

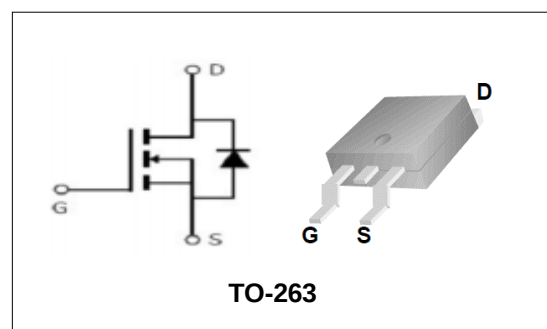
**60V/80A N-Channel Advanced Power MOSFET****Features**

- Improved dv/dt Capability, High Ruggedness.
- Maximum Junction Temperature Range (150°C)
- 100% Avalanche Tested

|               |     |    |
|---------------|-----|----|
| BVDSS         | 60  | V  |
| ID            | 80  | A  |
| RDSON@VGS=10V | 5.8 | mΩ |

**Applications**

- Power Supply
- DC-DC Converters
- Uninterruptible Power Supply (UPS)

**TO-263****Order Information**

| Product  | Package | Marking  | Reel Size | Reel   | Carton  |
|----------|---------|----------|-----------|--------|---------|
| PTY80N06 | TO-263  | PTY80N06 | 13inch    | 800PCS | 6400PCS |
|          |         |          | /         | 50PCS  | 5000PCS |

**Absolute Maximum Ratings**

| Symbol                                          | Parameter                                      |          | Rating     | Unit |
|-------------------------------------------------|------------------------------------------------|----------|------------|------|
| Common Ratings (TC=25°C Unless Otherwise Noted) |                                                |          |            |      |
| V <sub>(BR)DSS</sub>                            | Drain-Source Breakdown Voltage                 |          | 60         | V    |
| V <sub>GS</sub>                                 | Gate-Source Voltage                            |          | ±25        | 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               | TC =25°C | 100        | A    |
| Mounted on Large Heat Sink                      |                                                |          |            |      |
| E <sub>AS</sub>                                 | Single Pulse Avalanche Energy (Note1)          |          | 242        | mJ   |
| I <sub>DM</sub>                                 | Pulse Drain Current Tested (Note2)             | TC =25°C | 320        | A    |
| I <sub>D</sub>                                  | Continuous Drain current                       | TC =25°C | 80         | A    |
| P <sub>D</sub>                                  | Maximum Power Dissipation                      | TC =25°C | 125        | W    |
| R <sub>θJc</sub>                                | Thermal Resistance Junction-to-Case            |          | 1          | °C/W |
| R <sub>θJA</sub>                                | Thermal Resistance Junction-to-Ambient (Note3) |          | 62.5       | °C/W |



## 60V/80A 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                | 60   | --   | --   | V    |
| I <sub>DSS</sub>                                                                 | Zero Gate Voltage Drain current          | VDS=60V,VGS=0V                 | --   | --   | 1    | μA   |
| I <sub>GSS</sub>                                                                 | Gate-Body Leakage Current                | VGS=±25V,VDS=0V                | --   | --   | ±100 | nA   |
| V <sub>GS(TH)</sub>                                                              | Gate Threshold Voltage                   | VDS=VGS,ID=250μA               | 2    | 3    | 4    | V    |
| R <sub>DS(ON)</sub>                                                              | Drain-Source On-State Resistance (Note4) | VGS=10V, ID=40A                | --   | 5.8  | 8    | mΩ   |
| Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated) (Note5) |                                          |                                |      |      |      |      |
| C <sub>iss</sub>                                                                 | Input Capacitance                        | VDS=25V,<br>VGS=0V,<br>F=1MHz  | --   | 3970 | --   | pF   |
| C <sub>oss</sub>                                                                 | Output Capacitance                       |                                | --   | 365  | --   | pF   |
| C <sub>rss</sub>                                                                 | Reverse Transfer Capacitance             |                                | --   | 257  | --   | pF   |
| Q <sub>g</sub>                                                                   | Total Gate Charge                        | VDS=48V<br>ID=40A<br>VGS=10V   | --   | 91   | --   | nC   |
| Q <sub>gs</sub>                                                                  | Gate-Source Charge                       |                                | --   | 19   | --   | nC   |
| Q <sub>gd</sub>                                                                  | Gate-Drain Charge                        |                                | --   | 30   | --   | nC   |
| Switching Characteristics (Note5)                                                |                                          |                                |      |      |      |      |
| t <sub>d(on)</sub>                                                               | Turn-on Delay Time                       | VDD=34V,<br>ID=40A,<br>VGS=10V | --   | 57   | --   | nS   |
| t <sub>r</sub>                                                                   | Turn-on Rise Time                        |                                | --   | 63   | --   | nS   |
| t <sub>d(off)</sub>                                                              | Turn-off Delay Time                      |                                | --   | 139  | --   | nS   |
| t <sub>f</sub>                                                                   | Turn-off Fall Time                       |                                | --   | 50   | --   | nS   |
| Source- Drain Diode Characteristics@ TJ = 25°C (unless otherwise stated)         |                                          |                                |      |      |      |      |
| V <sub>SD</sub>                                                                  | Forward on voltage                       | IS=40A,VGS=0V                  | --   | --   | 1.3  | V    |

Note:

- Limited by TJmax, starting TJ = 25° C, RG = 25Ω, VD =30V, VGS =10V. Part not recommended for use above this value.
- Repetitive Rating: Pulse width limited by maximum junction temperature.
- Surface Mounted on FR4 Board, t ≤ 10 sec.
- Pulse Test: pulse width ≤ 300 us, duty cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.



## 60V/80A N-Channel Advanced Power MOSFET

### Typical Characteristics

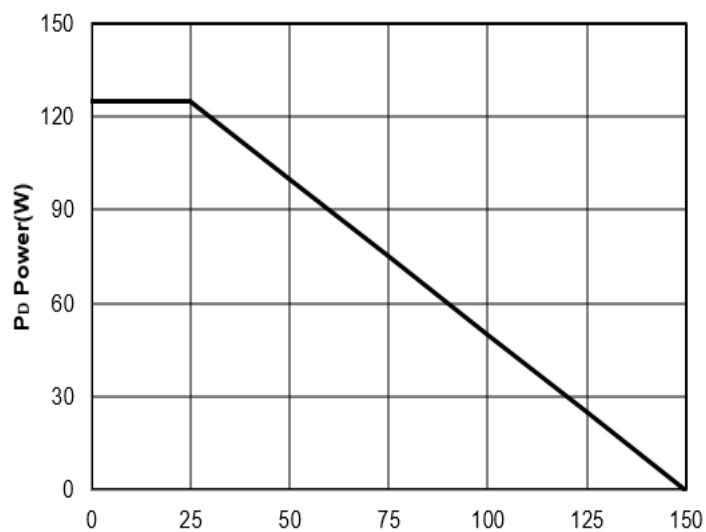


Figure1: T<sub>J</sub> Junction Temperature (°C)

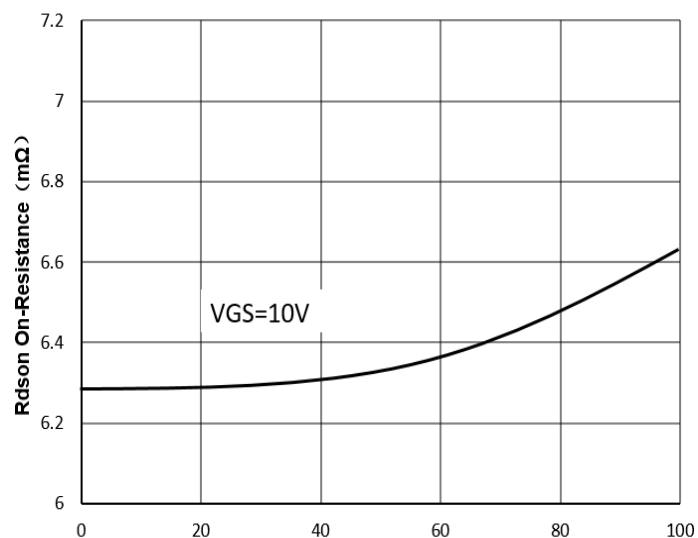


Figure2: I<sub>D</sub> Drain Current (A)

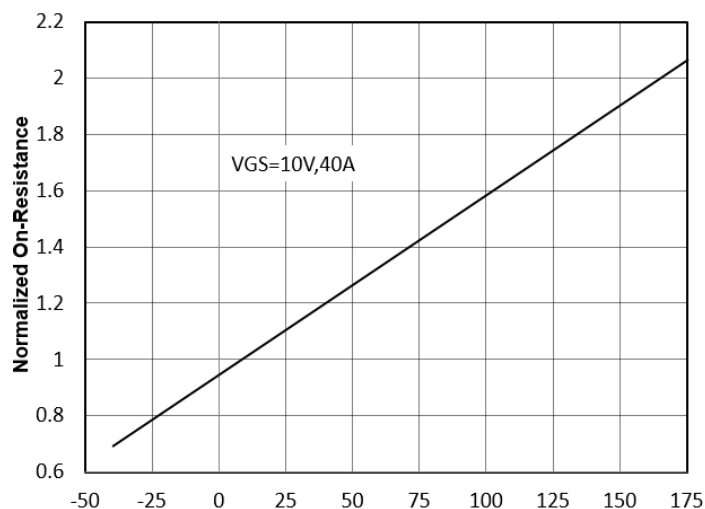


Figure3: T<sub>J</sub> Junction Temperature (°C)

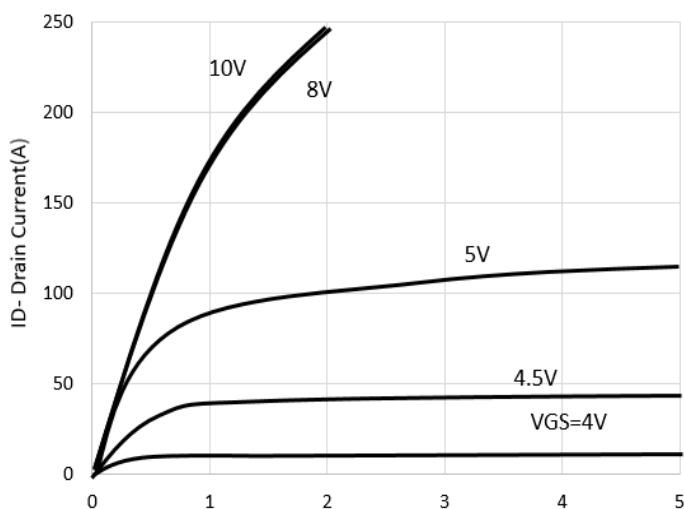


Figure4: V<sub>DS</sub> Drain-Source Voltage (V)

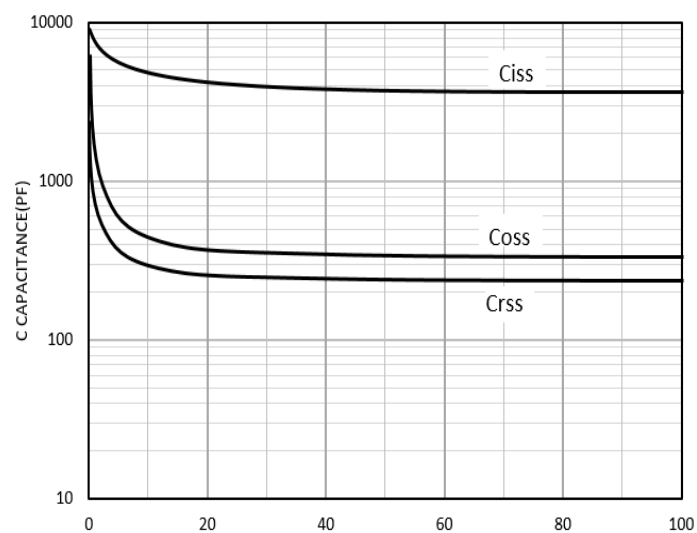


Figure5: V<sub>DS</sub> Drain-Source Voltage (V)

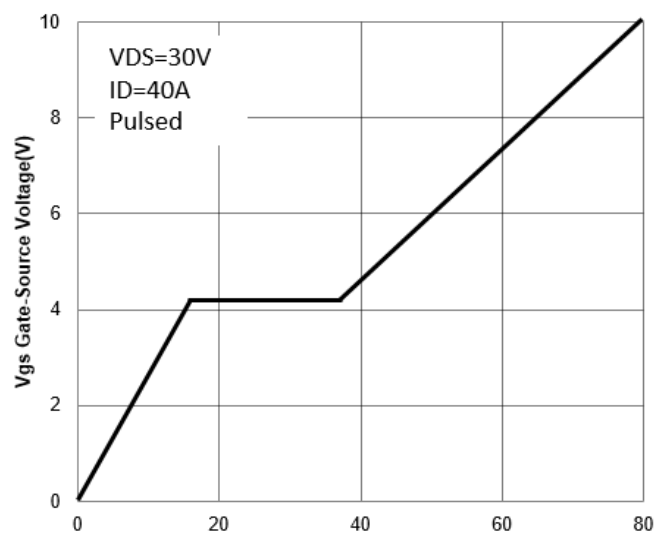


Figure6: Q<sub>g</sub> Gate Charge (nC)



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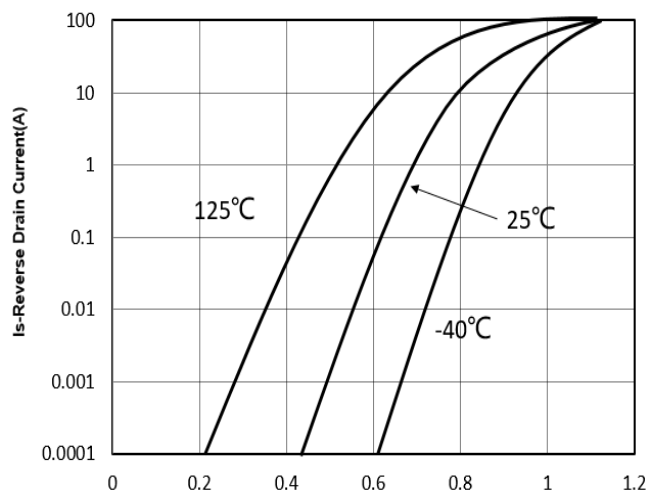


Figure7: Vsd Source-Drain Voltage (V)

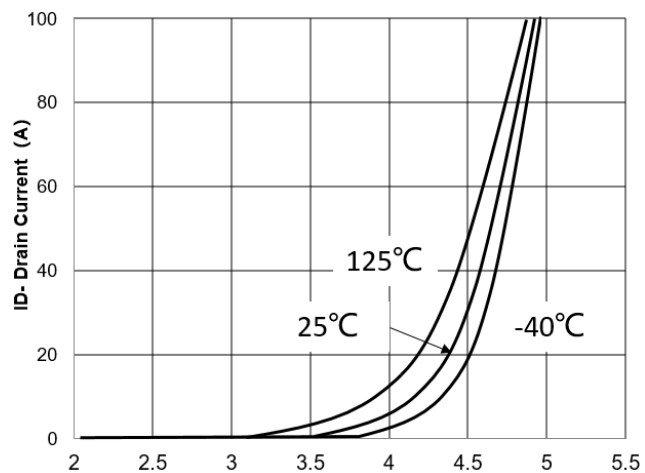


Figure8: Vgs Gate-Source Voltage (V)

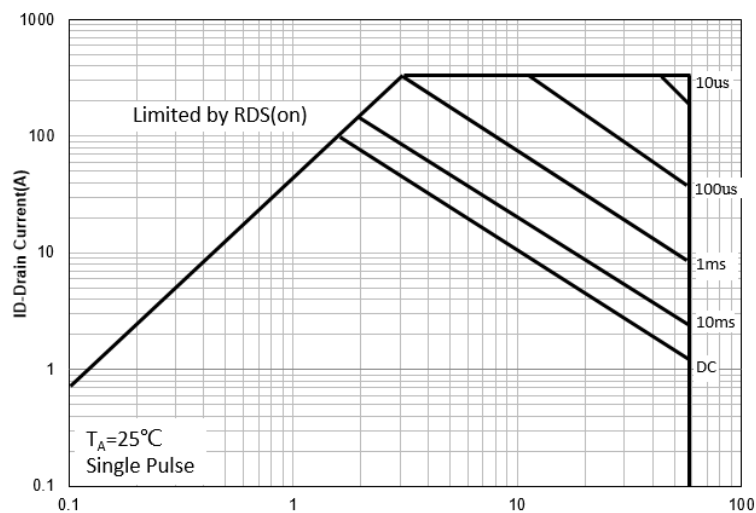


Figure9: VDS Drain -Source Voltage (V)

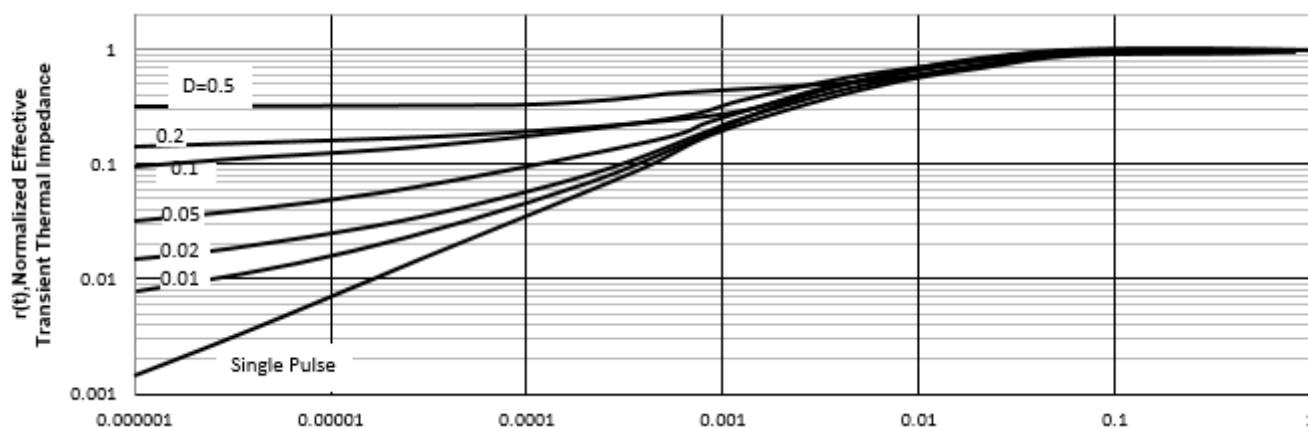
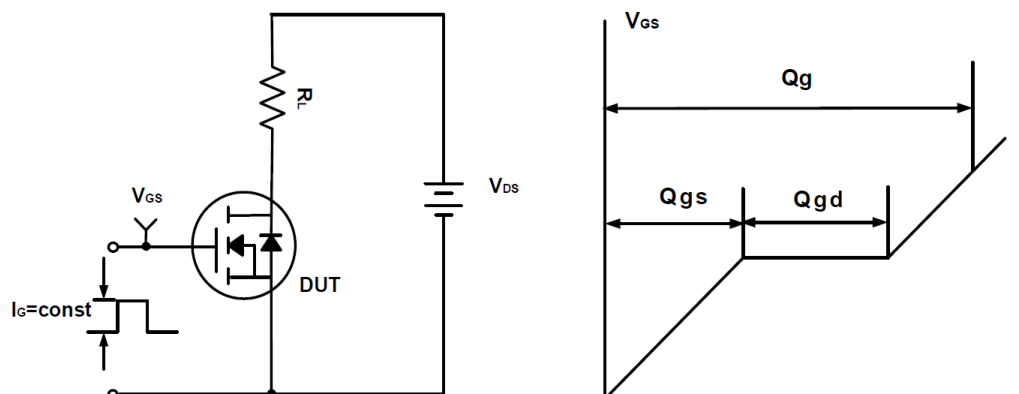
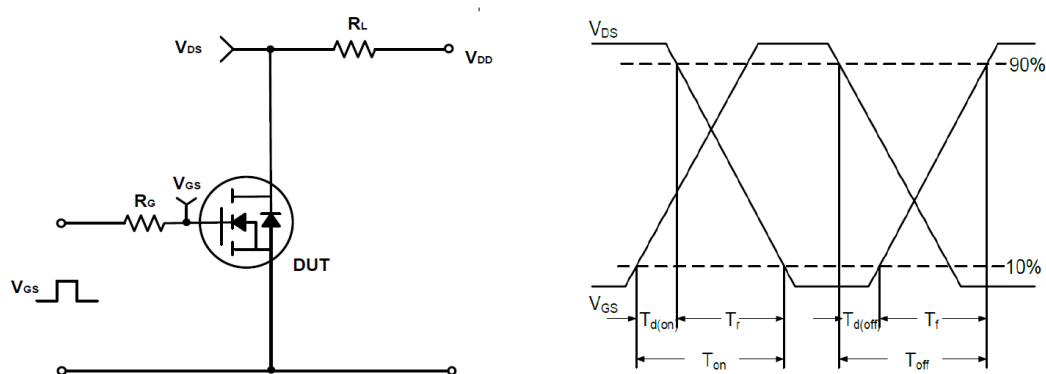
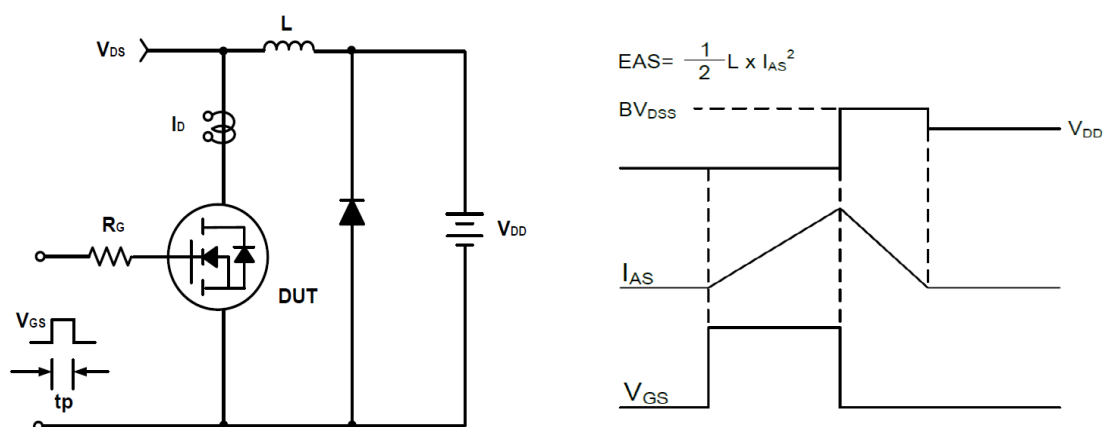
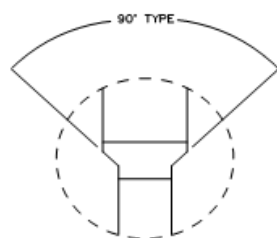
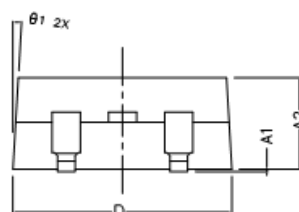


Figure10: Square Wave Pulse Duration (sec)

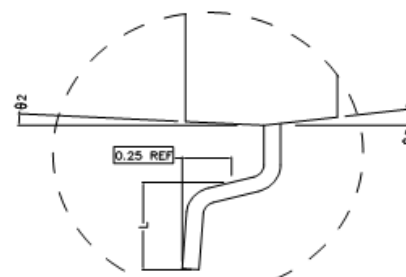
**60V/80A N-Channel Advanced Power MOSFET****Test Circuit and Waveform:****Figure A Gate Charge Test Circuit & Waveforms****Figure B Switching Test Circuit & Waveforms****Figure C Unclamped Inductive Switching Circuit & Waveforms**

**60V/80A N-Channel Advanced Power MOSFET****TO-263 Package Outline Dimensions (Units: mm)**

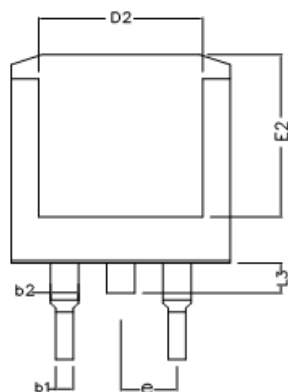
DETAIL F



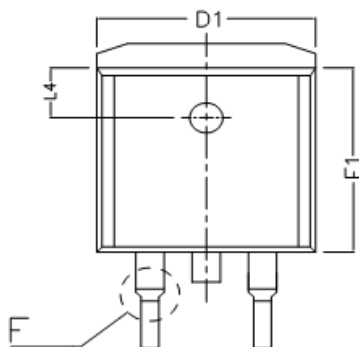
SIDE VIEW



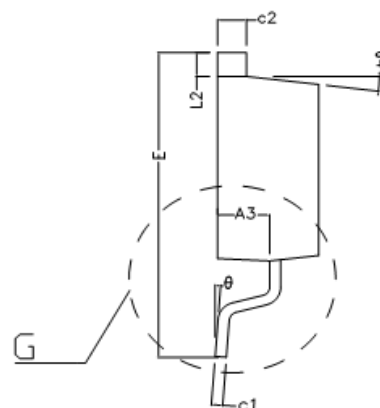
DETAIL G



BOTTOM VIEW



TOP VIEW



SIDE VIEW

| COMMON DIMENSIONS<br>(UNITS OF MEASURE IS mm) |           |        |        |
|-----------------------------------------------|-----------|--------|--------|
|                                               | MIN       | NORMAL | MAX    |
| A1                                            | 0.020     | 0.100  | 0.200  |
| A2                                            | 4.470     | 4.570  | 4.670  |
| A3                                            | 2.300     | 2.350  | 2.400  |
| b1                                            | 0.750     | 0.800  | 0.850  |
| b2                                            | 1.220     | 1.270  | 1.320  |
| c1                                            | 0.450     | 0.500  | 0.550  |
| c2                                            | 1.250     | 1.300  | 1.350  |
| D                                             | 9.900     | 10.000 | 10.100 |
| D1                                            | 9.880REF  |        |        |
| D2                                            | 7.400REF  |        |        |
| E                                             | 14.900    | 15.100 | 15.300 |
| E1                                            | 9.000     | 9.100  | 9.200  |
| E2                                            | 8.100REF  |        |        |
| e                                             | 2.540TYPE |        |        |
| L                                             | 2.100     | 2.300  | 2.500  |
| L2                                            | 1.100     | 1.200  | 1.300  |
| L3                                            | 1.300     | 1.500  | 1.700  |
| L4                                            | 2.50 TYPE |        |        |
| theta1                                        | 3° TYPE   |        |        |
| theta2                                        | 3° TYPE   |        |        |
| theta3                                        | 7° TYPE   |        |        |
| theta4                                        | 7° TYPE   |        |        |
| theta                                         | 0 ~ 8°    |        |        |