



# NPN POWER TRANSISTORS

COMPLEMENTARY TO THE TIP42 SERIES

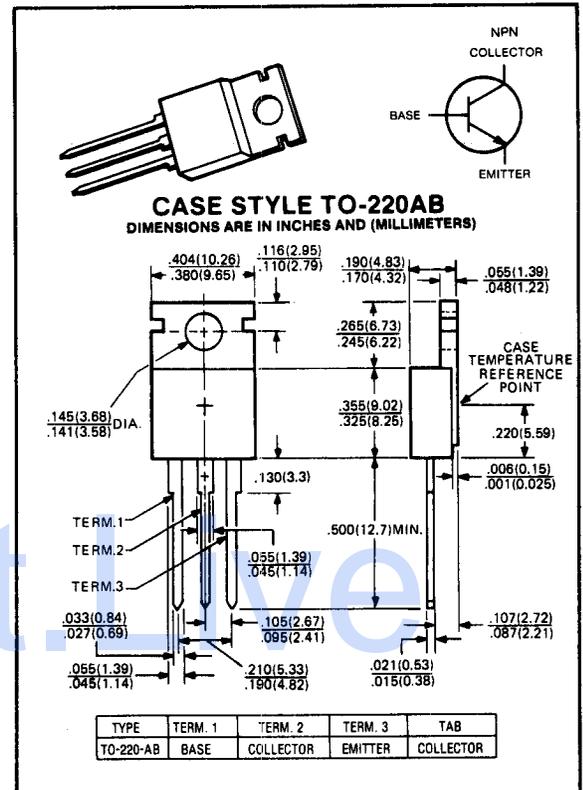
**TIP 41 Series**

40-100 VOLTS  
6 AMP, 65 WATTS

The TIP41 Series power transistors are designed for use in general purpose amplifier and switching applications.

**Features:**

- Designed for complementary use with TIP42 series
- 65W at 25°C case temperature
- 6A continuous collector current
- 10A peak collector current
- Minimum  $f_T$  of 3 MHz at 10V, 0.5A
- Customer-specified selections available



DatasheetLive

maximum ratings ( $T_C = 25^\circ C$ ) (unless otherwise noted)

RATING	SYMBOL	TIP41	TIP41A	TIP41B	TIP41C	UNITS
Collector-Emitter Voltage	$V_{CEO}$	40	60	80	100	Volts
Collector-Base Voltage	$V_{CBO}$	80	100	120	140	Volts
Emitter Base Voltage	$V_{EBO}$	5	5	5	5	Volts
Collector Current — Continuous	$I_C$	6	6	6	6	A
Peak	$I_{CM}$	10	10	10	10	A
Base Current — Continuous	$I_B$	3	3	3	3	A
Total Power Dissipation @ $T_A = 25^\circ C$ @ $T_C = 25^\circ C$	$P_D$	2 65	2 65	2 65	2 65	Watts
Operating and Storage Junction Temperature Range	$T_J, T_{STG}$	-65 to +150	-65 to +150	-65 to +150	-65 to +150	$^\circ C$

**thermal characteristics**

Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.92	1.92	1.92	1.92	$^\circ C/W$
Maximum Lead Temperature for Soldering Purposes: 1/8" from Case for 5 Seconds	$T_L$	250	250	250	250	$^\circ C$

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

CHARACTERISTIC		SYMBOL	MIN	TYP	MAX	UNIT
Collector-Emitter Breakdown Voltage ( $I_C = 30\text{mA}$ )	TIP41 TIP41A TIP41B TIP41C	$V_{CEO}$	40 60 80 100	— — — —	— — — —	Volts
Collector Cutoff Current ( $V_{CE} = 30\text{V}$ ) ( $V_{CE} = 60\text{V}$ )	TIP41, TIP41A TIP41B, TIP41C	$I_{CEO}$	— —	— —	0.7 0.7	mA
Collector Cutoff Current ( $V_{CE} = 80\text{V}$ ) ( $V_{CE} = 100\text{V}$ ) ( $V_{CE} = 120\text{V}$ ) ( $V_{CE} = 140\text{V}$ )	TIP41 TIP41A TIP41B TIP41C	$I_{CES}$	— — — —	— — — —	0.4 0.4 0.4 0.4	mA
Emitter Cutoff Current ( $V_{EB} = 5\text{V}$ , $I_C = 0$ )		$I_{EBO}$	—	—	1	mA

second breakdown

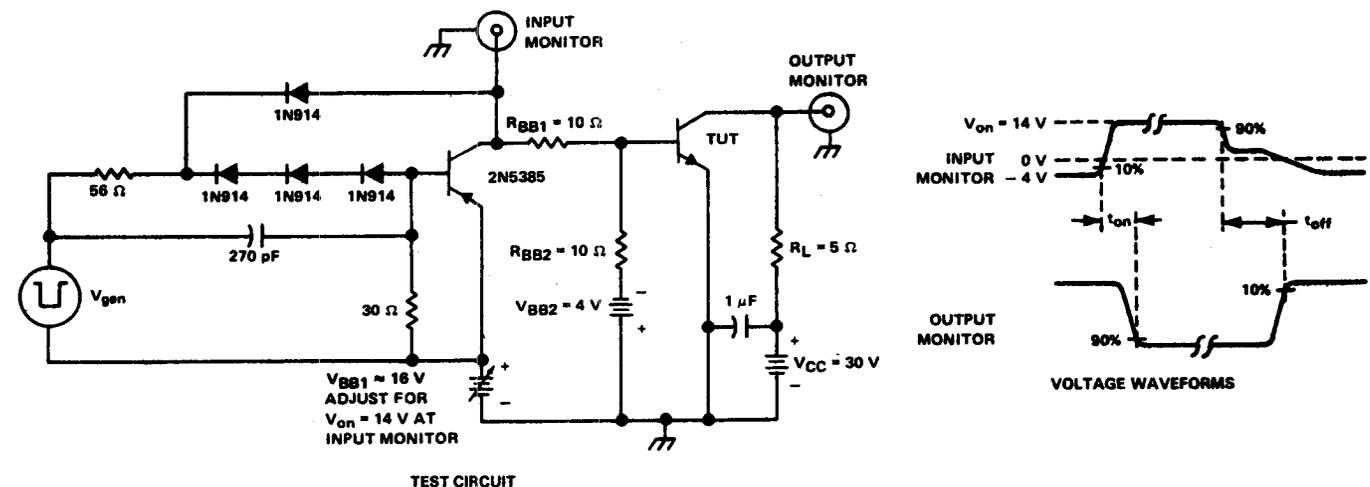
Second Breakdown with Base Forward Biased	FBSOA	SEE FIGURE 3
-------------------------------------------	-------	--------------

on characteristics

DC Current Gain ( $I_C = .3\text{A}$ , $V_{CE} = 4\text{V}$ ) ( $I_C = 3\text{A}$ , $V_{CE} = 4\text{V}$ )	$h_{FE}$	30 15	— —	— 75	—
Collector-Emitter Saturation Voltage ( $I_C = 6\text{A}$ , $I_B = .6\text{A}$ )	$V_{CE(sat)}$	—	—	1.5	V
Base-Emitter Voltage ( $I_C = 6\text{A}$ , $V_{CE} = 4\text{V}$ )	$V_{BE(on)}$	—	—	2.0	V

switching characteristics

Turn-on Time	$I_C = 6\text{A}$ , $R_L = 5\Omega$ $I_{B1} = I_{B2} = 0.6\text{A}$ $V_{BE(off)} = -4\text{V}$	$t_{on}$	—	0.6	—	$\mu\text{S}$
Turn-off Time		$t_{off}$	—	1	—	



- NOTES:
- $V_{gen}$  is a  $-30\text{V}$  pulse into a  $50\Omega$  termination.
  - The  $V_{gen}$  waveform is supplied by a generator with the following characteristics:  $t_r < 15\text{ns}$ ,  $t_f < 15\text{ns}$ ,  $Z_{out} = 50\Omega$ ,  $t_w = 20\mu\text{s}$ , duty cycle  $< 2\%$ .
  - Waveforms are monitored on an oscilloscope with the following characteristics:  $t_r < 15\text{ns}$ ,  $R_{in} > 10\text{M}\Omega$ ,  $C_{in} < 11.5\text{pF}$ .
  - Resistors must be noninductive types.
  - The d-c power supplies may require additional bypassing in order to minimize ringing.

FIGURE 1. RESISTIVE-LOAD SWITCHING

STATIC FORWARD CURRENT TRANSFER RATIO  
vs  
COLLECTOR CURRENT

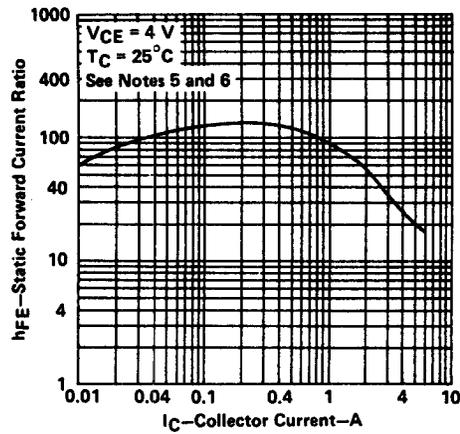


FIGURE 2. TYPICAL CHARACTERISTICS

- NOTES: 5. These parameters must be measured using pulse techniques,  $t_w = 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$ .  
6. These parameters are measured with voltage-sensing contacts separate from the current-carrying contacts.

FORWARD-BIAS SAFE OPERATING AREA

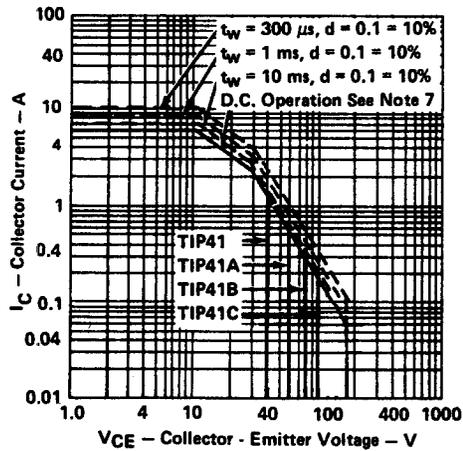


FIGURE 3. MAXIMUM SAFE OPERATING AREA

- NOTES: 7. This combination of maximum voltage and current may be achieved only when switching from saturation to cutoff with a clamped inductive load.

DISSIPATION DERATING CURVE

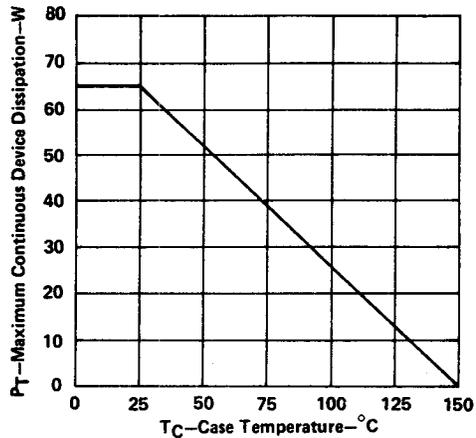


FIGURE 4. THERMAL INFORMATION