

# **www.mbsm.pro , Practical Electronics for Inventors, Fourth Edition**

written by mahdi miled | 23 November 2017

**Practical Electronics for Inventors, Fourth Edition**

by: Paul Scherz, Dr. Simon Monk

**Abstract:** A fully updated, no-nonsense guide to electronics. Advance your electronics knowledge and gain the skills necessary to develop and construct your own functioning gadgets. Written by a pair of experienced engineers and dedicated hobbyists, *Practical Electronics for Inventors, Fourth Edition*, lays out the essentials and provides step-by-step instructions, schematics, and illustrations. Discover how to select the right components, design and build circuits, use microcontrollers and ICs, work with the latest software tools, and test and tweak your creations. This easy-to-follow book features new instruction on programmable logic, semiconductors, operational amplifiers, voltage regulators, power supplies, digital electronics, and more. Coverage includes:

- Resistors, capacitors, inductors, and transformers
- Diodes, transistors, and integrated circuits
- Optoelectronics, solar cells, and phototransistors
- Sensors, GPS modules, and touch screens
- Op amps, regulators, and power supplies
- Digital electronics, LCDs, and logic gates
- Microcontrollers and prototyping platforms
- Combinational and sequential programmable logic
- DC motors, RC servos, and stepper motors
- Microphones, audio amps, and speakers
- Modular electronics and prototypes

**Book Details**

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Authors:

Paul Scherz is a Systems Operation Manager who received his B.S. in physics from the University of Wisconsin. He is an inventor/hobbyist in electronics, an area he grew to appreciate through his experience at the University's Department of Nuclear Engineering and Engineering Physics and Department of Plasma Physics.

Dr. Simon Monk has a bachelor's degree in cybernetics and computer science and a Ph.D. in software engineering. He spent several years as an academic before he returned to industry, co-founding the mobile software company Momote Ltd. He has been an active electronics hobbyist since his early teens and is a full-time writer on hobby electronics and open-source hardware. Dr. Monk is author of numerous electronics books, including Programming Arduino, Hacking Electronics, and Programming the Raspberry Pi.

Description: A fully updated, no-nonsense guide to electronics. Advance your electronics knowledge and gain the skills necessary to develop and construct your own functioning gadgets. Written by a pair of experienced engineers and dedicated hobbyists, Practical Electronics for Inventors, Fourth Edition, lays out the essentials and provides step-by-step instructions, schematics, and illustrations. Discover how to select the right components, design and build circuits, use microcontrollers and ICs, work with the latest software tools, and test and tweak your creations. This easy-to-follow book

features new instruction on programmable logic, semiconductors, operational amplifiers, voltage regulators, power supplies, digital electronics, and more. Coverage includes:

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1. <https://www.amazon.com/Practical-Electronics-Inventors-Fourth-Scherz/dp/1259587541> [back]

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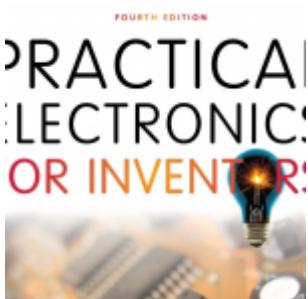
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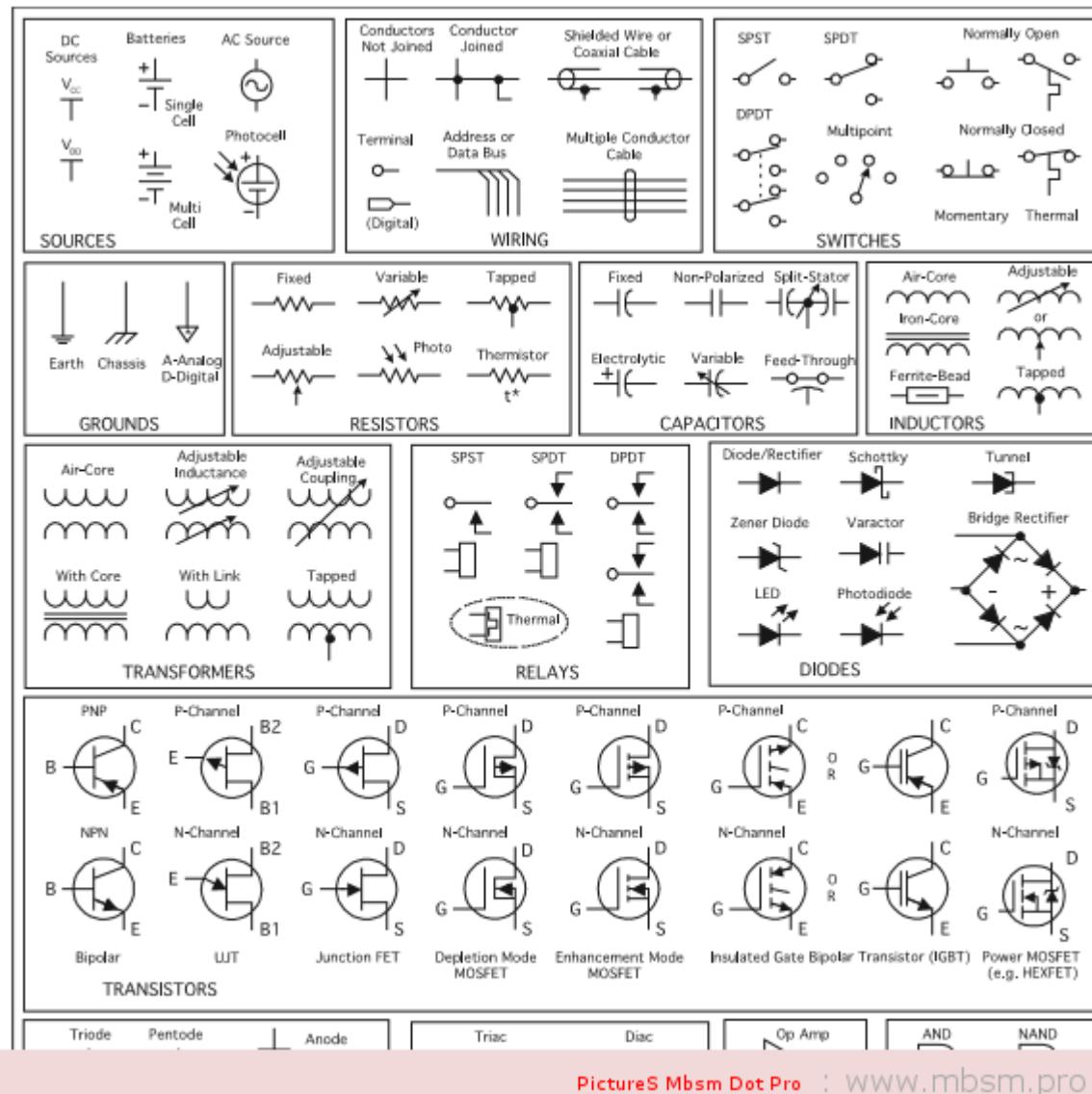


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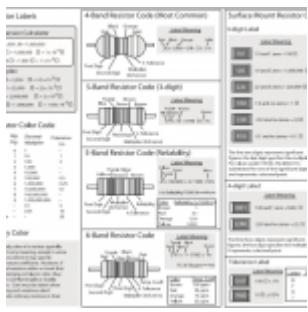
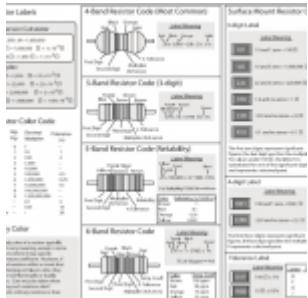


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Resistor Labels																																																										
<b>Conversion Calculator</b> $k = 1,000; M = 1,000,000$ $1M\Omega = 1,000,000 \Omega = 1 \times 10^6 \Omega$ $1k\Omega = 1,000 \Omega = 1 \times 10^3 \Omega$																																																										
<b>Examples:</b> $3.3 k\Omega = 3,300 \Omega = 3.3 \times 10^3 \Omega$ $22 k\Omega = 22,000 \Omega = 22 \times 10^3 \Omega$ $2 M\Omega = 2,000,000 \Omega = 2 \times 10^6 \Omega$ $1.68 M\Omega = 1,680,000 \Omega = 1.68 \times 10^6 \Omega$																																																										
<b>Resistor Color Code</b> <table border="1"> <thead> <tr> <th>Color</th> <th>Sig. Fig.</th> <th>Decimal Multiplier</th> <th>Tolerance (%)</th> </tr> </thead> <tbody> <tr><td>Black</td><td>0</td><td>1</td><td>-</td></tr> <tr><td>Brown</td><td>1</td><td>10</td><td>1</td></tr> <tr><td>Red</td><td>2</td><td>100</td><td>2</td></tr> <tr><td>Orange</td><td>3</td><td>1,000</td><td>-</td></tr> <tr><td>Yellow</td><td>4</td><td>10,000</td><td>-</td></tr> <tr><td>Green</td><td>5</td><td>100,000</td><td>0.5</td></tr> <tr><td>Blue</td><td>6</td><td>1,000,000</td><td>0.25</td></tr> <tr><td>Purple</td><td>7</td><td>10,000,000</td><td>0.1</td></tr> <tr><td>Gray</td><td>8</td><td>100,000,000</td><td>-</td></tr> <tr><td>White</td><td>9</td><td>1,000,000,000</td><td>-</td></tr> <tr><td>Gold</td><td>-</td><td>0.1</td><td>5</td></tr> <tr><td>Silver</td><td>-</td><td>0.01</td><td>10</td></tr> <tr><td>No Color</td><td>-</td><td>-</td><td>20</td></tr> </tbody> </table>			Color	Sig. Fig.	Decimal Multiplier	Tolerance (%)	Black	0	1	-	Brown	1	10	1	Red	2	100	2	Orange	3	1,000	-	Yellow	4	10,000	-	Green	5	100,000	0.5	Blue	6	1,000,000	0.25	Purple	7	10,000,000	0.1	Gray	8	100,000,000	-	White	9	1,000,000,000	-	Gold	-	0.1	5	Silver	-	0.01	10	No Color	-	-	20
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<b>Body Color</b> <p>The body color of a resistor typically doesn't carry meaning, except in some instances where it may specify temperature coefficient. However, if you find resistors within a circuit that are white/gray or blue in color, they may be non-flammable or fusible resistors. Care must be taken when installing such resistors.</p>																																																										
<b>4-Band Resistor Code (Most Common)</b> <p><b>Label Meaning</b></p> $Red \ Black \ Orange \ Gold$ $20 \times 1,000 = 20k \ \Omega \pm 5\%$																																																										
<b>5-Band Resistor Code (3-digit)</b> <p><b>Label Meaning</b></p> $Purple \ Blue \ Green \ Brown \ Brown$ $675 \times 10 = 6750 \ \Omega \pm 1\%$																																																										
<b>5-Band Resistor Code (Reliability)</b> <p><b>Label Meaning</b></p> $Purple \ Yellow \ Silver \ Green \ Brown$ $47 \times 100,000 = 4.7 \text{ MO} \pm 10\%$ <p><b>Color Reliability (%/1000 Hr)</b></p> <table border="1"> <tr><td>Brown</td><td>1</td></tr> <tr><td>Red</td><td>0.1</td></tr> <tr><td>Orange</td><td>0.01</td></tr> <tr><td>Yellow</td><td>0.001</td></tr> </table> <p>1% Reliability/1000 Hr — Brown</p>			Brown	1	Red	0.1	Orange	0.01	Yellow	0.001																																																
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<b>6-Band Resistor Code</b> <p><b>Label Meaning</b></p> $Purple \ Red \ Blue \ Black \ Red \ Brown$ $276 \times 1 = 276\Omega \pm 1\%$ <p>TC of 50 ppm — Red</p> <p><b>Color Temp. Coeff.</b></p> <table border="1"> <tr><td>Brown</td><td>100 ppm</td></tr> <tr><td>Red</td><td>50 ppm</td></tr> </table>			Brown	100 ppm	Red	50 ppm																																																				
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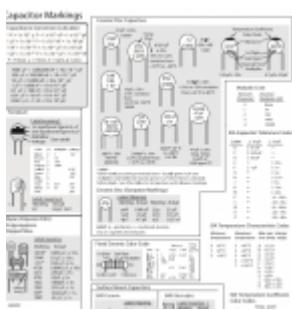
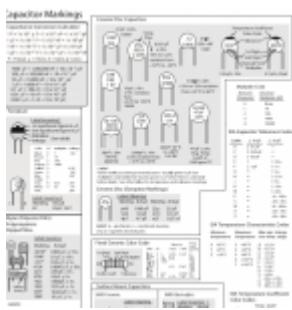
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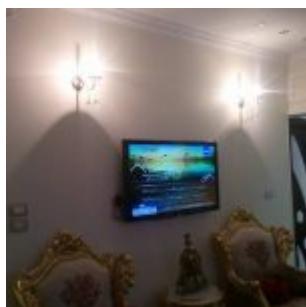
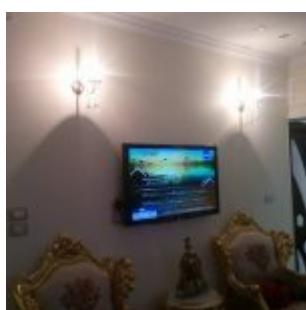
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mbsm-dot-pro-electricitee-S.jpg (52 KB)



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mbsm-dot-pro-electricitee-Y.jpg (82 KB)



mbsm-dot-pro-electricitee-V.jpg (33 KB)



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# **www.mbsm.pro , branchement de detecteur de mouvement infrarouge exterieur**

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www.mbsm.pro , branchement de detecteur de mouvement infrarouge exterieur

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PictureS Mbsm Dot Pro : [www.mbsm.pro](http://www.mbsm.pro)

mbsm\_dot\_pro\_detecteur2.jpg (49 KB)



mbsm\_dot\_pro\_detecteur.png (26 KB)

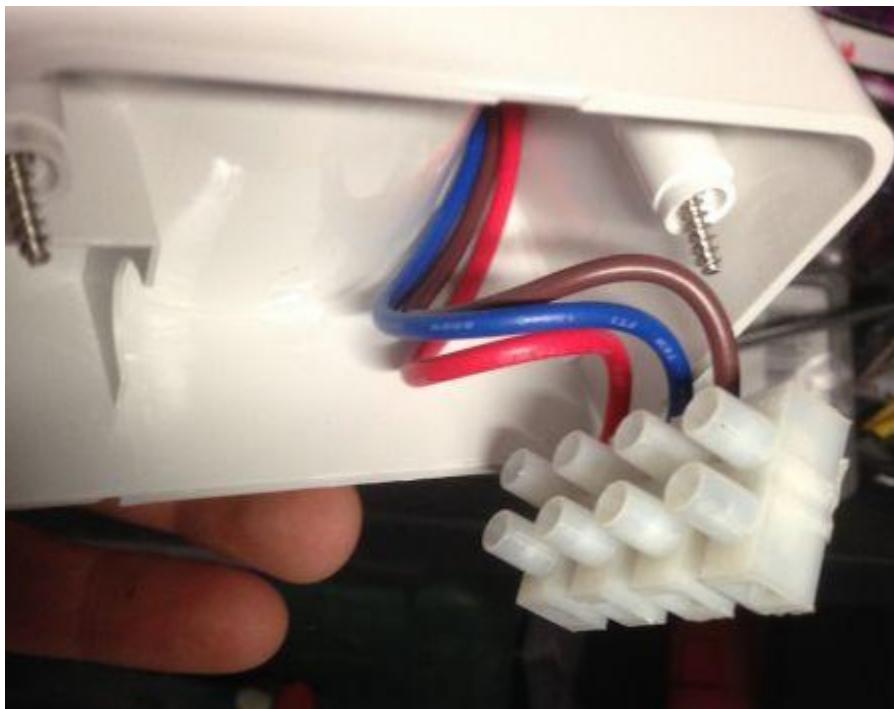


mbsm\_dot\_pro\_detecteur.png (26 KB)



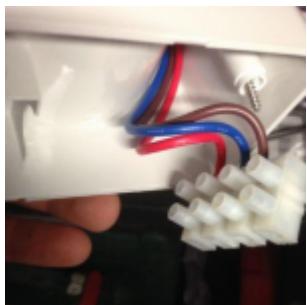


mbsm\_dot\_pro\_detecteur1.png (167 KB)



PictureS Mbsm Dot Pro : [www.mbsm.pro](http://www.mbsm.pro)

mbsm\_dot\_pro\_detecteur1.png (156 KB)



# قصيدة بمناسبة اليوم العالمي للمرأة للشاعر التونسي منير بن صالح ميلاد

written by mahdi miled | 23 November 2017

International\_Women's\_Day\_mbsm\_dot\_pro.jpg (203 KB)



Picture5 Mbsm Dot Pro : www.mbsm.pro

International\_Women's\_Day\_mbsm\_dot\_pro.jpg (189 KB)





International\_Women's\_Day\_mbsm\_dot\_pro2.png (34 KB)

أعترف ياقلبي أنك تحب كل النساء  
أعترف أنك لست من الحمقى ولا من الجبناء  
ولست طاغوت دين يجالس السفهاء  
أنت ياقلبي تعشق جنس الطيبة والوفاء  
وتاجا من النور على رؤوس النبلاء  
نساء صنعن بأيديهن التاريخ ولبنين النداء  
ورفعن راية المجد عالية في غياهب السماء  
**سأعيش رغم الداء والأعداء كالنسر فوق القيمة الشماء**  
**أرנו إلى الشمس المضيئة .. هاربا بالسحب، والأمطار، والأنواء**  
أعترف ياقلبي أنك تحب إهتزاز الثورة  
على صدور الشرفاء  
ووأن أمي هي مناضلة بل هي أجمل النساء...

PictureS Mbsm Dot Pro : [www.mbsm.pro](http://www.mbsm.pro)

International\_Women's\_Day\_mbsm\_dot\_pro2.png (33 KB)

، ياقلبي أنك تحب كل النساء  
، أنك لست من الحمقى ولا من الجبناء  
، طاغوت دين يجالس السفهاء  
ياقلبي تعشق جنس الطيبة والوفاء  
من النور على رؤوس النبلاء  
صنعن بأيديهن التاريخ ولبنين النداء  
، راية المجد عالية في غياهب السماء  
، رغم الداء والأعداء كالنسر فوق القيمة الشماء  
لي الشمس المضيئة .. هاربا بالسحب، والأمطار، والأنواء  
، ياقلبي أنك تحب إهتزاز الثورة  
سور الشرفاء  
أني هي مناضلة بل هي أجمل النساء...  
الشاعر التونسي مهدي بن صالح بن علي

وأيضاً أنت تحب كل النساء  
ذلك لست من الحق ولأن الجنينا  
نط طاغوت دين ي pals السفهانا  
ويقى تشقق جلس العطيبة والوفاة  
من دور العزل يرويون التلاوة  
صعنان يذبحين التاريخ وبين الندا  
ن رأية العهد عالية في شرائب النساء  
من رأس الماء والأقدار تلمس فوق القمة. **الختام**  
في النساء العطيبة... هزاز في الشغف، والأمتعة، والكتوا  
وأيضاً أنت تحب إلهزاز المرة  
سدر الشرفاء  
أني هي معاشرة على هي أحفل النساء.  
**الباحث التونسي متبر بن حمادج ميلاد**

[International\\_Women's\\_Day\\_mbsm\\_dot\\_pro.jpg1.jpg \(185 KB\)](#)



International Women's Day mbsm dot pro.ipq1.ipq (44 KB)





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# **www.mbsm.pro , Schema de branchement interphone acet ,interphone acet nuance audio 67620x – 67622x**

written by mahdi miled | 23 November 2017

[www.mbsm.pro](http://www.mbsm.pro) , Schema de branchement interphone acet  
,interphone acet nuance audio 67620x – 67622x

mbsmdotpro-interphonel.jpg (67 KB)



PictureS Mbsm Dot Pro : www.mbsm.pro

mbsmdotpro-interphone1.jpg (39 KB)



mbsmdotpro-interphone2.jpg (66 KB)



mbsmdotpro-interphone2.jpg (39 KB)



mbsmdotpro-interphone3.jpg (86 KB)



mbsmdotpro-interphone3.jpg (50 KB)





mbsmdotpro-interphone4.jpg (134 KB)



mbsmdotpro-interphone4.jpg (98 KB)



mbsmdotpro-interphone5.jpg (1 MB)



mbsmdotpro-interphone5.jpg (1 MB)



mbsmdotpro-interphone6.jpg (1 MB)



mbsmdotpro-interphone6.jpg (1 MB)



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**www.mbsm.pro , Contrôleur de température numérique /**

# **thermoélectrique / pour système frigorifique ou couveuse , STC-200+ , STC-1000+**

written by mahdi miled | 23 November 2017

Le contrôleur de température de STC-200+ est conçu avec l'arrangement séparé de menu d'utilisateur et de menu d'administrateur. Les options incluses dans cette unité sont alarmantes, chauffage, et modules de frigorigénération. Ce contrôleur de la température est applicable à tous les types d'entreposage au froid qui exige la température accrue. Il est également approprié au réfrigérateur de l'eau et à la machine de fruits de mer.

mbsmdotpro-regulateur (0).jpg (15 KB)



mbsmdotpro-regulateur (0).jpg (16 KB)



mbsmdotpro-regulateur (1).png (527 KB)



mbsmdotpro-regulateur (1).png (480 KB)



mbsmdotpro-regulateur (2).jpg (58 KB)



mbsmdotpro-regulateur (2).jpg (36 KB)



mbsmdotpro-regulateur (3).jpg (32 KB)



mbsmdotpro-regulateur (3).jpg (22 KB)



mbsmdotpro-regulateur (4).jpg (15 KB)



mbsmdotpro-regulateur (4).jpg (15 KB)



mbsmdotpro-regulateur (5).jpg (124 KB)



mbsmdotpro-regulateur (5).jpg (126 KB)



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# **www.mbsm.pro , Crazy Funny Pictures**

written by mahdi miled | 23 November 2017  
The Best Funny Pictures website on the internet

Mbsm-pro-funny (2).jpg (49 KB)



Pictures Mbsm Dot Pro : [www.mbsm.pro](http://www.mbsm.pro)

Mbsm-pro-funny (2).jpg (50 KB)





Mbsm-pro-funny (1).jpg (36 KB)



Mbsm-pro-funny (1).jpg (36 KB)



Mbsm-pro-funny (3).jpg (64 KB)



Mbsm-pro-funny (3).jpg (41 KB)



Mbsm-pro-funny (4).jpg (56 KB)



Mbsm-pro-funny (4).jpg (56 KB)



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# [www.mbsm.pro](http://www.mbsm.pro) , S2000 Silicon NPN Transistor , Bipolar transistors data tables

written by Lilianne | 23 November 2017



[www.mbsm.pro](http://www.mbsm.pro)

S2000			Advanced Information for: S2000	
Silicon NPN Transistor			OEM	Toshiba Tokyo Shibaura Electric Co. Ltd. Japan
Ucb:	1500V		pkg details:	-
Ic:	8A		datasheet (jpg):	-
$\beta$ ( $I_c/I_b$ ):	-		datasheet (pdf):	-
N:	125W		OEM datasheet:	-
F:	-		complementary:	<a href="#">complementary search</a>
Tmax:	-		similar types:	<a href="#">similar search</a>
the S2000 is a silicon NPN transistor, Ucb = 1500V, Ic = 8A, applications: TV horizontal deflection, color TV, switch mode power supply		the S2000 <a href="#">similar</a> search accesses the database for types with the same values.		
Source:	Jaeger electronic catalog 1999	<small>Picture5 Mbsm Dot Pro : <a href="http://www.mbsm.pro">www.mbsm.pro</a></small>		

the S2000 is a silicon NPN transistor, Ucb = 1500V, Ic = 8A, applications: TV horizontal deflection, color TV, switch mode power supply

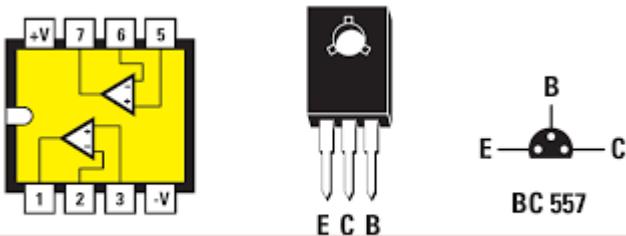
Toshiba Tokyo Shibaura Electric Co. Ltd. Japan

Ucb: 1500V  
Ic: 8A  
 $\beta$  (Ic/Ib): -  
N: 125W  
F: -  
Tmax: -

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# Mbsm.pro , principe de fonctionnement d'un transistor

written by Lilianne | 23 November 2017  
images.png (4 KB)



PictureS Mbsm Dot Pro : [www.mbsm.pro](http://www.mbsm.pro)

images.png (10 KB)



Description du transistor

Le transistor est un composant d'où sortent 3 fils électriques. Ils sont dénommés B (base), C (collecteur), et

E (émetteur).

Voici un dessin du transistor BC 547, agrandi quatre fois :



Un tel transistor coûte de l'ordre de 10 FB dans les magasins de composants électronique.

Voici la représentation classique du transistor dans les schémas électroniques :



Le principe de fonctionnement

- Si on branche une source de tension entre les bornes C et E, le transistor ne laisse pas passer de courant (fig. 1).
- Par contre, entre B et E il y a un court-circuit. Si on veut faire passer un courant précis entre B et E, il faut utiliser une source de tension et une résistance (fig. 2).
- **Si** on envoie un courant de  $I_B$  ampères entre B et E, **alors** le transistor acceptera de laisser passer un courant de  $I_C = \beta \cdot I_B$  ampères entre C et E (fig. 3). Dans ce cas ci,  $\beta$  vaut de l'ordre de 100.



Les schémas électroniques correspondants aux dessins des figures 1, 2 et 3 sont représentés par les figures 4, 5 et 6 :



Note : Pour ceux qui voudraient essayer ces branchements : une seule pile de 9 Volts peut jouer le rôle des deux piles (fig. 7 et 8) :



Faites attention à la polarité : mettez bien le pôle positif et le pôle négatif de la pile au bon endroit. Le sens du courant est important pour un transistor.

Le BC 547 est un transistor un peu faible pour allumer une lampe. Vous aurez peut-être intérêt à utiliser un transistor plus puissant, comme par exemple le BD 649. En voici un dessin, agrandi deux fois :



Au début, en faisant des erreurs de branchement ou en faisant dissiper une énergie trop importante au transistor, vous risquez fort d'en brûler quelques uns. C'est normal.

La raison pour laquelle on soustrait systématiquement 0,7 Volts de la tension  $U_{BE}$  est que les transistors bipolaires actuels contiennent une diode "parasite". La tension soustraite dépend du type de semiconducteur utilisé : 0,7 Volts pour le silicium, et 0,2 Volts pour le germanium.



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**www.mbsm.pro , Mounir ben salah miled , poème 7orkate 7alib (حرقة حليب للشاعر) (التونسي منير بن صالح ميلاد**

written by Lilianne | 23 November 2017



لazلت أحلم أني رضيعٌ في دِهْنِكَ  
أبكى بكاءً غريبًا  
أم سك بطرف ثوبك  
وفي عيني خوفٌ عجيبٌ  
وخدودي تزهر كأنّها تمتص اللهيبَ  
ونسيت أنّك في الحقيقة  
سرقْتني نهْدك من بين شفتي  
وهو يقْطُر حليبَكَ



## الشاعر التونسي منير بن صالح ميلاد