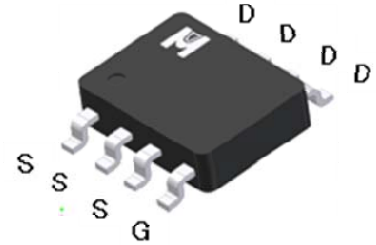


N-Channel Logic Level Enhancement Mode Field Effect Transistor

Product Summary:

| | |
|----------------------------|-----|
| BV _{DSS} | 30V |
| R _{DS(on)} (MAX.) | 5mΩ |
| I _D | 20A |



UIS, R_g 100% Tested

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 | 20 | A |
| | T _A = 100 °C | | 13 | |
| Pulsed Drain Current ¹ | | I _{DM} | 80 | |
| Avalanche Current | | I _{AS} | 20 | |
| Avalanche Energy | L = 0.1mH, I _D =20A, R _G =25Ω | E _{AS} | 20 | mJ |
| Repetitive Avalanche Energy ² | L = 0.05mH | E _{AR} | 10 | |
| Power Dissipation | T _A = 25 °C | P _D | 2.5 | W |
| | T _A = 100 °C | | 1 | |
| 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_c = 25 °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 = 250μA | 30 | | | V |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = 250μA | 1 | 1.5 | 3 | |
| Gate-Body Leakage | I _{GSS} | V _{DS} = 0V, V _{GS} = ±20V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} = 24V, V _{GS} = 0V | | | 1 | μA |
| | | V _{DS} = 20V, V _{GS} = 0V, T _J = 125 °C | | | 25 | |
| On-State Drain Current ¹ | I _{D(ON)} | V _{DS} = 10V, V _{GS} = 10V | 20 | | | A |
| Drain-Source On-State Resistance ¹ | R _{DS(ON)} | V _{GS} = 10V, I _D = 20A | | 3.9 | 5 | mΩ |
| | | V _{GS} = 4.5V, I _D = 15A | | 7.1 | 9 | |
| Forward Transconductance ¹ | g _{fs} | V _{DS} = 5V, I _D = 20A | | 28 | | S |
| DYNAMIC | | | | | | |
| Input Capacitance | C _{iss} | V _{GS} = 0V, V _{DS} = 15V, f = 1MHz | | 2935 | | pF |
| Output Capacitance | C _{oss} | | | 217 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 142 | | |
| Gate Resistance | R _g | V _{GS} = 15mV, V _{DS} = 0V, f = 1MHz | | 1.3 | | Ω |
| Total Gate Charge ^{1,2} | Q _g (V _{GS} =10V) | V _{DS} = 15V, V _{GS} = 10V, I _D = 20A | | 52 | | nC |
| | Q _g (V _{GS} =4.5V) | | | 32 | | |
| Gate-Source Charge ^{1,2} | Q _{gs} | | | 5.7 | | |
| Gate-Drain Charge ^{1,2} | Q _{gd} | | | 7.2 | | |
| Turn-On Delay Time ^{1,2} | t _{d(on)} | | V _{DS} = 15V, I _D = 1A, V _{GS} = 10V, R _{GS} = 2.7Ω | | 25 | |
| Rise Time ^{1,2} | t _r | | | 20 | | |
| Turn-Off Delay Time ^{1,2} | t _{d(off)} | | | 70 | | |
| Fall Time ^{1,2} | t _f | | | 20 | | |
| SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_c = 25 °C) | | | | | | |
| Continuous Current | I _S | | | | 10 | A |
| Pulsed Current ³ | I _{SM} | | | | 40 | |
| Forward Voltage ¹ | V _{SD} | I _F = I _S , V _{GS} = 0V | | | 1.2 | V |
| Reverse Recovery Time | t _{rr} | I _F = I _S , dI _F /dt = 100A / μS | | 35 | | nS |
| Peak Reverse Recovery Current | I _{RM(REC)} | | | 50 | | A |
| Reverse Recovery Charge | Q _{rr} | | | 15 | | nC |

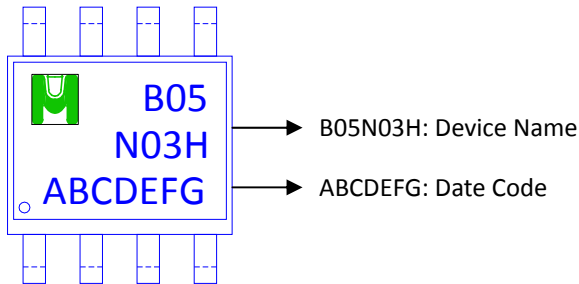
¹Pulse test : Pulse Width $\leq 300 \mu\text{sec}$, Duty Cycle $\leq 2\%$.

²Independent of operating temperature.

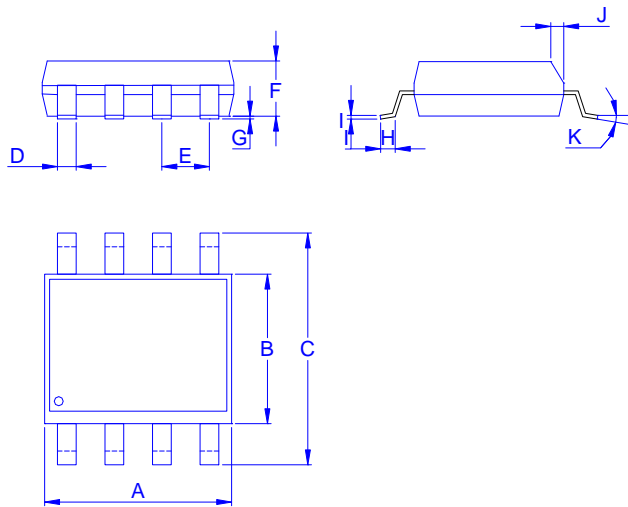
³Pulse width limited by maximum junction temperature.

Ordering & Marking Information:

Device Name: EMB05N03GH 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° |

