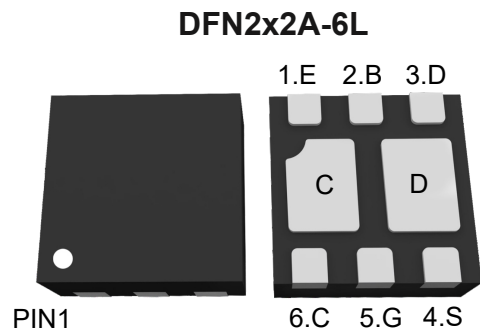


### Features

- Small Surface Mount Package
- ESD Protected(HBM) up to 2KV
- N-Channel MOSFET  
 $V_{DS} = 20V$ ,  $I_D = 0.8A$   
 $R_{DS(on)} < 300m\Omega @ V_{GS} = 4.5V$
- PNP Transistor  
 $V_{CBO} = -40V$ ,  $V_{CEO} = -25V$

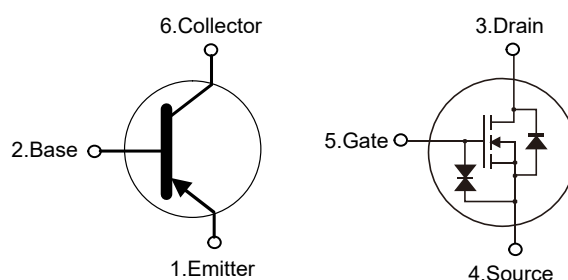


**Marking Code: 720**

### Applications

- Li-Battery Charging
- Other power management in portable

### Schematic Diagram



### Absolute Maximum Ratings

Ratings at 25°C ambient temperature unless otherwise specified.

| Parameter                                | Symbol     | Value       | Unit |
|--|------------|-------------|------|
| <b>N-MOS</b>                             |            |             |      |
| Drain-Source Voltage                     | $V_{DS}$   | 20          | V    |
| Gate-Source Voltage                      | $V_{GS}$   | $\pm 12$    | V    |
| Drain Current-Continuous                 | $I_D$      | 0.8         | A    |
| Drain Current-Pulsed <sup>Note1</sup>    | $I_{DM}$   | 3.2         | A    |
| <b>PNP Transistor</b>                    |            |             |      |
| Collector Base Voltage                   | $-V_{CBO}$ | 40          | V    |
| Collector Emitter Voltage                | $-V_{CEO}$ | 25          | V    |
| Emitter Base Voltage                     | $-V_{EBO}$ | 6           | V    |
| Collector Current                        | $-I_C$     | 1.5         | A    |
| <b>Power Dissipation and Temperature</b> |            |             |      |
| Maximum Power Dissipation                | $P_D$      | 0.35        | W    |
| Junction Temperature                     | $T_J$      | 150         | °C   |
| Storage Temperature Range                | $T_{STG}$  | -55 to +150 | °C   |

### Thermal Characteristics

|  |                 |     |      |
|--|-----------------|-----|------|
| Thermal Resistance, Junction-to-Ambient <sup>Note2</sup> | $R_{\theta JA}$ | 357 | °C/W |
|--|-----------------|-----|------|



## N-MOS

### Electrical Characteristics

(Ta=25°C unless otherwise specified)

| Parameter                                   | Symbol        | Test Condition  | Min. | Typ. | Max.     | Unit       |
|---|---------------|---|------|------|----------|------------|
| <b>Static Characteristics</b>               |               |   |      |      |          |            |
| Drain-Source Breakdown Voltage              | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$                             | 20   | --   | --       | V          |
| Zero Gate Voltage Drain Current             | $I_{DSS}$     | $V_{DS}=20V, V_{GS}=0V$                               | --   | --   | 1        | $\mu A$    |
| Gate-Body Leakage Current                   | $I_{GSS}$     | $V_{GS}=\pm 10V, V_{DS}=0V$                           | --   | --   | $\pm 10$ | $\mu A$    |
| Gate Threshold Voltage <sup>Note3</sup>     | $V_{GS(th)}$  | $V_{DS}=V_{GS}, I_D=250\mu A$                         | 0.35 | 0.75 | 1.1      | V          |
| Drain-Source On-Resistance <sup>Note3</sup> | $R_{DS(on)}$  | $V_{GS}=4.5V, I_D=0.6A$                               | --   | 180  | 300      | m $\Omega$ |
|   |               | $V_{GS}=2.5V, I_D=0.5A$                               | --   | 260  | 350      | m $\Omega$ |
| Forward Transconductance <sup>Note3</sup>   | $g_{FS}$      | $V_{DS}=5V, I_D=0.5A$                                 | --   | 2    | --       | S          |
| <b>Dynamic Characteristics</b>              |               |   |      |      |          |            |
| Input Capacitance                           | $C_{iss}$     | $V_{DS}=10V, V_{GS}=0V, f=1MHz$                       | --   | 56   | --       | pF         |
| Output Capacitance                          | $C_{oss}$     |   | --   | 20   | --       | pF         |
| Reverse Transfer Capacitance                | $C_{rss}$     |   | --   | 2.5  | --       | pF         |
| <b>Switching Characteristics</b>            |               |   |      |      |          |            |
| Turn-on Delay Time                          | $t_{d(on)}$   | $V_{DD}=10V, I_D=0.5A$<br>$V_{GS}=4.5V, R_G=10\Omega$ | --   | 2    | --       | nS         |
| Turn-on Rise Time                           | $t_r$         |   | --   | 18.8 | --       | nS         |
| Turn-off Delay Time                         | $t_{d(off)}$  |   | --   | 10   | --       | nS         |
| Turn-off Fall Time                          | $t_f$         |   | --   | 23   | --       | nS         |
| Total Gate Charge                           | $Q_g$         | $V_{DS}=10V, I_D=0.5A, V_{GS}=4.5V$                   | --   | 1    | --       | nC         |
| Gate-Source Charge                          | $Q_{gs}$      |   | --   | 0.28 | --       | nC         |
| Gate-Drain Charge                           | $Q_{gd}$      |   | --   | 0.22 | --       | nC         |
| <b>Source-Drain Diode Characteristics</b>   |               |   |      |      |          |            |
| Diode Forward Voltage <sup>Note3</sup>      | $V_{SD}$      | $V_{GS}=0V, I_S=0.8A$                                 | --   | --   | 1.2      | V          |
| Diode Forward Current <sup>Note2</sup>      | $I_S$         |   | --   | --   | 0.8      | A          |

Note: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.

3. Pulse Test: Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 0.5\%$ .

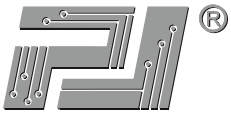


## PNP Transistor

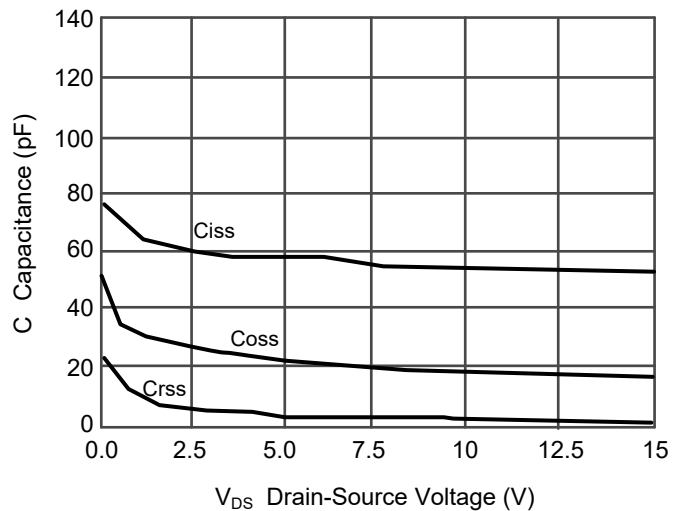
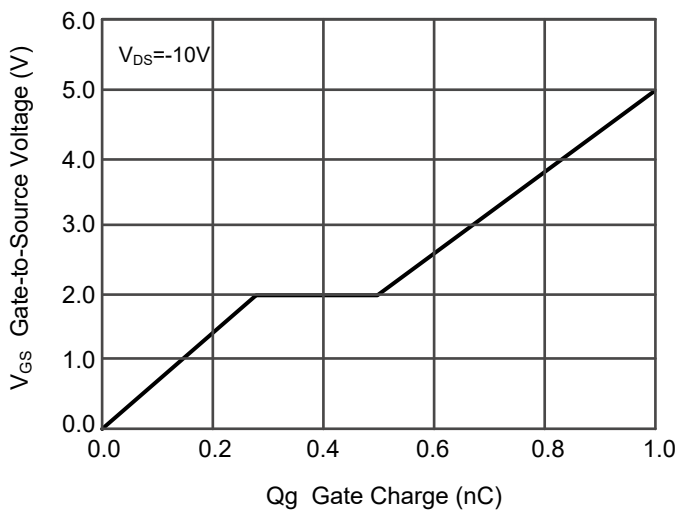
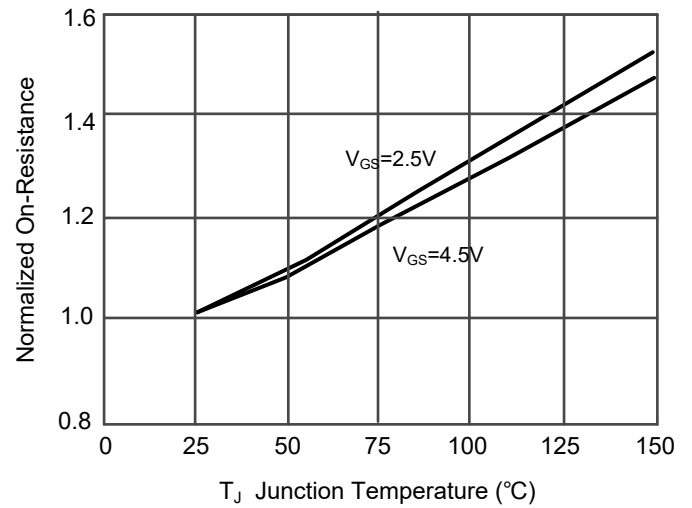
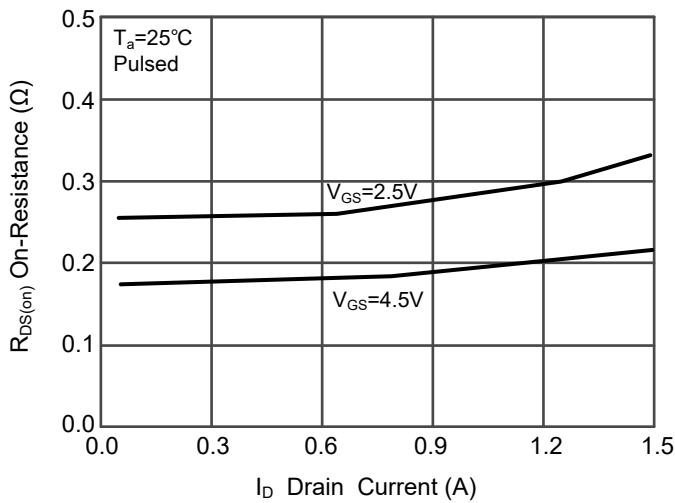
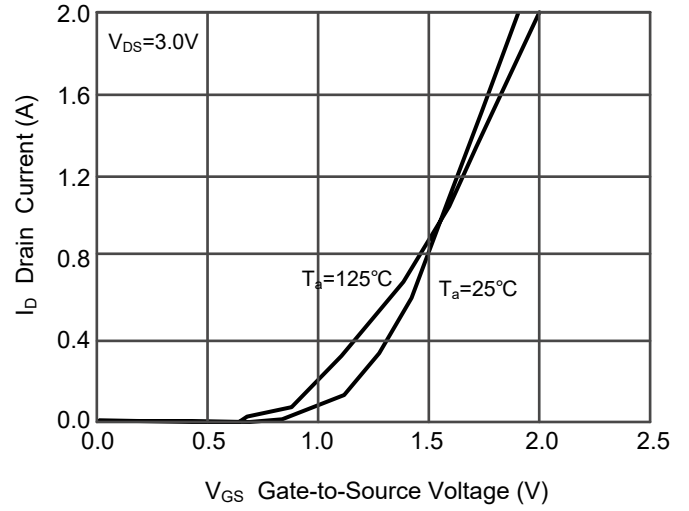
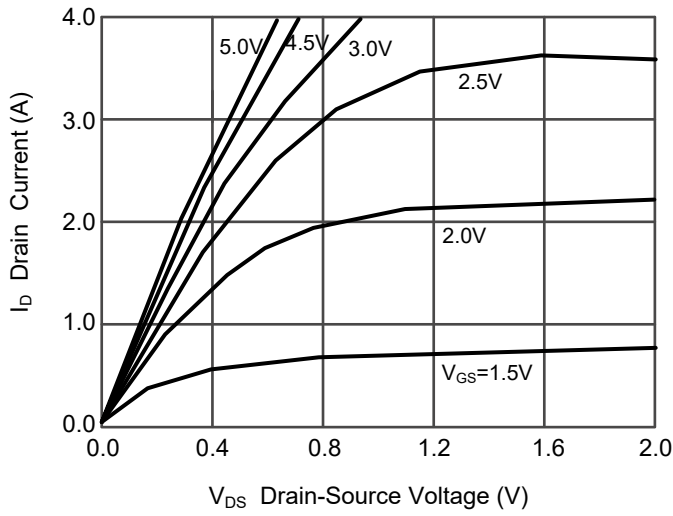
### Electrical Characteristics

(Ta=25°C unless otherwise specified)

| Parameter   | Symbol         | Min. | Max. | Unit |
|---|----------------|------|------|------|
| DC Current Gain<br>at $V_{CE} = -2\text{ V}$ , $I_C = -500\text{ mA}$                     | $H_{FE}$       | 100  | 360  | --   |
| Collector Base Cutoff Current<br>at $V_{CB} = -35\text{ V}$                               | $-I_{CBO}$     | --   | 100  | nA   |
| Base Base Cutoff Current<br>at $V_{EB} = -6\text{ V}$                                     | $-I_{EBO}$     | --   | 100  | nA   |
| Collector Base Breakdown Voltage<br>at $I_C = -100\text{ }\mu\text{A}$                    | $-V_{(BR)CBO}$ | 40   | --   | V    |
| Collector Emitter Breakdown Voltage<br>at $I_C = -2\text{ mA}$                            | $-V_{(BR)CEO}$ | 25   | --   | V    |
| Emitter Base Breakdown Voltage<br>at $I_E = -100\text{ }\mu\text{A}$                      | $-V_{(BR)EBO}$ | 6    | --   | V    |
| Collector Emitter Saturation Voltage<br>at $I_C = -800\text{ mA}$ , $I_B = -80\text{ mA}$ | $-V_{CE(sat)}$ | --   | 0.5  | V    |
| Base Emitter Saturation Voltage<br>at $I_C = -800\text{ mA}$ , $I_B = -80\text{ mA}$      | $-V_{BE(sat)}$ | --   | 1.2  | V    |
| Base Emitter On Voltage<br>at $V_{CE} = -1\text{ V}$ , $I_C = -10\text{ mA}$              | $-V_{BE(on)}$  | --   | 1    | V    |
| Transition Frequency<br>at $V_{CE} = -10\text{ V}$ , $I_C = -50\text{ mA}$                | $F_T$          | 120  | --   | MHz  |



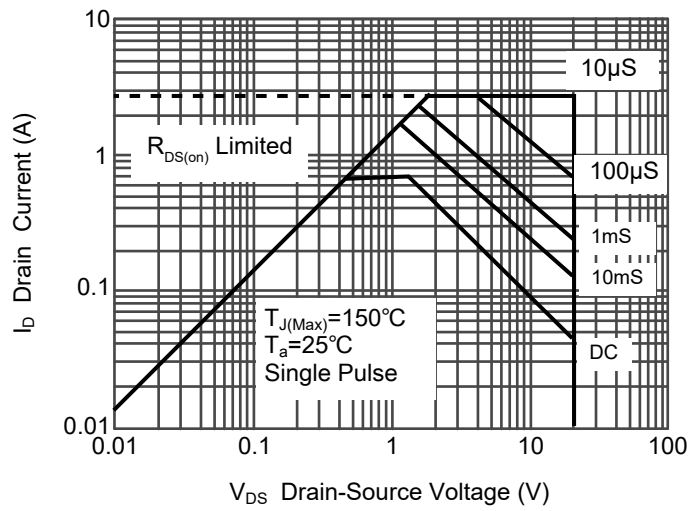
**N-MOS**  
**Typical Characteristic Curves**





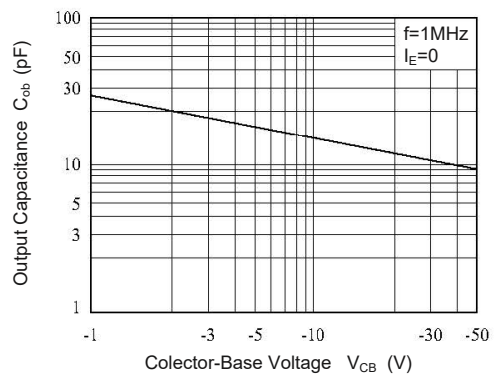
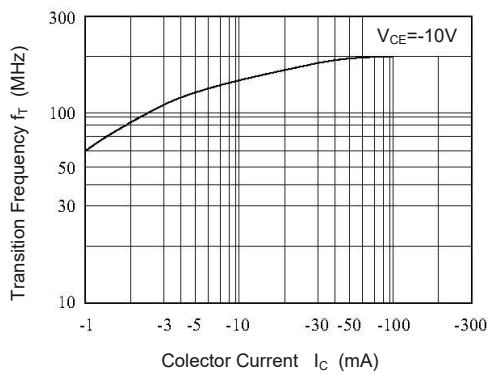
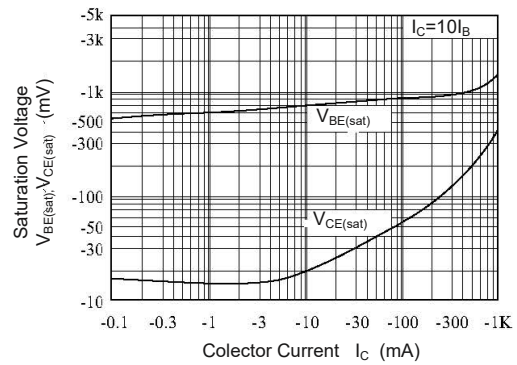
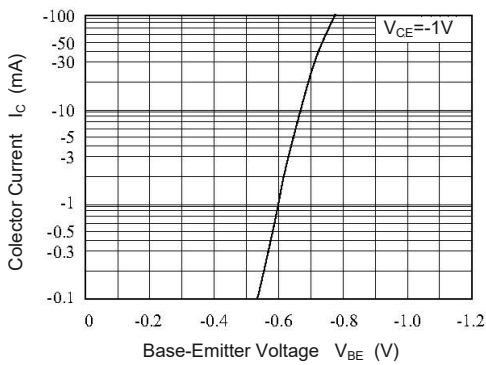
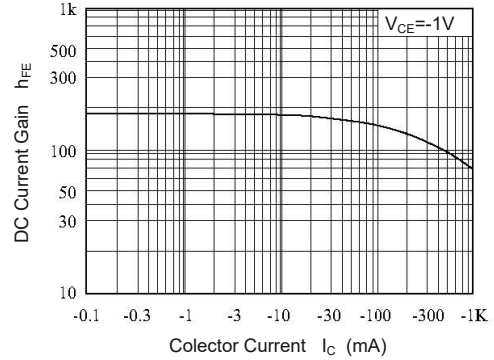
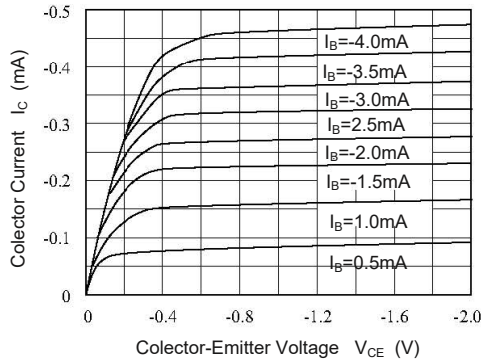
# PJMT23DFA

## N-Channel Enhancement Mode MOSFET with PNP Transistor





### PNP Transistor Typical Characteristic Curves





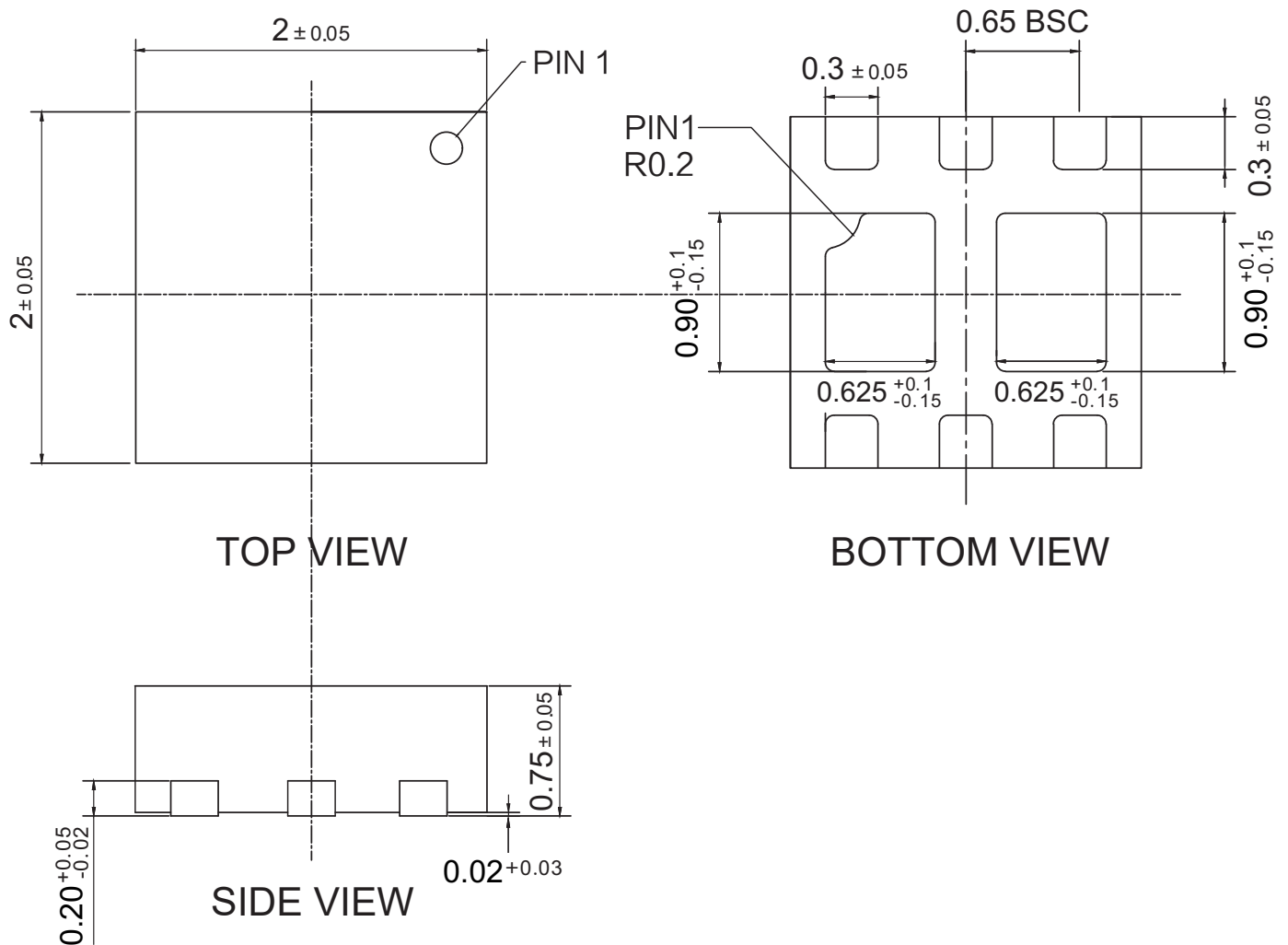
# PJMT23DFA

## N-Channel Enhancement Mode MOSFET with PNP Transistor

### Package Outline

DFN2x2-6L-0002

Dimensions in mm



### Ordering Information

| Device    | Package    | Shipping              |
|-----------|------------|-----------------------|
| PJMT23DFA | DFN2x2A-6L | 3,000PCS/Reel&7inches |