

## Plastic NPN Silicon Medium-Power Transistors

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

### MAXIMUM RATINGS

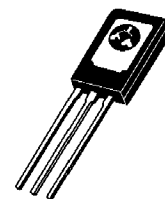
Rating	Symbol	MJE341	MJE344	Unit
Collector-Emitter Voltage	$V_{CEO}$	150	200	Vdc
Collector-Base Voltage	$V_{CB}$	175	200	Vdc
Emitter-Base Voltage	$V_{EB}$	3.0	5.0	Vdc
Collector Current — Continuous	$I_C$	500		mAdc
Base Current	$I_B$	250		mAdc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	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	$\theta_{JC}$	6.25	$^\circ\text{C}/\text{W}$

**MJE341**  
**MJE344**

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



TO-225AA TYPE

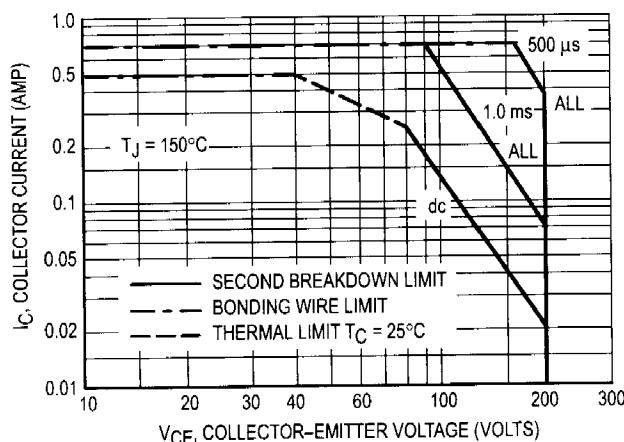
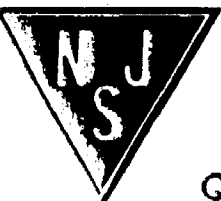


Figure 1. Active Region Safe Operating Area

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<sub>C</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit	
<b>OFF CHARACTERISTICS</b>					
Collector-Emitter Sustaining Voltage (I <sub>C</sub> = 1.0 mA, I <sub>B</sub> = 0)	MJE341 MJE344	V <sub>CEO(sus)</sub>	150 200	— —	Vdc
Collector Cutoff Current (V <sub>CE</sub> = 150 Vdc, I <sub>B</sub> = 0) (V <sub>CE</sub> = 200 Vdc, I <sub>B</sub> = 0)	MJE341 MJE344	I <sub>CEO</sub>	— —	1.0 1.0	mA
Collector Cutoff Current (V <sub>CB</sub> = 175 Vdc, I <sub>E</sub> = 0) (V <sub>CB</sub> = 200 Vdc, I <sub>E</sub> = 0)	MJE341 MJE344	I <sub>CBO</sub>	— —	0.3 0.1	mA
Emitter Cutoff Current (V <sub>EB</sub> = 3.0 Vdc, I <sub>C</sub> = 0) (V <sub>EB</sub> = 5.0 Vdc, I <sub>C</sub> = 0)	MJE341 MJE344	I <sub>EBO</sub>	— —	0.1 0.1	mA
<b>ON CHARACTERISTICS</b>					
DC Current Gain (I <sub>C</sub> = 10 mA, V <sub>CE</sub> = 10 Vdc) (I <sub>C</sub> = 50 mA, V <sub>CE</sub> = 10 Vdc)  (I <sub>C</sub> = 150 mA, V <sub>CE</sub> = 10 Vdc)	MJE341 MJE341 MJE344 MJE341	h <sub>FE</sub>	20 25 30 20	— 200 300 —	—
Collector-Emitter Saturation Voltage (I <sub>C</sub> = 50 mA, I <sub>B</sub> = 5.0 mA) (I <sub>C</sub> = 150 mA, I <sub>B</sub> = 15 mA)	MJE344 MJE341	V <sub>CE(sat)</sub>	— —	1.0 2.3	Vdc
Base-Emitter On Voltage (I <sub>C</sub> = 50 mA, V <sub>CE</sub> = 10 Vdc)		V <sub>BE(on)</sub>	—	1.0	Vdc
<b>DYNAMIC CHARACTERISTICS</b>					
Current-Gain — Bandwidth Product (I <sub>C</sub> = 50 mA, V <sub>CE</sub> = 25 Vdc, f = 10 MHz)		f <sub>T</sub>	15	—	MHz
Output Capacitance (V <sub>CB</sub> = 20 Vdc, I <sub>E</sub> = 0, f = 100 kHz)		C <sub>ob</sub>	—	15	pF
Small-Signal Current Gain (I <sub>C</sub> = 50 mA, V <sub>CE</sub> = 10 Vdc, f = 1.0 kHz)		h <sub>fe</sub>	25	—	—

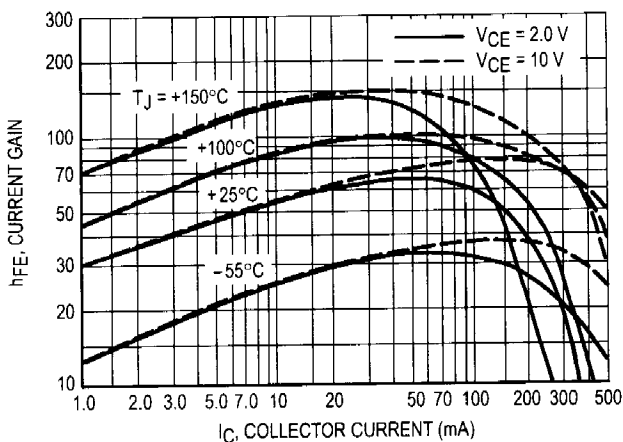


Figure 2. DC Current Gain

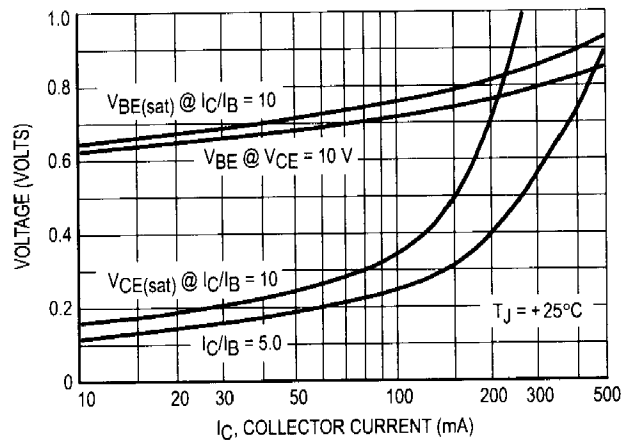
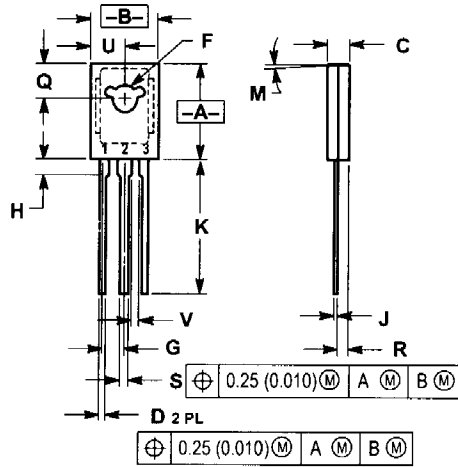


Figure 3. "On" Voltages



- 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. EMITTER
  2. COLLECTOR
  3. BASE