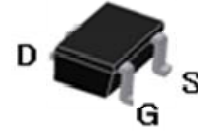
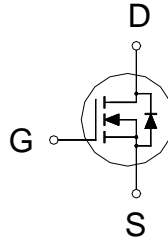


N-Channel Logic Level Enhancement Mode Field Effect Transistor

Product Summary:

| | |
|-------------------|--------------|
| BV_{DSS} | 30V |
| $R_{DSON (MAX.)}$ | 55m Ω |
| I_D | 3.5A |



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} | ± 20 | V |
| Continuous Drain Current | $T_A = 25\text{ }^\circ\text{C}$ | I_D | 3.5 | A |
| | $T_A = 70\text{ }^\circ\text{C}$ | | 2.4 | |
| Pulsed Drain Current ¹ | | I_{DM} | 14 | |
| Power Dissipation | $T_A = 25\text{ }^\circ\text{C}$ | P_D | 1.25 | W |
| | $T_A = 70\text{ }^\circ\text{C}$ | | 0.8 | |
| 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-Ambient | $R_{\theta JA}$ | | 100 | $^\circ\text{C} / \text{W}$ |

¹Pulse width limited by maximum junction temperature.

²Duty cycle $\leq 1\%$



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} | $V_{DS} = 0V, V_{GS} = \pm 20V$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 24V, V_{GS} = 0V$ | | | 1 | μA |
| | | $V_{DS} = 20V, V_{GS} = 0V, T_J = 125\text{ }^\circ\text{C}$ | | | 10 | |
| On-State Drain Current ¹ | $I_{D(ON)}$ | $V_{DS} = 5V, V_{GS} = 10V$ | 3.5 | | | A |
| Drain-Source On-State Resistance ¹ | $R_{DS(ON)}$ | $V_{GS} = 10V, I_D = 3.5A$ | | 45 | 55 | $m\Omega$ |
| | | $V_{GS} = 4.5V, I_D = 2A$ | | 65 | 85 | |
| Forward Transconductance ¹ | g_{fs} | $V_{DS} = 5V, I_D = 3.5A$ | | 5 | | S |
| DYNAMIC | | | | | | |
| Input Capacitance | C_{iss} | $V_{GS} = 0V, V_{DS} = 10V, f = 1MHz$ | | 319 | | pF |
| Output Capacitance | C_{oss} | | | 66 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 53 | | |
| Total Gate Charge ^{1,2} | Q_g | $V_{DS} = 10V, V_{GS} = 4.5V,$ $I_D = 3.5A$ | | 6 | | nC |
| Gate-Source Charge ^{1,2} | Q_{gs} | | | 0.8 | | |
| Gate-Drain Charge ^{1,2} | Q_{gd} | | | 1.8 | | |
| Turn-On Delay Time ^{1,2} | $t_{d(on)}$ | $V_{DS} = 10V,$ $I_D = 1A, V_{GS} = 10V, R_{GS} = 6\Omega$ | | 8 | | nS |
| Rise Time ^{1,2} | t_r | | | 2.5 | | |
| Turn-Off Delay Time ^{1,2} | $t_{d(off)}$ | | | 20 | | |
| Fall Time ^{1,2} | t_f | | | 5 | | |
| SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS ($T_C = 25\text{ }^\circ\text{C}$) | | | | | | |
| Continuous Current | I_S | | | | 2 | A |
| Pulsed Current ³ | I_{SM} | | | | 8 | |
| Forward Voltage ¹ | V_{SD} | $I_F = I_S, V_{GS} = 0V$ | | | 1.2 | V |

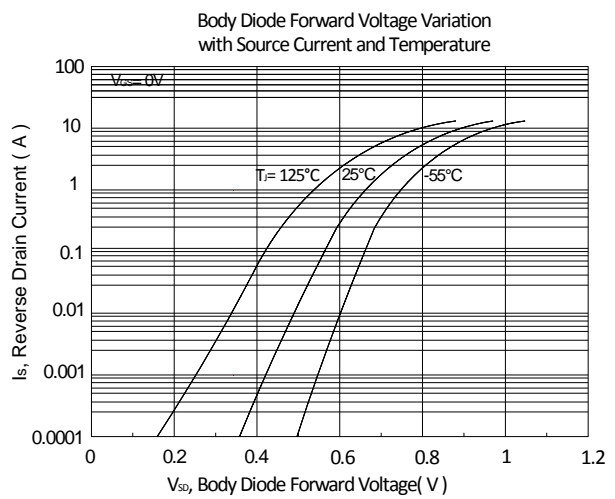
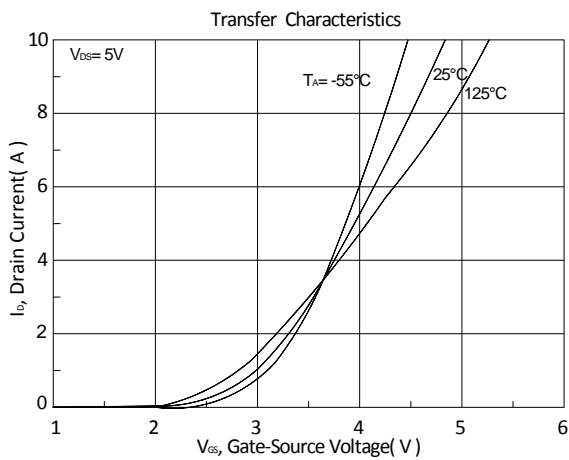
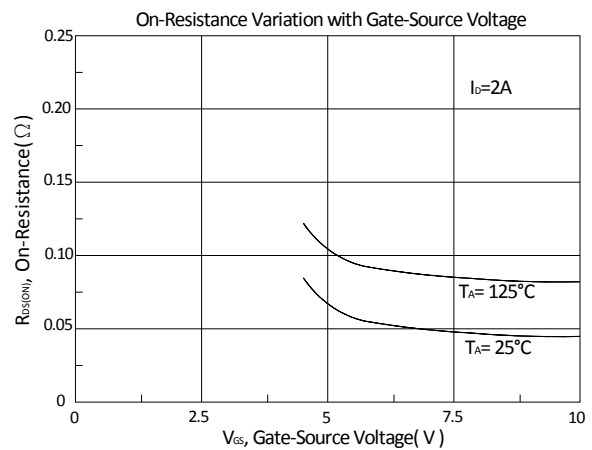
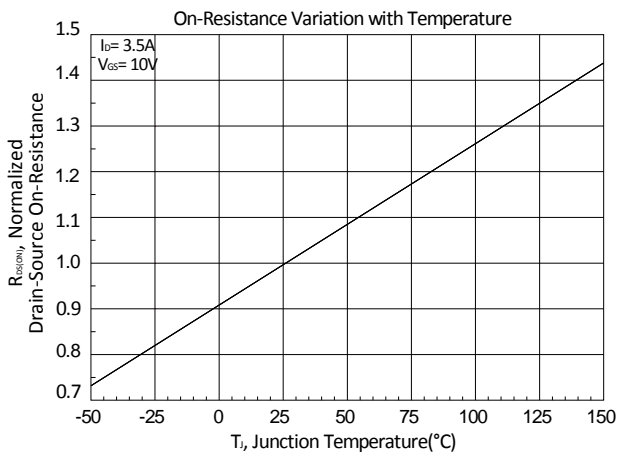
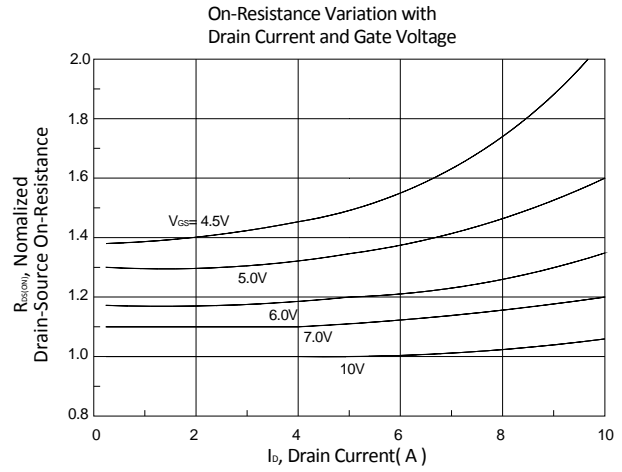
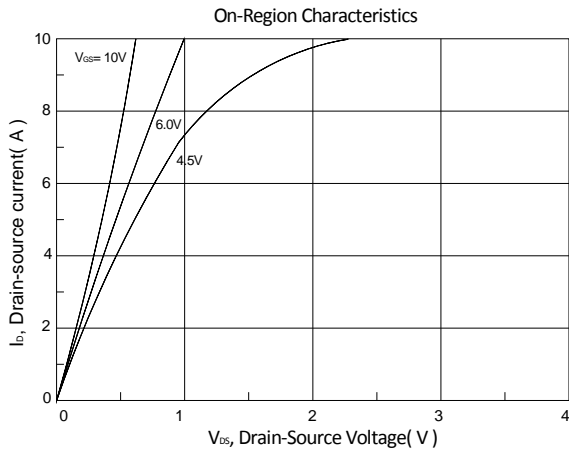
¹Pulse test : Pulse Width $\leq 300\ \mu\text{sec}$, Duty Cycle $\leq 2\%$.

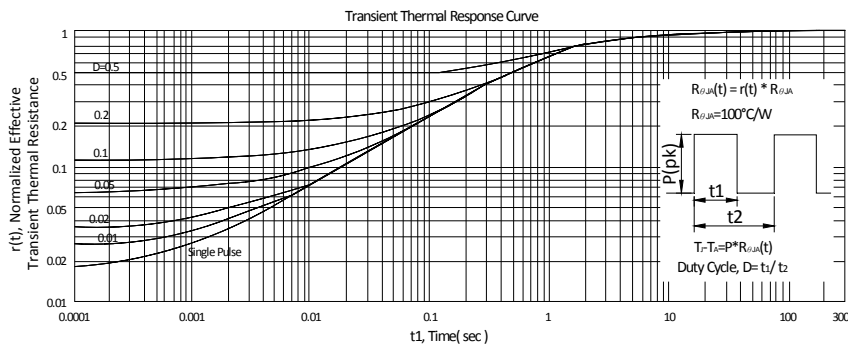
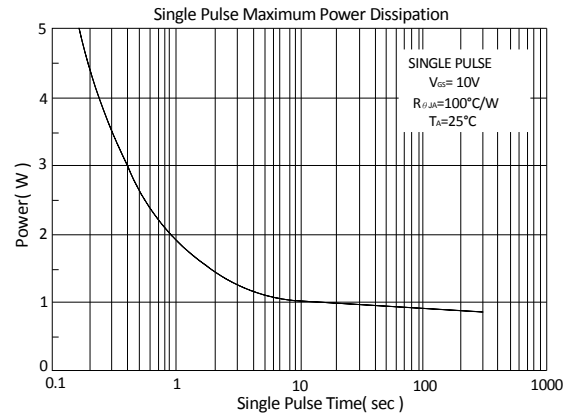
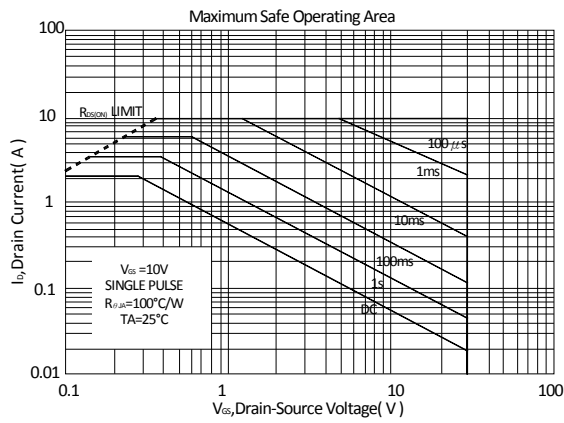
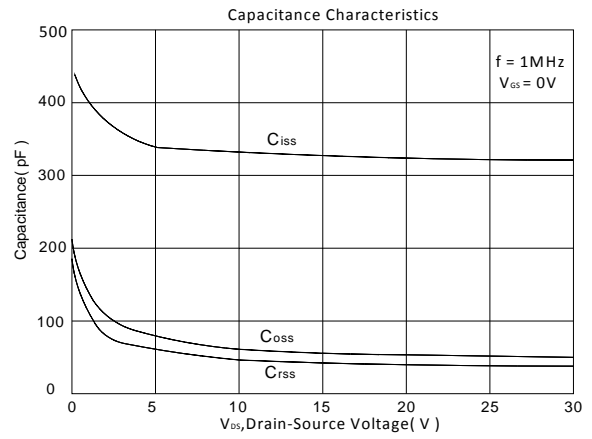
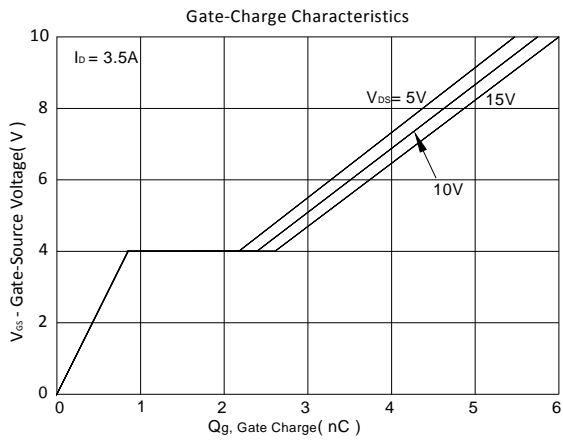
²Independent of operating temperature.

³Pulse width limited by maximum junction temperature.



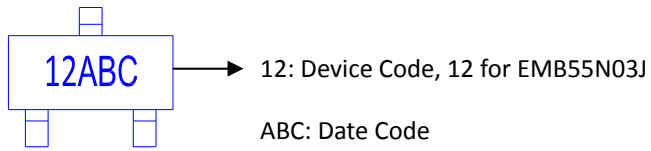
TYPICAL CHARACTERISTICS



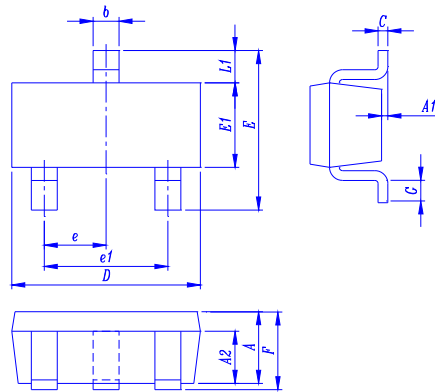


Ordering & Marking Information:

Device Name: EMB55N03J for SOT-23



Outline Drawing



Dimension in mm

| Dimension | A | A1 | A2 | b | C | D | E | E1 | e | e1 | F | G | L1 |
|-----------|------|------|------|------|------|------|------|------|------|------|------|-----|------|
| Min. | 0.85 | 0 | | 0.30 | 0.08 | 2.75 | 2.30 | 1.35 | | | 0.85 | 0.2 | 0.35 |
| Typ. | | | 0.80 | | | | | | 0.95 | 1.90 | | | |
| Max. | 1.25 | 0.13 | | 0.50 | 0.20 | 3.10 | 2.70 | 1.80 | | | 1.38 | 0.6 | 0.75 |

Footprint

