

Silicon Power Transistors

The MJ15023 and MJ15025 are PowerBase power transistors designed for high power audio, disk head positioners and other linear applications.

- High Safe Operating Area (100% Tested) —
2 A @ 80 V
- High DC Current Gain —
 $h_{FE} = 15$ (Min) @ $I_C = 8$ Adc

MAXIMUM RATINGS

Rating	Symbol	MJ15023	MJ15025	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 @ $T_C = 25^\circ\text{C}$ 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

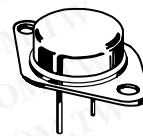
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.70	°C/W

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

PNP
MJ15023
MJ15025 *

*ON Semiconductor Preferred Device

16 AMPERE
SILICON
POWER TRANSISTORS
200 AND 250 VOLTS
250 WATTS



CASE 1-07
TO-204AA
(TO-3)

勝特力材料 886-3-5753170
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勝特力电子(深圳) 86-755-83298787
[Http://www.100y.com.tw](http://www.100y.com.tw)

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

MJ15023 MJ15025

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Sustaining Voltage (1) (I _C = 100 mA _{dc} , I _B = 0)	MJ15023 MJ15025	V _{CEO(sus)}	200 250	—
Collector Cutoff Current (V _{CE} = 200 V _{dc} , V _{BE(off)} = 1.5 V _{dc}) (V _{CE} = 250 V _{dc} , V _{BE(off)} = 1.5 V _{dc})	MJ15023 MJ15025	I _{CEX}	— —	250 250
Collector Cutoff Current (V _{CE} = 150 V _{dc} , I _B = 0) (V _{CE} = 200 V _{dc} , I _B = 0)	MJ15023 MJ15025	I _{CEO}	— —	500 500
Emitter Cutoff Current (V _{CE} = 5 V _{dc} , I _B = 0)	Both	I _{EBO}	—	500

SECOND BREAKDOWN

Second Breakdown Collector Current with Base Forward Biased (V _{CE} = 50 V _{dc} , t = 0.5 s (non-repetitive)) (V _{CE} = 80 V _{dc} , t = 0.5 s (non-repetitive))	I _{S/b}	5 2	— —	A _{dc}
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ON CHARACTERISTICS

DC Current Gain (I _C = 8 A _{dc} , V _{CE} = 4 V _{dc}) (I _C = 16 A _{dc} , V _{CE} = 4 V _{dc})	h _{FE}	15 5	60 —	—
Collector–Emitter Saturation Voltage (I _C = 8 A _{dc} , I _B = 0.8 A _{dc}) (I _C = 16 A _{dc} , I _B = 3.2 A _{dc})	V _{CE(sat)}	—	1.4 4.0	V _{dc}
Base–Emitter On Voltage (I _C = 8 A _{dc} , V _{CE} = 4 V _{dc})	V _{BE(on)}	—	2.2	V _{dc}

DYNAMIC CHARACTERISTICS

Current–Gain — Bandwidth Product (I _C = 1 A _{dc} , V _{CE} = 10 V _{dc} , f _{test} = 1 MHz)	f _T	4	—	MHz
Output Capacitance (V _{CB} = 10 V _{dc} , I _E = 0, f _{test} = 1 MHz)	C _{ob}	—	600	pF

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

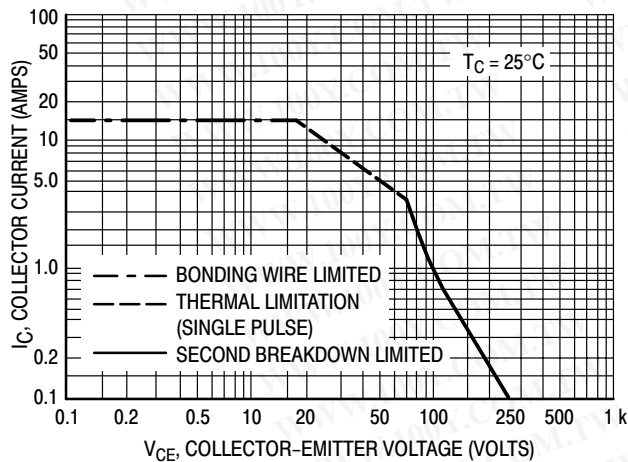


Figure 1. Active–Region Safe Operating Area

There are two limitations on the powerhandling ability of a transistor: average junction temperature and second 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 Figure 1 is based on T_{J(pk)} = 200°C; T_C is variable depending on conditions. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

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TYPICAL CHARACTERISTICS

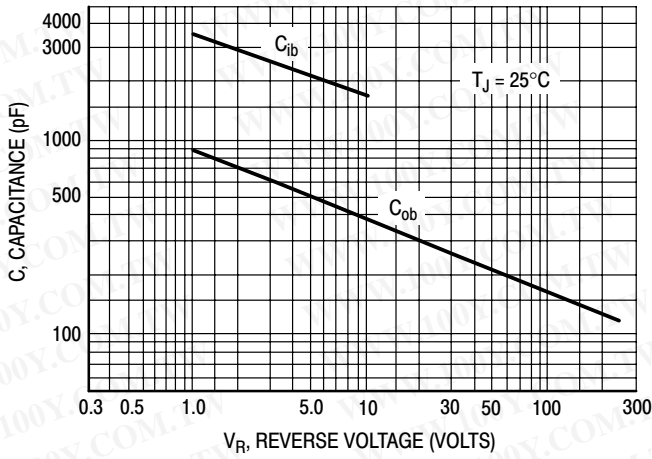


Figure 2. Capacitances

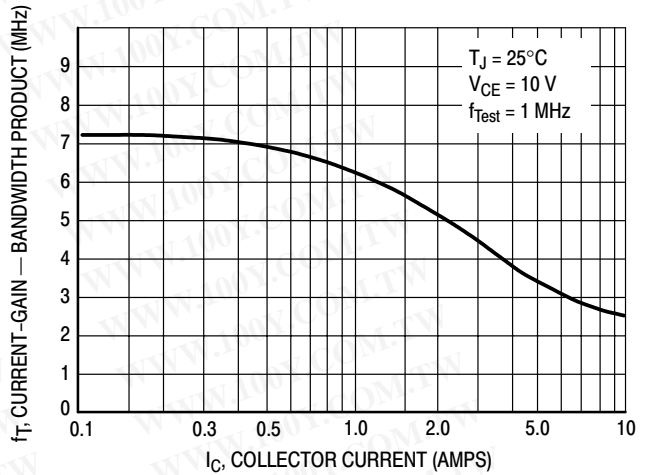


Figure 3. Current-Gain — Bandwidth Product

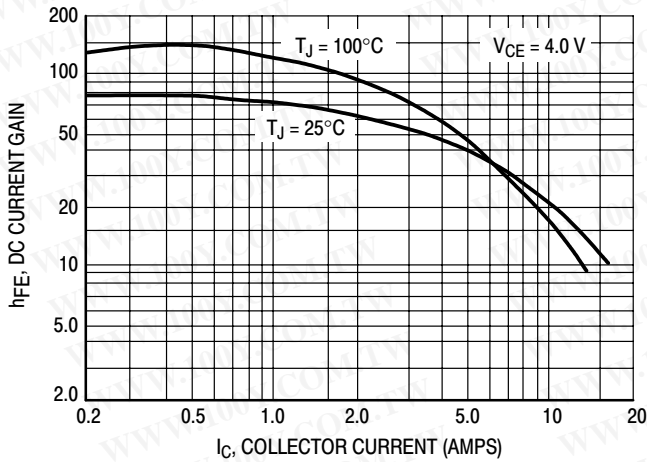


Figure 4. DC Current Gain

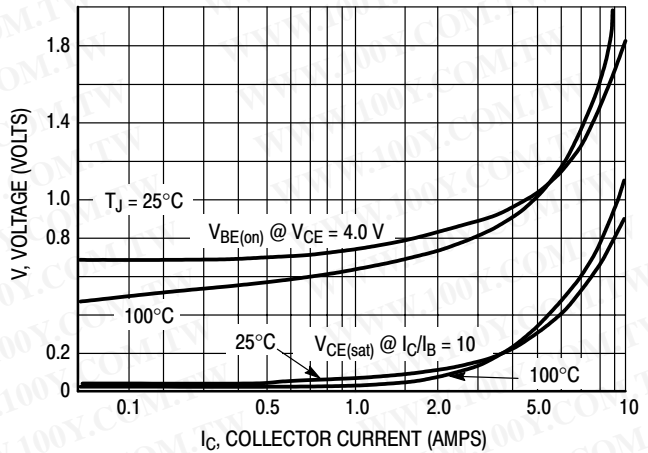


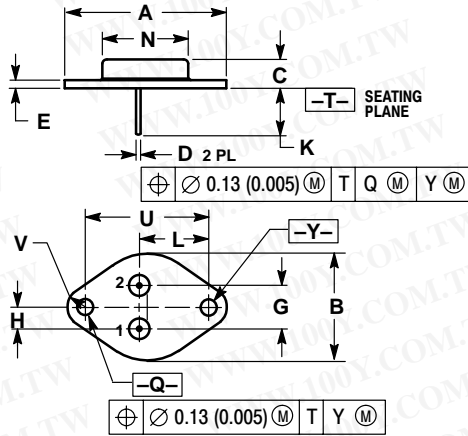
Figure 5. "On" Voltages

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MJ15023 MJ15025

PACKAGE DIMENSIONS

CASE 1-07 TO-204AA (TO-3) ISSUE Z



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. ALL RULES AND NOTES ASSOCIATED WITH REFERENCED TO-204AA OUTLINE SHALL APPLY.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.550	REF	39.37	REF
B	---	1.050	---	26.67
C	0.250	0.335	6.35	8.51
D	0.038	0.043	0.97	1.09
E	0.055	0.070	1.40	1.77
G	0.430	BSC	10.92	BSC
H	0.215	BSC	5.46	BSC
K	0.440	0.480	11.18	12.19
L	0.665	BSC	16.89	BSC
N	---	0.830	---	21.08
Q	0.151	0.165	3.84	4.19
U	1.187	BSC	30.15	BSC
V	0.131	0.188	3.33	4.77

STYLE 1:
PIN 1: BASE
2: EMITTER
CASE: COLLECTOR

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