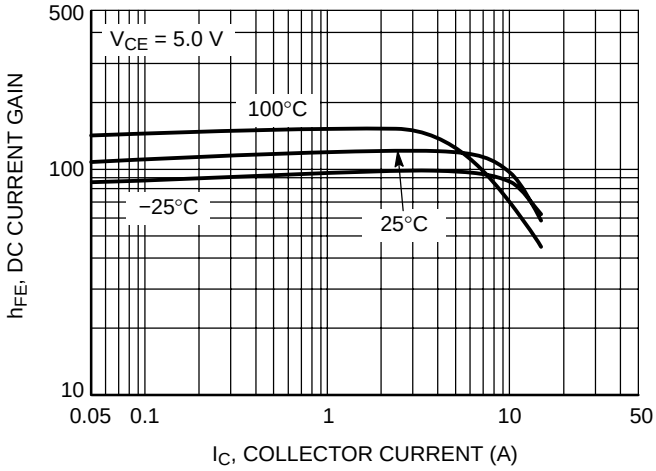


Figure 3. MJL0281A DC Current Gain

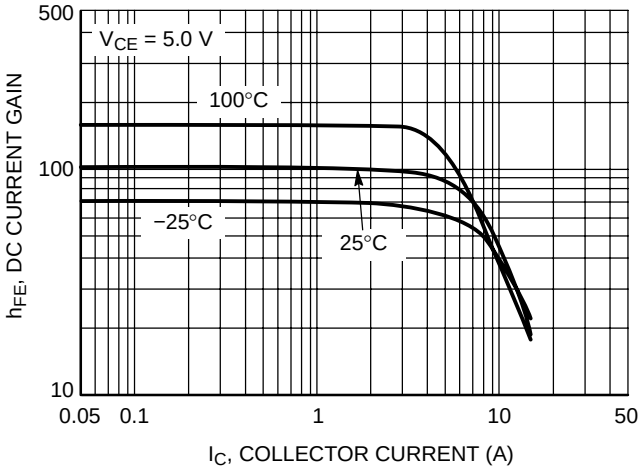


Figure 4. MJL0302A DC Current Gain

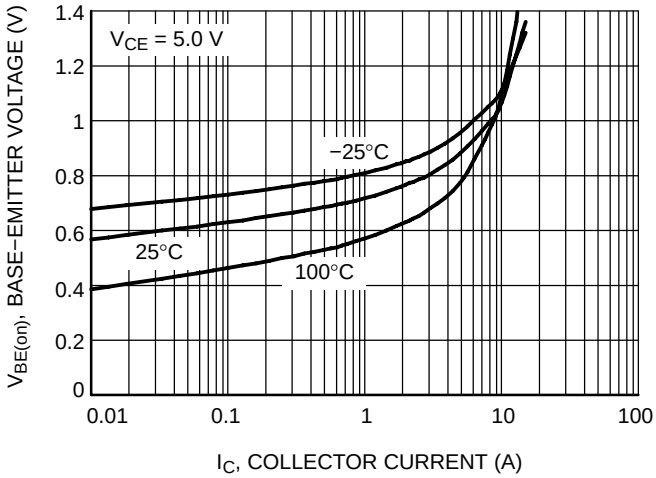


Figure 5. MJL0281A Base−Emitter Voltage

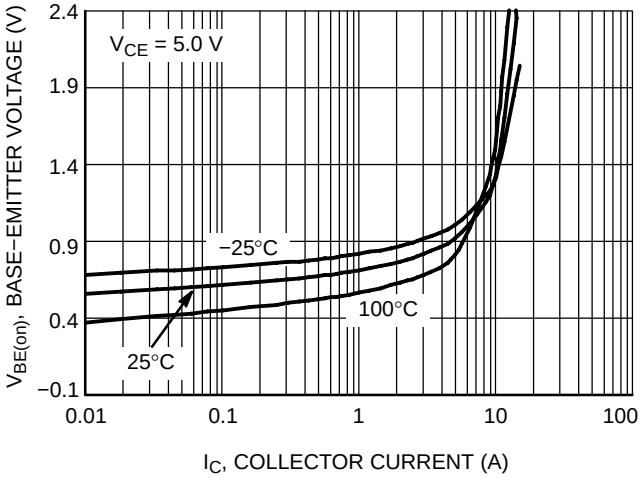


Figure 6. MJL0302A Base−Emitter Voltage

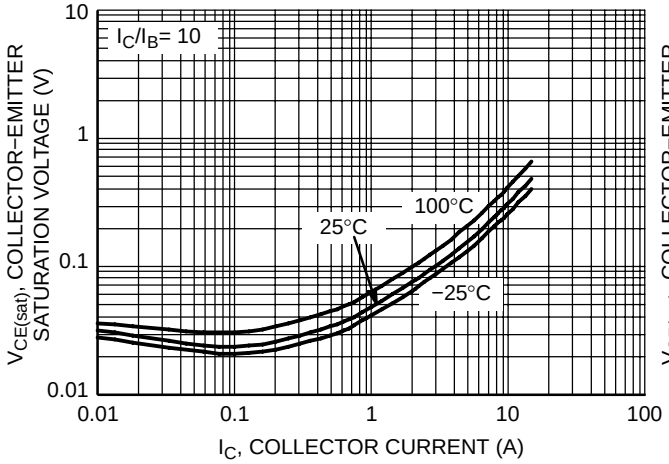


Figure 7. MJL0281A Saturation Voltage

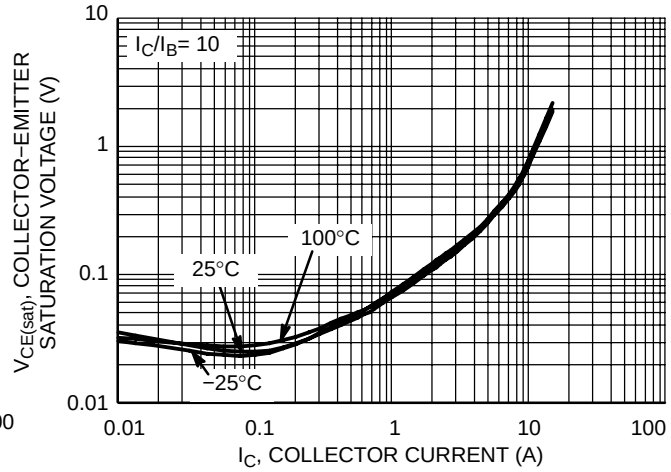


Figure 8. MJL0302A Saturation Voltage

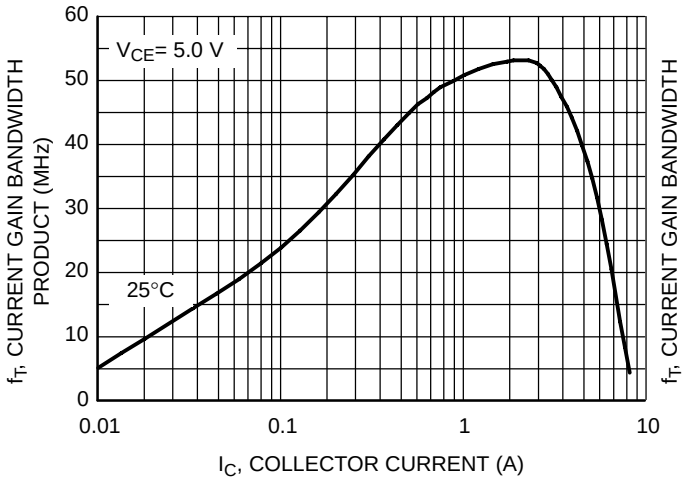


Figure 9. MJL0281A Current Gain Bandwidth Product

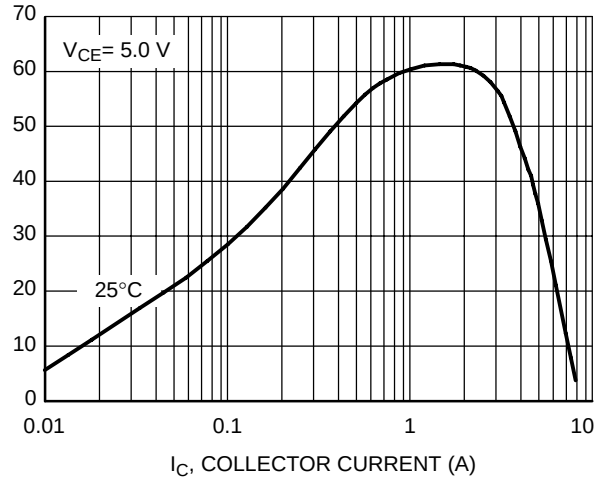
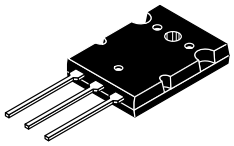


Figure 10. MJL0302A Current Gain Bandwidth Product

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

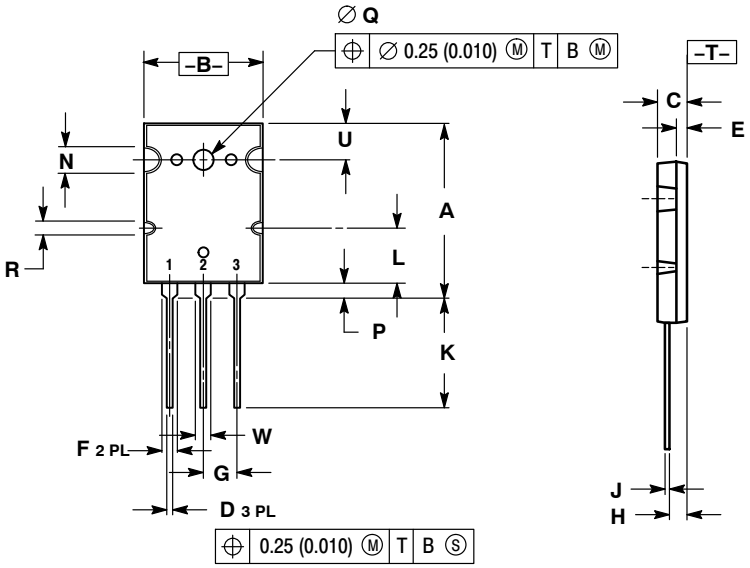
ON Semiconductor®



TO−3BPL (TO−264)
CASE 340G−02
ISSUE J

DATE 17 DEC 2004

SCALE 1:2



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

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	28.0	29.0	1.102	1.142
B	19.3	20.3	0.760	0.800
C	4.7	5.3	0.185	0.209
D	0.93	1.48	0.037	0.058
E	1.9	2.1	0.075	0.083
F	2.2	2.4	0.087	0.102
G	5.45 BSC		0.215 BSC	
H	2.6	3.0	0.102	0.118
J	0.43	0.78	0.017	0.031
K	17.6	18.8	0.693	0.740
L	11.2 REF		0.411 REF	
N	4.35 REF		0.172 REF	
P	2.2	2.6	0.087	0.102
Q	3.1	3.5	0.122	0.137
R	2.25 REF		0.089 REF	
U	6.3 REF		0.248 REF	
W	2.8	3.2	0.110	0.125

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

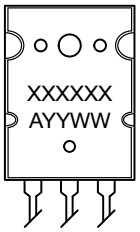
STYLE 2:
PIN 1. BASE
2. COLLECTOR
3. EMITTER

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

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

STYLE 5:
PIN 1. GATE
2. COLLECTOR
3. EMITTER

GENERIC MARKING DIAGRAM*



XXXXXX = Specific Device Code
A = Location Code
YY = Year
WW = Work Week

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “ ▪”, may or may not be present.

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DESCRIPTION:	TO−3BPL (TO−264)	PAGE 1 OF 1

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