

T2N4401

Low Power Bipolar Transistors

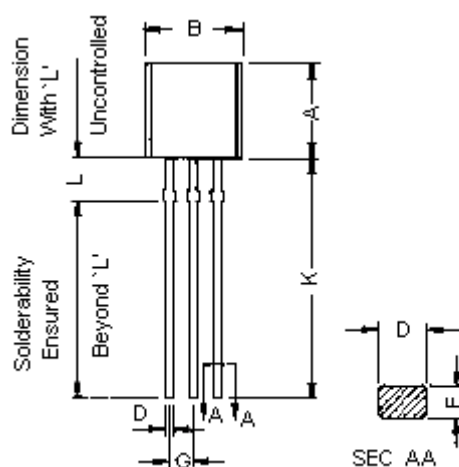


Features:

- NPN Silicon Planar Epitaxial Transistors.
- General purpose Switching Applications.

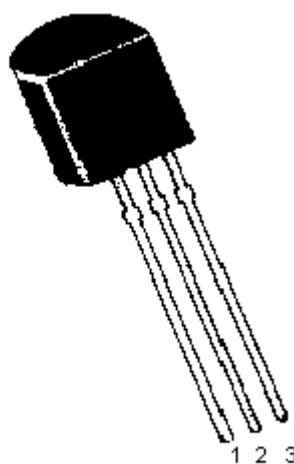
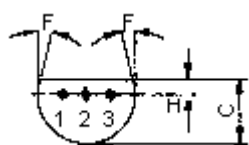


TO-92 Plastic Package



Dimensions	Minimum	Maximum
A	4.32	5.33
B	4.45	5.20
C	3.18	4.19
D	0.41	0.55
E	0.35	0.50
F	5°	
G	1.14	1.40
H		1.53
K	12.70	-
L	1.982	2.082

Dimensions : Millimetres



Pin Configuration

1 = Emitter

2 = Base

3 = Collector



T2N4401

Low Power Bipolar Transistors



Absolute Maximum Ratings

Rating	Symbol	T2N4401	Unit
Collector-Emitter Voltage	V_{CEO}	40	V
Collector-Base Voltage	V_{CBO}	60	
Emitter-Base Voltage	V_{EBO}	6	
Collector Current Continuous	I_C	600	mA
Power Dissipation at $T_a = 25^\circ\text{C}$ Derate above 25°C	P_D	625 5.0	mW mW/ $^\circ\text{C}$
Power Dissipation at $T_C = 25^\circ\text{C}$ Derate above 25°C		1.5 12	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_j, T_{stg}	-55 to +150	$^\circ\text{C}$
Thermal Resistance			
Junction to Case	$R_{th(j-c)}$	83.3	$^\circ\text{C/W}$
Junction to Ambient	$R_{th(j-a)}$	200	

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

Characteristic	Symbol	T2N4401	Unit
Collector Emitter Voltage $I_C = 1\text{mA}, I_B = 0$	BV_{CEO}^*	>40	V
Collector Base Voltage $I_C = 100\mu\text{A}, I_E = 0$	BV_{CBO}	>60	
Emitter Base Voltage $I_E = 100\mu\text{A}, I_C = 0$	BV_{EBO}	>6	
Base Cut off Current $V_{CE} = 35\text{V}, V_{EB} = 0.4\text{V}$	I_{BEV}	<0.1	μA
Collector Cut off Current $V_{CE} = 35\text{V}, V_{EB} = 0.4\text{V}$	I_{CEX}		
Collector Emitter Saturation Voltage $I_C = 150\text{mA}, I_B = 15\text{mA}$ $I_C = 500\text{mA}, I_B = 50\text{mA}$	$V_{CE(Sat)}^*$	<0.4 <0.75	V
Base Emitter Saturation Voltage $I_C = 150\text{mA}, I_B = 15\text{mA}$ $I_C = 500\text{mA}, I_B = 50\text{mA}$	$V_{BE(Sat)}^*$	0.75 - 0.95 <1.2	

*Pulse Test : Pulse Width: $\leq 300\mu\text{s}$, Duty $\leq 2.0\%$

T2N4401

Low Power Bipolar Transistors



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

Characteristic	Symbol	T2N4401	Unit
DC Current Gain I _C = 0.1mA, V _{CE} = 1V I _C = 1mA, V _{CE} = 1V I _C = 10mA, V _{CE} = 1V I _C = 150mA, V _{CE} = 1V* I _C = 500mA, V _{CE} = 2V*	h _{FE}	>20 >40 >80 100 - 300 >40	-
Dynamic Characteristics			
Small Signal Current Gain I _C = 1mA, V _{CE} = 10V, f = 1KHz	h _{fe}	40 - 500	-
Input Impedance I _C = 1mA, V _{CE} = 10V, f = 1KHz	h _{ie}	1.0 - 15	kΩ
Characteristic	Symbol	2N4401	Unit
Voltage Feedback Ratio I _C = 1mA, V _{CE} = 10V, f = 1KHz	h _{re}	0.1 - 8.0	x10 ⁻⁴
Output Impedance I _C = 1mA, V _{CE} = 10V, f = 1KHz	h _{oe}	1.0 - 30	μΩ
Collector-Base Capacitance V _{CB} = 5V, I _E = 0, f = 100KHz V _{CB} = 10V, I _E = 0, f = 140KHz	C _{cb}	<6.5 -	pF
Emitter-Base Capacitance V _{EB} = 0.5V, I _C = 0, f = 100kHz	C _{eb}	<30	
Transition Frequency I _C = 20mA, V _{CE} = 10V, f = 100MHz	f _T	>250	MHz
Switching Characteristics			
V _{CC} = 30V, V _{EB} = 2V I _C = 150mA, I _{B1} = 15mA			
Delay Time	t _d	<15	ns
Rise Time	t _r	<20	
V _{CC} = 30V, I _C = 150mA I _{B1} = I _{B2} = 15mA			
Storage time	t _s	<225	ns
Fall Time	t _f	<30	

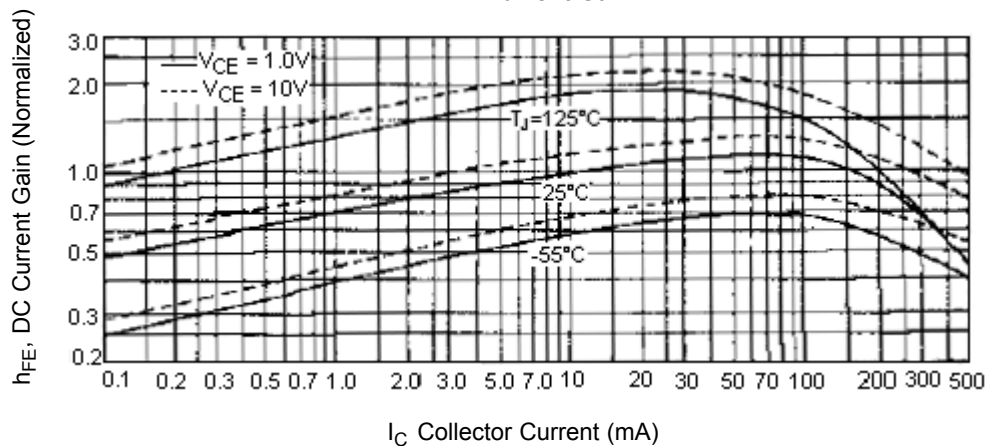
*Pulse Test : Pulse Width: $\leq 300\mu\text{s}$, Duty $\leq 2.0\%$

T2N4401

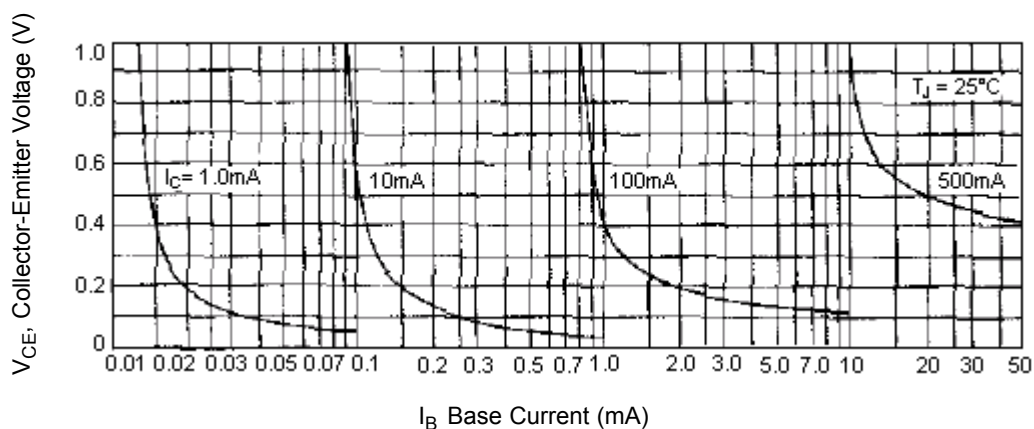
Low Power Bipolar Transistors



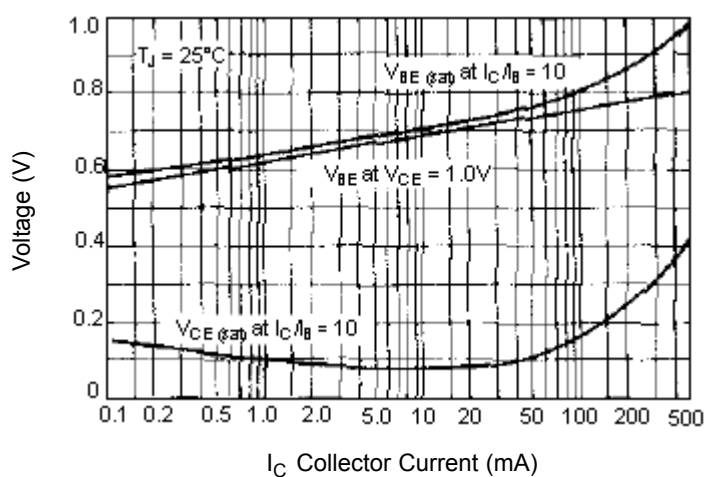
DC Current Gain



DC Current Gain



On Voltages

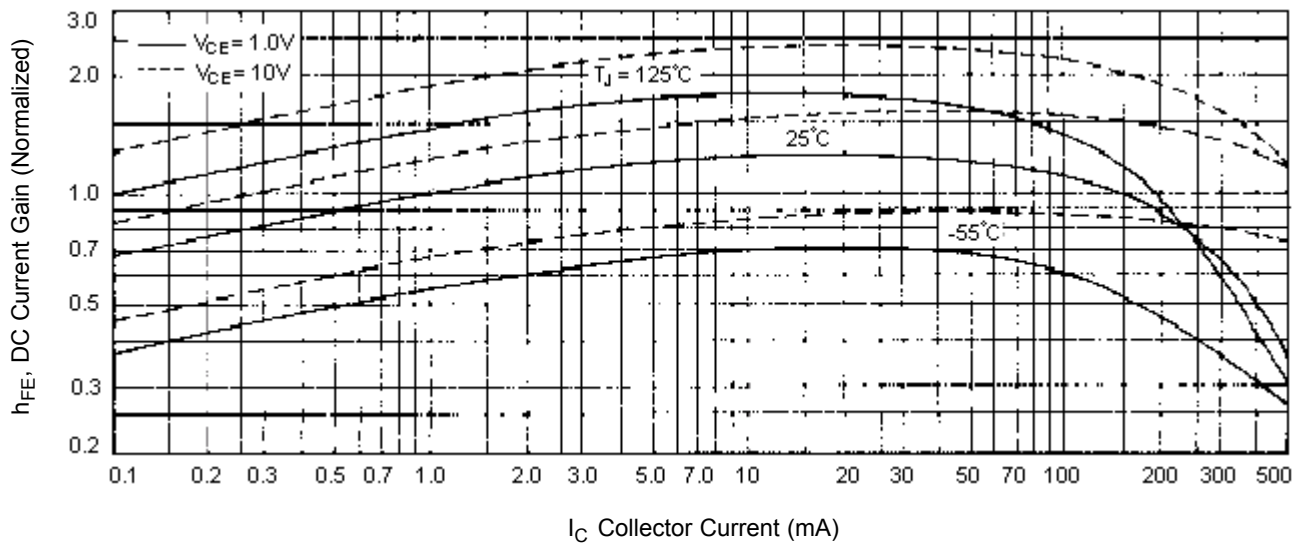


T2N4401

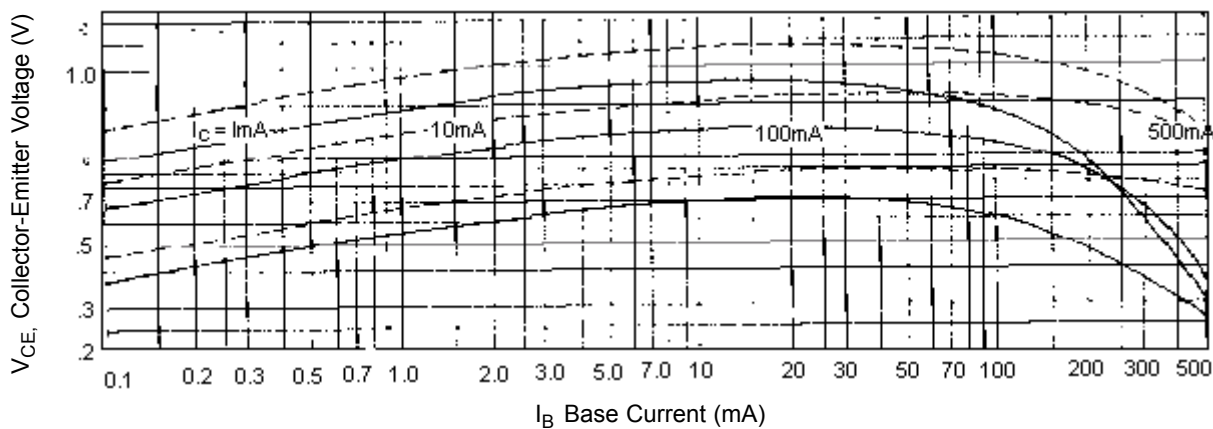
Low Power Bipolar Transistors



DC Current Gain



Collector Saturation Region

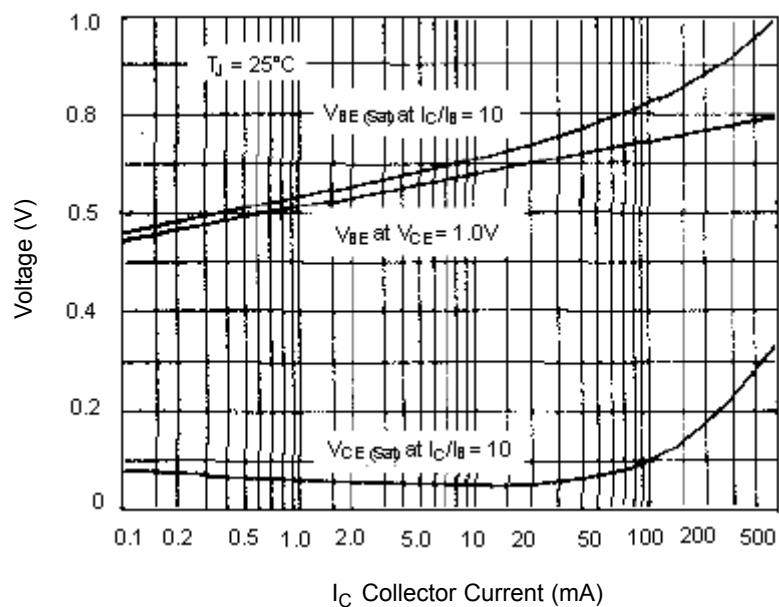


T2N4401

Low Power Bipolar Transistors



On Voltages



Part Number Table

Package	Part Number
TO-92	2N4401

T2N4401

Low Power Bipolar 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.

