

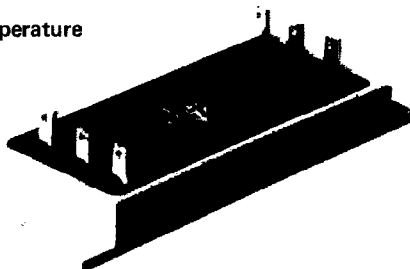
# SOLID-STATE POWER FUNCTIONS

# TYPE TIXH702 DUAL HIGH-CURRENT SWITCH

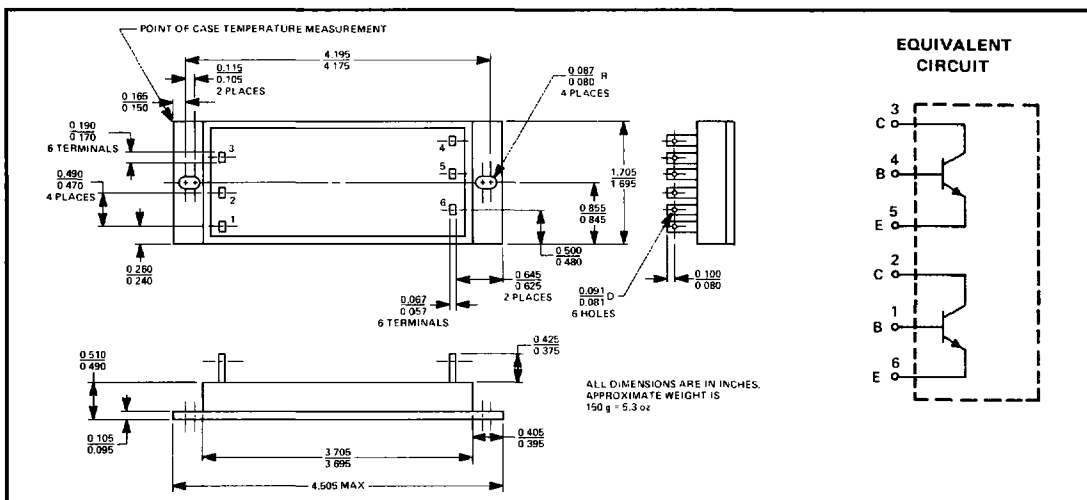
- 25-A Continuous Collector Current
- 400 V Collector-Base Voltage
- 300 Watts at 25°C Case Temperature

## description

The TIXH702 is a high-voltage power stage which can be utilized in many types of circuit applications operating from a rectified 115-volt a-c line. Typical examples include motor controls and frequency conversion systems.



## mechanical data



TYPE TIXH702  
BULLETIN NO. DL-S-711652, DECEMBER 1971

## absolute maximum ratings over operating case temperature range (unless otherwise noted)

Terminal-to-Case Voltage	±500 V
Collector-Base Voltage	400 V
Collector-Emitter Voltage (See Note 1)	300 V
Emitter-Base Voltage	5 V
Continuous Collector Current	25 A
Continuous Base Current	10 A
Safe Operating Area at (or below) 25°C Case Temperature	See Figure 2
Continuous Total Package Dissipation at (or below) 25°C Case Temperature (See Note 2)	300 W
Unclamped Inductive Load Energy (See Note 3)	90 mJ
Operating Case and Storage Temperature Range	-25°C to 85°C
Terminal Temperature 1/8 Inch from Case for 5 Seconds	260°C

- NOTES: 1. This value applies when the base-emitter diode is open-circuited.  
2. Derate linearly to 120 W at 85°C case temperature at the rate of 3 W/°C. Power may be divided between the two switches in any proportion subject to the limitations of the Maximum Safe Operating Area Curve, Figure 2.  
3. This rating is based on the capability of each switch to operate safely in the unclamped-inductive load circuit of Section 3.2 of the forthcoming JEDEC publication *Suggested Standards on Power Transistors*.<sup>†</sup> L = 20 mH, R<sub>BB1</sub> = 20 Ω, R<sub>BB2</sub> = 100 Ω, V<sub>BB1</sub> = 10 V, V<sub>BB2</sub> = 0 V, R<sub>L</sub> = 0.2 Ω, V<sub>CC</sub> = 10 V, I<sub>CM</sub> = 3 A. Energy ≈ I<sub>C</sub><sup>2</sup>L/2.

<sup>†</sup>This circuit appears on page 5-1 of this data book.

# TYPE T1XH702

## DUAL HIGH-CURRENT SWITCH

electrical characteristics at 25°C case temperature

PARAMETER	TEST CONDITIONS	MIN	MAX	UNIT
$V_{(BR)CEO}$ Collector-Emitter Breakdown Voltage	$I_C = 1 \text{ mA}$ , $I_B = 0$ , See Note 4	300		V
$I_{CBO}$ Collector Cutoff Current	$V_{CB} = 400 \text{ V}$ , $I_E = 0$		1	mA
$I_{EBO}$ Emitter Cutoff Current	$V_{EB} = 5 \text{ V}$ , $I_C = 0$		4	mA
$h_{FE}$ Static Forward Current Transfer Ratio	$V_{CE} = 5 \text{ V}$ , $I_C = 25 \text{ A}$ , See Notes 4 and 5	12		
$V_{BE}$ Base-Emitter Voltage	$I_B = 2.5 \text{ A}$ , $I_C = 25 \text{ A}$ , See Notes 4 and 5		4	V
$V_{CE(sat)}$ Collector-Emitter Saturation Voltage	$I_B = 2.5 \text{ A}$ , $I_C = 25 \text{ A}$ , See Notes 4 and 5		3	V

### TYPICAL CHARACTERISTICS

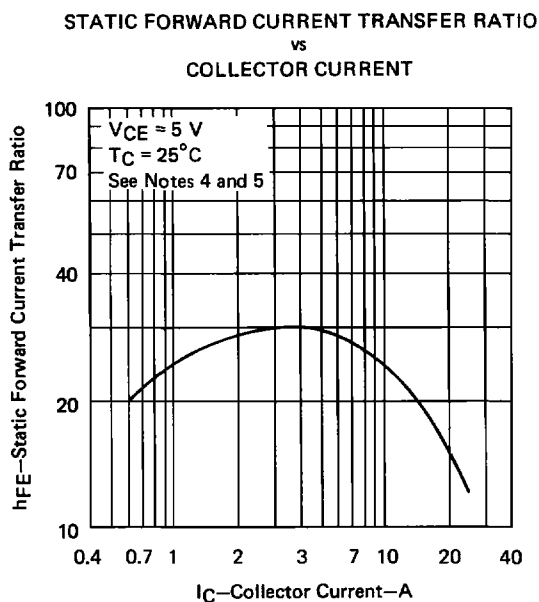


FIGURE 1

### MAXIMUM SAFE OPERATING AREA

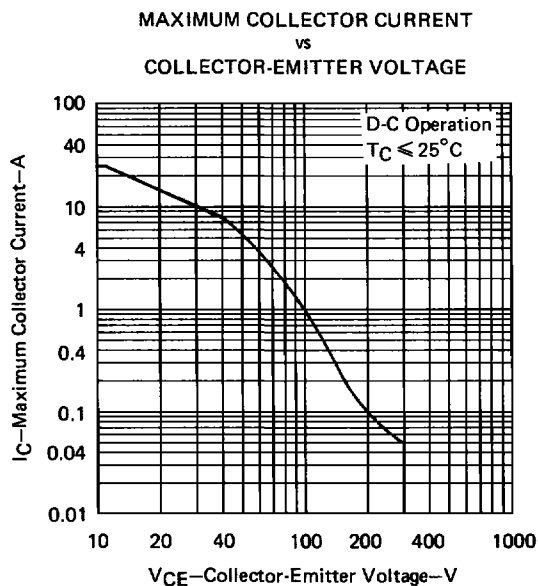


FIGURE 2

NOTES: 4. These parameters must be measured using pulse techniques.  $t_w = 300 \mu\text{s}$ , duty cycle  $< 2\%$ .

5. These parameters are measured with voltage-sensing contacts separate from the current-carrying contacts and located within 0.2 inch from the device body.