

Complementary Silicon Plastic Power Transistors

... designed for use in general purpose amplifier and switching applications.
Compact TO-220 AB package.

MAXIMUM RATINGS

Rating	Symbol	TIP29B TIP30B	TIP29C TIP30C	Unit
Collector-Emitter Voltage	V_{CEO}	80	100	Vdc
Collector-Base Voltage	V_{CB}	80	100	Vdc
Emitter-Base Voltage	V_{EB}	5.0		Vdc
Collector Current — Continuous	I_C	1.0	1.0	Adc
Peak		3.0	3.0	
Base Current	I_B	0.4	0.4	Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$	P_D	30	30	Watts
Derate above 25°C		0.24	0.24	W/ $^\circ\text{C}$
Total Power Dissipation @ $T_A = 25^\circ\text{C}$	P_D	2.0	2.0	Watts
Derate above 25°C		0.016	0.016	W/ $^\circ\text{C}$
Unclamped Inductive Load Energy (See Note 3)	E	32	32	mJ
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +150		$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	4.167	$^\circ\text{C/W}$

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Sustaining Voltage (1) ($I_C = 30\text{ mAdc}$, $I_B = 0$)	$V_{CEO(sus)}$	80 100	— —	Vdc
Collector Cutoff Current ($V_{CE} = 60\text{ Vdc}$, $I_B = 0$)	I_{CEO}	—	0.3	mAdc
Collector Cutoff Current ($V_{CE} = 80\text{ Vdc}$, $V_{EB} = 0$) ($V_{CE} = 100\text{ Vdc}$, $V_{EB} = 0$)	I_{CES}	— —	200 200	μAdc
Emitter Cutoff Current ($V_{BE} = 5.0\text{ Vdc}$, $I_C = 0$)	I_{EBO}	—	1.0	mAdc

ON CHARACTERISTICS (1)

DC Current Gain ($I_C = 0.2\text{ Adc}$, $V_{CE} = 4.0\text{ Vdc}$) ($I_C = 1.0\text{ Adc}$, $V_{CE} = 4.0\text{ Vdc}$)	h_{FE}	40 15	— 75	—
Collector-Emitter Saturation Voltage ($I_C = 1.0\text{ Adc}$, $I_B = 125\text{ mAdc}$)	$V_{CE(sat)}$	—	0.7	Vdc
Base-Emitter On Voltage ($I_C = 1.0\text{ Adc}$, $V_{CE} = 4.0\text{ Vdc}$)	$V_{BE(on)}$	—	1.3	Vdc

DYNAMIC CHARACTERISTICS

Current-Gain — Bandwidth Product (2) ($I_C = 200\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$, $f_{test} = 1.0\text{ MHz}$)	f_T	3.0	—	MHz
Small-Signal Current Gain ($I_C = 0.2\text{ Adc}$, $V_{CE} = 10\text{ Vdc}$, $f = 1.0\text{ kHz}$)	h_{fe}	20	—	—

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

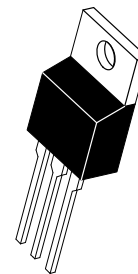
(2) $f_T = |h_{fe}| \cdot f_{test}$.

(3) This rating based on testing with $L_C = 20\text{ mH}$, $R_{BE} = 100\text{ }\Omega$, $V_{CC} = 10\text{ V}$, $I_C = 1.8\text{ A}$, P.R.F = 10 Hz.

REV 1

NPN
TIP29B
TIP29C
PNP
TIP30B
TIP30C

1 AMPERE
POWER TRANSISTORS
COMPLEMENTARY
SILICON
80-100 VOLTS
30 WATTS



CASE 221A-06
TO-220AB

TIP29B TIP29C TIP30B TIP30C

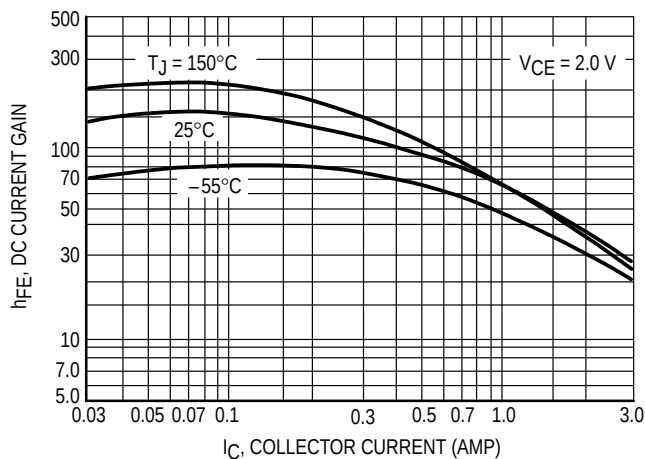


Figure 1. DC Current Gain

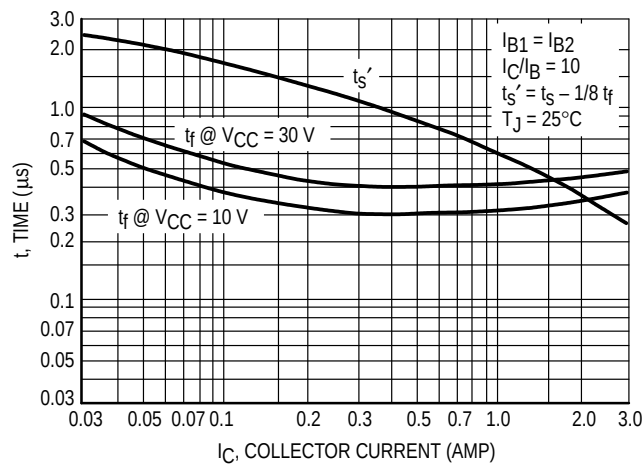


Figure 2. Turn-Off Time

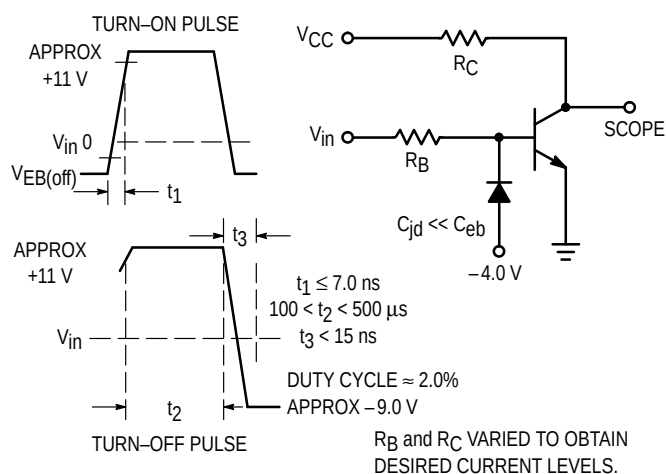


Figure 3. Switching Time Equivalent Circuit

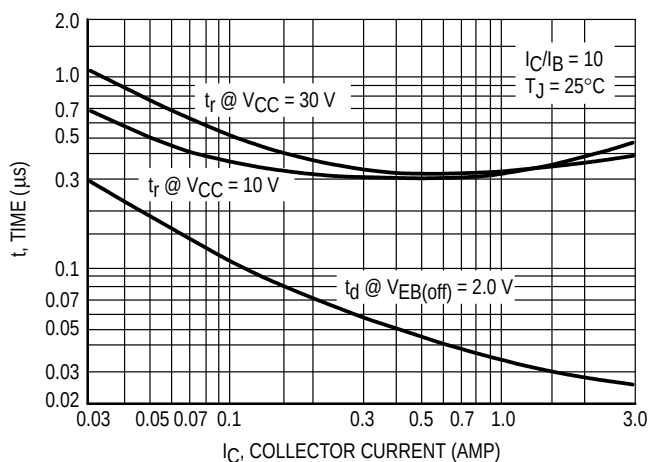


Figure 4. Turn-On Time

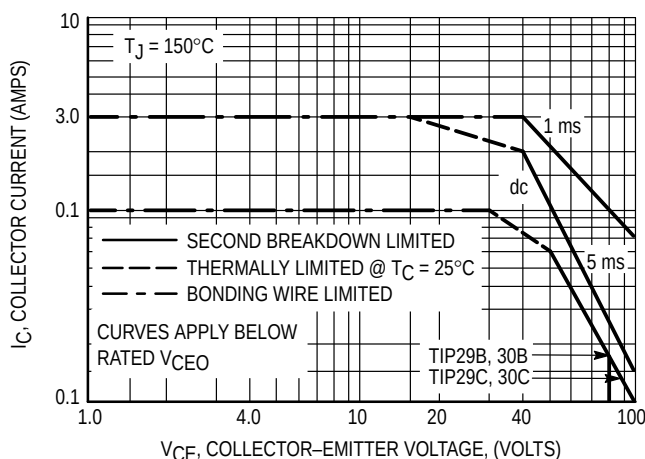
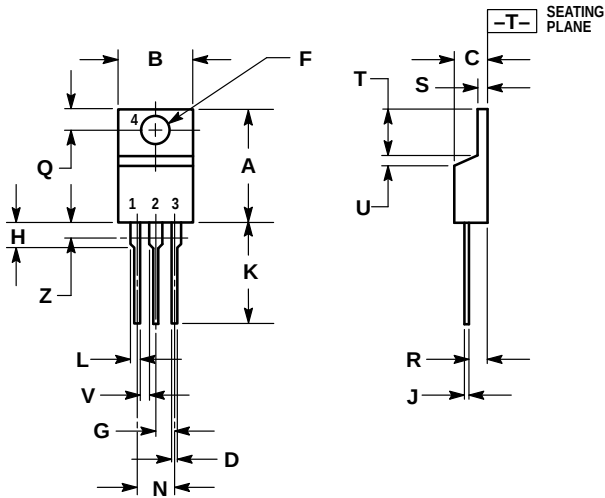


Figure 5. Active Region Safe Operating Area

There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown. Safe operating area curves indicate $I_C - V_{CE}$ operation; i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data of Figure 5 is based on $T_{J(pk)} = 150^\circ\text{C}$; T_C is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(pk)} \leq 150^\circ\text{C}$. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

PACKAGE DIMENSIONS



- NOTES:
- 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 - 2. CONTROLLING DIMENSION: INCH.
 - 3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.570	0.620	14.48	15.75
B	0.380	0.405	9.66	10.28
C	0.160	0.190	4.07	4.82
D	0.025	0.035	0.64	0.88
F	0.142	0.147	3.61	3.73
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.018	0.025	0.46	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.15	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
V	0.045	—	1.15	—
Z	—	0.080	—	2.04

- STYLE 1:
- PIN 1. BASE
 - 2. COLLECTOR
 - 3. EMITTER
 - 4. COLLECTOR

CASE 221A-06
TO-220AB
ISSUE Y

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How to reach us:

USA / EUROPE: Motorola Literature Distribution;
P.O. Box 20912; Phoenix, Arizona 85036. 1-800-441-2447

MFAX: RMFAX0@email.sps.mot.com – TOUCHTONE (602) 244-6609
INTERNET: <http://Design-NET.com>

JAPAN: Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, Toshikatsu Otsuki,
6F Seibu-Butsuryu-Center, 3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 03-3521-8315

HONG KONG: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298



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