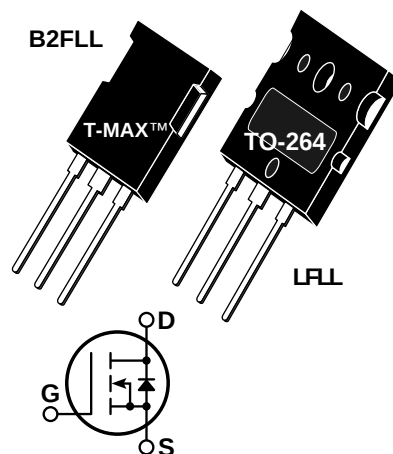


**POWER MOS 7™**
**FREDFET**

Power MOS 7™ is a new generation of low loss, high voltage, N-Channel enhancement mode power MOSFETS. Both conduction and switching losses are addressed with Power MOS 7™ by significantly lowering  $R_{DS(ON)}$  and  $Q_g$ . Power MOS 7™ combines lower conduction and switching losses along with exceptionally fast switching speeds inherent with APT's patented metal gate structure.

- Lower Input Capacitance
- Lower Miller Capacitance
- Lower Gate Charge,  $Q_g$
- Increased Power Dissipation
- Easier To Drive
- Popular T-MAX™ or TO-264 Package
- **FAST RECOVERY BODY DIODE**


**MAXIMUM RATINGS**

All Ratings:  $T_C = 25^\circ\text{C}$  unless otherwise specified.

| Symbol         | Parameter                                                      | APT55M85   | UNIT                |
|----------------|----------------------------------------------------------------|------------|---------------------|
| $V_{DSS}$      | Drain-Source Voltage                                           | 550        | Volts               |
| $I_D$          | Continuous Drain Current @ $T_C = 25^\circ\text{C}$            | 59         | Amps                |
| $I_{DM}$       | Pulsed Drain Current <sup>①</sup>                              | 236        |                     |
| $V_{GS}$       | Gate-Source Voltage Continuous                                 | $\pm 30$   | Volts               |
| $V_{GSM}$      | Gate-Source Voltage Transient                                  | $\pm 40$   |                     |
| $P_D$          | Total Power Dissipation @ $T_C = 25^\circ\text{C}$             | 694        | Watts               |
|                | Linear Derating Factor                                         | 5.56       | W/ $^\circ\text{C}$ |
| $T_J, T_{STG}$ | Operating and Storage Junction Temperature Range               | -55 to 150 | $^\circ\text{C}$    |
| $T_L$          | Lead Temperature: 0.063" from Case for 10 Sec.                 | 300        |                     |
| $I_{AR}$       | Avalanche Current <sup>①</sup> (Repetitive and Non-Repetitive) | 59         | Amps                |
| $E_{AR}$       | Repetitive Avalanche Energy <sup>①</sup>                       | 50         | mJ                  |
| $E_{AS}$       | Single Pulse Avalanche Energy <sup>④</sup>                     | 3000       |                     |

**STATIC ELECTRICAL CHARACTERISTICS**

| Symbol       | Characteristic / Test Conditions                                                                   | MIN | TYP | MAX       | UNIT    |
|--------------|----------------------------------------------------------------------------------------------------|-----|-----|-----------|---------|
| $BV_{DSS}$   | Drain-Source Breakdown Voltage ( $V_{GS} = 0V, I_D = 250\mu A$ )                                   | 550 |     |           | Volts   |
| $I_{D(on)}$  | On State Drain Current <sup>②</sup> ( $V_{DS} > I_{D(on)} \times R_{DS(on)}$ Max, $V_{GS} = 10V$ ) | 59  |     |           | Amps    |
| $R_{DS(on)}$ | Drain-Source On-State Resistance <sup>②</sup> ( $V_{GS} = 10V, 0.5 I_{D(Cont.)}$ )                 |     |     | 0.085     | Ohms    |
| $I_{DSS}$    | Zero Gate Voltage Drain Current ( $V_{DS} = V_{DSS}, V_{GS} = 0V$ )                                |     |     | 250       | $\mu A$ |
|              | Zero Gate Voltage Drain Current ( $V_{DS} = 0.8 V_{DSS}, V_{GS} = 0V, T_C = 125^\circ\text{C}$ )   |     |     | 1000      |         |
| $I_{GSS}$    | Gate-Source Leakage Current ( $V_{GS} = \pm 30V, V_{DS} = 0V$ )                                    |     |     | $\pm 100$ | nA      |
| $V_{GS(th)}$ | Gate Threshold Voltage ( $V_{DS} = V_{GS}, I_D = 2.5mA$ )                                          | 3   |     | 5         | Volts   |

 **CAUTION:** These Devices are Sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed.

# DYNAMIC CHARACTERISTICS

# APT55M85 B2FLL - LFLL

| Symbol              | Characteristic                 | Test Conditions                                                                                                                            | MIN | TYP  | MAX | UNIT |
|---------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-----|------|-----|------|
| C <sub>iss</sub>    | Input Capacitance              | V <sub>GS</sub> = 0V<br>V <sub>DS</sub> = 25V<br>f = 1 MHz                                                                                 |     | 6850 |     | pF   |
| C <sub>oss</sub>    | Output Capacitance             |                                                                                                                                            |     | 1320 |     |      |
| C <sub>rss</sub>    | Reverse Transfer Capacitance   |                                                                                                                                            |     | 92   |     |      |
| Q <sub>g</sub>      | Total Gate Charge <sup>③</sup> | V <sub>GS</sub> = 10V<br>V <sub>DD</sub> = 0.5 V <sub>DSS</sub><br>I <sub>D</sub> = I <sub>D</sub> [Cont.] @ 25°C                          |     | 164  |     | nC   |
| Q <sub>gs</sub>     | Gate-Source Charge             |                                                                                                                                            |     | 41   |     |      |
| Q <sub>gd</sub>     | Gate-Drain ("Miller") Charge   |                                                                                                                                            |     | 74   |     |      |
| t <sub>d(on)</sub>  | Turn-on Delay Time             | V <sub>GS</sub> = 15V<br>V <sub>DD</sub> = 0.5 V <sub>DSS</sub><br>I <sub>D</sub> = I <sub>D</sub> [Cont.] @ 25°C<br>R <sub>G</sub> = 0.6Ω |     | 19   |     | ns   |
| t <sub>r</sub>      | Rise Time                      |                                                                                                                                            |     | 14   |     |      |
| t <sub>d(off)</sub> | Turn-off Delay Time            |                                                                                                                                            |     | 41   |     |      |
| t <sub>f</sub>      | Fall Time                      |                                                                                                                                            |     | 6    |     |      |

# SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

| Symbol           | Characteristic / Test Conditions                                                                    | MIN                    | TYP | MAX | UNIT  |
|------------------|-----------------------------------------------------------------------------------------------------|------------------------|-----|-----|-------|
| I <sub>S</sub>   | Continuous Source Current (Body Diode)                                                              |                        |     | 59  | Amps  |
| I <sub>SM</sub>  | Pulsed Source Current <sup>①</sup> (Body Diode)                                                     |                        |     | 236 |       |
| V <sub>SD</sub>  | Diode Forward Voltage <sup>②</sup> (V <sub>GS</sub> = 0V, I <sub>S</sub> = -I <sub>D</sub> [Cont.]) |                        |     | 1.3 | Volts |
| dv/dt            | Peak Diode Recovery dv/dt <sup>⑤</sup>                                                              |                        |     | 15  | V/ns  |
| t <sub>rr</sub>  | Reverse Recovery Time<br>(I <sub>S</sub> = -I <sub>D</sub> [Cont.], di/dt = 100A/μs)                | T <sub>j</sub> = 25°C  |     | 270 | ns    |
|                  |                                                                                                     | T <sub>j</sub> = 125°C |     | 540 |       |
| Q <sub>rr</sub>  | Reverse Recovery Charge<br>(I <sub>S</sub> = -I <sub>D</sub> [Cont.], di/dt = 100A/μs)              | T <sub>j</sub> = 25°C  | 1.8 |     | μC    |
|                  |                                                                                                     | T <sub>j</sub> = 125°C | 6.2 |     |       |
| I <sub>RRM</sub> | Peak Recovery Current<br>(I <sub>S</sub> = -I <sub>D</sub> [Cont.], di/dt = 100A/μs)                | T <sub>j</sub> = 25°C  | 16  |     | Amps  |
|                  |                                                                                                     | T <sub>j</sub> = 125°C | 29  |     |       |

# THERMAL CHARACTERISTICS

| Symbol           | Characteristic      | MIN | TYP | MAX  | UNIT |
|------------------|---------------------|-----|-----|------|------|
| R <sub>θJC</sub> | Junction to Case    |     |     | 0.18 | °C/W |
| R <sub>θJA</sub> | Junction to Ambient |     |     | 40   |      |

① Repetitive Rating: Pulse width limited by maximum junction temperature.

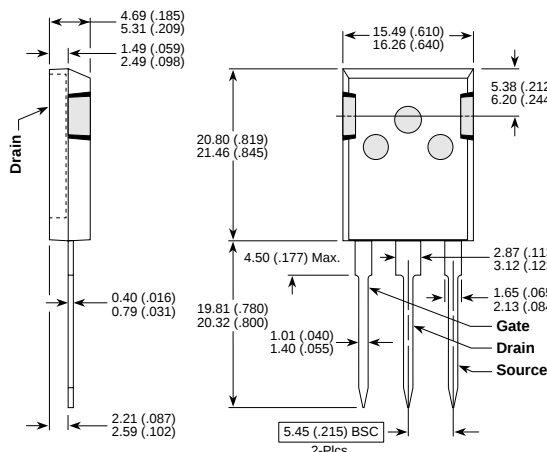
③ See MIL-STD-750 Method 3471

② Pulse Test: Pulse width < 380 μs, Duty Cycle < 2%

④ Starting T<sub>j</sub> = +25°C, L = 1.72mH, R<sub>G</sub> = 25Ω, Peak I<sub>L</sub> = 59A

APT Reserves the right to change, without notice, the specifications and information contained herein.

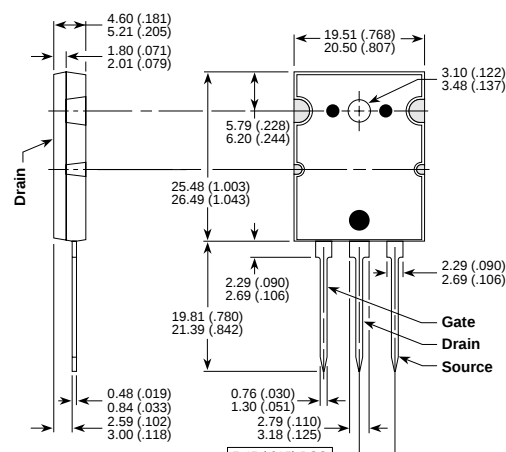
## T-MAX™ (B2) Package Outline



These dimensions are equal to the TO-247 without the mounting hole.

Dimensions in Millimeters and (Inches)

## TO-264 (L) Package Outline



Dimensions in Millimeters and (Inches)

APT's devices are covered by one or more of the following U.S.patents: 4,895,810 5,045,903 5,089,434 5,182,234 5,019,522 5,262,336  
5,256,583 4,748,103 5,283,202 5,231,474 5,434,095 5,528,058