



NPN POWER TRANSISTOR

2N3442



TO-3

TO-3
Metal Can Package

DESCRIPTION:

2N3442 is High-power industrial transistor NPN silicon power transistor designed for applications in industrial and commercial equipment including high fidelity audio amplifiers, series and shunt regulators and power switches

FEATURES

1. Higher safe operating area at $V_{CE} > 40V$
2. Low saturation voltages
3. High power dissipation capability

APPLICATIONS:

For high power audio, series pass power supplies, disk-head positioners and other linear application. These devices can also be used in power switching circuits such as converters or inverters

ABSOLUTE MAXIMUM RATINGS ($T_a = 25\text{ }^\circ\text{C}$)

Parameter	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	160	V DC
Collector-Emitter Voltage	V_{CEO}	140	
Emitter-Base Voltage	V_{EBO}	7	
Collector Current-continuous	I_C	10	A
Collector Current-Peak	I_{CM}	15	
Base Current	I_B	7	A
Total Power Dissipation @TC= 25 °C	P_D	117	W
Total Power Dissipation Derate above @TC= 25 °C		0.67	W/ °C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	°C

THERMAL CHARACTERISTICS

Parameter	Symbol	Value	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.17	°C/W



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ELECTRICAL CHARACTERISTICS at $T_a = 25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Test Conditions	Value		Unit
			Min.	Max.	
OFF CHARACTERISTICS					
Collector-Emitter Sustaining Voltage	$V_{CEO(SUS)}$	$I_C = 200\text{mA}, I_B = 0$	140	--	V DC
Collector Cut-off Current	I_{CEO}	$V_{CE} = 140\text{V}, I_B = 0$	--	200	mA
Collector Cut-off Current	I_{CEX}	$V_{CE} = 140\text{V DC},$ $V_{BE(off)} = 1.5\text{V DC}$	--	5	mA
		$V_{CE} = 140\text{V DC},$ $V_{BE(off)} = 1.5\text{V DC},$ $T_C = 150^\circ\text{C}$	--	30	
Emitter Cut-off Current	I_{EBO}	$V_{EB} = 7\text{V DC}, I_C = 0$	--	5	mA
ON CHARACTERISTICS Note3.					
DC Current Gain	h_{FE}	$I_C = 3\text{A DC}, V_{CE} = 4\text{V DC}$	20	70	
		$I_C = 10\text{A DC}, V_{CE} = 4\text{V DC}$	7.5	--	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 10\text{A DC}, I_B = 2\text{A DC}$	--	5	V DC
Base-Emitter On Voltage	$V_{BE(ON)}$	$I_C = 10\text{A DC}, V_{CE} = 4\text{V DC}$	--	5.7	
DYNAMIC CHARACTERISTICS					
Current-Gain - Bandwidth Product (Note 4)	f_T	$I_C = 2\text{A DC}, V_{CE} = 4\text{V DC},$ $f_{test} = 40\text{kHz}$	80	--	KHz
Small-Signal Current Gain	h_{fe}	$I_C = 2\text{A DC}, V_{CE} = 4\text{V DC},$ $f = 1\text{kHz}$	12	72	

Note:

(3) Pulse Test : Pulse Width = 300 μs , Duty Cycle $\leq 2\%$

(4) $f_T = |h_{fe}| \cdot f_{test}$



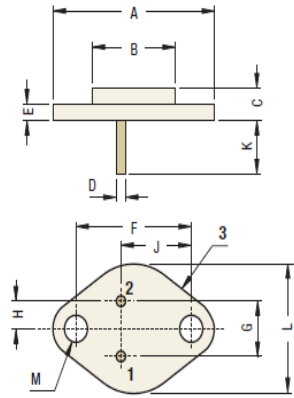
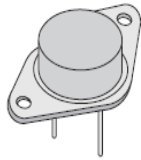
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CHARACTERISTIC CURVES

Package Details

T0-3
 Metal Can Package



DIM	Min	Max
A	—	40.00
B	—	25.00
C	6.35	11.43
D	0.70	1.09
E	—	3.80
F	29.90	30.40

DIM	Min	Max
G	10.67	11.18
H	5.21	5.72
J	16.64	17.15
K	7.92	—
L	—	26.68
M	3.84	4.09

Pin Configuration Pin 1: Base Pin 2: Emitter Pin 3: Collector

All Dimensions are in mm

Drawings are not to scale



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Recommended Product Storage Environment for Diode and Transistors

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

Figure 1 Floor Life according to JEDEC MSL Level



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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).

CDIL strives for continuous improvement and reserves the right to change the specifications of its products without prior notice.



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CIN No. - U32109DL1964PTC004291