PNP
MJ15023
MJ15025*

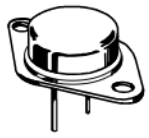
*Motorola Preferred Device

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

16 AMPERE
SILICON
POWER TRANSISTORS
200 AND 250 VOLTS
250 WATTS



CASE 1–07
TO–204AA
(TO–3)

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°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 ≤ 10%.

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

REV 7

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Sustaining Voltage (1)		$V_{CEO(sus)}$			
(I_C = 100 mAdc, I_B = 0)	MJ15023		200	—	
	MJ15025		250	—	
Collector Cutoff Current		I_{CEX}			∝Adc
(V_{CE} = 200 Vdc, $V_{BE(off)}$ = 1.5 Vdc)	MJ15023		—	250	
(V_{CE} = 250 Vdc, $V_{BE(off)}$ = 1.5 Vdc)	MJ15025		—	250	
Collector Cutoff Current		I_{CEO}			∝Adc
(V_{CE} = 150 Vdc, I_B = 0)	MJ15023		—	500	
(V_{CE} = 200 Vdc, I_B = 0)	MJ15025		—	500	
Emitter Cutoff Current		I_{EBO}	—	500	∝Adc
(V_{CE} = 5 Vdc, I_B = 0)	Both				
SECOND BREAKDOWN					
Second Breakdown Collector Current with Base Forward Biased		$I_{S/b}$			Adc
(V_{CE} = 50 Vdc, t = 0.5 s (non–repetitive))			5	—	
(V_{CE} = 80 Vdc, t = 0.5 s (non–repetitive))			2	—	
ON CHARACTERISTICS					
DC Current Gain		h_{FE}			—
(I_C = 8 Adc, V_{CE} = 4 Vdc)			15	60	
(I_C = 16 Adc, V_{CE} = 4 Vdc)			5	—	
Collector–Emitter Saturation Voltage		$V_{CE(sat)}$			Vdc
(I_C = 8 Adc, I_B = 0.8 Adc)			—	1.4	
(I_C = 16 Adc, I_B = 3.2 Adc)				4.0	
Base–Emitter On Voltage		$V_{BE(on)}$	—	2.2	Vdc
(I_C = 8 Adc, V_{CE} = 4 Vdc)					
DYNAMIC CHARACTERISTICS					
Current–Gain — Bandwidth Product		f_T	4	—	MHz
(I_C = 1 Adc, V_{CE} = 10 Vdc, f_{test} = 1 MHz)					
Output Capacitance		C_{ob}	—	600	pF
(V_{CB} = 10 Vdc, I_E = 0, f_{test} = 1 MHz)					

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

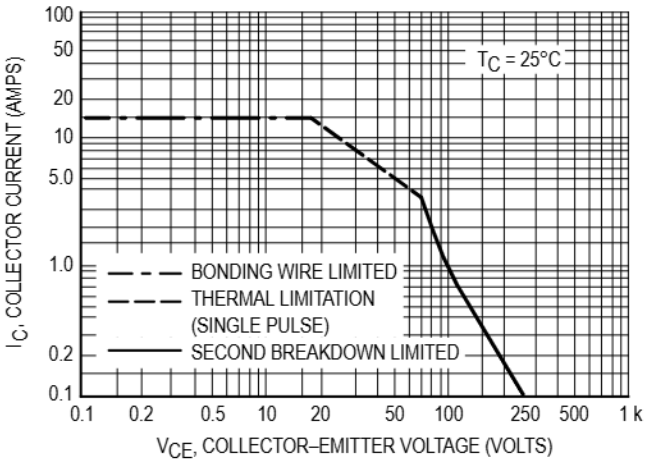


Figure 1. Active–Region Safe Operating Area

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.

TYPICAL CHARACTERISTICS

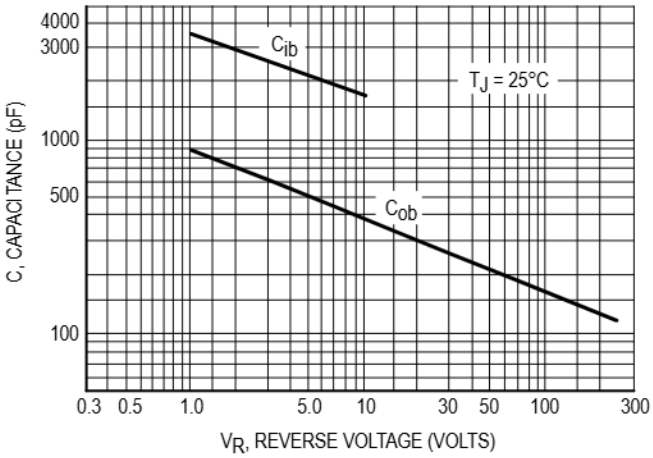


Figure 2. Capacitances

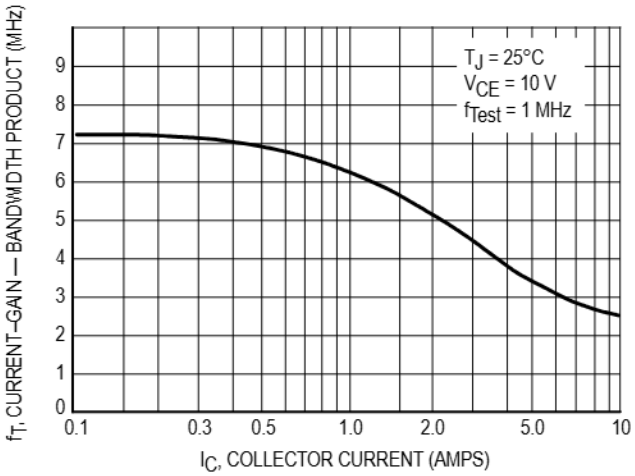


Figure 3. Current–Gain — Bandwidth Product

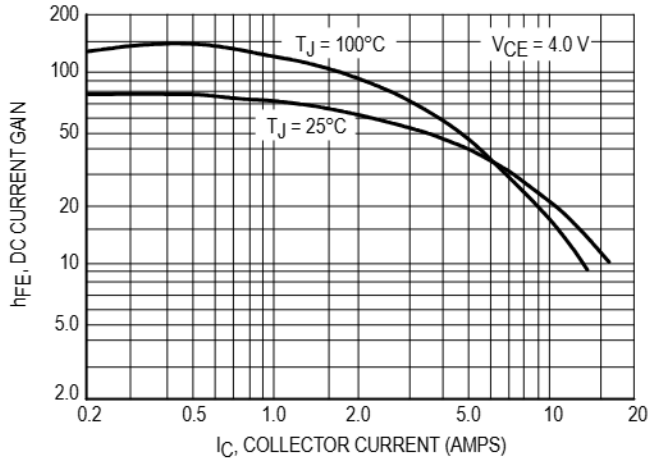


Figure 4. DC Current Gain

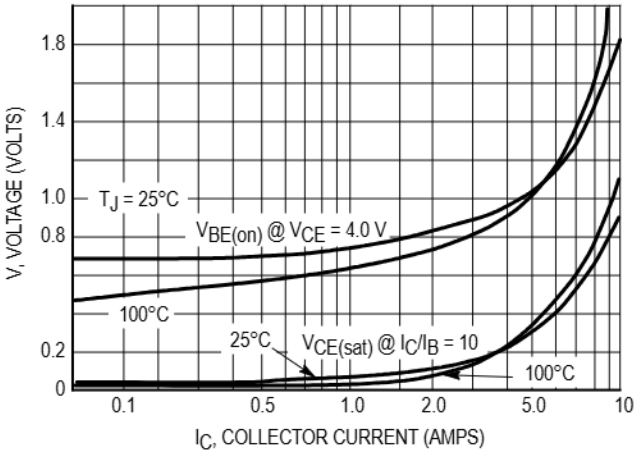
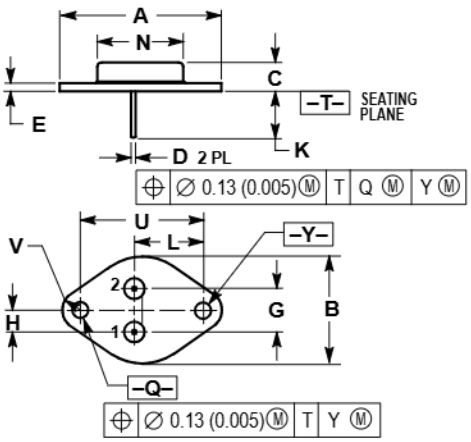


Figure 5. “On” Voltages

PACKAGE DIMENSIONS



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.

	INCHES		MILLIMETERS	
DIM	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

CASE 1–07
TO–204AA (TO–3)
ISSUE Z

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