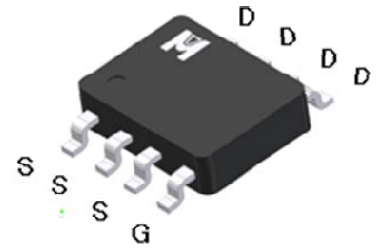


P-Channel Logic Level Enhancement Mode Field Effect Transistor

Product Summary:

| | |
|-----------------------------------|--------------|
| BV_{DSS} | -30V |
| $R_{DS(on) (MAX.) (V_{GS}=-10V)}$ | 10m Ω |
| I_D | -13A |



UIS, Rg 100% Tested

Pb-Free Lead Plating & Halogen Free



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

| PARAMETERS/TEST CONDITIONS | | SYMBOL | LIMITS | UNIT |
|--|---|------------------|------------|------------------|
| Gate-Source Voltage | | V_{GS} | ± 25 | V |
| Continuous Drain Current | $T_A = 25\text{ }^\circ\text{C}$ | I_D | -13 | A |
| | $T_A = 100\text{ }^\circ\text{C}$ | | -10 | |
| Pulsed Drain Current ¹ | | I_{DM} | -50 | |
| Avalanche Current | | I_{AS} | -15 | |
| Avalanche Energy | $L = 0.1\text{mH}, I_D = -15\text{A}, R_G = 25\text{ }\Omega$ | E_{AS} | 11.25 | mJ |
| Repetitive Avalanche Energy ² | $L = 0.05\text{mH}$ | E_{AR} | 5.62 | |
| Power Dissipation | $T_A = 25\text{ }^\circ\text{C}$ | P_D | 2.5 | W |
| | $T_A = 100\text{ }^\circ\text{C}$ | | 1 | |
| Operating Junction & Storage Temperature Range | | T_{j}, T_{stg} | -55 to 150 | $^\circ\text{C}$ |

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

THERMAL RESISTANCE RATINGS

| THERMAL RESISTANCE | SYMBOL | TYPICAL | MAXIMUM | UNIT |
|----------------------------------|-----------------|---------|---------|-----------------------------|
| Junction-to-Case | $R_{\theta JC}$ | | 25 | $^\circ\text{C} / \text{W}$ |
| Junction-to-Ambient ³ | $R_{\theta JA}$ | | 50 | |

¹Pulse width limited by maximum junction temperature.

²Duty cycle $\leq 1\%$

³50 $^\circ\text{C} / \text{W}$ 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 | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = -250\mu A$ | -30 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = -250\mu A$ | -1 | -1.5 | -3 | |
| Gate-Body Leakage | I_{GSS} | $V_{DS} = 0V, V_{GS} = \pm 25V$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = -24V, V_{GS} = 0V$ | | | -1 | μA |
| | | $V_{DS} = -20V, V_{GS} = 0V, T_J = 125\text{ }^\circ\text{C}$ | | | -10 | |
| On-State Drain Current ¹ | $I_{D(ON)}$ | $V_{DS} = -5V, V_{GS} = -10V$ | -13 | | | A |
| Drain-Source On-State Resistance ¹ | $R_{DS(ON)}$ | $V_{GS} = -10V, I_D = -13A$ | | 8.2 | 10 | m Ω |
| | | $V_{GS} = -4.5V, I_D = -9A$ | | 12.5 | 16 | |
| Forward Transconductance ¹ | g_{fs} | $V_{DS} = -5V, I_D = -10A$ | | 30 | | S |
| DYNAMIC | | | | | | |
| Input Capacitance | C_{iss} | $V_{GS} = 0V, V_{DS} = -15V, f = 1MHz$ | | 3067 | | pF |
| Output Capacitance | C_{oss} | | | 453 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 398 | | |
| Gate Resistance | R_g | $V_{GS} = 15mV, V_{DS} = 0V, f = 1MHz$ | | 4.0 | | Ω |
| Total Gate Charge ^{1,2} | $Q_g(V_{GS}=10V)$ | $V_{DS} = -15V, V_{GS} = -10V, I_D = -10A$ | | 52 | | nC |
| | $Q_g(V_{GS}=4.5V)$ | | | 23 | | |
| Gate-Source Charge ^{1,2} | Q_{gs} | | | 6.5 | | |
| Gate-Drain Charge ^{1,2} | Q_{gd} | | | 10 | | |
| Turn-On Delay Time ^{1,2} | $t_{d(on)}$ | | $V_{DS} = -15V, I_D = -1A, V_{GS} = -10V, R_{GS} = 2.7\Omega$ | | 15 | |
| Rise Time ^{1,2} | t_r | | | 12 | | |
| Turn-Off Delay Time ^{1,2} | $t_{d(off)}$ | | | 40 | | |
| Fall Time ^{1,2} | t_f | | | 10 | | |
| SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS ($T_C = 25\text{ }^\circ\text{C}$) | | | | | | |
| Continuous Current | I_S | | | | -3 | A |
| Pulsed Current ³ | I_{SM} | | | | -12 | |
| Forward Voltage ¹ | V_{SD} | $I_F = I_S, V_{GS} = 0V$ | | | -1.2 | V |
| Reverse Recovery Time | t_{rr} | $I_F = I_S, di_F/dt = 100A / \mu S$ | | 32 | | nS |
| Reverse Recovery Charge | Q_{rr} | | | 26 | | nC |

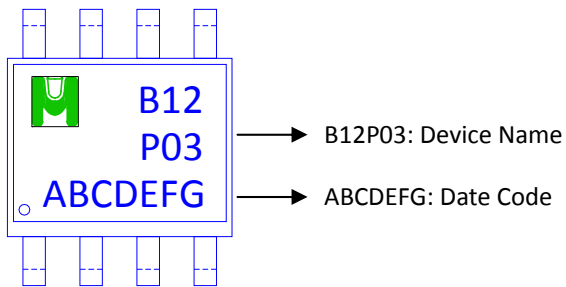
¹Pulse test : Pulse Width $\leq 300\text{ }\mu\text{sec}$, Duty Cycle $\leq 2\%$.

²Independent of operating temperature.

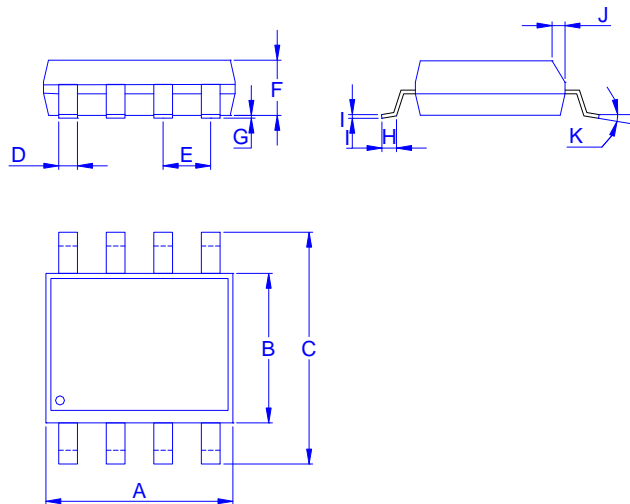
³Pulse width limited by maximum junction temperature.

Ordering & Marking Information:

Device Name: EMB12P03G 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° |

