

POWER MOSFETS – Recent Advancements

Acknowledgements: Developed by Laura Marmolejo, Faculty of Austin Community College, Austin, Texas

Time Required: 3 hours

Equipment & Tools

- Computer with Internet Connection
- Standard browsing (web surfing) capabilities

Team or Individual: This is an individual activity.

Learning Objectives

1. Use the Internet to gain a greater understanding of recent improvements in power MOSFET designs.
2. Become familiar with vendor websites and gather information on two critical parameters for power MOSFETS.
3. Locate information on the application of the latest power MOSFETS designs.

Introduction:

MOSFET designs are constantly being improved. One of the most commonly found discrete MOSFETs is the power MOSFET. Although the power MOSFET has been improved in many areas, this drill down will focus on just two key advancements. These advances include the increase in output voltage (for high voltage applications) and the reduction in on-resistance. Applications, which benefit from these improvements, cover a wide spectrum, from industrial applications to consumer products. In many industrial applications, a very high voltage and low on-resistance is desired. Although high voltage is not necessary in many consumer applications (where high current is preferred), the low on-resistance is still desirable.

Performance and Task Procedures:

1. Use a search engine like Yahoo.com or Google.com to research power recent advancements in MOSFETs. Start the search by entering “MOSFET Applications” or “Power MOSFETS” in the search window.
2. Search through the various websites and identify the latest advancements and new applications in power MOSFET technology (example: automotive industry). Search for information under headings such as “new products” or “discrete device”. Identify three product improvements and their application.
3. Search supplier websites and see what kind of specification information they provide. Look at the product description and determine the voltage and on-resistance for three different products. Enter the information found on the tables at the end of this drill down. Some useful sites are:
 - a. www.lrf.com
 - b. www.st.com
 - c. www.fairchildsemi.com
 - d. www.vishay.com

These websites may also help with step 2.

**Deliverables:**

- Completed table on MOSFET specifications and websites accessed
- Description of two power MOSFET improvements and their application

Scoring or Grading Criteria:

The criteria for grading the student, is left to the discretion of the instructor.

MOSFET Applications:

| | MOSFET #1 | MOSFET #2 | MOSFET #3 |
|---------------------|-----------|-----------|-----------|
| Website | | | |
| Part Number | | | |
| Design improvement? | | | |
| Application | | | |

Specification Data:

| | MOSFET #1 | MOSFET #2 | MOSFET #3 |
|---|-----------|-----------|-----------|
| Website | | | |
| Part Number | | | |
| V _{ds} (volts) | | | |
| On-Resistance (R _{ds}) (ohms) | | | |