

General Description

The MY65T180PT is silicon N-channel Enhanced VDMOSFETs, obtained by the self-aligned planar Technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy.

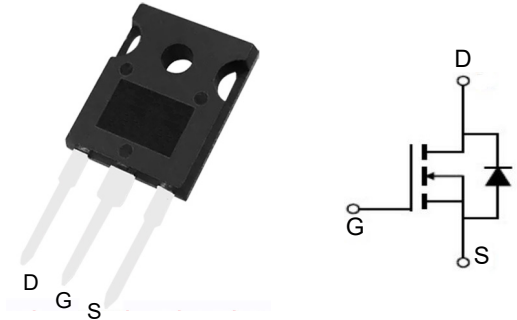


Features

| | | |
|--|------|----------|
| V_{DSS} | 650 | V |
| I_D | 20 | A |
| $P_D(T_C=25\text{ }^\circ\text{C})$ | 416 | W |
| $R_{DS(ON)}(\text{at } V_{GS} = 10\text{V})$ | 0.27 | Ω |

Application

- Fast Switching
- Low ON Resistance
- Low Gate Charge
- Power factor correction



Package Marking and Ordering Information

| Product ID | Pack | Marking | Qty(PCS) |
|------------|--------|------------|----------|
| MY65T180PT | TO-247 | MY65T180PT | 600 |

Absolute Maximum Ratings ($T_C=25\text{ }^\circ\text{C}$ unless otherwise noted)

| Symbol | Parameter | Max. | Units |
|-----------------|---|-----------------------------------|--------------------|
| V_{DSS} | Drain-Source Voltage | 650 | V |
| V_{GSS} | Gate-Source Voltage | ± 30 | V |
| I_D | Continuous Drain Current | $T_C = 25\text{ }^\circ\text{C}$ | 20 |
| | | $T_C = 100\text{ }^\circ\text{C}$ | 13 |
| I_{DM} | Pulsed Drain Current ^{note1} | 80 | A |
| E_{AS} | Single Pulsed Avalanche Energy ^{note2} | 1350 | mJ |
| P_D | Power Dissipation | $T_C = 25\text{ }^\circ\text{C}$ | 416 |
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case | 0.3 | $^\circ\text{C/W}$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 60 | $^\circ\text{C/W}$ |
| T_J, T_{STG} | Operating and Storage Temperature Range | -55 to +150 | $^\circ\text{C}$ |

Electrical Characteristics (T_c=25 °C, unless otherwise noted)

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Units |
|---|--|---|------|------|------|-------|
| Off Characteristic | | | | | | |
| V _{(BR)DSS} | Drain-Source Breakdown Voltage | V _{GS} =0V, I _D =250μA | 650 | - | - | V |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} = 600V, V _{GS} = 0V, T _J = 25°C | - | - | 1 | μA |
| I _{GSS} | Gate to Body Leakage Current | V _{DS} =0V, V _{GS} = ±30V | - | - | ±100 | nA |
| On Characteristics | | | | | | |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} = V _{GS} , I _D =250μA | 2 | 3 | 4 | V |
| R _{DS(on)} | Static Drain-Source on-Resistance note3 | V _{GS} =10V, I _D =10A | - | 0.27 | 0.45 | Ω |
| Dynamic Characteristics | | | | | | |
| C _{iss} | Input Capacitance | V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz | - | 2980 | - | pF |
| C _{oss} | Output Capacitance | | - | 291 | - | pF |
| C _{rss} | Reverse Transfer Capacitance | | - | 40 | - | pF |
| Q _g | Total Gate Charge | V _{DD} = 480V, I _D = 20A, V _{GS} = 10V | - | 80 | - | nC |
| Q _{gs} | Gate-Source Charge | | - | 12 | - | nC |
| Q _{gd} | Gate-Drain("Miller") Charge | | - | 34 | - | nC |
| Switching Characteristics | | | | | | |
| t _{d(on)} | Turn-on Delay Time | V _{DD} = 250V, I _D =20A, R _G = 25Ω | - | 37 | - | ns |
| t _r | Turn-on Rise Time | | - | 66 | - | ns |
| t _{d(off)} | Turn-off Delay Time | | - | 175 | - | ns |
| t _f | Turn-off Fall Time | | - | 84 | - | ns |
| Drain-Source Diode Characteristics and Maximum Ratings | | | | | | |
| I _S | Maximum Continuous Drain to Source Diode Forward Current | | - | - | 20 | A |
| I _{SM} | Maximum Pulsed Drain to Source Diode Forward Current | | - | - | 80 | A |
| V _{SD} | Drain to Source Diode Forward Voltage | V _{GS} = 0V, I _{SD} = 20A | - | - | 1.4 | V |
| t _{rr} | Reverse Recovery Time | V _{GS} =0V, I _S =20A, di/dt=100A/μs | - | 450 | - | ns |
| Q _{rr} | Reverse Recovery Charge | | - | 7.1 | - | μC |

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. I_{AS} =16A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J= 25°C

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤1%

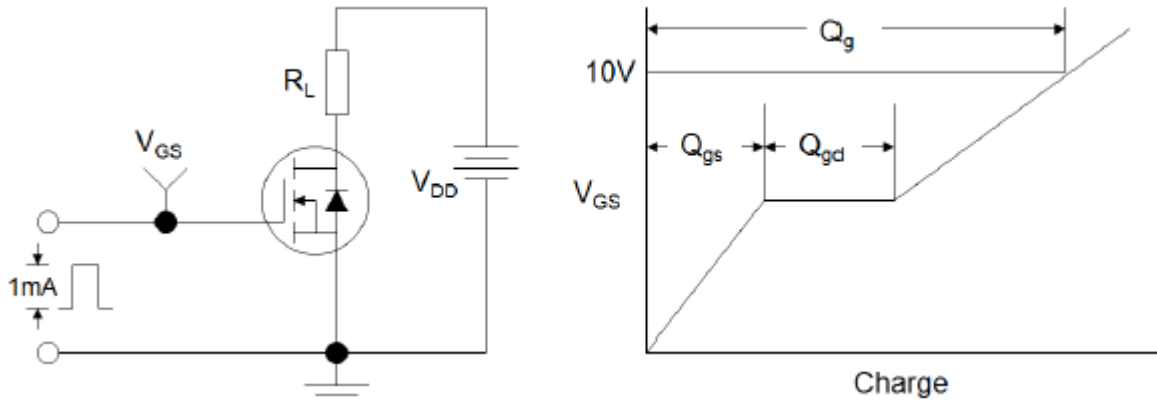


Figure1:Gate Charge Test Circuit & Waveform

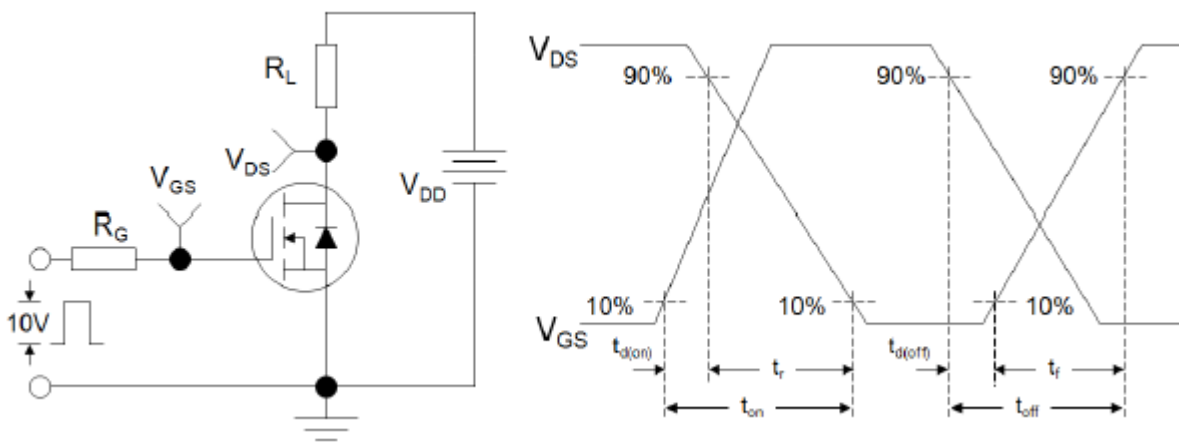


Figure 2: Resistive Switching Test Circuit & Waveforms

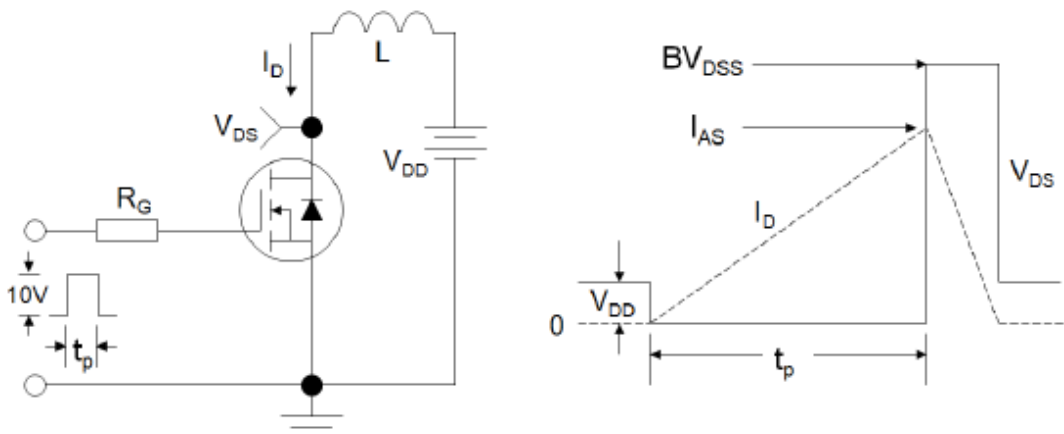
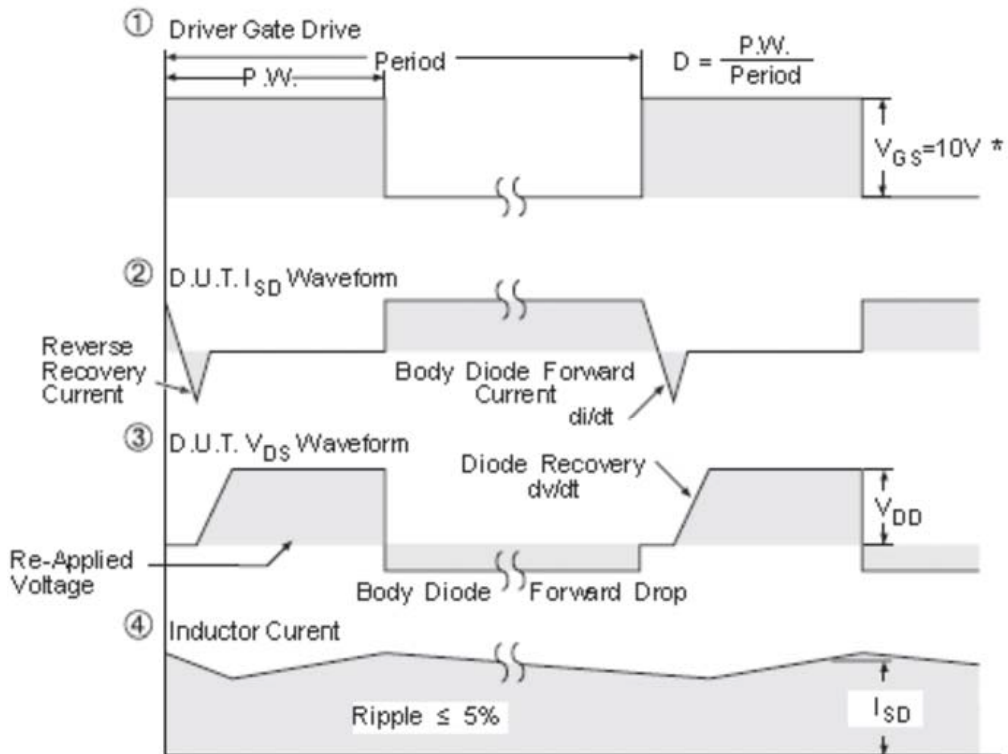
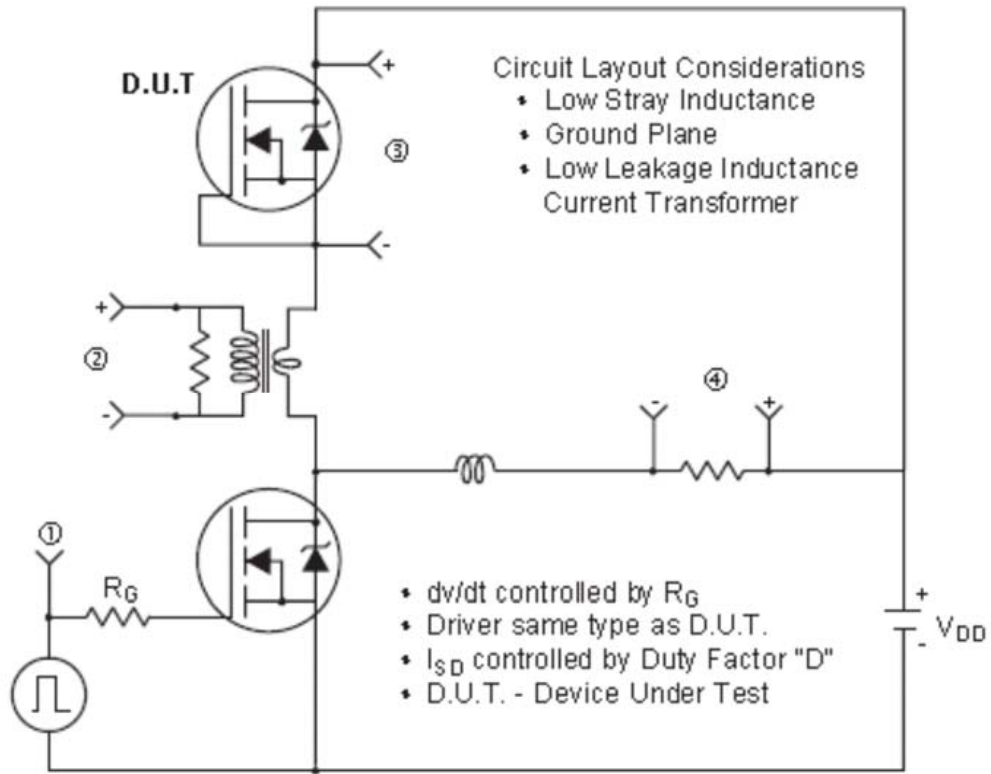


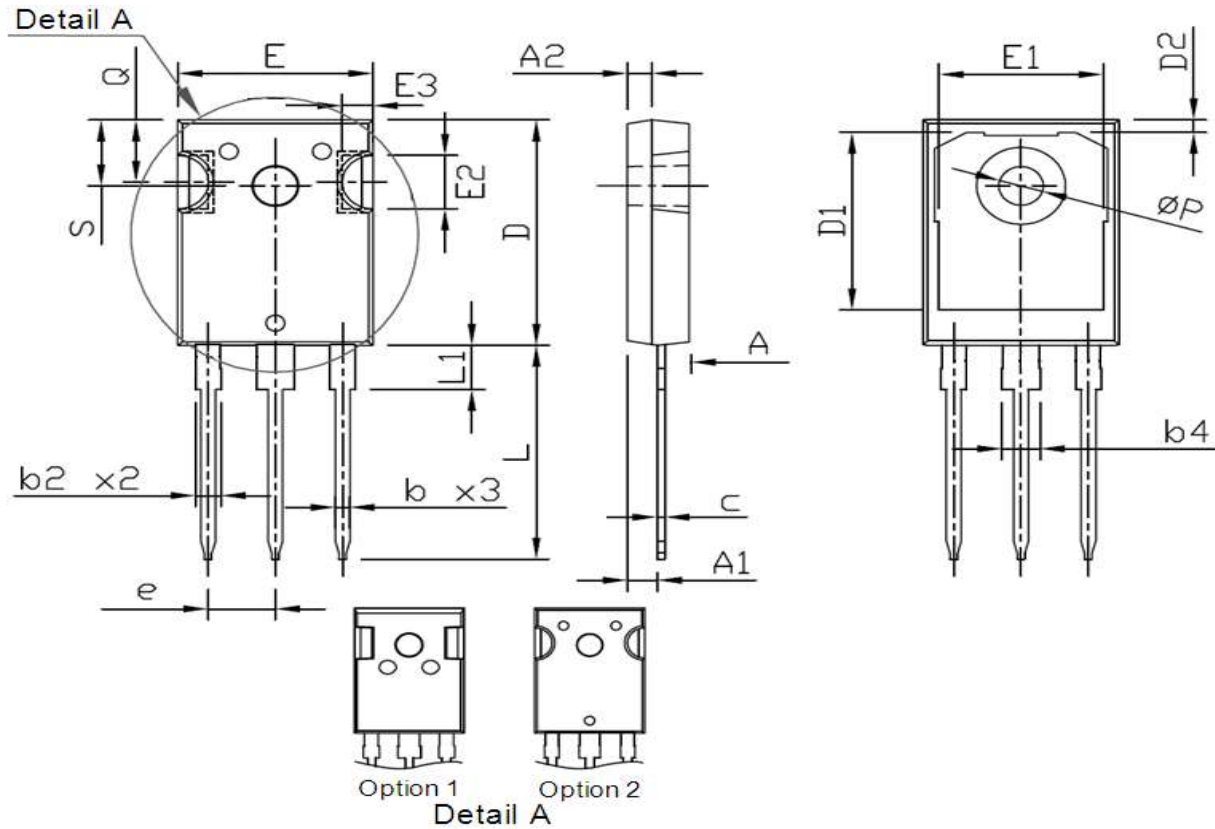
Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms



* $V_{GS} = 5V$ for Logic Level Devices

Figure 4: Peak Diode Recovery dv/dt Test Circuit & Waveforms (For N-channel)

Package Mechanical Data-TO-247 Single



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 4.70 | 5.30 | 0.185 | 0.209 |
| A1 | 2.20 | 2.60 | 0.087 | 0.102 |
| A2 | 1.50 | 2.49 | 0.059 | 0.098 |
| b | 1.04 | 1.33 | 0.041 | 0.052 |
| b2 | 1.90 | 2.41 | 0.075 | 0.095 |
| b4 | 2.87 | 3.43 | 0.113 | 0.135 |
| c | 0.55 | 0.70 | 0.022 | 0.028 |
| D | 20.70 | 21.30 | 0.815 | 0.839 |
| D1 | 16.25 | 17.65 | 0.640 | 0.695 |
| D2 | 0.51 | 1.40 | 0.020 | 0.055 |
| e | 5.44 BSC. | | 0.214 BSC. | |
| E | 15.50 | 16.30 | 0.610 | 0.642 |
| E1 | 13.08 | 14.16 | 0.515 | 0.557 |
| E2 | 3.80 | 5.49 | 0.150 | 0.216 |
| E3 | 1.00 | 2.75 | 0.039 | 0.108 |
| L | 19.72 | 20.32 | 0.776 | 0.800 |
| L1 | 3.85 | 4.50 | 0.152 | 0.177 |
| Q | 5.25 | 6.25 | 0.207 | 0.246 |
| P | 3.50 | 3.70 | 0.138 | 0.146 |
| S | 6.04 | 6.30 | 0.238 | 0.248 |