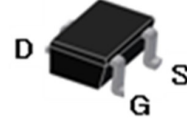
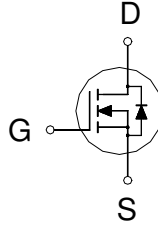


**N-Channel Logic Level Enhancement Mode Field Effect Transistor**

**Product Summary:**

|                            |      |
|----------------------------|------|
| BV <sub>DSS</sub>          | 20V  |
| R <sub>DS(on)</sub> (MAX.) | 30mΩ |
| I <sub>D</sub>             | 5A   |



Pb-Free Lead Plating & Halogen Free



**ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25 °C Unless Otherwise Noted)**

| PARAMETERS/TEST CONDITIONS                     |                        | SYMBOL                            | LIMITS     | UNIT |
|--|------------------------|-----------------------------------|------------|------|
| Gate-Source Voltage                            |                        | V <sub>GS</sub>                   | ±12        | V    |
| Continuous Drain Current                       | T <sub>A</sub> = 25 °C | I <sub>D</sub>                    | 5          | A    |
|  | T <sub>A</sub> = 70 °C |                                   | 3.6        |      |
| Pulsed Drain Current <sup>1</sup>              |                        | I <sub>DM</sub>                   | 20         |      |
| Power Dissipation                              | T <sub>A</sub> = 25 °C | P <sub>D</sub>                    | 1.25       | W    |
|  | T <sub>A</sub> = 70 °C |                                   | 0.8        |      |
| Operating Junction & Storage Temperature Range |                        | T <sub>J</sub> , T <sub>stg</sub> | -55 to 150 | °C   |

**THERMAL RESISTANCE RATINGS**

| THERMAL RESISTANCE               | SYMBOL           | TYPICAL | MAXIMUM | UNIT   |
|----------------------------------|------------------|---------|---------|--------|
| Junction-to-Ambient <sup>3</sup> | R <sub>θJA</sub> |         | 100     | °C / W |
| Junction-to-Lead <sup>4</sup>    | R <sub>θJL</sub> |         | 55      |        |

<sup>1</sup>Pulse width limited by maximum junction temperature.

<sup>2</sup>Duty cycle ≤ 1%

<sup>3</sup>100°C / W when mounted on a 1 in<sup>2</sup> pad of 2 oz copper.

<sup>4</sup> R<sub>θJA</sub> is the sum of the thermal impedance from junction to lead R<sub>θJL</sub> and lead to ambient.

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

| PARAMETER   | SYMBOL        | TEST CONDITIONS  | LIMITS |      |           | UNIT       |
|---|---------------|--|--------|------|-----------|------------|
|   |               |  | MIN    | TYP  | MAX       |            |
| <b>STATIC</b>   |               |  |        |      |           |            |
| Drain-Source Breakdown Voltage  | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$                                | 20     |      |           | V          |
| Gate Threshold Voltage  | $V_{GS(th)}$  | $V_{DS} = V_{GS}, I_D = 250\mu A$                            | 0.45   | 0.75 | 1.2       |            |
| Gate-Body Leakage   | $I_{GSS}$     | $V_{DS} = 0V, V_{GS} = \pm 12V$                              |        |      | $\pm 100$ | nA         |
| Zero Gate Voltage Drain Current   | $I_{DSS}$     | $V_{DS} = 16V, V_{GS} = 0V$                                  |        |      | 1         | $\mu A$    |
|   |               | $V_{DS} = 16V, V_{GS} = 0V, T_J = 125\text{ }^\circ\text{C}$ |        |      | 10        |            |
| On-State Drain Current <sup>1</sup>   | $I_{D(ON)}$   | $V_{DS} = 5V, V_{GS} = 4.5V$                                 | 5      |      |           | A          |
| Drain-Source On-State Resistance <sup>1</sup>   | $R_{DS(ON)}$  | $V_{GS} = 4.5V, I_D = 5A$                                    |        | 26   | 30        | m $\Omega$ |
|   |               | $V_{GS} = 2.5V, I_D = 4A$                                    |        | 45   | 51        |            |
|   |               | $V_{GS} = 1.8V, I_D = 2A$                                    |        | 56   | 80        |            |
| Forward Transconductance <sup>1</sup>   | $g_{fs}$      | $V_{DS} = 5V, I_D = 5A$                                      |        | 7    |           | S          |
| <b>DYNAMIC</b>  |               |  |        |      |           |            |
| Input Capacitance   | $C_{iss}$     | $V_{GS} = 0V, V_{DS} = 10V, f = 1MHz$                        |        | 280  |           | pF         |
| Output Capacitance  | $C_{oss}$     |  |        | 47   |           |            |
| Reverse Transfer Capacitance  | $C_{rss}$     |  |        | 38   |           |            |
| Total Gate Charge <sup>1,2</sup>  | $Q_g$         | $V_{DS} = 10V, V_{GS} = 4.5V, I_D = 5A$                      |        | 6.2  |           | nC         |
| Gate-Source Charge <sup>1,2</sup>   | $Q_{gs}$      |  |        | 0.9  |           |            |
| Gate-Drain Charge <sup>1,2</sup>  | $Q_{gd}$      |  |        | 2.1  |           |            |
| Turn-On Delay Time <sup>1,2</sup>   | $t_{d(on)}$   | $V_{DS} = 10V, I_D = 1A, V_{GS} = 4.5V, R_{GS} = 6\Omega$    |        | 12   |           | nS         |
| Rise Time <sup>1,2</sup>  | $t_r$         |  |        | 15   |           |            |
| Turn-Off Delay Time <sup>1,2</sup>  | $t_{d(off)}$  |  |        | 30   |           |            |
| Fall Time <sup>1,2</sup>  | $t_f$         |  |        | 13   |           |            |
| <b>SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (<math>T_c = 25\text{ }^\circ\text{C}</math>)</b> |               |  |        |      |           |            |
| Continuous Current  | $I_S$         |  |        |      | 3         | A          |
| Pulsed Current <sup>3</sup>   | $I_{SM}$      |  |        |      | 12        |            |
| Forward Voltage <sup>1</sup>  | $V_{SD}$      | $I_F = I_S, V_{GS} = 0V$                                     |        |      | 1.2       | V          |

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

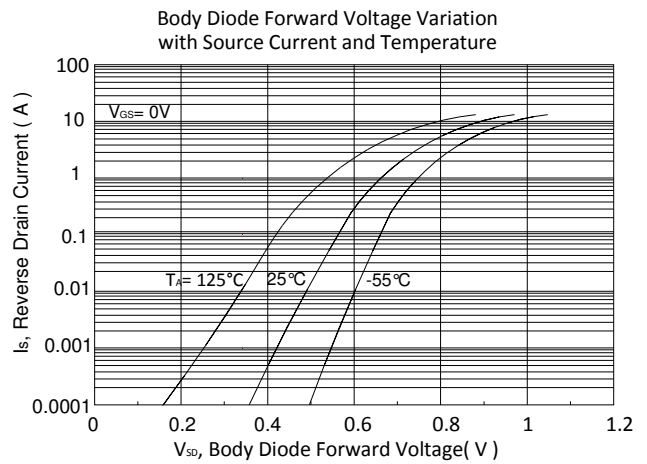
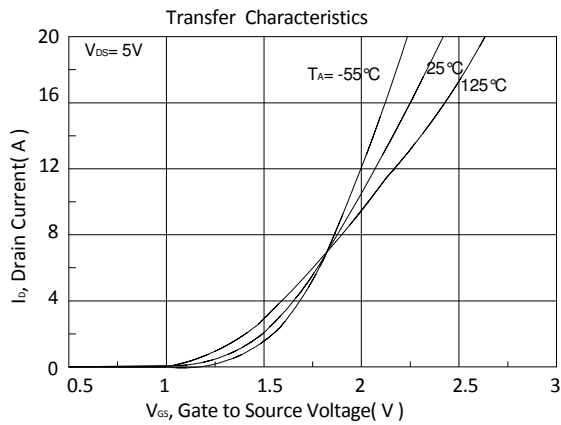
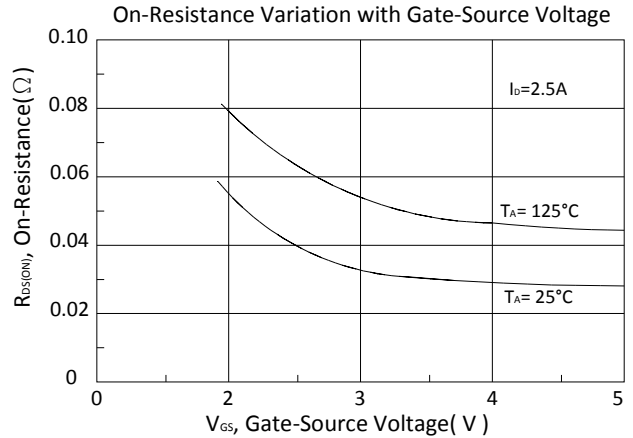
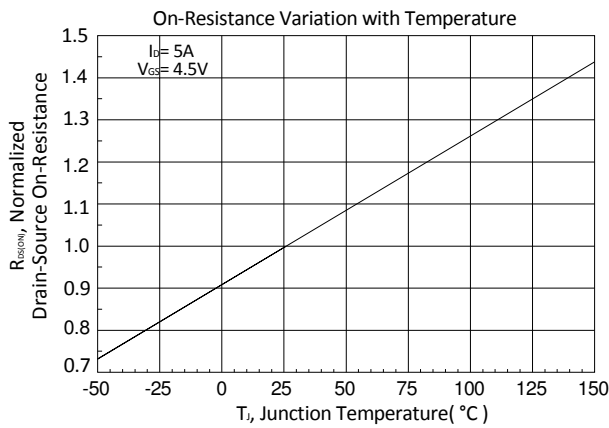
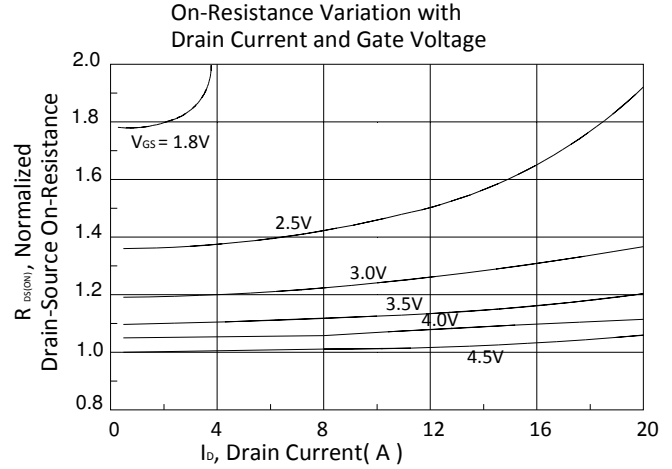
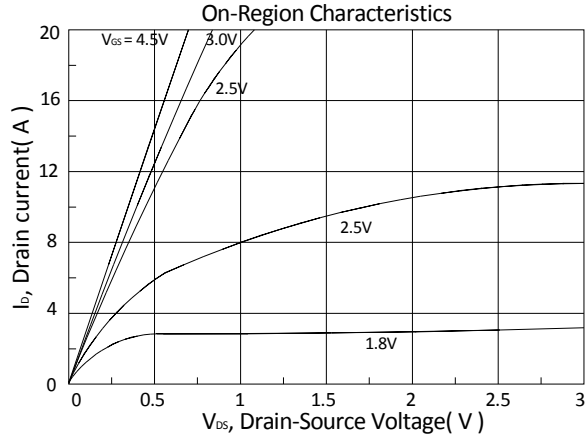
<sup>2</sup>Independent of operating temperature.

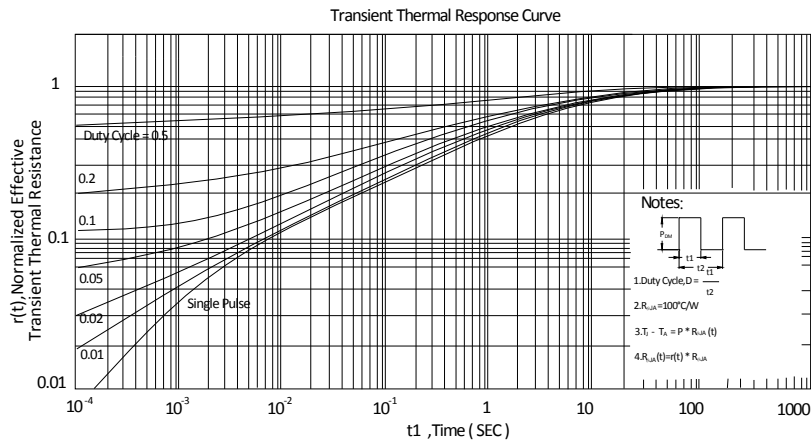
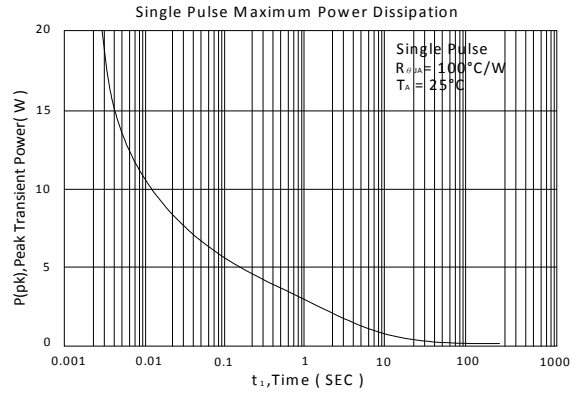
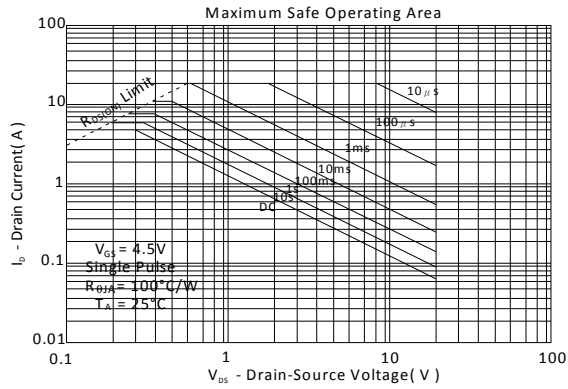
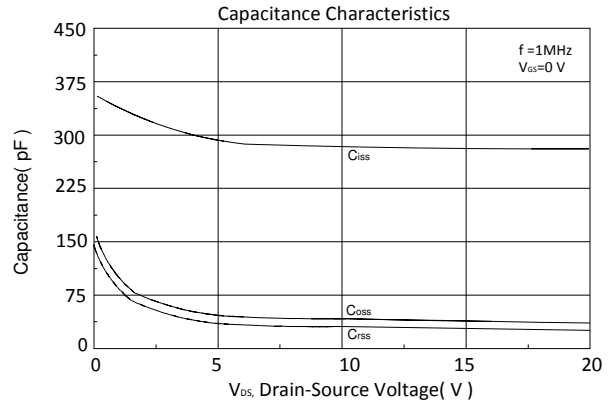
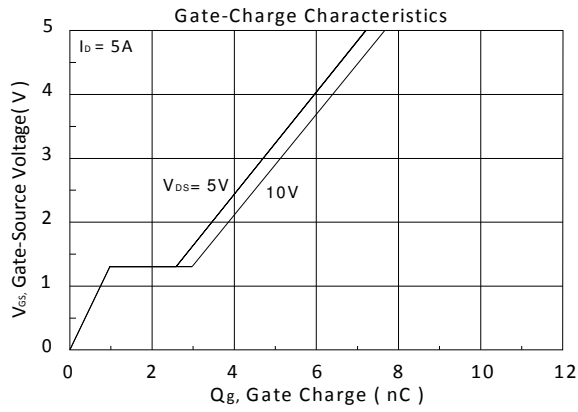
<sup>3</sup>Pulse width limited by maximum junction temperature.

EMC will review datasheet by quarter, and update new version.



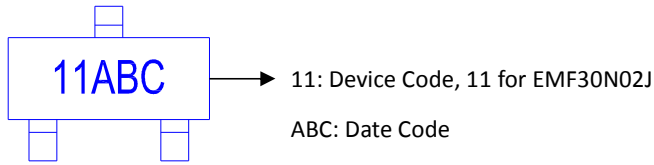
TYPICAL CHARACTERISTICS



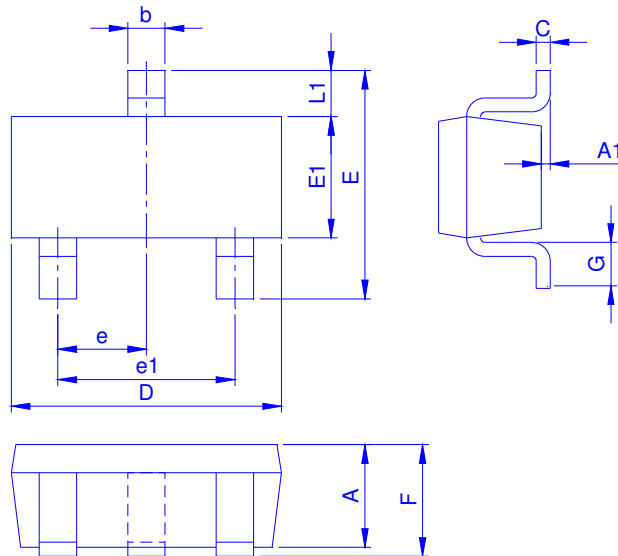


Ordering & Marking Information:

Device Name: EMF30N02J for SOT23-3



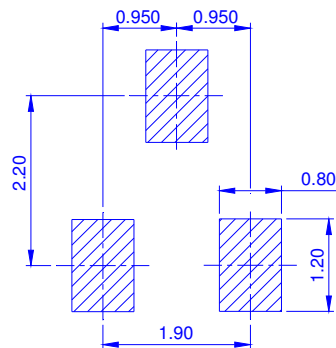
Outline Drawing



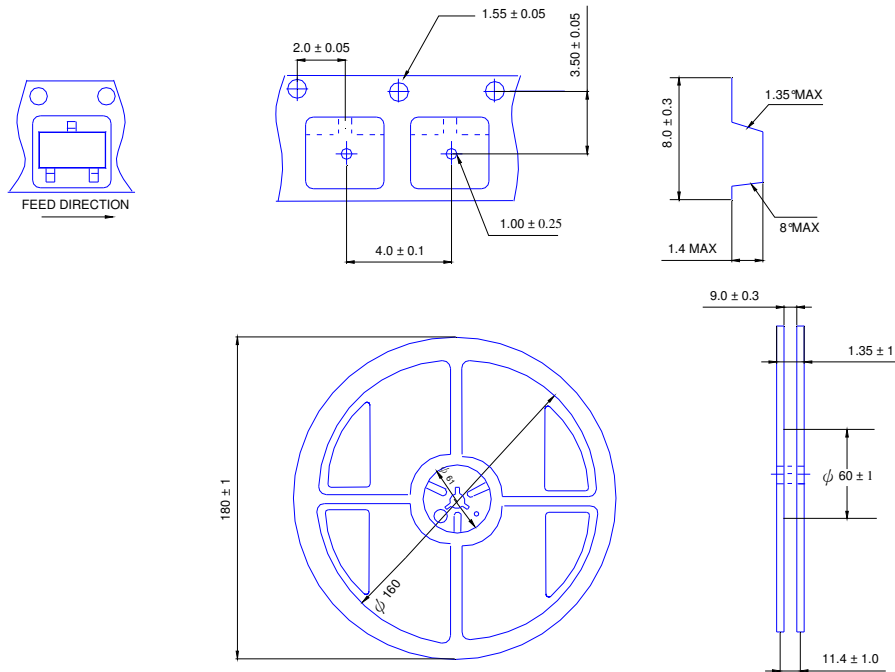
Dimension in mm

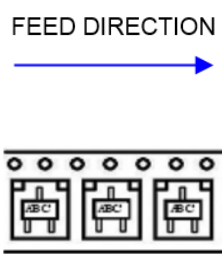
| Dimension | A    | A1   | b    | C     | D    | E    | E1   | e    | e1   | F    | G    | L1   |
|-----------|------|------|------|-------|------|------|------|------|------|------|------|------|
| Min.      | 0.70 | -    | 0.30 | 0.080 | 2.80 | 2.10 | 1.20 | 0.90 | 1.80 | 0.80 | 0.30 | 0.54 |
| Typ.      | 0.95 | -    | 0.40 | 0.127 | 2.90 | 2.50 | 1.30 | 0.95 | 1.90 | 0.95 | 0.40 | 0.57 |
| Max.      | 1.20 | 0.15 | 0.50 | 0.202 | 3.10 | 3.00 | 1.80 | 1.00 | 2.00 | 1.25 | 0.60 | 0.70 |

Footprint



◆ Tape&Reel Information:3000pcs/Reel



|         |  |
|---------|--|
| 產品別     | SOT23-3  |
| Reel 尺寸 | 7"   |
| 編帶方式    | FEED DIRECTION<br> |
| 前空格     | 50   |
| 後空格     | 50   |
| 裝箱數     |  |
| 滿捲數量    | 3K   |
| 捲/內盒比   | 5 : 1  |
| 內盒滿箱數   | 15K  |
| 內/外箱比   | 12 : 1   |
| 外箱滿箱數   | 180K   |