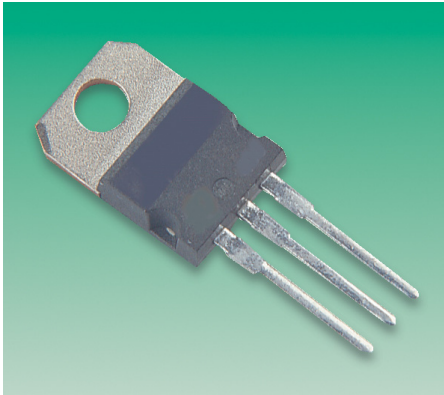


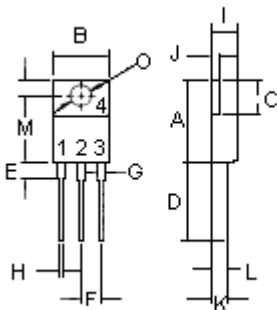
TIP120, 121, 122, 125, 126, 127

Darlington Transistors



Features:

- Designed for general-purpose amplifier and low speed switching applications.
- Collector-Emitter sustaining voltage- $V_{CEO(sus)}$ = 60V (Minimum) - TIP120, TIP125
80V (Minimum) - TIP121, TIP126
100V (Minimum) - TIP122, TIP127.
- Collector-Emitter saturation voltage- $V_{CE(sat)}$ = 2.0V (Maximum) at $I_C = 3.0A$.
- Monolithic construction with built-in-base-emitter shunt resistors.



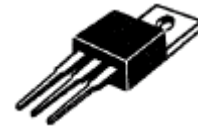
- Pin 1. Base
2. Collector
3. Emitter
4. Collector (Case)

	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

Dimensions : Millimetres

NPN	PNP
TIP120	TIP 125
TIP121	TIP 126
TIP122	TIP 127

5.0 Ampere
Darlington
Complementary Silicon
Power Transistors
60 - 100 Volts
65 Watts



TO-220

Maximum Ratings

Characteristic	Symbol	TIP120	TIP121	TIP122	Unit
		TIP125	TIP126	TIP127	
Collector-Emitter Voltage	V_{CEO}	60	80	100	V
Collector-Base Voltage	V_{CBO}				
Emitter-Base Voltage	V_{EBO}				
Collector Current -Continuous	I_C	5.0			A
-Peak	I_{CM}	8.0			
Base Current	I_B	120			mA
Total Power Dissipation at $T_C = 25^\circ C$	P_D	65			W
Derate above $25^\circ C$		0.52			
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-65 to +150			$^\circ C$

Thermal Characteristics

Characteristic	Symbol	Maximum	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.92	$^\circ C/W$

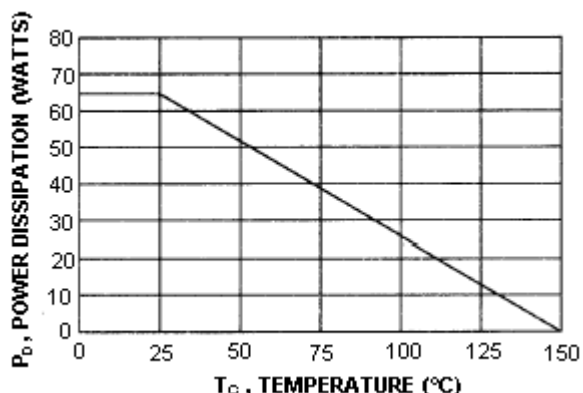


TIP120, 121, 122, 125, 126, 127

Darlington Transistors



FIGURE-1 POWER DERATING



Electrical Characteristics (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Minimum	Maximum	Unit	
OFF Characteristics					
Collector-Emitter Sustaining Voltage (1) (I _C = 30mA, I _B = 0)	TIP120, TIP125 TIP121, TIP126 TIP122, TIP127	V _{CEO(sus)}	60 80 100	- - -	V
Collector Cut off Current (V _{CE} = 30V, I _B = 0) (V _{CE} = 40V, I _B = 0) (V _{CE} = 50V, I _B = 0)	TIP120, TIP125 TIP121, TIP126 TIP122, TIP127	I _{CEO}	- - -	0.5 0.5 0.5	mA
Collector Cut off Current (V _{CB} = 60V, I _B = 0) (V _{CB} = 80V, I _B = 0) (V _{CB} = 100V, I _B = 0)	TIP120, TIP125 TIP121, TIP126 TIP122, TIP127	I _{CBO}	- - -	0.2 0.2 0.2	
Collector Cut off Current (V _{EB} = 5.0V, I _C = 0)		I _{EBO}	-	2.0	
ON Characteristics (1)					
DC Current Gain (I _C = 0.5A, V _{CE} = 3.0V) (I _C = 3.0A, V _{CE} = 3.0V)		h _{FE}	1000 1000	- -	-
Collector-Emitter Saturation Voltage (I _C = 3.0A, I _B = 12mA) (I _C = 5.0A, I _B = 20mA)		V _{CE(sat)}	- -	2.0 4.0	V
Base-Emitter On Voltage (I _C = 3.0A, V _{CE} = 3.0V)		V _{BE(on)}	-	2.5	
Dynamic Characteristics					
Small-Signal Current Gain (I _C = 3.0A, V _{CE} = 4.0V, f = 1.0MHz)		h _{fe}	4.0	-	-
Output Capacitance (V _{CB} = 10V, I _E = 0, f = 0.1MHz)	TIP120, TIP121, TIP122 TIP125, TIP126, TIP127	C _{ob}	-	300 250	pF

(1) Pulse Test : Pulse Width = 300μs, Duty Cycle ≤2.0%



TIP120, 121, 122, 125, 126, 127

Darlington Transistors

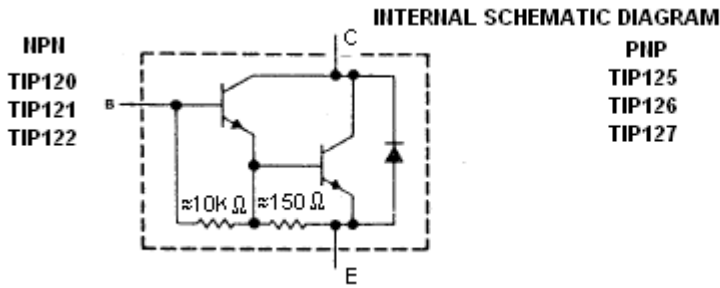


FIGURE - 2 SWITCHING TIME

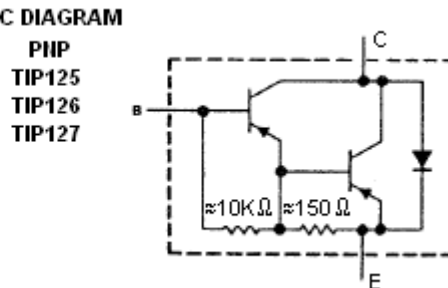


FIGURE - 3 SWITCHING TIME

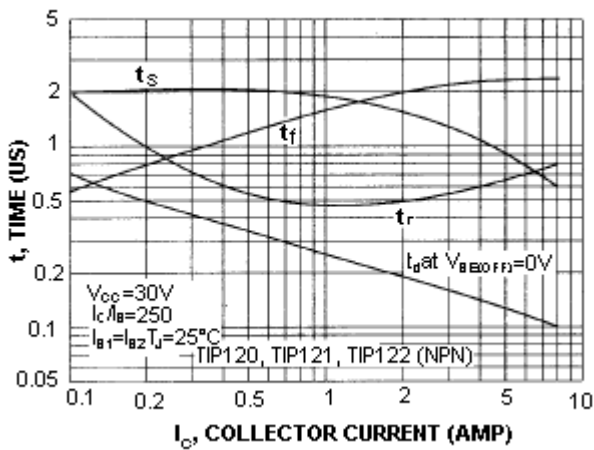


FIGURE - 4 SMALL SIGNAL CURRENT GAIN

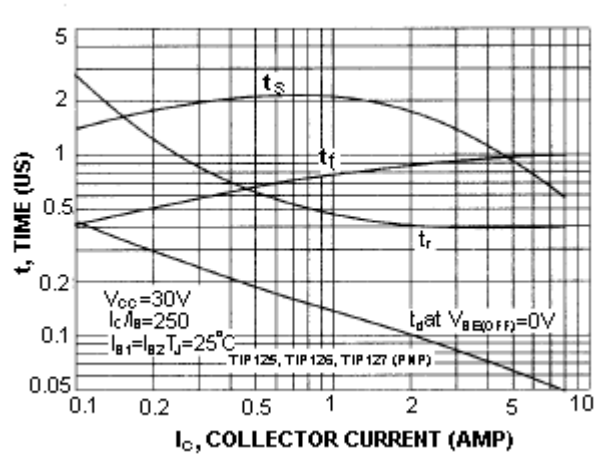
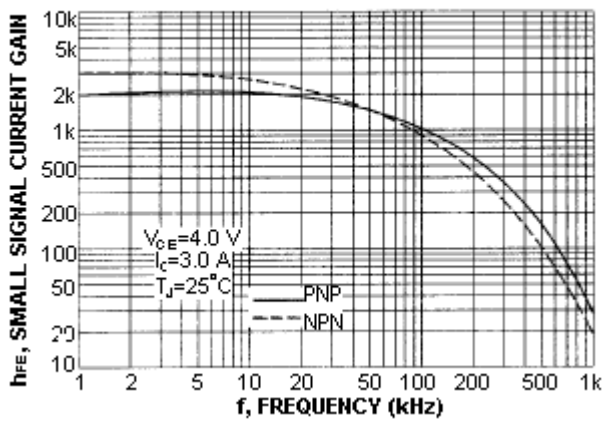
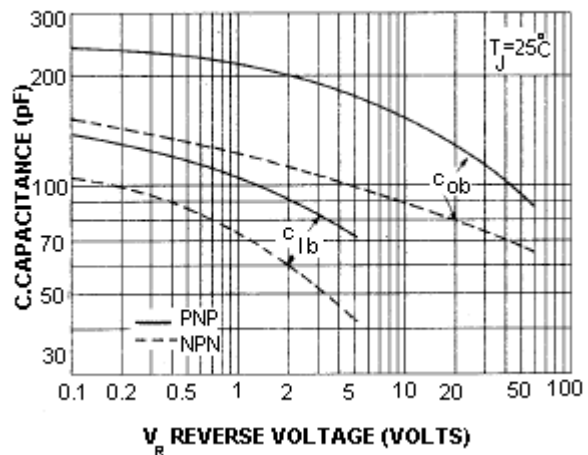


FIGURE - 5 CAPACITANCES

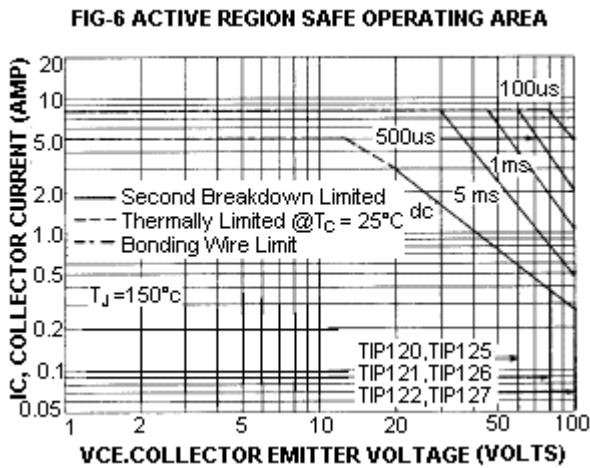


TIP120, 121, 122, 125, 126, 127

Darlington Transistors



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 not be subjected to greater dissipation than the curves indicate.

The data of Figure - 6 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 $T_{J(PK)} \leq 150^\circ\text{C}$. At high case temperatures, thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

FIGURE - 7 DC CURRENT GAIN

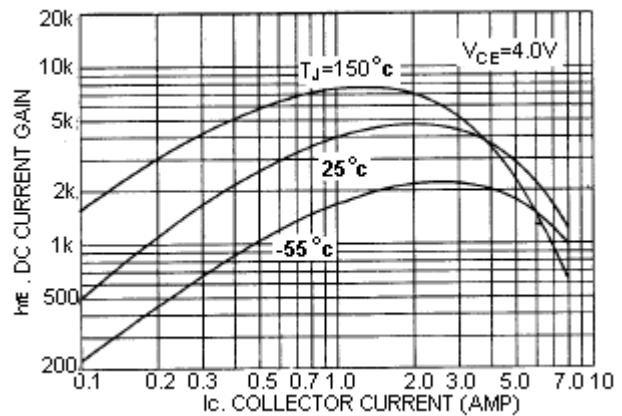
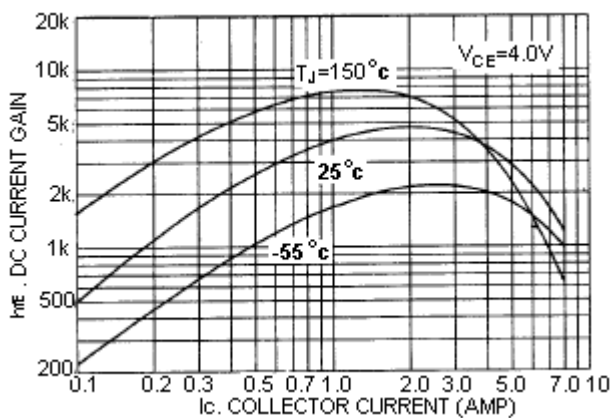
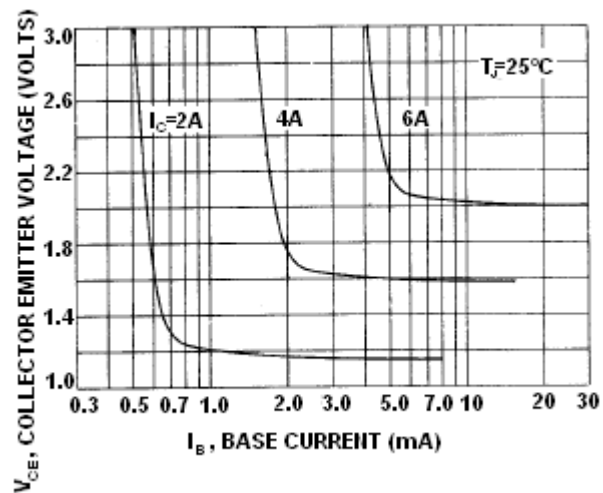
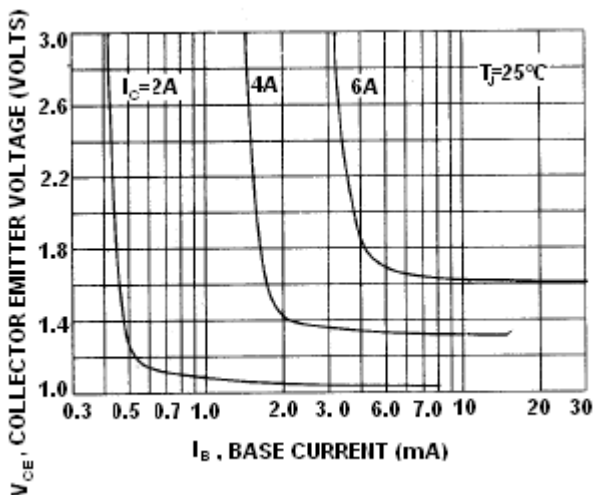


FIGURE - 8 COLLECTOR SATURATION REGION

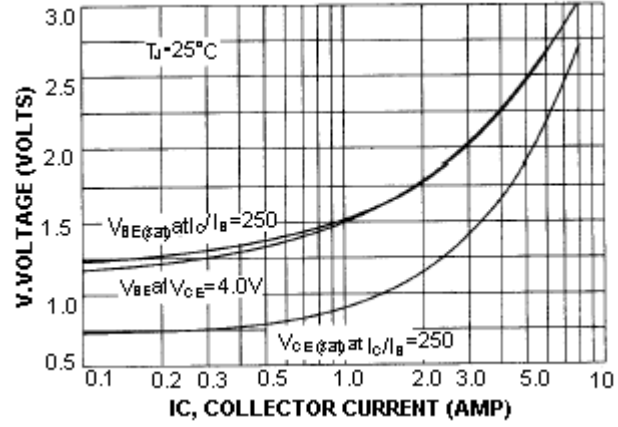
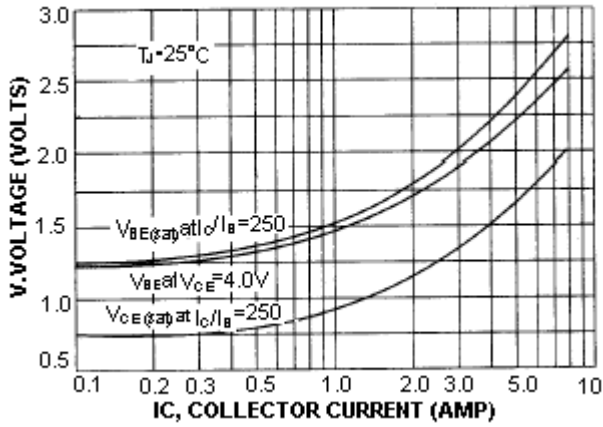


TIP120, 121, 122, 125, 126, 127

Darlington Transistors



FIGURE - 9 "ON" VOLTAGES



Specifications

I_C A	V_{CE0} (maximum) V	h_{FE} minimum at $I_C = 3\text{A}$	P_{tot} at 25°C W	Package	Part Number	
					NPN	PNP
5	60	1000	65	TO-220	TIP120	TIP125
	80				TIP121	TIP126
	100				TIP122	TIP127



TIP120, 121, 122, 125, 126, 127

Darlington Transistors



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.

