

# Central<sup>TM</sup> Semiconductor Corp.

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Manufacturers of World Class Discrete Semiconductors  
www.centrasemi.com

MJ10023

NPN SILICON  
POWER DARLINGTON TRANSISTOR

JEDEC TO-3 CASE

DESCRIPTION

The CENTRAL SEMICONDUCTOR MJ10023 is a Silicon NPN Power Darlington Transistor, mounted in a hermetically sealed metal case, designed for high voltage, high speed, power applications.

MAXIMUM RATINGS ( $T_A=25^\circ\text{C}$  unless otherwise noted)

	<u>SYMBOL</u>		<u>UNITS</u>
Collector-Emitter Voltage	$V_{CEO}$	400	V
Collector-Emitter Voltage	$V_{CEV}$	600	V
Emitter-Base Voltage	$V_{EBO}$	8.0	V
Collector Current	$I_C$	40	A
Peak Collector Current	$I_{CM}$	80	A
Base Current	$I_B$	20	A
Peak Base Current	$I_{BM}$	40	A
Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	250	W
Operating and Storage Junction Temperature	$T_J, T_{stg}$	-65 to +200	$^\circ\text{C}$
Thermal Resistance	$\theta_{JC}$	0.7	$^\circ\text{C/W}$

ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$  unless otherwise noted)

<u>SYMBOL</u>	<u>TEST CONDITIONS</u>	<u>MIN</u>	<u>MAX</u>	<u>UNITS</u>
$I_{CEV}$	$V_{CE}=600\text{V}, V_{BE}(\text{OFF})=1.5\text{V}$		0.25	mA
$I_{CEV}$	$V_{CE}=600\text{V}, V_{BE}(\text{OFF})=1.5\text{V}, T_C=150^\circ\text{C}$		5.0	mA
$I_{CER}$	$V_{CE}=600\text{V}, R_{BE}=50\Omega, T_C=100^\circ\text{C}$		5.0	mA
$I_{EBO}$	$V_{EB}=2.0\text{V}$		175	mA
$BV_{CEO}$	$I_C=100\text{mA}$	400		V
$V_{CE}(\text{SAT})$	$I_C=20\text{A}, I_B=1.0\text{A}$		2.2	V
$V_{CE}(\text{SAT})$	$I_C=20\text{A}, I_B=1.0\text{A}, T_C=100^\circ\text{C}$		2.5	V
$V_{CE}(\text{SAT})$	$I_C=40\text{A}, I_B=5.0\text{A}$		5.0	V
$V_{BE}(\text{SAT})$	$I_C=20\text{A}, I_B=1.2\text{A}$		2.5	V
$V_{BE}(\text{SAT})$	$I_C=20\text{A}, I_B=1.2\text{A}, T_C=100^\circ\text{C}$		2.5	V
$h_{FE}$	$V_{CE}=5.0\text{V}, I_C=10\text{A}$	50	600	
$V_F$	$I_F=20\text{A}$		5.0	V
$C_{ob}$	$V_{CB}=10\text{V}, I_E=0, f=1.0\text{kHz}$	150	600	pF

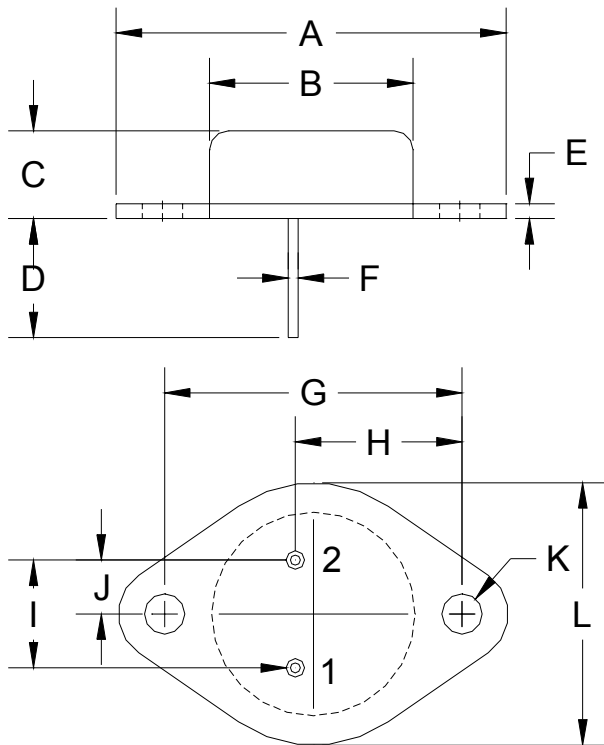
(SEE REVERSE SIDE)

R0

ELECTRICAL CHARACTERISTICS (CONTINUED)

SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
$t_d$	$V_{CC}=250V, I_C=20A, I_{B1}=1.0A, V_{BE(off)}=5.0V$	-	0.03	0.2	$\mu s$
$t_r$	$V_{BE(off)}=5.0V, t_P=50\mu s, \text{Duty Cycle} \leq 2.0\%$	-	0.40	1.2	$\mu s$
$t_s$		-	0.90	2.5	$\mu s$
$t_f$		-	0.30	0.9	$\mu s$
$t_{SV}$	$I_{CM}=20A, V_{CEM}=250V, I_{B1}=1.0A,$	-	1.9	4.4	$\mu s$
$t_C$	$V_{BE(off)}=5.0V, T_C=100^\circ C$	-	0.6	2.0	$\mu s$
$t_{fi}$		-	0.3	-	$\mu s$
$t_{SV}$	$I_{CM}=20A, V_{CEM}=250V, I_{B1}=1.0A,$	-	1.0	-	$\mu s$
$t_C$	$V_{BE(off)}=5.0V, T_C=25^\circ C$	-	0.3	-	$\mu s$
$t_{fi}$		-	0.15	-	$\mu s$

TO-3 PACKAGE - MECHANICAL OUTLINE



SYMBOL	DIMENSIONS			
	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.516	1.573	38.50	39.96
B (DIA)	0.748	0.875	19.00	22.23
C	0.250	0.450	6.35	11.43
D	0.433	0.516	11.00	13.10
E	0.054	0.065	1.38	1.65
F	0.035	0.045	0.90	1.15
G	1.177	1.197	29.90	30.40
H	0.650	0.681	16.50	17.30
I	0.420	0.440	10.67	11.18
J	0.205	0.225	5.21	5.72
K (DIA)	0.151	0.172	3.84	4.36
L	0.984	1.050	25.00	26.67

TO-3 (REV: R1)

R1

Lead Code:

- 1) Base
- 2) Emitter
- Case) Collector

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