

Complementary Silicon Power Plastic Transistors

... designed for low power audio amplifier and low-current, high-speed switching applications.

- High Collector-Emitter Sustaining Voltage —
 $V_{CEO(sus)} = 100 \text{ Vdc (Min) — MJE243, MJE253}$
- High DC Current Gain @ $I_C = 200 \text{ mAdc}$
 $h_{FE} = 40-200$
 $= 40-120 — \text{MJE243, MJE253}$
- Low Collector-Emitter Saturation Voltage —
 $V_{CE(sat)} = 0.3 \text{ Vdc (Max) @ } I_C = 500 \text{ mAdc}$
- High Current Gain Bandwidth Product —
 $f_T = 40 \text{ MHz (Min) @ } I_C = 100 \text{ mAdc}$
- Annular Construction for Low Leakages
 $I_{CBO} = 100 \text{ nAdc (Max) @ Rated } V_{CB}$

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	100	Vdc
Collector-Base Voltage	V_{CB}	100	Vdc
Emitter-Base Voltage	V_{EB}	7.0	Vdc
Collector Current — Continuous Peak	I_C	4.0 8.0	Adc
Base Current	I_B	10	Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	15 0.12	Watts W/ac
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate @ 25°C	P_D	1.5 0.012	Watts W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +150	°C

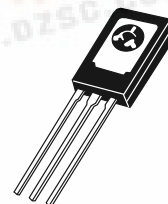
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	θ_{JC}	8.34	°C/W
Thermal Resistance, Junction to Ambient	θ_{JA}	83.4	°C/W

NPN
MJE243*
PNP
MJE253*

*Motorola Preferred Device

4 AMPERE
POWER TRANSISTORS
COMPLEMENTARY
SILICON
100 VOLTS
15 WATTS



CASE 77-08
TO-225AA

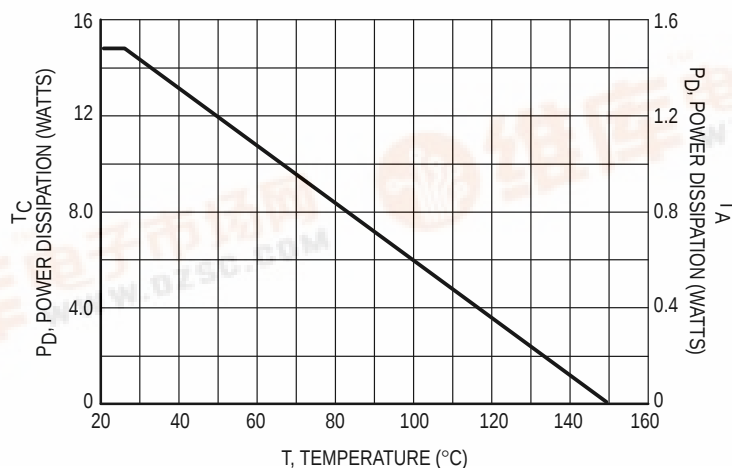


Figure 1. Power Derating

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

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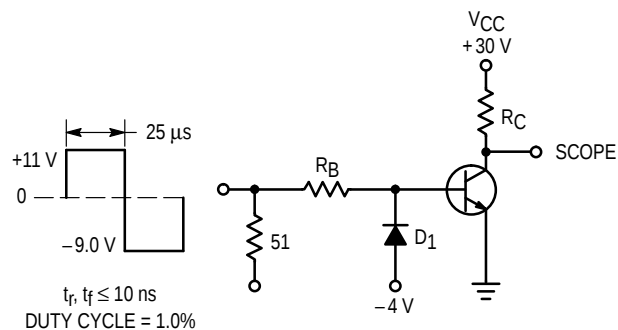


MOTOROLA

MJE243 MJE253

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Sustaining Voltage ($I_C = 10\text{ mAdc}$, $I_B = 0$)	$V_{CEO(sus)}$	100	—	Vdc
Collector Cutoff Current ($V_{CB} = 100\text{ Vdc}$, $I_E = 0$) ($V_{CE} = 100\text{ Vdc}$, $I_E = 0$, $T_C = 125^\circ\text{C}$)	I_{CBO}	—	0.1 0.1	μAdc
Emitter Cutoff Current ($V_{BE} = 7.0\text{ Vdc}$, $I_C = 0$)	I_{EBO}	—	0.1	μAdc
ON CHARACTERISTICS				
DC Current Gain ($I_C = 200\text{ mAdc}$, $V_{CE} = 1.0\text{ Vdc}$) ($I_C = 1.0\text{ Adc}$, $V_{CE} = 1.0\text{ Vdc}$)	h_{FE}	40 15	180 —	—
Collector–Emitter Saturation Voltage ($I_C = 500\text{ mAdc}$, $I_B = 50\text{ mAdc}$) ($I_C = 1.0\text{ Adc}$, $I_B = 100\text{ mAdc}$)	$V_{CE(sat)}$	— —	0.3 0.6	Vdc
Base–Emitter Saturation Voltage ($I_C = 2.0\text{ Adc}$, $I_B = 200\text{ mAdc}$)	$V_{BE(sat)}$	—	1.8	Vdc
Base–Emitter On Voltage ($I_C = 500\text{ mAdc}$, $V_{CE} = 1.0\text{ Vdc}$)	$V_{BE(on)}$	—	1.5	Vdc
DYNAMIC CHARACTERISTICS				
Current–Gain — Bandwidth Product ($I_C = 100\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$, $f_{test} = 10\text{ MHz}$)	f_T	40	—	MHz
Output Capacitance ($V_{CB} = 10\text{ Vdc}$, $I_E = 0$, $f = 0.1\text{ MHz}$)	C_{ob}	—	50	pF



R_B and R_C VARIED TO OBTAIN DESIRED CURRENT LEVELS
 D_1 MUST BE FAST RECOVERY TYPE, e.g.:
1N5825 USED ABOVE $I_B \approx 100\text{ mA}$
MSD6100 USED BELOW $I_B \approx 100\text{ mA}$
FOR PNP TEST CIRCUIT, REVERSE ALL POLARITIES

Figure 2. Switching Time Test Circuit

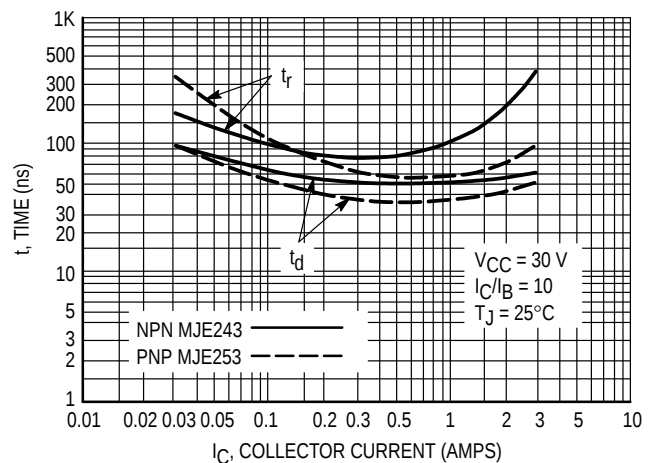


Figure 3. Turn–On Time

MJE243 MJE253

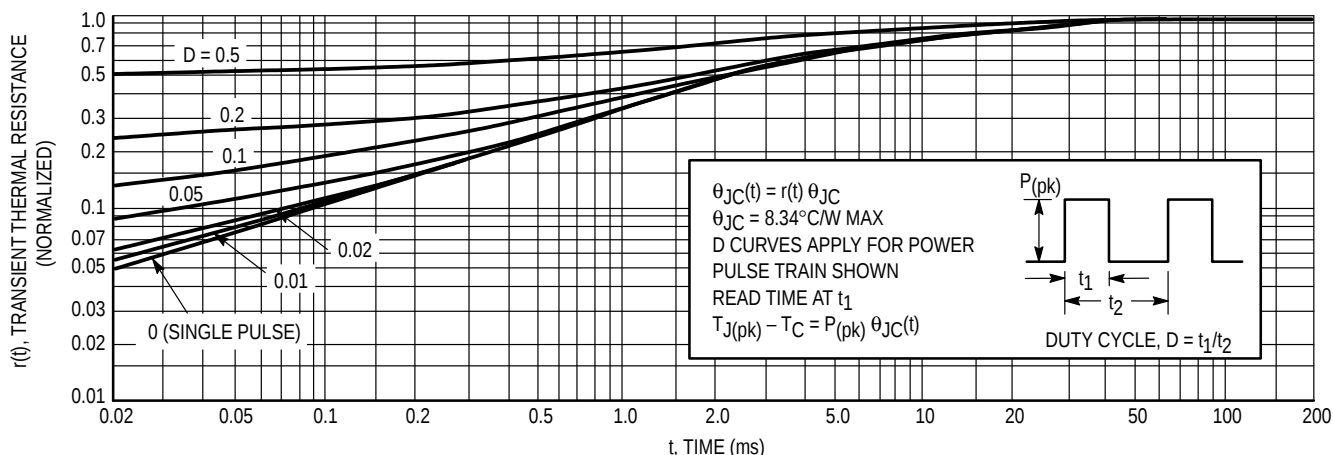


Figure 4. Thermal Response

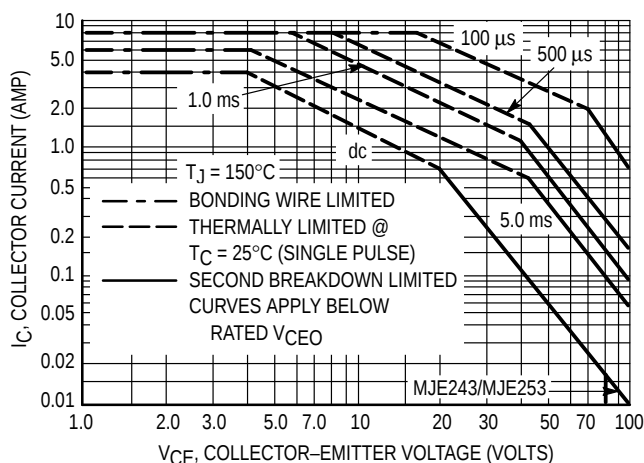


Figure 5. Active Region Safe Operating Area

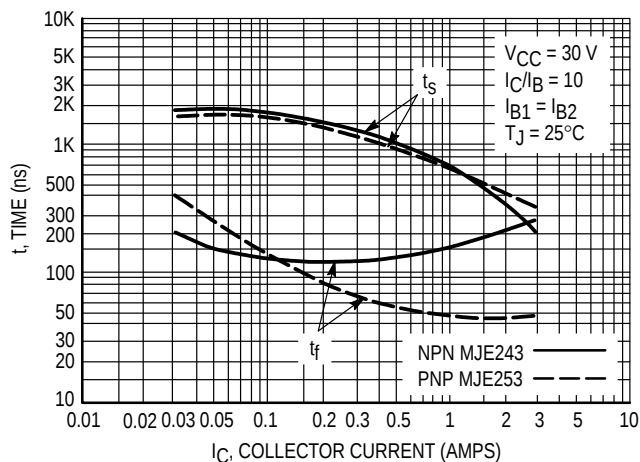


Figure 6. Turn-Off Time

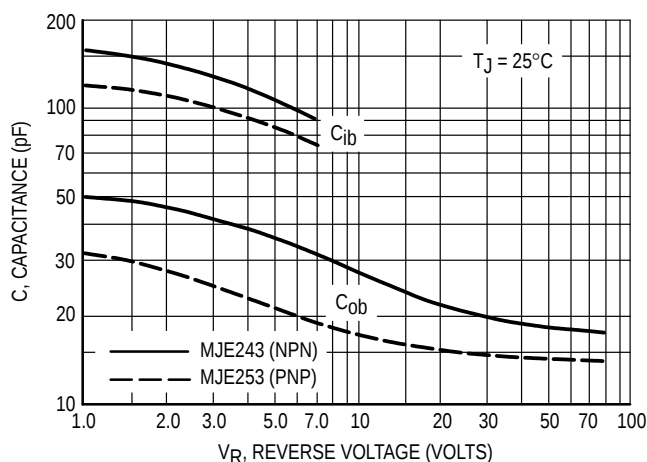


Figure 7. Capacitance

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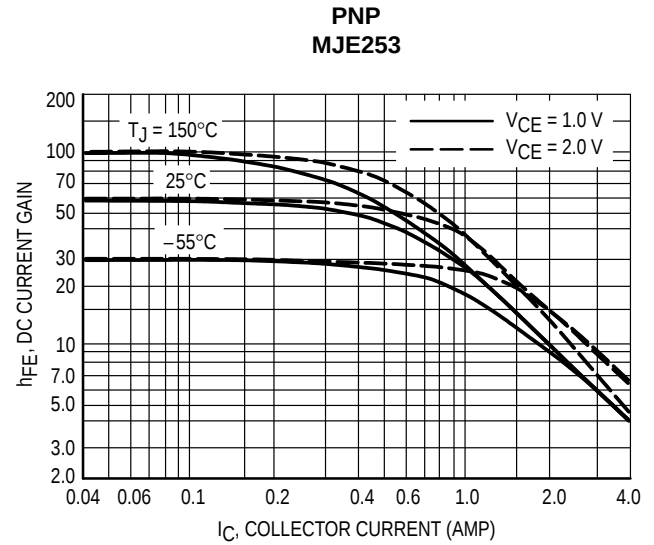
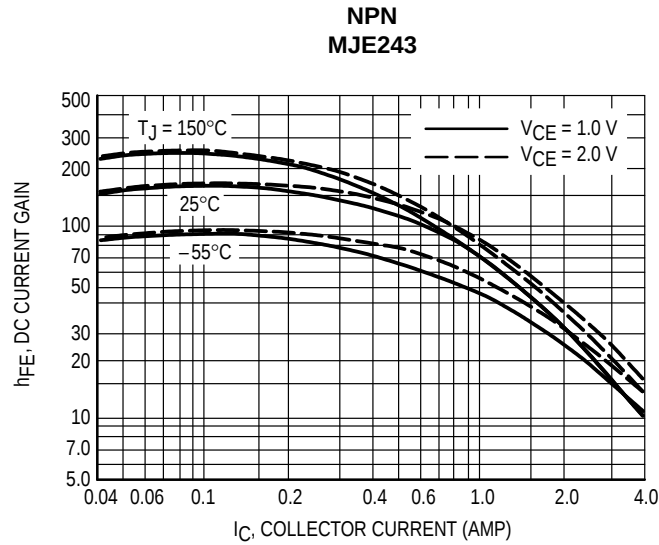


Figure 8. DC Current Gain

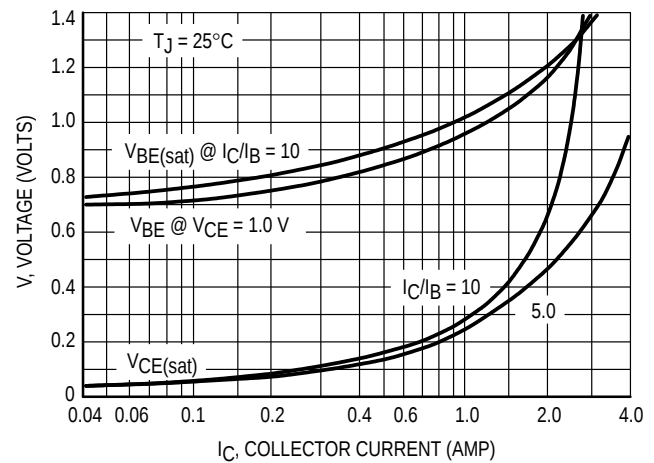
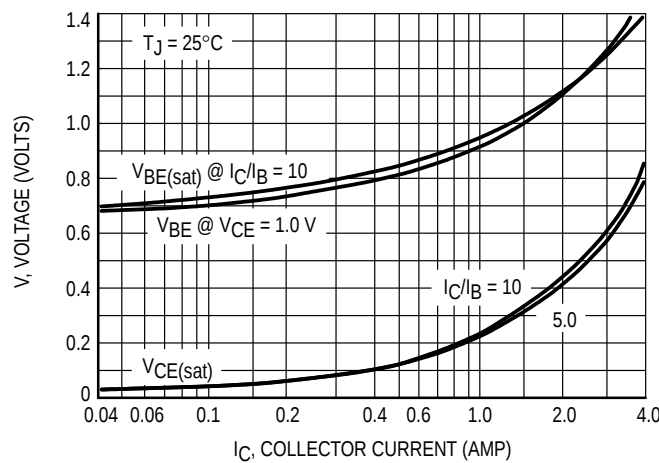


Figure 9. "On" Voltages

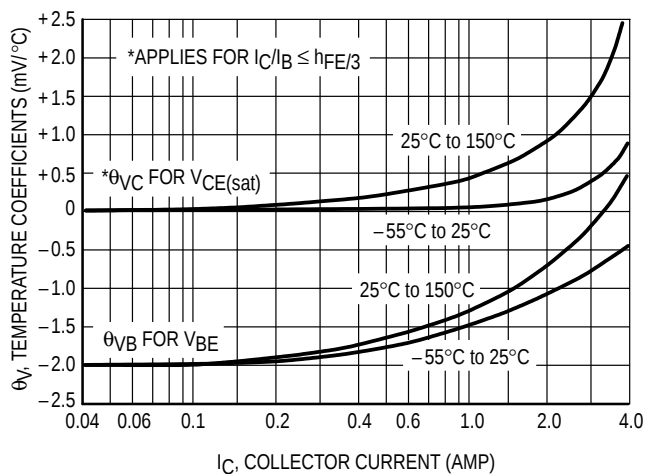
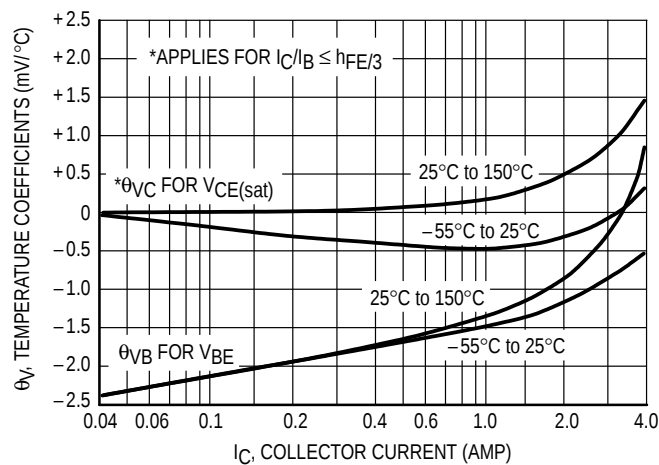
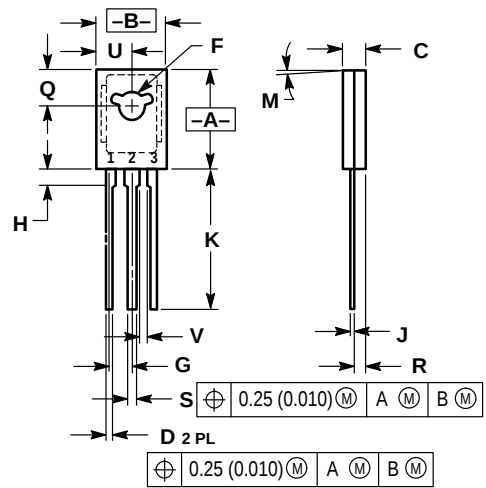


Figure 10. Temperature Coefficients

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:
PIN 1. EMITTER
2. COLLECTOR
3. BASE

CASE 77-08
TO-225AA
ISSUE V

MJE243 MJE253

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