

2N3740, A (SILICON)

2N3741, A

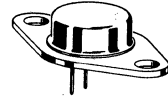
MEDIUM-POWER PNP TRANSISTORS

... ideal for use as drivers, switches and direct replacement of germanium medium-power devices. These devices feature:

- Low Saturation Voltage –
 $V_{CE(sat)} = 0.6 \text{ Vdc @ } I_C = 1.0 \text{ Amp}$
- High Gain Characteristics –
 $h_{FE} = 30\text{--}100 @ I_C = 250 \text{ mAdc}$
- Direct Substitution for Germanium Equivalents
- Excellent Safe Area Limits (See Figure 2)
- Low Collector Cutoff Current –
 $100 \text{ nA (Max) } 2N3740A, 2N3741A$
- Complementary to NPN 2N3766
 (2N3740) and 2N3767 (2N3741)

POWER TRANSISTORS

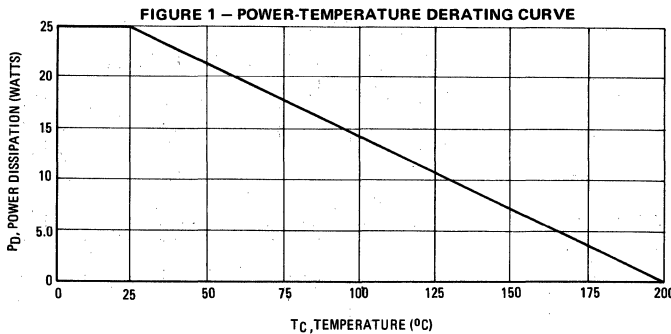
PNP SILICON
60–80 VOLTS
25 WATTS



*MAXIMUM RATINGS

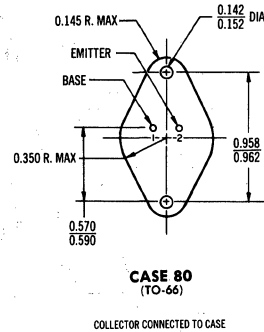
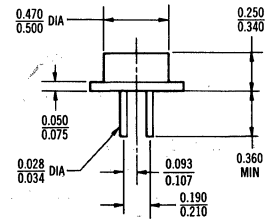
Rating	Symbol	2N3740 2N3740A	2N3741 2N3741A	Unit
Collector-Emitter Voltage	V_{CEO}	60	80	Vdc
Emitter-Base Voltage	V_{EB}	7.0	7.0	Vdc
Collector-Base Voltage	V_{CB}	60	80	vdc
Collector Current – Continuous – Peak (Note 1)	I_C	4.0 10		Adc
Base Current	I_B		2.0	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	25	0.143	Watts W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200		$^\circ\text{C}$

Note 1: See Figure 2



Safe Area Curves are indicated by Figure 2.
 Both limits are applicable and must be observed.

*Indicates JEDEC Registered Data.



2N3740,A, 2N3741,A (continued)

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

Characteristic	Figure No.	Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Sustaining Voltage ^① ($I_C = 100 \text{ mAdc}$, $I_B = 0$)	2	$V_{CE(sus)}$ ^①	60 80	— —	Vdc
Emitter Base Cutoff Current ($V_{EB} = 7.0 \text{ Vdc}$)	—	I_{EBO}	—	0.5 100	mAdc nAdc
Collector Cutoff Current ($V_{CE} = 60 \text{ Vdc}$, $V_{BE(off)} = 1.5 \text{ Vdc}$)	5, 6 ^②	I_{CEX}	—	100	μAdc nAdc
($V_{CE} = 80 \text{ Vdc}$, $V_{BE(off)} = 1.5 \text{ Vdc}$)			—	100	μAdc nAdc
($V_{CE} = 40 \text{ Vdc}$, $V_{BE(off)} = 1.5 \text{ Vdc}$, $T_C = 150^\circ\text{C}$)			—	1.0	mAdc
($V_{CE} = 60 \text{ Vdc}$, $V_{BE(off)} = 1.5 \text{ Vdc}$, $T_C = 150^\circ\text{C}$)			—	0.5 1.0 0.5	mAdc
Collector-Emitter Cutoff Current ($V_{CE} = 40 \text{ Vdc}$, $I_B = 0$)	5, 6 ^②	I_{CEO}	—	1.0	mAdc μAdc
($V_{CE} = 60 \text{ Vdc}$, $I_B = 0$)			—	1.0 1.0 1.0	mAdc nAdc μAdc
Collector Base Cutoff Current ($V_{CB} = 60 \text{ Vdc}$, $I_E = 0$)	—	I_{CBO}	—	100	μAdc nAdc
($V_{CB} = 80 \text{ Vdc}$, $I_E = 0$)			—	100 100	μAdc nAdc

ON CHARACTERISTICS

DC Current Gain ($I_C = 100 \text{ mAdc}$, $V_{CE} = 1.0 \text{ Vdc}$) ($I_C = 250 \text{ mAdc}$, $V_{CE} = 1.0 \text{ Vdc}$) ($I_C = 500 \text{ mAdc}$, $V_{CE} = 1.0 \text{ Vdc}$) ($I_C = 1.0 \text{ Adc}$, $V_{CE} = 1.0 \text{ Vdc}$)	7	h_{FE} ^①	40 30 20 10	— 100 — —	—
Collector-Emitter Saturation Voltage ($I_C = 1.0 \text{ Adc}$, $I_B = 125 \text{ mAdc}$)	8, 9, 10	$V_{CE(sat)}$ ^①	—	0.6	Vdc
Base-Emitter Voltage ($I_C = 250 \text{ mAdc}$, $V_{CE} = 1.0 \text{ Vdc}$)	3, 4, 9, 10	V_{BE} ^①	—	1.0	Vdc

TRANSIENT CHARACTERISTICS

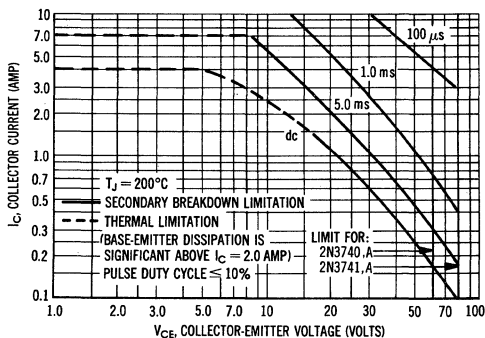
Current-Gain-Bandwidth Product ($I_C = 100 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$, $f = 1.0 \text{ MHz}$)	—	f_T	4.0	—	MHz
Common Base Output Capacitance ($V_{CB} = 10 \text{ Vdc}$, $I_C = 0$, $f = 100 \text{ kHz}$)	14	C_{ob}	—	100	pF
Small-Signal Current Gain ($I_C = 50 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$, $f = 1.0 \text{ kHz}$)	—	h_{fe}	25	—	—

* Indicates JEDEC Registered Data.

① Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

② Figures 5 and 6 apply to 2N3740 and 2N3741 only.

FIGURE 2 — ACTIVE REGION SAFE OPERATING AREA



The Safe Operating Area Curves indicate $I_C - V_{CE}$ limits below which the device will not enter secondary breakdown. Collector load lines for specific circuits must fall within the applicable Safe Area to avoid causing a catastrophic failure. To insure operation below the maximum T_J , power-temperature derating must be observed for both steady state and pulse power conditions.

2N3740,A, 2N3741,A (continued)

LARGE SIGNAL CHARACTERISTICS

FIGURE 3 – TRANSCONDUCTANCE

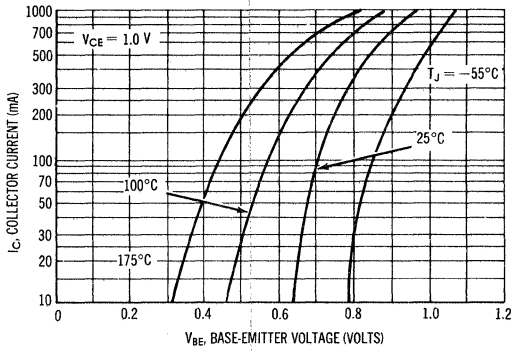
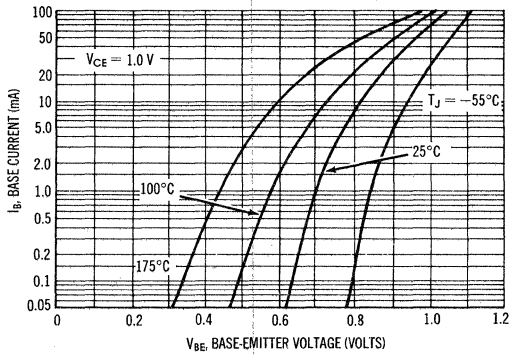


FIGURE 4 – INPUT ADMITTANCE



"OFF" REGION CHARACTERISTICS

FIGURE 5 – TRANSCONDUCTANCE

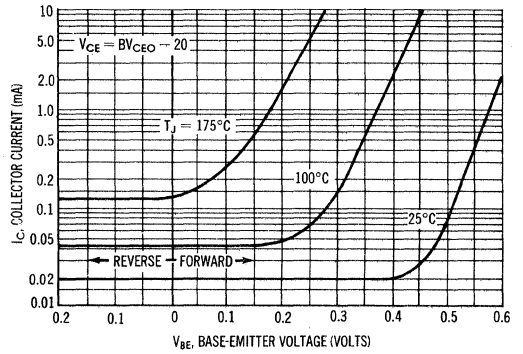
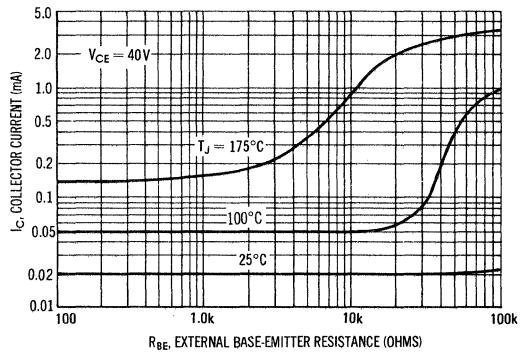


FIGURE 6 – EFFECTS OF BASE-EMITTER RESISTANCE



② Figures 5 and 6 apply to 2N3740 and 2N3741.

FIGURE 7 – THERMAL RESPONSE

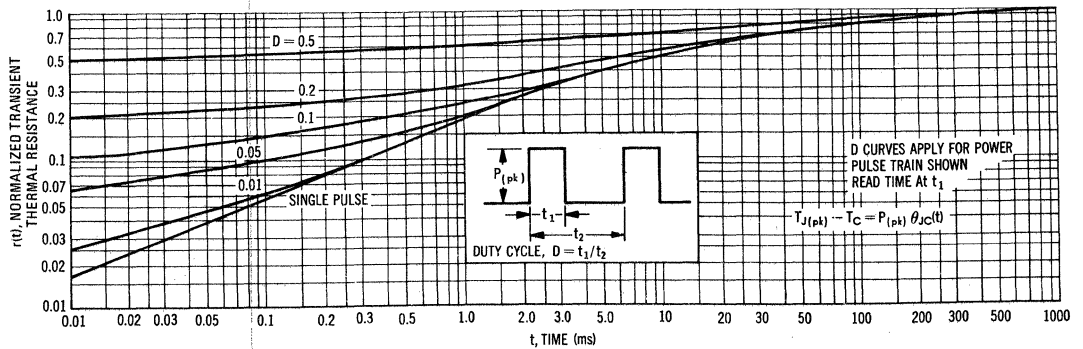
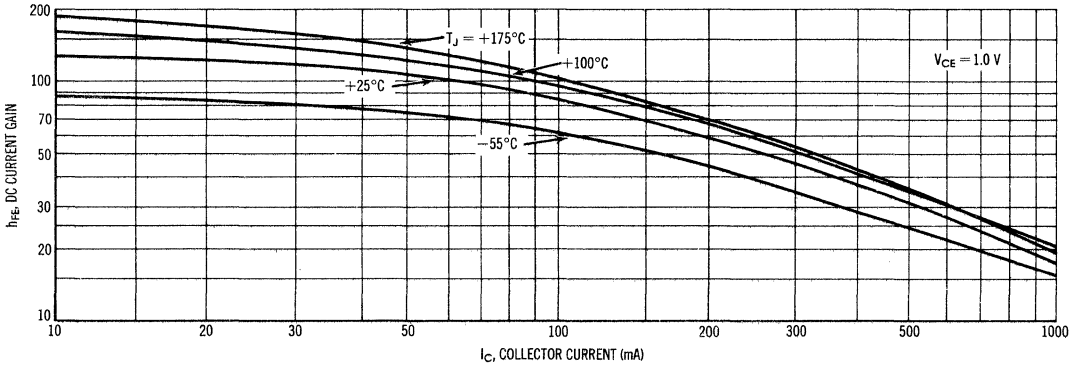


FIGURE 8 – CURRENT GAIN



SATURATION REGION CHARACTERISTICS

FIGURE 9 – COLLECTOR SATURATION REGION

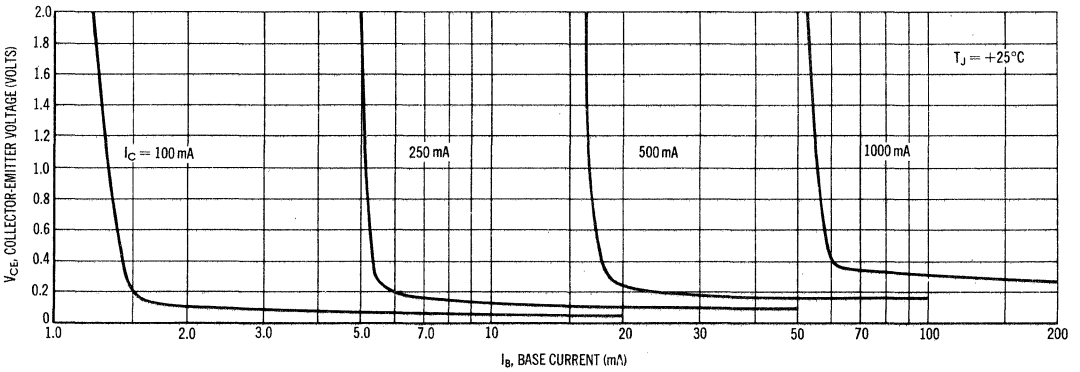


FIGURE 10 – "ON" VOLTAGES

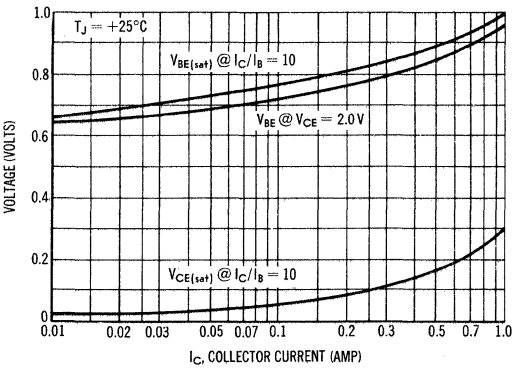


FIGURE 11 – TEMPERATURE COEFFICIENTS

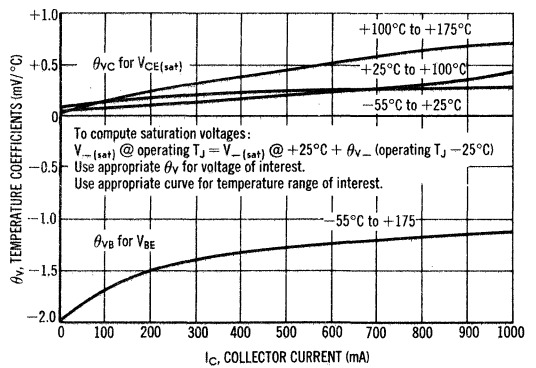


FIGURE 12 – TURN-ON TIME

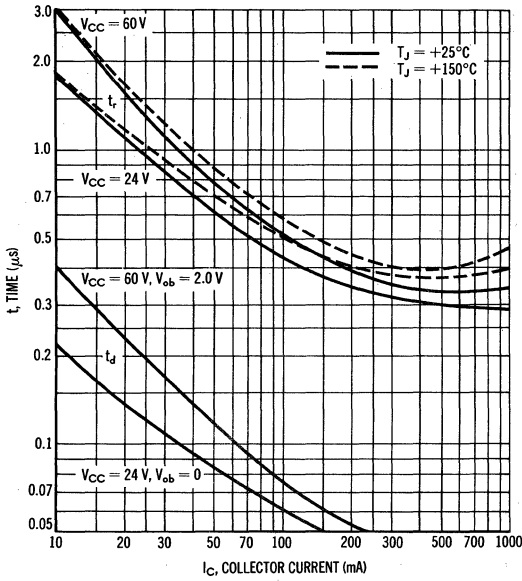


FIGURE 13 – CAPACITANCE

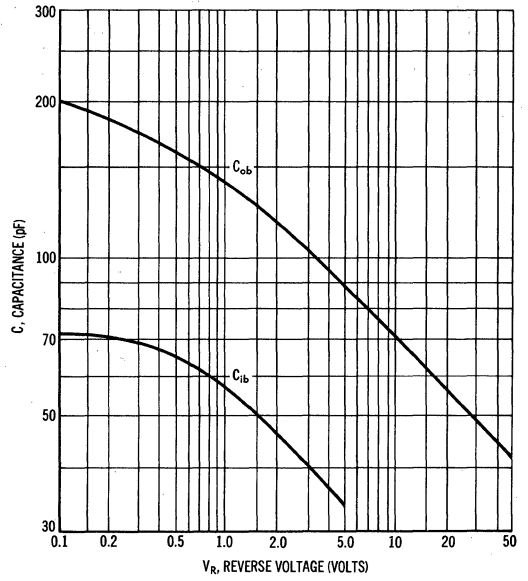


FIGURE 14 – STORAGE TIME

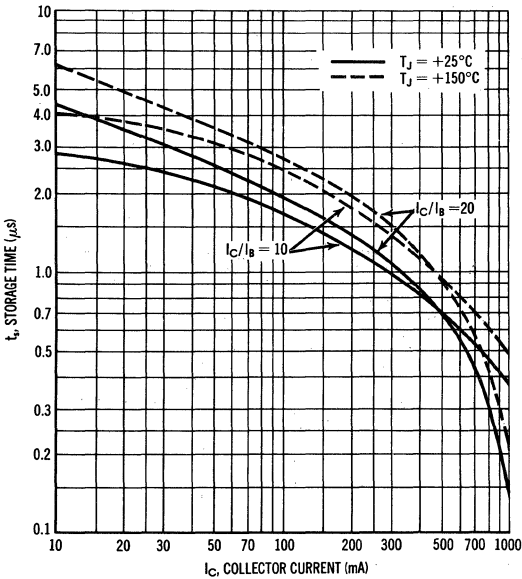


FIGURE 15 – FALL TIME

