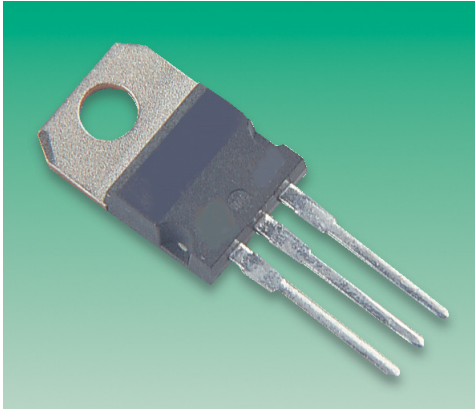


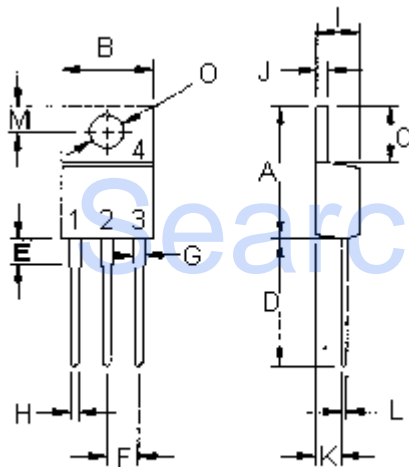
TIP29, 30

High Power Bipolar Transistor



Features:

- Collector-Emitter sustaining voltage-
 $V_{CE(sus)}$ = 60V (Minimum) - TIP29A, TIP30A
 = 100V (Minimum) - TIP29C, TIP30C.
- Collector-Emitter saturation voltage-
 $V_{CE(sat)}$ = 0.7V (Maximum) at $I_C = 1.0A$.
- Current gain-bandwidth product $f_T = 3.0MHz$ (Minimum) at $I_C = 200mA$.

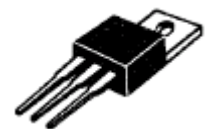


Dimensions	Minimum	Maximum
A	14.68	15.31
B	9.78	10.42
C	5.01	6.52
D	13.06	14.62
E	3.57	4.07
F	2.42	3.66
G	1.12	1.36
H	0.72	0.96
I	4.22	4.98
J	1.14	1.38
K	2.20	2.97
L	0.33	0.55
M	2.48	2.98
O	3.70	3.90

NPN
TIP29A
TIP29C

PNP
TIP30A
TIP30C

1.0 Ampere
 Complementary Silicon
 Power Transistors
 40 - 100 Volts
 30 Watts



TO-220

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

Dimensions : Millimetres



TIP29, 30

High Power Bipolar Transistor



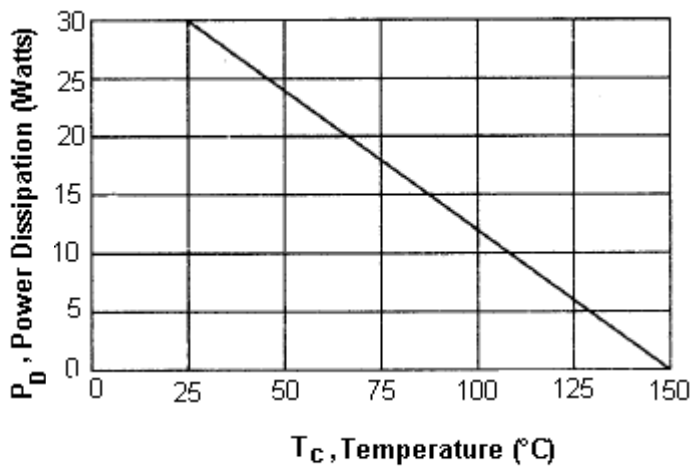
Maximum Ratings

Characteristic	Symbol	TIP29A TIP30A	TIP29C TIP30C	Unit
Collector-Emitter Voltage	V_{CEO}	60	100	V
Collector-Base Voltage	V_{CBO}			
Emitter-Base Voltage	V_{EBO}	5.0		
Collector Current-Continuous -Peak	I_C	1.0 3.0		A
Base Current	I_B	0.4		
Total Power Dissipation at $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	30 0.24		W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-65 to +150		$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Maximum	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	4.167	$^\circ\text{C}/\text{W}$

Figure - 1 Power Derating



TIP29, 30

High Power Bipolar Transistor



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

Characteristic	Symbol	Minimum	Maximum	Unit
OFF Characteristics				
Collector-Emitter Sustaining Voltage (1) ($I_C = 30\text{mA}$, $I_B = 0$) TIP29A, TIP30A TIP29C, TIP30C	$V_{CE(sus)}$	60 100	-	V
Collector Cut off Current ($V_{CE} = 30\text{V}$, $I_B = 0$) TIP29A, TIP30A ($V_{CE} = 60\text{V}$, $I_B = 0$) TIP29C, TIP30C	I_{CEO}	-	0.3	mA
Collector Cut off Current ($V_{CE} = 60\text{V}$, $V_{EB} = 0$) TIP29A, TIP30A ($V_{CE} = 100\text{V}$, $V_{EB} = 0$) TIP29C, TIP30C	I_{CES}	-	0.2	
Emitter Cut off Current ($V_{EB} = 5.0\text{V}$, $I_C = 0$)	I_{EBO}	-	1.0	

ON CHARACTERISTICS (1)

DC Current Gain ($I_C = 0.2\text{A}$, $V_{CE} = 4.0\text{V}$) ($I_C = 1.0\text{A}$, $V_{CE} = 4.0\text{V}$)	h_{FE}	40 15	- 75	-
Collector-Emitter Saturation Voltage ($I_C = 1.0\text{A}$, $I_B = 125\text{mA}$)	$V_{CE(sat)}$	-	0.7	V
Base-Emitter On Voltage ($I_C = 1.0\text{A}$, $V_{CE} = 4.0\text{V}$)	$V_{BE(on)}$	-	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	3.0	-	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 $\leq 2.0\%$.

(2) $f_T = |h_{FE}| \cdot f_{TEST}$.



TIP29, 30

High Power Bipolar Transistor



Figure - 2 Turn-On Time

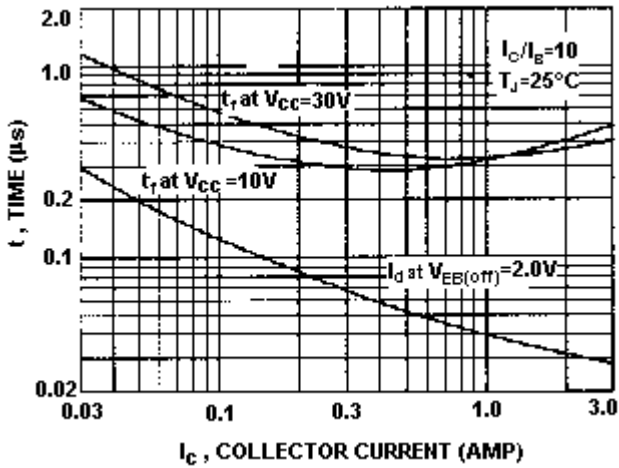


Figure - 3 Switching Time Equivalent Circuit

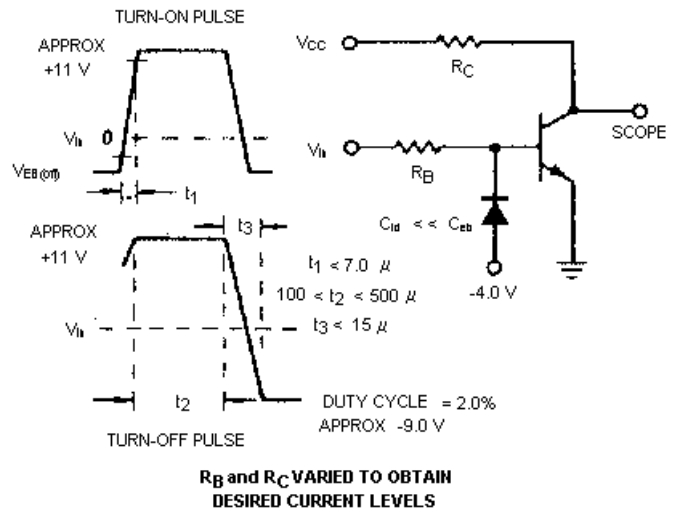


Figure - 4 DC Current Gain

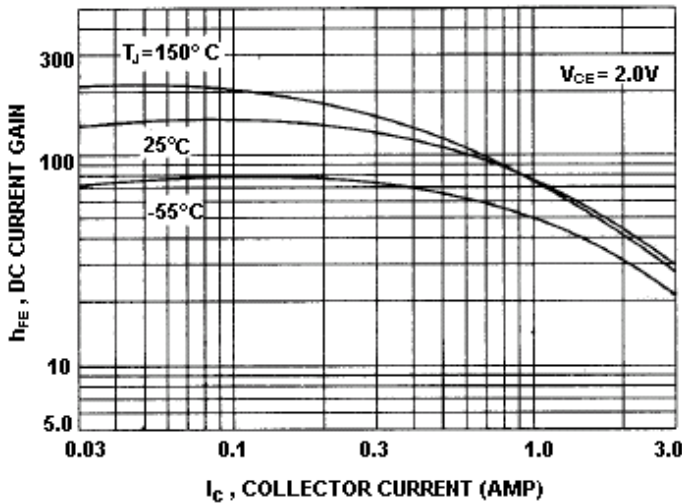


Figure - 5 Turn-Off Time

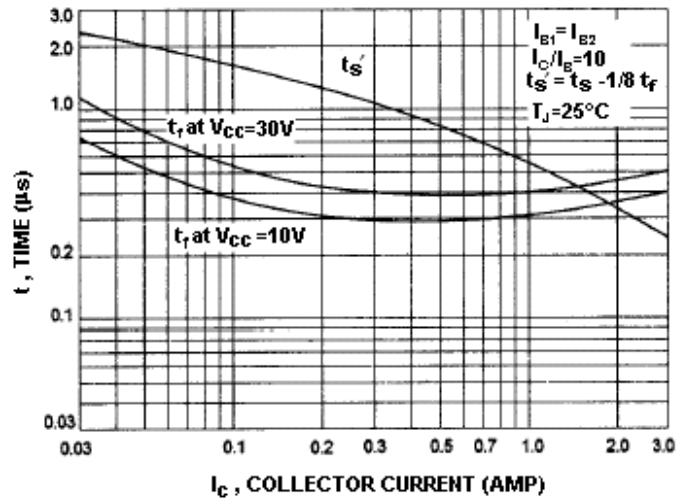
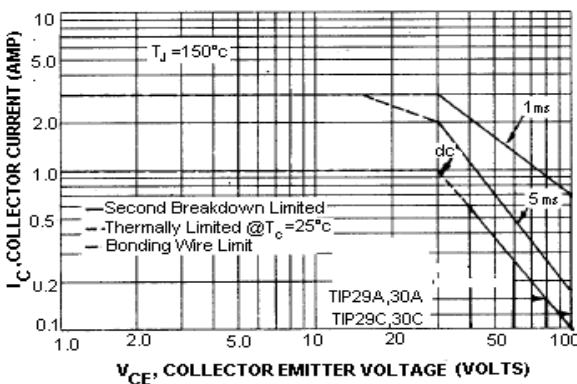


Figure - 6 Active Region Safe Operating Area



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 Figure - 6 curve is based on $T_{J(PK)} = 150^\circ C$; T_C is variable depending on power level. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(PK)} \leq 150^\circ C$. At high case temperatures, thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown.



TIP29, 30

High Power Bipolar Transistor



Specifications

TYPE	Part Number
NPN	TIP29A
	TIP29C
PNP	TIP30A
	TIP30C

TIP29, 30

High Power Bipolar Transistor



Notes:

International Sales Offices:



AUSTRALIA – Farnell InOne
Tel No: ++ 61 2 9645 8888
Fax No: ++ 61 2 9644 7898



FINLAND – Farnell InOne
Tel No: ++ 358 9 560 7780
Fax No: ++ 358 9 345 5411



NETHERLANDS – Farnell InOne
Tel No: ++ 31 30 241 7373
Fax No: ++ 31 30 241 7333



SWITZERLAND – Farnell InOne
Tel No: ++ 41 1 204 64 64
Fax No: ++ 41 1 204 64 54



AUSTRIA – Farnell InOne
Tel No: ++ 43 662 2180 680
Fax No: ++ 43 662 2180 670



FRANCE – Farnell InOne
Tel No: ++ 33 474 68 99 99
Fax No: ++ 33 474 68 99 90



NEW ZEALAND – Farnell InOne
Tel No: ++ 64 9 357 0646
Fax No: ++ 64 9 357 0656



UK – Farnell InOne
Tel No: ++ 44 8701 200 200
Fax No: ++ 44 8701 200 201



BELGIUM – Farnell InOne
Tel No: ++ 32 3 475 2810
Fax No: ++ 32 3 227 3648



GERMANY – Farnell InOne
Tel No: ++ 49 89 61 39 39 39
Fax No: ++ 49 89 613 59 01



NORWAY – Farnell InOne
Tel No: ++ 45 44 53 66 66
Fax No: ++ 45 44 53 66 02



UK – BuckHickman InOne
++ 44 8450 510 150
++ 44 8450 510 130



BRAZIL – Farnell-Newark InOne
Tel No: ++ 55 11 4066 9400
Fax No: ++ 55 11 4066 9410



HONG KONG – Farnell-Newark InOne
Tel No: ++ 852 2268 9888
Fax No: ++ 852 2268 9899



PORTUGAL – Farnell InOne
Tel No: ++ 34 93 475 8804
Fax No: ++ 34 93 474 5288



UK – CPC
++ 44 8701 202 530
++ 44 8701 202 531



CHINA – Farnell-Newark InOne
Tel No: ++86 10 6238 5152
Fax No: ++86 10 6238 5022



IRELAND – Farnell InOne
Tel No: ++ 353 1 830 9277
Fax No: ++ 353 1 830 9016



SINGAPORE – Farnell-Newark InOne
Tel No: ++ 65 6788 0200
Fax No: ++ 65 6788 0300



EXPORT – Farnell InOne
Tel No: ++ 44 8701 200 208
Fax No: ++ 44 8701 200 209

For enquiries from all other markets



DENMARK – Farnell InOne
Tel No: ++ 45 44 53 66 44
Fax No: ++ 45 44 53 66 06



ITALY – Farnell InOne
Tel No: ++ 39 02 93 995 200
Fax No: ++ 39 02 93 995 300



SPAIN – Farnell InOne
Tel No: ++ 34 93 475 8805
Fax No: ++ 34 93 474 5107



ESTONIA – Farnell InOne
Tel No: ++ 358 9 560 7780
Fax No: ++ 358 9 345 5411



MALAYSIA – Farnell-Newark InOne
Tel No: ++ 60 3 7873 8000
Fax No: ++ 60 3 7873 7000



SWEDEN – Farnell InOne
Tel No: ++ 46 8 730 50 00
Fax No: ++ 46 8 83 52 62

<http://www.farnellinone.com>

<http://www.buckhickmaninone.com>

<http://www.cpc.co.uk>

Disclaimer This data sheet and its contents (the "Information") belong to the Premier Farnell Group (the "Group") or are licensed to it. No licence is granted for the use of it other than for information purposes in connection with the products to which it relates. No licence of any intellectual property rights is granted. The Information is subject to change without notice and replaces all data sheets previously supplied. The Information supplied is believed to be accurate but the Group assumes no responsibility for its accuracy or completeness, any error in or omission from it or for any use made of it. Users of this data sheet should check for themselves the Information and the suitability of the products for their purpose and not make any assumptions based on information included or omitted. Liability for loss or damage resulting from any reliance on the Information or use of it (including liability resulting from negligence or where the Group was aware of the possibility of such loss or damage arising) is excluded. This will not operate to limit or restrict the Group's liability for death or personal injury resulting from its negligence. Multicomp is the registered trademark of the Group. © Premier Farnell plc 2004.

