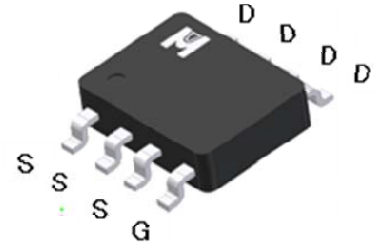
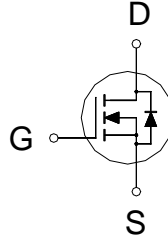


N-Channel Logic Level Enhancement Mode Field Effect Transistor

Product Summary:

| | |
|--------------------------|------|
| BV _{DSS} | 40V |
| R _{DSON} (MAX.) | 22mΩ |
| I _D | 9A |



Pb-Free Lead Plating & Halogen Free



ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C Unless Otherwise Noted)

| PARAMETERS/TEST CONDITIONS | | SYMBOL | LIMITS | UNIT |
|--|------------------------|-----------------------------------|------------|------|
| Gate-Source Voltage | | V _{GS} | ±20 | V |
| Continuous Drain Current | T _A = 25 °C | I _D | 9 | A |
| | T _A = 70 °C | | 8 | |
| Pulsed Drain Current ¹ | | I _{DM} | 36 | |
| Power Dissipation | T _A = 25 °C | P _D | 2.5 | W |
| | T _A = 70 °C | | 1.6 | |
| Operating Junction & Storage Temperature Range | | T _J , T _{stg} | -55 to 150 | °C |

THERMAL RESISTANCE RATINGS

| THERMAL RESISTANCE | SYMBOL | TYPICAL | MAXIMUM | UNIT |
|----------------------------------|------------------|---------|---------|--------|
| Junction-to-Case | R _{θJC} | | 25 | °C / W |
| Junction-to-Ambient ³ | R _{θJA} | | 50 | |

¹Pulse width limited by maximum junction temperature.

²Duty cycle ≤ 1%

³50°C / W when mounted on a 1 in² pad of 2 oz copper.



ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, Unless Otherwise Noted)

| PARAMETER | SYMBOL | TEST CONDITIONS | LIMITS | | | UNIT |
|---|---------------|---|--------|------|-----------|------------|
| | | | MIN | TYP | MAX | |
| STATIC | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$ | 40 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\mu A$ | 1.0 | 1.7 | 3.0 | V |
| Gate-Body Leakage | I_{GSS} | $V_{DS} = 0V, V_{GS} = \pm 20V$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 32V, V_{GS} = 0V$ | | | 1 | μA |
| | | $V_{DS} = 30V, V_{GS} = 0V, T_J = 125\text{ }^\circ\text{C}$ | | | 25 | |
| On-State Drain Current ¹ | $I_{D(ON)}$ | $V_{DS} = 5V, V_{GS} = 10V$ | 9 | | | A |
| Drain-Source On-State Resistance ¹ | $R_{DS(ON)}$ | $V_{GS} = 10V, I_D = 9A$ | | 20 | 22 | m Ω |
| | | $V_{GS} = 4.5V, I_D = 5A$ | | 30 | 37 | |
| Forward Transconductance ¹ | g_{fs} | $V_{DS} = 5V, I_D = 9A$ | | 20 | | S |
| DYNAMIC | | | | | | |
| Input Capacitance | C_{iss} | $V_{GS} = 0V, V_{DS} = 20V, f = 1MHz$ | | 536 | | pF |
| Output Capacitance | C_{oss} | | | 83 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 66 | | |
| Total Gate Charge ^{1,2} | Q_g | $V_{DS} = 20V, V_{GS} = 10V,$ $I_D = 9A$ | | 14.5 | | nC |
| Gate-Source Charge ^{1,2} | Q_{gs} | | | 2.1 | | |
| Gate-Drain Charge ^{1,2} | Q_{gd} | | | 4.3 | | |
| Turn-On Delay Time ^{1,2} | $t_{d(on)}$ | $V_{DS} = 20V,$ $I_D = 1A, V_{GS} = 10V, R_{GS} = 6\Omega$ | | 5 | | nS |
| Rise Time ^{1,2} | t_r | | | 10 | | |
| Turn-Off Delay Time ^{1,2} | $t_{d(off)}$ | | | 15 | | |
| Fall Time ^{1,2} | t_f | | | 12 | | |
| SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS ($T_C = 25\text{ }^\circ\text{C}$) | | | | | | |
| Continuous Current | I_S | | | | 2.3 | A |
| Pulsed Current ³ | I_{SM} | | | | 9.2 | |
| Forward Voltage ¹ | V_{SD} | $I_F = I_S, V_{GS} = 0V$ | | | 1.3 | V |

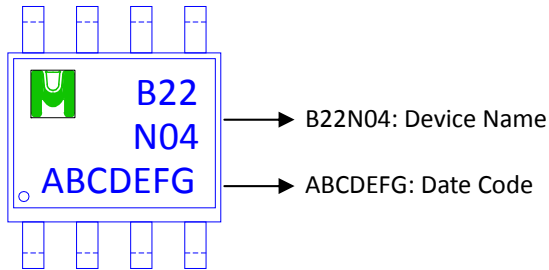
¹Pulse test : Pulse Width $\leq 300\text{ }\mu\text{sec}$, Duty Cycle $\leq 2\%$.

²Independent of operating temperature.

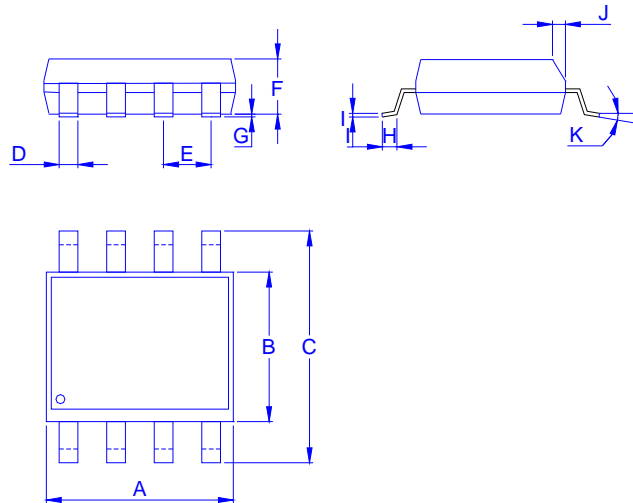
³Pulse width limited by maximum junction temperature.

Ordering & Marking Information:

Device Name: EMB22N04G for SOP-8



Outline Drawing



Dimension in mm

| Dimension | A | B | C | D | E | F | G | H | I | J | K |
|-----------|------|------|------|------|------|------|------|------|------|------|----|
| Min. | 4.70 | 3.70 | 5.80 | 0.33 | | 1.20 | 0.08 | 0.40 | 0.19 | 0.25 | 0° |
| Typ. | | | | | 1.27 | | | | | | |
| Max. | 5.10 | 4.10 | 6.20 | 0.51 | | 1.62 | 0.28 | 0.83 | 0.26 | 0.50 | 8° |



TYPICAL CHARACTERISTICS

