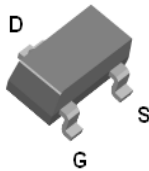


# P5103EMA

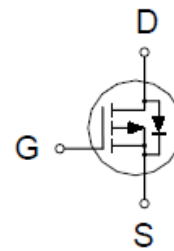
## P-Channel Enhancement Mode MOSFET

### PRODUCT SUMMARY

| $V_{(BR)DSS}$ | $R_{DS(ON)}$           | $I_D$ |
|---------------|------------------------|-------|
| -30V          | 51mΩ @ $V_{GS} = -10V$ | -3.8A |



SOT-23(S)



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

| PARAMETERS/TEST CONDITIONS           |                      | SYMBOL         | LIMITS     | UNITS |
|--------------------------------------|----------------------|----------------|------------|-------|
| Drain-Source Voltage                 |                      | $V_{DS}$       | -30        | V     |
| Gate-Source Voltage                  |                      | $V_{GS}$       | ±20        |       |
| Continuous Drain Current             | $T_A = 25\text{ °C}$ | $I_D$          | -3.8       | A     |
|                                      | $T_A = 70\text{ °C}$ |                | -3         |       |
| Pulsed Drain Current <sup>1</sup>    |                      | $I_{DM}$       | -20        |       |
| Power Dissipation                    | $T_A = 25\text{ °C}$ | $P_D$          | 1          | W     |
|                                      | $T_A = 70\text{ °C}$ |                | 0.7        |       |
| Junction & Storage Temperature Range |                      | $T_J, T_{STG}$ | -55 to 150 | °C    |

### THERMAL RESISTANCE RATINGS

| THERMAL RESISTANCE               | SYMBOL          | TYPICAL | MAXIMUM | UNITS  |
|----------------------------------|-----------------|---------|---------|--------|
| Junction-to-Ambient <sup>2</sup> | $R_{\theta JA}$ |         | 117     | °C / W |

<sup>1</sup>Limited by maximum junction temperature.

<sup>2</sup>The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25\text{ °C}$ .

# P5103EMA

## P-Channel Enhancement Mode MOSFET

### ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25 °C, Unless Otherwise Noted)

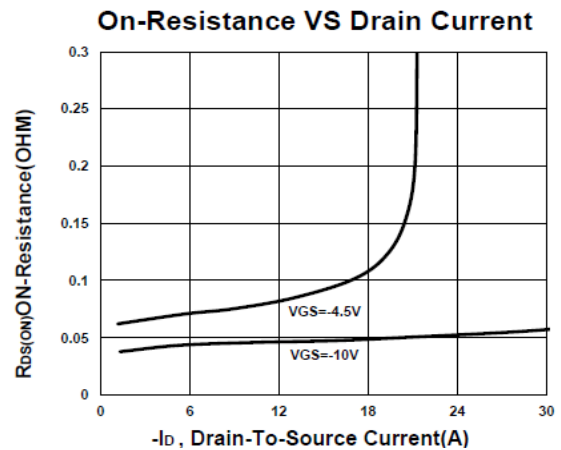
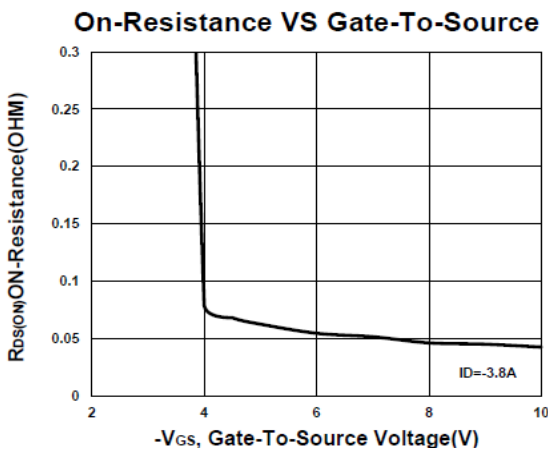
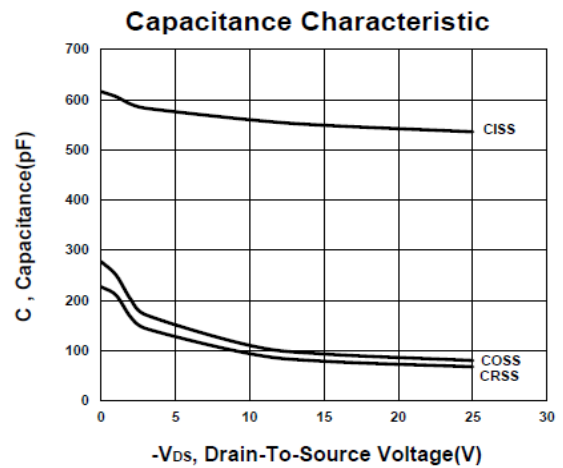
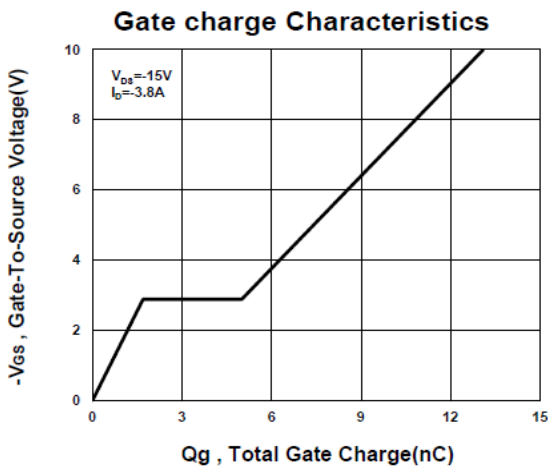
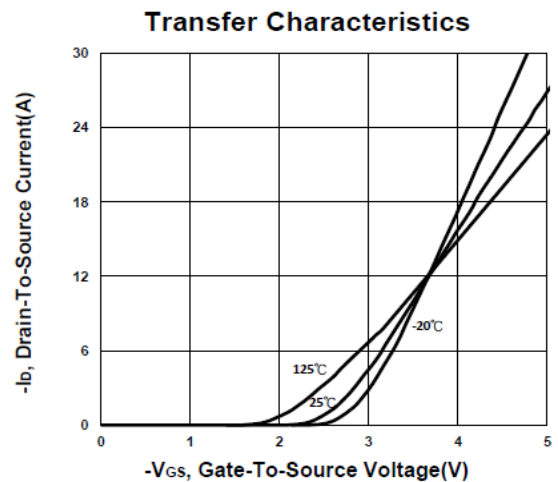
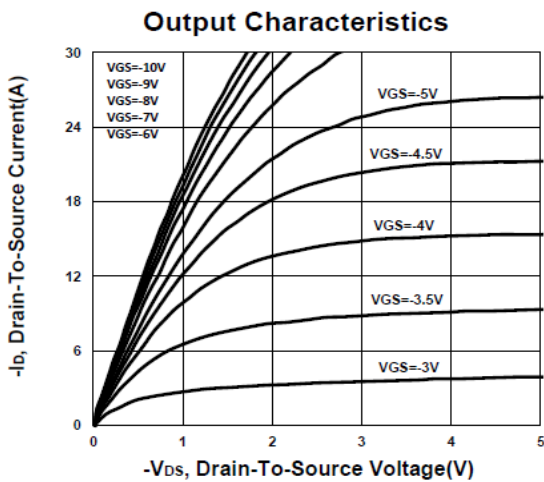
| PARAMETER  | SYMBOL                   | TEST CONDITIONS  | LIMITS  |      |      | UNIT |    |    |
|--|--------------------------|--|---|------|------|------|----|----|
|  |                          |  | MIN   | TYP  | MAX  |      |    |    |
| <b>STATIC</b>  |                          |  |   |      |      |      |    |    |
| Drain-Source Breakdown Voltage   | V <sub>(BR)DSS</sub>     | V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA                        | -30   |      |      | V    |    |    |
| Gate Threshold Voltage   | V <sub>GS(th)</sub>      | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA          | -1  | -1.8 | -3   | V    |    |    |
| Gate-Body Leakage  | I <sub>GSS</sub>         | V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V                         |   |      | ±100 | nA   |    |    |
| Zero Gate Voltage Drain Current  | I <sub>DSS</sub>         | V <sub>DS</sub> = -24V, V <sub>GS</sub> = 0V                         |   |      | -1   | μA   |    |    |
|  |                          | V <sub>DS</sub> = -20V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 70 °C |   |      | -10  |      |    |    |
| Drain-Source On-State Resistance <sup>1</sup>                                  | R <sub>DS(ON)</sub>      | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -3.5A                      |   | 65   | 85   | mΩ   |    |    |
|  |                          | V <sub>GS</sub> = -10V, I <sub>D</sub> = -3.8A                       |   | 41   | 51   |      |    |    |
| Forward Transconductance <sup>1</sup>  | g <sub>fs</sub>          | V <sub>DS</sub> = -5V, I <sub>D</sub> = -3.8A                        |   | 7    |      | S    |    |    |
| <b>DYNAMIC</b>   |                          |  |   |      |      |      |    |    |
| Input Capacitance  | C <sub>iss</sub>         | V <sub>GS</sub> = 0V, V <sub>DS</sub> = -15V, f = 1MHz               |   | 562  |      | pF   |    |    |
| Output Capacitance   | C <sub>oss</sub>         |  |   | 98   |      |      |    |    |
| Reverse Transfer Capacitance   | C <sub>rss</sub>         |  |   | 85   |      |      |    |    |
| Total Gate Charge <sup>2</sup>   | Q <sub>g(VGS=10V)</sub>  | V <sub>DS</sub> = -15V, I <sub>D</sub> = -3.8A                       |   | 13.3 |      | nC   |    |    |
|  | Q <sub>g(VGS=4.5V)</sub> |  |   | 6.9  |      |      |    |    |
| Gate-Source Charge <sup>2</sup>  | Q <sub>gs</sub>          |  |   | 1.9  |      |      |    |    |
| Gate-Drain Charge <sup>2</sup>   | Q <sub>gd</sub>          |  |   | 3.5  |      |      |    |    |
| Turn-On Delay Time <sup>2</sup>  | t <sub>d(on)</sub>       |  | V <sub>DS</sub> = -15V<br>I <sub>D</sub> ≅ -3.8A, V <sub>GS</sub> = -10V, R <sub>GEN</sub> = 6Ω |      | 22   |      |    | nS |
| Rise Time <sup>2</sup>   | t <sub>r</sub>           |  |   |      | 23   |      |    |    |
| Turn-Off Delay Time <sup>2</sup>   | t <sub>d(off)</sub>      |  |   | 110  |      |      |    |    |
| Fall Time <sup>2</sup>   | t <sub>f</sub>           |  |   | 58   |      |      |    |    |
| <b>SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTIC ( T<sub>J</sub> = 25 °C )</b> |                          |  |   |      |      |      |    |    |
| Continuous Current   | I <sub>S</sub>           |  |   |      | -0.9 | A    |    |    |
| Forward Voltage <sup>1</sup>   | V <sub>SD</sub>          | I <sub>F</sub> = -3.8A, V <sub>GS</sub> = 0V                         |   |      | -1.1 | V    |    |    |
| Reverse Recovery Time  | t <sub>rr</sub>          | I <sub>F</sub> = -3.8A, dI <sub>F</sub> /dt = 100A /μS               |   | 13.2 |      | nS   |    |    |
| Reverse Recovery Charge  | Q <sub>rr</sub>          |  |   |      | 6    |      | nC |    |

<sup>1</sup>Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

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

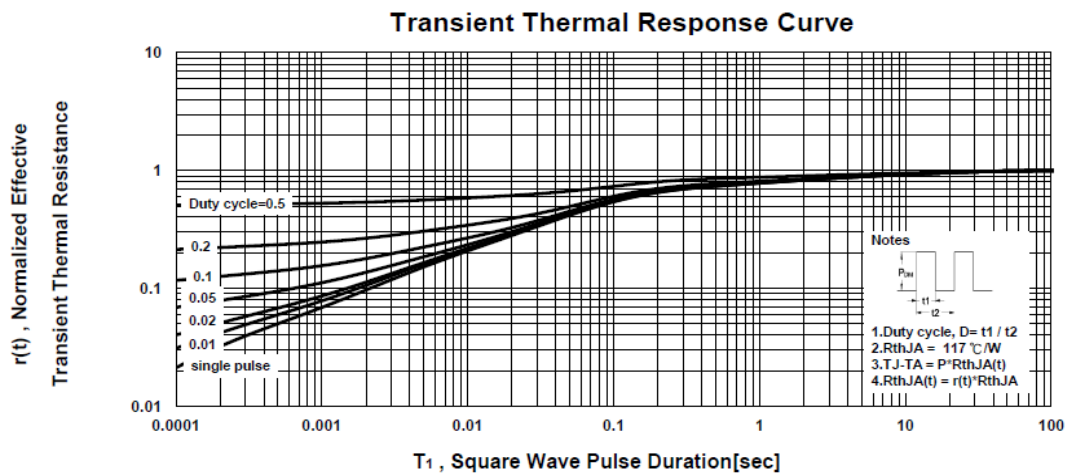
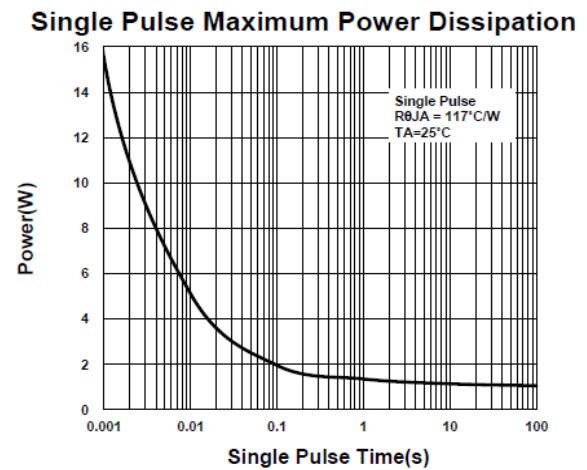
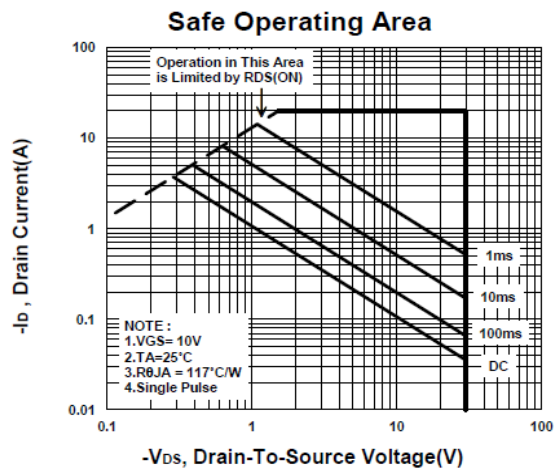
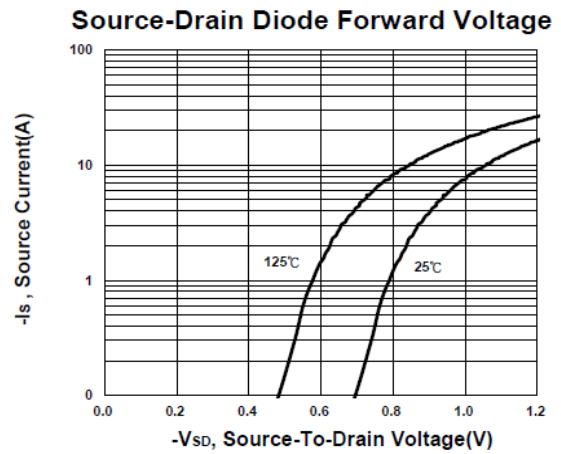
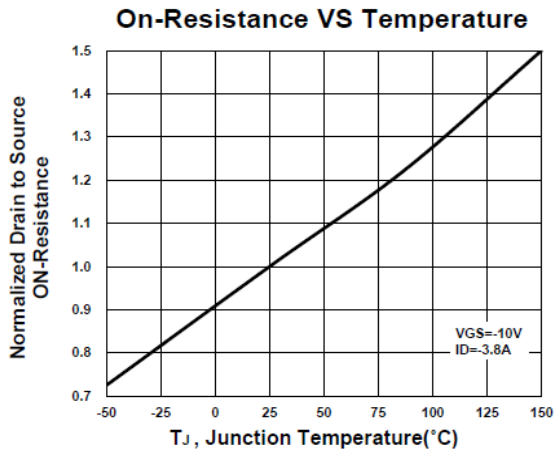
# P5103EMA

## P-Channel Enhancement Mode MOSFET



# P5103EMA

## P-Channel Enhancement Mode MOSFET



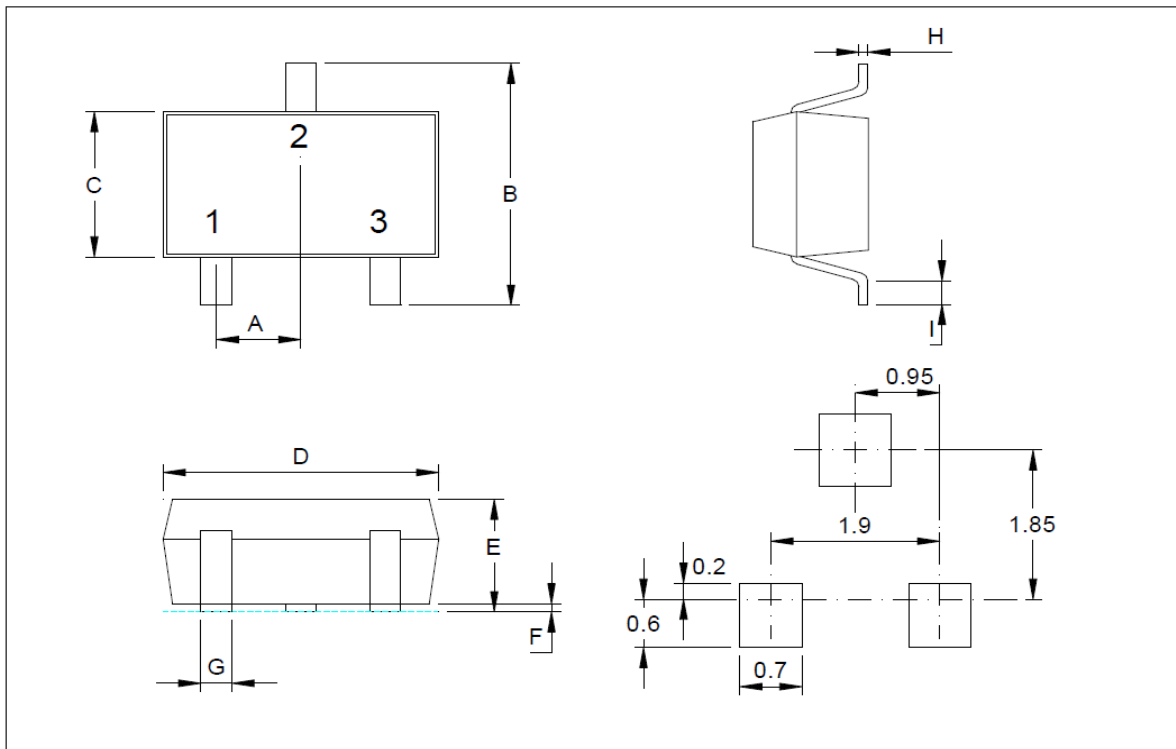
# P5103EMA

## P-Channel Enhancement Mode MOSFET

### Package Dimension

### SOT-23 (S) MECHANICAL DATA

| Dimension | mm   |      |      | Dimension | mm   |      |      |
|-----------|------|------|------|-----------|------|------|------|
|           | Min. | Typ. | Max. |           | Min. | Typ. | Max. |
| A         | 0.9  |      | 1    | H         | 0.08 |      | 0.2  |
| B         | 2.25 |      | 2.85 | I         | 0.15 |      | 0.6  |
| C         | 1.2  |      | 1.4  |           |      |      |      |
| D         | 2.8  |      | 3.04 |           |      |      |      |
| E         | 0.89 |      | 1.2  |           |      |      |      |
| F         | 0    |      | 0.1  |           |      |      |      |
| G         | 0.3  |      | 0.5  |           |      |      |      |



\*因为各家封装模具不同而外观略有所差异，不影响电性及Layout。