

**N-Channel 60V (D-S) MOSFET**

**GENERAL DESCRIPTION**

The ME3205T is the N-Channel logic enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology. This high density process is especially tailored to minimize on-state resistance. These devices are particularly suited for low voltage application such as cellular phone and notebook computer power management and other battery powered circuits where high-side switching and low in-line power loss are needed in a very small outline surface mount package.

**FEATURES**

- $R_{DS(ON)} \leq 6.5m\Omega @ V_{GS}=10V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

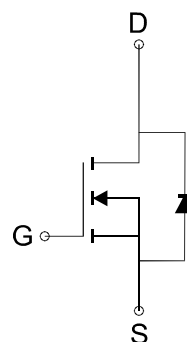
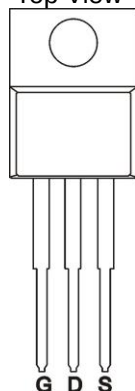
**APPLICATIONS**

- Power Management
- DC/DC Converter

**PIN CONFIGURATION**

(TO-220)

Top View



N-Channel MOSFET

Ordering Information: ME3205T (Pb-free)

ME3205T-G (Green product-Halogen free)

**Absolute Maximum Ratings (T<sub>c</sub>=25°C Unless Otherwise Noted)**

| Parameter                                        |                      | Symbol                            | Maximum Ratings | Unit |
|--------------------------------------------------|----------------------|-----------------------------------|-----------------|------|
| Drain-Source Voltage                             |                      | V <sub>DS</sub>                   | 60              | V    |
| Gate-Source Voltage                              |                      | V <sub>GS</sub>                   | ±20             | V    |
| Continuous Drain Current*                        | T <sub>c</sub> =25°C | I <sub>D</sub>                    | 105             | A    |
|                                                  | T <sub>c</sub> =70°C |                                   | 88              |      |
| Pulsed Drain Current                             |                      | I <sub>DM</sub>                   | 419             | A    |
| Maximum Power Dissipation                        | T <sub>c</sub> =25°C | P <sub>D</sub>                    | 150             | W    |
|                                                  | T <sub>c</sub> =70°C |                                   | 105             |      |
| Operating Junction and Storage Temperature Range |                      | T <sub>J</sub> , T <sub>stg</sub> | -55 to 175      | °C   |
| Thermal Resistance-Junction to Case**            |                      | R <sub>θJC</sub>                  | 1               | °C/W |

\*Calculated continuous current based on maximum allowable junction temperature. Package limitation current is 80A.

\*\* The device mounted on 1in<sup>2</sup> FR4 board with 2 oz copper.

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Electrical Characteristics (T<sub>c</sub> =25℃ Unless Otherwise Specified)

| Symbol              | Parameter                       | Limit                                                                                                                              | Min | Typ  | Max       | Unit       |
|---------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-----|------|-----------|------------|
| <b>STATIC</b>       |                                 |                                                                                                                                    |     |      |           |            |
| BV <sub>DSS</sub>   | Drain-Source Breakdown Voltage  | V <sub>GS</sub> =0V, I <sub>D</sub> =250 $\mu$ A                                                                                   | 60  |      |           | V          |
| V <sub>GS(th)</sub> | Gate Threshold Voltage          | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250 $\mu$ A                                                                     | 2   |      | 4         | V          |
| I <sub>GSS</sub>    | Gate-Body Leakage               | V <sub>DS</sub> =0V, V <sub>GS</sub> = $\pm$ 20V                                                                                   |     |      | $\pm$ 100 | nA         |
| I <sub>DSS</sub>    | Zero Gate Voltage Drain Current | V <sub>DS</sub> =60, V <sub>GS</sub> =0V                                                                                           |     |      | 1         | $\mu$ A    |
| R <sub>DS(ON)</sub> | Drain-Source On-Resistance*     | V <sub>GS</sub> =10V, I <sub>D</sub> =66A                                                                                          |     | 4.9  | 6.5       | m $\Omega$ |
| V <sub>SD</sub>     | Diode Forward Voltage*          | I <sub>S</sub> =66A, V <sub>GS</sub> =0V                                                                                           |     |      | 1.3       | V          |
| <b>DYNAMIC</b>      |                                 |                                                                                                                                    |     |      |           |            |
| Q <sub>g</sub>      | Total Gate Charge               | V <sub>DS</sub> =44V, V <sub>GS</sub> =10V, I <sub>D</sub> =66A                                                                    |     | 133  |           | nc         |
| Q <sub>gs</sub>     | Gate-Source Charge              |                                                                                                                                    |     | 42.5 |           |            |
| Q <sub>gd</sub>     | Gate-Drain Charge               |                                                                                                                                    |     | 40.5 |           |            |
| C <sub>iss</sub>    | Input Capacitance               | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, f=1MHz                                                                                  |     | 7747 |           | pF         |
| C <sub>oss</sub>    | Output Capacitance              |                                                                                                                                    |     | 317  |           |            |
| C <sub>rss</sub>    | Reverse Transfer Capacitance    |                                                                                                                                    |     | 248  |           |            |
| t <sub>d(on)</sub>  | Turn-On Delay Time              | V <sub>DS</sub> =28V, I <sub>D</sub> =66A,<br>V <sub>GS</sub> =10V, R <sub>G</sub> =6.8 $\Omega$ ,<br>R <sub>L</sub> =0.5 $\Omega$ |     | 60.9 |           | ns         |
| t <sub>r</sub>      | Turn-On Rise Time               |                                                                                                                                    |     | 219  |           |            |
| t <sub>d(off)</sub> | Turn-Off Delay Time             |                                                                                                                                    |     | 114  |           |            |
| t <sub>f</sub>      | Turn-Off Fall Time              |                                                                                                                                    |     | 34.3 |           |            |

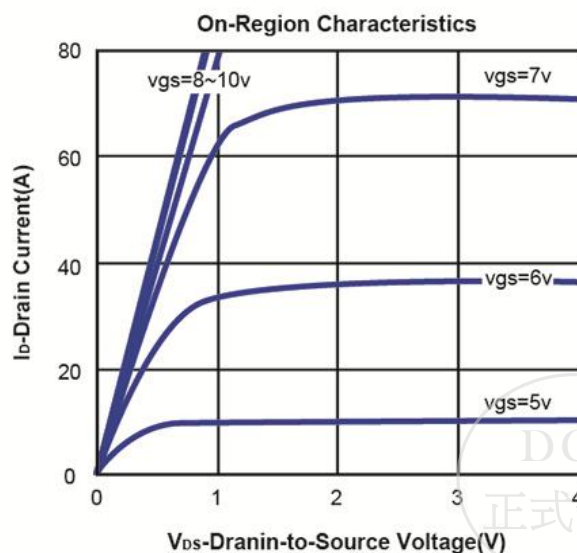
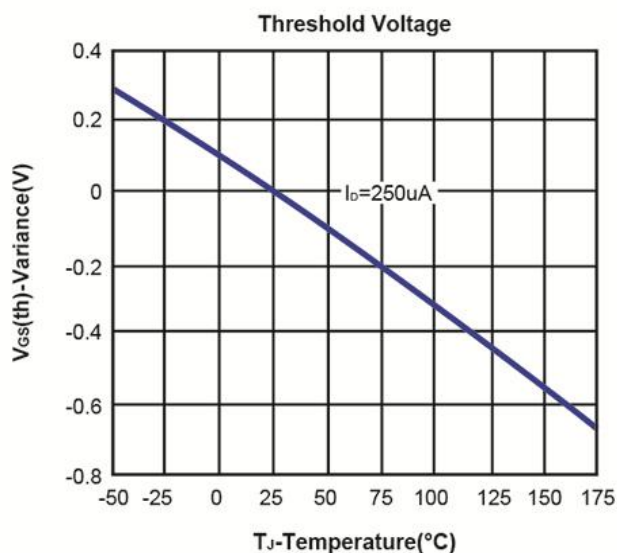
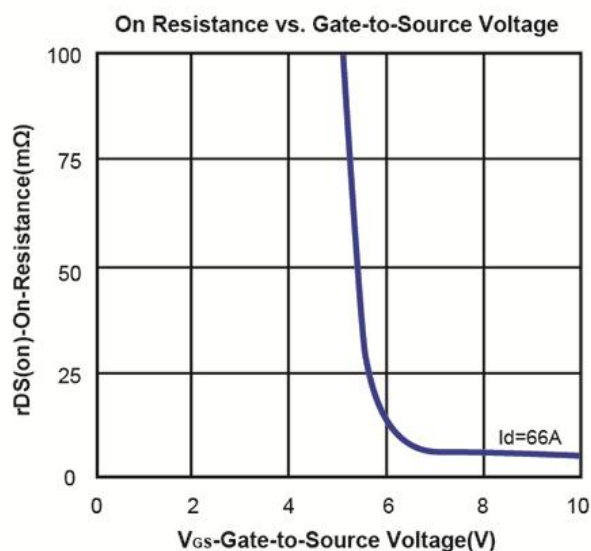
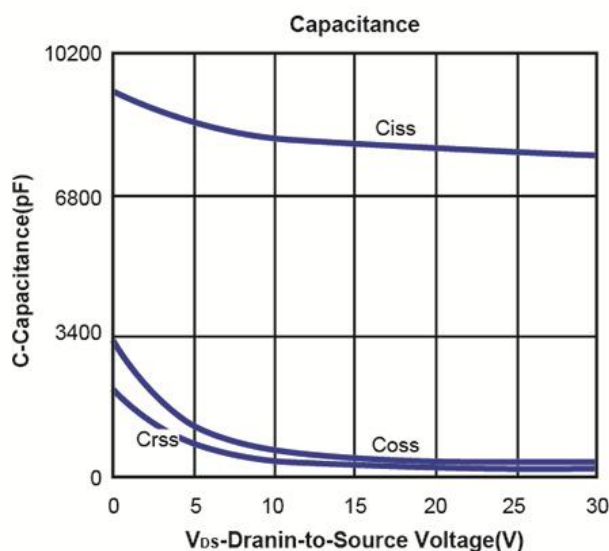
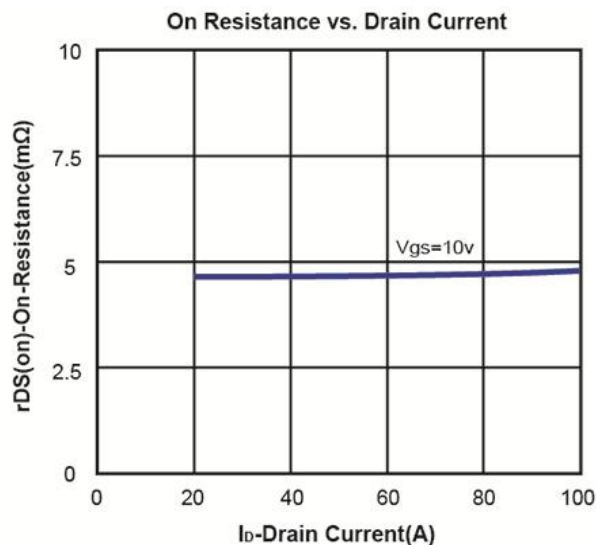
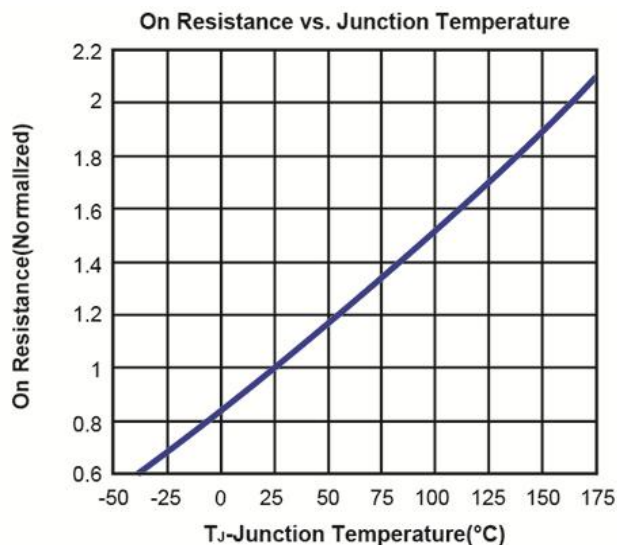
Notes: a, pulse test: pulse width  $\leq$  300 $\mu$ s, duty cycle  $\leq$  2%, Guaranteed by design, not subject to production testing.

b, Matsuki Electric/ Force mos reserves the right to improve product design, functions and reliability without notice.



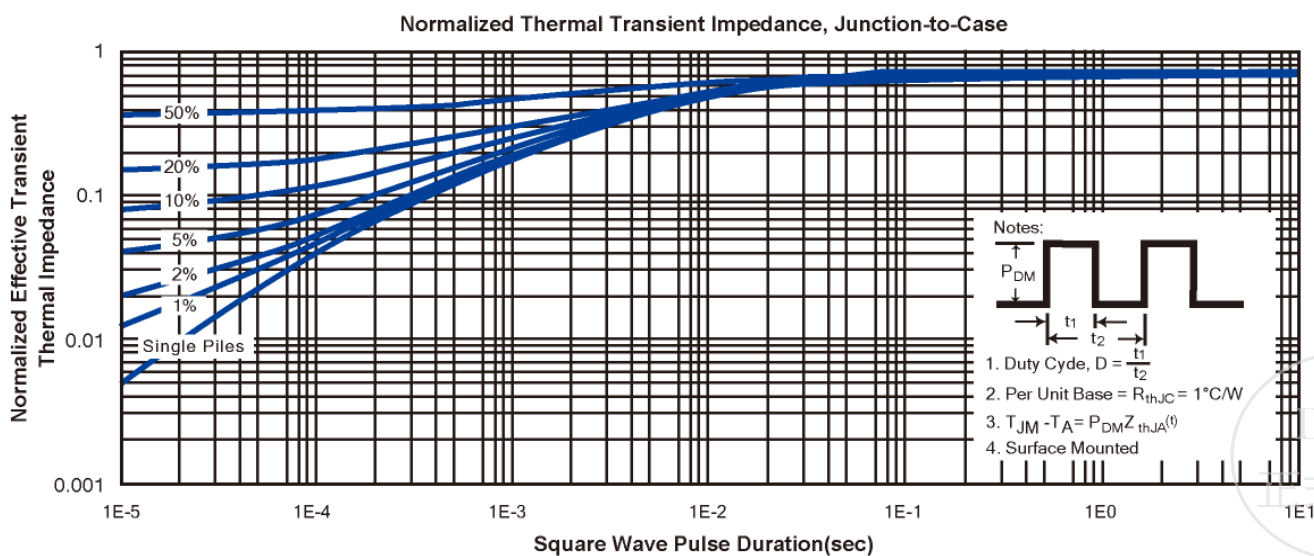
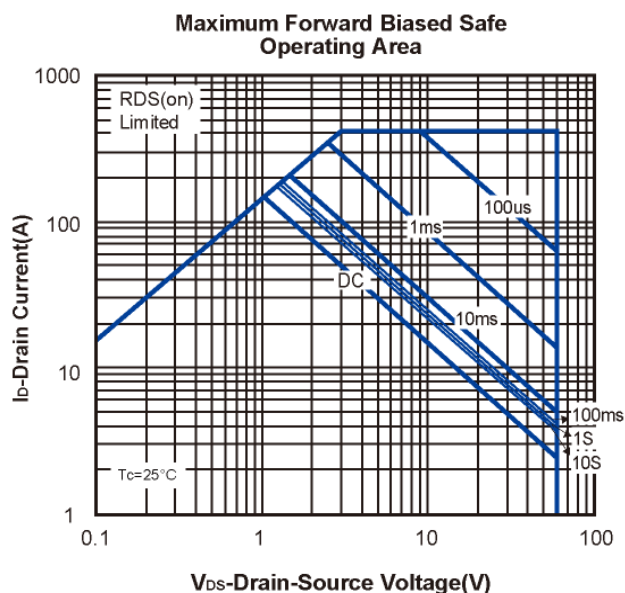
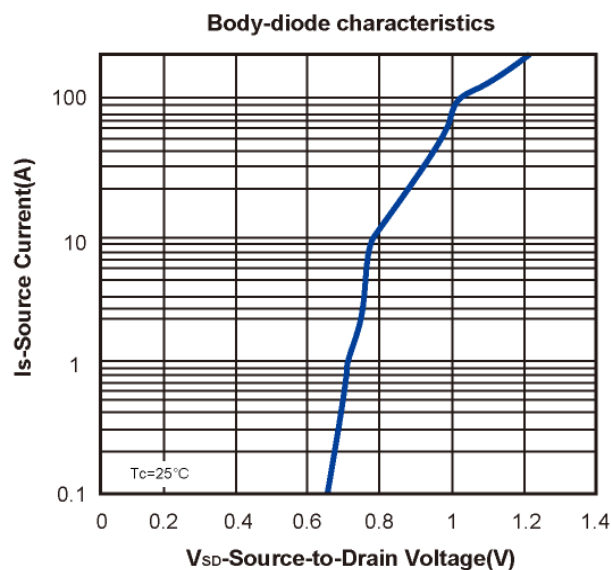
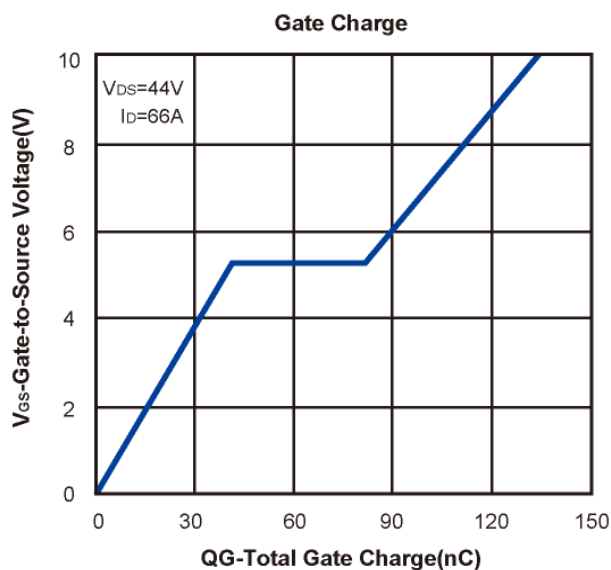
**N-Channel 60V (D-S) MOSFET**

**Typical Characteristics (T<sub>J</sub> =25°C Noted)**

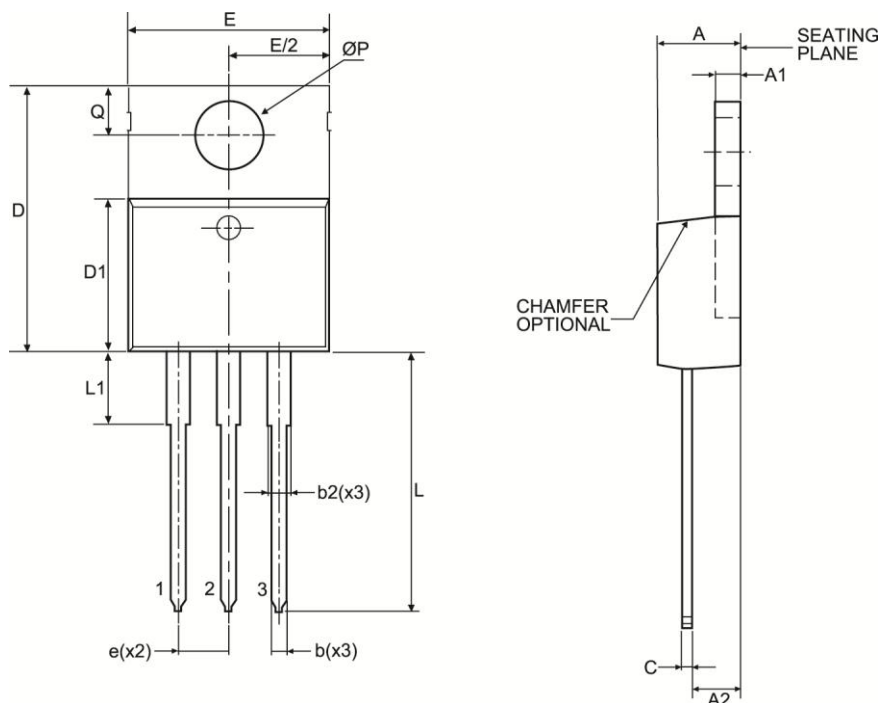


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**Typical Characteristics (T<sub>J</sub> =25°C Noted)**



## TO-220 Package Outline



| Symbol | MILLIMETERS (mm) |       |
|--------|------------------|-------|
|        | MIN              | MAX   |
| A      | 3.50             | 4.90  |
| A1     | 1.00             | 1.40  |
| A2     | 2.00             | 3.00  |
| b      | 0.70             | 1.40  |
| c      | 0.35             | 0.65  |
| D      | 14.00            | 16.50 |
| D1     | 8.30             | 9.50  |
| E      | 9.60             | 10.70 |
| e      | 2.54 BSC         |       |
| L      | 12.50            | 15.00 |
| ØP     | 3.60 TYP         |       |
| Q      | 2.50             | 3.10  |
| b2     | 1.10             | 1.80  |
| L1     | 2.40             | 3.20  |

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