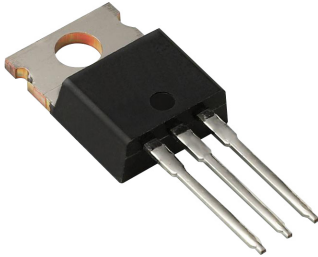
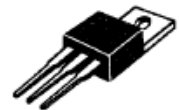


High Power Bipolar Transistors **multicomp**PRO



NPN
TIP29A
TIP29C
1A
Complementary Silicon
Power Transistors
60 - 100V
30W



TO-220

Features

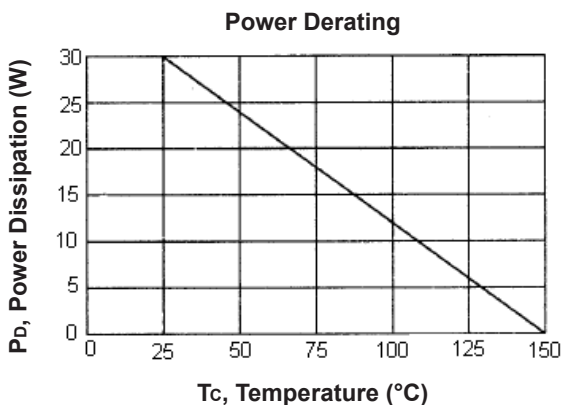
- Collector-Emitter sustaining voltage - $V_{CEO} (sust) = 60V$ (Minimum) - TIP29A
= 100V (Minimum) - TIP29C
- Collector-Emitter saturation voltage - $V_{CE} (sat) = 0.7V$ (Maximum) at $I_C = 1A$
- Current gain-bandwidth product $f_T = 3MHz$ (Minimum) at $I_C = 200mA$

Maximum Ratings

Characteristic	Symbol	TIP29A	TIP29C	Unit
Collector-Emitter Voltage	V _{CEO}	60	100	V
Collector-Base Voltage	V _{CBO}			
Emitter-Base Voltage	V _{EBO}	5		
Collector Current - Continuous - Peak	I _C	1 3		A
Base Current	I _B	0.4		
Total Power Dissipation at T _C = 25°C Derate above 25°C	P _D	30 0.24		W W / °C
Operating and Storage Junction Temperature Range	T _J , T _{STG}	-65 to +150		°C

Thermal Characteristics

Characteristic	Symbol	Max.	Unit
Thermal Resistance Junction to Case	$R_{\theta JC}$	4.167	$^\circ C / W$



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

Parameter	Symbol	Min.	Max.	Unit
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OFF Characteristics

Collector - Emitter Breakdown Voltage (Note 1) ($I_C = 30\text{mA}$, $I_B = 0$) TIP29A TIP29C	$V_{CEO(sus)}$	60 100	-	V
Collector Cut-off Current $V_{CE} = 30\text{V}$, $I_B = 0$ TIP29A $V_{CE} = 60\text{V}$, $I_B = 0$ TIP29C	I_{CEO}	-	0.3 0.3	mA
Collector Cut-off Current $V_{CE} = 60\text{V}$, $V_{EB} = 0$ TIP29A $V_{CE} = 100\text{V}$, $V_{EB} = 0$ TIP29C	I_{CES}		0.2 0.2	
Emitter Cut-off Current ($V_{EB} = 5\text{V}$, $I_C = 0$)	I_{EBO}	-	1	

ON Characteristics (Note 1)

DC Current Gain ($I_C = 0.2\text{A}$, $V_{CE} = 4\text{V}$) ($I_C = 1\text{A}$, $V_{CE} = 4\text{V}$)	h_{FE}	40 15	75	-
Collector - Emitter Saturation Voltage ($I_C = 1\text{A}$, $I_B = 125\text{mA}$)	$V_{CE(sat)}$	-	0.7	V
Base - Emitter On Voltage ($I_C = 1\text{A}$, $V_{CE} = 4\text{V}$)	$V_{BE(on)}$	-	1.3	

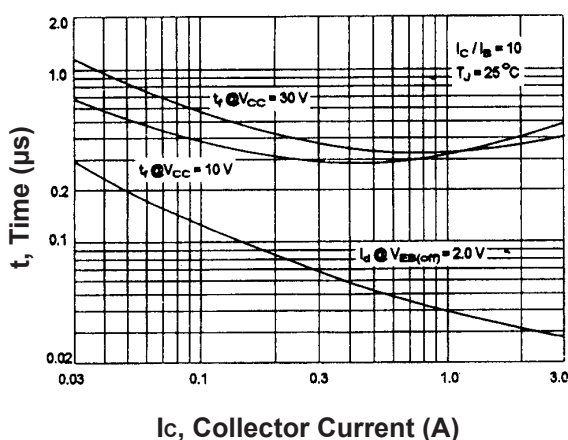
Dynamic Characteristics

Current Gain-Bandwidth Product (2) ($I_C = 200\text{mA}$, $V_{CE} = 10\text{V}$, $f = 1\text{MHz}$)	f_T	3	-	MHz
Small-Signal Current Gain ($I_C = 200\text{mA}$, $V_{CE} = 10\text{V}$, $f = 1\text{kHz}$)	h_{fe}	20	-	-

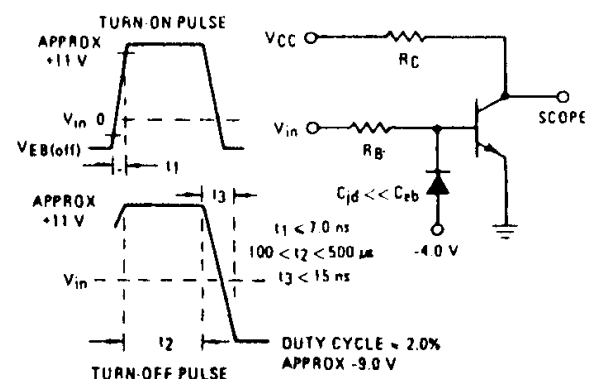
(1) Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$

(2) $f_T = |h_{FE}| \cdot f_{\text{Test}}$

Turn - On Time

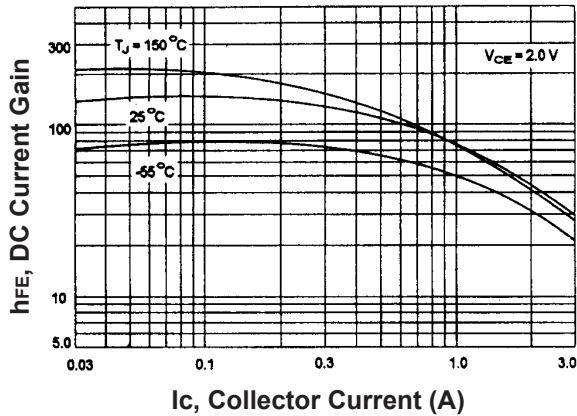


Switching Time Equivalent Circuit

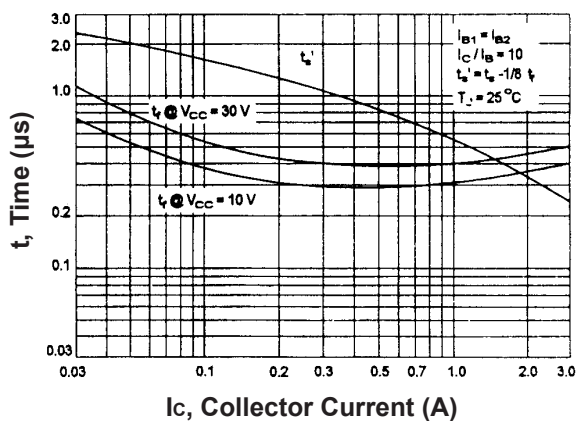


R_B and R_C Varied to Obtain Desired Current Levels

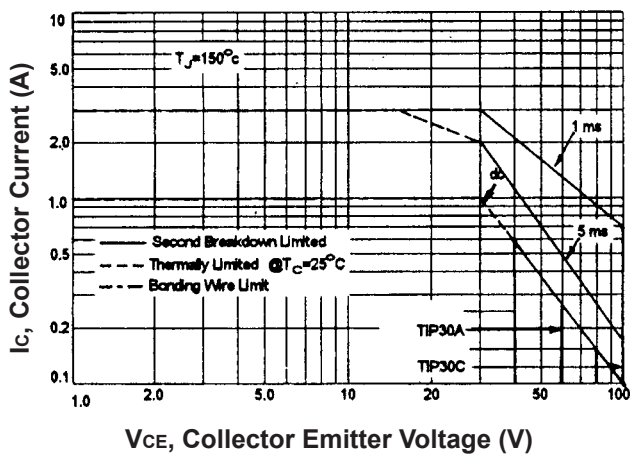
DC Current Gain



Turn-Off Time



Active Region Safe Operating Area

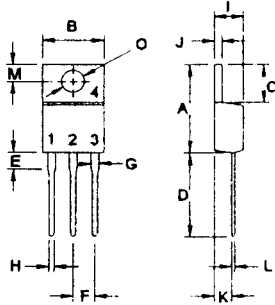


There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate $I_C - V_{CE}$ limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation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

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

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Diagram



Pin Configuration:

1. Base
2. Collector
3. Emitter
4. Collector (Case)

Dim.	Min.	Max.	Dim.	Min.	Max.
A	14.68	15.31	H	0.72	0.96
B	9.78	10.42	I	4.22	4.98
C	5.01	6.52	J	1.14	1.38
D	13.06	14.62	K	2.2	2.97
E	3.57	4.07	L	0.33	0.55
F	2.42	3.66	M	2.48	2.98
G	1.12	1.36	O	3.7	3.9

Dimensions : Millimetres

Part Number Table

Description	Part Number
Power Transistor, NPN, 60V, TO-220	TIP29A
Power Transistor, NPN, 100V, TO-220	TIP29C

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