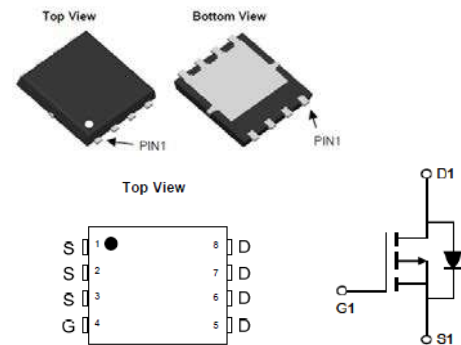


**t -Channel Enhancement Mode Power MOSFET****PRIMARY CHARACTERISTICS**

| BV <sub>DSS</sub> | R <sub>DS(on)</sub> MAX       | I <sub>D</sub> |
|-------------------|-------------------------------|----------------|
| -60V              | 13.5mΩ@V <sub>GS</sub> =-10V  | -63A           |
|                   | 17.5mΩ@V <sub>GS</sub> =-4.5V |                |

**PR-PAK PACKAGE****GENERAL DESCRIPTION**

- Load Switch
- Power Management

**MECHANICAL DATA**

- Case : Molded plastic,PR-PAK
- Polarity : Shown above
- Terminals :Plated terminals, solderable per MIL-STD-750,Method 2026
- Epoxy : UL94-V0 rated flame retardant

**Absolute Maximum Ratings @T<sub>A</sub>=25°C unless otherwise noted**

| Parameter                                  |                       | Symbol                           | Ratings | Unit |
|--------------------------------------------|-----------------------|----------------------------------|---------|------|
| Drain-Source Voltage                       |                       | V <sub>DSS</sub>                 | -60     | V    |
| Gate-Source Voltage                        |                       | V <sub>GSS</sub>                 | ± 20    | V    |
| Drain Current (Continuous) *AC             | T <sub>C</sub> =25°C  | I <sub>D</sub>                   | -63     | A    |
|                                            | T <sub>C</sub> =100°C |                                  | -39.7   |      |
|                                            | T <sub>A</sub> =25°C  |                                  | -15     | A    |
|                                            | T <sub>A</sub> =70° C |                                  | -12     |      |
| Drain Current (Pulse) *B                   |                       | I <sub>DM</sub>                  | -189    | A    |
| Power Dissipation                          | T <sub>C</sub> =25°C  | P <sub>D</sub>                   | 96      | W    |
| Operating Temperature/ Storage Temperature |                       | T <sub>J</sub> /T <sub>STG</sub> | -55~150 | °C   |

**Thermal Resistance Ratings \*AC**

| Parameter                        |              | Symbol            | Typical | Maximum | Unit |
|----------------------------------|--------------|-------------------|---------|---------|------|
| Maximum Junction-to-Ambient      | t≤10s        | R <sub>thJA</sub> | 18      | 23      | °C/W |
| Maximum Junction-to-Case (Drain) | Steady State | R <sub>thJC</sub> | 1       | 1.3     |      |



## t -Channel Enhancement Mode Power MOSFET

**Electrical Characteristics** @T<sub>A</sub>=25°C unless otherwise noted

| Parameter                        | Symbol                | Test Conditions                                                                                                     | Min | Typ   | Max  | Unit |
|----------------------------------|-----------------------|---------------------------------------------------------------------------------------------------------------------|-----|-------|------|------|
| Static                           |                       |                                                                                                                     |     |       |      |      |
| Drain-Source Breakdown Voltage   | V <sub>(BR)DSS</sub>  | V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA                                                                       | -60 | --    | --   | V    |
| Zero Gate Voltage Drain Current  | I <sub>DSS</sub>      | V <sub>DS</sub> = -60V, V <sub>GS</sub> = 0V                                                                        | --  | --    | -1   | μA   |
| Gate Threshold Voltage           | V <sub>GS(TH)</sub>   | V <sub>GS</sub> = V <sub>DS</sub> , I <sub>DS</sub> = -250μA                                                        | -1  | -1.85 | -2.5 | V    |
| Gate Leakage Current             | I <sub>GSS</sub>      | V <sub>GS</sub> = ±20V, V <sub>DS</sub> =0V                                                                         | --  | --    | ±100 | nA   |
| Drain-Source On-state Resistance | R <sub>DS(on)</sub>   | V <sub>GS</sub> = -10V, I <sub>D</sub> = -30A                                                                       | --  | 10.5  | 13.5 | mΩ   |
|                                  | R <sub>DS(on)</sub>   | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -30A                                                                      | --  | 13.5  | 17.5 | mΩ   |
| Diode Forward Voltage            | V <sub>SD</sub>       | I <sub>SD</sub> = -1A , V <sub>GS</sub> =0V                                                                         | --  | -0.69 | -1.2 | V    |
| Diode Forward Current *AC        | I <sub>S</sub>        | T <sub>C</sub> =25°C                                                                                                | --  | --    | -63  | A    |
| Switching                        |                       |                                                                                                                     |     |       |      |      |
| Total Gate Charge                | Q <sub>g</sub>        | V <sub>DS</sub> = -30 V, V <sub>GS</sub> = -10 V,<br>I <sub>D</sub> = -14.4 A                                       | --  | 121   | --   | nC   |
| Gate-Source Charge               | Q <sub>gs</sub>       |                                                                                                                     | --  | 20    | --   | nC   |
| Gate-Drain Charge                | Q <sub>gd</sub>       |                                                                                                                     | --  | 32    | --   | nC   |
| Turn-on Delay Time               | t <sub>d ( on )</sub> | V <sub>DD</sub> = -30 V, R <sub>L</sub> = 30Ω<br>I <sub>D</sub> =-1 A, V <sub>GEN</sub> = -10 V, R <sub>g</sub> = 6 | --  | 20    | --   | ns   |
| Turn-on Rise Time                | t <sub>r</sub>        |                                                                                                                     | --  | 20    | --   | ns   |
| Turn-off Delay Time              | t <sub>d( off )</sub> |                                                                                                                     | --  | 205   | --   | ns   |
| Turn-Off Fall Time               | t <sub>f</sub>        |                                                                                                                     | --  | 90    | --   | ns   |
| Dynamic                          |                       |                                                                                                                     |     |       |      |      |
| Input Capacitance                | C <sub>iss</sub>      | V <sub>DS</sub> =-30V,V <sub>GS</sub> =0V, f=1.0MHz                                                                 | --  | 5600  | --   | pF   |
| Output Capacitance               | C <sub>oss</sub>      |                                                                                                                     | --  | 510   | --   | pF   |
| Reverse Transfer Capacitance     | C <sub>rss</sub>      |                                                                                                                     | --  | 480   | --   | pF   |

A: The value of R<sub>θJA</sub> is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with T<sub>A</sub>=25°C. The value in any given application depends on the user's specific board design.

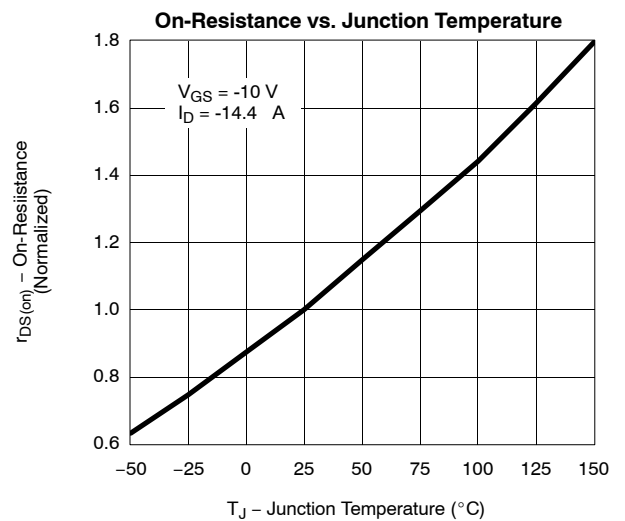
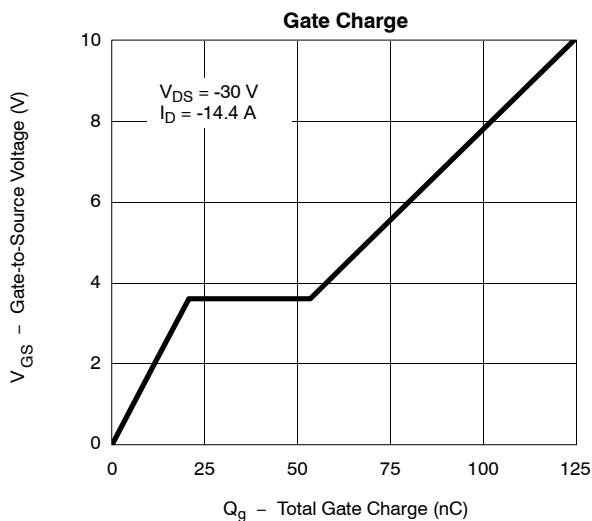
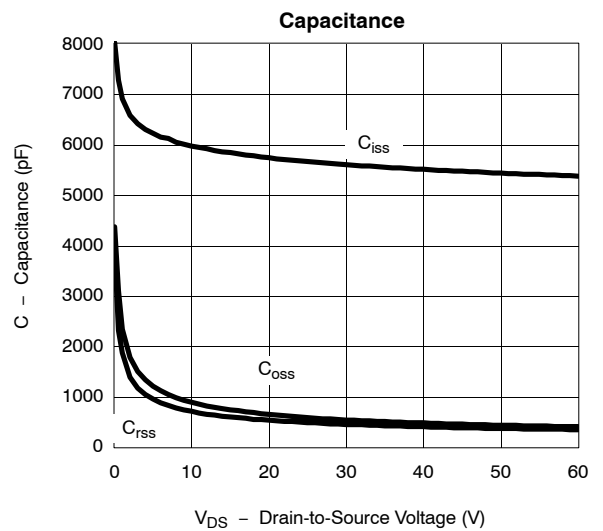
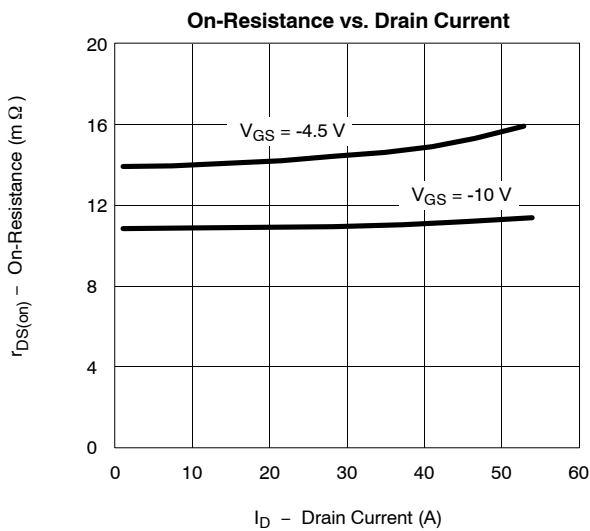
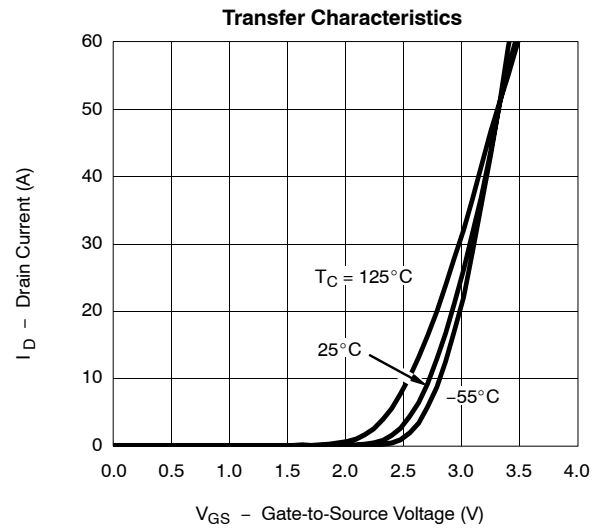
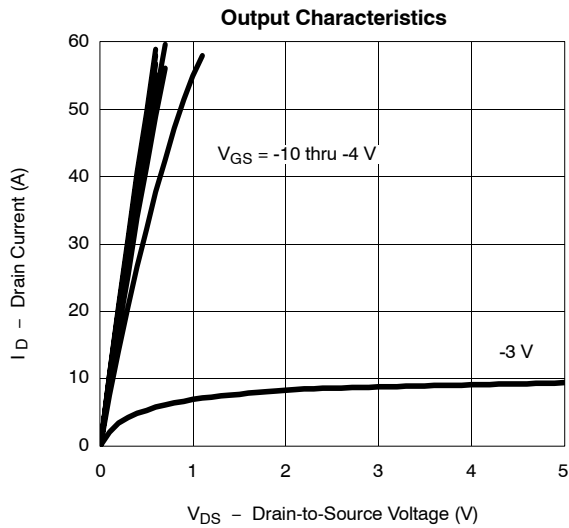
B: Repetitive rating, pulse width limited by junction temperature.

C: The current rating is based on the t<sub>s</sub> ≤ 10s junction to ambient thermal resistance rating.



## t-Channel Enhancement Mode Power MOSFET

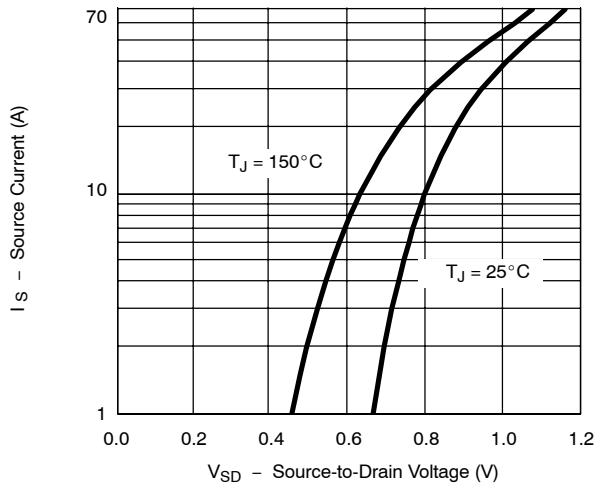
Typical Performance Characteristics (T<sub>J</sub> = 25 °C, unless otherwise noted)



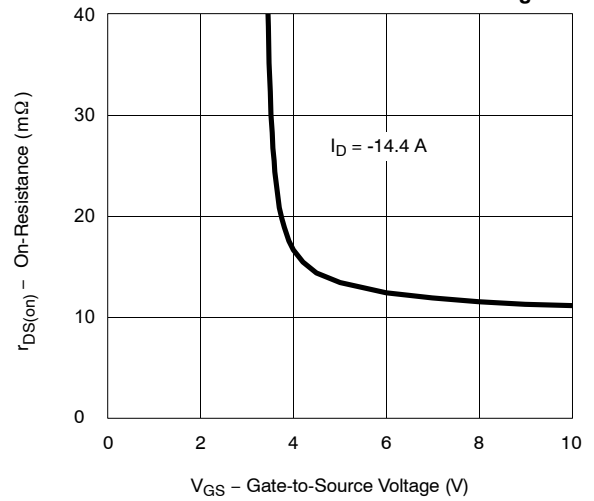


## t-Channel Enhancement Mode Power MOSFET

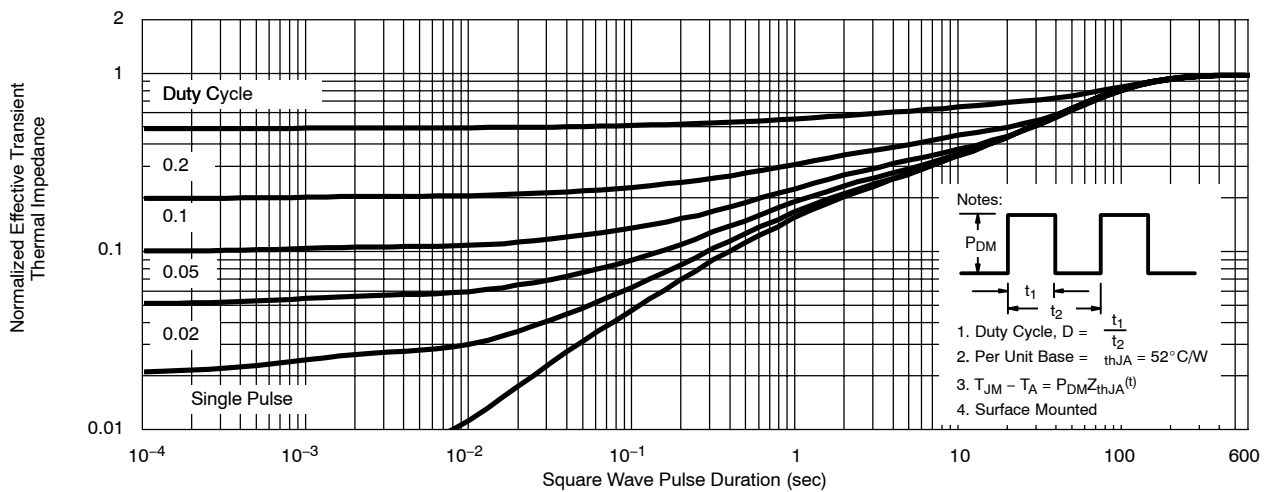
Source-Drain Diode Forward Voltage



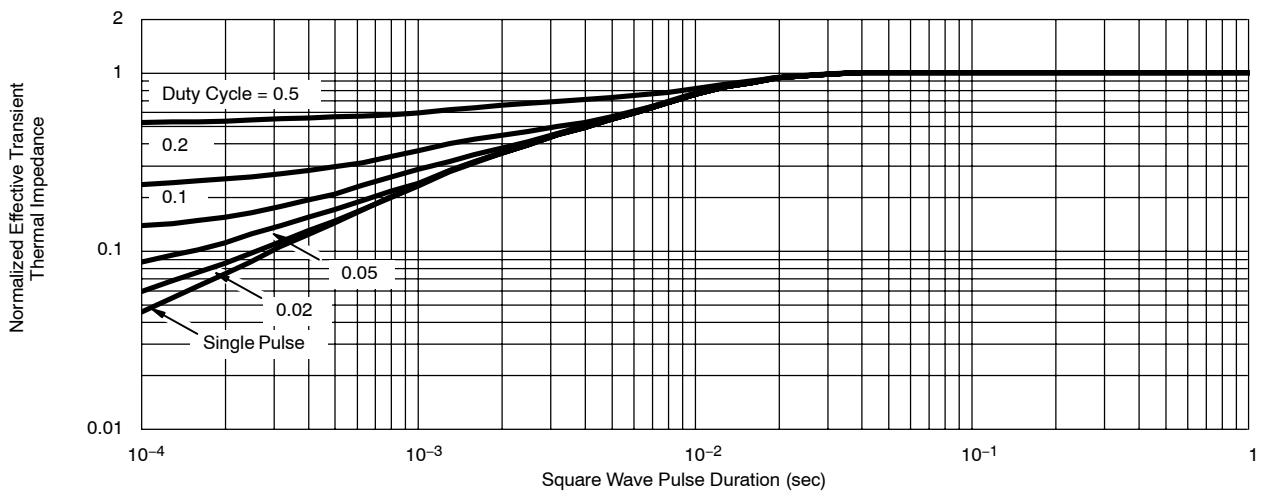
On-Resistance vs. Gate-to-Source Voltage



Normalized Thermal Transient Impedance, Junction-to-Ambient

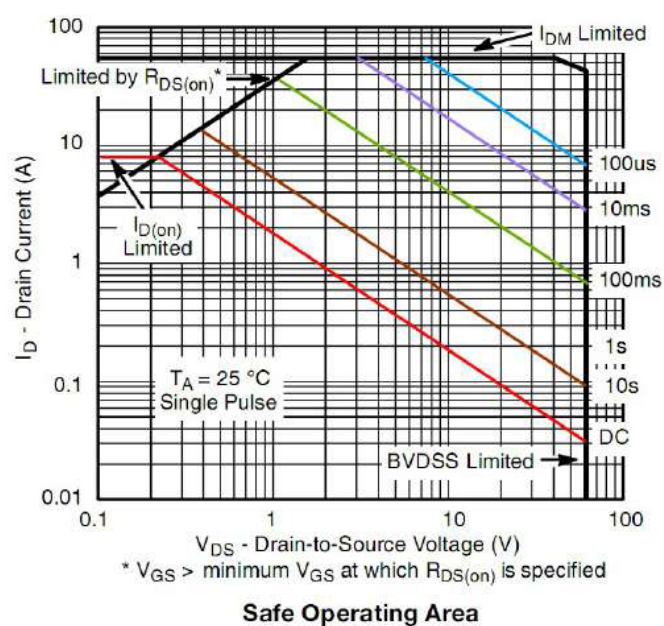


Normalized Thermal Transient Impedance, Junction-to-Case





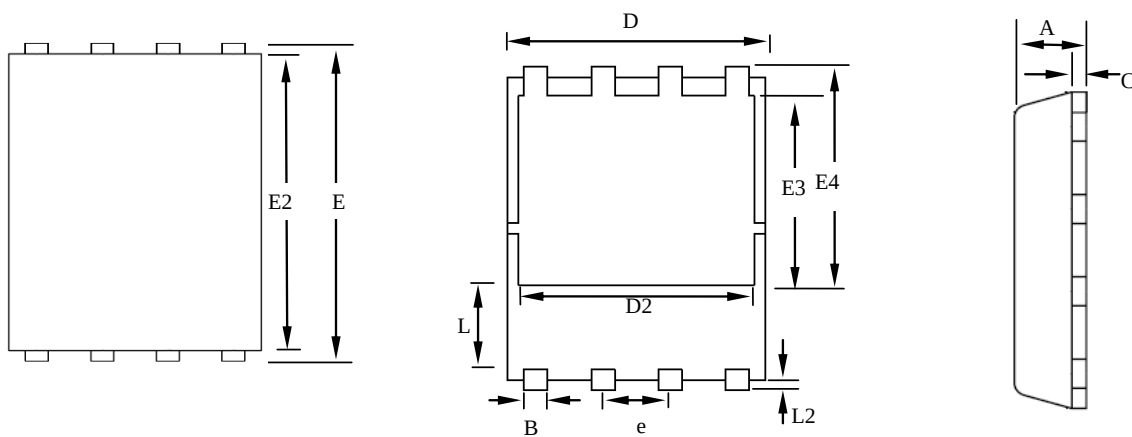
## t -Channel Enhancement Mode Power MOSFET





## Outline Drawing

## PR-PAK



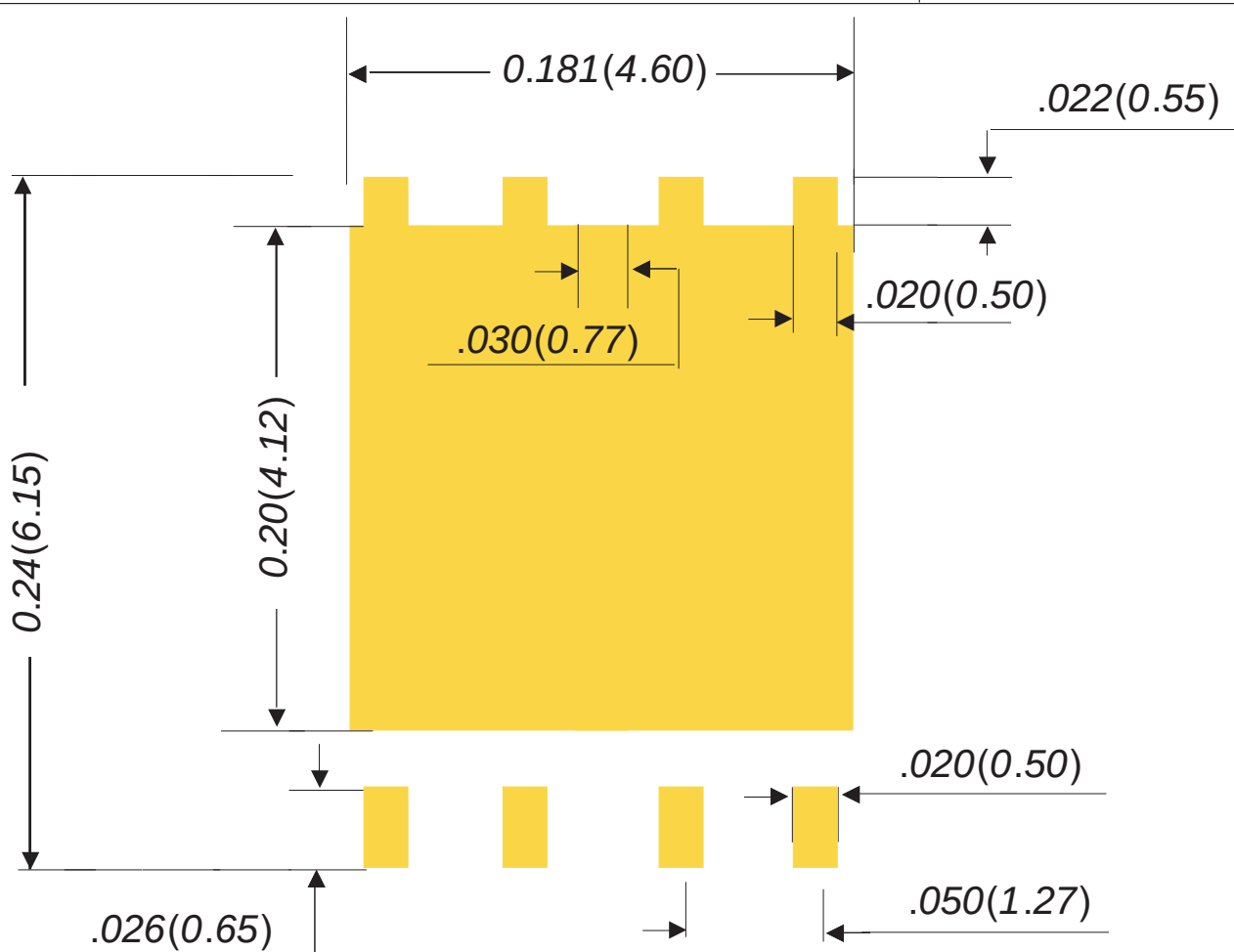
| SYMBOLS | MILLIMETERS |      |      | INCHES |       |       |
|---------|-------------|------|------|--------|-------|-------|
|         | MIN         | NOM  | MAX  | MIN    | NOM   | MAX   |
| A       | 0.80        | --   | 1.20 | 0.031  | --    | 0.047 |
| B       | 0.30        | --   | 0.51 | 0.012  | --    | 0.020 |
| C       | 0.15        | --   | 0.35 | 0.006  | --    | 0.014 |
| D       | 4.80        | --   | 5.30 | 0.189  | --    | 0.209 |
| D2      | 3.61        | --   | 4.35 | 0.142  | --    | 0.171 |
| E       | 5.90        | --   | 6.35 | 0.232  | --    | 0.250 |
| E2      | 5.42        | --   | 5.90 | 0.213  | --    | 0.232 |
| E3      | 3.23        | --   | 3.90 | 0.127  | --    | 0.154 |
| E4      | 3.69        | --   | 4.55 | 0.145  |       | 0.179 |
| L       | 0.61        | --   | 1.80 | 0.024  | --    | 0.071 |
| L2      | 0.05        | --   | 0.36 | 0.002  | --    | 0.014 |
| e       | --          | 1.27 | --   | --     | 0.050 | --    |

Rev.A



## Suggested Soldering Pad Layout

PR-PAK



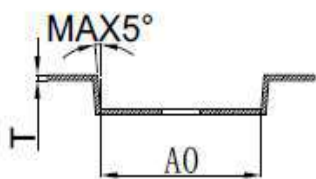
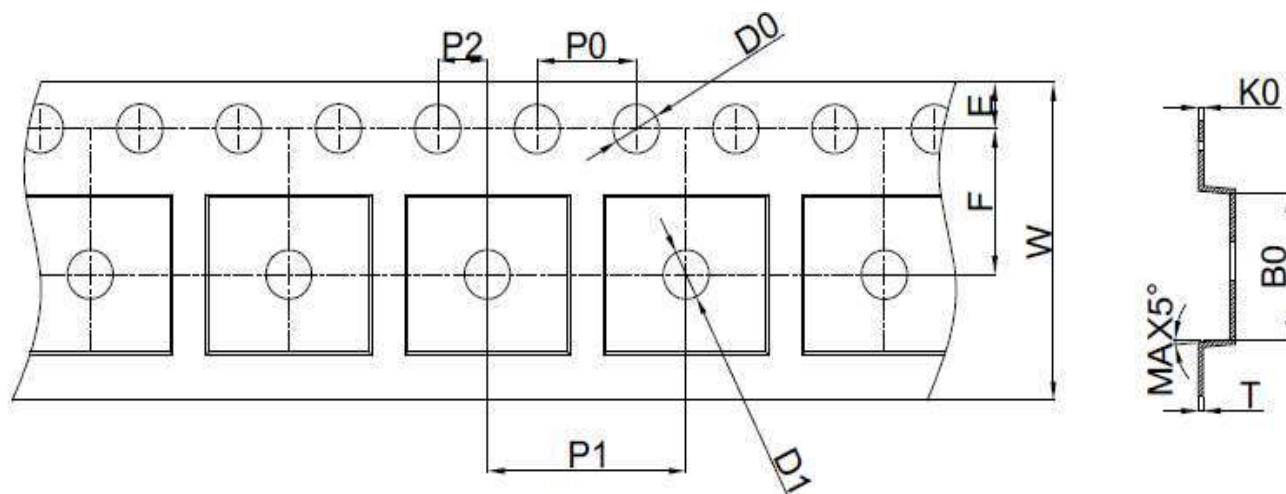
Dimensions in inches and (millimeters)

RevB



## DFN5\*6 Tape&amp;Reel

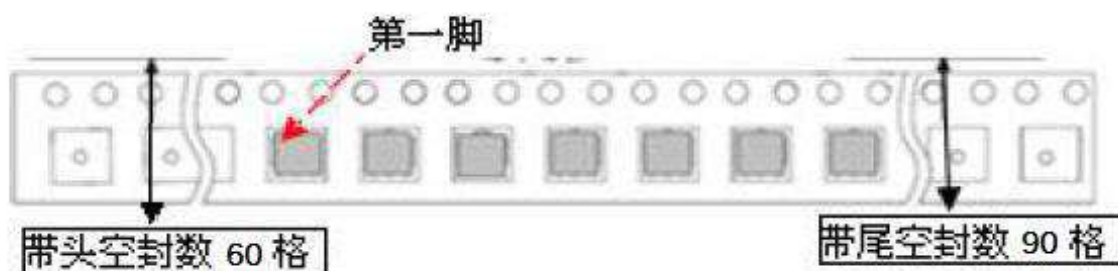
Tape:



| SYMBOL | A0        | B0        | K0        | P0        | P1        | P2                                    |
|--------|-----------|-----------|-----------|-----------|-----------|---------------------------------------|
| SPEC   | 6.50±0.10 | 5.50±0.10 | 1.30±0.10 | 4.00±0.10 | 8.00±0.10 | 2.00±0.05                             |
| SYMBOL | T         | E         | F         | D0        | D1        | W                                     |
| SPEC   | 0.20±0.05 | 1.75±0.10 | 5.50±0.10 | 1.55±0.05 | 1.55±0.05 | 12.00 <sup>+0.2</sup> <sub>-0.1</sub> |

## NOTE:

- 1.材料：黑色防静电材料
- 2.10个链孔的累积公差不能超过±0.2；
- 3.尺寸符合EIA-481-E的要求。

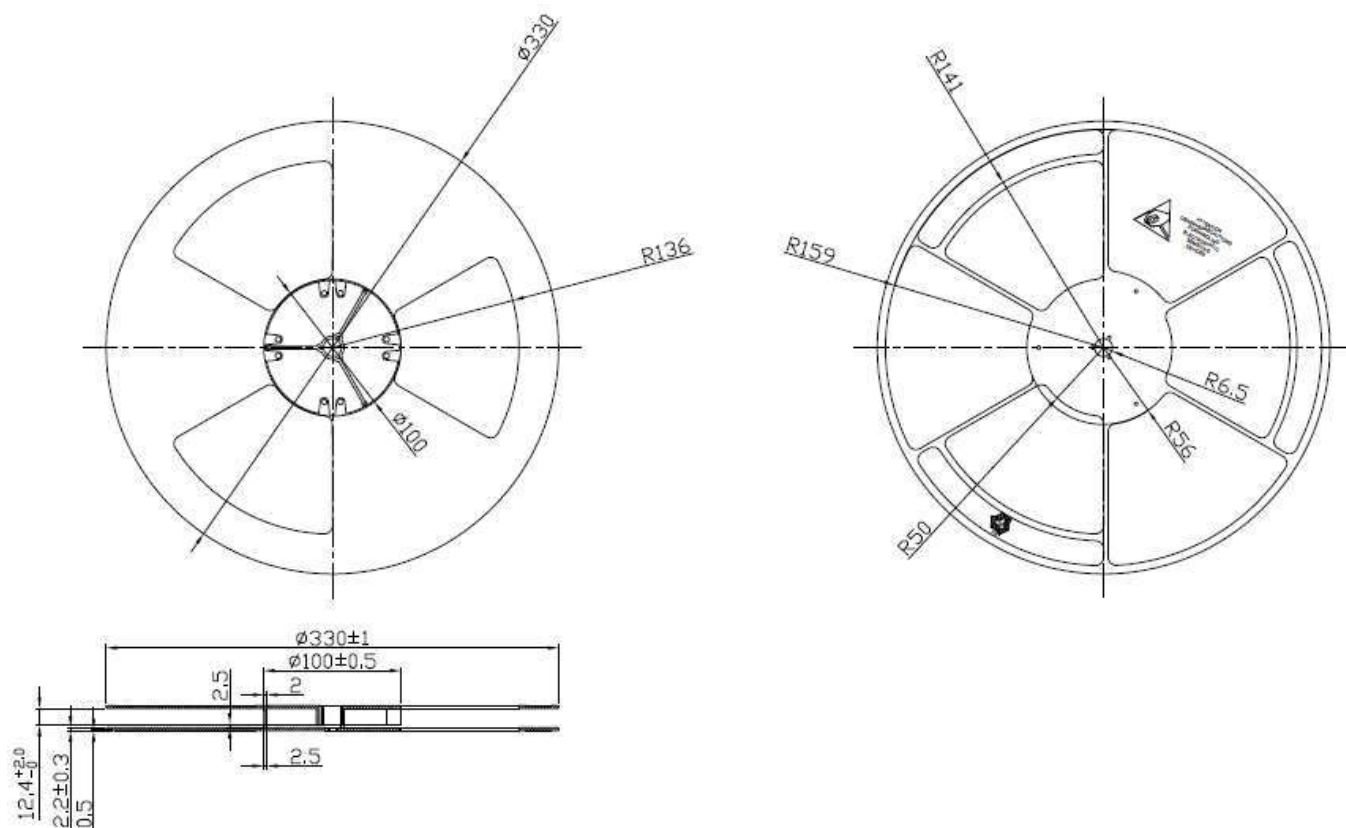


产品带头（60 个空格），带尾（90 个空格）



## t -Channel Enhancement Mode Power MOSFET

Reel:



**Ordering Information:**

| Device PN                                                     | Marking | Packing                |
|---------------------------------------------------------------|---------|------------------------|
| SPR60P63-T <sup>(1)</sup> H <sup>(2)</sup> -WS <sup>(3)</sup> | 60P100  | Tape&Reel: 5 Kpcs/Reel |

Note: (1) Packing code, Tape & Reel Packing

(2) Halogen free product for packing code suffix "H"

(3) WS : Willas brand abbreviation, Label Type does not display

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