067-E105 Semiconductors

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|  |  |  |  |  | 2  P |  | 3  P | I | N |  | 4  C |  |  |  |  |  |  |  |  |  | 5  T |  |  |  |  |  |  |  |  |
|  |  |  |  |  | H |  |  |  | N |  | U |  |  |  |  |  |  |  |  |  | R |  |  |  |  |  |  |  |  |
|  |  |  |  |  | O |  |  | 6  P | E | N | T | A | V | A | L | E | N | T |  |  | I |  |  |  |  |  |  |  |  |
|  |  |  |  |  | T |  |  |  | L |  | O |  |  |  |  |  |  |  |  |  | V |  |  |  |  |  |  |  |  |
|  |  |  |  |  | O |  |  |  |  |  | F |  |  |  |  | 7  S |  |  |  |  | A |  | 8  S |  |  |  |  |  |  |
|  |  |  |  |  | D |  |  |  |  |  | F |  |  |  |  | O |  |  | 9  G |  | L |  | E |  |  |  |  |  |  |
|  |  |  |  |  | I |  |  |  | 10  L |  |  |  | 11  R |  |  | L |  |  | E |  | E |  | M |  |  |  |  |  |  |
|  |  |  |  |  | O |  |  | 12  B | A | R | R | I | E | R |  | 13  I | N | T | R | I | N | S | I | C |  | 14  J |  |  |  |
|  |  |  |  |  | D |  | 15  B |  | S |  |  |  | C |  |  | D |  |  | M |  | T |  | C |  |  | U |  |  |  |
|  |  |  |  | 16  B | E | T | A |  | E |  | 17  F | E | T | S |  | S |  |  | A |  |  | 18  D | O | P | I | N | G |  |  |
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|  |  | 19  C | 20  L | I | P | P | E | R | S |  | 21  T |  | F |  | 22  G | A | L | L | I | U | M |  | D |  |  | T |  |  |  |
|  |  |  | E |  |  |  |  |  |  |  | R |  | I |  |  | T |  |  | U |  |  |  | U |  |  | I |  |  |  |
|  |  |  | 23  D | I | O | D | E |  |  | 24  V | A | L | E | N | C | E |  |  | M |  | 25  E |  | C |  |  | O |  |  |  |
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|  |  | 26  T | H | Y | 27  R | I | 28  S | T | O | R | S |  |  |  |  |  |  | 29  S | I | L | I | C | O | N |  |  |  |  |  |
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|  |  |  |  |  | A |  | U |  |  |  | T |  |  |  |  |  |  |  |  |  | E |  |  |  |  |  |  |  |  |
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|  |  |  |  |  | A |  | A |  |  | 31  B | R | E | A | K | D | O | W | N |  |  |  |  |  |  |  |  |  |  |  |
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|  |  |  |  |  | 32  Z | E | N | E | R |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

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| **Across**  **3.** Not a needle, but a type of diode.  **6.** Like 30-across; 5 electrons on the outside.  **12.** A voltage wall that must be overcome to move forward.  **13.** Pure semiconductor material.  **16.** Gain, after Greek A.  **17.** These are controlled by voltage, not current.  **18.** Adding impurity to semiconductor material  **19.** Cutoff circuits; hair trimmers; a basketball team  **22.** Element: Ga  **23.** A device like a one-way street for electrons.  **24.** The electrons farthest away from the nucleus  **26.** A whole family of triggers and switches.  **29.** Element: Si  **30.** Element: As  **31.** Too much voltage in the wrong direction.  **32.** It's a diode made to work in breakdown. | **Down**  **1.** There's negative resistance inside this diode. No light at the end of it.  **2.** This device has seen the light.  **4.** When no current flows in a transistor, it's in this mode.  **5.** Like 22-across; 3 electrons on the outside.  **7.** Works like a switch while having no moving parts.  **8.** Materials with conductivity that is better than insulators but poorer than conductors.  **9.** Element: Ge  **10.** A doctor once asked for sharks equipped with these devices.  **11.** Circuit for AC to DC  **14.** Where N and P meet.  **15.** A small signal here on a BJT can have a big effect.  **20.** This device shines. Not bad for three letters.  **21.** It's the T in "BJT"  **25.** On a BJT, where the arrow is.  **27.** When semiconductors can't handle the heat, they \_\_\_\_\_\_.  **28.** When too much current flows in a transistor, it's in this mode. |