NPN Silicon Power Transistors

MJ15022
MJ15024

16 AMPERES,200 and 250 VOLTS,250 WATTS

TO-3

TO-3
Metal Can Package
RoHS compliant

General Description

The MJ15022 and MJ15024 are Power Base power transistors designed for high power audio, disk head positioners and other linear applications

FEATURES:

1. High Safe Operating Area (100% Tested) 2 A @ 80 V
2. High DC Current Gain

h_{FE} = 15 (Min) @ I_C = 8 Adc

APPLICATIONS: High power audio, disk head positioners and other linear applications

ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

Rating	Symbol	MJ15022	MJ15024	Unit
Collector–Emitter Voltage	V_{CEO}	200	250	Vdc
Collector–Base Voltage	V_{CBO}	350	400	Vdc
Emitter–Base Voltage	V_{EBO}	5		Vdc
Collector–Emitter Voltage	V_{CEX}	400		Vdc
Collector Current — Continuous Peak (1)	I_C	16 30		Adc
Base Current — Continuous	I_B	5		Adc
Total Power Dissipation @ T_C = 25°C Derate above 25°C	P_D	250 1.43		Watts W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	–65 to +200		°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	R_{JC}	0.70	°C/W

(1) Pulse Test: Pulse Width = 5 ms, Duty Cycle ≤ 10%.

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ELECTRICAL CHARACTERISTICS (T_a = 25 °C unless otherwise specified)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Sustaining Voltage (1) (I_C = 100 mAdc, I_B = 0)	 MJ15022 MJ15024	$V_{CEO(sus)}$	 200 250	 — —	
Collector Cutoff Current (V_{CE} = 200 Vdc, $V_{BE(off)}$ = 1.5 Vdc) (V_{CE} = 250 Vdc, $V_{BE(off)}$ = 1.5 Vdc)	 MJ15022 MJ15024	I_{CEX}	 — —	 250 250	Adc
Collector Cutoff Current (V_{CE} = 150 Vdc, I_B = 0) (V_{CE} = 200 vdc, I_B = 0)	 MJ15022 MJ15024	I_{CEO}	 — —	 500 500	Adc
Emitter Cutoff Current (V_{CE} = 5 Vdc, I_B = 0)		I_{EBO}	—	500	Adc
SECOND BREAKDOWN					
Second Breakdown Collector Current with Base Forward Biased (V_{CE} = 50 Vdc, t = 0.5 s (non–repetitive)) (V_{CE} = 80 Vdc, t = 0.5 s (non–repetitive))		$I_{S/b}$	 5 2	 — —	Adc
ON CHARACTERISTICS					
DC Current Gain (I_C = 8 Adc, V_{CE} = 4 Vdc) (I_C = 16 Adc, V_{CE} = 4 Vdc)		h_{FE}	 15 5	 60 —	—
Collector–Emitter Saturation Voltage (I_C = 8 Adc, I_B = 0.8 Adc) (I_C = 16 Adc, I_B = 3.2 Adc)		$V_{CE(sat)}$	 — —	 1.4 4.0	Vdc
Base–Emitter On Voltage (I_C = 8 Adc, V_{CE} = 4 Vdc)		$V_{BE(on)}$	—	2.2	Vdc
DYNAMIC CHARACTERISTICS					
Current–Gain — Bandwidth Product (I_C = 1 Adc, V_{CE} = 10 Vdc, f_{test} = 1 MHz)		f_T	4	—	MHz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f_{test} = 1 MHz)		C_{ob}	—	500	pF

(1) Pulse Test: Pulse Width = 300 s, Duty Cycle ≤ 2%.

TYPICAL CHARACTERISTICS CURVES

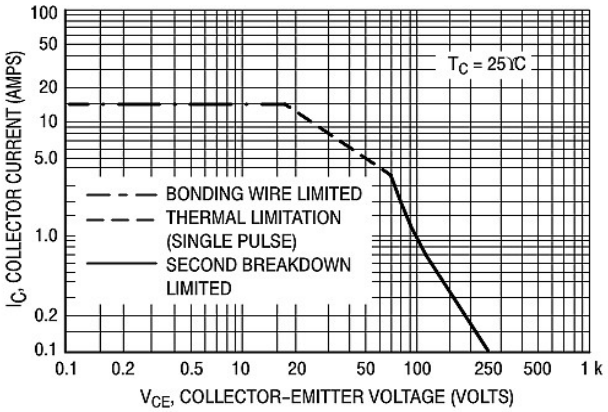


Figure 1. Active–Region Safe Operating Area

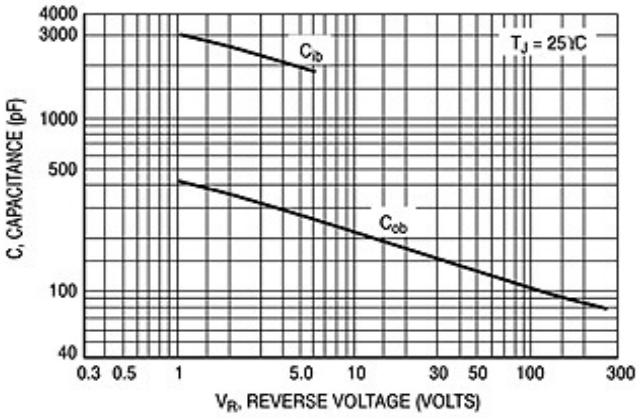


Figure 2. Capacitances

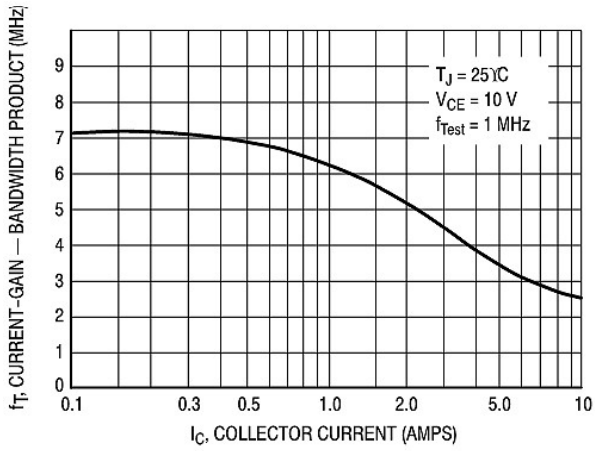


Figure 3. Current–Gain — Bandwidth Product

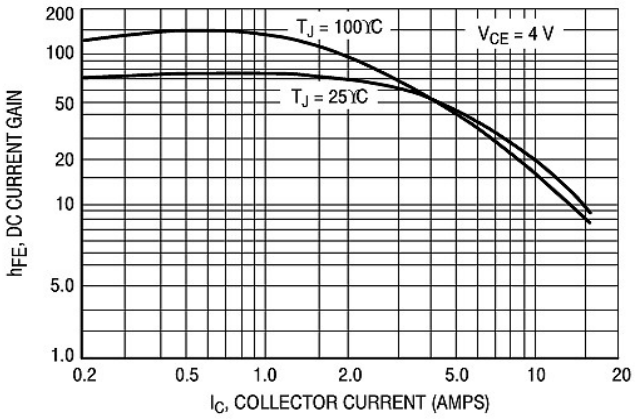


Figure 4. DC Current Gain

TYPICAL CHARACTERISTICS CURVES

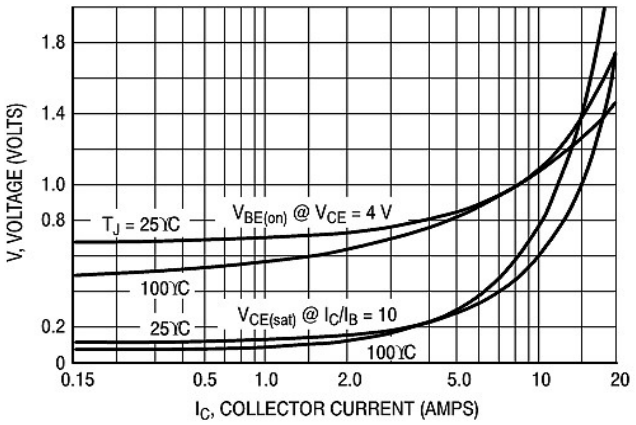


Figure 5. "On" Voltage

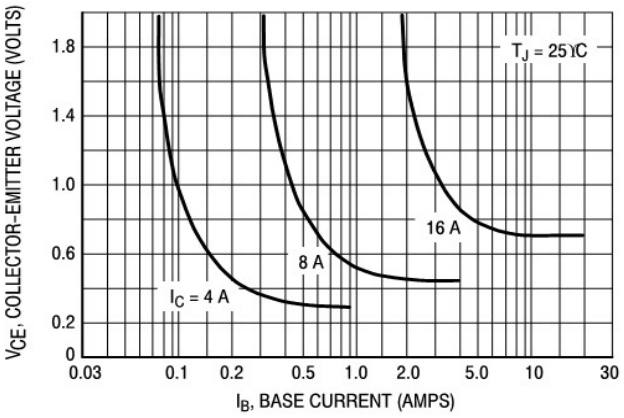
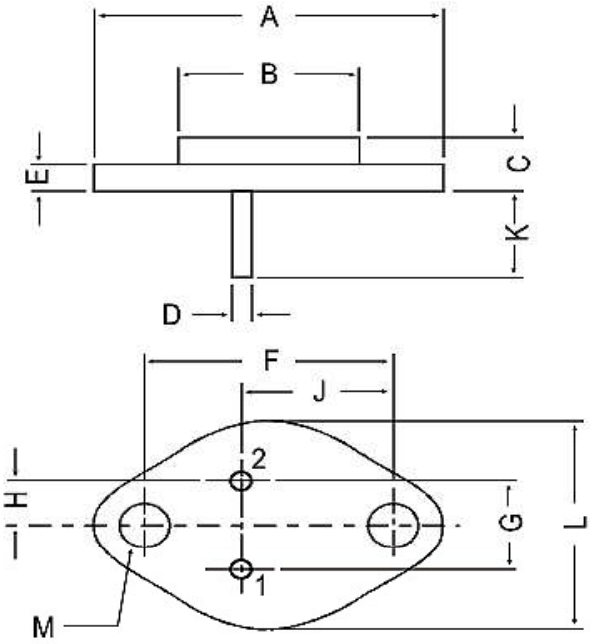


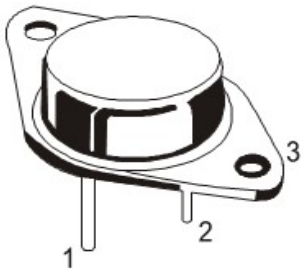
Figure 6. Collector Saturation Region

Package Details



All dimensions in mm.

DIM	MIN.	MAX.
A	—	39.37
B	—	22.22
C	6.35	8.50
D	0.96	1.09
E	—	1.77
F	29.90	30.40
G	10.69	11.18
H	5.20	5.72
J	16.64	17.15
K	11.15	12.25
L	—	26.67
M	3.84	4.19



PIN CONFIGURATION
1. BASE
2. EMITTER
3. COLLECTOR

Packing Detail

PACKAGE	STANDARD PACK		INNER CARTON BOX		OUTER CARTON BOX		
	Details	Net Weight/Qty	Size	Qty	Size	Qty	Gr Wt
TO-3	100 pcs/pkt	1.3 kg/100 pcs	12.5" x 8" x 1.8"	0.1K	17" x 11.5" x 21"	2K	27.5 kgs

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Recommended Product Storage Environment for Discrete Semiconductor Devices

This storage environment assumes that the Diodes and transistors are packed properly inside the original packing supplied by CDIL.

- Temperature 5 °C to 30 °C
- Humidity between 40 to 70 %RH
- Air should be clean.
- Avoid harmful gas or dust.
- Avoid outdoor exposure or storage in areas subject to rain or water spraying .
- Avoid storage in areas subject to corrosive gas or dust. Product shall not be stored in areas exposed to direct sunlight.
- Avoid rapid change of temperature.
- Avoid condensation.
- Mechanical stress such as vibration and impact shall be avoided.
- The product shall not be placed directly on the floor.
- The product shall be stored on a plane area. They should not be turned upside down. They should not be placed against the wall.

Shelf Life of CDIL Products

The shelf life of products is the period from product manufacture to shipment to customers. The product can be unconditionally shipped within this period. The period is defined as 2 years.
If products are stored longer than the shelf life of 2 years the products shall be subjected to quality check as per CDIL quality procedure.
The products are further warranted for another one year after the date of shipment subject to the above conditions in CDIL original packing.

Floor Life of CDIL Products and MSL Level

When the products are opened from the original packing, the floor life will start.
For this, the following JEDEC table may be referred:

JEDEC MSL Level		
Level	**Time**	**Condition**
1	Unlimited	≤30 °C / 85% RH
2	1 Year	≤30 °C / 60% RH
2a	4 Weeks	≤30 °C / 60% RH
3	168 Hours	≤30 °C / 60% RH
4	72 Hours	≤30 °C / 60% RH
5	48 Hours	≤30 °C / 60% RH
5a	24 Hours	≤30 °C / 60% RH
6	Time on Label(TOL)	≤30 °C / 60% RH

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Customer Notes

Component Disposal Instructions

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.
2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

Disclaimer

The product information and the selection guides facilitate selection of the CDIL's Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished in the Data Sheet and on the CDIL Web Site/CD are believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information. Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).
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