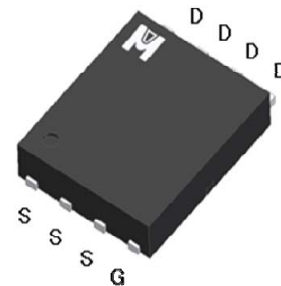


P-Channel Logic Level Enhancement Mode Field Effect Transistor

Product Summary:

|                     |               |
|---------------------|---------------|
| $BV_{DSS}$          | -30V          |
| $R_{DS(on)} (MAX.)$ | 3.1m $\Omega$ |
| $I_D$               | -85A          |



UIS, Rg 100% Tested

Pb-Free Lead Plating & Halogen Free



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$  Unless Otherwise Noted)

| PARAMETERS/TEST CONDITIONS                     |   | SYMBOL           | LIMITS     | UNIT             |
|--|---|------------------|------------|------------------|
| Gate-Source Voltage                            |   | $V_{GS}$         | $\pm 20$   | V                |
| Continuous Drain Current                       | $T_C = 25^\circ\text{C}$                              | $I_D$            | -85        | A                |
|  | $T_C = 100^\circ\text{C}$                             |                  | -65        |                  |
| Pulsed Drain Current <sup>1</sup>              |   | $I_{DM}$         | -260       |                  |
| Avalanche Current                              |   | $I_{AS}$         | -80        |                  |
| Avalanche Energy                               | $L = 0.1\text{mH}, I_D = -80\text{A}, R_G = 25\Omega$ | $E_{AS}$         | 320        | mJ               |
| Repetitive Avalanche Energy <sup>2</sup>       | $L = 0.05\text{mH}$                                   | $E_{AR}$         | 160        |                  |
| Power Dissipation                              | $T_C = 25^\circ\text{C}$                              | $P_D$            | 69         | W                |
|  | $T_C = 100^\circ\text{C}$                             |                  | 27         |                  |
| Operating Junction & Storage Temperature Range |   | $T_{j}, T_{stg}$ | -55 to 150 | $^\circ\text{C}$ |

100% UIS testing in condition of  $V_D = -15\text{V}, L = 0.1\text{mH}, V_G = -10\text{V}, I_L = -50\text{A}$ , Rated  $V_{DS} = -30\text{V}$  P-CH

THERMAL RESISTANCE RATINGS

| THERMAL RESISTANCE               | SYMBOL          | TYPICAL | MAXIMUM | UNIT                        |
|----------------------------------|-----------------|---------|---------|-----------------------------|
| Junction-to-Case                 | $R_{\theta JC}$ |         | 1.8     | $^\circ\text{C} / \text{W}$ |
| Junction-to-Ambient <sup>3</sup> | $R_{\theta JA}$ |         | 62.5    |                             |

<sup>1</sup>Pulse width limited by maximum junction temperature.

<sup>2</sup>Duty cycle  $\leq 1\%$

**ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25 °C, Unless Otherwise Noted)**

| PARAMETER   | SYMBOL               | TEST CONDITIONS   | LIMITS |      |      | UNIT |
|---|----------------------|---|--------|------|------|------|
|   |                      |   | MIN    | TYP  | MAX  |      |
| <b>STATIC</b>   |                      |   |        |      |      |      |
| Drain-Source Breakdown Voltage  | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA   | -30    |      |      | V    |
| Gate Threshold Voltage  | V <sub>GS(th)</sub>  | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA                                     | -1     | -1.5 | -3   |      |
| Gate-Body Leakage   | I <sub>GSS</sub>     | V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V  |        |      | ±100 | nA   |
| Zero Gate Voltage Drain Current   | I <sub>DSS</sub>     | V <sub>DS</sub> = -24V, V <sub>GS</sub> = 0V  |        |      | -1   | μA   |
|   |                      | V <sub>DS</sub> = -20V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 125 °C                           |        |      | -10  |      |
| On-State Drain Current <sup>1</sup>   | I <sub>D(ON)</sub>   | V <sub>DS</sub> = -5V, V <sub>GS</sub> = -10V   | -85    |      |      | A    |
| Drain-Source On-State Resistance <sup>1</sup>                                 | R <sub>DS(ON)</sub>  | V <sub>GS</sub> = -10V, I <sub>D</sub> = -30A   |        | 2.7  | 3.1  | mΩ   |
|   |                      | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -30A  |        | 4.0  | 5.0  |      |
| Forward Transconductance <sup>1</sup>   | g <sub>fs</sub>      | V <sub>DS</sub> = -5V, I <sub>D</sub> = -30A  |        | 70   |      | S    |
| <b>DYNAMIC</b>  |                      |   |        |      |      |      |
| Input Capacitance   | C <sub>iss</sub>     | V <sub>GS</sub> = 0V, V <sub>DS</sub> = -15V, f = 1MHz  |        | 6400 |      | pF   |
| Output Capacitance  | C <sub>oss</sub>     |   |        | 913  |      |      |
| Reverse Transfer Capacitance  | C <sub>rss</sub>     |   |        | 656  |      |      |
| Gate Resistance   | R <sub>g</sub>       | V <sub>GS</sub> = 15mV, V <sub>DS</sub> = 0V, f = 1MHz  |        | 3.4  |      | Ω    |
| Total Gate Charge <sup>1,2</sup>  | Q <sub>g</sub>       | V <sub>DS</sub> = -15V, V <sub>GS</sub> = -10V,<br>I <sub>D</sub> = -30A                        |        | 96.5 |      | nC   |
| Gate-Source Charge <sup>1,2</sup>   | Q <sub>gs</sub>      |   |        | 24.8 |      |      |
| Gate-Drain Charge <sup>1,2</sup>  | Q <sub>gd</sub>      |   |        | 13.8 |      |      |
| Turn-On Delay Time <sup>1,2</sup>   | t <sub>d(on)</sub>   | V <sub>DS</sub> = -15V,<br>I <sub>D</sub> = -1A, V <sub>GS</sub> = -10V, R <sub>GS</sub> = 2.7Ω |        | 15   |      | nS   |
| Rise Time <sup>1,2</sup>  | t <sub>r</sub>       |   |        | 20   |      |      |
| Turn-Off Delay Time <sup>1,2</sup>  | t <sub>d(off)</sub>  |   |        | 130  |      |      |
| Fall Time <sup>1,2</sup>  | t <sub>f</sub>       |   |        | 55   |      |      |
| <b>SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T<sub>C</sub> = 25 °C)</b> |                      |   |        |      |      |      |
| Continuous Current  | I <sub>S</sub>       |   |        |      | -85  | A    |
| Pulsed Current <sup>3</sup>   | I <sub>SM</sub>      |   |        |      | -260 |      |
| Forward Voltage <sup>1</sup>  | V <sub>SD</sub>      | I <sub>F</sub> = -30A, V <sub>GS</sub> = 0V   |        |      | -1.2 | V    |
| Reverse Recovery Time   | t <sub>rr</sub>      | I <sub>F</sub> = I <sub>S</sub> , dI <sub>F</sub> /dt = 100A / μS                               |        | 26   |      | nS   |
| Reverse Recovery Charge   | Q <sub>rr</sub>      |   |        |      | 80   |      |

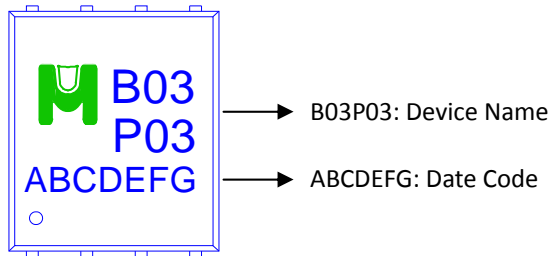
<sup>1</sup>Pulse test : Pulse Width  $\leq 300 \mu\text{sec}$ , Duty Cycle  $\leq 2\%$ .

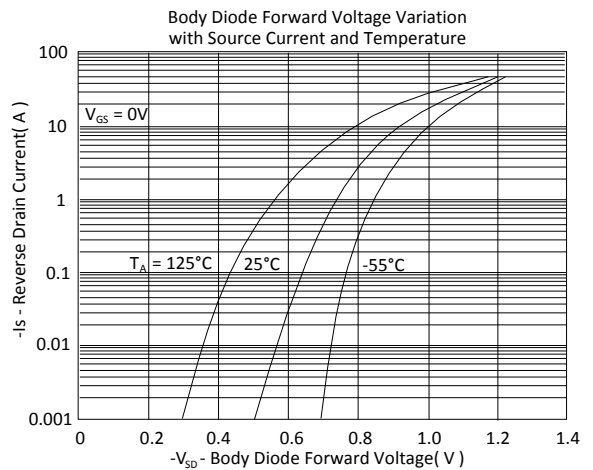
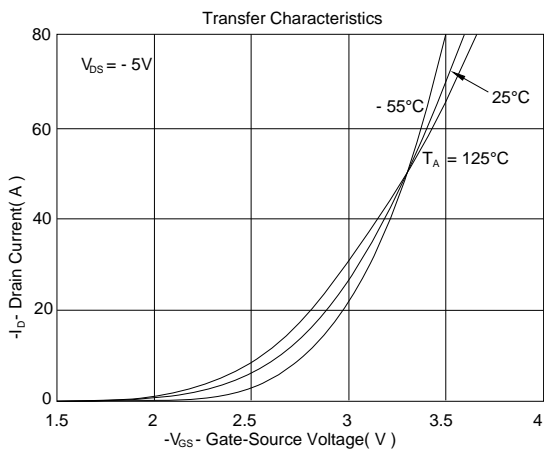
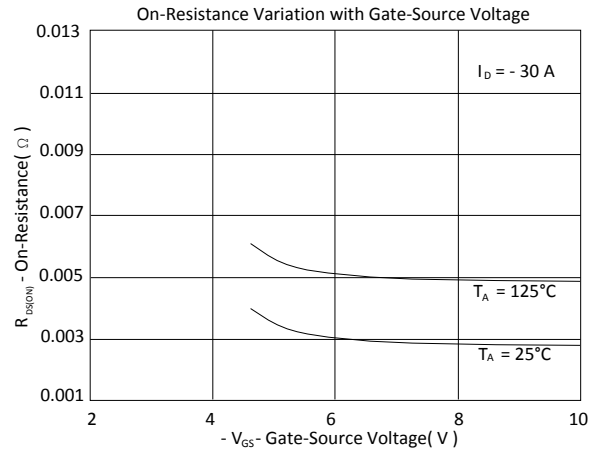
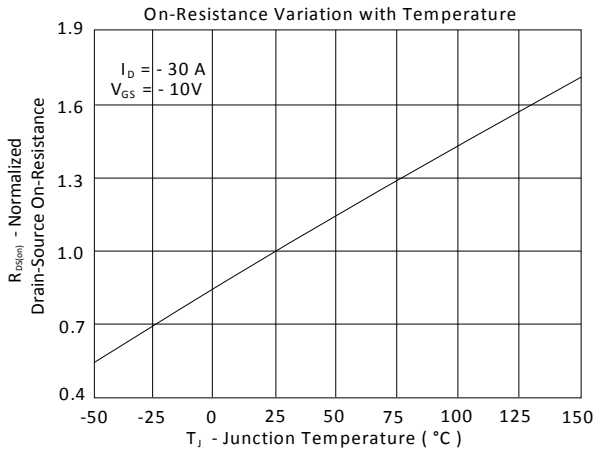
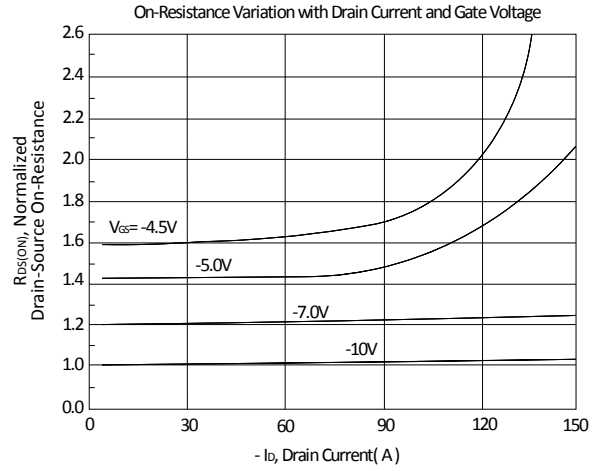
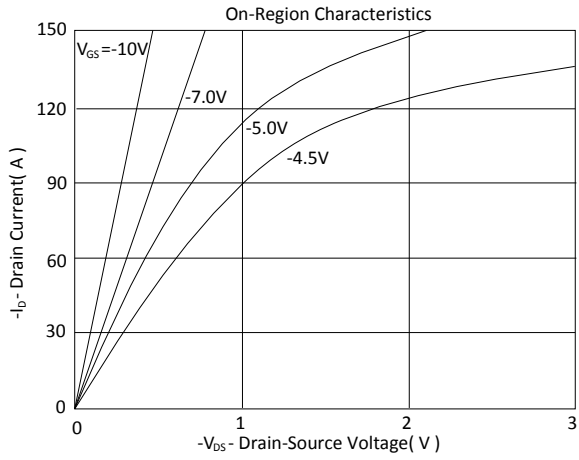
<sup>2</sup>Independent of operating temperature.

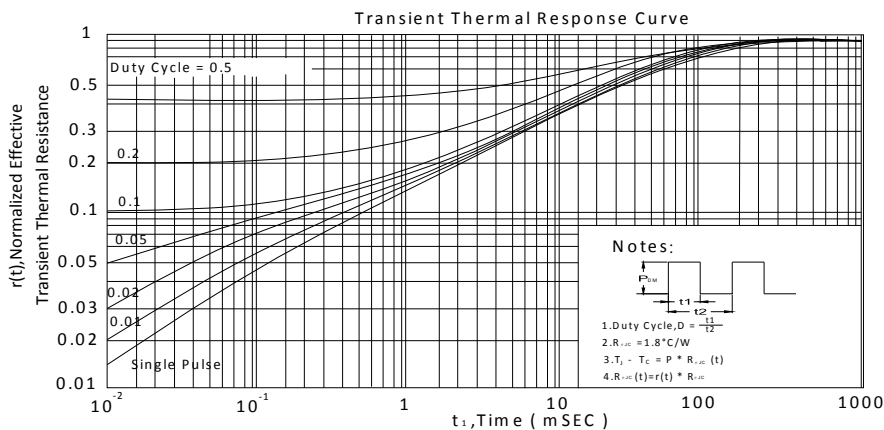
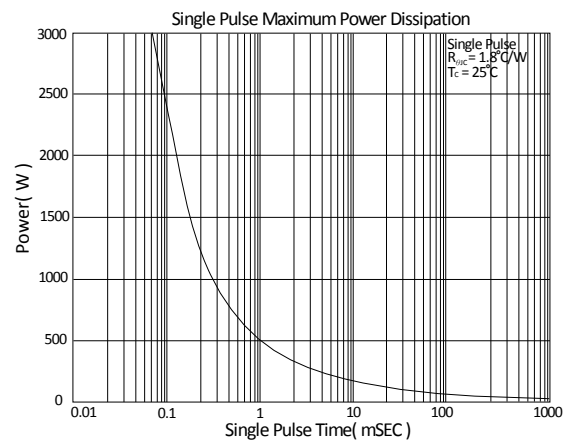
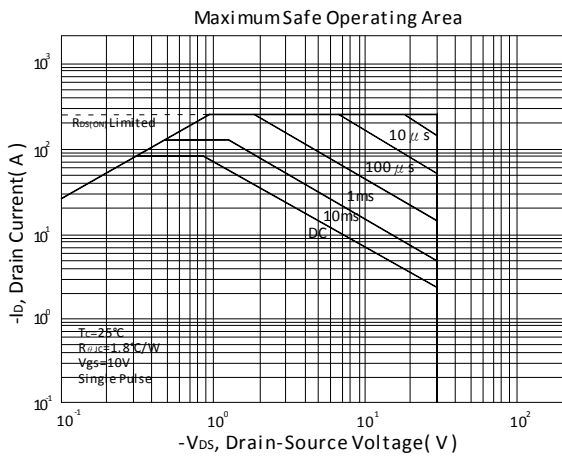
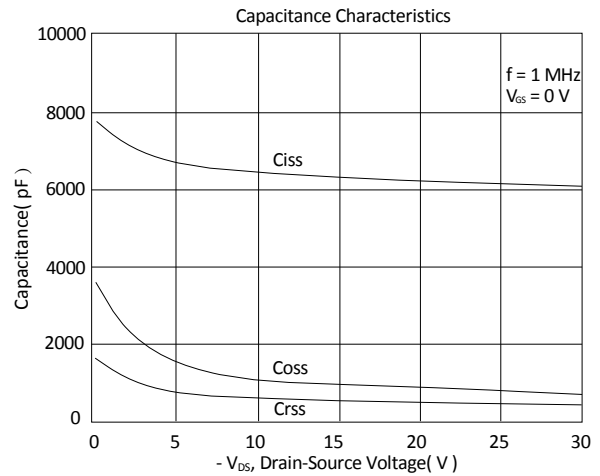
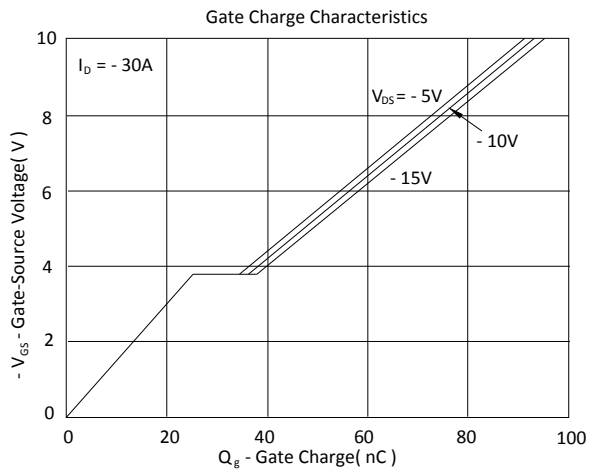
<sup>3</sup>Pulse width limited by maximum junction temperature.

Ordering & Marking Information:

Device Name: EMB03P03H for EDFN 5 x 6

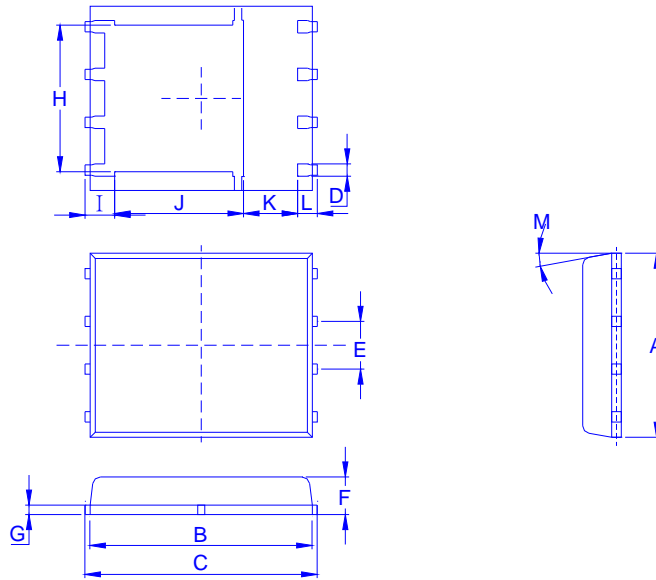








Outline Drawing



Dimension in mm

| Dimension | A    | B    | C    | D    | E    | F    | G    | H    | I    | J    | K    | L    | M   |
|-----------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| Min.      | 4.80 | 5.50 | 5.90 | 0.3  |      | 0.85 | 0.15 | 3.67 | 0.41 | 3.00 | 0.94 | 0.45 | 0°  |
| Typ.      |      |      |      |      | 1.27 |      |      |      |      |      |      |      |     |
| Max.      | 5.30 | 5.90 | 6.15 | 0.51 |      | 1.20 | 0.30 | 4.54 | 0.85 | 3.92 | 1.7  | 0.71 | 12° |

Recommended minimum pads

