



SURFACE-MOUNT NPN POWER DARLINGTON TRANSISTORS

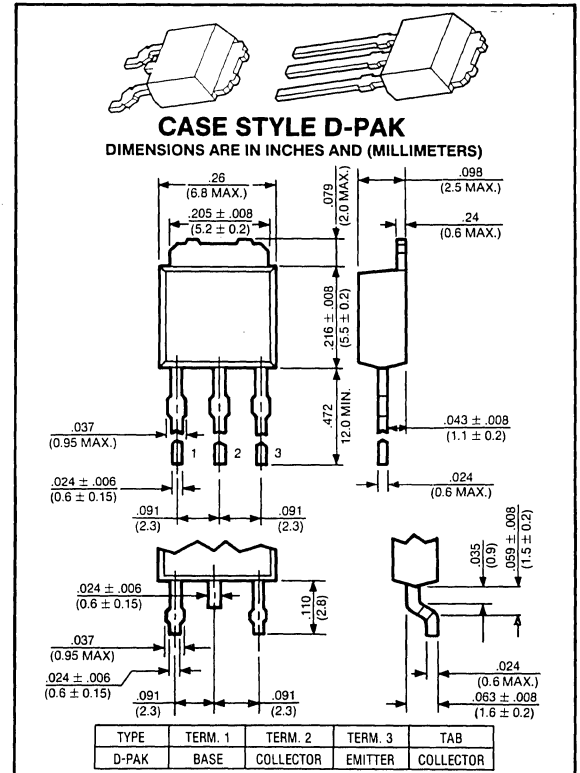
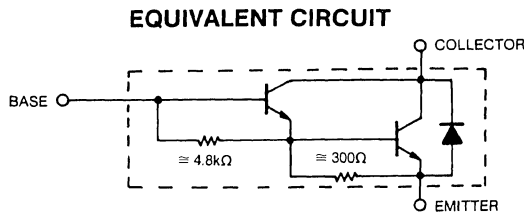
D72K3D1,2

**40 VOLTS
3 AMP, 15 WATTS**

Designed for switching applications, hammer drive, pulse motor drive applications, power amplifier applications.

Features:

- High DC Current Gain
: $hFE(1) = 2000(\text{Min.})$ ($V_{CE} = 2V, I_C = 1A$)
- Low Saturation Voltage
: $V_{CE}(\text{sat}) = 1.5V$ (Max.) ($I_C = 2A$)
- Complementary to D73K3D1,2
- Suffix "2" designates lead formed version
- See page 840 for mounting and handling considerations.



maximum ratings ($T_A = 25^\circ C$) (unless otherwise specified)

RATING	SYMBOL	D72K3D	UNITS
Collector-Emitter Voltage	V_{CEO}	40	Volts
Collector-Base Voltage	V_{CBO}	60	Volts
Emitter Base Voltage	V_{EBO}	5	Volts
Collector Current — Continuous	I_C	3	A
Base Current — Continuous	I_B	0.3	A
Total Power Dissipation @ $T_A = 25^\circ C$ @ $T_C = 25^\circ C$	P_D	1.0 15	Watts
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ C$

thermal characteristics⁽¹⁾

Maximum Lead Temperature for Soldering Purposes: 1/8" from Case for 5 Seconds	T_L	235	$^\circ C$
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(1) See page 841 for thermal considerations.

electrical characteristics ($T_A = 25^\circ\text{C}$) (unless otherwise specified)

CHARACTERISTIC	SYMBOL	MIN	TYP	MAX	UNIT
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off characteristics

Collector-Emitter Breakdown Voltage ($I_C = 25\text{mA}$, $I_B = 0$)	$V_{(BR)CEO}$	40	—	—	Volts
Collector Cutoff Current ($V_{CB} = 60\text{V}$, $I_E = 0$)	I_{CBO}	—	—	20	μA
Emitter Cutoff Current ($V_{EB} = 5\text{V}$, $I_C = 0$)	I_{EBO}	—	—	2.5	mA

second breakdown

Second Breakdown with Base Forward Biased	FBSOA	SEE FIGURE 10
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on characteristics

DC Current Gain ⁽²⁾ ($I_C = 1\text{A}$, $V_{CE} = 2\text{V}$) ($I_C = 3\text{A}$, $V_{CE} = 2\text{V}$)	h_{FE}	2000	—	—	—
	h_{FE}	1000	—	—	—
Collector-Emitter Saturation Voltage ($I_C = 2\text{A}$, $I_B = 4\text{mA}$)	$V_{CE(sat)}$	—	—	1.5	V
Base-Emitter Saturation Voltage ($I_C = 2\text{A}$, $I_B = 4\text{mA}$)	$V_{BE(sat)}$	—	—	2.0	Volts

switching characteristics

Turn-on Time	$V_{CC} = 30\text{V}$ $I_{B1} = -I_{B2} = 6\text{mA}$ Duty Cycle $\leq 1\%$	t_{on}	—	0.1	—	μs
Storage Time		t_{stg}	—	1.0	—	
Fall Time		t_f	—	0.2	—	

(3) See page 43 for h_{FE} ranges.

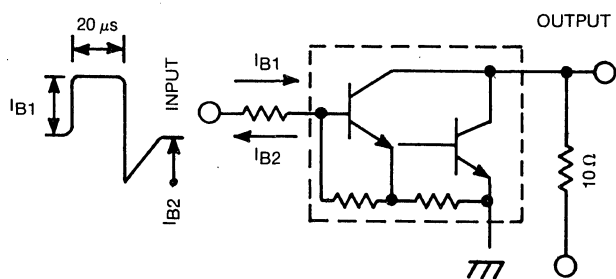


FIG. 1 SWITCHING TIME TEST CIRCUIT

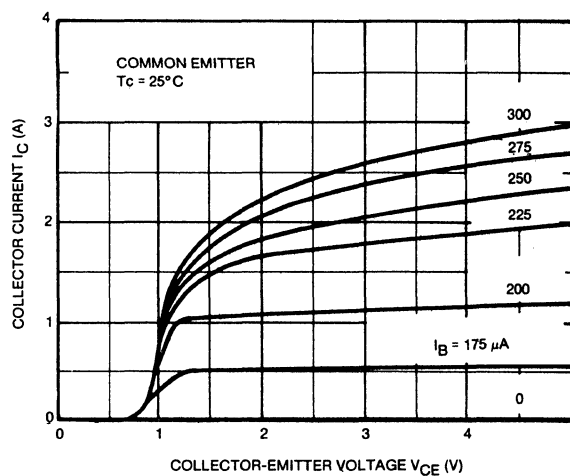


FIG. 2 $I_C - V_{CE}$

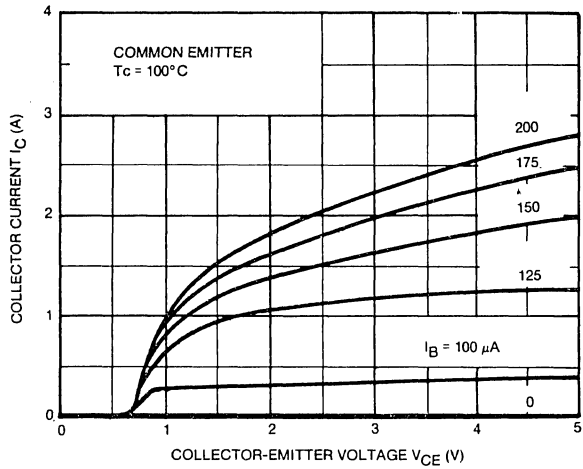


FIG. 3 $I_C - V_{CE}$

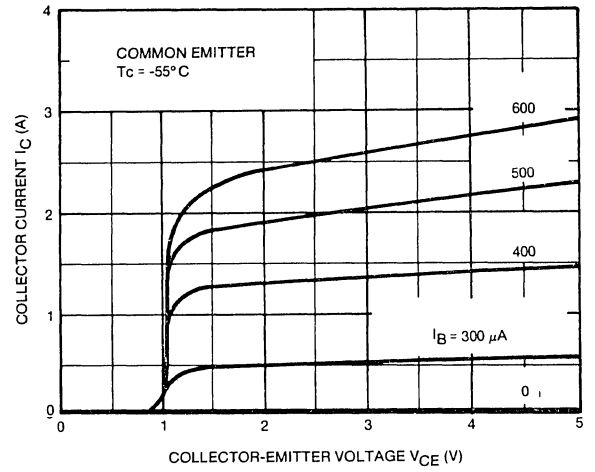


FIG. 4 $I_C - V_{CE}$

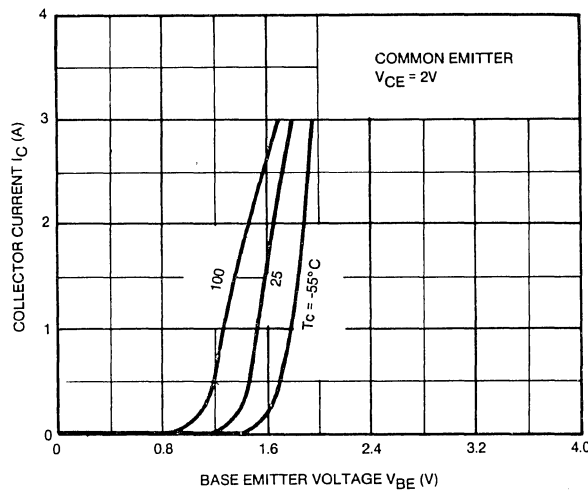


FIG. 5 $I_C - V_{BE}$

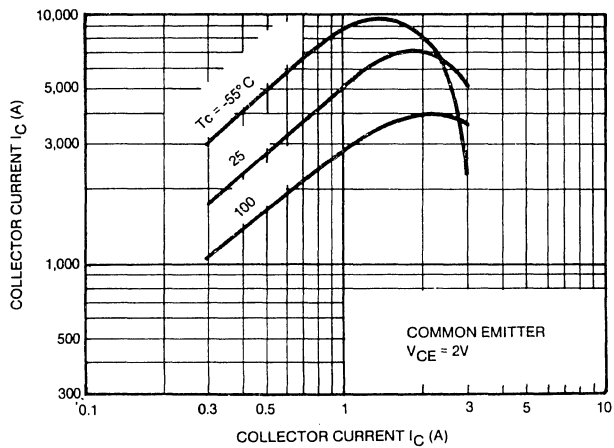


FIG. 6 $h_{FE} - I_C$

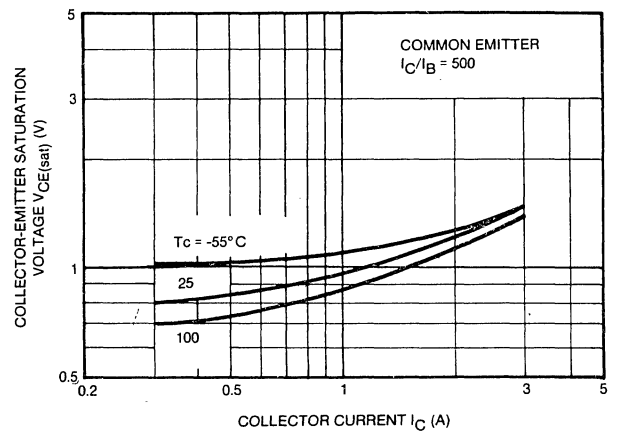


FIG. 7 $V_{CE(sat)} - I_C$

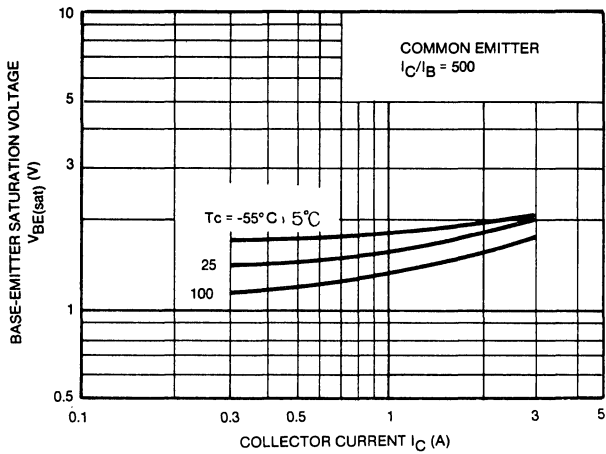


FIG. 8 $V_{BE(sat)} - I_C$

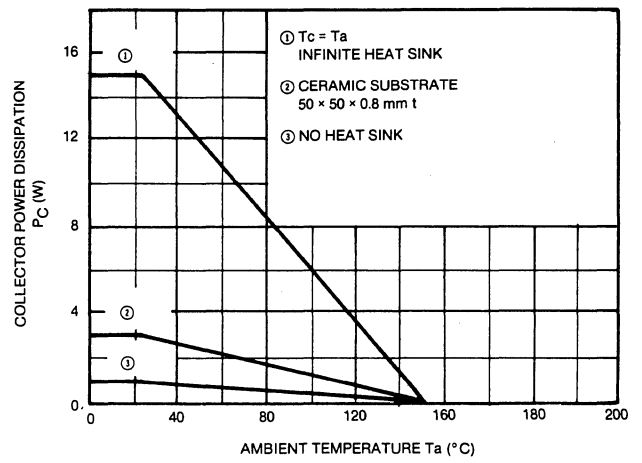


FIG. 9 $P_C - T_a$

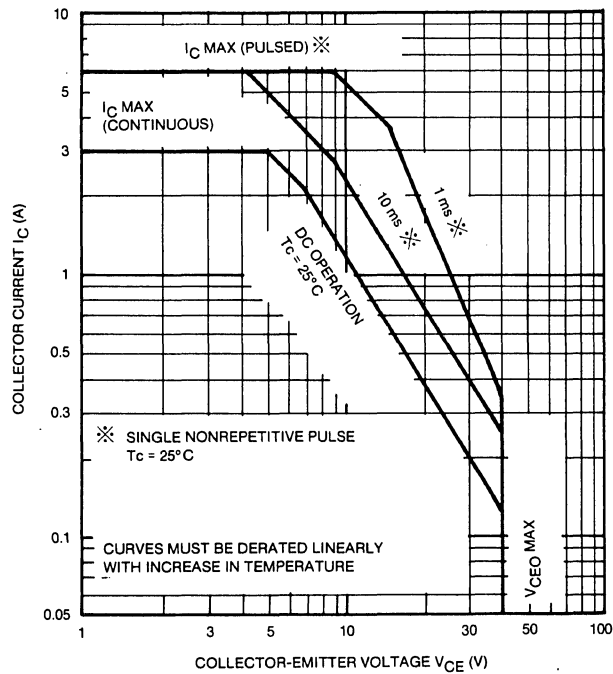


FIG. 10 SAFE OPERATING AREA