



# EM02P06FM

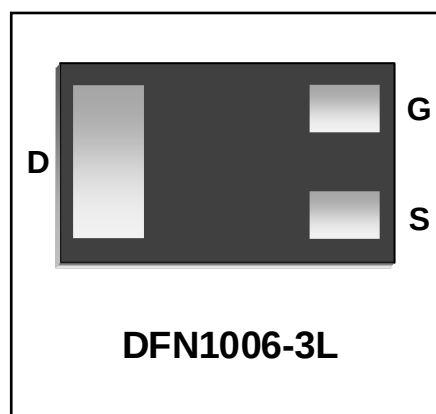
## P-Channel Trench MOSFET

### Features

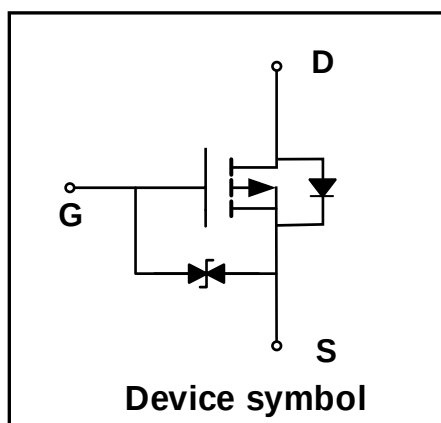
- Very Fast switching
- Trench MOSFET technology
- Low threshold voltage
- Pb Free Device
- ESD protected

### Mechanical Characteristics

- DFN1006-3L package
- Marking : Making Code
- RoHS Compliant



### Schematic & PIN Configuration



### Absolute Maximum Rating

| Parameter                                                | Symbol          | Value       | Unit |
|----------------------------------------------------------|-----------------|-------------|------|
| Drain-Source Voltage                                     | $V_{DS}$        | -20         | V    |
| Gate-Source Voltage                                      | $V_{GS}$        | $\pm 10$    | V    |
| Continuous Drain Current <sup>1</sup>                    | $I_D$           | -0.66       | A    |
| Pulsed Drain Current( $t_p=10\mu s$ )                    | $I_{DM}$        | -1.2        | A    |
| Power Dissipation <sup>1</sup>                           | $P_D$           | 150         | mW   |
| Junction Temperature                                     | $T_J$           | 150         | °C   |
| Storage Temperature                                      | $T_{STG}$       | -55 to +150 | °C   |
| Thermal Resistance from Junction to Ambient <sup>1</sup> | $R_{\theta JA}$ | 833         | °C/W |

**Electrical Characteristics ( $T_{amb}=25^{\circ}\text{C}$  unless otherwise specified)**

| Parameter                                     | Symbol              | Test Condition                                                                              | Min. | Typ. | Max. | Unit |
|-----------------------------------------------|---------------------|---------------------------------------------------------------------------------------------|------|------|------|------|
| Static Characteristics                        |                     |                                                                                             |      |      |      |      |
| Drain-Source Breakdown Voltage                | BV <sub>DSS</sub>   | V <sub>GS</sub> = 0 V, I <sub>D</sub> = -250μA                                              | -20  | -    | -    | V    |
| Zero Gate Voltage Drain Current               | I <sub>DSS</sub>    | V <sub>DS</sub> = -20V, V <sub>GS</sub> = 0 V                                               | -    | -    | -1   | μA   |
| Gate-body Leakage Current                     | I <sub>GSS</sub>    | V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±10V                                               | -    | -    | ±20  | μA   |
| Drain-Source On-state Resistance <sup>2</sup> | R <sub>DS(on)</sub> | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -1.0A                                             | -    | 450  | 520  | mΩ   |
|                                               |                     | V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -0.8A                                             | -    | 650  | 780  |      |
|                                               |                     | V <sub>GS</sub> = -1.8V, I <sub>D</sub> = -0.5A                                             | -    | 950  | -    |      |
| Gate Threshold Voltage <sup>2</sup>           | V <sub>GS(th)</sub> | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA                                 | -0.3 | -0.6 | -1.1 | V    |
| Dynamic Characteristics                       |                     |                                                                                             |      |      |      |      |
| Input Capacitance                             | C <sub>iss</sub>    | V <sub>GS</sub> = 0V, V <sub>DS</sub> = -16V, f = 1MHz                                      | -    | 113  | -    | pF   |
| Output Capacitance                            | C <sub>oss</sub>    |                                                                                             | -    | 15   | -    |      |
| Reverse Transfer Capacitance                  | C <sub>rss</sub>    |                                                                                             | -    | 9    | -    |      |
| Switching Characteristics <sup>3,4</sup>      |                     |                                                                                             |      |      |      |      |
| Turn-On Delay Time                            | t <sub>d(on)</sub>  | V <sub>DS</sub> = -10V, V <sub>GS</sub> = -4.5V,I <sub>D</sub> = -0.2A, R <sub>G</sub> =10Ω | -    | 9    | -    | ns   |
| Turn-On Rise Time                             | t <sub>r</sub>      |                                                                                             | -    | 5.7  | -    |      |
| Turn-Off Delay Time                           | t <sub>d(off)</sub> |                                                                                             | -    | 32.6 | -    |      |
| Turn- Off Fall Time                           | t <sub>f</sub>      |                                                                                             | -    | 20.3 | -    |      |
| Source-Drain Diode characteristics            |                     |                                                                                             |      |      |      |      |
| Diode Forward Voltage                         | V <sub>SD</sub>     | I <sub>S</sub> = -0.5A, V <sub>GS</sub> = 0V                                                | -    | -    | -1.2 | V    |

Notes :

1. Surface mounted on FR4 board using the minimum recommended pad size.
2. Pulse Test: Pulse width $\leq 300\mu\text{s}$ , duty cycle $\leq 2\%$ .
3. Switching characteristics are independent of operating junction temperatures.
4. Guaranteed by design, not subject to producing.

Typical Characteristics

Figure 1. Output Characteristics

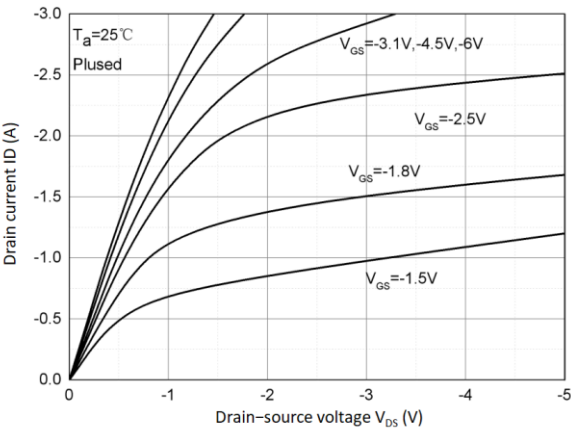


Figure 2. Transfer Characteristics

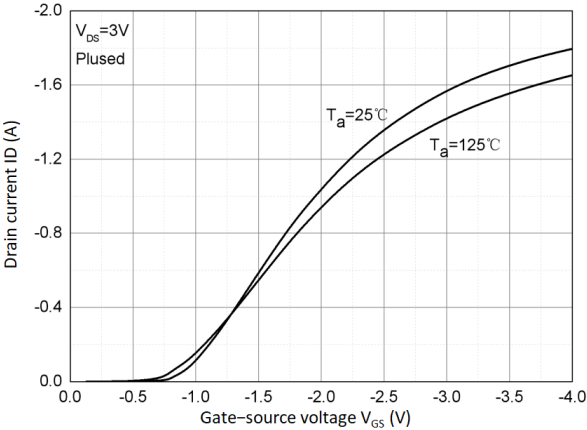


Figure 3.  $R_{DS(ON)}$  vs.  $I_D$

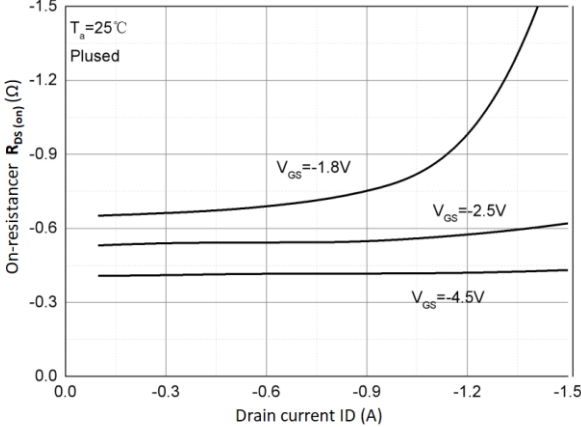


Figure 4.  $R_{DS(ON)}$  vs.  $V_{GS}$

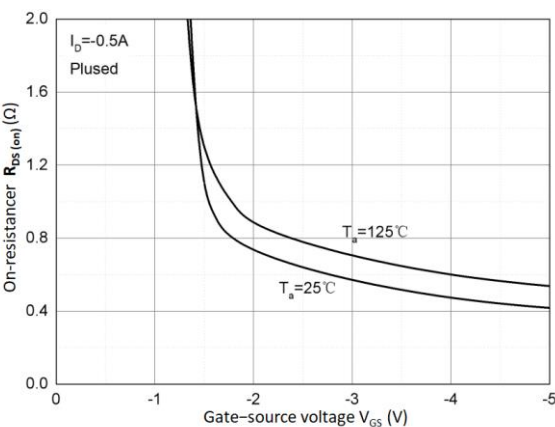


Figure 5.  $I_S$  vs.  $V_{SD}$

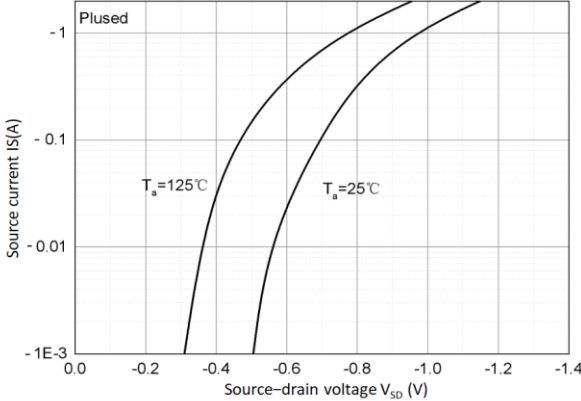
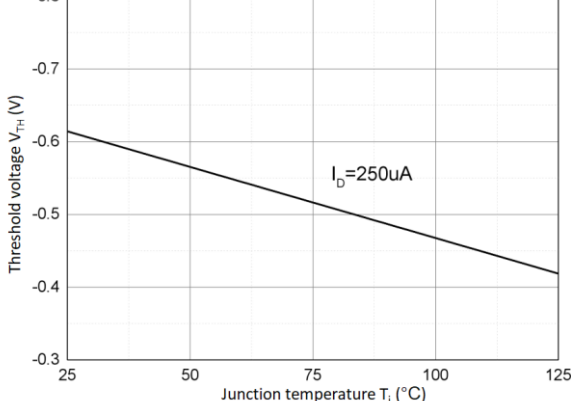
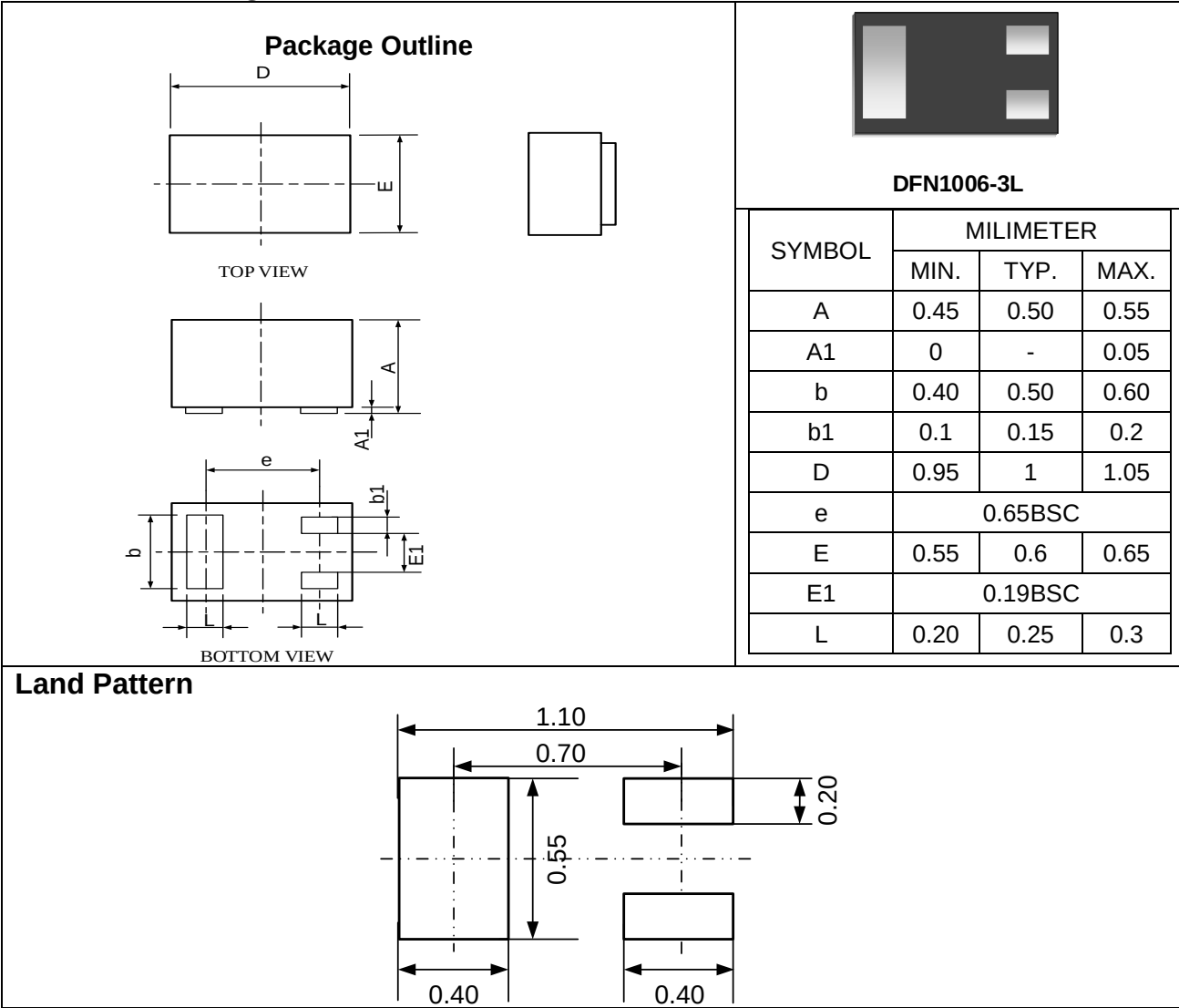


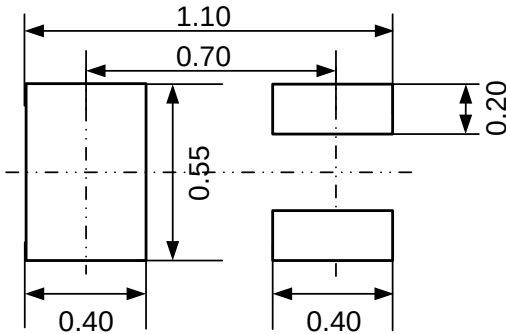
Figure 6. Threshold Voltage



Outline Drawing – DFN1006-3L



Land Pattern



Marking Codes

|              |           |
|--------------|-----------|
| Part Number  | EM02P06FM |
| Marking code |           |

Package Information

Qty: 10k/Reel

Revision History

| No. | Version | Date       | Revision Item    | Request    | Function and characteristic checking | Package dimension checking | Typos checking |
|-----|---------|------------|------------------|------------|--------------------------------------|----------------------------|----------------|
| 1   | 1.0     | 2018-08-14 | Released Version | Qi Shu Kun | Qi Shu Kun                           | Liu Jia Ying               | Liu Jia Ying   |
|     |         |            |                  |            |                                      |                            |                |
|     |         |            |                  |            |                                      |                            |                |