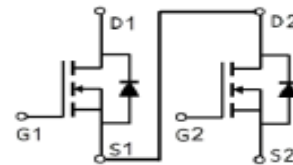
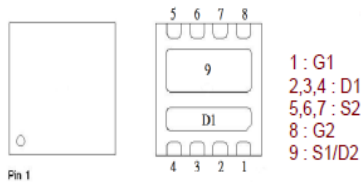


# PE618DT

## Dual N-Channel Enhancement Mode MOSFET

### PRODUCT SUMMARY

|    | $V_{(BR)DSS}$ | $R_{DS(ON)}$          | $I_D$ |
|----|---------------|-----------------------|-------|
| Q2 | 30V           | 7mΩ @ $V_{GS} = 10V$  | 39A   |
| Q1 | 30V           | 16mΩ @ $V_{GS} = 10V$ | 23A   |



PDFN 3X3S

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

| PARAMETERS/TEST CONDITIONS                     |                           | SYMBOL         | Q2         | Q1  | UNITS            |
|------------------------------------------------|---------------------------|----------------|------------|-----|------------------|
| Drain-Source Voltage                           |                           | $V_{DS}$       | 30         | 30  | V                |
| Gate-Source Voltage                            |                           | $V_{GS}$       | ±20        | ±20 |                  |
| Continuous Drain Current <sup>3</sup>          | $T_C = 25^\circ\text{C}$  | $I_D$          | 39         | 23  | A                |
|                                                | $T_C = 100^\circ\text{C}$ |                | 25         | 14  |                  |
| Pulsed Drain Current <sup>1</sup>              |                           | $I_{DM}$       | 50         | 32  |                  |
| Continuous Drain Current                       | $T_A = 25^\circ\text{C}$  | $I_D$          | 12         | 7.3 |                  |
|                                                | $T_A = 70^\circ\text{C}$  |                | 10         | 5.8 |                  |
| Avalanche Current                              |                           | $I_{AS}$       | 23         | 12  |                  |
| Avalanche Energy                               | $L = 0.1\text{mH}$        | $E_{AS}$       | 26         | 7   | mJ               |
| Power Dissipation                              | $T_C = 25^\circ\text{C}$  | $P_D$          | 20         | 16  | W                |
|                                                | $T_C = 100^\circ\text{C}$ |                | 8.3        | 6   |                  |
| Power Dissipation                              | $T_A = 25^\circ\text{C}$  | $P_D$          | 2.2        | 1.6 |                  |
|                                                | $T_A = 70^\circ\text{C}$  |                | 1.4        | 1   |                  |
| Operating Junction & Storage Temperature Range |                           | $T_J, T_{stg}$ | -55 to 150 |     | $^\circ\text{C}$ |

### THERMAL RESISTANCE RATINGS

| THERMAL RESISTANCE               | SYMBOL          |    | TYPICAL | MAXIMUM | UNITS                       |
|----------------------------------|-----------------|----|---------|---------|-----------------------------|
| Junction-to-Ambient <sup>2</sup> | $R_{\theta JA}$ | Q2 |         | 56      | $^\circ\text{C} / \text{W}$ |
|                                  | $R_{\theta JA}$ | Q1 |         | 77      |                             |
| Junction-to-case                 | $R_{\theta JC}$ | Q2 |         | 6       |                             |
|                                  | $R_{\theta JC}$ | Q1 |         | 7.5     |                             |

<sup>1</sup>Pulse width limited by maximum junction temperature  $T_{J(MAX)} = 150^\circ\text{C}$ .

<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  $T_A = 25^\circ\text{C}$ . The value in any given application depends on the user's specific board design.

<sup>3</sup>Package limitation current is Q2=19A , Q1=11A.

# PE618DT

## Dual N-Channel Enhancement Mode MOSFET

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

| PARAMETER                                     | SYMBOL        |                 | TEST CONDITIONS                                        | LIMITS |     |      | UNITS     |
|-----------------------------------------------|---------------|-----------------|--------------------------------------------------------|--------|-----|------|-----------|
|                                               |               |                 |                                                        | MIN    | TYP | MAX  |           |
| STATIC                                        |               |                 |                                                        |        |     |      |           |
| Drain-Source Breakdown Voltage                | $V_{(BR)DSS}$ |                 | $V_{GS} = 0V, I_D = 250\mu A$                          | Q2     | 30  |      | V         |
|                                               |               |                 |                                                        | Q1     | 30  |      |           |
| Gate Threshold Voltage                        | $V_{GS(th)}$  |                 | $V_{DS} = V_{GS}, I_D = 250\mu A$                      | Q2     | 1.3 | 1.75 | 2.3       |
|                                               |               |                 |                                                        | Q1     | 1.3 | 1.75 | 2.3       |
| Gate-Body Leakage                             | $I_{GSS}$     |                 | $V_{DS} = 0V, V_{GS} = \pm 20V$                        | Q2     |     |      | $\pm 100$ |
|                                               |               |                 |                                                        | Q1     |     |      | $\pm 100$ |
| Zero Gate Voltage Drain Current               | $I_{DSS}$     |                 | $V_{DS} = 24V, V_{GS} = 0V$                            | Q2     |     |      | 1         |
|                                               |               |                 |                                                        | Q1     |     |      | 1         |
|                                               |               |                 | $V_{DS} = 20V, V_{GS} = 0V, T_J = 55\text{ }^{\circ}C$ | Q2     |     |      | 10        |
|                                               |               |                 |                                                        | Q1     |     |      | 10        |
| Drain-Source On-State Resistance <sup>1</sup> | $R_{DS(ON)}$  |                 | $V_{GS} = 4.5V, I_D = 10A$                             | Q2     |     | 7    | 9.5       |
|                                               |               |                 | $V_{GS} = 4.5V, I_D = 6A$                              | Q1     |     | 19.4 | 24        |
|                                               |               |                 | $V_{GS} = 10V, I_D = 12A$                              | Q2     |     | 5.4  | 7         |
|                                               |               |                 | $V_{GS} = 10V, I_D = 7A$                               | Q1     |     | 13   | 16        |
| Forward Transconductance <sup>1</sup>         | $g_{fs}$      |                 | $V_{DS} = 5V, I_D = 12A$                               | Q2     |     | 55   | S         |
|                                               |               |                 | $V_{DS} = 5V, I_D = 7A$                                | Q1     |     | 34   |           |
| DYNAMIC                                       |               |                 |                                                        |        |     |      |           |
| Input Capacitance                             | $C_{iss}$     |                 | $V_{GS} = 0V, V_{DS} = 15V, f = 1MHz$                  | Q2     |     | 941  | pF        |
|                                               |               |                 |                                                        | Q1     |     | 331  |           |
| Output Capacitance                            | $C_{oss}$     |                 |                                                        | Q2     |     | 172  |           |
|                                               |               |                 |                                                        | Q1     |     | 71   |           |
| Reverse Transfer Capacitance                  | $C_{rss}$     |                 |                                                        | Q2     |     | 118  |           |
|                                               |               |                 |                                                        | Q1     |     | 48   |           |
| Total Gate Charge <sup>2</sup>                | $Q_g$         | $V_{GS} = 10V$  | Q2                                                     |        | 21  | nC   |           |
|                                               |               |                 | Q1                                                     |        | 8   |      |           |
|                                               |               | $V_{GS} = 4.5V$ | Q2                                                     |        | 14  |      |           |
|                                               |               |                 | Q1                                                     |        | 4.4 |      |           |
| Gate-Source Charge <sup>2</sup>               | $Q_{gs}$      |                 | Q1                                                     | Q2     |     |      | 2         |
| Gate-Drain Charge <sup>2</sup>                | $Q_{gd}$      |                 | $V_{DS} = 15V, V_{GS} = 10V, I_D = 12A$                | Q1     |     |      | 1.2       |
|                                               |               |                 | $V_{DS} = 15V, V_{GS} = 10V, I_D = 7A$                 | Q2     |     |      | 7         |
|                                               |               |                 | Q1                                                     |        | 2.3 |      |           |

## PE618DT

### Dual N-Channel Enhancement Mode MOSFET

|                                                                         |                     |                                                                                                                                                                                                            |    |  |      |      |    |
|-------------------------------------------------------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|--|------|------|----|
| Turn-On Delay Time <sup>2</sup>                                         | t <sub>d(on)</sub>  | Q2<br>V <sub>DS</sub> = 15V ,<br>I <sub>D</sub> ≅ 12A, V <sub>GS</sub> = 10V, R <sub>GEN</sub> =6Ω<br>Q1<br>V <sub>DS</sub> = 15V ,<br>I <sub>D</sub> ≅ 7A, V <sub>GS</sub> = 10V,<br>R <sub>GEN</sub> =6Ω | Q2 |  | 28   |      | nS |
|                                                                         |                     |                                                                                                                                                                                                            | Q1 |  | 17   |      |    |
| Rise Time <sup>2</sup>                                                  | t <sub>r</sub>      |                                                                                                                                                                                                            | Q2 |  | 23.8 |      |    |
|                                                                         |                     |                                                                                                                                                                                                            | Q1 |  | 17   |      |    |
| Turn-Off Delay Time <sup>2</sup>                                        | t <sub>d(off)</sub> |                                                                                                                                                                                                            | Q2 |  | 51   |      |    |
|                                                                         |                     |                                                                                                                                                                                                            | Q1 |  | 37   |      |    |
| Fall Time <sup>2</sup>                                                  | t <sub>f</sub>      |                                                                                                                                                                                                            | Q2 |  | 25   |      |    |
|                                                                         |                     |                                                                                                                                                                                                            | Q1 |  | 18   |      |    |
| SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T <sub>j</sub> = 25 °C) |                     |                                                                                                                                                                                                            |    |  |      |      |    |
| Continuous Current <sup>3</sup>                                         | I <sub>S</sub>      |                                                                                                                                                                                                            | Q2 |  |      | 16   | A  |
|                                                                         |                     |                                                                                                                                                                                                            | Q1 |  |      | 11.4 |    |
| Forward Voltage <sup>1</sup>                                            | V <sub>SD</sub>     | I <sub>F</sub> = 12A, V <sub>GS</sub> = 0V                                                                                                                                                                 | Q2 |  |      | 1.2  | V  |
|                                                                         |                     | I <sub>F</sub> = 7A, V <sub>GS</sub> = 0V                                                                                                                                                                  | Q1 |  |      | 1.4  |    |
| Reverse Recovery Time                                                   | t <sub>rr</sub>     | Q2<br>I <sub>F</sub> = 12A, dl <sub>F</sub> /dt = 100A /μS                                                                                                                                                 | Q2 |  | 16   |      | nS |
|                                                                         |                     |                                                                                                                                                                                                            | Q1 |  | 8.8  |      |    |
| Reverse Recovery Charge                                                 | Q <sub>rr</sub>     | Q1<br>I <sub>F</sub> = 7A, dl <sub>F</sub> /dt = 100A /μS                                                                                                                                                  | Q2 |  | 7    |      | nC |
|                                                                         |                     |                                                                                                                                                                                                            | Q1 |  | 2.3  |      |    |

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

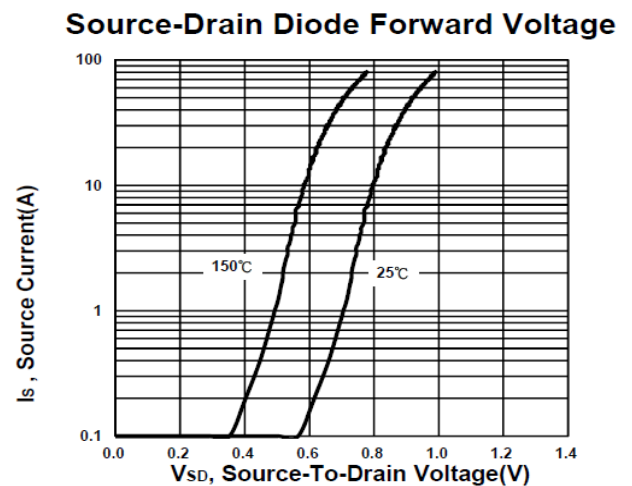
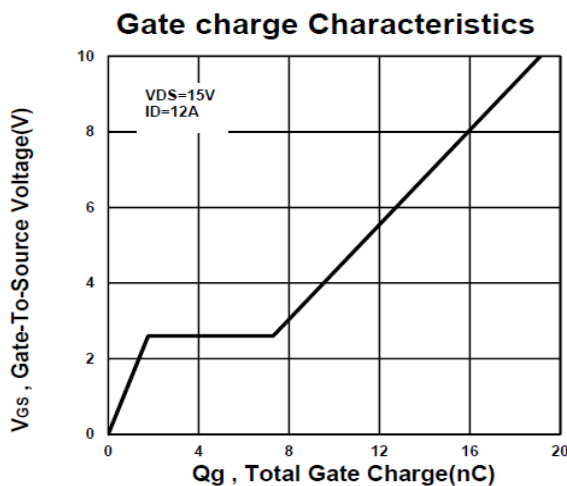
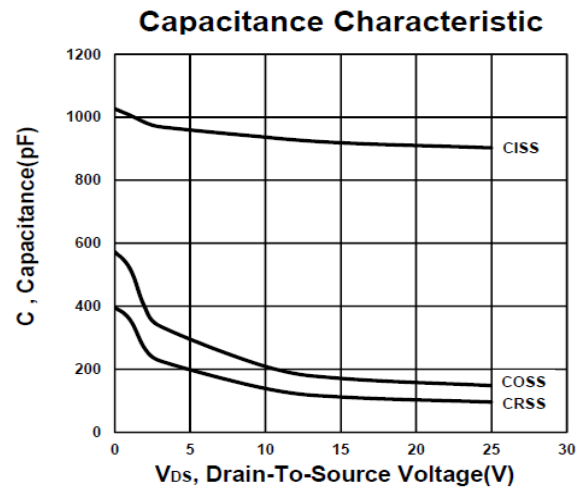
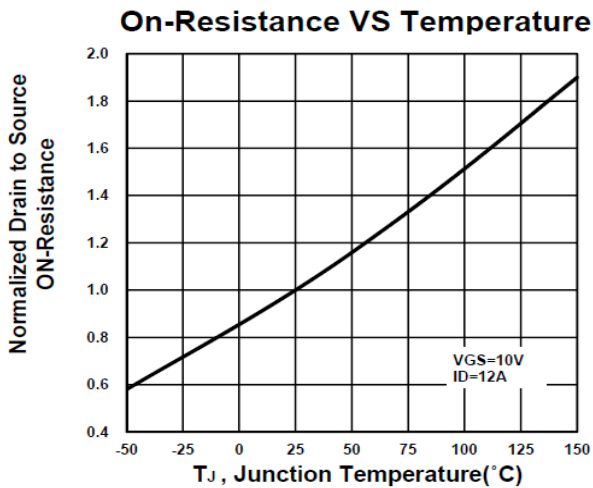
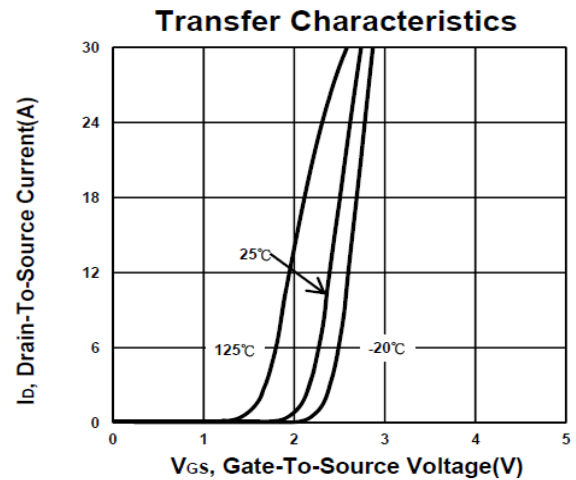
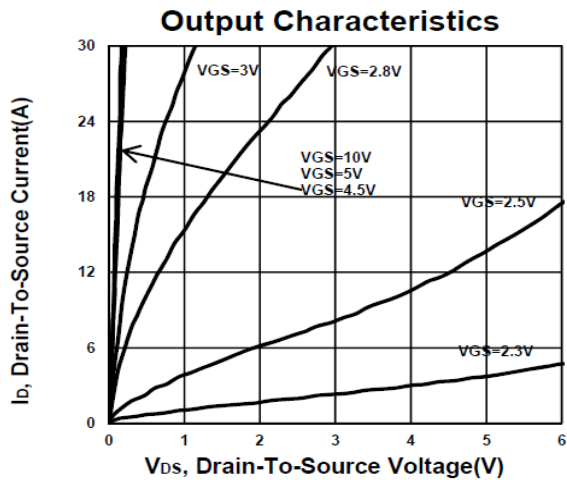
<sup>2</sup>Independent of operating temperature.

<sup>3</sup>Package limitation current is Q2=19A , Q1=11A.

## PE618DT

### Dual N-Channel Enhancement Mode MOSFET

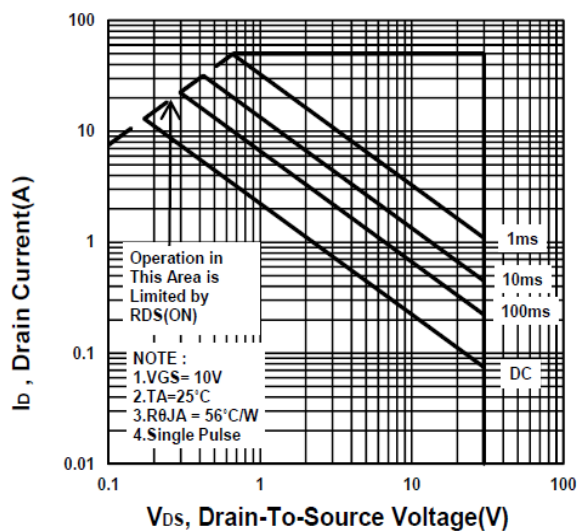
#### Q2 – Channel : Typical Characteristics



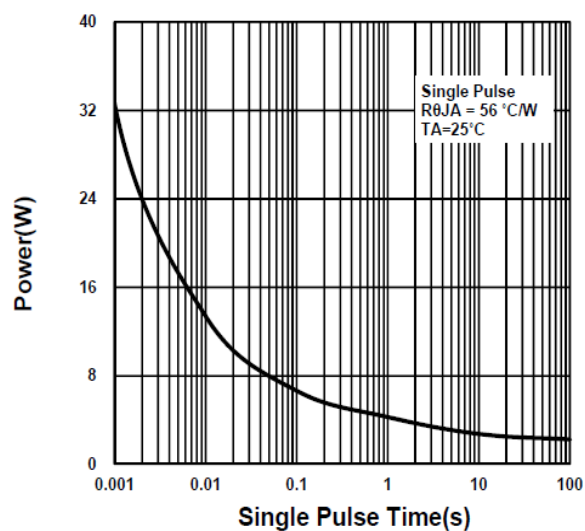
## PE618DT

### Dual N-Channel Enhancement Mode MOSFET

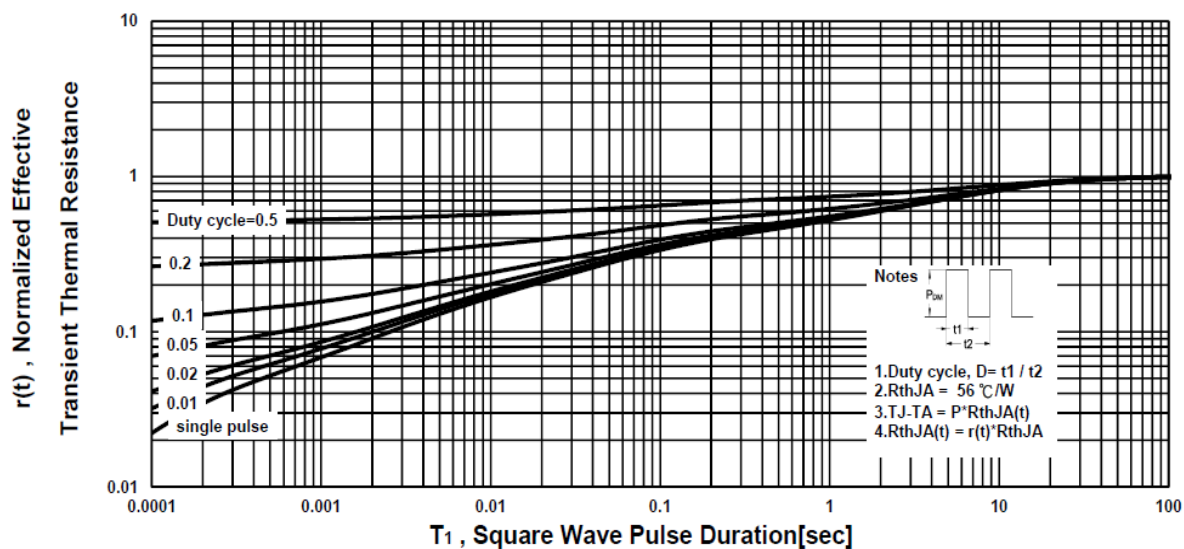
**Safe Operating Area**



**Single Pulse Maximum Power Dissipation**



**Transient Thermal Response Curve**

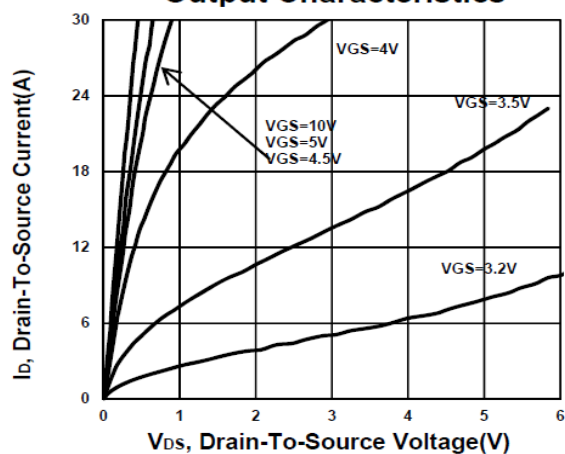


## PE618DT

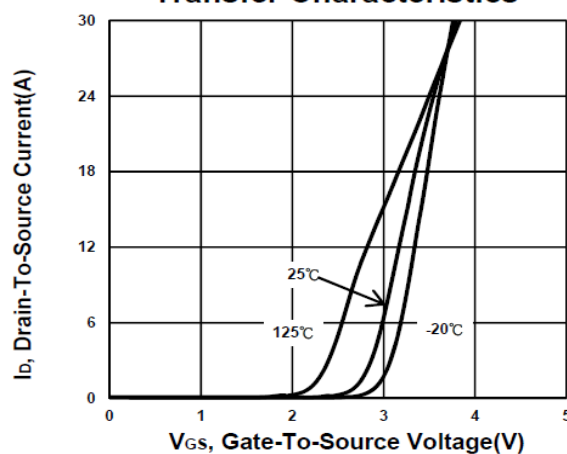
### Dual N-Channel Enhancement Mode MOSFET

#### Q1 – Channel : Typical Characteristics

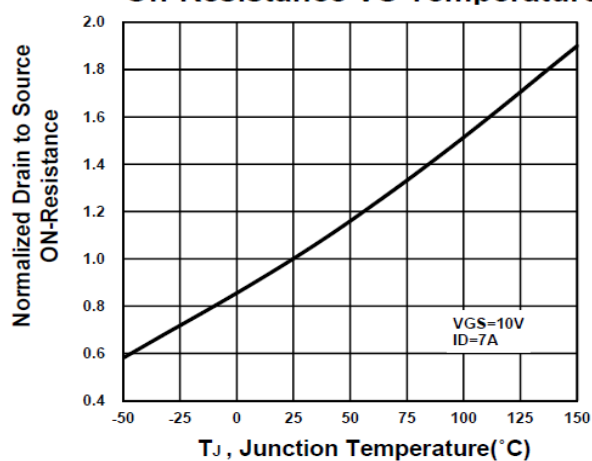
**Output Characteristics**



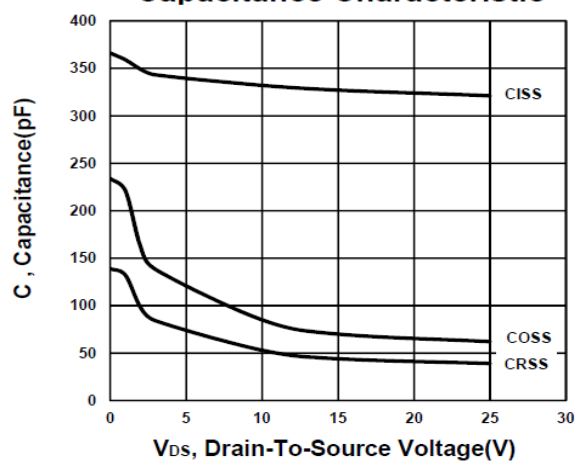
**Transfer Characteristics**



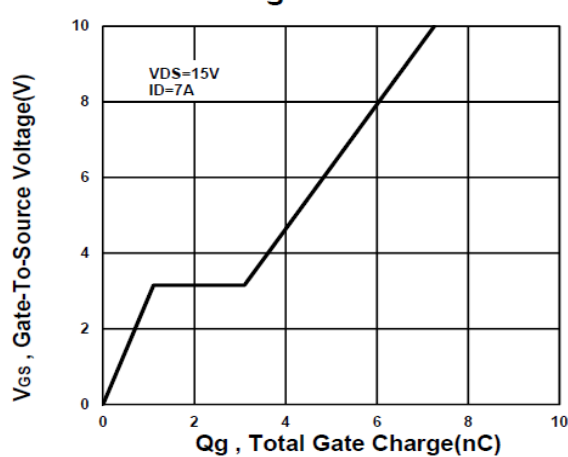
**On-Resistance VS Temperature**



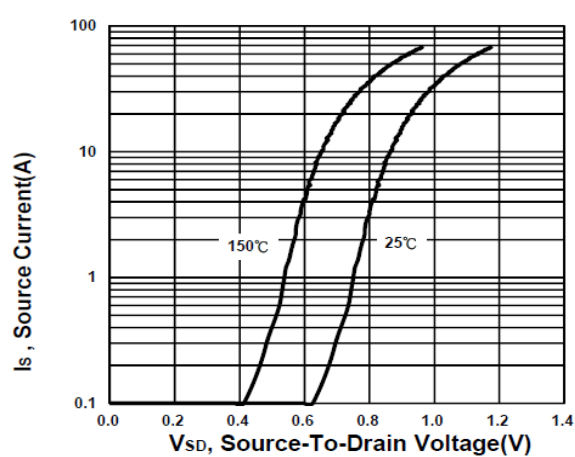
**Capacitance Characteristic**



**Gate charge Characteristics**



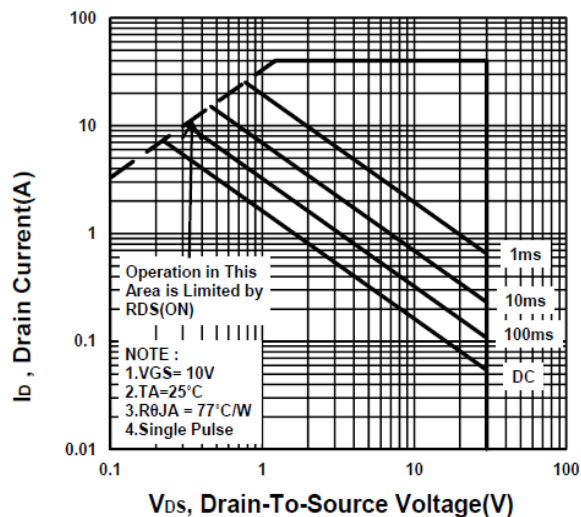
**Source-Drain Diode Forward Voltage**



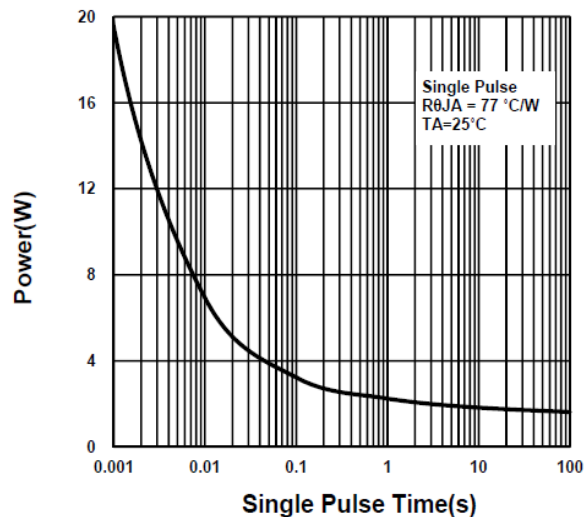
## PE618DT

### Dual N-Channel Enhancement Mode MOSFET

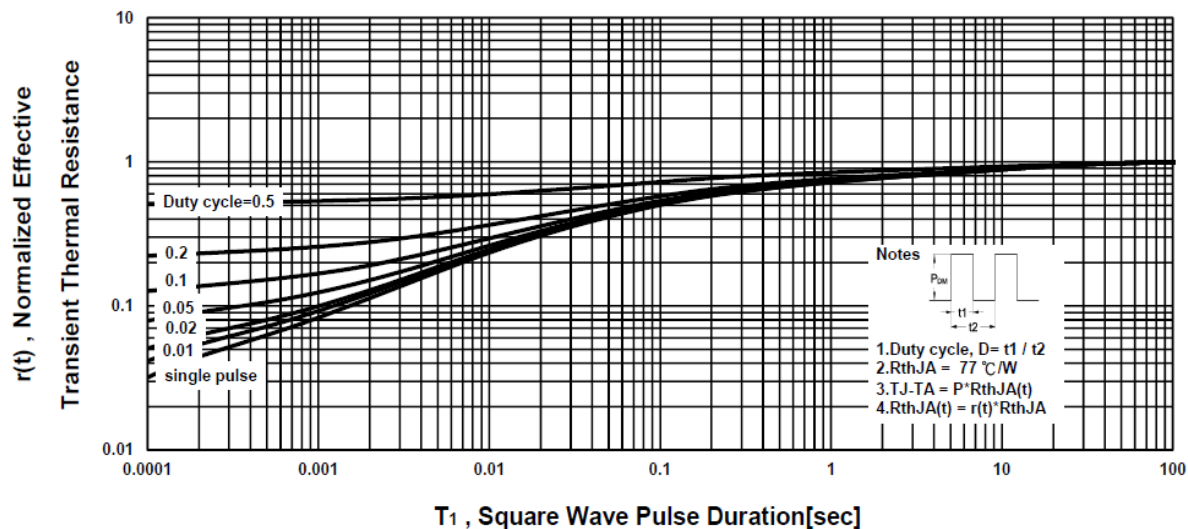
**Safe Operating Area**



**Single Pulse Maximum Power Dissipation**



**Transient Thermal Response Curve**



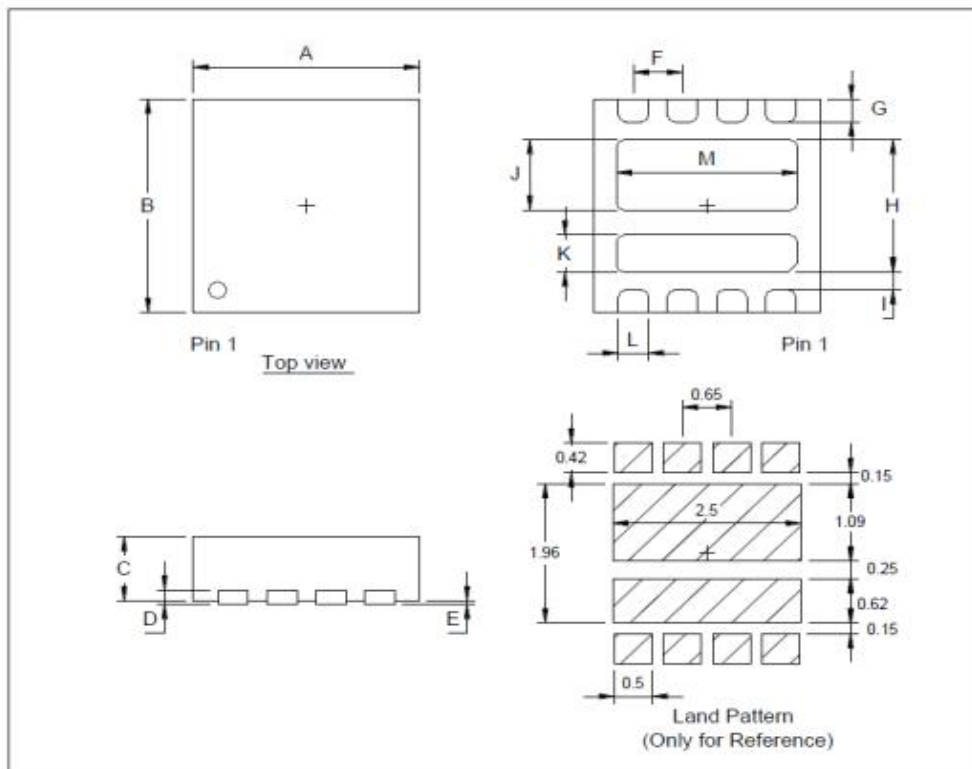
## PE618DT

### Dual N-Channel Enhancement Mode MOSFET

#### Package Dimension

#### PDFN 3x3S(上下 Dual) MECHANICAL DATA

| Dimension | mm    |       |       | Dimension | mm   |      |      |
|-----------|-------|-------|-------|-----------|------|------|------|
|           | Min.  | Typ.  | Max.  |           | Min. | Typ. | Max. |
| A         | 2.9   | 3     | 3.1   | I         |      | 0.25 |      |
| B         | 2.9   | 3     | 3.1   | J         | 0.94 | 0.99 | 1.04 |
| C         | 0.8   | 0.85  | 0.9   | K         | 0.47 | 0.52 | 0.57 |
| D         | 0.195 | 0.203 | 0.211 | L         | 0.35 | 0.4  | 0.45 |
| E         | 0     |       | 0.05  | M         | 2.35 | 2.40 | 2.45 |
| F         |       | 0.65  |       |           |      |      |      |
| G         | 0.27  | 0.32  | 0.37  |           |      |      |      |
| H         |       | 1.86  |       |           |      |      |      |

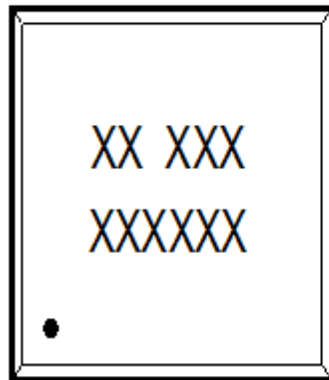




## PE618DT

### Dual N-Channel Enhancement Mode MOSFET

#### A. Marking Information(此产品代码为: I4)

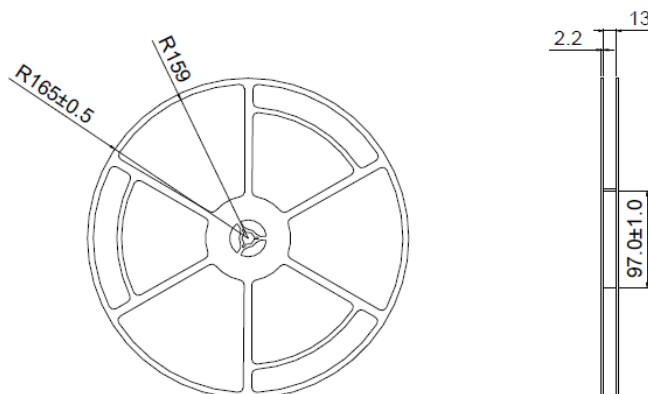
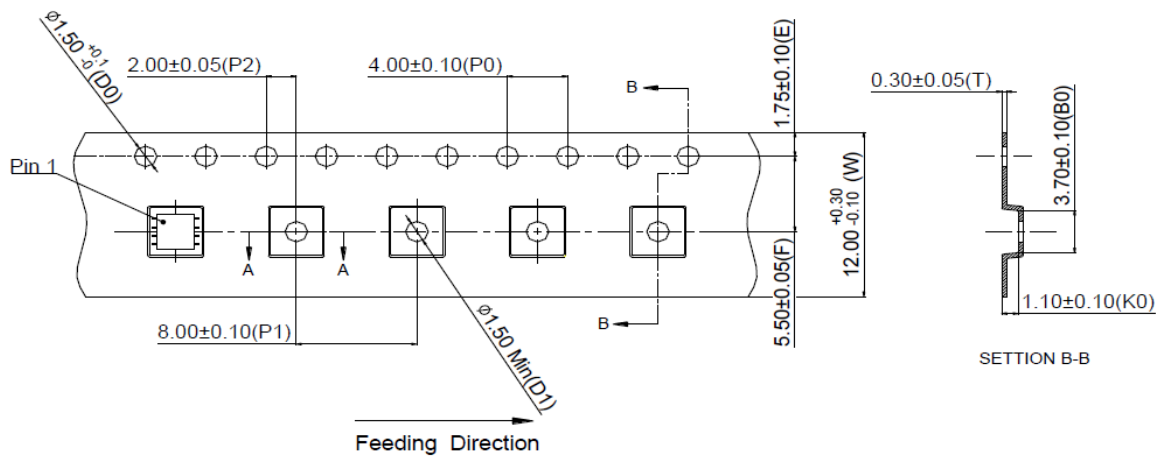


XX(前两码):产品代码

XXX

XXXXXX(后九码):LOT.NO

#### B. Tape&Reel Information:5000pcs/Reel



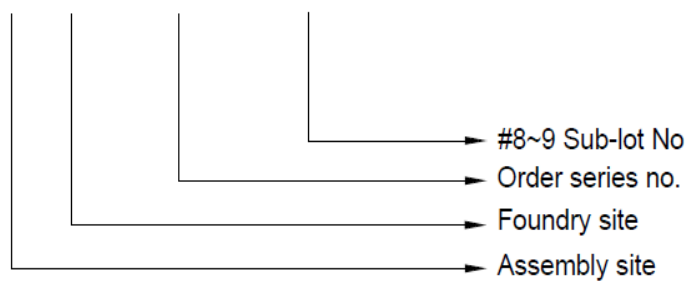
## PE618DT

### Dual N-Channel Enhancement Mode MOSFET

#### C. Lot.No. & Date Code rule

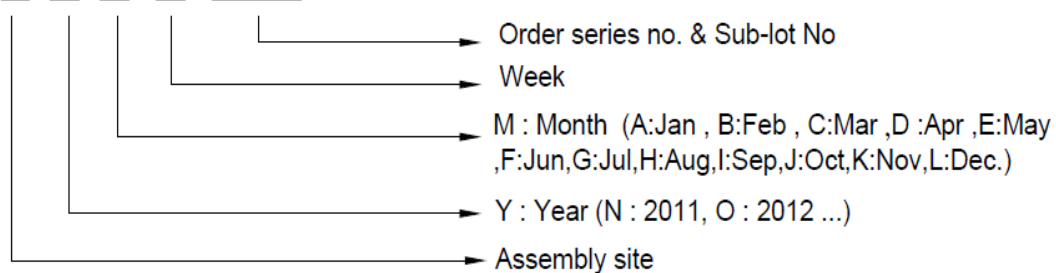
##### 1.LOT.NO.

M N 15M21 03



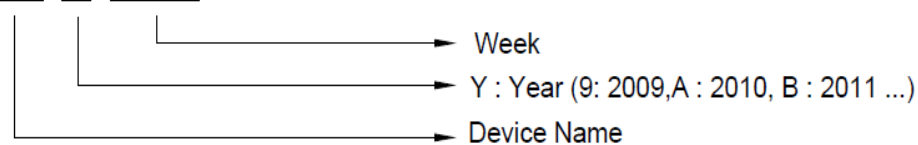
##### 2.Date Code

D Y M X XXX



##### 3.Date Code (for Small package)

XX Y WW



## PE618DT

### Dual N-Channel Enhancement Mode MOSFET

#### D.Label rule

标签内容(Label content)



|    |                    |                                                                                                                                                                                               |
|----|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Label Size         | 30 * 90 mm                                                                                                                                                                                    |
| 2  | Font style         | Times New Roman or Arial<br>(或可区分英文"0"和数字"0", "G"和"Q"的字型即可)                                                                                                                                   |
| 3  | Great Power        | Height: 4 mm                                                                                                                                                                                  |
| 4  | Package            | Height: 2 mm                                                                                                                                                                                  |
| 5  | Date               | Height: 2 mm Shipping date: YYYY/MM/DD, ex. 2008/09/12                                                                                                                                        |
| 6  | Device             | Height: 3 mm (Max: 16 Digit)                                                                                                                                                                  |
| 7  | Lot                | Height: 3 mm (Max: 9 Digit) Sub lot                                                                                                                                                           |
| 8  | D/C                | Height: 3 mm (Max: 7 Digit)                                                                                                                                                                   |
| 9  | QTY                | Height: 3 mm (Max: 6 Digit) Thousand mark is no needed                                                                                                                                        |
| 10 | Pb Free label      |  Diameter: 1 cm bottom color: Green<br>Font color: Black Font style: Arial                                 |
| 11 | Halogen Free label |  Diameter: 1 cm bottom color: Green<br>Font color: Black Font style: Arial                                 |
| 12 | Scan info          | Device / Lot / D/C / QTY , Insert " / " between every parts.<br>for example: P3055LDG/G12345601/GGG2301/2000<br>DPI (Dots per inch): Over 300 dpi<br>Code : Code 128<br>Height: 6 mm at least |