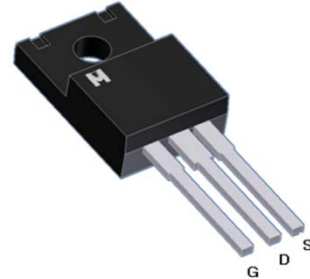


N-Channel Logic Level Enhancement Mode Field Effect Transistor

Product Summary:

| | |
|---------------------|--------------|
| BV_{DSS} | 100V |
| $R_{DS(on)} (MAX.)$ | 14m Ω |
| I_D | 40A |



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} | ± 30 | V |
| Continuous Drain Current | $T_C = 25^\circ\text{C}$ | I_D | 40 | A |
| | $T_C = 100^\circ\text{C}$ | | 28 | |
| Pulsed Drain Current ¹ | | I_{DM} | 140 | |
| Avalanche Current | | I_{AS} | 40 | |
| Avalanche Energy | $L = 0.1\text{mH}, I_D=40\text{A}, R_G=25\Omega$ | E_{AS} | 80 | mJ |
| Repetitive Avalanche Energy ² | $L = 0.05\text{mH}$ | E_{AR} | 40 | |
| Power Dissipation | $T_C = 25^\circ\text{C}$ | P_D | 40 | W |
| | $T_C = 100^\circ\text{C}$ | | 16 | |
| Operating Junction & Storage Temperature Range | | T_{j}, T_{stg} | -55 to 150 | $^\circ\text{C}$ |

THERMAL RESISTANCE RATINGS

| THERMAL RESISTANCE | SYMBOL | TYPICAL | MAXIMUM | UNIT |
|---------------------|-----------------|---------|---------|-----------------------------|
| Junction-to-Case | $R_{\theta JC}$ | | 3.1 | $^\circ\text{C} / \text{W}$ |
| Junction-to-Ambient | $R_{\theta JA}$ | | 62.5 | |

¹Pulse width limited by maximum junction temperature.

²Duty cycle $\leq 1\%$

ELECTRICAL CHARACTERISTICS (T_J = 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 | 100 | | | V |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = 250μA | 2.0 | 3.0 | 4.0 | |
| Gate-Body Leakage | I _{GSS} | V _{DS} = 0V, V _{GS} = ±30V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} = 80V, V _{GS} = 0V | | | 1 | μA |
| | | V _{DS} = 70V, V _{GS} = 0V, T _J = 125 °C | | | 25 | |
| On-State Drain Current ¹ | I _{D(ON)} | V _{DS} = 10V, V _{GS} = 10V | 30 | | | A |
| Drain-Source On-State Resistance ¹ | R _{DS(ON)} | V _{GS} = 10V, I _D = 20A | | 12 | 14 | mΩ |
| Forward Transconductance ¹ | g _{fs} | V _{DS} = 5V, I _D = 20A | | 42 | | S |
| DYNAMIC | | | | | | |
| Input Capacitance | C _{iss} | V _{GS} = 0V, V _{DS} = 25V, f = 1MHz | | 6557 | | pF |
| Output Capacitance | C _{oss} | | | 417 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 122 | | |
| Gate Resistance | R _g | V _{GS} = 15mV, V _{DS} = 0V, f = 1MHz | | 1.5 | | Ω |
| Total Gate Charge ^{1,2} | Q _g | V _{DS} = 50V, V _{GS} = 10V, I _D = 20A | | 64.7 | | nC |
| Gate-Source Charge ^{1,2} | Q _{gs} | | | 24.4 | | |
| Gate-Drain Charge ^{1,2} | Q _{gd} | | | 18.1 | | |
| Turn-On Delay Time ^{1,2} | t _{d(on)} | V _{DS} = 50V, I _D = 1A, V _{GS} = 10V, R _{GS} = 6Ω | | 25 | | nS |
| Rise Time ^{1,2} | t _r | | | 120 | | |
| Turn-Off Delay Time ^{1,2} | t _{d(off)} | | | 100 | | |
| Fall Time ^{1,2} | t _f | | | 150 | | |
| SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_C = 25 °C) | | | | | | |
| Continuous Current | I _S | | | | 40 | A |
| Pulsed Current ³ | I _{SM} | | | | 140 | |
| Forward Voltage ¹ | V _{SD} | I _F = 20A, V _{GS} = 0V | | | 1.3 | V |
| Reverse Recovery Time | t _{rr} | I _F = 25A, dI _F /dt = 100A / μS | | 150 | | nS |
| Reverse Recovery Charge | Q _{rr} | | | | 450 | |

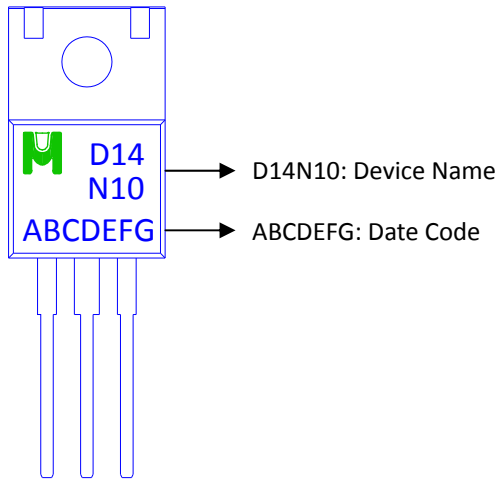
¹Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

²Independent of operating temperature.

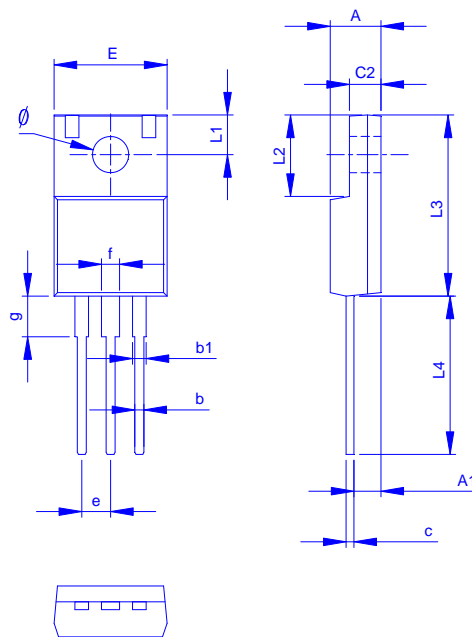
³Pulse width limited by maximum junction temperature.

Ordering & Marking Information:

Device Name: EMD14N10F for TO-220F



Outline Drawing



Dimension in mm

| Dimension | A | A1 | b | b1 | c | c2 | E | L1 | L2 | L3 | L4 | ∅ | e | f | g |
|-----------|------|------|------|------|------|------|-------|------|------|-------|-------|------|------|------|------|
| Min. | 4.20 | 1.95 | 0.50 | 0.90 | 0.45 | 2.34 | 9.70 | 2.70 | 6.48 | 14.80 | 12.68 | 3.00 | 2.35 | 1.18 | 3.13 |
| Max. | 4.90 | 2.96 | 1.05 | 1.50 | 0.80 | 3.20 | 10.66 | 3.80 | 7.50 | 16.30 | 14.50 | 3.50 | 2.75 | 1.90 | 4.00 |



TYPICAL CHARACTERISTICS

