

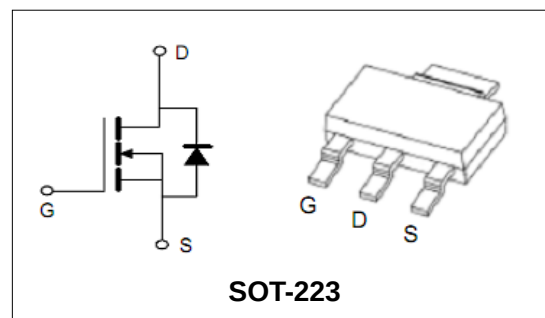
**100V/3A N-Channel Advanced Power MOSFET****Features**

- Improved dv/dt capability high ruggedness.
- Maximum junction temperature range (150°C)

|                |     |    |
|----------------|-----|----|
| BVDSS          | 100 | V  |
| ID             | 3   | A  |
| RDSON@VGS=10V  | 67  | mΩ |
| RDSON@VGS=4.5V | 92  | mΩ |

**Applications**

- PWM applications
- Load switch
- Power management

**Order Information**

| Product  | Package | Marking  | Reel Size | Reel    | Carton   |
|----------|---------|----------|-----------|---------|----------|
| PTH03N10 | SOT-223 | PTH03N10 | 13inch    | 4000PCS | 80000PCS |

**Absolute Maximum Ratings**

| Symbol                                          | Parameter                                  |          | Rating     | Unit |      |
|-------------------------------------------------|--------------------------------------------|----------|------------|------|------|
| Common Ratings (TC=25°C Unless Otherwise Noted) |                                            |          |            |      |      |
| V <sub>(BR)DSS</sub>                            | Drain-Source Breakdown Voltage             |          | 100        | V    |      |
| V <sub>GS</sub>                                 | Gate-Source Voltage                        |          | ±20        | V    |      |
| T <sub>J</sub>                                  | Maximum Junction Temperature               |          | 150        | °C   |      |
| T <sub>STG</sub>                                | Storage Temperature Range                  |          | -55 to 150 | °C   |      |
| I <sub>S</sub>                                  | Diode Continuous Forward Current           | TA =25°C | 3          | A    |      |
| Mounted on Large Heat Sink                      |                                            |          |            |      |      |
| I <sub>DM</sub>                                 | Pulse Drain Current Tested (Silicon Limit) | (Note1)  | TA =25°C   | 12   | A    |
| I <sub>D</sub>                                  | Continuous Drain current                   |          | TA =25°C   | 3    | A    |
| P <sub>D</sub>                                  | Maximum Power Dissipation                  |          | TA =25°C   | 3    | W    |
| R <sub>θJA</sub>                                | Thermal Resistance Junction-to-Ambient     |          | (Note2)    | 41.7 | °C/W |



## 100V/3A N-Channel Advanced Power MOSFET

| Symbol                                                                           | Parameter                                | Condition                                 | Min. | Typ. | Max. | Unit |
|----------------------------------------------------------------------------------|------------------------------------------|-------------------------------------------|------|------|------|------|
| Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)          |                                          |                                           |      |      |      |      |
| V <sub>(BR)DSS</sub>                                                             | Drain- Source Breakdown Voltage          | VGS=0V ID=250μA                           | 100  | --   | --   | V    |
| I <sub>DSS</sub>                                                                 | Zero Gate Voltage Drain current          | VDS=100V,VGS=0V                           | --   | --   | 1    | μA   |
| I <sub>GSS</sub>                                                                 | Gate-Body Leakage Current                | VGS=±20V,VDS=0V                           | --   | --   | ±100 | nA   |
| V <sub>GS(TH)</sub>                                                              | Gate Threshold Voltage                   | VDS=VGS,ID=250μA                          | 1.2  | --   | 2.5  | V    |
| R <sub>DS(ON)</sub>                                                              | Drain-Source On-State Resistance (Note3) | VGS=10V, ID=2.5A                          | --   | 67   | 100  | mΩ   |
|                                                                                  |                                          | VGS=4.5V, ID=1.5A                         | --   | 92   | 138  | mΩ   |
| Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated) (Note4) |                                          |                                           |      |      |      |      |
| C <sub>iss</sub>                                                                 | Input Capacitance                        | VDS=30V,<br>VGS=0V,<br>F=1MHz             | --   | 240  | --   | pF   |
| C <sub>oss</sub>                                                                 | Output Capacitance                       |                                           | --   | 91   | --   | pF   |
| C <sub>rss</sub>                                                                 | Reverse Transfer Capacitance             |                                           | --   | 11   | --   | pF   |
| Q <sub>g</sub>                                                                   | Total Gate Charge                        | VDS=30V,<br>ID=3A,<br>VGS=10V             | --   | 6    | --   | nC   |
| Q <sub>gs</sub>                                                                  | Gate-Source Charge                       |                                           | --   | 1.3  | --   | nC   |
| Q <sub>gd</sub>                                                                  | Gate-Drain Charge                        |                                           | --   | 1.4  | --   | nC   |
| Switching Characteristics (Note4)                                                |                                          |                                           |      |      |      |      |
| t <sub>d(on)</sub>                                                               | Turn-on Delay Time                       | VDD=30V,<br>ID=3A,<br>VGS=10V,<br>RG=2.5Ω | --   | 10   | --   | nS   |
| t <sub>r</sub>                                                                   | Turn-on Rise Time                        |                                           | --   | 8    | --   | nS   |
| t <sub>d(off)</sub>                                                              | Turn-off Delay Time                      |                                           | --   | 29   | --   | nS   |
| t <sub>f</sub>                                                                   | Turn-off Fall Time                       |                                           | --   | 9    | --   | nS   |
| Source- Drain Diode Characteristics@ TJ = 25°C (unless otherwise stated)         |                                          |                                           |      |      |      |      |
| V <sub>SD</sub>                                                                  | Forward on voltage                       | IS=2.5A,VGS=0V                            | --   | --   | 1.3  | V    |

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  $\leq 300$  us, duty cycle  $\leq 2\%$ .
4. Guranteed by design, not subject to production testing.



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### Typical Characteristics

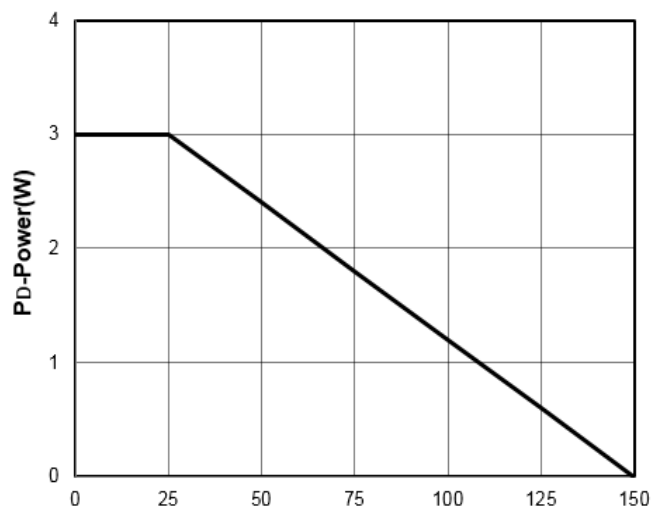


Figure1: T<sub>J</sub> Junction Temperature (°C)

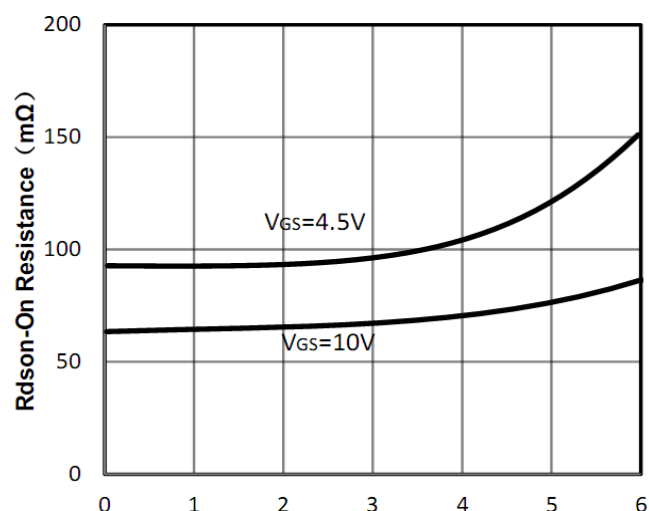


Figure2: I<sub>D</sub> Drain Current (A)

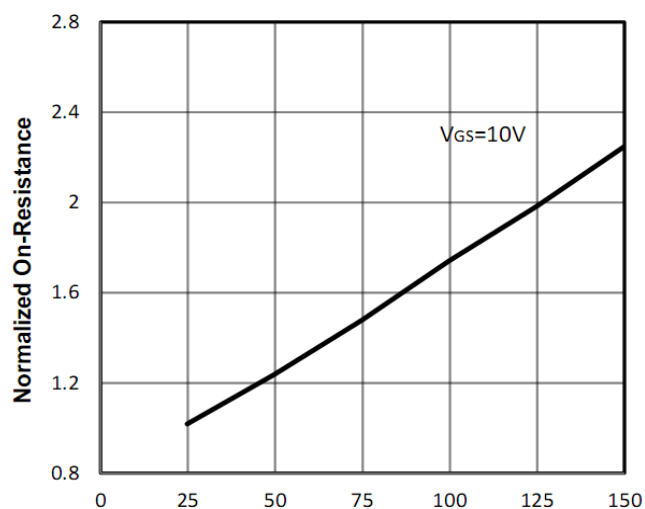


Figure3: T<sub>J</sub> Junction Temperature (°C)

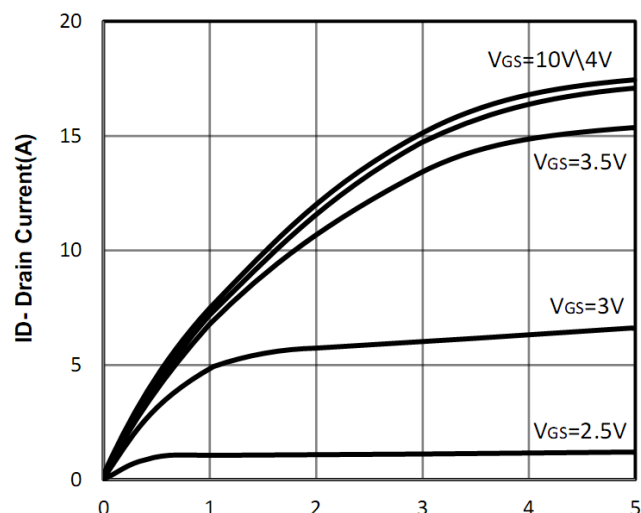


Figure4: V<sub>DS</sub> Drain-Source Voltage (V)

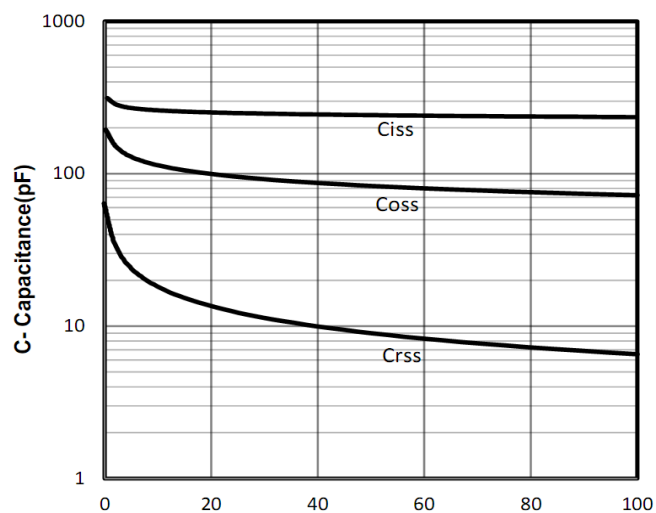


Figure5: V<sub>DS</sub> Drain-Source Voltage (V)

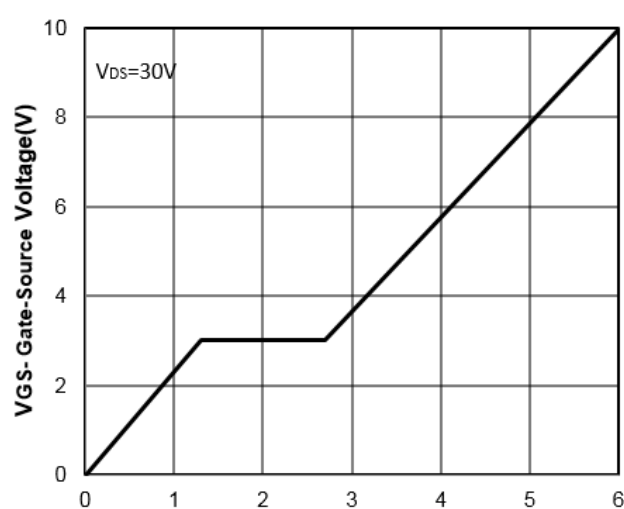


Figure6: Q<sub>g</sub> Gate Charge (nC)

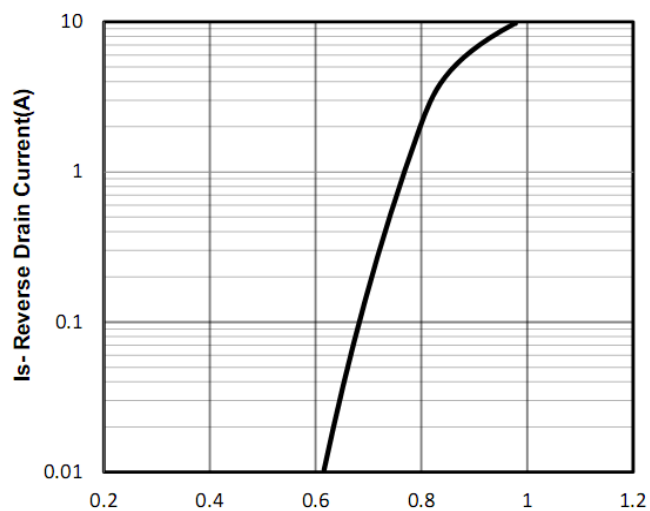


Figure7: Vsd Source-Drain Voltage (V)

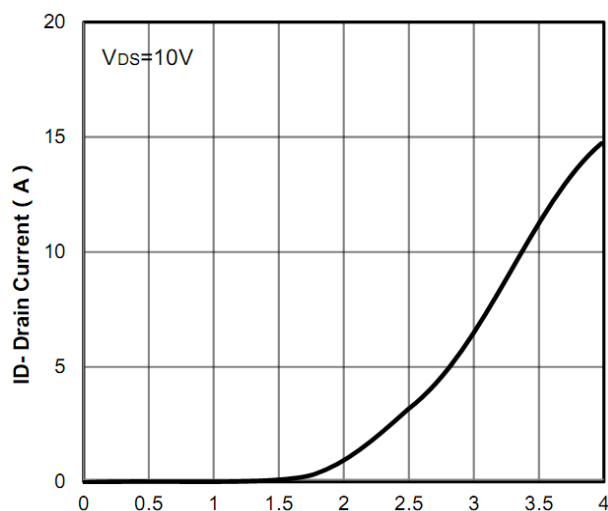


Figure8: Vgs Gate-Source Voltage (V)

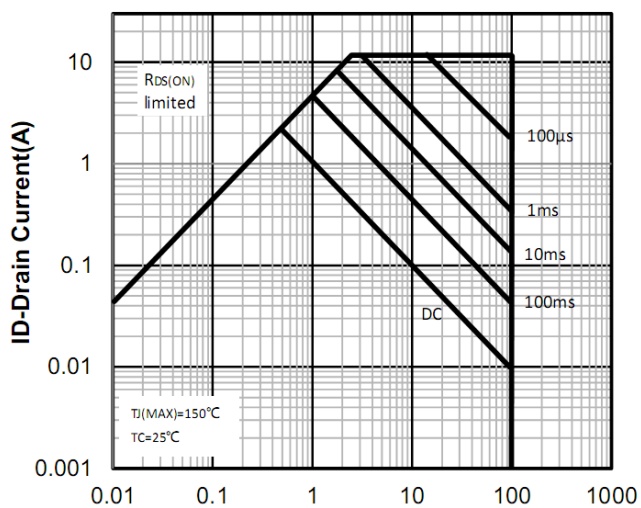


Figure9: Vsd Drain -Source Voltage (V)

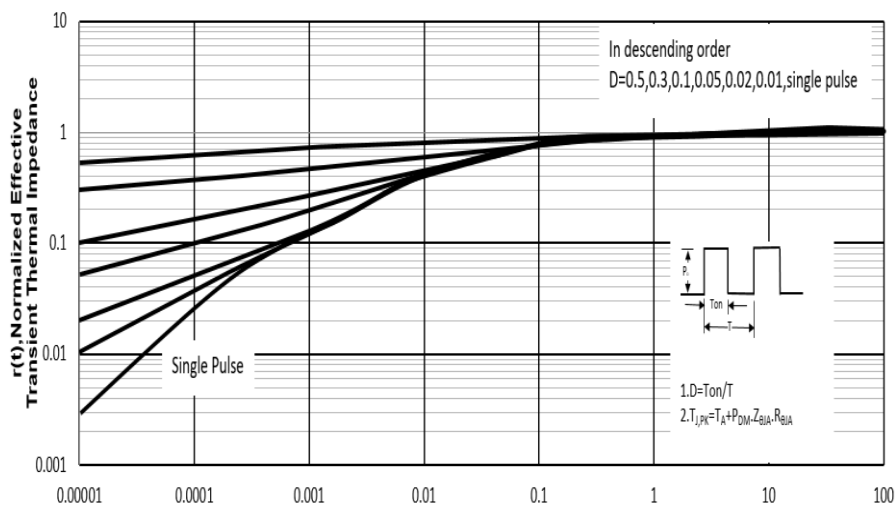


Figure10: Square Wave Pulse Duration (sec)



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Test Circuit and Waveform:

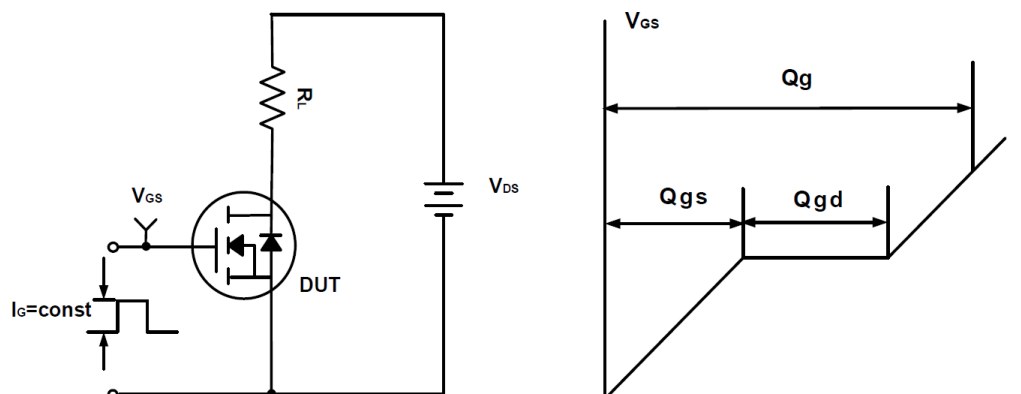


Figure A Gate Charge Test Circuit & Waveforms

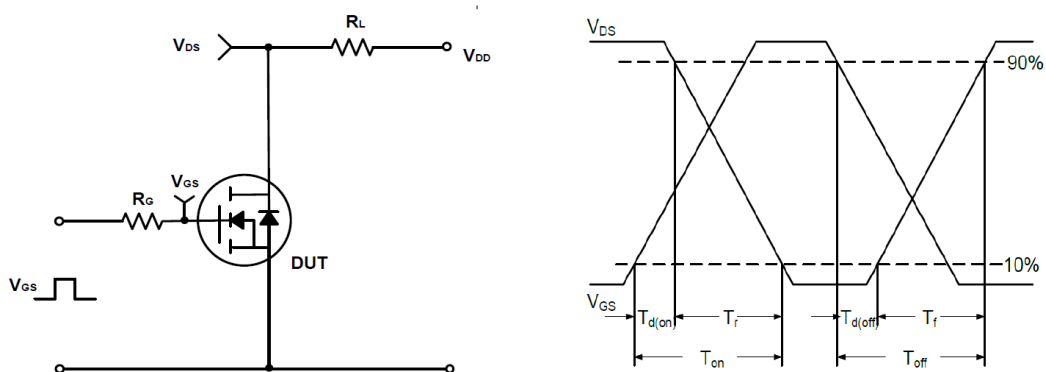
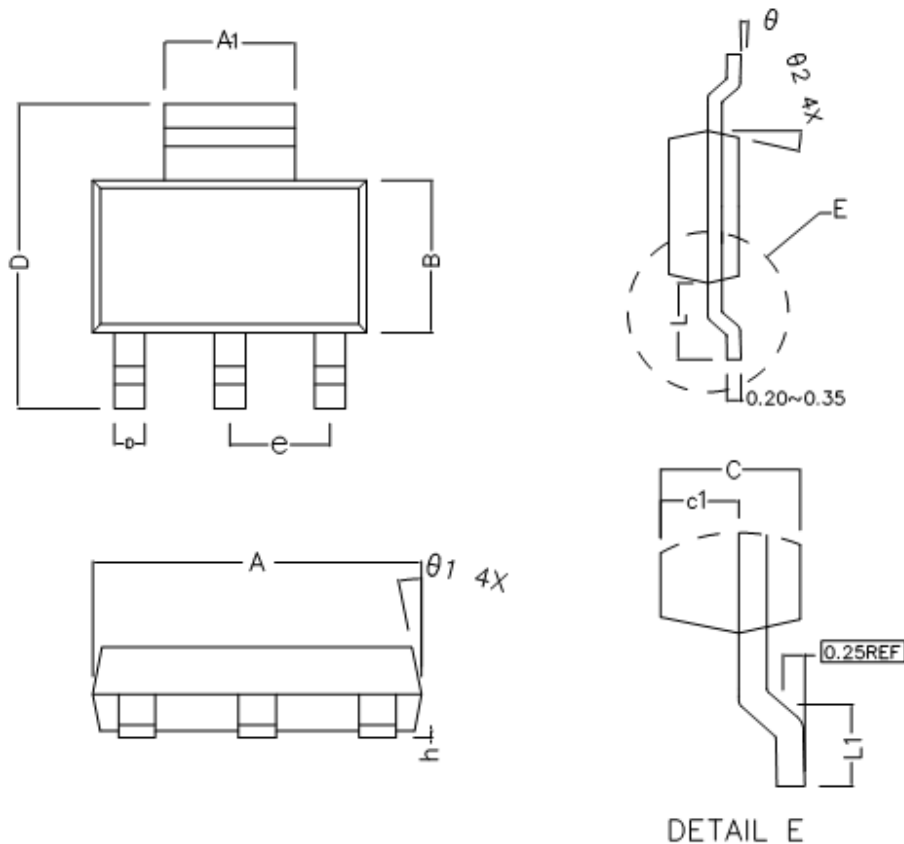


Figure B Switching Test Circuit & Waveforms

**SOT-223 Package Outline Dimensions (Units: mm)**

| COMMON DIMENSIONS<br>(UNITS OF MEASURE IS mm) |           |        |       |
|-----------------------------------------------|-----------|--------|-------|
|                                               | MIN       | NORMAL | MAX   |
| A                                             | 6.400     | 6.500  | 6.600 |
| A1                                            | 2.900     | 3.000  | 3.100 |
| B                                             | 3.400     | 3.500  | 3.600 |
| C                                             | 1.550     | 1.600  | 1.650 |
| C1                                            | 0.850     | 0.900  | 0.950 |
| D                                             | 6.800     | 7.000  | 7.200 |
| L                                             | 1.650     | 1.750  | 1.850 |
| L1                                            | 0.900     | 1.000  | 1.150 |
| b                                             | 0.660     | 0.740  | 0.820 |
| h                                             | 0.020     | 0.050  | 0.100 |
| e                                             | 2.300TYPE |        |       |
| θ <sub>1</sub>                                | 13° TYPE  |        |       |
| θ <sub>2</sub>                                | 13° TYPE  |        |       |
| θ                                             | 0° ~ 8°   |        |       |