

Plastic NPN Silicon Medium-Power Transistors

... useful for medium voltage applications requiring high f_T such as converters and extended range amplifiers.

MAXIMUM RATINGS

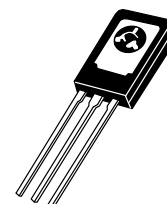
Rating	Symbol	MJE341	MJE344	Unit
Collector-Emitter Voltage	V_{CEO}	150	200	Vdc
Collector-Base Voltage	V_{CB}	175	200	Vdc
Emitter-Base Voltage	V_{EB}	3.0	5.0	Vdc
Collector Current — Continuous	I_C	500		mAdc
Base Current	I_B	250		mAdc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	20	0.16	Watts W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +150		$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	θ_{JC}	6.25	$^\circ\text{C/W}$

MJE341
MJE344

0.5 AMPERE
POWER TRANSISTORS
NPN SILICON
150–200 VOLTS
20 WATTS



CASE 77-08
TO-225AA TYPE

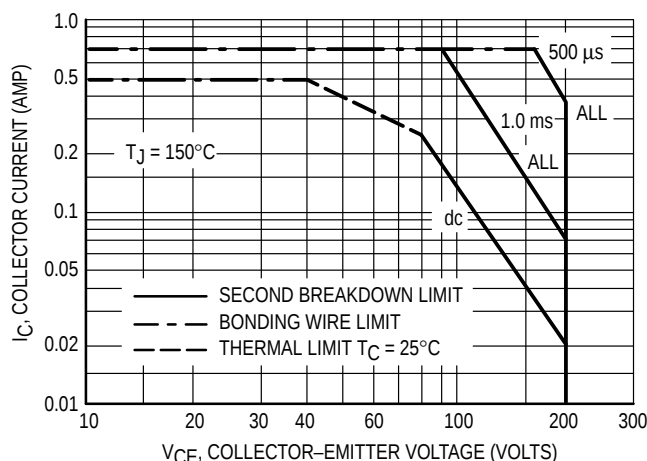


Figure 1. Active Region Safe Operating Area

There are two limitations on the power handling 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 $T_{J(pk)} = 150^\circ\text{C}$; T_C is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(pk)} \leq 150^\circ\text{C}$. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

MJE341 MJE344

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Sustaining Voltage ($I_C = 1.0\text{ mAdc}$, $I_B = 0$)	$V_{CE(sus)}$	150 200	— —	Vdc
Collector Cutoff Current ($V_{CE} = 150\text{ Vdc}$, $I_B = 0$) ($V_{CE} = 200\text{ Vdc}$, $I_B = 0$)	I_{CEO}	— —	1.0 1.0	mAdc
Collector Cutoff Current ($V_{CB} = 175\text{ Vdc}$, $I_E = 0$) ($V_{CB} = 200\text{ Vdc}$, $I_E = 0$)	I_{CBO}	— —	0.3 0.1	mAdc
Emitter Cutoff Current ($V_{EB} = 3.0\text{ Vdc}$, $I_C = 0$) ($V_{EB} = 5.0\text{ Vdc}$, $I_C = 0$)	I_{EBO}	— —	0.1 0.1	mAdc
ON CHARACTERISTICS				
DC Current Gain ($I_C = 10\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$) ($I_C = 50\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$) ($I_C = 150\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$)	h_{FE}	20 25 30 20	— 200 300 —	—
Collector–Emitter Saturation Voltage ($I_C = 50\text{ mAdc}$, $I_B = 5.0\text{ mAdc}$) ($I_C = 150\text{ mAdc}$, $I_B = 15\text{ mAdc}$)	$V_{CE(sat)}$	— —	1.0 2.3	Vdc
Base–Emitter On Voltage ($I_C = 50\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$)	$V_{BE(on)}$	—	1.0	Vdc
DYNAMIC CHARACTERISTICS				
Current–Gain — Bandwidth Product ($I_C = 50\text{ mAdc}$, $V_{CE} = 25\text{ Vdc}$, $f = 10\text{ MHz}$)	f_T	15	—	MHz
Output Capacitance ($V_{CB} = 20\text{ Vdc}$, $I_E = 0$, $f = 100\text{ kHz}$)	C_{ob}	—	15	pF
Small–Signal Current Gain ($I_C = 50\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$, $f = 1.0\text{ kHz}$)	h_{fe}	25	—	—

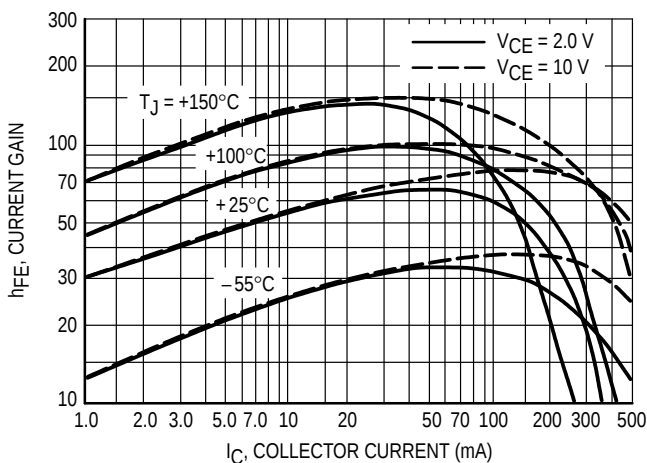


Figure 2. DC Current Gain

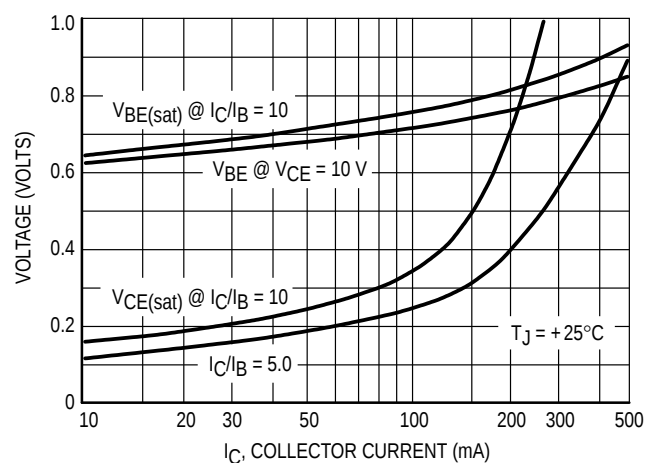
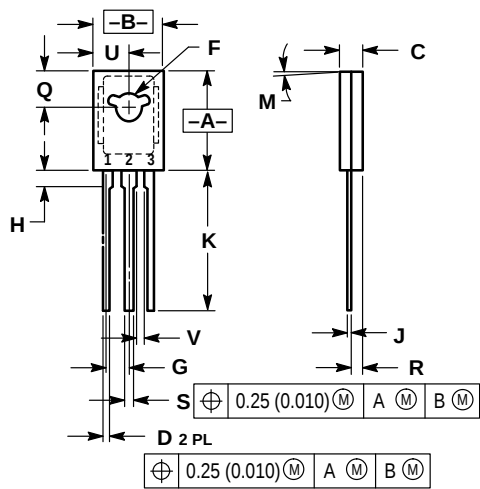


Figure 3. "On" Voltages

PACKAGE DIMENSIONS



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.425	0.435	10.80	11.04
B	0.295	0.305	7.50	7.74
C	0.095	0.105	2.42	2.66
D	0.020	0.026	0.51	0.66
F	0.115	0.130	2.93	3.30
G	0.094 BSC		2.39 BSC	
H	0.050	0.095	1.27	2.41
J	0.015	0.025	0.39	0.63
K	0.575	0.655	14.61	16.63
M	5° TYP		5° TYP	
Q	0.148	0.158	3.76	4.01
R	0.045	0.055	1.15	1.39
S	0.025	0.035	0.64	0.88
U	0.145	0.155	3.69	3.93
V	0.040	—	1.02	—

- STYLE 1:
1. PIN 1. EMITTER
 2. COLLECTOR
 3. BASE

CASE 77-08
TO-225AA TYPE
ISSUE V

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